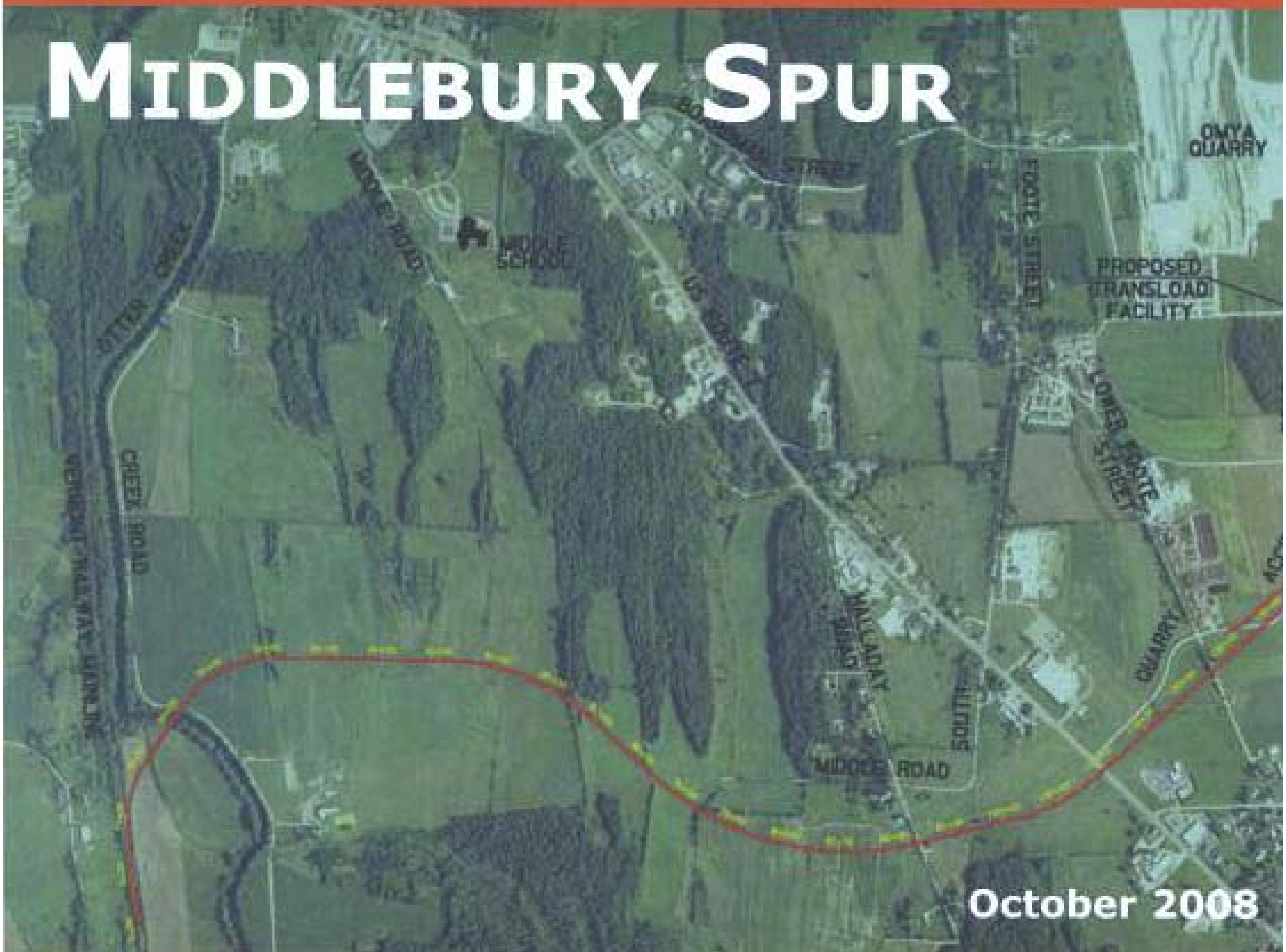
FINAL ENVIRONMENTAL IMPACT STATEMENT

Volume I

MIDDLEBURY SPUR



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U.S. Department of Transportation
Federal Highway Administration

VTrans Working to Get You There

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MIDDLEBURY SPUR PROJECT

MIDDLEBURY
ADDISON COUNTY, VERMONT

Final Environmental Impact Statement

Prepared pursuant to 42 U.S.C. 4332(2)(c) and 49 U.S.C. 303
by the
U.S. Department of Transportation, Federal Highway Administration
and
Vermont Agency of Transportation

Cooperating Agencies:
Federal Railroad Administration
Surface Transportation Board
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

Abstract: This statement concerns the potential environmental impacts associated with proposed improvements to the freight transportation system in the Town of Middlebury, Addison County, Vermont. The project will affect freight transportation along US Route 7, local roads, and the mainline railroad from Middlebury to Pittsford, Rutland County, Vermont. Material from a marble quarry in Middlebury is presently trucked on US 7 and local roads, passing through historic Brandon Village, to a processing plant in Pittsford, 23 miles south of the quarry. US Route 7 is the major south-north highway in the western part of the state, and has a relatively high percentage of trucks. In historic Brandon Village, this has resulted in concerns over pedestrian safety, access to businesses and side streets, effects on historic buildings, and aesthetics. A railroad owned by the State of Vermont roughly parallels US 7 in this area, and is considered under-utilized. The purpose of the project is to provide for the safe and efficient transportation of freight to and from Middlebury by providing better access to the rail system and removing freight trucks from the roadway system. The EIS evaluates the impacts of the No-Build, two build alternatives, and five options associated with the build alternatives. The EIS identifies rail spur Alternative RS-1 with a grade separated crossing over Halladay Road and a roadway bridge at Lower Foote Street as the preferred alternative. Comments on this statement may be sent to the parties listed below, by December 23, 2008.

10/8/08	David C Dill
Date of Approval	For Vermont Agency of Transportation
10-8-08	Kenneth R Sikora Jr
Date of Approval	For Federal Highway Administration

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Executive Summary

A Summary of Changes from the DEIS

The Final Environmental Impact Statement incorporates a number of changes from the Draft Environmental Impact Statement. These changes are based upon changes that have occurred to the resources being affected (for example, the construction of a subdivision west of Halladay Road); regulatory changes that have occurred since the DEIS was published (for example, changes to the National Air Quality Standards); changes to alternatives, impacts, or mitigation based on comments received after publication of the DEIS; and corrections of fact. Changes by Chapter are outlined below:

Chapter 1 Project Background Purpose and Need
- No substantive changes

Chapter 2 Alternatives
- Modifications to the proposed RS-1 alignment and transload facility location are described.
- The grades of the DEIS RS-1 Halladay Road options have been included.
- The results of additional screening of the RS-1 Halladay Road options has been added, with information on the wetland, farmland, and material (cut and fill) impacts of each of these options.
- Cost information has been updated to reflect current construction costs as of 2008.

Chapter 3 Affected Environment
- Figure 3.2-1, showing town zoning districts, has been updated.
- More information is provided regarding the Town Plan elements addressing the proposed rail spur.
- Miscellaneous revisions relating to changes in the corridor such as the South Ridge Subdivision and Connor Homes.
- EPA Air Quality Standards that were updated after the publication of the DEIS (Table 3.4-1) have been added.
- The “Highest Measured Ambient Air Quality Data” was updated from 2005 data to 2007 data (Table 3.4-2).
- Updated wildlife observations are described in Section 3.6.3.2.
- Information on historical marble and slate quarries was added to Section 3.7.1.
- Information of the National Wild and Scenic Act Rivers Inventory was added to Section 3.9.2.1.
- Wetland descriptions were changed to reflect refinements to the wetland delineation (Section 3.10.2). Information on reed canarygrass was added to the discussion of invasive species in wetlands (Section 3.10.3).

- The archaeology section was updated to include the results of the archaeological study that was conducted after the publication of the DEIS (Section 3.11.2.2).

Chapter 4 Environmental Consequences

- The text and impact tables have been updated to reflect changes in the proposed RS-1 alignment, Halladay Road options, and trestle structure options.
- The text has been modified where appropriate to reflect land use changes west of Halladay Road (South Ridge Subdivision), at the former Standard Register Company building on US 7, elsewhere (e.g., change in ownership at Specialty Filaments).
- Floodplain impacts have been updated based on a hydraulic study conducted for the project.
- Refinements made to the wetland mapping have changed impacts to this resource for all the build alternatives.
- Wetland mitigation has been more clearly defined; a preferred site has been identified to compensate for RS-1 impacts, and additional details about the site are provided.
- The archaeological survey has been advanced and details about the next level of survey are provided.
- The FEIS includes a section summarizing measures proposed to mitigate impacts associated with the preferred alternative (Section 4.21).

Chapter 5 Section 4(f)

- Updated regulatory language based on regulatory changes since DEIS.
- Updated archaeological resource descriptions based on Phase I study.

Chapter 6 List of Preparers

- No substantive changes.

Chapter 7 Comments and Coordination

- Added resource agency meetings, public hearing, and Omya meeting to list of meetings.

Chapter 8 Abbreviations, Acronyms, and Symbols

- Minor additions.

Appendices

- Appendix A: Added recent resource agency meeting minutes.
- Appendix D: Added Phase I archaeological study report as Appendix D2 and Process Memorandum of Agreement as Appendix D3.
- Appendix G: Replaced Farmland Conversion Impact Rating form with updated form.
- Appendix I: New appendix with public hearing comments and responses.
- No changes to Appendices B, C, E, F, or H.

Available Technical Reports

- Added Wetland Delineation Report, Halladay Road Option Screening document, and Hydraulic Memorandum to the available technical reports.

B Project Location

The Middlebury Spur project involves the north-south transportation system in west central Vermont from the Town of Middlebury, in Addison County, to the Town of Pittsford, in Rutland County (see Figure 1.1-1 in Volume IIA). The project is generally located in the southern Champlain Valley, beginning in Middlebury, approximately 35 miles south of Burlington, and continuing south to Pittsford, about 10 miles north of Rutland. US Route 7 (US 7) is the major south-north highway in the western part of the state, extending the length of Vermont from the Massachusetts border to the Canadian border to the north. US 7 passes through downtown Middlebury just north of the project area, and continues through Brandon Village to the south. Brandon Village is listed as a Historic District on the National Register of Historic Places and has many historic buildings and narrow streets, with two sharp turns on US 7 near the town center. There is a relatively high percentage of trucks on US 7, resulting in concerns over pedestrian safety, access to businesses and side streets, effects on historic buildings, and aesthetics in Brandon Village.

A railroad owned by the State of Vermont and operated by privately-owned Vermont Railway, Inc. (VTR) roughly parallels US 7 in this area. A marble quarry that is owned and operated by Omya, Inc. is situated southeast of downtown Middlebury, approximately one mile east of US 7. Marble from the quarry is presently shipped to Omya's processing plant 23 miles south of the quarry in an area of the Town of Pittsford known as Florence, about a mile west of Pittsford Village. The truck route from the quarry to the processing plant follows a private access road to US 7, then follows US 7 south through portions of Middlebury, Salisbury, Leicester, Brandon, and Pittsford, and then follows Kendall Hill Road west from US 7 to West Creek Road and the plant.

C Project Overview and History

The Middlebury Spur project follows a series of freight transportation studies spanning over 20 years. In the mid-1980's, the Vermont Agency of Transportation (VTrans) and VTR considered constructing a rail spur from the Northern Maine railroad tracks ("mainline") in Middlebury to Omya, Inc.'s Middlebury quarry. A preliminary alignment was selected and topography mapped, but it was determined that marble shipments would have to increase to make the project economically viable.

Marble shipments from the quarry doubled by 1995, whereupon VTrans engaged a consultant to study alternative means of transporting ore from Middlebury to the plant in Florence. The study included "preliminary qualitative and quantitative assessments of environment impacts."

On April 27, 1998, the Vermont Legislature enacted legislation that led to the development of the *Middlebury Rail Spur Legislative Study* ("Legislative Study") dated January 6, 1999. This study considered the economic and environmental impacts and effects of several alternative means of transporting marble from Omya's Middlebury quarry. The study ultimately recommended three alternatives for additional study; two rail spur routes and one truck to rail alternative.

On October 8, 1998, Omya, VTrans, VTR, the Vermont Agency of Natural Resources (VANR), and the Conservation Law Foundation entered into a Memorandum of Understanding which sought to "…facilitate the timely planning and construction of the most feasible and practicable alternative for shipment of Omya's quarry material, with major consideration given to construction of a rail spur to the Middlebury Quarry."

Omya received a Vermont Act 250 permit on May 25, 1999 which limited the number of trucks Omya was allowed to ship per day to 115 trucks from the Middlebury quarry, which was less than the 170 truck trips per day sought by Omya. The primary basis for this limitation was concerns over the effects of heavy truck traffic in Brandon Village.

All of the alternatives under consideration at that time would likely impact wetlands, and some required river crossings which would require state and federal permitting. In anticipation of permit requirements under Section 404 of the Clean Water Act administered by the US Army Corps of Engineers (ACOE), VTR and Omya further developed the environmental studies in order to determine the Least Environmentally Damaging Practicable Alternative ("LEDPA"). The ACOE subsequently determined that, for the purposes of shipping marble from Omya's Middlebury quarry to its Florence plant, the A-1 or "Western Rail Spur" alternative was the LEDPA.

More recently, it was anticipated that federal funding would be necessary for the project to move forward, and the project would therefore have to comply with the National Environmental Policy Act ("NEPA"). Under NEPA, federal projects which are likely to result in "significant" impacts must have an Environmental Impact Statement (EIS) prepared, including a Draft EIS (DEIS) and Final EIS (FEIS).

D Alternatives Considered

The screening of alternatives involved two steps: first, all possible alternatives were screened for viability to determine whether they could meet basic design criteria, could be effective, and could meet the project purpose and need. The alternatives that passed this physical and operational screening were then screened for resource impacts, based on existing, “macro-level” resource mapping. A preliminary selection was made regarding which alternatives should be considered for detailed study in the EIS. Further study revealed that one of the remaining alternatives would have substantially greater socioeconomic effects than other alternatives and might not be appropriate for further study.

The Preliminary Alternatives considered during the first phases of EIS screening included: Seven rail spur alternatives, seven truck to rail alternatives, five highway bypass alternatives and one conveyor alternative. The preliminary alternatives are described below and shown in Figure 2.2-1 in Volume IIB. (Volume IIA, EIS Figures, includes a location map (Figure 1.1-1) and all figures prepared for the detailed study of the No Build Alternative and Alternatives RS-1 and TR-1. Volume IIB, Screening Figures, includes figures prepared in the screening of preliminary alternatives.)

Rail Spur Alternatives

The rail spur alternatives would begin (at their eastern terminus) at Omya’s marble quarry, and would exit the quarry to either the north or south before turning toward the mainline. Road crossings by the rail spur could be at-grade or grade separated, except at US 7, where a grade separation is assumed. Below are brief descriptions of rail spur alternatives. The configuration of each rail spur alternative can be seen on Figure 2.2-1 and Figures 1, 2, and 3 in FEIS Volume IIB.

<u>Rail Spur Alternative 1 (RS-1)</u>: RS-1 would begin at the Omya quarry where it would head south and then southwest toward US 7, roughly following the current Omya access road. A transload facility would be constructed along the rail spur just south of the quarry to allow other shippers access to the rail spur. The alignment would cross Lower Foote Street about 25 feet below the existing elevation and would therefore sever Lower Foote Street. The alternative would then cross under US 7, passing under a new US 7 vehicular bridge over the rail spur. The alignment would then head west toward the mainline, traversing mostly farmland. It would cross Halladay Road, with the type of crossing (at grade, grade separated, or severing and relocating Halladay Road) to be determined. Toward the western terminus, the alternative would head south, bridging over Creek Road and Otter Creek, and connecting with the mainline heading south. The total length of the alternative would be about 3.3 miles.

<u>Rail Spur Alternative 2 (RS-2)</u>: RS-2 would be identical to RS-1 from the quarry to US 7, including a transload facility just south of the quarry. After crossing under US 7, RS-2 would head south. It would cross Halladay Road, with the type of crossing to be determined. The alternative would head south, west of Halladay Road, traversing forested areas and farmland. After an at-grade crossing of Three Mile Bridge Road, the alternative would head southwest, west of Shard Villa Road. It would continue in a southwest direction and connect with the mainline heading south. The total length of the alternative would be about 5.22 miles.

<u>Rail Spur Alternative 3 (RS-3)</u>: RS-3 would be identical to RS-1 from the quarry to Halladay Road, including a transload facility just south of the quarry. West of Halladay Road, RS-3 would head northwest, traversing mostly farmland until it approaches Middle Road. It would parallel the west side of Middle Road past the Middlebury Union Middle School and then would head west just north of the VTrans maintenance facility. Towards its western terminus, RS-3 would cross Creek Road at grade, pass through town recreational fields, bridge over Otter Creek, and then connect with the mainline heading north. The total length of the alternative would be about 3.84 miles.

<u>Rail Spur Alternative 4 (RS-4)</u>: RS-4 would begin at the Omya quarry where it would head south and then west toward US 7. Any transload facility for RS-4 would likely be identical to that for RS-1. The alignment would cross Foote Street just north of its junction with Lower Foote Street. The alternative would be about 40 feet below the existing elevation and would therefore cut off Foote Street and dead end Lower Foote Street. The alternative would then cross under US 7, utilizing a bridge on US 7. The alignment would then head northwest around a hill and cross over Middle Road just north of the Middle School. After crossing over Middle Road, the alignment would head west, bridge over Otter Creek and then connect with the mainline heading south.

<u>Rail Spur Alternative 5 (RS-5)</u>: RS-5 would begin at the Omya quarry, where it would head north and then northwest, roughly following the old Beldens Rail Line. The alignment would traverse mostly farmland for about two miles northwest of the quarry. It would cross over Quarry Road, where a bridge would be constructed over the roadway. The alignment would then cross Painter Road at grade, Happy Valley Road at grade, and would then cross under US 7, utilizing a bridge on US 7. At the western terminus, RS-5 would connect with the mainline heading north. The location of any required transload facility would be determined during EIS studies. The total length of the alternative would be about 4.08 miles.

<u>Rail Spur Alternative 6 (RS-6)</u>: RS-6 would begin at the Omya quarry where it would head north but would soon head southwest toward US 7. The alignment would cross Foote Street at grade and would require a rail-crossing signal. It would traverse mostly farmland from the quarry to US 7. RS-6 would cross

under US 7 utilizing a bridge on US 7. However, US 7 would have to be raised about 10 feet to accommodate the rail grades. The alignment would head west after crossing US 7 and pass just north of the Middle School. Toward the western terminus, RS-6 would bridge over Creek Road and Otter Creek, connecting with the mainline heading south. The location of a transload facility would be determined during EIS studies. The total length of the alternative would be about 2.76 miles.

Rail Spur Alternative 1/4 (RS-1/4): RS-1/4 is a hybrid consisting of the western portion of RS-1 and the eastern portion of RS-4. The two ends would be connected by traversing an area of forest and farmland west of US 7. Any transload facility for this alternative would likely be identical to that for RS-1. The total length of the alternative would be about 3.20 miles.

Truck to Rail Alternatives

The truck to rail alternatives would begin (at their eastern terminus) near US 7, because the existing Omya access road would be used from the quarry. Crossings of roads by truck to rail roadways could be at-grade or grade separated, except at US 7, where a grade separation is assumed. Below are brief descriptions of the truck to rail alternatives. The configuration of each truck to rail alternative can be seen on Figure 2.2-1 and Figures 1 through 4 in FEIS Volume IIB.

Truck to Rail Alternative 1 (TR-1): TR-1 would be an east to west roadway located in Middlebury within the RS-1 corridor. East of US 7, TR-1 would follow the existing Omya access road. TR-1 would then pass under US 7, and roughly follow the RS-1 alignment, heading southwest and then west across Halladay Road. The Halladay Road crossing could be either at grade or grade separated, with TR-1 passing over Halladay Road. It would then head west, traversing mostly farmland. The transload facility for TR-1 would likely be located in a field east of Otter Creek, as there are no suitable sites closer to the mainline. A short rail spur would be constructed from the transload facility to the mainline. The rail spur would bridge over Creek Road and Otter Creek. The total length of the alternative would be about 3.10 miles, which includes 1.20 miles on the existing Omya access road, 1.18 miles on new roadway alignment, and 0.72 miles on new rail alignment.

Truck to Rail Alternative 2 (TR-2): TR-2 would follow the existing quarry access road, US 7, and Three Mile Bridge Road, an east to west roadway in southern Middlebury. Three Mile Bridge Road is an existing road that currently is cut off by Otter Creek. A bridge over Otter Creek once existed, but was destroyed in a flood several decades ago. TR-2 would require an upgrade of the road along its existing alignment and construction of a new bridge over Otter Creek. The upgrade would include raising the grade of portions of the roadway because they lie within the 100-year floodplain and are prone to flooding in the spring. At the western terminus, the road would need to be raised to bridge over the mainline. The transload facility for TR-2 would likely be located on the west side of the mainline and would parallel the tracks. The total length of the alternative would be about 5.35 miles, which includes 1.20 miles on the existing Omya access road; 1.61 miles on US 7, which would likely need no upgrades; and 2.54 miles on existing local roads, which would likely need to be upgraded.

<u>Truck to Rail Alternative 3 (TR-3)</u>: TR-3 would follow the existing quarry access road, US 7, and an east to west roadway in Salisbury between US 7 and the mainline. This east to west roadway would begin on US 7 south of Holman Road, opposite Kelly Cross Road. From US 7, TR-3 would follow Kelly Cross Road by creating a new intersection with Kelly Cross Road and US 7. After following Kelly Cross Road for about two-thirds of a mile, TR-3 would head overland on new alignment until it connects with West Salisbury Road. It would follow West Salisbury Road past Leland Road, and then would follow Dewey Road past Salisbury Station. South of Salisbury Station, TR-3 would likely end at a transload facility located on the east side of the mainline and parallel to the tracks. The total length of the alternative would be about 8.99 miles. This includes 1.20 miles on the existing Omya access road; 4.94 miles on US 7, which would likely need no upgrades; 1.56 miles on existing local roadway alignments, which would likely need to be upgraded; and 1.29 miles on new roadway alignments.

<u>Truck to Rail Alternative 4 (TR-4)</u>: TR-4 would be another truck to rail alternative joining the mainline in Salisbury. Like TR-3, TR-4 would follow the existing quarry access road, US 7, and local roads in Salisbury. The local road segment would begin on US 7 south of Holman Road opposite Kelly Cross Road. However, it would then head southwest through mostly forested area, cross Salisbury Road, and would connect with Morgan Road. TR-4 would follow Morgan Road southwesterly to its terminus with Leland Road. From the intersection of Morgan and Leland Roads, there are two options for TR-4. The north option would continue southwest on new roadway through mostly farmland, until it met the mainline. The alignment would turn south to a transload facility on the east side of the tracks. The total length of the north option of TR-4 is about 9.25 miles. This includes 1.20 miles on the Omya access road, 4.94 miles on US 7 which would likely need no upgrades, 1.40 miles on existing local roadway alignments which would likely need to be upgraded, and 1.71 miles are on new roadway alignments. The south option would follow Leland Road southerly to where it crosses the mainline. As the south option approaches the mainline, it would head north to a likely transload facility location on the east side of the tracks. The total length of the south option would be about 10.82 miles. This includes 1.20 miles on the Omya access road; 4.94 miles on US 7, which would likely need no upgrades; 3.24 miles on existing local roadway alignments, which would likely need to be upgraded; and 1.44 miles on new roadway alignments.

Truck to Rail Alternative 5 (TR-5): TR-5 would follow the existing quarry access road, US 7, and an east to west roadway located in Leicester between US 7 and the mainline. The local road segment would begin at the terminus of Leicester-Whiting Road at US 7 and would follow Leicester-Whiting Road west and southwest to its junction with Memoe Road. As the alignment approaches Memoe Road it would head southwest traversing mostly farmland until it re-connects with the western portion of Leicester-Whiting Road. TR-5 would follow Leicester-Whiting Road to a point where it is adjacent to the mainline. As it approaches the mainline, the alignment would head south to a point where a transload facility could likely be constructed. The transload facility would likely be located on the east side of the tracks, but perpendicular to the tracks. There is no appropriate site to align the transload facility parallel to the tracks. The total length of the alternative would be about 12.61 miles. This includes 1.20 miles on the existing Omya access road; 8.72 miles on US 7, which would likely need no upgrades; 2.22 miles on existing local roads, which would likely need to be upgraded; and 0.47 miles on new roadway alignments.

Truck to Rail Alternative 6 (TR-6): TR-6 would be another truck to rail alternative joining the mainline in Leicester and following an east to west roadway between US 7 and the mainline. TR-6 would follow the existing quarry access road and US 7, then follow Cram Road from US 7 west to Swinington Hill Road. From the end of Cram Road the alignment would head west traversing mostly farmland to a western terminus that would be similar to TR-5. The transload facility would likely be at the same location as proposed for TR-5. The total length of the alternative would be about 12.81 miles. This includes 1.20 miles on the existing Omya access road; 9.76 miles on US 7, which would likely need no upgrades; 0.99 miles on existing roadway alignments, which would likely need to be upgraded; and 0.86 miles on new roadway alignments.

Truck to Rail Alternative 7 (TR-7): TR-7 would be a truck to rail alternative joining the mainline in northern Brandon. TR-7 would follow the existing quarry access road and US 7, turning off US 7 at the intersection with New Road. It would then follow a new, curved alignment around a hill before heading north to parallel the mainline. The transload facility for TR-7 would likely be located on the east side of the mainline and would parallel the tracks. The total length of the alternative would be about 15.48 miles. This includes 1.20 miles on the existing Omya access road; 12.52 miles on US 7, which would likely need no upgrades; and 1.76 miles of new roadway alignment.

Highway Bypass Alternatives

Highway bypass alternatives have previously been studied along US 7 because of traffic congestion in the village centers. A US 7 bypass would remove through traffic from the village centers, thereby reducing congestion and decreasing travel times for through traffic. Highway bypass alternatives were part of the first phase of screening because their ability to reduce congestion would appear to satisfy part of the project purpose and need. Each of the bypass alternatives was developed as part of other studies. Below is a brief description of the highway bypass alternatives. The configuration of each highway bypass alternative can be seen on Figure 2.2-1 and Figures 1, 2, and 4 in Volume IIB.

Highway Bypass Alternative 1 (HB-1): HB-1 would be a north to south bypass of US 7 along the eastern side of Middlebury Village. HB-1 would begin just north of the Boardman Street terminus, then would head north around Chipman Hill, reconnecting with US 7 near the Happy Valley Road terminus. HB-1 also has a truck to rail component so that marble shipments from the quarry could access the mainline. The truck to rail component of HB-1 would begin where the highway bypass ends on US 7. The truck to rail alignment would head west from US 7, curve around a commercial district and would then head to a point where a transload facility could be constructed. The transload facility would likely be located on the east side of the tracks parallel to the tracks. The total length of the bypass is about 2.66 miles. For HB-1 to be used as a truck to rail route for Omya, the total length of the alternative would be about 6.21 miles. This includes 1.20 miles on the existing Omya access road; 1.41 miles on existing US 7, which would likely need no upgrades; 2.66 miles on the new US 7 bypass; and 0.94 miles of new roadway alignment from the end of the bypass to the mainline.

Highway Bypass Alternative 2 (HB-2): HB-2 would be a north to south bypass of US 7 along the western side of Brandon Village. From the southern terminus, HB-2 would begin north of Humiston Drive, head west and then cross the mainline. After crossing the rail, the alignment would head northwest, cross Pearl Street and then would head north. It would again cross the mainline traversing due north. After crossing Steinberg Road, the alternative would head northeast to US 7. It would reconnect with US 7 near the New Road terminus. The total length of the bypass would be about 2.66 miles.

Highway Bypass Alternative 3 (HB-3): HB-3 would be a north to south bypass of US 7 along the eastern side of Brandon Village. HB-3 would begin just north of Country Club Road, then would head north around the village. HB-3 would cross Park Street and then would head northwest, cross Marble Street, cross Wheeler Road, and then head west to US 7. It would reconnect with US 7 across from the terminus of Arnold District Road. The total length of the bypass would be about 3.26 miles.

Highway Bypass Alternative 4 (HB-4): HB-4 would be a bypass of Pittsford and Brandon Villages that is east of existing US 7. HB-4 is a major bypass that is up to 2.5 miles east of the existing highway. It is primarily a north to south alignment traversing mostly forested land. The total length of the alternative, according to prior studies, would be about 12.7 miles.

Highway Bypass Alternative 5 (HB-5): HB-5 would be a bypass of Pittsford and Brandon Villages that is west of existing US 7. HB-5 is a major bypass that parallels the existing highway. It is primarily a north to south alignment traversing mostly forested land and some farmland. The total length of the alternative, according to prior studies, would be about 13.8 miles.

Conveyor Alternative

Conveyor Alternative 1 (C-1): C-1 would follow the same alignment as RS-1, the transload facility location would be identical to the likely TR-1 transload facility and its size would be comparable. As was the case with TR-1, a short rail spur would be constructed from the transload facility to the mainline. The conveyor portion would require a maintenance access road in addition to the conveyor. The conveyor system would include an enclosure over the mechanical components of the system, and the conveyor would operate continually during the day. The total length of the alternative would be about 3.17 miles, of which 2.45 miles is the conveyor/access road and 0.72 miles is a new rail spur.

Alternatives Selected for Further Study

Based upon the screening and careful consideration described in the previous sections of this chapter, the No-Build Alternative and Build Alternatives RS-1 and TR-1 were selected as the “reasonable” alternatives for more detailed evaluation in this FEIS. The alternatives, including the options associated with RS-1 and TR-1, are summarized below.

No Build Alternative

The No Build Alternative serves as a baseline for comparison to the two build alternatives. “No build” means that no improvements are made to address the needs outlined for the project, and the current operations for the movement of freight are left in place. However, the No Build may include improvements which have been planned independently, as part of other projects, including improvements to US 7.

For the movement of freight in and out of the Middlebury area, the primary route would continue to be US 7 under the No Build Alternative. The transportation of marble from the Omya quarry in Middlebury to the Omya Verpol Plant in Florence would continue to be done by truck under the No Build Alternative. These trucks would continue to travel on the Omya access road, US 7, Kendall Hill Road, West Creek Road, and Whipple Hollow Road. Other shippers would continue to use US 7 and other public roads in the region to move their materials and goods.

Alternative RS-1

Three options were developed for a portion of RS-1 where it crosses Halladay Road, a small collector road that runs parallel to US 7. The three options are:

<u>Grade Separated over Halladay Road</u>
This option proposes RS-1 to cross over Halladay Road and provide a grade separation between the rail spur and the road. A grade separation provides a higher degree of safety for both road and rail traffic, and would need a smaller roadway cut at US 7. However, the raised rail spur profile would create an embankment west of Halladay Road that would reach 29 feet in height. This embankment would be highly visible from nearby homes and roadways.

<u>At-Grade with Halladay Road</u>
This option proposes an at-grade crossing where RS-1 meets Halladay Road. The at-grade option was developed with Halladay Road raised about 5 feet at the crossing to reduce the amount of cut between Halladay Road and US 7. A quiet zone signal would be used to reduce the noise levels when a train crossed the road. Halladay Road would be reconstructed for about 550 feet to accommodate raising it 5 feet at the crossing.

<u>Halladay Road Relocation</u>
This option proposes to sever Halladay Road where it would be crossed by RS-1. A cul-de-sac would be placed north of RS-1 and the properties along this portion of Halladay Road would only access US 7 to the north. The southern portion of Halladay would be re-connected to US 7 via a new relocated roadway. That would parallel the RS-1 alignment and reconnect to US 7 south of the bridge over RS-1. With this option, Halladay Road would no longer be a constraint for the RS-1 profile.

The relocated Halladay Road would require about 2,200 feet of new roadway, following the existing grade for much its length. The proposed cul-de-sac for the north portion of Halladay Road would be located on the east side of the road to minimize impacts to the historic residential property to the west.

Alternative TR-1

Two options for the TR-1 alternative are under consideration:

<u>Truck to Rail Bridging over Halladay Road</u>
This option proposes TR-1 to cross over Halladay Road and provide a grade separation between the truck to rail roadway and Halladay Road. The grade separation for TR-1 is meant to separate the industrial truck traffic of the truck to rail roadway from the residential automobile traffic of Halladay Road. This option

maintains Halladay Road in its current location, with the truck to rail bridge crossing over Halladay Road. The bridge would be approximately 50 feet wide and provide 14 feet of vertical clearance.

At-Grade Halladay Road Intersection
This option proposes an at-grade roadway intersection where TR-1 meets Halladay Road. This option maintains Halladay Road in its current location but adds a four-way intersection at the TR-1 crossing. Halladay Road would continue as the primary roadway with no stop controls. The truck to rail roadway would be stop-controlled at both sides of the intersection.

Preferred Alternative

Following the screening process, the RS-1 alternative was selected as the preferred alternative. Based on further analysis of the RS-1 options (see Section 2.6.2), the Grade Separated over Halladay Road and Lower Foote Street Bridge options are now included as part of the preferred alternatives for the respective road crossings.

RS-1 has several advantages over the No Build Alternative and TR-1.

The No Build Alternative does not satisfy the project purpose and need. Specifically, it would not remove trucks from US 7, local roads, or Brandon Village, would not improve transportation efficiency, and would not allow Omya and other shippers to take advantage of access to the mainline.

TR-1 has inherent inefficiencies by requiring (for Omya, the principal shipper) additional material handling steps and two modes of transportation (truck and rail).

Rail spur alternative RS-1 would remove a portion of the freight traffic from US 7, village centers, and local roads, and allow Omya and other shippers to access the mainline. Expected impacts to natural, historical, and archaeological resources are generally comparable to impacts expected from TR-1.

E Potential Environmental Impacts and Mitigation Measures

The principal social, economic, natural, historical, and archaeological resource impacts of the project alternatives are summarized below. The No Build Alternative serves as a baseline for comparing impacts of the build alternatives.

Freight Transportation

The No Build Alternative would not provide any new means for moving freight in and out of the Middlebury region, and compared to the build alternatives would result in more trucks on US 7 and other roads in the region. RS-1 and TR-1 would address the purpose and need of providing efficient transportation of freight to and from Middlebury by providing an alternative to US 7, and would reduce truck volumes on area roadways. Because the effect of the build alternatives on roadway freight transportation would be beneficial, no mitigation is necessary.

The level of freight movement on the rail system expected in 2010 for either RS-1 or TR-1 is considered to be well within the capacity of a single track mainline. In 2030, the expected additional freight traffic from the quarry would likely be handled by operating at the same daily volume for a sixth day each week. Including increases in freight shipments on the mainline unrelated to this project, the overall level of freight movement is still expected to be well within the capacity of a single track mainline. Therefore, no mitigation measures are needed for effects on the rail system.

Traffic

The No Build does not address the purpose or need to provide efficient transportation of freight to and from Middlebury. US 7 would continue to be the primary means for moving freight, with the expected growth in the region resulting in increased congestion and decreased levels of service.

RS-1 would address the purpose and need of providing efficient transportation of freight to and from Middlebury by providing an alternative to US 7. Removing trucks from US 7 would reduce congestion. RS-1 would also eliminate over half of the heavy trucks and nearly a third of all truck traffic from Brandon Village in 2010.

Like RS-1, TR-1 would remove trucks from US 7, reduce congestion, and maintain an acceptable level of service for a longer period of time. It would also eliminate a large volume of large industrial trucks from traveling through village centers. However, TR-1 would not meet the project purpose to provide for the efficient transportation of freight to and from Middlebury as well as RS-1.

Although RS-1 and TR-1 would result in small increases in truck traffic on local roads and minor delays with at-grade options, no reduction in LOS is anticipated and no formal mitigation is necessary.

Safety

The No Build would not reduce the crash rate along portions of US 7. Compared to the No Build, RS-1and TR-1 would reduce the volume of existing and future truck traffic along US 7 in the region, and therefore could reduce the number of crashes. Most of the local road crossings of RS-1 and TR-1, including the preferred alternative, would be grade separated and would not pose a safety concern. RS-1 would also likely result in increased truck traffic on Lower Foote Street, while TR-1 would result in increased truck traffic on Halladay Road and Lower Foote Street, as access routes to the transload facility for either alternative. No formal mitigation is warranted, but the town may consider measures such as reduced speed limits or requirements that shippers use alternate routes (such as accessing the road to the transload facility via US 7 rather than Lower Foote Street).

Pedestrians and Bicyclists

The No Build would not address safety concerns for pedestrians and bicyclists related to the relatively high volumes of trucks, particularly in Brandon Village, where pedestrian activity is higher. Both RS-1 and TR-1 would reduce the number of large trucks on US 7 and local roadways, reducing safety concerns for pedestrians and bicyclists. The increases in truck traffic on Lower Foote Street and Halladay Road are not expected to cause safety concerns. The preferred alternative would not sever any local roads.

Since pedestrian and bicyclist impacts are expected to be minimal, no formal mitigation is proposed. However, the town may consider measures such as reduced speed limits or the requirement that truckers use alternative routes.

Social and Economic Resources

The principal social and economic effects and the possible mitigation measures (where warranted) are:

- *Economic Development*. Heavy truck traffic in Brandon Village associated with the No Build Alternative adversely affects the village's aesthetic and therefore its economic environment. The build alternatives would positively affect Brandon's economic environment. Impacts to property access may be mitigated by constructing access (such as farm crossings) across the new alignments, if warranted.

- *Employment.* The RS-1 Alternative and the TR-1 alternative would both result in the loss of trucking and other jobs, ranging from 18 for TR-1 to 62 jobs for RS-1, including indirect job losses. Some of these losses may be offset by an improved investment climate generated by the removal of Omya trucks from US 7. Measured at the regional economy's level, these job losses will be negligible in an economy that supports 13,000 jobs.

- *Land Acquisition.* Portions of an estimated 16 parcels would be acquired for RS-1, including approximately 55 acres for the preferred alternative. An estimated 14 parcels and 48 to 50 acres would be acquired for TR-1. Landowners would be compensated, at fair market value, for the land taken and for any "uneconomic remnants" (portions of property which would have little or no value or utility to the owner following acquisition). The acquisition program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, without discrimination.

- *Land Use Planning*. The Addison County Regional Plan, the Middlebury Town Plan (2007) and the Brandon Town Plan (2002) all cite either limiting truck traffic or, more specifically, utilizing rail to move materials from the Omya quarry to Florence. The project substantially conforms with the Middlebury Town Plan but is inconsistent in the following two areas. First, "supplementary compensation" and "additional mitigation" as described in the Town Plan are not being proposed in addition to just compensation for acquired properties. In addition, there may be some town responsibilities for maintaining the bridge at Lower Foote Street. No mitigation is proposed.

Public Lands

No public lands would be affected by the project. Therefore, no mitigation is warranted. However, consideration may be given to maintaining the integrity of the private recreational trails during the design process, within the parameters of the project's cost and design constraints.

Visual Resources

The visual impacts of the build alternatives would vary through the project area. The most notable impacts are described below.

The Halladay Road area displays a relatively high degree of scenic quality based on the diversity of the landscape. The landform in this area allows the alignment to run through a small valley that greatly helps to de-emphasize any of the build options and reduce the impacts. Options to bridge over Halladay Road would result in greater impacts and increase the visual prominence of proposed conditions west of Halladay Road. This area would have an elevated degree of visual impact compared to existing conditions.

East of Otter Creek, the addition of a rail spur seems to present minimal visual impacts; however, the addition of the TR-1 transload facility would result in substantially greater impacts, as it would add an industrial activity and visually prominent facility into an area that exhibits a quiet and rural character. The introduction of a trestle through the agricultural fields east of Otter Creek would create a potential visual impact on existing views. However, the repetition of piers, rail segments, and train cars (when present) mimic the repetition of farm fields, and certain aspects of farming activities are not out of character with the proposed rail spur. Additionally, the crossing is located in a short stretch between bends that will avoid extended views when navigating the creek. Visual impacts would be minimal at the crossing of Otter Creek.

To help offset visual impacts, a variety of mitigation practices can be utilized. Mitigation can include screening and buffering of unwanted views of project elements; modification of landforms to create a more natural appearance; or modification of project design features.

Air Quality

The air quality analysis demonstrated that both RS-1 and TR-1 would increase emissions compared to the No-Build Alternative for all pollutants, except for nitrogen oxide (NOx) and carbon monoxide (CO), which decrease with Alternative RS-1 in 2010. Among all project alternatives, Alternative TR-1 results in the highest emissions of all pollutants. The minor increases in emissions in the build alternatives are well below their respective General Conformity de minimis threshold levels (40 CFR Part 51 Subpart W and Part 93 Subpart B). Given the relatively small size of the increases, neither build alternative is expected to result in adverse air quality impacts for the region. No mitigation is necessary for potential air quality impacts.

Noise

Rail Noise

The noise impacts associated with the additional freight rail operations are due to the increased use of warning horns at grade crossings along the mainline corridor. As a result of the build alternatives, the cumulative increase in noise exposure near the grade crossings is expected to result in a total of 13 Federal Transit Administration (FTA) moderate noise impacts for both year 2010 and 2030. However, it should be noted that these receptors are currently impacted by the warning horns from the existing freight rail operations along the mainline corridor.

Possible noise mitigation measures could include noise barriers or the use of quad-gates that would eliminate the use of warning horns at the grade crossing. In addition, local communities could petition the FRA to establish “quiet zones” at grade crossings.

Traffic Noise

The traffic noise impacts predicted for the project include:

- For the year 2010 No Build Alternative, there is expected to be a total of 58 impacted receptors along US 7. For the year 2030 No Build Alternative, the increase in traffic is expected to result in a total of 84 impacted receptors along US 7.

- For the year 2010 build alternatives, with the Omya heavy trucks removed, the number of total noise impacts along US 7 is expected to decrease to 34 residential impacts, a decrease of 24 impacts from the 2010 No Build Alternative. For 2030, this number is expected to be 61 impacted receptors, a decrease of 23 impacts from the year 2030 No Build Alternative.

- For the year 2010 build alternatives, the number of noise impacts in Brandon Village would decrease from 4 receptors under the No Build Alternative to none under the Build Alternative.

- Along the TR-1 road to the off-site transload facility, the predicted truck noise levels at the nearest receptors will not exceed either of the VTrans noise impact criteria in either 2010 or 2030.

- Noise levels from the train loading operations at the TR-1 transload facility are not expected to exceed VTrans criteria. Noise levels at the proposed RS-1 transload facility are expected to be similar to the existing noise levels from quarry truck loading operations.

Because the build alternatives would not result in noise impacts, no formal traffic noise mitigation is proposed.

Vibration

The vibration modeling analysis indicates that FTA vibration impacts are expected to occur at five residential receptor locations along the mainline corridor. However, it should be noted that these receptors are currently impacted by existing freight rail operations along the mainline corridor.

An effective vibration mitigation measure could consist of installing ballast mats under sections of track to reduce vibration levels. Ballast mats have been shown to reduce vibration levels by up to 10 VdB, depending on the frequency content of the vibration, the method of installation, and ground conditions. However, ballast mats are relatively costly and typically have less effect on vibration than other factors, such as wheel maintenance. VTrans currently does not have criteria in place for determining the reasonableness of vibration mitigation; however, VTrans and FHWA have determined that, for purposes of this project, the general premise of reasonableness developed for noise mitigation is also appropriate for vibration mitigation. Specifically, noise (or vibration in this case) mitigation measures costing in excess of $20,000 per impacted receptor are not considered reasonable. A preliminary estimate shows that the cost of installing ballast mats as part of the Middlebury Spur project to mitigate rail vibration impacts would exceed the VTrans reasonableness criteria that were developed for noise mitigation.

Nevertheless, ballast mat costs could possibly be reduced by modifying the length or design of ballast mats, or by constructing them as part of independent mainline improvement projects. Improvements to the mainline are included in the Draft 2009-2012 State Transportation Improvement Program (STIP), and it is expected that installation of ballast mats would be most cost-effective if constructed as part of those improvements. Further research into the cost, reasonableness, and effectiveness of ballast mats as vibration mitigation will therefore be undertaken during the design of mainline improvement projects. At that time, an updated cost estimate for installing ballast mats would be made and a decision on whether or not to implement the mitigation will be made by FHWA and VTrans.

Wildlife Habitat

RS-1, depending on the option, would impact from 29.9 to 34.9 acres of open field habitat (including wet meadows, ditches, hedgerows, and other farm field features) and approximately 0.9 acres of forested land. The Grade Separated Over Halladay Road Option would affect slightly more open field habitat overall (34.9 acres) than Halladay Road Relocation (34.1 acres), and RS-1 At-Grade with Halladay Road would affect the least open field habitat (29.9 acres). The most notable habitat impacts are to areas that provide wildlife corridors and connectivity between habitats: the various hedgerows and fallow farmlands; the wildlife corridor about 2,200 feet west of Halladay Road; and the Otter Creek corridor.

TR-1's total habitat impact acreage would be greater than RS-1's impacts, due primarily to the larger footprint of the transload facility. The TR-1 Grade Separated over Halladay Road Option would have a slightly smaller footprint than the at grade option and would affect 34.2 acres of open field habitat (including wet meadows, ditches, hedgerows, and other farm field features) versus 35.5 acres for TR-1 At-Grade with Halladay Road. The two TR-1 options would have identical impacts to forested land (1.1 acres). The most notable impacts would be the wildlife corridor about 2,200 feet west of Halladay Road and the approximately 25 acres of open farmland to be impacted for the transload facility, east of Creek Road.

Wildlife habitat impacts have been avoided to the extent practicable by avoiding important habitats such as large forest blocks or large wetlands. Measures to minimize and compensate for these impacts could include minimizing the project footprint by constructing 2:1 side slopes; minimizing loss of adjacent hedgerows and drainages; plantings along road or rail embankments that will allow wildlife to cross the alignment with minimal exposure to open spaces; and wildlife passage structures in the important wildlife corridor area west of Halladay Road.

Fisheries

Both RS-1 and TR-1 would cross several intermittent streams, but the affected streams do not appear to support fish populations. Any stormwater runoff would pass through a series of intermittent streams and wetlands before entering surface waters with potential fisheries, so no impacts are expected. Because impacts to fisheries are expected to be negligible, no mitigation other than standard stormwater management measures are proposed.

Threatened and Endangered Species

Because upland sandpipers and grasshopper sparrows were not found nesting in the affected habitat, and because the habitat has limitations as foraging habitat, the impacts to these species are considered inconsequential, and no formal mitigation measures are proposed. RS-1 also would not affect important Indiana bat habitat, while TR-1 would affect a small area of potential Indiana bat habitat. Coordination with U.S. Fish and Wildlife Service (USFWS) and the Vermont Nongame and Natural Heritage Program (NNHP) will continue in future design and permitting phases.

Agricultural Resources

The No Build Alternative would not affect important farmland soils. Much of the alternatives corridor has soils classified by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) as being of “Statewide Importance” to agriculture, and all build alternatives and options would impact between 26 and 34 acres of prime and important farmland soils combined. RS-1 At-Grade with Halladay Road would affect the least total acreage, while the TR-1 At-Grade with Halladay Road Option would affect the most. Impacts to prime farmland soils would be relatively small.

The primary impacts to active agricultural land, besides the direct impacts from the footprint of the alignments, are bisecting fields and isolation of small portions of agricultural land, rendering them less efficient to farm. The principal differences between RS-1 and TR-1 in this regard are the effects of RS-1's new alignment and transload facility east of Lower Foote Street; and the large footprint of TR-1's transload facility in active pasture, active cropland, and fallow farmland east of Creek Road.

Landowners would be compensated for any land that may be taken in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (the Uniform Act). Impacts would further be minimized by accommodating farmers with rail or road crossings to access portions of fields that would be divided.

There will be continued coordination with USDA and the Vermont Agency of Agriculture, Food & Markets regarding agricultural resource impacts as the project moves forward.

Groundwater Resources

No impacts to groundwater resources are expected. However, VTrans policy is to monitor wells that could potentially be affected by construction. Should private wells be affected, owners would be compensated by replacing affected wells, or by connecting affected property owners to public water supplies where possible.

Water Body Modifications

Direct water body impacts are limited to seven intermittent streams, all of which have already been altered by ditching. These streams would be culverted or redirected. Diversion of Wetland 5 is unlikely to have any measurable effect on stream flow in Beaver Brook. Because of the small and disturbed nature of these streams, no mitigation other than standard stream crossing practices is proposed. Otter Creek would not be directly affected by the proposed rail bridge, which would span the entire river channel.

Water Quality

The RS-1 rail spur would involve very small increases in impervious surfaces and therefore little stormwater runoff. The proposed RS-1 transload facility and access drive would involve 2.61 acres of impervious surface. Runoff from this area would pass through a network of ditches before reaching Beaver Brook, the Middlebury River, and ultimately Otter Creek. TR-1 would involve an increase of 8.52 acres of impervious surface for the roadway and an additional 16.87 acres of gravel surface that would be slightly more pervious than pavement.

Stormwater runoff would be managed by using Best Management Practices, such as grass-lined swales or detention basins.

Floodplains and Floodways

The No Build Alternative (except for independently planned projects) would not affect floodplains and floodways. Both RS-1 and TR-1 would fill relatively small amounts of 100-year floodplain but would span essentially the entire floodplain and floodway with trestle and bridge structures. A detailed hydraulic study was performed which showed that the backwater effect would be about 0.01 feet above the existing floodwater levels. This effect is negligible, and meets the National Flood Insurance Program requirement of no backwater effect.

The preferred alternative minimizes impacts to floodplains. The trestle concept would minimize floodplain and floodway encroachments by avoiding the substantial fill that would be required to build the new rail on a fill section. The trestle would further provide waterway vertical clearance between 4 and 15 feet above the estimated FIS 100-year flood water surface elevation, and may incorporate the use of driven pile bent-style piers that do not require substantial foundation excavation. Because of these efforts, there will be minimal impact to floodplain storage and a negligible change to the backwater effect. Therefore, no mitigation is necessary.

Wetlands

The build alternatives were configured to minimize impacts to the extent practicable, particularly impacts to the larger and more valuable wetlands in the area. The RS-1 Halladay Road Relocation Option would have the greatest impacts of the build alternatives, with 6.86 acres of total wetland impact, followed by RS-1 Grade Separated over Halladay Road (5.91 acres) and RS-1 At-Grade with Halladay Road (5.82 acres). The TR-1 alternatives are slightly lower, with 5.37 acres (Grade Separated) or 5.28 acres (At-Grade) of total wetland impact. However, RS-1 would have greater impacts east of Lower Foote Street, while TR-1 would have greater impacts west of Halladay Road, because of the proposed transload facility. These impacts include direct fill and also areas where cut sections are expected to eliminate wetland hydrology in a portion of adjacent wetlands (specifically, 30 feet beyond the proposed project slope limits in Wetlands 5, 9a, 9b, and 20). RS-1 would also result in the diversion of the stream associated with Wetland 5, as discussed above, but effects on the Beaver Brook drainage system are expected to be negligible.

The great majority of wetlands that would be impacted by the build alternatives are excavated drainage ditches and swales in farm fields and farmed wet meadows. Most of the affected wetlands also include intermittent stream channels.

The primary wetland functions that would be impacted by both the RS-1 and TR-1 alternatives include water quality related functions, wildlife habitat, and because of the hydrologic diversion, potential off-site impacts to fisheries and wildlife habitat.

Mitigation measures considered for this project, and discussed with resource agency staff, include broadening and stabilizing farm field ditches to provide additional treatment for existing agricultural runoff; blocking ditches to create wetlands in portions of farm fields along the corridor that may be abandoned; creating wetlands in gravel pits that lie along the foothills of the Green Mountains to the east of the alternatives corridor; and preserving and enhancing wetland/wildlife habitat in farm fields within the floodplain of Otter Creek and its tributaries. Of these options, the floodplain farm fields appear to have the greatest promise. The preferred mitigation site is in Bridport along the Lemon Fair River.

Archaeological Resources

The RS-1 alternatives involve from 8.22 to 10.42 acres of archaeologically sensitive land, with the preferred alternative having 8.22 acres of involvement. The estimated impacts have decreased since the DEIS because certain areas were investigated and found to lack archaeological resources.

The TR-1 alternatives have higher potential involvement with archaeologically sensitive areas, primarily because of the sensitivity of the area of the proposed TR-1 transload facility. TR-1 At-Grade with Halladay Road had the most extensive potential involvement.

Based on the limited field testing, it is not expected that archaeological sites are important to preserve in place. Instead, the mitigation of impacts to archaeological resources may be achieved through the recovery of information through excavation and documentation, through avoidance and minimization of impacts, through burial in place of resources, or through public outreach and education. Recovery of archaeological resources would occur under an approved plan which would provide for the reporting and dissemination of results, as well as the curation of artifacts.

Further Phase I testing will be conducted in all the sensitive areas following conclusion of the NEPA process and acquisition of involved land. As information on archaeological resources becomes available, there will be continued consultation with interested parties, including ten federally recognized Native American tribes.

Historic Resources

Under the No Build scenario, freight transportation would continue to use US 7 and local roads, passing through Brandon Village, which is listed on the National Register as an historic district and has 102 contributing structures located along US 7/Main Street. Another 62 buildings and structures that are listed on or that appear to be individually eligible for listing on the NR occur elsewhere in the No Build's Area of Potential Effect (APE). Residents and town officials have expressed concern about impacts from noise, vibration, dust, and acids. Heavy traffic may also affect the economy of the historic village as it could discourage tourism. The truck traffic also passes through Leicester Four Corners, with three buildings that are individually listed on the NR, and the small hamlet of Florence, negatively affecting the rural character of these villages.

The RS-1 Alternative would have No Adverse Effect on Sites M15, M16, M18, M19, M20, M21, M22, M23, and M28. The RS-1 At-Grade with Halladay Road and Halladay Road Relocation Options would have No Adverse Effect on Site M25 (the house and associated barn on Halladay Road). The RS-1 Grade Separated over Halladay Road Option would have an Adverse Effect on Site M25 because the option would diminish the integrity of the property's setting and feeling.

The TR-1 Alternative would have No Adverse Effects to historic resources, including Sites M15, M16, M18, M19, M20, M21, M22, M23, M25, and M28.

Possible mitigation measures for the historic resource effects associated with this project include screening and plantings. Screening could reduce the severity of the view of the RS-1 embankment from M25, but is not recommended as mitigation because it would only further isolate the property from its environment. Limited, irregular plantings of wildflowers and native shrubs that occur naturally in open fields on the embankment slopes, in the vicinity of Halladay Road, may help to mitigate the adverse effect because they would add texture, relief and color to the otherwise repetitive surface of the slopes.

Hazardous Materials

There are two facilities within or adjacent to the study area that have the potential to have resulted in OHM within the proposed corridor and may require further investigation. If any OHM is found within the vicinity of the proposed construction, the project will be designed to minimize impacts. Hazardous material contaminants will be characterized and studies will be performed with the assistance of hazardous materials specialists and governmental agencies as appropriate. An additional database search for OHM is proposed to be conducted prior to construction, to capture any possible new OHM sites.

Construction Impacts

Construction activities would impact traffic and traffic circulation in the Middlebury area, with possible delays, detours, and road closures. Construction will result in a temporary increase in construction-related employment in the Middlebury area. There may be temporary elevated levels of air pollutants such as carbon monoxide and dust, as well as temporary noise impacts, in the immediate vicinity of construction activities. The noise, dust, human activity, and other factors may also temporarily affect wildlife, but construction impacts to rare grassland birds or Indiana bats are expected to be negligible. Construction activities may result in erosion and sedimentation in surface waters and wetlands.

Specific construction mitigation measures will be identified and designed during final design. These measures may include detours; application of water to control dust; Best Management Practices such as silt fences and temporary sedimentation basins to control sedimentation; time of year restrictions to protect wildlife; time of day restrictions to reduce noise effects; or placement of construction fencing around wetlands, important habitats, or other resources needing special consideration. Additionally, measures must be taken to ensure continued access for emergency vehicles and access to public buildings. Access to farm fields will be maintained throughout construction.

Staging, material supply, and material disposal areas will be reviewed when they are identified. Appropriate mitigation measures, consistent with those described above, will be applied where appropriate.

F Regulatory Requirements

Construction of the rail spur will require compliance with a variety of federal, state, and local laws, and the acquisition of various federal, state, and local permits. Permitting will follow the issuance of a Record of Decision (ROD), which is subsequent to the FEIS. The following permits and/or clearances are expected to be required:

Federal

- Clean Water Act Section 404
- Farmland Protection Policy Act – Farmland Conversion Impact Rating Form
- Conditional Letter of Map Revision (CLOMR), if required.
- Section 10 of the Rivers and Harbors Act (if applicable)
- Clean Water Act Section 401 Water Quality Certification: Issued by VANR

- National Pollutant Discharge Elimination System construction site runoff permit

State

- Conditional Use Determination
- Stream Alteration Permit
- Vermont's Land Use and Development Law (Act 250) (Applicability has not been determined)
- Stormwater Discharge Permit

G Comments and Coordination

This project has involved extensive coordination with regulatory and resource agencies, local officials and businesses, and the public. The coordination goes well beyond minimum NEPA requirements (23 CFR 771) and has provided ample opportunities for interested parties to comment and participate. The major coordination activities are listed in Chapter 7 and included:

- Eight meetings with regulatory and resource agencies; ACOE staff have also attended many internal project team meetings
- Four Advisory Committee meetings
- Three public meetings and one public hearing
- One meeting with the Middlebury Selectboard
- Meetings with Omya, Foster Brothers Farm, and others

Coordination with these parties and the public will continue through the FEIS development and project design.

1 Project Background, Purpose and Need

1.1 Description of Project Area

The Middlebury Spur project involves the north-south transportation system in west central Vermont from the Town of Middlebury, in Addison County, to the Town of Pittsford, in Rutland County. The project area is generally located in the southern Champlain Valley, beginning in Middlebury, approximately 35 miles south of Burlington, and continuing south to Pittsford, about 10 miles north of Rutland. The southern part of Lake Champlain is about fifteen miles to the west, and the Green Mountain National Forest sits about five miles east of the project corridor. See Figure 1.1-1, Location Map (Volume IIA).

US 7 is the major north-south highway in the western part of the state, extending the length of Vermont from the Canadian border and continuing south into Massachusetts and points south. US 7 is part of the National Highway System, which includes the Interstate Highway System and certain other highways, principal arterials, and connector roads that are considered important to the nation's economy, defense, and mobility[1]. US 7 is a two-lane principal arterial, and provides the most important link for travel and mobility in the Middlebury region.

US 7 passes through downtown Middlebury just north of the project area, and continues through Brandon Village to the south. Brandon Village is listed as a Historic District on the National Register of Historic Places and has many historic buildings and narrow streets, with two sharp turns on US 7 near the town center. There is a relatively high percentage of trucks on US 7, resulting in concerns over pedestrian safety, access to businesses and side streets, effects on historic buildings, and aesthetics in Brandon Village.

A railroad owned by the State of Vermont and operated by privately-owned VTR roughly parallels US 7 in this area. Both US 7 and the railroad follow the Otter Creek valley in this part of Vermont. Otter Creek flows north through the project area, ultimately entering Lake Champlain.

Topography in the study area is relatively flat, with scattered bedrock ridges running north to south. The predominant land use in the region is agriculture, and forested areas are confined primarily to the bedrock ridges and wetlands. Residential, commercial, industrial, and public utility land uses also occur within and adjacent to the study area.

[1] Federal Highway Administration, "*The National Highway System*". *http://www.fhwa.dot.gov/hep10/nhs/*

Bedrock in the area is dominated by limestone and marble, and the economy of the region has historically been based in part on extraction and preparation of these materials. There is a marble quarry that is owned and operated by Omya, Inc. that sits southeast of downtown Middlebury, approximately one mile east of US 7. Marble from the quarry is presently shipped to Omya's processing plant 23 miles south of the quarry in an area of the Town of Pittsford known as Florence, about a mile west of Pittsford Village. The truck route from the quarry to the processing plant follows a private access road to US 7, then follows US 7 south through portions of Middlebury, Salisbury, Leicester, Brandon, and Pittsford, and then follows Kendall Hill Road west from US 7 to West Creek Road, Whipple Hollow Road, and the plant.

1.2 Project History and Status

The Middlebury Spur project follows a series of freight transportation studies spanning over 20 years. In the mid-1980's, VTrans and VTR considered constructing a rail spur from the mainline railroad tracks in Middlebury to Omya, Inc.'s Middlebury quarry. A preliminary alignment was selected and topography mapped, but it was determined that marble shipments would have to increase to make the project economically viable.

Marble shipments from the quarry doubled by 1995, whereupon VTrans engaged a consultant (R.L. Banks & Associates, Inc.) to study three alternative means of transporting ore – rail spur, conveyor, and intermodal "truck to rail" shipments – along with improvements needed at Omya's Florence processing plant to receive the shipments. The study also included "preliminary qualitative and quantitative assessments of environment impacts."

In 1998, Omya applied for an amendment to their existing Act 250 permit (Land Use Permit #9A0107-2) at the quarry to allow them to expand their operations at the quarry. They received an Act 250 permit on May 25, 1999 which allowed Omya to ship a maximum of 115 trucks per day, 6 days per week, from the Middlebury quarry, which was less than the 170 truck trips per day sought by Omya. The primary basis for this limitation was concerns over the effects of heavy truck traffic in Brandon Village.

On April 27, 1998, the Vermont Legislature approved Act No. 144 of 1998 (introduced as H.760), which provided in Section 10(d) as follows:

> *The secretary of transportation, in consultation with the secretary of commerce and community development, the Vermont Railway, Inc. and Omya, Inc., shall engage in a preliminary engineering and financial analysis of alternative means of transporting materials from Omya's quarry in Middlebury, VT to points of processing and distribution.*

This statute led to the development of the *Omya Quarry Material Alternative Transport Legislative Study* ("Legislative Study") dated January 6, 1999. This study considered the economic and environmental impacts and effects of several alternative means of transporting marble from Omya's Middlebury quarry. Studied in some detail were three rail spur alternatives, three truck to rail alternatives (one of which involved a highway bypass), and a conveyor alternative. The Legislative Study concluded that all the alternatives would reduce truck traffic, congestion, petroleum usage, and noise and airborne emissions. It further concluded that transporting material by rail would cost less than half as much as transporting the same material by truck (excluding the initial capital cost of constructing a new rail spur), and that rail transport would help to prevent damage to roadways from heavy trucks. The study recommended three alternatives for additional study: two rail spur routes and one truck to rail alternative. The study recommended eliminating all the other alternatives for economic and environmental reasons.

On October 8, 1998, Omya, VTrans, VTR, ANR, and the Conservation Law Foundation entered into a Memorandum of Understanding which sought to "…facilitate the timely planning and construction of the most feasible and practicable alternative for shipment of Omya's quarry material, with major consideration given to construction of a rail spur to the Middlebury Quarry."

All of the potential alternatives would likely impact wetlands, and some required river crossings which would require state and federal permitting. In anticipation of permit requirements under Section 404 of the Clean Water Act administered by the ACOE, VTR and Omya further developed the environmental studies in order to determine the LEDPA. The LEDPA study confirmed the conclusions of the Legislative Study (as described above), included additional studies, and was finalized in March 2002. The ACOE issued a letter on May 8, 2002, stating that, for the purposes of shipping marble from Omya's Middlebury quarry to its Florence plant, the A-1 or "Western Rail Spur" alternative (which followed an alignment similar to the RS-1 preferred alternative studied in this EIS) was the LEDPA.

More recently, it was anticipated that federal funding would be necessary for the project to move forward, and the project would therefore have to comply with NEPA. Under NEPA, projects which are likely to result in "significant" impacts must have an EIS prepared. It was decided, because of the involvement with the National Highway System and other considerations, that the Federal Highway Administration (FHWA) would be the lead federal agency on the EIS. After consultation, it was agreed that impacts could be significant and an EIS would be required. In 2004, VTrans contracted with a team of consultants led by the consulting firm McFarland Johnson (MJ) to prepare the EIS.

1.3 Purpose and Need Statement

A Purpose and Need Statement in an EIS is a formal statement of the need for the project and the overall project purpose. The Statement documents the justification for the project study and provides the basis for evaluating the effectiveness of alternatives. For this project, the preliminary alternatives were screened based partly on how well they met the project purpose and need.

The Middlebury Spur Purpose and Need Statement was developed through consultation with the public, an Advisory Committee[2], and state and federal resource agencies. Statements of purpose and need made in previous studies (the Legislative and LEDPA studies in particular) were studied; concerns over truck traffic in Brandon Village, on US 7, and local roads were investigated; current and future shipping needs of Omya and other shippers in the study area were discussed; and town and regional plans were reviewed as were other materials relating to freight transportation in the region.

The Purpose and Need Statement developed for the project is as below.

Middlebury Spur Environmental Impact Statement
Purpose and Need Statement

Purpose

The purpose of the project is to provide for the safe and efficient transportation of freight to and from Middlebury, Vermont.

Need

Traffic studies have shown that trucks, including busses and vehicles with more than four tires or two axles, constitute between 7 and 12% of the total traffic volume on US 7 in the Middlebury region. US 7 is the primary north-south highway in western Vermont, is part of the National Highway System (NHS), is a two-lane principal arterial, and provides the most important link for travel and mobility in the Middlebury region. The high volume of trucks traveling through Pittsford, Brandon and Middlebury presents safety concerns for pedestrians, restricts access to businesses and side streets, and detracts from the character of these village centers, all of which are National Register Historic Districts. In

[2] The Advisory Committee was formed to provide local input on important project decision points and coordination activities. The committee was made up of representatives of town governments, regional planning commissions (Rutland and Addison Counties), state agencies, the Addison County Economic Development Corp., Vermont Railway, and Omya. Also invited to participate were representatives of Vermont Natural Ag Products, Inc., the Conservation Law Foundation (CLF), the Rutland Economic Development Corp., and the Rutland Redevelopment Authority.

addition, the level of truck traffic has raised concerns about aesthetics, traffic, vibration, noise, and economic impacts.

A substantial portion of the truck traffic along US 7 in the Middlebury region are trucks carrying marble to the hamlet of Florence in Pittsford, Vermont. Omya, Inc. operates a marble quarry in Middlebury that supplies its processing plant in Florence. Currently, crushed marble is trucked about 23 miles via private and public roads. The trip includes travel on US 7 for about 20 miles through the towns of Middlebury, Salisbury, Leicester, Brandon and Pittsford. The trucks carrying marble are mostly 5- and 6-axle, have an average net load size of 29 tons, and are currently permitted for up to 45 tons gross weight. These trucks constitute approximately one quarter of the total truck traffic on US 7 in Brandon Village. Omya forecasts continued growth in its business.

Due to concerns about noise, safety, and vibration, Vermont Land Use (Act 250) Permit #9A0107-2 limits the numbers of round trip trucks to and from Omya's Middlebury marble quarry to 115 per day, thus limiting the potential total amount of marble transported between Middlebury and Florence. If permit restrictions continue to limit the shipment of marble from Omya's quarry in Middlebury, Omya's ability to grow and contribute to the economic growth of the region and state will also be limited.

There are currently two north-south transportation corridors in Western Vermont: US 7 and the Vermont Railway corridor. US 7 currently carries on average between 6,000 and 14,000 vehicles per day in the Middlebury region. Traffic projections conducted for the Pittsford-Brandon US 7 Improvement Study predict that traffic on US 7 will increase by 35% by the Year 2027 to between 8,100 and 18,900 vehicles per day. This level of traffic would certainly increase congestion and other traffic-related concerns along US 7. By contrast, Vermont Railway operates one round-trip on this segment of its corridor each day. A more effective and integrated use of all transportation modes would improve the safety and efficiency of the entire transportation system and better accommodate economic development.

For over two decades, local residents and local and state officials have recognized a need to accommodate increased freight transport to and from Middlebury. In 1998, the Vermont Legislature enacted a statute to study "alternative means for transporting materials from Omya's quarry in Middlebury, Vermont". The resulting Omya Quarry Material Alternative Transport Legislative Study, completed in 1999, evaluated eleven alternatives and recommended three for continued evaluation. A Transportation Alternative Analysis was completed in 2002 that determined, for purposes of permitting under Section 404 of the Clean Water Act, the Least Environmentally Damaging Practicable Alternative (LEDPA) to be the Middlebury Rail Spur Alternative A-1 (Western Rail Spur). The Middlebury and Brandon town plans support measures, including roadway bypasses and increased rail transport, to reduce traffic impacts to their village *centers. The Pittsford Town Plan also supports a roadway bypass. The 2007 Middlebury Town Plan endorses the development of a Middlebury Rail Spur, and supports "greater rail use to reduce truck traffic on roads". The Brandon Town Plan supports increased use of rail for freight transportation.*

1.4 The Environmental Impact Statement Process

NEPA is a federal law which prescribes the procedural steps that must be taken in preparing environmental documents, including an EIS. The major steps of an EIS and their status are listed below.

- *Notice of Intent (NOI) to Prepare an EIS*: The NOI formally announces the start of an EIS by publication in the Federal Register. The NOI for this project was published in the Federal Register in January 2005 (Appendix A).

- *Scoping*: Scoping is "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action" (40 CFR 1501.7). A scoping meeting for the public was held in January 2005. This followed meetings with the project Advisory Committee and state and federal resource agencies to get input on the issues to address in the EIS. The scoping process was completed by May 2005 and a summary report was prepared (Appendix B). It was during this process that the project's Purpose and Need Statement was first drafted.

- *Screening/ Determination of the reasonable range of alternatives*: This involves screening a broad range of alternatives to determine which should be carried forward for detailed study in the DEIS and which are not reasonable and should be eliminated. The screening is based primarily on how well the alternatives meet the project Purpose and Need and the likelihood of substantial impacts. Screening was completed for this project and is discussed in detail in Chapter 2.

- *Identification of existing resources*: Existing social, economic, cultural, and natural resources in the study area are identified and described in Chapter 3, Affected Environment.

- *Determination of resource impacts*: Impacts of alternatives to social, economic, cultural, and natural resources are assessed and documented in Chapter 4, Environmental Consequences.

- *Publication of Draft EIS*: The documentation was assembled into a Draft EIS document and was made publicly available through a notice of availability in the Federal Register.

- *Public hearing and public comment period*: A 45-day formal public comment period followed the DEIS notice of availability in the Federal Register. A formal public hearing was held during the public comment period; details of this and the public comment period were publicly noticed.

- *Publication of the FEIS*: A preferred alternative was confirmed, additional studies were conducted on it, and responses to comments made during the public comment period were prepared. The documentation was assembled into this Final EIS document and is being made publicly available through a notice of availability in the Federal Register.

- *Record of Decision (ROD)*: No sooner than 30 days following FEIS publication, each involved federal agency prepares a ROD. This constitutes the selection of the alternative that will be implemented and documents any commitments and mitigation measures. This concludes the NEPA process.

After the FHWA ROD has been issued, final design and ROW acquisition may begin. Construction of any improvements would follow.

2 Alternatives

This chapter includes the following substantive revisions made since publication of the DEIS:

- *Modifications to the proposed RS-1 alignment and transload facility location are described.*
- *The grades of the DEIS RS-1 Halladay Road options have been included.*
- *The results of additional screening of the RS-1 Halladay Road options (Section 2.6.2.4) has been added, with information on the wetland, farmland, and material (cut and fill) impacts of each of these options.*
- *Cost information has been updated to reflect current construction costs as of 2008.*

2.1 Introduction

This chapter provides a summary of all the alternatives that have been considered for the project, the screening processes used to evaluate the alternatives, the alternatives that have been deemed reasonable for more detailed assessment, and the basis for identifying the preferred alternative.

Selection of alternatives to study in an EIS is described in Council on Environmental Quality (CEQ) regulations at 40 CFR 1502.14 and in FHWA regulations at 23 CFR 771.123(c). These regulations require that “all reasonable alternatives” be studied, but do not define what constitutes “reasonable”. FHWA Technical Advisory T 6640.8A states that: “A representative number of reasonable alternatives must be presented and evaluated in the EIS. The determination of the number of reasonable alternatives in the Draft EIS (DEIS), therefore, depends on the particular project and the facts and circumstances in each case.”

The alternatives that were considered for this study, and the process by which they were identified, are described below in Section 2.2. The screening of alternatives is described in Section 2.3. The screening involved two steps: first, all possible alternatives were screened for viability to determine whether they could meet basic design criteria, could be effective, and could meet the project purpose and need. The alternatives that passed this physical and operational screening were then screened for resource impacts, based on existing, “macro-level” resource mapping. A preliminary selection was made regarding which alternatives should be considered for detailed study in the EIS. Further study revealed that one of the remaining alternatives would have substantially greater socioeconomic effects than other alternatives and might not be appropriate for further study.

2.2 Description of Preliminary Alternatives for Screening

2.2.1 Identification of Preliminary Alternatives

The EIS process requires that all reasonable alternatives that have potential to meet the purpose and need of the project be considered. To ensure that all such alternatives were considered, the project team reviewed previous transportation studies of the general project area and also identified additional alternatives that were not previously studied. In addition, Advisory Committee, resource agency, and Public Scoping meetings were held to ensure all interested parties had the opportunity to comment on the selection of alternatives to be studied. The No Build Alternative must also be considered as a baseline for comparison.

The previous studies and initiatives evaluated ways to improve the transportation system along the US 7 corridor in Addison and Rutland Counties. These studies included:

- Middlebury/Route 7 Corridor Management Study (November 1998)
- OMYA Quarry Material Alternative Transport Legislative Study (January 1999)
- Pittsford and Brandon US Route 7 Bypass Scoping Study (August 2000)
- Rail Based Transportation System, Least Environmentally Damaging Practicable Alternative (LEDPA), Transportation Alternative Analysis (March 2002)

These studies evaluated various transportation modes to determine the ability of each to improve the movement of people and goods along the corridor. Several of the studies focused on constructing a rail spur from the mainline railroad to the Omya quarry. Providing a roadway connection from the quarry to the mainline (referred to as “truck to rail”) was also considered. US 7 bypass alternatives have also been studied to remove traffic from village centers.

The alternatives previously considered that were included in the first phases of EIS screening include:

- No Build
- Three rail spur alternatives included in the LEDPA evaluation and Legislative Study as detailed in the next section
- Two truck to rail alternatives included in the LEDPA evaluation and Legislative Study
- Highway bypass alternatives previously evaluated in various studies
- A conveyor alternative included in the Legislative Study

The previously identified alternatives are shown on Figure 2.2-1 and other figures in Volume IIB (the Screening Figures) as the alignments with solid lines.

The design team also reviewed the project area and identified additional rail and truck to rail alternatives to connect the Omya quarry and the mainline while minimizing the impacts to property and natural, historical, and archaeological resources. These alternatives were presented to the Resource Agencies, Advisory Committee and public for comment and input.

The resulting additional alternatives that were included in the first phases of EIS screening included four rail spur alternatives and five truck to rail alternatives.

These additional alternatives can be found on the figures in Volume IIB as the alignments with dashed lines. Figure 2.2-1 shows all of the preliminary alternatives.

In summary, the Preliminary Alternatives considered during the first phases of EIS screening included: seven rail spur alternatives, seven truck to rail alternatives, five highway bypass alternatives and one conveyor alternative. These alternatives are described in the following sections and are shown on Figure 2.2-1.

2.2.2 Description of Preliminary Alternatives

The project area has sparse to medium development and contains a diverse range of land uses, including heavy to light industrial, commercial, residential, and agricultural activities. The area immediately surrounding the Omya quarry includes primarily agricultural and rural residential land uses.

2.2.2.1 Rail Spur Alternatives

Rail spur alternatives were developed primarily to provide a rail connection to transport marble from the Omya quarry in Middlebury to the mainline that runs north to south through Middlebury. There are other potential users of a rail spur that may benefit from access to the rail line. Therefore, a rail transload facility would be constructed to allow other shippers to load or unload material to and from rail cars. The transload facility would include sidings for rail car storage and open areas for material and goods storage. (The likely location and dimensions of transload facilities for those alternatives advanced for further consideration are described later in this chapter).

Crossings of roads by rail spurs could be at grade or grade separated, except at US 7, where a grade separation is assumed. Below is a brief description of the rail spur alternatives. The configuration of each rail spur alternative can be seen on Figure 2.2-1 and on Figures 1, 2, and 3 in Volume IIB.

<u>Rail Spur Alternative 1 (RS-1)</u>: RS-1 would begin at the Omya quarry where it would head south and then southwest toward US 7, roughly following the current

Omya access road. A transload facility would be constructed along the rail spur just south of the quarry to allow other shippers access to the rail spur. The alignment would cross Lower Foote Street about 25 feet below the existing elevation and would therefore cut off Lower Foote Street. The alternative would then cross under US 7, passing under a new US 7 vehicular bridge over the rail spur. The alignment would then head west toward the mainline, traversing mostly farmland. It would cross Halladay Road, with the type of crossing (at grade, grade separated, or cutting off and relocating Halladay Road) to be determined. Toward the western terminus, the alternative would head south, bridging over Creek Road and Otter Creek, and connecting with the mainline heading south. The total length of the alternative would be about 3.17 miles.

<u>Rail Spur Alternative 2 (RS-2)</u>: RS-2 would be identical to RS-1 from the quarry to US 7, including a transload facility just south of the quarry. After crossing under US 7, RS-2 would head south. It would cross Halladay Road, with the type of crossing to be determined. The alternative would head south, west of Halladay Road, traversing forested areas and farmland. After an at-grade crossing of Three Mile Bridge Road, the alternative would head southwest, west of Shard Villa Road. It would continue in a southwest direction and connect with the mainline heading south. The total length of the alternative would be about 5.22 miles.

<u>Rail Spur Alternative 3 (RS-3)</u>: RS-3 would be identical to RS-1 from the quarry to Halladay Road, including a transload facility just south of the quarry. West of Halladay Road, RS-3 would head northwest, traversing mostly farmland until it approaches Middle Road. It would parallel the west side of Middle Road past the Middlebury Union Middle School and then would head west just north of the VTrans maintenance facility. Towards its western terminus, RS-3 would cross Creek Road at grade, pass through town recreational fields, bridge over Otter Creek, and then connect with the mainline heading north. The total length of the alternative would be about 3.84 miles.

<u>Rail Spur Alternative 4 (RS-4)</u>: RS-4 would begin at the Omya quarry where it would head south and then west toward US 7. Any transload facility for RS-4 would likely be identical to that for RS-1. The alignment would cross Foote Street just north of its junction with Lower Foote Street. The alternative would be about 40 feet below the existing elevation and would therefore cut off Foote Street and dead end Lower Foote Street. The alternative would then cross under US 7, utilizing a bridge on US 7. The alignment would then head northwest around a hill and cross over Middle Road just north of the Middle School. After crossing over Middle Road, the alignment would head west, bridge over Otter Creek and then connect with the mainline heading south. The total length of the alternative would be about 2.59 miles.

<u>Rail Spur Alternative 5 (RS-5)</u>: RS-5 would begin at the Omya quarry, where it would head north and then northwest, roughly following the old Beldens Rail

Line. The alignment would traverse mostly farmland for about two miles northwest of the quarry. It would cross over Quarry Road, where a bridge would be constructed over the roadway. The alignment would then cross Painter Road at grade, Happy Valley Road at grade, and would then cross under US 7, utilizing a bridge on US 7. At the western terminus, RS-5 would connect with the mainline heading north. The location of any required transload facility would be determined during EIS studies. The total length of the alternative would be about 4.08 miles.

Rail Spur Alternative 6 (RS-6): RS-6 would begin at the Omya quarry where it would head north but would soon head southwest toward US 7. The alignment would cross Foote Street at grade and would require a rail-crossing signal. It would traverse mostly farmland from the quarry to US 7. RS-6 would cross under US 7 utilizing a bridge on US 7. However, US 7 would have to be raised about 10 feet to accommodate the rail grades. The alignment would head west after crossing US 7 and pass just north of the Middle School. Toward the western terminus, RS-6 would bridge over Creek Road and Otter Creek, connecting with the mainline heading south. The location of a transload facility would be determined during EIS studies. The total length of the alternative would be about 2.76 miles.

Rail Spur Alternative 1/4 (RS-1/4): RS-1/4 is a hybrid consisting of the western portion of RS-1 and the eastern portion of RS-4. The two ends would be connected by traversing an area of forest and farmland west of US 7. Any transload facility for this alternative would likely be identical to that for RS-1. The total length of the alternative would be about 3.20 miles.

2.2.2.2 Truck to Rail Alternatives

Truck to rail alternatives would allow freight to be transported by truck to the mainline north of Brandon Village. Each of the truck to rail alternatives is located north of Brandon Village so that marble trucks from the Omya quarry would not drive through the center of Brandon Village. Each truck to rail alternative would need a transload facility to serve the same purpose as those for the rail spur alternatives. However, the truck to rail transloads would need to be larger than the rail spur transloads as they would have to accommodate Omya's marble shipments as well as other shippers' freight transport. The transload facility would ideally be located close to the mainline and must have sufficient land to accommodate the facility. A short new rail segment would be required to connect the transload facility to the mainline.

The truck to rail alternatives would begin (at their eastern terminus) near US 7, because the existing Omya access road would be used from the quarry. Crossings of roads by truck to rail roadways could be at-grade or grade separated, except at US 7, where a grade separation is assumed. Below are brief descriptions of the truck to rail alternatives. The configuration of each truck to rail alternative can be seen on Figure 2.2-1 and Figures 1 through 4 in FEIS Volume IIB.

Truck to Rail Alternative 1 (TR-1): TR-1 would be an east to west roadway located in Middlebury within the RS-1 corridor. East of US 7, TR-1 would follow the existing Omya access road. TR-1 would then pass under US 7, and roughly follow the RS-1 alignment, heading southwest and then west across Halladay Road. The Halladay Road crossing could be either at grade or grade separated, with TR-1 passing over Halladay Road. It would then head west, traversing mostly farmland. The transload facility for TR-1 would likely be located in a field east of Otter Creek, as there are no suitable sites closer to the mainline. A short rail spur would be constructed from the transload facility to the mainline. The rail spur would bridge over Creek Road and Otter Creek. The total length of the alternative would be about 3.10 miles, which includes 1.20 miles on the existing Omya access road, 1.18 miles on new roadway alignment, and 0.72 miles on new rail alignment.

Truck to Rail Alternative 2 (TR-2): TR-2 would follow the existing quarry access road, US 7, and Three Mile Bridge Road, an east to west roadway in southern Middlebury. Three Mile Bridge Road is an existing road that currently is cut off by Otter Creek. A bridge over Otter Creek once existed, but was destroyed in a flood several decades ago. TR-2 would require an upgrade of the road along its existing alignment and construction of a new bridge over Otter Creek. The upgrade would include raising the grade of portions of the roadway because they lie within the 100-year floodplain and are prone to flooding in the spring. At the western terminus, the road would need to be raised to bridge over the mainline. The transload facility for TR-2 would likely be located on the west side of the mainline and would parallel the tracks. The total length of the alternative would be about 5.35 miles, which includes 1.20 miles on the existing Omya access road; 1.61 miles on US 7, which would likely need no upgrades; and 2.54 miles on existing local roads, which would likely need to be upgraded.

Truck to Rail Alternative 3 (TR-3): TR-3 would follow the existing quarry access road, US 7, and an east to west roadway in Salisbury between US 7 and the mainline. This east to west roadway would begin on US 7 south of Holman Road, opposite Kelly Cross Road. From US 7, TR-3 would follow Kelly Cross Road by creating a new intersection with Kelly Cross Road and US 7. After following Kelly Cross Road for about two-thirds of a mile, TR-3 would head overland on new alignment until it connects with West Salisbury Road. It would follow West Salisbury Road past Leland Road, and then would follow Dewey Road past Salisbury Station. South of Salisbury Station, TR-3 would likely end at a transload facility located on the east side of the mainline and parallel to the tracks. The total length of the alternative would be about 8.99 miles. This includes 1.20 miles on the existing Omya access road; 4.94 miles on US 7, which would likely need no upgrades; 1.56 miles on existing local roadway alignments, which would likely need to be upgraded; and 1.29 miles on new roadway alignments.

<u>Truck to Rail Alternative 4 (TR-4)</u>: TR-4 would be another truck to rail alternative joining the mainline in Salisbury. Like TR-3, TR-4 would follow the existing quarry access road, US 7, and local roads in Salisbury. The local road segment would begin on US 7 south of Holman Road opposite Kelly Cross Road. However, it would then head southwest through mostly forested area, cross Salisbury Road, and would connect with Morgan Road. TR-4 would follow Morgan Road southwesterly to its terminus with Leland Road. From the intersection of Morgan and Leland Roads, there are two options for TR-4. The north option would continue southwest on new roadway through mostly farmland, until it met the mainline. The alignment would turn south to a transload facility on the east side of the tracks. The total length of the north option of TR-4 is about 9.25 miles. This includes 1.20 miles on the Omya access road, 4.94 miles on US 7 which would likely need no upgrades, 1.40 miles on existing local roadway alignments which would likely need to be upgraded, and 1.71 miles are on new roadway alignments. The south option would follow Leland Road southerly to where it crosses the mainline. As the south option approaches the mainline, it would head north to a likely transload facility location on the east side of the tracks. The total length of the south option would be about 10.82 miles. This includes 1.20 miles on the Omya access road; 4.94 miles on US 7, which would likely need no upgrades; 3.24 miles on existing local roadway alignments, which would likely need to be upgraded; and 1.44 miles on new roadway alignments.

<u>Truck to Rail Alternative 5 (TR-5)</u>: TR-5 would follow the existing quarry access road, US 7, and an east to west roadway located in Leicester between US 7 and the mainline. The local road segment would begin at the terminus of Leicester-Whiting Road at US 7 and would follow Leicester-Whiting Road west and southwest to its junction with Memoe Road. As the alignment approaches Memoe Road it would head southwest traversing mostly farmland until it re-connects with the western portion of Leicester-Whiting Road. TR-5 would follow Leicester-Whiting Road to a point where it is adjacent to the mainline. As it approaches the mainline, the alignment would head south to a point where a transload facility could likely be constructed. The transload facility would likely be located on the east side of the tracks, but perpendicular to the tracks. There is no appropriate site to align the transload facility parallel to the tracks. The total length of the alternative would be about 12.61 miles. This includes 1.20 miles on the existing Omya access road; 8.72 miles on US 7, which would likely need no upgrades; 2.22 miles on existing local roads, which would likely need to be upgraded; and 0.47 miles on new roadway alignments.

<u>Truck to Rail Alternative 6 (TR-6)</u>: TR-6 would be another truck to rail alternative joining the mainline in Leicester and following an east to west roadway between US 7 and the mainline. TR-6 would follow the existing quarry access road and US 7, then follow Cram Road from US 7 west to Swinington Hill Road. From the

end of Cram Road the alignment would head west traversing mostly farmland to a western terminus that would be similar to TR-5. The transload facility would likely be at the same location as proposed for TR-5. The total length of the alternative would be about 12.81 miles. This includes 1.20 miles on the existing Omya access road; 9.76 miles on US 7, which would likely need no upgrades; 0.99 miles on existing roadway alignments, which would likely need to be upgraded; and 0.86 miles on new roadway alignments.

Truck to Rail Alternative 7 (TR-7): TR-7 would be a truck to rail alternative joining the mainline in northern Brandon. TR-7 would follow the existing quarry access road and US 7, turning off US 7 at the intersection with New Road. It would then follow a new, curved alignment around a hill before heading north to parallel the mainline. The transload facility for TR-7 would likely be located on the east side of the mainline and would parallel the tracks. The total length of the alternative would be about 15.48 miles. This includes 1.20 miles on the existing Omya access road; 12.52 miles on US 7, which would likely need no upgrades; and 1.76 miles of new roadway alignment.

2.2.2.3 Highway Bypass Alternatives

Highway bypass alternatives have previously been studied along US 7 because of traffic congestion in the village centers. A US 7 bypass would remove through traffic from the village centers, thereby reducing congestion and decreasing travel times for through traffic. Highway bypass alternatives were part of the first phase of screening because their ability to reduce congestion would appear to satisfy part of the project purpose and need. Each of the bypass alternatives was developed as part of other studies. Below is a brief description of the highway bypass alternatives. The configuration of each highway bypass alternative can be seen on Figure 2.2-1 and Figures 1, 2, and 4 in Volume IIB.

Highway Bypass Alternative 1 (HB-1): HB-1 would be a north to south bypass of US 7 along the eastern side of Middlebury Village. HB-1 would begin just north of the Boardman Street terminus, then would head north around Chipman Hill, reconnecting with US 7 near the Happy Valley Road terminus. HB-1 also has a truck to rail component so that marble shipments from the quarry could access the mainline. The truck to rail component of HB-1 would begin where the highway bypass ends on US 7. The truck to rail alignment would head west from US 7, curve around a commercial district and would then head to a point where a transload facility could be constructed. The transload facility would likely be located on the east side of the tracks parallel to the tracks. The total length of the bypass is about 2.66 miles. For HB-1 to be used as a truck to rail route for Omya, the total length of the alternative would be about 6.21 miles. This includes 1.20 miles on the existing Omya access road; 1.41 miles on existing US 7, which would likely need no upgrades; 2.66 miles on the new US 7 bypass; and 0.94 miles of new roadway alignment from the end of the bypass to the mainline.

Highway Bypass Alternative 2 (HB-2): HB-2 would be a north to south bypass of US 7 along the western side of Brandon Village. From the southern terminus, HB-2 would begin north of Humiston Drive, head west and then cross the mainline. After crossing the rail, the alignment would head northwest, cross Pearl Street and then would head north. It would again cross the mainline traversing due north. After crossing Steinberg Road, the alternative would head northeast to US 7. It would reconnect with US 7 near the New Road terminus. The total length of the bypass would be about 2.66 miles.

Highway Bypass Alternative 3 (HB-3): HB-3 would be a north to south bypass of US 7 along the eastern side of Brandon Village. HB-3 would begin just north of Country Club Road, then would head north around the village. HB-3 would cross Park Street and then would head northwest, cross Marble Street, cross Wheeler Road, and then head west to US 7. It would reconnect with US 7 across from the terminus of Arnold District Road. The total length of the bypass would be about 3.26 miles.

Highway Bypass Alternative 4 (HB-4): HB-4 would be a bypass of Pittsford and Brandon Villages that is west of existing US 7. HB-4 is a major bypass that is up to 2.5 miles west of the existing highway. It is primarily a north to south alignment traversing mostly forested land. The total length of the alternative, according to prior studies, would be about 13.8 miles.

Highway Bypass Alternative 5 (HB-5): HB-5 would be a bypass of Pittsford and Brandon Villages that is east of existing US 7. HB-5 is a major bypass that parallels the existing highway. It is primarily a north to south alignment traversing mostly forested land and some farmland. The total length of the alternative, according to prior studies, would be about 12.7 miles.

2.2.2.4 Conveyor Alternative

Conveyor Alternative 1 (C-1): C-1 would follow the same alignment as RS-1, the transload facility location would be identical to the likely TR-1 transload facility and its size would be comparable. As was the case with TR-1, a short rail spur would be constructed from the transload facility to the mainline. The conveyor portion would require a maintenance access road in addition to the conveyor. The conveyor system would include an enclosure over the mechanical components of the system, and the conveyor would operate continually during the day. The total length of the alternative would be about 3.17 miles, of which 2.45 miles is the conveyor/access road and 0.72 miles is a new rail spur.

2.3 Alternatives Screening

A two-step alternative screening process was conducted to determine which alternatives would be carried forward for more detailed studies. The first phase of alternatives screening focused on each alternative’s viability in terms of physical and operational considerations. Alternatives that failed this screening were not carried further for resource screening. The resource screening focused on a broad range of environmental and cultural (historical and archaeological) resource impacts.

2.3.1 Physical and Operational Screening

The Physical and Operational screening results are described below and shown in Table 2.3-1, and described in more detail in the *Physical and Operational Screening of Alternatives* technical report, which remains available.

2.3.1.1 Screening Methods

Alternatives were screened using three broad criteria:

1. Ability to meet design criteria (such as minimum horizontal curves and maximum vertical grades for the railroad or roadway design speeds and classifications);
2. Relative effectiveness in freight handling and movement; and
3. Removal of freight traffic from US 7, village centers, and local roads.

2.3.1.2 Screening Results

2.3.1.2.1 No Build Alternative

The physical and operational screening of the No Build Alternative showed that it would be able to meet design criteria and would be partially effective in handling freight, but would not remove freight traffic from area roadways and village centers. For these reasons, the No Build Alternative did not pass the physical and operational screening. However, the No Build Alternative must, per NEPA requirements, be carried forward for detailed study in the EIS.

2.3.1.2.2 Rail Spur Alternatives

The screening showed that each of the rail spur alternatives met the three criteria, so they were recommended for macro-level resource screening.

TABLE 2.3-1. PHYSICAL AND OPERATIONAL SCREENING RESULTS

January 20, 2006

CRITERIA	NO BUILD	RS-1	RS-2	RS-3	RS-4 or 1/4	RS-5	RS-6	TR-1	TR-2	TR-3 thru TR-7	HB-1	HB-2	HB-3	HB -4 and -5	C-1
	Existing US Route 7	Middlebury Rail Spur (Western Rail Spur [A-1])	Middlebury Rail Spur (Southern Rail Spur [A-2])	Middlebury Rail Spur (Northern Rail Spur [A-3])	Middlebury Rail Spur (Southern Direct Routes)	Northern Middlebury Rail Spur	Middlebury Rail Spur (Northern Direct Route)	Middlebury Truck to Rail (RS-1 Alignment)	Middlebury Truck to Rail (Three Mile Bridge Road)	Salisbury, Leicester, and Brandon Truck to Rail	Middlebury Bypass and Local Connector	Western Brandon Bypass (BW)	Eastern Brandon Bypass (BE)	Western and Eastern Pittsford-Brandon Bypass (PBW and PBE)	Conveyor on RS-1
Able to meet design criteria	Yes	Yes	Yes	Yes	Yes, but subtantial cuts and fills required	Yes, but subtantial cuts and fills required	Yes, but subtantial cuts and fills required	Yes	Yes	Yes	Yes, but substantial cuts and fills required	Yes	Yes	Possibly (design not studied in detail)	Yes
Relatively effective in terms of freight handling and movement (1)	Partially (effective, but not as cost-effective to operate as rail spurs)	Yes (more cost-effective to operate than truck or transload alternatives)	Yes (more cost-effective to operate than truck or transload alternatives)	Yes (more cost-effective to operate than truck or transload alternatives)	Yes (more cost-effective to operate than truck or transload alternatives)	Partially (probably cost-effective to operate, but initial north-bound movement required)	Yes (more cost-effective to operate than truck or transload alternatives)	No (trucking less cost-effective to operate than rail, and transload required)	No (trucking less cost-effective to operate than rail, and transload required)	No (trucking less cost-effective to operate than rail, and transload required)	No (trucking less cost-effective to operate than rail, transload required, and initial north-bound movement)	Partially (effective, but not as cost-effective to operate as rail spurs)	Partially (effective, but not as cost-effective to operate as rail spurs)	Partially (effective, but not as cost-effective to operate as rail spurs)	No (transload required)
Removes freight traffic from:															
Village centers	No	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (Omya trucks removed from Brandon Village)	Yes (most trucks removed from Middlebury and Omya trucks removed from Brandon Village)	Yes (most trucks removed from Brandon Village)	Yes (most trucks removed from Brandon Village)	Yes (most trucks removed from Brandon and Pittsford Villages)	Yes (most trucks removed from Brandon Villages)
US Route 7	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Partially (Omya trucks removed from portion of US 7)	Partially (Omya trucks removed from portion of US 7)	Partially (Omya trucks removed from portion of US 7)	No	No	Partially (Omya trucks removed from portion of US 7)	Yes
Local roads	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Partially (freight trucks travel on local road in commercial park)	No	No	Partially (some local road travel required)	Yes
DOES ALTERNATIVE PASS PHYS./OP. SCREENING?	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Partially**	**Yes**	**No**	**No**	**No**	**No**	**Partially**	**Partially**	**Partially**	**No**
STUDY IN RESOURCE SCREENING?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**No?**	**No**	**No?**	**Yes**	**Yes**	**No**	**No**
REASON	Required	Meets criteria	Meets criteria	Meets criteria	Meets criteria	Generally meets criteria	Meets criteria	Best truck to rail alternative (2)	Does not meet criteria but has other benefits (reestablishes Otter Creek road crossing)	Does not meet criteria	Does not meet criteria but has other benefits	Partially meets criteria and has other benefits (2)	Partially meets criteria and has other benefits (2)	Scope of this alternative is well beyond purpose of project	Does not meet criteria

COST (3)	NO BUILD	RS-1	RS-2	RS-3	RS-4 or 1/4	RS-5	RS-6	TR-1	TR-2	TR-3 thru TR-7	HB-1	HB-2	HB-3	HB -4 and -5	C-1
										TR-3:					
Annual Operational	$4,105,000	$1,860,000	$1,880,000	$1,880,000						$3,460,000	$3,050,000				$2,370,000
Annual Total (low)	$4,136,000	$3,250,000	$3,620,000	$3,440,000						$4,770,000	$5,570,000				$3,830,000
Annual Total (high)	$4,151,000	$3,940,000	$4,490,000	$4,200,000						$5,400,000	$6,820,000				$4,550,000

NOTES
(1) This criterion considers operational effectiveness; it does not address the initial investment requried to construct and establish the facility, which can affect its net cost-effectiveness.
Omya, Inc. is assumed to be the principal shipper, with VNAP and others' participation possible.
(2) It is preferable not to limit the study to only rail spur alternatives, so at least one truck to rail and one highway bypass alternative will be taken to the next level of screening.
Because the length and impacts of HB-2 and HB-3 are similar, both will be considered in the resource screening.
(3) Cost figures are based on the "OMYA Quarry Material Alternative Transport Legislative Study" dated January 6, 1999. Operational costs are only for Omya.
Total costs include initial capital costs (including at Omya's facility) and annualized capital costs.

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2.3.1.2.3 Truck to Rail Alternatives

The screening showed that each of the truck to rail alternatives could be made to meet design criteria and therefore meet the first screening criterion. However, because trucking would require two modes of transportation and extra material handling steps, they would be less efficient than all-rail shipment. In the 1999 Legislative Study[1], the annual operating costs of truck to rail alternatives (including Middlebury Bypass, Salisbury, and Leicester routes) were found to be much higher than those for rail spur alternatives. For these reasons, the truck to rail alternatives do not meet the second criterion. Regarding the third criterion, only TR-1 would completely remove trucks from US 7, village centers, and local roads; all other alternatives would involve some combination of US 7 and local roads and therefore would not completely meet the third criterion.

Although none of the truck to rail alternatives were deemed to meet all three criteria, it was determined that one should be retained for detailed study for comparison purposes as an alternative mode. The truck to rail alternative that appears to be most efficient and cost-effective (since it is the shortest truck to rail route) and would have the greatest benefit in terms of removing traffic from US 7 and local roads is TR-1, so this alternative is recommended to be included for detailed study. TR-2 would have the possible added public benefit of an Otter Creek vehicular crossing, so it was recommended for macro-level resource screening.

2.3.1.2.4 Highway Bypass Alternatives

The physical and operational screening of the highway bypass alternatives showed they all could be made to meet design criteria, and therefore all meet the first criterion.

HB-2 and HB-3, although less efficient than all-rail alternatives, could be effective in freight handling and movement, and therefore were deemed to meet the second criterion. These alternatives would remove through truck traffic from Brandon Village, but not US 7 or local roads, and therefore partially meet the second criterion. For these reasons, HB-2 and HB-3 were recommended for macro-level resource screening.

HB-1, in terms moving freight to the rail line, is essentially a truck to rail alternative, and like those alternatives would involve two modes of transportation and extra material handling. Therefore HB-1 was deemed less efficient and more costly to operate than rail spur alternatives, and did not meet the second criterion. It would remove freight traffic from village centers and portions of US 7 and local roads, and therefore partially meet the third criterion. However,

[1] *OMYA Quarry Material Alternative Transport Legislative Study, Volume 1* prepared by R.L. Banks & Associates, Inc. and DuBois & King Inc., published January 1999.

because of the Town of Middlebury's interest in this alternative and because it has benefits beyond the purpose and need of this project, it was decided to carry it forward for macro-level resource screening.

HB-4 and HB-5 are major bypasses and were deemed not viable due to their expected high costs, impacts, and time to implement, and therefore were not recommended for macro-level resource screening.

2.3.1.2.5 Conveyor Alternative

The conveyor alternative, C-1, could be made to meet design criteria and therefore meets the first criterion. It was believed to be less efficient and cost effective than rail spur alternatives, because, as with truck to rail alternatives, it would involve extra material handling and two modes of transportation. As with truck to rail alternatives, the 1999 Legislative Study cited above found the annual operating costs of a conveyor alternative to be higher than those for rail spur alternatives. Although it could be more cost effective than truck to rail alternatives for Omya, it did not meet the second criterion. The conveyor would remove freight traffic from US 7, village centers, and local roads, and therefore meet the third criterion.

The conveyor alternative was originally proposed because a conveyor system has more grade flexibility than a rail spur and would therefore involve less cut and fill and less resource impact. While this is true, the conveyor would have other impacts and limitations that would make it less desirable. First, the conveyor envisioned would only accommodate shipments from Omya's quarry. In order to accommodate shipments for other shippers, a truck to rail route and transload facility would also need to be provided. In essence, Alternative C-1 would be comparable to constructing truck to rail alternative TR-1 plus a conveyor line for Omya. The conveyor itself would have a smaller footprint than a rail spur, but would require a parallel maintenance road.

Although no resource screening was performed on C-1, there are specific impacts that should be noted. The conveyor system envisioned for this alternative would include an enclosure over the mechanical components of the system. This enclosure would be five feet wide and seven feet tall and could have an adverse visual and aesthetic effect. Also, the conveyor would operate continually during the day. The noise and vibration of this continuous operation could impact the properties surrounding the conveyor. For these reasons C-1 was not recommended for macro-level resource screening.

2.3.1.3 Summary of Physical and Operational Screening Recommendations

Table 2.3-2 lists recommendations for macro-level resource screening.

Table 2.3-2 Physical and Operational Screening Recommendations

Recommended for Macro-level Resource Screening:		Not Recommended for Macro-level Resource Screening:
RS-1	TR-1	TR-3
RS-2	TR-2*	TR-4
RS-3	HB-1*	TR-5
RS-4	HB-2	TR-6
RS-5	HB-3	TR-7
RS-6		HB-4
RS-1/4		HB-5
		C-1

** TR-2 and HB-1 did not meet physical and operational screening criteria, but were recommended for resource screening because of their other benefits.*

2.3.2 Macro-Level Resource Screening

2.3.2.1 Introduction

Macro-level resource screening of the Middlebury Spur preliminary alternatives was conducted during February, March, and April 2005. A broad range of environmental and cultural resource impacts were assessed in this process. This section describes the results of the macro-level resource screening. All impacts were measured assuming a 100-foot wide footprint (for all build alternatives) and a 300-foot by 1,500-foot transload facility, where material would be temporarily stockpiled and transferred from truck to rail. (It was later determined that the truck to rail transload facilities would have to be larger than this, while the rail spur transload facilities could be smaller, but the screening was conducted assuming the same size for all alternatives. If the transload size estimates were modified, the resource impacts of rail spur alternatives would be somewhat lower, and impacts of truck to rail alternatives somewhat higher, than reported in this section.) In order to ensure an “apples to apples” comparison of the alternatives, the same sources of resource data and the same impact measurement methods were used for all alternatives.

2.3.2.2 Data Sources

A variety of data sources were used to assess resource impacts. Because this was a preliminary impact screening, it was based on available mapping resources with no field verification. The various sources of data had varying levels of accuracy, depending on the original data source, the media used in transferring it, and other factors. Data sources for the resource screening included:

Vermont Center for Geographic Information (VCGI) Website
- Wetlands
- Farmland Soils
- Hazardous Materials Sites
- Deer Wintering Areas
- Conserved Public Lands
- Trails
- Floodplains (Rutland County Only)

Printed Maps
- Parcels
- State-Listed Historic Properties
- Floodplains (not available for all communities)
- 1995 and 2003 Orthophotos, and 2004 Aerial Photography
- Structures
- Residences
- Undeveloped Habitat
- Water Bodies

Rare and Endangered Species data was received directly from Vermont's NNHP. National Register properties were located from the National Register of Historic Places Website and 1995 orthophotos.

2.3.2.3 Resource Identification and Impact Assessment Methods

Resources are shown on Figures 7 through 15 in Volume IIB. The study area was divided into three segments: northern, middle, and southern. Water-based resources (wetlands, floodplains, surface waters, and hydric soils) are displayed on Figures 7, 8, and 9, and land-based resources (conserved land, prime farmland soils, recreational trails or areas, deer wintering areas, rare species elements, hazardous materials, and historic properties) on Figures 10, 11, and 12. Groundwater favorability areas (areas with favorable conditions for groundwater supply) are mapped on Figures 13, 14, and 15.

Wetlands: Wetland impacts were measured as impacts to hydric soils and Vermont Significant Wetland Inventory (VSWI) wetlands. Hydric soils were identified based on the NRCS's Comprehensive Hydric Soils List. Soils that are listed as possibly having hydric inclusions were not counted as hydric soils. Where hydric soils overlapped with VSWI wetlands, the wetland impact was counted only once.

Archaeological Sensitivity and Sites: Archaeologically sensitive area mapping was not available from existing sources for the study area, and therefore was not identified or assessed. Archaeologically sensitive land was identified as part of the Archaeological Resource Assessment during the detailed study in Chapter 4.

National Register Historic Resources: Locations of National Register-listed historic resources were identified from the National Register's web site. Only listed properties were included, and only those within an alternative's footprint were considered impacts.

State-Listed Historic Resources: Historic resources listed on the Vermont State Register of Historic Places were extracted from maps in documents published by the Vermont Division for Historic Preservation. Only those within an alternative's footprint were considered impacts.

Conserved Public Lands: Conserved public lands (i.e., parks, wildlife refuges, or other public lands protected or managed as public open space) were taken from VCGI data.

Section 4(f) and 6(f) Resources: This level of screening did not include a determination of which resources are regulated under Section 4(f) or Section 6(f), or whether there would be impacts to the resources. This was addressed during the detailed study in Chapter 4.

Recreational Trail Crossings: Trail Crossings for all alternatives were determined from VCGI data, with the number of crossings tabulated and reported.

Right of Way: The number of parcels impacted was extracted from the most recent tax maps available from town offices.

Structures Impacted: Structures (such as buildings, sheds, silos, barns, etc.) to be impacted were based upon visual assessment of orthophotos from 1995, and supplemented with project aerial photos taken in 2004 (available for all alternatives except RS-5 and HB-1).

Floodplains: Floodplain impacts were assessed based on available Federal Emergency Management Agency (FEMA) mapping. Digital data for Rutland County was available through VCGI, and printed maps were scanned and scaled for the other alternatives.

Hazardous Material Sites: Possible involvement with hazardous material sites was based on the VANR quarterly Active Hazardous Sites lists.

Deer Wintering Areas: Deer wintering areas were based upon VANR data, accessed through VCGI.

Rare and Endangered Species: Impacts were based upon data received directly from the Vermont NNHP.

Undeveloped Land: Impacts were based upon linear feet of alignment that bisected undeveloped land, evaluated from 1995 orthophotos and 2004 aerial photography. Agricultural land was considered undeveloped for purposes of this category.

Water Body Crossings: Water body crossings were based upon stream or river channels that were identified on the U.S. Geological Survey (USGS) topographic maps.

Residences within 100 feet: This category is intended to represent impacts such as air, noise, vibration, and aesthetic concerns in the screening. Because such impacts are related to the proximity of residences to the alignments, the number of residences within 100 feet of the edge of the impact area (which is equivalent to 150 feet from the centerline) was counted using 1995 orthophotos and 2004 aerial photos. For the purposes of this measurement, residences within 100 feet of US 7 were not included.

Agricultural Land: Agricultural impacts were based upon an assessment of 1995 orthophotography. Areas that were in active farm use such as hay or crop fields were counted as impacted land if they fell within the 100-foot wide corridor.

Prime and Statewide Farmland Soils: Prime and statewide farmland soils were based solely upon the USDA NRCS soil units identified as such. All areas identified as prime or statewide farmland soils were included, including those that are not currently in agricultural use, such as areas used for housing or covered by roadways. Prime farmland soil impacts were reported separately, to represent the soils of highest importance. Prime and statewide soil impacts were also reported collectively, because they comprise “Primary” soils as defined in Act 250. Soil units identified as having statewide significance were included when they were impacted, even when those soil units were footnoted (b) or (c). Under NRCS’s definitions, footnote “b” denotes that “The soils in this map unit have a wetness limitation that may be difficult and/or unfeasible to overcome. Areas of this soil map unit don’t qualify as Prime, Statewide, or local, if artificial drainage is not feasible”. Footnote (c) denotes that “Bedrock outcrops commonly cover more than 2 percent of the surface. Areas of this soil map unit will not qualify as prime, Statewide, or Local, if bedrock outcrops are extensive enough to prohibit efficient farming.”

2.3.2.4 Results of Macro-Level Resource Screening

Results of the resource screening are shown in Table 2.3-3, *Macro-Level Resource Screening Evaluation Results*. Preliminary earthwork volumes of rail spur alternatives are listed in Table 2.3-4. Highlights of the evaluation of each alternative are described below.

TABLE 2.3-3. MACRO-LEVEL RESOURCE SCREENING EVALUATION RESULTS

January 20, 2006

CRITERIA	NO BUILD Existing US Route 7	RS - 1 Middlebury Rail Spur (Western Rail Spur [A-1])	RS-2 Middlebury Rail Spur (Southern Rail Spur [A-2])	RS - 3 Middlebury Rail Spur (Northern Rail Spur [A-3])	RS - 4 Middlebury Rail Spur (Direct Route)	RS-5 Northern Middlebury Rail Spur	RS-6 Second Northern Middlebury Rail Spur	TR - 1 Middlebury Truck to Rail (RS-1 Alignment)	TR - 2 Middlebury Truck to Rail (Three Mile Bridge Road)	HB-1 Middlebury Bypass and Local Connector	HB - 2 Western Brandon Bypass (BW)	HB - 3 Eastern Brandon Bypass (BE)
CONSTRUCTION AND DESIGN												
New Roadway Alignment	None	None	None	None	None	None	None	1.18 Miles	0.00	2.66 Miles	2.66 Miles	3.26 Miles
New Railway Alignment	None	3.17 Miles	5.22 Miles	3.83 Miles	2.58 Miles	4.08 Miles	2.76 Miles	0.72 Miles	0.30 Miles	0.30 Miles	None	None
Length of Local Roads Used	1.46 Miles	None	None	None	None	None	None	None	2.54 Miles	0.94 Miles	1.46 Miles	1.46 Miles
New Road or Rail Crossings	None	3	4	4	5	6	3	2	None	3	8	3
RESOURCE IMPACTS												
Total Wetlands (VSWI and hydric soils)	None	7.1 Acres	9.3 Acres	7.6 Acres	11.9 Acres	17.8 Acres	17.3 Acres	2.8 Acres	11.0 Acres	5.0 Acres	1.6 Acres	4.3 Acres
Class II Wetlands (VSWI)	None	0.9 Acres	None	4.1 Acres	2.5 Acres	2.9 Acres	5.4 Acres	0.9 Acres	0.1 Acres	0.5 Acres	1.1 Acres	1.4 Acres
Historical Structures (on National Register)	Many	None	None	None	None	None	None	None	None	None	None	None
Historic Districts (on National Register)	1 (Brandon Village)	None	None	None	None	None	None	None	None	None	None	None
State Listed Historic Structures		0	0	0	1	3	0	0	0	0	1	0
Conserved Lands (Public)	None	None	None	None	None	None	None	None	None	None	None	None
Trail Crossings	0	0	0	0	0	0	0	0	0	1	0	1
Right-of-Way (Parcels Directly Impacted)	None	14 Parcels	29 Parcels	17 Parcels	18 Parcels	33 Parcels	18 Parcels	7 Parcels	29 Parcels	17 Parcels	22 Parcels	15 Parcels
Structures Impacted	None	0	4	3	7	12	4	0	5	0	7	5
Floodplain	None	4.7 Acres	4.9 Acres	5.2 Acres	5.6 Acres	None	5.7 Acres	4.7 Acres	15.0 Acres	None	3.9 Acres	3.6 Acres
Hazardous Materials	None	None	None	None	2	None	2	None	None	None	1	None
Deer Wintering Areas	None	None	None	None	None	None	None	None	None	None	None	None
Rare & Endangered Species	None	None	None	None	None	None	None	None	None	None	None	None
Linear Feet of Undeveloped Habitat	None	12600	21500	11800	5900	12900	10400	8800	300	12900	8300	11700
Waterbody Crossings	None	3	2	3	2	6	1	3	2	1	1	5
Residences within 100 Feet	Not Assessed	0	2	0	3	3	2	0	6	7	2	1
Agricultural (active farm fields)	None	42.8 Acres	56.6 Acres	39.8 Acres	19.0 Acres	29.9 Acres	23.5 Acres	28.9 Acres	12.3 Acres	21.7 Acres	12.2 Acres	18.8 Acres
Prime Farmland Soils	0.5 Acres	1.4 Acres	4.9 Acres	0.8 Acres	3.3 Acres	0 Acres	0 Acres	1.4 Acres	9.3 Acres	0 Acres	1.8 Acres	0 Acres
Prime and Statewide Soils	No data	48.8 Acres	73.6 Acres	53.5 Acres	31.3 Acres	49.4 Acres	40.4 Acres	33.3 Acres	41.0 Acres	40.5 Acres	21.4 Acres	35.6 Acres

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Table 2.3-4 Preliminary Earthwork Volumes of Rail Spur Alternatives

Alternative	Total Cut (CY)	Total Fill (CY)	Total Earthwork (CY)	Net Excess Material (CY)
RS-1	389,912	135,015	524,927	254,897
RS-2	895,232	159,074	1,054,306	736,158
RS-3	490,233	148,872	639,105	341,361
RS-4	896,575	280,177	1,176,752	616,398
RS-5	1,485,103	58,465	1,543,568	1,426,638
RS-6	594,931	92,249	687,180	502,682
RS-1/4	756,359	90,705	847,064	665,654

CY = cubic yards

No-Build Alternative: The no-build alternative would have no impact to wetlands, floodplains, farmland soils, or most other natural resources. However, the no-build alternative would continue to affect historic structures in Salisbury and Brandon Village, as trucks continue to pass through these areas. The no-build must be carried forward as a baseline for comparison to the build alternatives which are carried forward for detailed study.

RS-1 Rail Spur: RS-1 would have 3.17 miles of new rail alignment. This alignment would not directly impact any structures, and there are no residences within 100 feet of the impact area. Impacts to active agricultural land (42.8 acres) and prime and statewide farmland soils (48.8 acres) would be relatively high. However, wetland impacts would be moderate (7.1 acres), the lowest of the rail spur alternatives. Floodplain impacts would be moderate at 4.7 acres. Because RS-1 would be a relatively direct route and have comparatively lower resource impacts, it was retained for detailed assessment.

RS-2 Rail Spur: RS-2 would have 5.22 miles of new rail alignment, more than any other alternative. RS-2 would cross 21,500 linear feet of undeveloped habitat. RS-2 would impact 56.6 acres of active farm fields and 73.6 acres of prime and statewide soils, more than any other alternative. It would pass through 29 parcels, and would impact 9.3 acres of wetland. Floodplain impacts would be moderate at 4.9 acres. It would directly impact four structures. RS-2 would also require a large amount of earthwork (1,054,306 cubic yards). Given the comparatively high resource impacts of RS-2 compared to RS-1 and RS-3, it was not carried forward for detailed assessment.

RS-3 Rail Spur: RS-3 would have 3.83 miles of new rail alignment. RS-3 would impact three structures on Middle Road near the Middle School. There are no other structures within 100 feet of the alignment. RS-3 would impact 7.6 acres of wetland, which is moderate compared with other alternatives, and 53.5 acres of prime and statewide soils, which is comparatively high. RS-3 would require 639,105 cubic yards of total earthwork. RS-3 was retained for detailed assessment because most resource impacts are relatively low.

RS-4 Rail Spur: RS-4 would have 2.58 miles of new rail alignment, making it the most direct rail alternative. However, RS-4 would have high wetland impacts (11.9 acres), including 2.5 acres of Class II wetlands, and would pass close to two hazardous materials sites. It would impact a state-listed historic structure. Given these impacts, and given that RS-4 does not provide any advantages over RS-1 or RS-3, it was eliminated from further consideration.

RS-5 Rail Spur: RS-5 would have 4.08 miles of new rail alignment. RS-5 would have the highest wetland impacts of all alternatives, at 17.8 acres. It also would impact twelve structures, including three state-listed historic structures, would have six new road or rail crossings, and six water body crossings. Given the relatively high impacts in most resource categories compared to RS-1 and RS-3, RS-5 was eliminated from further consideration.

RS-6 Rail Spur: RS-6 would have 2.76 miles of new rail alignment, making it the second most direct rail option. It would have relatively low impacts to floodplains, farmland soils, and undeveloped habitat. However, RS-6 would have 17.3 acres of wetland impact, including 5.4 acres of Class II wetlands, and would impact four structures. RS-6 was not carried forward for further study because of its impacts to wetlands and structures, and because it does not offer any distinct advantage over RS-1 or RS-3.

RS-1/4 Combination Rail Spur: RS-1/4 includes the eastern portion of RS-4 and the western portion of RS-1, with 3.20 miles of new rail alignment. This alignment has substantially greater topographic constraints than RS-1 or RS-4, as it would have to pass through two north-south ridges. Accordingly, it would require substantially more earthwork than RS-1 (847,064 cubic yards, compared with 524,927 cubic yards for RS-1). Furthermore, it would have many of the impacts of RS-1 (farmlands) and RS-4 (historic resources, farmlands, and a large dairy farm, along with deep cuts at Foote Street), while offering no clear advantages over RS-1 or RS-4. For these reasons, it was not included in the resource matrix, and will not be studied further.

TR-1 Truck to Rail: TR-1 would have 1.2 miles of new roadway alignment (plus additional new roadway within the transload facility) and 1.0 miles of new rail alignment, and would use 1.2 miles of existing private roadway. TR-1 would include a short rail spur to a transload facility in the field east of the rail line. TR-1 would have 2.8 acres of wetland impact, would impact no structures, and would pass through seven parcels. Because it was determined that one truck to rail should be kept for detailed assessment as an alternative mode, and many of the impacts would be lower than TR-2, TR-1 was retained for detailed assessment.

TR-2 Truck to Rail: TR-2 would have no new roadway alignment, 0.30 miles of new rail alignment, and uses 5.34 miles of existing roadway. TR-2 would have relatively high floodplain impacts (15.0 acres) compared to all other alternatives and impacts 11.0 acres of wetlands. Agricultural impacts would be comparable to all other alternatives. It would have low impacts to undeveloped habitat because it would use existing roadways, although those roads would have to be raised out of the floodplain to remain open year round. Given the high wetland and floodplain impacts relative to other alternatives, along with the operational inefficiencies discussed earlier, TR-2 was eliminated from further study.

HB-1 Middlebury Bypass: HB-1 would have 2.66 miles of new roadway alignment and 0.30 miles of new rail alignment, and would use 2.35 miles of existing roadway. HB-1 would have no floodplain impacts, and would not directly impact any structures, but would pass within 100 feet of seven residences. It was also believed that the cost and the time to construct such a highway bypass would be much greater than rail spur or truck to rail alternatives. Selection of a highway bypass alternative would probably require that an interim project be implemented to address the project need until the bypass could be constructed. Furthermore, highway bypasses do not meet the purpose and need as well as some of the other alternatives. Because other resource impacts are generally comparable to the rail spur impacts, and because of the operational inefficiencies discussed earlier, HB-1 was eliminated from further consideration.

HB-2 Western Brandon Bypass: HB-2 would have 2.66 miles of new roadway alignment and use 15.25 miles of existing roadway. HB-2 would have the lowest impacts to active farm fields, at 12.2 acres, and the lowest wetland impacts at 1.6 acres. It would, however, impact seven structures. HB-2 appears to have relatively low resource impacts. However, for the reasons listed above for HB-1, HB-2 was eliminated from further consideration.

HB-3 Eastern Brandon Bypass: would have 3.26 miles of new roadway alignment and would use 14.97 miles of existing roadway. HB-3 would have five water body crossings. Other impacts would be comparable to or lower than impacts of the other alternatives. HB-3 was eliminated from further consideration for the same reasons described above for HB-1.

2.3.2.5 Summary of Macro-Level Resource Screening

The No Build Alternative must be carried forward as a basis for comparison with build alternatives. “No Build” means that no improvements are made to address the needs outlined for the project. Although the No Build may include improvements which have been planned independently, as part of other projects, such impacts were not included in the macro-level resource screening. Based on this screening, the major resource impact of the No Build Alternative appears to be the effect on historic structures and districts.

RS-1, RS-3, and TR-1 would have relatively high impacts to agricultural resources, but moderate wetland and floodplain impacts, and relatively low impacts to most other resources. Therefore, they were carried forward for detailed assessment.

The other rail spur alternatives and TR-2 had relatively high resource impacts, parcel impacts, or impacts to structures. Most also would require substantially more earthwork, which would likely increase resource impacts. Therefore they were not carried forward.

Although the highway bypass alternatives HB-1, HB-2, and HB-3 had moderate resource impacts relative to other alternatives, they only partially meet the project purpose and need, and the cost and time to construct highway bypasses make them impractical to alleviate the immediate areas of need for this project. Therefore, they were not carried forward for detailed assessment.

2.3.3 Modification of RS-3 and Additional Alternative Screening

As alternatives studies proceeded, new information became available that made it apparent that the RS-3 rail spur alternative would have certain impacts which would be substantially greater than the other remaining alternatives, RS-1 and TR-1. Specifically, information pertaining to socioeconomic, wetlands, floodplain, prime soils, and statewide soils impacts was obtained. It should be noted that this impacts screening utilized alternatives that had been developed to a greater level of detail than those screened in the preliminary phase.

The original RS-3 alignment would have tied into the mainline west of Otter Creek, just south of downtown Middlebury, more or less across Otter Creek from the high school. Freight trains running from the quarry to the mainline, carrying southbound freight, would have had to join the tracks heading in a northerly direction before heading south.

Furthermore, the alignment that proceeds northward would have passed through a portion of a second large development, Middlebury South Village, which was under construction at the time of the screening. Middlebury South Village includes commercial and residential land use, with 30 townhouse apartments and 56 single-family houses. The northern RS-3 alignment would have passed through the southern portion of the property, affecting several proposed houses and open space. It would then have passed over Creek Road, through a 19.5-acre town recreational field complex, affecting at least 3 athletic fields, across Otter Creek near an existing pedestrian bridge, and across a pedestrian trail.

For these reasons, an option was developed which turns to the south before joining the mainline. Like the RS-1 and TR-1 alignments, it was assumed this alignment would be constructed on a trestle through the floodplain and wetland areas adjacent to Otter Creek, including a bridge over Otter Creek and grade separation over Creek Road. This option would tie into the mainline in an undeveloped area south and west of the Creek Road recreational fields. Trains carrying freight from the quarry would head northward on RS-3 but could then turn south and join the mainline heading in a southerly direction. Because of the greater efficiency of this option and the adverse effects of the original alignment, this option was screened as a new alignment, Modified RS-3.

The socioeconomic and resource impacts of RS-1, TR-1, and Modified RS-3, and the viability of an RS-3 alternative, are discussed below.

2.3.3.1 Socioeconomic Impacts

Modified RS-3 has substantially more socioeconomic impact than RS-1 or TR-1. Just north of the split with RS-1, it passes through a large development, South Ridge Subdivision, which had received Planned Unit Development approval from the Middlebury Planning Commission at the time of the screening. The first phase of the South Ridge Subdivision includes 44 single-family house lots, 42 condominiums, and a senior housing facility, along with a network of roads. Modified RS-3 would pass directly through the development, affecting many of the single-family house lots and associated roads. The South Ridge Subdivision Master Plan involves future development on adjacent land, which would also be affected by Modified RS-3. North of South Ridge Subdivision, Modified RS-3 would pass just west of several residences along Middle Road, directly across the road from the Middle School.

Although the macro-level screening showed there would be no residences within 100 feet of RS-1, TR-1, and Modified RS-3, there are several residences just over 100 feet from these alternatives. In order to represent possible effects (such as noise or visual impacts) on these residences, the number of residences within 500 feet of each alternative were identified and counted. Not counting proposed developments, the Modified RS-3 alignment would pass within 500 feet of 7 residences, while RS-1 and TR-1 would pass within 500 feet of 2 and 3 residences, respectively (see Table 2.3-5 below). Since it would be closer to more residences, Modified RS-3 would have more potential for visual, noise, and aesthetic impacts than RS-1 or TR-1. Based on the current slope limit lines and property boundaries, Modified RS-3 would also affect more individual properties (22) than the other alternatives (17 for RS-1 and 14 for TR-1). The total acreage that would be acquired for each alternative has not been determined, but the greater length of RS-3 (3.8 miles vs. 3.2 for RS-1) indicates it would involve proportionately more land acquisition than RS-1.

Table 2.3-5 Involvement of RS-1, TR-1, and Modified RS-3 with Residences and Parcels

	RS-1	TR-1	Modified RS-3
Number of residences within 500 feet of centerline	2	3	7
Actual distances of residences from centerline (feet)	220, 450	440, 240, 440	500, 200, 400, 300, 160, 170, 320
Number of parcels affected (based on slope limit lines)	17	14	22

2.3.3.2 Resource Impacts

Resource impacts were measured as the overlap of the project footprints and resources. The footprints of the three alternatives under consideration (RS-1, TR-1, and Modified RS-3) were developed based on reasonable assumptions for alignments, grades, profiles, and road crossings. These footprints are to a greater level of detail than was developed for the preliminary screening. It was assumed that all alternatives would include a trestle over the floodplain from the mainline tracks to the higher ground east of Otter Creek; there would be a bridge over Creek Road; TR-1 would involve a transload facility large enough for Omya and other shippers; all alternatives would bridge over Halladay Road; all alternatives would pass under a roadway bridge at US 7; RS-1 and Modified RS-3 would cut off Lower Foote Street; TR-1 would cross Lower Foote Street at grade; and a transload for shippers other than Omya would be constructed just south of the quarry for RS-1 and Modified RS-3.

The impacts of the resulting footprints on some of the key resources are listed in Table 2.3-6 below. Note that the impacts listed below are based on more detailed information than the macro-level resource screening impacts. Project slope limits were developed for each alternative, and more detailed wetland and floodplain mapping was used. Wetland impacts were based on field-identified wetland boundaries, rather than the wetlands based on existing National Wetlands Inventory (NWI) and soils maps used in the macro-level resource screening. Floodplains were mapped using FEMA floodplain elevations interpolated onto project two-foot and five-foot contour mapping.

Table 2.3-6 Preliminary Impacts of RS-1, TR-1, and RS-3 on Selected Resources (Acres)

	RS-1	TR-1	Modified RS-3
Field-Identified Wetlands (Class 2 & 3)	3.4	3.9	4.7
100-Year Floodplain (based on FEMA elevations)	0.02	0.1	0
Prime Soils	1.7	0.6	1.4
Statewide Soils	31.8	35	14.5

Modified RS-3 would have greater wetland impact, but lower farmland soil impacts. However, much of the wetland impacted by Modified RS-3 is much more valuable than wetlands found along the RS-1/TR-1 corridor. Modified RS-3 would affect forested and emergent floodplain wetlands both east and west of Otter Creek. These wetlands are large, structurally diverse, relatively little disturbed, and appear to be important riparian wildlife corridors. These wetlands are important for a broad range of functions and values. The affected land west of Otter Creek is owned by Middlebury College, and is reportedly used for ecological studies.

2.3.3.3 Summary of Additional Alternative Screening

Socioeconomic or natural resource impacts alone do not make any of these three alternatives unreasonable. However, the likely effects of Modified RS-3 on the South Ridge Subdivision development; the proximity to existing residences and a school; and the effects on important wetland, floodplain, and riparian habitat (or, if the original RS-3 alignment were constructed, the effects on Middlebury South Village, recreational fields, and pedestrian trails) are all impacts which appear to be substantially greater than impacts expected from RS-1. On the other hand, Modified RS-3 would have less farmland soil impact than RS-1. Modified RS-3 would be longer than RS-1 and offers no operational benefit over RS-1. In consideration of the much greater socioeconomic impacts, along with somewhat greater natural resource impacts and the lack of greater efficiencies or operational benefits, Modified RS-3 presented no advantage over RS-1 and was therefore eliminated from further consideration.

2.4 Coordination Activities During Screening

The project team, including representatives of VTrans, FHWA, and the consultants, coordinated with resource agency staff, the Advisory Committee, and the Surface Transportation Board (STB) in several meetings and miscellaneous correspondence to derive the alternatives to carry forward for further study. STB is a federal economic regulatory agency with jurisdiction over common carrier railroad lines that are part of the interstate rail network. On common carrier lines, the railroad has an obligation to provide rail service to any and all shippers upon request. Construction of a new common carrier line requires approval from the STB under 49 U.S.C. 10901. Since STB has a potential licensing role in this project, FHWA requested STB be a cooperating agency. STB's Section of Environmental Analysis is responsible for STB's environmental reviews and analysis, and reviewed this FEIS.

There was consultation with these parties regarding the conclusions of the physical and operational screening and the macro-level resource screening, as well as the alternatives proposed for further study. Public input on preliminary alternatives and local issues of concern was obtained at the public scoping meeting and at public meetings to discuss the screening and present the alternatives proposed for further study. A description of coordination activities can be found in Chapter 7.

2.5 Summary and Conclusions of Screening

The screening involved a three-step process: an initial "physical and operational" screening, a macro-level resource screening, and an additional screening of RS-1, Modified RS-3, and TR-1. The physical and operational screening was conducted to determine viability in terms of physical limitations, cost-effectiveness, and ability to meet the project purpose and need. As shown in Table 2.3-1, all of the rail spur alternatives, the most direct truck to rail alternative (TR-1), and the Brandon Bypass alternatives (HB-2 and HB-3) were deemed appropriate for further resource screening. The other alternatives did not meet the physical and operational screening and were not studied further, except for TR-2 and HB-1, which were carried forward because of their other benefits and their support from local residents and others.

The macro-level resource screening considered potential impacts to a broad range of environmental and cultural resources. The results showed that RS-1, RS-3, and TR-1 were likely to have lower resource impacts than other alternatives, so these alternatives were tentatively recommended as the alternatives to be studied in more detail in the EIS.

Additional screening showed that the likely effects of either RS-3 alignment on proposed developments, existing residences, a school, and on important wetland, floodplain, and riparian habitat all appear to be substantially greater than impacts expected from RS-1 or TR-1. In consideration of the much greater socioeconomic impacts, along with somewhat greater natural resource impacts and the lack of greater efficiencies or operational benefits, RS-3 was eliminated from further consideration.

The methods and results of the screening analyses were shared and discussed with resource agencies, the Advisory Committee, and the general public in various meetings and correspondence, as described previously. Through this consultation, resource agency staff and Advisory Committee participants provided input to the project team regarding the alternatives to be carried forward for further study.

In consideration of resource agency, Advisory Committee, and public input, along with the screening results described above, it is proposed that RS-1 and TR-1, along with the no build alternative, be carried forward as the alternatives to study in more detail.

2.6 Description of Reasonable Alternatives for Further Study

Based upon the screening and careful consideration described in the previous sections of this chapter, the No-Build Alternative and Build Alternatives RS-1 and TR-1 were selected as the "reasonable" alternatives for more detailed evaluation. These alternatives are described in more detail in the following sections. Figures referred to in this section and following chapters of the FEIS may be found in Volume IIA.

2.6.1 No Build Alternative

The No Build Alternative serves as a baseline for comparison to the two build alternatives. "No build" means that no improvements are made to address the needs outlined for the project, and the current operations for the movement of freight are left in place. However, the No Build includes improvements which have been planned independently, as part of other projects, or are otherwise reasonably foreseeable.

2.6.1.1 Physical Description

For the movement of freight in and out of the Middlebury area, the primary route would continue to be US 7 under the No Build Alternative. The transportation of marble from the Omya quarry in Middlebury to the Omya Verpol Plant in Florence would continue to be done by truck under the No Build Alternative. These trucks would travel on the Omya access road for about 1.2 miles, on US 7 for about 20.2 miles, on Kendall Hill Road for about 1.0 mile, on West Creek Road for about 0.4 miles, and finally on Whipple Hollow Road for about 0.4 miles. Other shippers would continue to use US 7 and other public roads in the region to move their materials and goods.

Improvements to the No Build roadway corridor which are independently planned include shoulder widening, roadway reconstruction, construction of truck climbing lanes, reconstruction of intersections, drainage improvements, landscaping, utilities relocations and safety improvements. These are proposed as part of the

Pittsford-Brandon US 7 Upgrade Project. Rail system improvements are also proposed, including relocation of the downtown Rutland railyard, bridge rehabilitation, and miscellaneous improvements related to the Albany-Bennington-Rutland-Burlington passenger rail service project.

2.6.1.2 No Build Operations

The shipping of marble from Omya's quarry in Middlebury would continue to operate as it does currently. The marble would be loaded onto trucks at the quarry and then the trucks would drive about 23 miles on public and private roads to the processing plant in Florence. The trucks would dump their loads at the plant and drive back to the quarry for another load. In 2006, Omya generally shipped from 80 to 85 truck round trips per day from their Middlebury quarry to their Florence plant. In the near future, Omya is expected to reach 115 daily round trips, which is the maximum allowable under their existing Act 250 permit. By 2030, it is reasonable to assume that Omya would develop a means to accommodate further growth in shipment volumes, by securing a new Act 250 permit, using larger trucks, extending hours of operation, etc. It is assumed here the shipments would grow an additional 20%, and therefore would be the same under the build and no-build alternatives. Other shippers would also continue to use current means to transport their materials and goods. These other shippers primarily use trucks on public roads.

2.6.2 Alternative RS-1

As described in Section 2.2.2.1, Rail Spur Alternative 1 (RS-1) is the rail spur alignment in southern Middlebury that would connect the Omya quarry to the mainline. See Figure 2.6-1 for an overall plan of RS-1, Figures 2.6-2 through 2.6-7 for detailed plans of RS-1, and Figures 2.6-8 through 2.6-10 for profiles of RS-1. (These figures and all others subsequently referenced in the FEIS are in Volume IIA.)

2.6.2.1 Physical Description

RS-1 would begin at the Omya quarry where it would head south and then southwest toward US 7, roughly following the current Omya access road. A portion of the access road would be realigned parallel to the RS-1 alignment. The alignment crosses Lower Foote Street about 25 feet below the existing elevation. Two options for Lower Foote Street were considered, and are described in Section 2.6.2.4 below. The alternative would then cross under US 7, passing under a new vehicular bridge over the rail spur. The alignment would then head west toward the mainline, traversing mostly farmland. It would cross Halladay Road with several options considered for the type of crossing (see Section 2.6.2.3). Toward the western terminus, the alternative would turn to the south before connecting with the mainline heading south. Near the western terminus the alignment crosses Otter Creek and the floodplains associated with the creek. The alignment presented in the FEIS has been modified from that shown in the DEIS to isolate a smaller portion of the fields on the western side of Otter Creek, based in part on comments received after publication of the DEIS. It has also been modified to avoid the recently constructed detention basin and sewage pumping station associated with the South Ridge Subdivision between Halladay Road and Creek Road. The rail spur would bridge over Creek Road and Otter Creek and be placed on a trestle structure over the floodplains. The total length of the alternative, from the beginning point on the mainline to its terminus within the quarry, is about 3.3 miles. (This estimate is based on an alignment layout which has been refined since the screening alignment layout, and therefore differs slightly from the length estimates in the screening analysis described above.)

RS-1 would be constructed primarily for transporting marble from the Omya quarry. There are other potential users of the rail spur that may benefit from access to the rail line. Therefore, a rail transload facility would be constructed to allow other shippers to load or unload material to and from rail cars. For RS-1, the proposed transload facility would be located on Omya property south of the quarry along the proposed rail spur tracks. Access to the transload facility would be provided via a driveway from the existing access road to the quarry. The transload facility has been sized to accommodate the storage of up to five rail cars, an office for rail workers, and a facility to store and maintain locomotives. It would be approximately 150 feet by 650 feet, or 2.2 acres in size. Ownership of the RS-1 rail spur, transload facility, and access roads has not yet been determined.

2.6.2.2 Rail Spur Operations

The following description of the rail spur operations are based upon discussions with VTR and Omya concerning how the rail spur would be expected to operate. These are assumptions based upon current understanding about the amount of material that would be expected to be transported from the quarry by the rail spur.

At the time of opening, the transportation of marble from the Omya quarry in Middlebury to the Omya Verpol Plant in Florence via RS-1 and the mainline would occur 5 days a week using two GP-38-2 locomotives. A railroad crew of two individuals would handle up to two round trips each day. Each trip would consist of 20 side-dump rail cars. For a typical day starting at 9 a.m., when one locomotive under power, acting as a switcher (pulling the second locomotive, not under power), would attach to a loaded 20-car set of rail cars in the quarry and pull them onto the rail spur tracks parallel to the passing siding . The loaded set of cars (with the second locomotive) would be left there while the locomotive moved the empty 20-car set of rail cars from the siding to the quarry for loading. These cars would be loaded by quarry personnel while the loaded cars are brought to the plant in Florence. Once the empty cars are in place, the locomotive would attach the loaded set of cars and prepare to leave for Florence.

The trip to Florence would start at about 9:30 a.m. The two locomotives and 20 rail cars would travel along RS-1 at 25 miles per hour and along the mainline at 40 miles per hour. (It is assumed that current speed restrictions of 10 miles per hour at two bridges along the mainline will be resolved by the time the rail spur is in operation.) The trip to Florence would take about an hour and 10 minutes. Upon arriving in Florence, the two locomotives would function as switcher locomotives that would deliver the cars, ten at a time, to the plant. Any rail cars from shippers other than Omya would be dropped off at the Florence siding to be picked up by other trains. The time required to move and unload the 20 cars at the Verpol plant, from the point of arrival in Florence to the time of departure with 20 empty cars, is expected to take approximately 3 hours and 15 minutes

The return trip to Middlebury, with one locomotive under power, would leave from the Florence siding at about 1:55 p.m. The locomotive would deliver the 20 empty rail cars to the siding near the quarry by 3:05 p.m. The locomotives would then attach to the 20 loaded rail cars at the quarry and repeat the same steps from the morning. Making this second trip to Florence and back would have the locomotives and cars returning by about 8:55 p.m. The empty cars would be placed on the siding and the locomotives would be placed on the locomotive storage siding to be ready for the next day's operation.

There is also expected to be transportation of material or goods from other users of RS-1 via the transload facility. The transload facility could accommodate the storage of up to 5 rail cars. It is assumed at this time that there would be one additional rail car each day to transport material or goods for the other shippers. This additional rail car would be transferred between the transload facility and the mainline by VTR on one of the two daily trains transporting marble from the quarry. The rail car would be placed on the Florence siding, or one of the sidings along the mainline, and then transferred to a mainline train for destinations beyond Middlebury per agreements that would be made between the railroad and the customer.

Omya and other shippers are expected to increase their shipments over the rail spur in future years. Neither Omya nor other shippers are willing to forecast expected future shipment volumes, and future market conditions are difficult to anticipate. For purposes of the EIS studies, it has been assumed that Omya will increase its shipments by approximately 20 percent by 2030, and other shippers will ship up to ten rail cars per week. It is assumed that Omya's additional shipments will be handled by running the same daily operations (two round trips of 20 rail cars each) for a sixth day each week, and that the additional freight from other shippers will continue to be accommodated with Omya's freight shipments.

2.6.2.3 Halladay Road Options

As mentioned above, there were three options under consideration for the crossing of Halladay Road by RS-1. Halladay Road is a collector road that runs parallel to and west of US 7. In the vicinity of RS-1 Halladay Road is a paved road that currently carries about 750 vehicles per day. Traffic on Halladay Road travels at relatively high speeds (40-45 mph). The profile of the roadway is depressed where it would be crossed by RS-1. The importance of the Halladay Road crossing is that it has a considerable impact on the profile for RS-1. Halladay Road is about 55 feet lower in elevation than US 7 where RS-1 would cross each roadway. Below is a description of the three Halladay Road options considered.

Grade Separated over Halladay Road
This option proposes RS-1 to cross over Halladay Road and provide a grade separation between the rail spur and the road. See Figure 2.6-3 for a plan view of the area and Figure 2.6-9 for a profile of the area. There are two reasons why the grade separation was proposed. First, the grade separation provides a much safer condition for both users of the road and the rail given the travel speeds on Halladay Road. Second, a grade separation with the rail spur over would allow for a smaller cut in the area of the US 7 crossing. However, the raised rail spur profile would create an embankment west of Halladay Road reaching approximately 29 feet in height (approximately 5 feet lower than this option as presented in the DEIS). This embankment would be highly visible from nearby homes and roadways. There is still a large amount of cut for this option, but much of the material might be able to be used on the embankment, so that overall, this option could result in the least amount of excess material of any of the Halladay Road options.

Halladay Road would not be directly altered under this option. The road would remain in its current location with a rail spur bridge over the road. The bridge would be approximately 50 feet wide and provide 14 feet of vertical clearance. There is a sanitary sewer pump station near the rail spur crossing that would be impacted by the proposed bridge. The pump station would need to be relocated as part of this option.

At-Grade with Halladay Road
This option proposes an at-grade crossing where RS-1 meets Halladay Road. See Figure 2.6-4 for a plan view of the area and Figure 2.6-9 for a profile of the area. The at-grade option was developed with Halladay Road raised about 5 feet at the crossing to reduce the amount of cut between Halladay Road and US 7. A “quiet zone” system would be used to reduce the noise levels when a train crossed the road. A quiet zone system uses a combination of flashing lights, gates, signs, and sometimes other measures so that the train will not need to sound its horn as it approaches the crossing. There would still be a large cut

east of Halladay, but the embankment to the west would be approximately 16 feet in height.

Halladay Road would be reconstructed for about 550 feet to accommodate raising it 5 feet at the crossing. Rail crossing equipment would be installed at the crossing to warn vehicles of an approaching train. The pump station may be impacted by this option and would need to be relocated if it were impacted.

<u>Halladay Road Relocation</u>
This option proposes to "cut off" Halladay Road where it would be crossed by RS-1. See Figure 2.6-5 for a plan view of the area and Figure 2.6-9 for a profile of the area. A cul-de-sac would be placed north of RS-1 and the properties along this portion of Halladay Road would only access US 7 to the north. The southern portion of Halladay would be re-connected to US 7 via a new relocated roadway. The relocated roadway would parallel the RS-1 alignment and reconnect to US 7 south of the bridge over RS-1. With this option, Halladay Road would no longer be a constraint for the RS-1 profile. The cut section east of Halladay Road would be slightly deeper, and the embankment west of Halladay Road would be slightly lower, than the At-Grade option.

The relocated Halladay Road would require about 2,200 feet of new roadway. This new roadway would closely follow the existing grade for much its length. It would meet US 7 with a new at-grade intersection just south of the US 7 Bridge over RS-1. A driveway connection would be provided to access the existing sewer pump station that would not be impacted by this option. The proposed cul-de-sac for the north portion of Halladay Road would be located on the east side of the road to minimize impacts to the historic residential property to the west.

2.6.2.4 Halladay Road Option Screening

Following the publication of the DEIS, additional screening of the Halladay Road crossing options was undertaken in order to determine which crossing would be the preferred option. It was found that the impacts of each option could be reduced through design modifications such as steeper rail grades. Because the impacts could affect the selection of the preferred option, a range of design modifications ("sub-options") were developed and their impacts assessed. The results are described in detail in the *Halladay Road Option Screening* technical report, which is publicly available.

Based on this screening, the Grade Separated over Halladay Road option with a 1.5% grade was identified as the preferred Halladay Road crossing option. This option was found to be consistent with FHWA and FRA preferences for grade-separated options for safety reasons and more consistent with the Middlebury Town Plan. This option would also have resource impacts comparable to the At-Grade option, and substantially lower impacts than the Relocation option. The relative costs, resource impacts, embankment heights, and earthwork volumes of these options and sub-options are summarized in Table 2.6-1.

Table 2.6-1 Additional Screening of Halladay Road Options

Note: DEIS options are in regular font; new options are in italics

Option	Cost* (Relative to At-Grade Option)	Wetland Impacts (Acres), Sta. 65+00 to US 7	Important Farmland Soil Impacts (Acres), Sta. 65+00 to US 7	Embankment Height (Feet), at Sta. 83+00 (1,000' west of Halladay Rd.)	Cut Volume (cubic yards), Entire Alternative	Fill Volume (cubic yards), Entire Alternative	Total Volume (cut + fill), Entire Alternative	Net Volume (cut - fill), Entire Alternative
Grade Separated over Halladay Road	+$400,000							
DEIS Design, 1%		2.45	10.97	34.0	345,733	232,756	578,489	112,977
1.5% Grade		*2.31*	*9.28*	*28.8*	*314,308*	*174,569*	*488,877*	*139,739*
2% Grade		*2.18*	*8.26*	*23.0*	*314,725*	*134,550*	*449,275*	*180,175*
3% Grade		*2.08*	*7.68*	*16.5*	*314,978*	*115,572*	*430,550*	*199,406*
At-Grade with Halladay Road	0							
DEIS Design, 1.33%		2.25	8.49	16.1	359,408	94,010	453,418	265,398
1.5% Grade		*2.26*	*8.67*	*14.4*	*352,163*	*89,992*	*442,155*	*262,171*
2% Grade		*2.06*	*8.39*	*10.5*	*349,167*	*84,552*	*433,719*	*264,615*
Halladay Road Relocation	+$500,000							
DEIS Design, 1%		3.40	14.66	25.8	322,127	104,178	426,305	217,949
1.5% Grade		*3.30*	*14.06*	*11.5*	*373,172*	*84,374*	*457,546*	*288,798*

* Costs exclude annual maintenance, operations, and insurance expenses.

2.6.2.5 Lower Foote Street Options

As mentioned above, there were two options under consideration for the crossing of Lower Foote Street by RS-1. Lower Foote Street is a local road that runs parallel to and east of US 7. In the vicinity of Alternative RS-1, Lower Foote Street is a narrow (20' wide) road with some portions paved and some portions gravel. There are homes and several businesses along the road. The RS-1 profile would be about 25 feet lower than the existing grade as it crosses Lower Foote Street. The options for crossing Lower Foote Street are described below.

<u>Cut Off Lower Foote Street</u>
As mentioned above, the RS-1 alternative would cross Lower Foote Street about 25 feet below its existing elevation. This option proposes to "cut off" Lower Foote Street. See Figure 2.6-6 for a plan view of the area and Figure 2.6-10 for a profile of the area. North of the RS-1 crossing, the existing roadway would be abandoned to the intersection with the Omya access road. A cul-de-sac would be provided south of the crossing. Traffic would have to use US 7 to cross the rail spur. The cut-off Lower Foote Street option is assumed for the RS-1 costs listed below for each of the Halladay Road options.

<u>Lower Foote Street Bridge</u>
This option proposes constructing a bridge for Lower Foote Street to cross RS-1. See Figure 2.6-7 for a plan view of the area and Figure 2.6-10 for a profile of the area. The bridge would maintain Lower Foote Street as a through road, and would add roughly $750,000 to project construction costs.

In the interests of maintaining the connectivity of local roads and avoiding disruption to local businesses, the Lower Foote Street bridge is the preferred option.

2.6.3 TR-1 Alternative

As described in Section 2.2.2.2, Truck to Rail Alternative 1 (TR-1) is the truck to rail alignment in southern Middlebury that roughly follows the RS-1 corridor. See Figure 2.6-11 for an overall plan of TR-1. See Figures 2.6-12 through 2.6-15 for detailed plans of TR-1 and Figures 2.6-16 through 2.6-17 for profiles of TR-1.

2.6.3.1 Physical Description

TR-1 would use the existing Omya access road to a point about 600 feet east of US 7, where it would begin to drop in order to pass under US 7. It would pass under US 7 where the existing access road meets US 7, and then roughly follow the RS-1 corridor, heading southwest and then west across Halladay Road. Two options were considered for the Halladay Road crossing, as described further below. TR-1 would then head west, traversing mostly farmland. The proposed transload facility for TR-1 would be located in a field east of Creek Road and

Otter Creek. A rail spur would be constructed from the transload facility to the mainline. West of the transload facility, the rail spur would be identical to the corresponding segment of RS-1, with a bridge over Creek Road and Otter Creek and a trestle structure over the floodplains. The total length of the alternative is about 3.4 miles, which includes 1.2 miles on the existing Omya access road (from the quarry to US 7), 1.2 miles on new roadway alignment (US 7 to the interior of the transload facility, with an additional 0.8 miles of new roadway within the transload facility for the loop road), and 1.0 miles on new rail alignment (including the trestle and bridge section and the new rail within the transload facility). (As with RS-1, this estimate is based on an alignment layout which has been refined since the screening alignment layout, and therefore differs slightly from the length estimates in the screening analysis described above.)

The transload facility for TR-1 must accommodate not only the shipments from other shippers, but the marble shipments from the Omya quarry as well. (Under RS-1, Omya's loading operations would be handled entirely within the quarry.) It would therefore be much larger than the transload facility for RS-1. The TR-1 transload has been sized to accommodate the 20 rail cars for the two daily Omya shipments, up to five cars for other shippers, storage areas for bulk marble, an office for rail workers, and a facility to store and maintain locomotives. It would cover approximately 450 feet by 2,700 feet, or 27.9 acres. The facility has been configured as an oval with a roadway around its entire perimeter. The rail spur would bisect this oval with storage tracks on either side. Trucks delivering marble would travel around the northern perimeter and be able to dump their loads anywhere along the northern storage track. Other shippers would make deliveries and pick-ups along the southern perimeter and access the southern storage track. The large area on the north side of the tracks is needed to accommodate piles of bulk marble along with space for front end loaders to pick up the marble and load it onto rail cars.

2.6.3.2 Truck to Rail Operations

The transportation of marble from the Omya quarry in Middlebury to the Omya Verpol Plant in Florence by means of TR-1 would consist of two components. Quarry personnel would load marble onto large trucks in the same way as is done currently. These trucks would then travel about 2.4 miles via the existing Omya access road and the proposed TR-1 roadway to the transload facility. At the transload facility the marble would be dumped from the trucks into piles adjacent to the proposed spur tracks. The marble would then be loaded from the piles into rail cars stored on sidings at the transload facility. There would be two trips a day from the transload facility to the Omya Verpol plant in Florence. The rail operations for TR-1 would be identical to those for RS-1 with the exception that the trip to Florence would take about five fewer minutes, so that the overall time of rail operation would be about 20 minutes shorter each day.

The operations for shippers other than Omya would be the same for TR-1 as for RS-1 (described above) with the exception that the transload facility would be in a different location.

As with RS-1, it is difficult to accurately predict future shipments on the truck to rail facility. For purposes of the EIS studies, it has been assumed that Omya will increase its shipments by 20 percent by 2030, and other shippers will ship up to two rail cars (and a corresponding number of truck shipments to the transload facility) five days per week.

2.6.3.3 Halladay Road Options

As mentioned above, two options were considered for the crossing of Halladay Road. Because roadway profiles are much more flexible than railroad profiles, they can follow the existing ground more closely. Unlike the RS-1 options, in which profile constraints are a major factor, the TR-1 options have more to do with access concerns. Below are descriptions of the two Halladay Road options that were considered.

<u>TR-1 Grade Separated over Halladay Road</u>
This option proposes TR-1 to cross over Halladay Road and provide a grade separation between the truck to rail roadway and Halladay Road. See Figure 2.6-13 for a plan view of the area and Figure 2.6-17 for a profile of the area. The grade separation for TR-1 is meant to separate the industrial truck traffic of the truck to rail roadway from the residential automobile traffic of Halladay Road. This option maintains Halladay Road in its current location, with the truck to rail bridge crossing over Halladay Road. The bridge would be approximately 50 feet wide and provide 14 feet of vertical clearance. There is a sanitary sewer pump station near the truck to rail crossing that would be impacted by the proposed bridge and would need to be relocated as part of this option.

Under this option, access to the truck to rail roadway would be confined to the Omya access road via Lower Foote Street. Marble shipments from the quarry would use the Omya access road and the truck to rail roadway only. The marble trucks would not need to use existing residential streets or US 7 to access the transload facility. However, other shippers would have to use US 7 and Lower Foote Street to access the transload facility.

<u>At-Grade with Halladay Road</u>
This option proposes an at-grade roadway intersection where TR-1 meets Halladay Road. See Figure 2.6-14 for a plan view of the area and Figure 2.6-17 for a profile of the area. This option maintains Halladay Road in its current location but adds a four-way intersection at the TR-1 crossing. Halladay Road would continue as the primary roadway with no stop controls. The truck to rail roadway would be stop-controlled at both sides of the intersection. The sanitary

sewer pump station near the intersection would be impacted and require relocation.

Under this option, access to the truck to rail roadway could occur from the Omya access road via Lower Foote Street or from Halladay Road. Marble shipments from the quarry would use the Omya access road and the truck to rail roadway only. The marble trucks would not need to use existing residential streets or US 7 to access the transload facility. Other shippers would use US 7 and either Lower Foote Street or Halladay Road to access the transload facility.

Because Alternative TR-1 was not identified as the preferred alternative, no preferred Halladay Road crossing option was determined for TR-1.

2.7 Project Costs

A breakdown of estimated project costs for the two build alternatives and the Halladay Road crossing options are shown in Table 2.7-1. The costs in the table assume a bridge would carry Lower Foote Street over the rail spur. The table outlines construction cost estimates for rail items, roadway items, transload facilities, mitigation measures, and bridges. Estimates of other project costs such as ROW and engineering are also outlined. These costs represent the best estimate of probable costs based upon the currently available information and data. A more detailed description of the components is found below.

The rail costs include typical items such as earthwork, ballast, track, turnouts, drainage facilities, and fence. These costs also include a quiet zone system for the At Grade option. The cost for an engine house to store and maintain the engines was not included at this time, but was estimated to be $2.5 million for either alternative.

Roadway costs include earthwork, grading, pavement and drainage items. The cost also includes a detour along US 7 to construct bridges over the rail spur or truck to rail roadway. Relocation of the sewer pump station on Halladay Road is included for those options that impact it.

The bridge costs include both roadway and rail bridges and trestle structures, and are based upon costs for similar structures.

Each component of cost, rail, roadway and bridge, includes additional costs for minor items and contingencies. This is meant to cover smaller items and any potential unforeseen costs that may occur. One category of high potential additional cost is material supply and disposal, as the soil survey for the area indicates that much of the excavated material may not be suitable for use as embankment.

Table 2.7-1 Build Alternative Costs

Cost Factors	Cost of Build Alternatives (Millions 2008$)				
	RS-1			TR-1	
	Grade Separated over Halladay Road	At-Grade with Halladay Road	Halladay Road Relocation	Grade Separated over Halladay Road	At-Grade with Halladay Road
Rail Components	$8.53	$9.21	$8.87	$4.19	$4.19
Roadway Components	$1.38	$1.59	$2.27	$5.37	$6.01
Bridges (including trestle)	$14.61	$13.46	$13.46	$13.92	$13.14
Mobilization	$1.23	$1.21	$1.23	$1.17	$1.17
Construction Engineering	$2.45	$2.43	$2.46	$2.35	$2.33
Total Construction Cost	**$28.20**	**$27.90**	**$28.29**	**$27.00**	**$26.85**
Preliminary/Final Engineering	$4.90	$4.85	$4.92	$4.70	$4.67
Right of Way	$0.51	$0.50	$0.53	$0.42	$0.42
Mitigation	$0.60	$0.60	$0.60	$0.60	$0.60
TOTAL COST	**$34.3**	**$33.9**	**$34.4**	**$32.8**	**$32.6**

2.8 Preferred Alternative

After a thorough analysis of all environmental, social and economic impacts; input received from local, state and federal agencies; input received from the Advisory Committee; and input gathered from the public, VTrans and FHWA identified RS-1 as the Preferred Alternative in the DEIS, but did not identify the preferred Halladay Road and Lower Foote Street crossing options. Based on the analysis presented above in Sections 2.6.2.4 and 2.6.2.5, the Grade Separated over Halladay Road and Lower Foote Street Bridge options are now included as part of the preferred alternatives for the respective road crossings.

RS-1 has several advantages over the No Build Alternative and TR-1.

The No Build Alternative does not satisfy the project purpose and need. Specifically, it would not remove trucks from US 7, local roads, or Brandon Village, would not improve transportation efficiency, and would not allow Omya and other shippers to take advantage of access to the mainline.

Rail spur alternative RS-1 and truck to rail alternative TR-1 would remove a portion of freight traffic from US 7, village centers, and local roads, although both RS-1 and TR-1 could result in small increases in truck traffic on other local roads (so other shippers could access transload facilities). Both RS-1 and TR-1 would allow Omya and other shippers to access the mainline. However, TR-1 has inherent inefficiencies by requiring (for Omya, the principal shipper) additional material handling steps and two modes of transportation (truck and rail). The extra material handling would make it more costly for Omya to operate than RS-1. Although TR-1 would require less new alignment than RS-1, the transload facility would be larger, so that expected impacts to natural and cultural resources are generally comparable to impacts expected from RS-1.

For these reasons, RS-1 is identified as the Preferred Alternative over the No Build Alternative and TR-1.

3 Affected Environment

This chapter summarizes existing or baseline conditions in the alternatives corridor. For the purposes of the EIS, the "alternatives corridor" is defined as the corridor along which resources have the potential to be directly affected by the proposed alignments. The alternatives corridor is outlined on the figures in Volume IIA and includes a broad area, approximately 2000 feet wide, from the Omya quarry to the mainline railroad. The broader context of the project, including the quarry, the alternatives corridor, the roadways comprising the existing freight transportation route used by Omya, and the resource context within which these project elements lie, is referred to as the "project area".

Current traffic conditions, natural resources, cultural resources and socio-economic characteristics are described in this chapter. For each resource, the federal or state regulations providing jurisdiction over the resource, along with any regulatory definitions or classifications of the resource, are described. This does not mean that all referenced laws and regulations apply to this project; applicability depends on which resources are affected, the nature of the impacts, and other factors, and will be determined following completion of the EIS process. Potential impacts of the project are described in Chapter 4.

The FEIS includes the following substantive revisions made since publication of the DEIS:

- *Figure 3.2-1, showing town zoning districts, has been updated.*
- *More information is provided regarding the Town Plan elements addressing the proposed rail spur.*
- *Miscellaneous revisions relating to changes in the corridor such as the South Ridge Subdivision and Connor Homes.*
- *EPA Air Quality Standards that were updated after the publication of the DEIS (Table 3.4-1) have been added.*
- *The "Highest Measured Ambient Air Quality Data" was updated from 2005 data to 2007 data (Table 3.4-2).*
- *Updated wildlife observations are described in Section 3.6.3.2.*
- *Information on historical marble and slate quarries was added to Section 3.7.1.*
- *Information of the National Wild and Scenic Act Rivers Inventory was added to Section 3.9.2.1.*
- *Wetland descriptions were changed to reflect refinements to the wetland delineation (Section 3.10.2). Information on reed canarygrass was added to the discussion of invasive species in wetlands (Section 3.10.3).*
- *The archaeology section was updated to include the results of the archaeological study that was conducted after the publication of the DEIS (Section 3.11.2.2).*

3.1 Traffic and Transportation

This section summarizes the traffic characteristics and the transportation system that exists in the project area. The purpose and need for the project specifies movement of freight as the primary reason for the project. This chapter will focus on freight travel but will address all types of traffic and travel.

3.1.1 Roadway System

US 7 is the primary means for moving freight in and out of the Middlebury region. US 7 is the primary north-south highway in western Vermont, is part of the National Highway System, and is classified as a two-lane principal arterial. Trucks use US 7 to access Middlebury and most of Addison and Rutland Counties. The following sections give more detail on the current operational characteristics of US 7. The roadway system is shown on Figures 3.1-1 (for the entire project area) and 3.1-2 (for the alternatives corridor area). (All figures referenced in this section are in Volume IIA.)

3.1.1.1 Traffic Volumes

VTrans maintains many Automatic Traffic Recorder Stations (ATRS) along US 7 in the project area. The most recent Annual Average Daily Traffic (AADT) data available are for 2004. Table 3.1-1 shows the AADT values for some of the ATRS's in the project area. See Figure 3.1-1 for ATRS locations.

The AADT values for US 7 range from 6,400 vehicles per day (VPD) to 14,500 VPD in 2004. The higher volumes are associated with the urban village centers of Pittsford, Brandon and Middlebury. The lower volumes occur between the villages on the more rural portions of the highway.

Traffic counts taken on US 7 south of Cady Road from October 3, 2005 through October 5, 2005 indicate a volume of approximately 11,100 VPD. This volume corresponds very closely to what would be expected based upon the ATRS data from 2004.

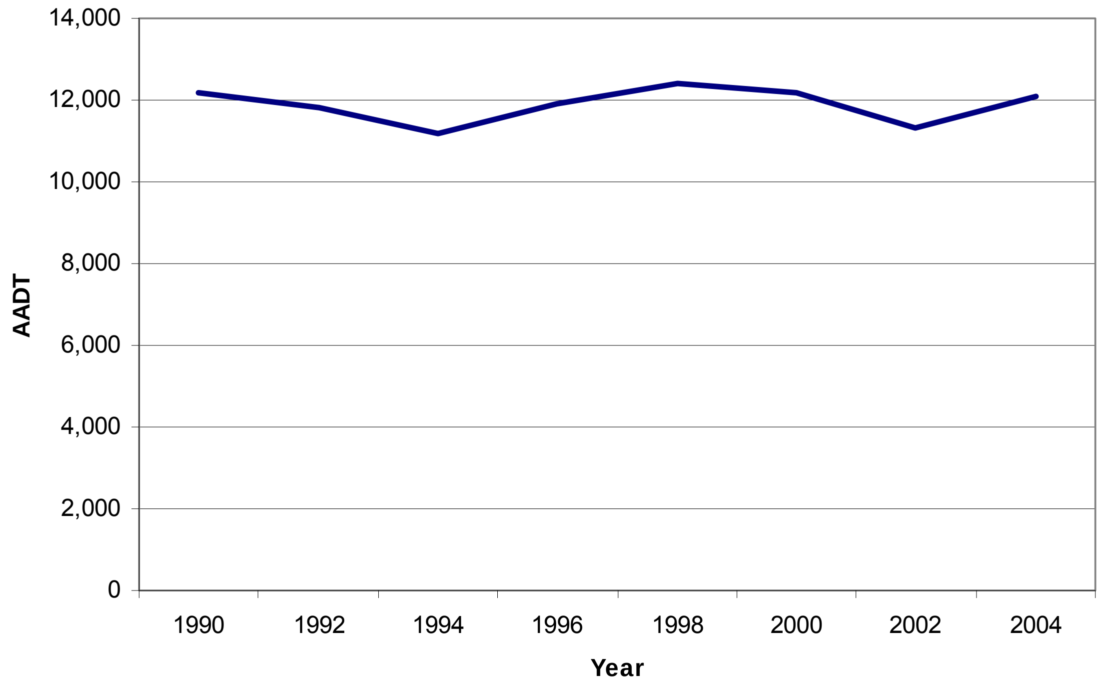
Table 3.1-1 Average Annual Daily Traffic (AADT) on US Route 7 (2004)

Site ID	Town	Location	AADT
S6R175	Pittsford	North of Village Green	10,800
S6R101	Pittsford	1.9 miles north of Kendall Hill Road	8,800
S6R158	Brandon	Conant Square south of Prospect Street	11,500
S6R100	Brandon	Between Leicester Junction Road and VT 73	6,400
P6A018	Leicester	0.3 miles south of Maple Street	6,400
S6A108	Salisbury	0.5 miles north of Holman Road South	6,400
S6A107	Salisbury	0.6 miles north of Lower Plains Road	7,800
S6A010	Middlebury	0.1 miles south of Lower Foote Street	10,200
S6A106	Middlebury	Between Willow Drive and Boardman Street	12,100
S6A179	Middlebury	Between Mary Hogan Drive and Court Square	14,500
S6A168	Middlebury	South of Seminary Street	12,000
S6A012	Middlebury	0.5 miles south of Happy Valley Road	9,500
S6A105	Middlebury	South of New Haven town line	10,000

The ATRS data also allow for a historical evaluation of the traffic growth trends along US 7. The change in traffic volume on US 7 between Willow Drive and Boardman Street from 1990 through 2004 is depicted in Table 3.1-2 below.

Table 3.1-2 shows that the traffic along US 7 has been variable over the period from 1990 to 2004. There have been two periods where traffic volumes have declined for four consecutive years.

Table 3.1-2 Average Annual Daily Traffic (AADT)
US 7 between Willow Drive and Boardman Street in Middlebury



3.1.1.2 Crash History

Crash statistics are compiled by VTrans based upon information it receives from the Department of Motor Vehicles (DMV). The DMV information is based upon crash reports it receives from the State Police, county sheriffs, and town and city police departments. VTrans statistics for US 7 in the project area are available over the five-year period from January 1, 2002 to December 31, 2006.

In 2002-2006, there were 156 reported crashes along the 7.5 miles of US 7 in Middlebury. Of these reported crashes, 49 were located along the southern, rural portion of the corridor; 96 were located along the northern, more urban portion; and 11 had no location specified. For the southern rural portion, the crash rate is below the average statewide crash rate for rural principal arterials. Further evaluation of the crashes show that 30 of the 49 were either rear-end collisions or sideswipes due to inappropriate turns. The rear-end type of collision is indicative of congestion and facilities where turning is made difficult by the congestion. For this portion of US 7, there are many side roads and driveways requiring left turns, but no left turn lanes. Motorists are travelling at high speeds along this portion of US 7, about 50 mph typically, and often encounter another vehicle stopped in the travel lane waiting for an opening to make a left turn. There was one fatality on this portion of US 7 in 2006.

The northern portion of US 7 has a crash rate below the average statewide crash rate for urban principal arterials. Further evaluation again shows that 65 of the 96 were either rear-end collisions or sideswipes due to inappropriate turns. This is not unexpected in downtown Middlebury, where the volume of traffic is higher, there are more points of access, and there are many more decision points. US 7 winds through downtown Middlebury and requires the full attention of drivers.

There were 99 reported crashes along the 7 miles of US 7 in Brandon over the five-year period from January 1, 2002 through December 31, 2006. Of these reported crashes, 57 were located in the village, 39 were outside the village center, and 3 had no location specified. The crash rate in the village center would be double the average statewide crash rate for rural principal arterials, but well below the rate for urban principal arterials. Evaulation of the data shows that 24 of the 57 crashes in the village center were rear-end collisions. The congestion, sharp turns, and many decision points along US 7 in the village are factors contributing to the rear-end collisions.

There is a considerable volume of heavy truck traffic on US 7, but it is not known whether any of the crashes have involved trucks.

3.1.1.3 Freight Transportation on Roadways

US 7 is the primary north-south highway in western Vermont and carries a large volume of trucks. A large portion of these trucks are “heavies”, which range from medium-haul delivery trucks with three axles to multi-trailer trucks with over six axles. A large number of heavies indicates longer haul trucks carrying larger loads. Table 3.1-3 lists the percentages of trucks and heavies at several locations on US 7 in the project area.

In 2004, the statewide averages for trucks and heavies on rural principal arterials were 10.16% and 4.42%, respectively. The statewide averages for trucks and heavies on urban principal arterials were 5.72% and 1.91%, respectively. US 7 in the project area is a rural principal arterial, with the exception of downtown Middlebury, where it is an urban principal arterial.

Table 3.1-3 Percent Trucks on US 7 (2004)

Town	Location	Percentage of All Traffic that Is:	
		Trucks	**Heavies***
Pittsford	North of Rutland Town Line	7.90	3.31
Pittsford	1.9 miles north of Kendall Hill Road	9.67	4.75
Brandon	Between Leicester Junction Road and VT 73	11.43	6.11
Salisbury	0.5 miles north of Holman Road South	11.94	6.03
Middlebury	0.1 miles south of Lower Foote Street	9.24	3.89
Middlebury	South of Seminary Street	7.51	2.91
Middlebury	0.5 miles south of Happy Valley Road	7.12	2.55

**Heavies are medium haul delivery trucks and larger.*

The data shown above indicate that the percentage of trucks and heavies is greater than the state average in those areas where the AADT is the lowest. In Brandon and Salisbury, more than 11% of the traffic on US 7 are trucks. The heavies through Brandon constitute 6.11% of all traffic. Based upon the 2004 AADT of 6,400 VPD, 391 heavies travel through Brandon every day. On days that Omya ships marble from Middlebury to Florence, approximately 160 to 170 of these heavies are likely to be Omya trucks. The Omya trucks make up around a quarter of the total truck traffic through Brandon. If Omya ships at its permit limit of 115 round trips, it would comprise over half of the heavies and nearly a third of the overall 2004 truck traffic.

3.1.1.4 Projected Traffic Growth

The expected opening year of this project was established as 2010. In projecting traffic, a design year is chosen that is about 20 years beyond the opening year, so the design year is 2030. Projected traffic volumes for 2030 were determined for US 7 based upon growth factors provided by the VTrans Traffic Research unit. Table 3.1-4 lists the 2004 AADTs along with the projected 2030 AADT. These 2030 projections assume no improvements are made to US 7 beyond those planned as part of the Pittsford-Brandon Upgrades Project. No improvements are assumed to occur on US 7 north of Brandon. The 2030 AADTs indicate an increase in traffic of over 35% along US 7 compared to 2004.

Table 3.1-4 Projected 2030 Average Annual Daily Traffic (AADT) along US 7

		2004		Projected 2030		
Town	**Location**	**Total AADT**	**AADT, Trucks Only**	**Total AADT**	**AADT, Trucks Only**	**Percent Trucks**
Pittsford	North of Village Green	10,800	1,025	14,960	1,420	9.5
Pittsford	1.9 miles north of Kendall Hill Road	8,800	850	12,190	1,180	9.7
Brandon	Conant Square south of Prospect St.	11,500	1,265	15,930	1,750	11.0
Brandon	Between Leicester Junction Road and VT 73	6,400	730	8,860	1,010	11.4
Leicester	0.3 miles south of Maple Street	6,400	735	8,860	1,020	11.5
Salisbury	0.5 miles north of Holman Road South	6,400	765	8,860	1,060	11.9
Salisbury	0.6 miles north of Lower Plains Road	7,800	945	10,800	1,310	12.1
Middlebury	0.1 miles south of Lower Foote Street	10,200	940	14,130	1,305	9.2
Middlebury	Between Willow Dr. and Boardman St.	12,100	880	16,760	1,220	7.3
Middlebury	Between Mary Hogan Drive and Court Square	14,500	1,065	20,090	1,475	7.4
Middlebury	South of Seminary Street	12,000	900	16,630	1,250	7.5
Middlebury	0.5 miles south of Happy Valley Road	9,500	675	13,160	940	7.1
Middlebury	South of New Haven Townline	10,000	775	13,850	1,080	7.8

3.1.2 Rail System

3.1.2.1 Existing Rail System and Usage

Existing Rail System Ownership and Operator

The existing rail system from Florence to Middlebury is part of a section of track that is owned by the State of Vermont but leased to and operated by VTR. The mainline section is the VTR Northern Main (Division) and the Florence Branch to the Omya plant is part of the privately owned Clarendon and Pittsford Railroad (CL&P) track and ROW (see Figure 3.1-3).

Existing Railroad Alignment Description

The Northern Main alignment runs in a north-south direction through the towns of Middlebury, Salisbury, Leicester, Brandon and Pittsford (Florence Station). The maximum degree of curvature on the Northern Main between Middlebury and Florence is three degrees with the majority of the curves along the route being one to two degrees. According to track chart information, the maximum grade on the Northern Main between Middlebury and Florence is 0.94 percent.

The Florence Branch from the Northern Main to the Omya plant entrance is approximately one mile in length. The maximum grade on the branch in that area is 2.5%, with heavy curvature and a current track speed of 10 mph.

Existing Railroad Track Structure

The existing track structure between Middlebury and Florence is maintained to Federal Railroad Administration (FRA) Class 3 track safety standards. (FRA regulations include speed-related “classes” for track, including a maximum speed for track with a given level of strength and curvature. The maximum freight train speed for a Class 3 track is 40 mph. See 49 C.F.R. 213.9, 213.307 for definitions of classes.) The track is primarily jointed rail on timber ties with cut spikes on either single or double shoulder tie plates. The predominant rail weights are a mixture of 90, 100, and 105 pound jointed rail with four or six hole joint bars. There is one section of 127 pound continuous welded rail (CWR) located just north of Florence. Approximately 20% of the track is currently restricted to 10 mph due to track conditions, with a maximum track speed of 25 mph.

Existing Railroad Bridges

There are eleven track bridges between Middlebury and Florence on the Northern Main. The bridge superstructures are of various types and spans and the spans range from 15 feet to 235 feet. Four are steel or iron through trusses, two are deck plate girders, two are reinforced concrete slabs, two are steel stringers and one is a timber stringer. Three of the through trusses were constructed in the 1890's and two of those currently have ten mile per hour speed restrictions for any 4-axle equipment exceeding 250,000 pounds per axle. The bridges are at mileposts 83.3 and 77.3 and carry the Northern Main over Otter Creek.

Existing Rail Usage

The VTR serves three sidetrack customers between Rutland and Leicester, including Omya, four sidetrack customers at Middlebury, and ten sidetrack customers north of Middlebury to Burlington, where the VTR interchanges with the New England Central Railroad. On this route the VTR currently handles 2.05 Million Gross Tons (MGT) between Rutland and Middlebury and then 1.16 MGT between Middlebury and Burlington. The Florence Branch to Omya handles 1.04 MGT. These figures indicate that half of the 2.05 MGT handled north of Rutland either is delivered to or is shipped from the Omya plant at Florence.

The current VTR operations normally have six road crews that operate weekly. Four of the road crews operate seven days per week on the following routes: Rutland to Florence, Rutland to Middlebury, Rutland to Bellows Falls, and Rutland to Whitehall, NY. One road crew operates six days per week between Burlington and Middlebury, and one road crew operates one day per week (or as needed) between Rutland and Bennington. In addition there are four switcher crews that operate six days per week at the following locations: Rutland, Burlington, Bellows Falls, and Smithville. Also there is a daily Amtrak passenger train between Whitehall, NY and Rutland and two excursion trains that operate between July and September each year. One excursion train operates between Bellows Falls and Chester six days a week, and the other excursion train operates between Burlington and Charlotte two days per week.

The Vermont Rail System, including VTR, the Clarendon and Pittsford Railroad, the Green Mountain Railroad, and other affiliates, serve the state of Vermont from Burlington on the north, to Hoosic Junction on the south, to Whitehall, NY on the west, and North Walpole, NH on the east. This rail system offers access to the North American rail transportation system, with direct connections to three interline carriers, the Canadian Pacific Railway System, Springfield Terminal Railway System, and New England Central Railroad.

3.1.2.2 Projected Rail System Growth

The 2006 Vermont State Rail & Policy Plan (Rail Plan) indicates that rail transportation is an integral component of the state's overall transportation system. Overall or "overhead[1]" freight rail traffic in Vermont has increased in recent years, although the total freight rail traffic originating and terminating in Vermont has declined in the past decade by 21 percent. These trends occur at a time when the current national freight rail industry projections indicate strong growth in the use of freight rail. The Rail Plan indicates that the current freight rail industry is moving toward heavier four axle equipment that has a gross weight of 286,000 pounds on four axles. The Rail Plan recommends that investments be made in increasing the capacity of the existing infrastructure bridges on corridors where an advantageous cost to benefit can be projected. VTrans is taking steps to make improvements in the infrastructure capacity between Rutland and Florence, and the Rail Plan recommends that further capacity improvements be made in the corridor from Rutland to Bellows Falls.

3.1.3 Pedestrians and Bicyclists

Pedestrian traffic in the project area is primarily within the village centers. As mentioned in Section 3.1.1.1, the village centers also have the highest volumes of vehicular traffic. US 7 runs through the centers of Pittsford, Brandon, and Middlebury, and pedestrians cross it in many locations. While there is no evidence of a safety problem, the number and size of trucks on US 7 has raised concerns by residents for the safety of pedestrians. The winding route US 7 follows through the village centers restricts pedestrians' ability to see vehicles on the road and for vehicles to see pedestrians crossing the road.

Bicycle use is limited in the project area. There is bicycle use in the village centers but it is limited because of the narrow streets and the absence of bike lanes. Vermont Bicycle Tours operates a tour that includes Middlebury, East Middlebury and Salisbury, that runs from May through September each year.

3.2 Social and Economic Resources

The focus of this section is the existing social and economic conditions in Middlebury and Addison County, since the primary socio-economic impact of the alternatives are expected to be felt in those areas. There may be secondary impacts felt in Rutland County, in that the Omya Florence processing plant could experience enhanced activity. Also, the alternatives will remove truck traffic from US 7, which will probably have some beneficial impact along the corridor. This is especially true in Brandon Village, which is in Rutland County.

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[1] "Overhead" rail traffic is traffic which neither originates nor terminates in the area under consideration.

3.2.1 Sociological Baseline

Addison County, the area of primary interest in terms of the project's social and economic setting and effects, has a generally rural agricultural setting, with the exception of Middlebury, which is best characterized as a college community with a diverse economic base. Addison County, with a 2004 population of 36,865, experienced a 12% increase in population between 1990 and 2004. This is a somewhat faster rate of growth than experienced state-wide (10%), as shown in Table 3.2-1.

Table 3.2-1 Population Trends

	1990	2000	2004	Change 1990-2004	% Change 1990-2004
Primary Area					
Addison County	32,953	35,974	36,865	3,912	12%
Middlebury	8,034	8,183	8,172	138	1%
Potential Secondary Area					
Rutland County	62,142	63,400	63,616	1,474	2%
Pittsford	2,900	3,140	3,200	300	10%
Vermont	562,758	608,827	621,394	58,636	10%

Source: US Census and Vermont Center for Geographic Information

Middlebury's population, in contrast, has been essentially stable since 1990, with a 2004 population of 8,172. Nearly one-fourth of the county's population resides in Middlebury.

Within the secondary impact area, Rutland County's population has shown modest growth, with a 2004 population of 63,616, while the town of Pittsford's 2004 population of 3,200 increased by 10% between 1990 and 2004. This growth rate matches the rate experienced statewide.

The age distributions of both Middlebury and Addison County (Table 3.2-2) reflect the presence of Middlebury College, with a disproportionate concentration of population in the 18-24 year old age category.

The median age in Middlebury in 2000 was 26 years, versus 36 years in Addison County and 37 years state-wide. The US Census tallied a total of just over 2,100 college students among Middlebury's year 2000 population. The town's population in group quarters (primarily dormitories) was slightly over 2,000, as well. Census figures show little change in college enrollees during the decade.

Table 3.2-2 Population Age Distribution: 1990-2000

	1990	2000	Change 1990-00	% Change 1990-00
Middlebury				
Under 5	407	312	(95)	-23.3%
5 to 17	1,112	1,119	7	0.6%
18 to 24	2,491	2,569	78	3.1%
25 to 34	898	675	(223)	-24.8%
35 to 44	1,067	843	(224)	-21.0%
45 to 64	1,144	1,577	433	37.8%
65 to 74	483	493	10	2.1%
75 and Older	432	595	163	37.7%
Totals	8,034	8,183	149	1.9%
Addison County				
Under 5	2,413	2,057	(356)	-14.8%
5 to 17	6,011	6,767	756	12.6%
18 to 24	4,500	4,635	135	3.0%
25 to 34	5,133	3,973	(1160)	-22.6%
35 to 44	5,457	5,721	264	4.8%
45 to 64	5,428	8,756	3328	61.3%
65 to 74	1,962	2,146	184	9.4%
75 and Older	1,400	1,919	519	37.1%
Totals	32,304	35,974	3670	11.4%

Note: The above tables include Middlebury College students.

Source: US Census, Addison County Regional Planning Commission

An examination of supplemental social indicators (Table 3.2-3) shows that Middlebury's population is more mobile and more diverse, and slightly better educated, than that of Addison County's or the State's population. The overall crime rate (including misdemeanors and felonies) was a bit higher in Middlebury than in Addison County or the State.

Table 3.2-3 Comparative Social Indicators

% of Total Population That:	Middlebury	Addison County	Vermont
Lived in a Different Town or City 5 Years Ago	48%	36%	37%
Is Over Age 65	13%	11%	13%
Is Non-White	6%	2%	2%
Holds Bachelor's Degree or Greater	21%	19%	20%
Crimes per 1,000 Population	118	70	101

Source: Vermont Center for Geographic Information

Population projections prepared as part of the Addison County Regional Plan anticipate faster population growth in both Middlebury and Addison County in the coming decades than was experienced during the past decade (Table 3.2-4).

Table 3.2-4 Population Projections: 2000-2020 - Middlebury & Addison County

Population Forecast:	2000	2010	2020	Numeric Change 2000-10	Numeric Change 2010-20	Percent Change 2000-10	Percent Change 2010-20
Middlebury							
Low Projection	8,183	8,770	9,290	587	520	7.2%	5.9%
High Projection	8,183	9,375	10,443	1,192	1,068	14.6%	11.4%
Addison County							
Low Projection	35,289	38,974	42,564	3,685	3,590	10.4%	9.2%
High Projection	35,289	41,664	47,842	6,375	6,178	18.1%	14.8%

Source: Addison County Regional Planning Commission

3.2.2 Economic Baseline

3.2.2.1 Employment Trends

Employment trends reveal the structure and growth characteristics of the regional economy (Table 3.2-5). There are several notable differences within the area economy as revealed in employment trends. This data set focuses on the jobs located in the respective areas (as compared to the location of workers, discussed below).

Table 3.2-5 Trends in Covered Employment, 1995-2004

				Change 1995-2000		% Change 1995-2004
	1995	2000	2004	1995-00	2000-04	
Middlebury	6,447	7,345	7,368	898	23	14%
Addison County	11,492	13,730	13,878	2,238	148	21%
Rutland County	27,586	28,930	29,318	1,344	388	6%
Vermont	266,028	296,468	298,491	30,440	2,023	12%

Source: Vermont Department of Labor

Between 1995 and 2004, jobs in Middlebury and Addison County overall increased at a faster rate (14% and 21% respectively) than growth statewide (12%). In contrast, Rutland County's employment base expanded at only half the rate experienced statewide.

A second observation is that employment growth in all areas subsided somewhat after 2000, as compared to the 1995-2000 period. From 2000-2004, statewide Vermont added only 2,023 jobs, versus over 30,000 between 1995 and 2000. This slower growth is attributable to the effects of a national recession which included a loss of manufacturing and high-tech jobs to overseas locations.

The above table reveals that Middlebury is a major employment setting within Addison County. About half of the jobs in Addison County are located in Middlebury. Middlebury College is the major employer in both the town and Addison County.

Addison County has a diverse economic base, as revealed in the Table 3.2-6. Major components of the regional economy include durable and nondurable goods manufacturing, educational services, trade-transportation-utilities, and the leisure-hospitality industry.

The Omya facility is included in the natural resources-mining sector. This sector, including Omya and other enterprises, accounted for 578 jobs in the county in 2004. This sector has experienced good growth, with over 250 jobs added to a base of only 320 jobs in 1995.

The county's manufacturing sector reflects broad national and statewide trends – growth in the 1990s followed by contraction since 2000. Employment losses were, in fact, sustained by several sectors since 2000, with growth since 2000 focusing on the education/health services, construction and local government sectors.

Table 3.2-6 Addison County Covered Employment 1995-2004

NAICS Industry	Annual Average Employment Total 1995	Annual Average Employment Total 2000	Annual Average Employment Total 2004	Change 1995-2000	Change 2000-2004
Total Covered Employment	**11,492**	**13,730**	**13,878**	**2,238**	**148**
Private ownership	**9,818**	**11,752**	**11,836**	**1,934**	**84**
Goods Producing	**2,798**	**3,445**	**3,452**	**647**	**7**
Natural Resources and Mining	320	538	578	218	40
Construction	474	687	813	213	126
Manufacturing:					
Durable Goods	1,269	1,389	1,199	120	-190
Non-Durable Goods	736	831	862	95	31
Service Providing	**7,020**	**8,307**	**8,383**	**1,287**	**76**
Trade, Transportation & Utilities	2,089	2,474	2,408	385	-66
Information	134	140	119	6	-21
Financial Activities	349	434	423	85	-11
Professional & Business Services	455	646	665	191	19
Education & Health Services	2,609	2,987	3,164	378	177
Leisure & Hospitality	1,133	1,247	1,267	114	20
Other services, except public admin.	251	378	337	127	-41
Government total	**1,674**	**1,978**	**2,042**	**304**	**64**
Federal Government	137	154	140	17	-14
State government	158	187	166	29	-21
Local Government	1,378	1,637	1,736	259	99

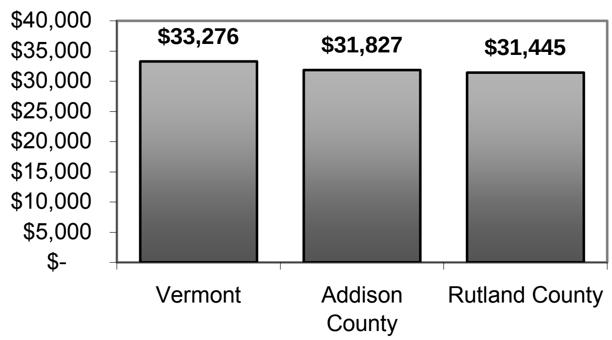
Source: Vermont Department of Labor

In summary, the Addison County economy has demonstrated its vitality over the past decade, although its growth has been slower since 2000 than in the prior period. The Addison County economy is diverse, with manufacturing, trade and educational services as major employment sectors.

3.2.2.2 Comparative Wages

Average weekly wages in both Addison and Rutland counties in 2004 were generally lower than the comparative state figure, as revealed in Table 3.2-7. Average wage rates are a function of the comparative wages generally prevailing in an area, and also the mix of jobs in the area. To the extent that an area has proportionately more jobs in high wage sectors, for example, its overall average wage will be higher than if the opposite is the case.

Table 3.2-7 Average Annual Wages, 2004



Source: Vermont Dept of Labor

The 2004 distribution of average wages among Addison County's economic sectors (Table 3.2-8) reveals that the goods producing sectors tend to pay higher wages than the service sectors. Within the service sectors, state government, professional/business services and educational service sector wages tend to be above average.

Unemployment rates (Table 3.2-9) within the primary impact area are 4% or lower, indicating essentially full employment prevails, based on the traditional economic measure of full employment.

Average per capita and household income (a household is a group of related or unrelated people occupying a housing unit) levels in the primary area are generally below the respective state levels, with the exception of Addison County's household income, which was slightly above the state average in 1999, the most recent year for which comparative data are available (Table 3.2-10).

Table 3.2-8 Average Annual Wages

NAICS Industry	Annual Avg. Wages 1995	Annual Avg. Wages 2004	% Change 1995-2004
Total Covered Employment	**$ 22,130**	**$ 31,827**	**44%**
Private ownership	**$ 21,961**	**$ 32,175**	**47%**
Goods Producing	**$ 27,121**	**$ 37,269**	**37%**
Natural Resources and Mining	$ 15,773	$ 24,428	**55%**
Construction	$ 22,387	$ 32,572	**45%**
Manufacturing:			
Durable Goods	$ 30,796	$ 47,334	**54%**
Non-Durable Goods	$ 28,767	$ 36,307	**26%**
Service Providing	**$ 19,904**	**$ 30,077**	**51%**
Trade, Transportation & Utilities	$ 18,261	$ 27,610	**51%**
Information	$ 19,928	$ 27,964	**40%**
Financial Activities	$ 24,057	$ 34,094	**42%**
Professional & Business Services	$ 23,304	$ 35,160	**51%**
Education & Health Services	$ 24,999	$ 37,431	**50%**
Leisure & Hospitality	$ 10,185	$ 14,954	**47%**
Other services, except public admin.	$ 12,547	$ 21,178	**69%**
Government total	**$ 23,124**	**$ 29,814**	**29%**
Federal Government	$ 28,276	$ 41,102	**45%**
State Government	$ 25,310	$ 42,502	**68%**
Local Government	$ 22,362	$ 27,613	**23%**

Source: Vermont Department of Labor

Table 3.2-9 Comparative Labor Force and Unemployment Data, 2004

	Labor Force	Employed	Unem-ployed	Unemploy-ment Rate
Primary Impact Area				
Middlebury	4,080	3,960	120	3.0%
Addison County	20,800	20,050	750	3.6%
Potential Secondary Impact Area				
Pittsford	2,070	2,000	70	3.5%
Rutland County	36,300	34,850	1,450	4.0%
Vermont	353,400	340,400	13,100	3.7%

Source: Vermont Department of Labor

Table 3.2-10 Per Capita and Household Income Levels, 1999

	Per Capita Income	Median Household Income
Primary Impact Area		
Middlebury	$ 17,926	$ 37,723
Addison County	$ 19,539	$ 43,142
Potential Secondary Impact Area		
Pittsford	$ 19,271	$ 40,027
Rutland County	$ 18,874	$ 36,743
Vermont	$ 20,625	$ 40,856

Source: US Census

As to policy dimensions of the regional economy, the Addison County Regional Plan[2], last adopted by the Addison County Regional Planning Commission in 2005, notes (page 5-4) that a goal of the plan is "To stimulate and support economic security, opportunity, growth and a high quality of life in the region's communities."

The plan goes on to state (pages 5-4 and 5-5):

- *The economy of the Addison Region is and should continue to be primarily comprised of small- to medium-sized, locally-owned businesses, which can be created and grow without placing undue strain on local services, schools and property taxes.*
- *The economy of the Addison Region should continue to be significantly tied to agriculture and forest products in order to ensure the continuation of sustainable farming and forestry in the region and the maintenance of the region's rural character.*

Among the plan's recommended actions (page 5-7) is: "Support improvements to and expansion of the rail system in Addison County, including upgrading the Vermont Rail line from Middlebury to Charlotte and development of the Omya rail spur."

[2] *Addison County Regional Plan*, Last adopted November, 2005 by the Addison County Regional Planning Commission. Available from the Planning Commission offices, 79 Court St., Middlebury. Portions are available on-line at http://www.acrpc.org/pages/publications/reg_plan.htm.

3.2.3 Existing Land Use and Development

Land use districts as depicted in the 2007 Middlebury Town Plan[3] are shown on Figure 3.2-1.

The area immediately surrounding the Omya quarry is primarily designated as Agricultural/Rural Residential. The proposed RS-1/TR-1 alignment, beginning at the quarry, first passes through farmland and crosses a transmission line within this zone. Approaching US 7 from the north and east, the designation changes to Protected Highway District, and the alignment passes through both commercial development and farm fields within this zone. Just west of US 7, the designation returns to Agricultural/Rural Residential. These designations reflect both the existing land use and the town's preferred pattern of development.

Further west, between Halladay Road and Creek Road, the alternatives corridor passes through the southern edge of a recently designated Medium Density Residential District, where a large mixed-use subdivision is under construction. The alternatives corridor then passes through a Flood Hazard District which occupies the broad Otter Creek floodplain.

With respect to the Agricultural/Rural Residential district, the Town Plan notes (page 72), "The purpose of this district is to maintain the character and agricultural viability of the rural and agricultural areas of the Town." As to the Protected Highway District, the plan notes, "The purpose of the Protected Highway District is to assure that land development along US 7 will not impede the safe flow of traffic or reduce highway capacity and to provide a well-planned, attractive entrance to Middlebury."

The Town Plan depicts a proposed rail spur (following approximately the RS-1 alignment) and notes (page 124) "This Plan supports rail system improvements in general and specifically endorses the Middlebury Spur route…." The plan goes on to note that the spur should allow for mitigation of any conservation land absorbed and separation of rail and roadway crossings, that the town should not be responsible for maintenance of new bridges, that impacts from herbicide use in the railroad right-of-way should be minimized, and that a public process should be involved in the design of highway and Otter Creek crossings.

[3] The *2007 Middlebury Town Plan*, adopted June 19, 2007 is available from the Town of Middlebury Planning Commission and on the town's web site (http://www.middlebury.govoffice.com).

3.2.4 Development Potential and Land Use Planning

As noted above, the alternatives corridor and its surroundings are now characterized by low intensity land use, with the exception of the Omya quarry, and commercial development along US 7, and the mixed use subdivision between Halladay Road and Creek Road.

The 2007 Middlebury Town Plan maps “Biologically Significant Areas” and septic soil suitability, both of which have a bearing on development potential. In general, the major development constraint along the proposed alternatives corridor is wetlands, which is addressed elsewhere in this FEIS. Apart from the wetland issues and development controls imposed by zoning and conservation easements, land in the area is generally suitable for development.

A major development is under construction immediately north of the proposed alternatives corridor, on the westerly side of US 7. This development, known as the South Ridge Subdivision, includes 44 residential lots, 42 townhouse units and 138 units of retirement housing. Future phases could include additional units. There are other developments underway (such as Middlebury South Village) or proposed in the general area, but no major development projects are proposed that are likely to be directly impacted by RS-1 or TR-1.

3.2.5 Public Lands and Recreational Resources

3.2.5.1 Introduction

Public lands, wildlife refuges, historic sites, and parks are protected through “Section 4(f)” – the original section of the Transportation Act of 1966 that pertained to public lands. For public land to be protected under Section 4(f), it must be publicly owned and open to the public. In addition, its primary purpose must be for recreation, and it must be “significant” as a park or recreation area.

Section 6(f) of the Land and Water Conservation Fund (LWCF) Act of 1965 provides a means for distributing federal funds to state and local programs for purchasing or improving recreation lands. VANR, which coordinates the Section 6(f) program in Vermont, was contacted regarding LWCF lands in the vicinity of the alternatives corridor.

Where applicable, Act 250 includes provisions regarding effects of a project on ”governmental and public utility facilities, services, and lands, including, but not limited to, highways,… electric generating and transmission facilities, parks, hiking trails and forest and game lands…” Applicants must demonstrate that a proposed development will not “unnecessarily or unreasonably endanger the public or quasi-public investment in the facility, service, or lands, or materially jeopardize or interfere with the function, efficiency, or safety of, or the public's use or enjoyment of or access to the facility, service, or lands." [4]

3.2.5.2 Public and Recreational Lands

Although there may be other types of Section 4(f) lands (such as historic resources, described in Section 3.11) within the alternatives corridor, there are no public or recreational lands that would qualify for protection under Section 4(f). There is a locally operated snowmobile trail that crosses the alternatives corridor between US 7 and Halladay Road, but it is not a public park, nor is it publicly owned. There are also no parks that have received LWCF funding within the alternatives corridor. Figure 3.2-2 shows recreational trails in the general area.

3.3 Visual and Aesthetic Resources

3.3.1 Introduction

The areas investigated to analyze existing visual conditions associated with the project included locations with potential views of the proposed improvements, focusing primarily on areas of concentrated use by the general public. Usually these areas include public roadways, recreation and park areas, public gathering spaces, and areas of high density development. Public roadways provide the major source from which the proposed project will be viewed by the public. Roadways that are within the area and cross the alternatives corridor include US 7, Halladay Road, Lower Foote Street, and Creek Road. Other roadways that might have views include Middle Road, Cady Road, and South Street. The private access road that services the existing Omya quarry runs through the eastern part of the alternatives corridor, east of US 7.

Descriptions of existing visual conditions include field observations of current land uses and associated development, distant views, vegetation, and the presence of notable visual resources. Each area was evaluated on the quality of the visual experience, which is often referred to as "scenic quality".
Views with high scenic quality are generally those with a high degree of landscape diversity, and with little or no landscape degradation. Many highly scenic landscapes include intact and diverse foreground, middleground and background views, particularly panoramic views and those that include water features. Landscape degradation results from development that degrades traditional landscape patterns such as the distinction between village and

[4]VSA Title 10, Ch. 151, Subchapter 4, Section 6086

countryside. Much of the Vermont landscape is relatively scenic, so that scenic quality must be judged in the context of many scenic areas in the larger region.

The alternatives corridor is in an area that has sparse to medium development and contains a diverse range of land uses including heavy to light industrial, commercial, residential, and agricultural activities. There are several roadways that run in a general north-south alignment and cross the corridor. Landform is generally level with a few small hills and valleys, though there are several views into the Green Mountains further to the south and east. Otter Creek runs along the western side of the alternatives corridor and is a valuable recreational and natural amenity to the region. The area is overwhelmingly open and vegetation is limited to hedgerows separating agricultural fields, or exists along roadsides. There are a few forest stands in the vicinity of the alternatives corridor.

The diversity in land use within the alternatives corridor is largely delimited by the bisecting roadways. The following description of visual character will be organized by the areas surrounding each of the roadways.

3.3.2 US Route 7 Area

US 7, which is part of the National Highway System and is the major north-south highway in the area, crosses the alternatives corridor less than 2 miles south of downtown Middlebury. The densest development in the alternatives corridor lies along US 7, although there are still large amounts of open space and fields that border US 7. On the east side of the road, the former Standard Register Company building, (now Connor Homes), is just north of the proposed alternatives crossing and is the largest facility along US 7. A car dealership is south of the proposed alternatives crossing. On the west side of US 7, residential structures are immediately adjacent, both north and south, to a large field that the alternatives corridor bisects. This section of US 7 is a major transportation corridor within the state. Visually the roadway is characterized by

US 7 looking south toward alternatives corridor

wide shoulders and open swales along the roadsides and it is devoid of street trees. Beyond the roadway corridor, vegetation is sporadic and concentrated around areas of development. There is a certain degree of 'visual clutter' that is created by the mix of commercial, industrial, and residential uses that are interspersed between open fields. Travelers heading south experience a higher level of scenic quality due to views of the distant mountains. Figure 3.1-2 shows the road network in Middlebury.

3.3.3 Lower Foote Street Area

Paralleling US 7 to the east is Lower Foote Street, a local road that provides access to rural residences, Vermont Natural Ag Products, Inc. (VNAP), and Foster Brothers Farm. South along Lower Foote Street there are two or three single family residential properties just north of the intersection with Cady Road, separated from the project by a hedgerow and a stretch of open fields. Just north of the quarry access road, along the east side of the road, is VNAP, with a complex of buildings and a large compost product processing and storage area. There are some larger trees along the roadside in certain areas, but open fields and isolated spots of vegetation are dominant. Northwest of the intersection of the Omya access road, open fields allow unobstructed views to the rear of the former Standard Register Company's facility. Further east of the VNAP facility, there is a dense stand of forest including a mix of deciduous and evergreen vegetation. This forest stand effectively screens the majority of views of existing activities at the Omya quarry from adjacent roadways. At several locations, and for extended durations, there are views east from Lower Foote Street toward several electrical transmission lines. Open fields allow unobstructed views in this direction and include visibility of a 46kV line in the middle ground, west of the intervening forest stands described above, and more distant views of a 115kV line and a 345kV line. Both the 115kV and 345kV line utilize H-frame structures.

Lower Foote Street looking south toward alternatives corridor

3.3.4 Halladay Road Area

To the west of US 7, the alternatives corridor would cross Halladay Road. This area has the largest concentration of rural residential development within the alternatives corridor. Four or five Halladay Road residences are within close proximity and have views to the alternatives corridor. The largest band of forest cover is in this area and for the most part visually separates the US 7 area from areas further west. Views of US 7 from residences further north and south along Halladay Road are obstructed. The area of the alternatives corridor is an exception and allows views from US 7 westerly and vice versa. Views along Halladay Road possess a higher level of visual quality due to the natural settings and residential development that exhibit characteristics of typical 'New England' settings (i.e., the combination of rolling hills, mixed open fields and forested areas, and the rural setting, which includes rustic fencing, horses at pasture, and a traditional farm house).

Halladay Road looking south toward alternatives corridor

Middle Road heads southwest from US 7 before making a sharp right turn and terminating perpendicularly into Halladay Road, north of the corridor. Views of the alternatives corridor are most prominent from the sharp right turn for travelers heading in either direction.

3.3.5 West of Halladay Road

Continuing west of Halladay Road, the alternatives corridor crosses a series of agricultural fields and hedgerows, with the new South Ridge Subdivision to the north. This area does not exhibit a high level of scenic quality because of the lack of visual diversity or interest. The alternatives corridor then passes through the broad floodplain associated with Otter Creek, crossing Creek Road and Otter Creek before connecting with the VTR mainline. South Street runs on the west side of Otter Creek and the mainline. Otter Creek provides a valuable visual and recreational amenity in the area. There is evidence of angler activity in several locations. Creek Road allows easy access to Otter Creek and in many locations

Agricultural fields west of Halladay Road

there is less than 25 feet separation. A strong row of vegetation borders both banks of the Creek. There is little vegetation east of Creek Road, but there are isolated areas of young roadside vegetation. A farm with associated fields and farm buildings lies along the southern edge of the alternatives corridor, just east of Creek Road. This farm has views to the south and east towards the Green Mountains. West of Otter Creek a berm that elevates the mainline and existing vegetation limit views to the alternatives corridor, including views from a residential structure and several agricultural buildings further west of the rail line. Recreational attributes of Otter Creek and scenic quality create a higher level of visual sensitivity in this area.

Creek Road looking south toward alternatives corridor; Otter Creek follows the vegetation line in the right-hand side of the photo.

3.3.6 Summary

Existing visual and aesthetic conditions vary throughout the alternatives corridor. Within this corridor, US 7 experiences the highest concentration of public use and has a lower visual quality due to a mix of development and associated visual clutter. The Halladay Road area and the South Ridge Subdivision to the west contain the majority of the residences that are in proximity to the corridor. The land west of Halladay Road is predominantly agricultural with moderate scenic quality. Otter Creek is the most visually sensitive area due to recreational and scenic attributes.

3.4 Air Quality

3.4.1 Introduction

This section describes the relevant pollutants and regulations and assesses the existing air quality conditions in the project area, for use in comparing air quality trends and the forecasted air quality impacts of the project alternatives.

An assessment of the existing air quality was performed through compilation of measured data on existing and historical air quality conditions for the area. The measured data on ambient pollutant concentrations were compared to applicable air quality standards.

3.4.2 Regulatory Standards and Criteria

Federal Regulations

The principal federal legislation dealing with air quality is the Clean Air Act (CAA) of 1970 as amended in 1977 and 1990. The purpose of the CAA is to preserve air quality and to protect the public's health and welfare. As such, it directed the U.S. Environmental Protection Agency (EPA) to establish air quality standards that define allowable limits for atmospheric concentrations of air pollutants. Under the authority of the CAA the EPA established a set of ambient air quality standards for seven “criteria” pollutants: carbon monoxide (CO); nitrogen dioxide (NO_2); ozone (O_3); particulate matter of 10 micrometers diameter and smaller (PM10); fine particulates 2.5 micrometers and smaller (PM2.5); sulfur dioxide (SO_2); and lead (Pb). These standards, shown in Table 3.4-1, are known as the National Ambient Air Quality Standards (NAAQS).

Table 3.4-1 National and Vermont Ambient Air Quality Standards

Pollutant	Standard	Averaging Period	National[a]	Vermont[b]
Carbon Monoxide (CO)	Primary and Secondary[c] Primary and Secondary	8-hour Average 1-hour Average	10 mg/m^3 (9 ppm) 40 mg/m^3 (35 ppm)	10 mg/m^3 (9 ppm) 40 mg/m^3 (35 ppm)
Nitrogen Dioxide (NO_2)	Primary and Secondary	Annual Arithmetic Mean	100 µg/m^3 (0.053 ppm)	100 µg/m^3 (0.053 ppm)
Ozone (O_3)	Primary and Secondary Primary and Secondary	1-hour Average[h] 8-hour Average[i]	No Standard[g] (0.075 ppm)	235 µg/m^3 (0.12 ppm) No Standard
Particulates (PM10)	Primary and Secondary Primary and Secondary	Annual Arithmetic Mean[j] 24-hour Average[k]	50 µg/m^3 150 µg/m^3	50 µg/m^3 150 µg/m^3
Fine Particulates (PM2.5)	Primary and Secondary Primary and Secondary	Annual Arithmetic Mean[j] 24-hour Average[l]	15 µg/m^3 35 µg/m^3	No Standard No Standard
Lead (Pb)	Primary and Secondary	Calendar Quarterly Mean	1.5 µg/m^3	0.25 µg/m^3
Sulfur Dioxide (SO_2)	Primary Primary Secondary Secondary Secondary	Annual Arithmetic Mean 24-hour Average[m] Annual Arithmetic Mean 24-hour Average 3-hour Average	80 µg/m^3 (0.03 ppm) 365 µg/m^3 (0.14 ppm) No Standard No Standard 1300 µg/m^3(0.5 ppm)	80 µg/m^3 (0.03 ppm) 365 µg/m^3 (0.14 ppm) No Standard No Standard 1300 µg/m^3 (0.5 ppm)

a National short-term standards are not to be exceeded more than once in a calendar year.
b Vermont short-term standards are not to be exceeded more than once per year.
c Former national secondary standards for carbon monoxide have been repealed.
d ppm: parts per million.
e mg/m^3: milligrams per cubic meter.
f µg/m^3: micrograms per cubic meter.
g The National one-hour average ozone standard was repealed on June 15, 2005.
h Maximum daily 1-hour average (averaged over a three-year period, the expected number of days above the standard must be less than or equal to one per year).
i Maximum daily 8-hour average (averaged over a three-year period, the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration must be less than or equal to the standard). The new standard of 0.075 ppm is in effect as of May 27, 2008.
j Annual PM10/PM2.5 average over a three-year period must be less than or equal to the standard.
k 99th percentile daily 24-hour mean PM10 concentration, averaged over a three-year period.
l 98th percentile daily 24-hour mean PM2.5 concentration, averaged over a three-year period. This standard was in effect as of December 17, 2006.
m National standards are block averages rather than moving averages.

Source: National – 40 CFR 50, Section 121; State – Vermont Air Pollution Control Regulations Subchapter III, Sections 5-301 through 5-312.

State Regulations

States can develop and implement air quality standards as long as they are at least as stringent as the prevailing national standards. Table 3.4-1 also shows the Vermont Ambient Air Quality Standards, as described in Subchapter III, Sections 5-301 through 5-312 of the Vermont Air Pollution Control Regulations, which are similar to the NAAQS. Primary standards are established at levels designed to protect the public health. Secondary standards are established at levels designed to protect the public welfare by accounting for the effects of air pollution on vegetation, soil, materials, visibility, and other aspects of the general welfare. Compliance with these standards must be achieved by any proposed project being constructed in the State of Vermont.

3.4.3 Relevant Pollutants

Air pollution is of concern because of its demonstrated effects on human health. Public awareness of the effects of air pollution has increased noticeably in recent years. This is evidenced by the passage of the CAA in 1970 and subsequent major Amendments in 1977 and 1990. Of special concern are the respiratory effects of the pollutants, as well as their general toxic effects. The air pollutants of concern in this assessment are listed here, along with a description of their potential health effects.

Volatile organic compounds (VOCs) are a general class of compounds containing hydrogen and carbon, and are a precursor to the formation of the pollutant ozone (see below). While concentrations of VOCs in the atmosphere are not generally measured, ground-level ozone is measured and used to assess potential health effects. Emissions of VOCs and nitrogen oxides (NOx) react in the presence of sunlight to form ozone in the atmosphere. These reactions occur over periods of hours to days during atmospheric dilution and transport downwind. Accordingly, ozone is regulated as a regional pollutant and is not assessed on a project-specific basis.

Oxides of nitrogen can form when combustion temperatures are extremely high, as in diesel engines, and atmospheric nitrogen gas combines with oxygen gas. Of these oxides, nitric oxide (NO) and NO_2 are the air pollutants of greatest concern. This group of pollutants is generally referred to as nitrogen oxides or NOx. NO is a colorless and odorless gas. It is relatively harmless to humans but quickly converts to NO_2. NO_2 has been found to be a lung irritant capable of producing pulmonary edema, and can lead to respiratory illnesses such as bronchitis and pneumonia. NOx, along with VOCs, are also precursors to ozone formation.

Ozone (O_3) is a strong oxidizer and a pulmonary irritant that affects the respiratory mucous membranes, other lung tissues, and respiratory functions.

Exposure to ozone can impair the ability to perform physical exercise, can result in symptoms such as tightness in the chest, coughing, and wheezing, and can ultimately result in asthma, bronchitis, and emphysema.

Carbon monoxide (CO) is a colorless and odorless gas, which is a product of incomplete combustion. CO is absorbed by the lungs and reacts with hemoglobin to reduce the oxygen carrying capacity of the blood. At low concentrations, CO has been shown to aggravate the symptoms of cardiovascular disease. It can cause headaches and nausea, and at sustained high concentration levels, can lead to coma and death.

Particulate matter (PM) is made up of small solid particles and liquid droplets. PM10 refers to particulate matter with a nominal aerodynamic diameter of 10 micrometers and smaller, and PM2.5 refers to particulate matter with an aerodynamic diameter of 2.5 micrometers and smaller. Particulates, especially PM2.5, have been associated with increased incidence of respiratory diseases such as asthma, bronchitis, and emphysema; cardiopulmonary disease; and cancer.

Sulfur dioxide (SO_2) is a colorless and odorless gas, which is formed during the combustion of fuels containing sulfur compounds. It can cause irritation and inflammation of tissues with which it comes into contact. Inhalation can cause irritation of the mucous membranes causing bronchial damage, and it can exacerbate pre-existing respiratory diseases such as asthma, bronchitis, and emphysema. Exposure to SO_2 can cause damage to vegetation, corrosion damage to many materials, and soiling of clothing and buildings.

Lead (Pb) is no longer considered to be a pollutant of concern for transportation projects because the major source of lead emissions to the atmosphere had been from motor vehicles burning gasoline with lead-containing additives. Emissions from this source have been nearly eliminated as unleaded gasoline has replaced leaded gasoline nationwide. Therefore, lead emissions are not assessed in this FEIS.

3.4.4 Existing Air Quality in the Project Area

The State of Vermont, including the project area, is currently classified by EPA as in attainment (compliance) for all criteria pollutants. The air pollutants of most concern in the assessment of impacts potentially associated with the proposed alternatives are those contained in emissions from mobile sources, specifically diesel-powered trucks, locomotives, and equipment. These pollutants include PM10/2.5, NOx, and to a lesser extent CO, SO_2, and VOC. Ozone is also of concern because it is derived from the photochemical reaction of NOx and VOCs in the atmosphere.

In order to determine compliance with the NAAQS, VANR, Department of Environmental Conservation (DEC) routinely conducts long-term air quality monitoring of CO, NO_2, SO_2, PM10, and PM2.5. While VOCs are not monitored, O_3 is routinely monitored by the DEC. Measurement instruments and quality assurance procedures must comply with EPA techniques and criteria. The DEC does not operate any Pb monitoring sites in Vermont. For all of the other monitored criteria pollutants, the nearest representative monitors to the project area are located in Rutland and Chittenden Counties.

For most criteria pollutants, the nearest representative DEC-operated monitoring station to the project area is located at 96 State Street, Rutland, Vermont. Although there are two monitoring stations in Addison County that are closer to the project area, those stations were located to monitor source-specific PM impacts that are not representative of the project region.

The maximum measured pollutant concentrations for the criteria pollutants, compiled from the nearest representative DEC monitoring stations for the most recent full year of data (2007), are presented in Table 3.4-2 along with the National and Vermont Ambient Air Quality Standards. Except for the maximum 8-hour ozone concentration, the maximum concentrations of all pollutants measured in the region in 2007 were well below the applicable federal and state standards.

The closest O_3 monitoring station to the project area is located in Chittenden County at the Proctor Maple Research Farm in Underhill, Vermont. This location recorded one exceedance of the federal eight-hour ozone standard at this site in 2007. The measured maximum eight-hour O_3 concentration was 0.086 parts per million (ppm), which slightly exceeded the standard in effect at the time of 0.08 ppm. (As of May 27, 2008, the ozone standard is 0.075 ppm.) This single exceedance in 2007 did not violate either ozone standard because the compliance level is defined statistically as the average of the fourth highest annual values for each year over a three year period.

The measured ambient concentration data show that no violations of the NAAQS or Vermont Ambient Air Quality Standards occurred at these monitoring stations in 2007, and indicate that existing pollutant levels in the project area are expected to be within the standards.

Table 3.4-2 Highest Measured Ambient Concentrations in 2007

Pollutant	Measurement Station Location	Averaging Period	Statistic (Units)	Measured Conc.	National Standards[a]	Vermont Standards[b]
CO	96 State Street, Rutland	1 Hours	Maximum (ppm)	2.8	35	35
		8 Hours	Maximum (ppm)	1.7	9	9
NO_2	96 State Street, Rutland	Annual	Arithmetic Mean (ppm)	0.012	0.053	0.053
Ozone	Proctor Maple Farm, Underhill	1 Hours	Maximum (ppm)	0.089	No Standard[c]	0.12[d]
		8 Hours	Maximum (ppm)	0.086	0.075[e]	No Standard
PM2.5	96 State Street, Rutland	24 Hours	Maximum ($\mu g/m^3$)	29	35[f]	No Standard
		Annual	Arithmetic Mean ($\mu g/m^3$)	10.7	15_g	No Standard
PM10	96 State Street, Rutland	24 Hours	Maximum ($\mu g/m^3$)	33	150[h]	150
		Annual	Arithmetic Mean ($\mu g/m^3$)	14	50[g]	50
Lead	NA	Quarterly	Arithmetic Mean ($\mu g/m^3$)	NA	1.5	0.25
SO_2	96 State Street, Rutland	3 Hours	Maximum (ppm)	0.047	0.5	0.5
		24 Hours	Maximum (ppm)	0.028	0.14	0.14
		Annual	Arithmetic Mean (ppm)	0.006	0.03	0.03

[a] National short-term standards are not to be exceeded more than once in a calendar year.
[b] Vermont short-term standards are not to be exceeded more than once per year.
[c] The National one-hour average ozone standard was repealed on June 15, 2005.
[d] Maximum daily 1-hour average (averaged over a three-year period, the expected number of days above the standard must be less than or equal to one per year).
[e] Maximum daily 8-hour average (averaged over a three-year period, the 3-year average of the annual fourth-highest daily maximum 8-hour average ozone concentration must be less than or equal to the standard) Effective May 27, 2008.
[f] 98th percentile daily 24-hour mean PM2.5 concentration, averaged over a three-year period. This standard was in effect as of December 17, 2006.
[g] Annual PM10/PM2.5 average over a three-year period must be less than or equal to the standard.
[h] 99th percentile daily 24-hour mean PM10 concentration, averaged over a three-year period.

Source: National – 40 CFR, Section 121 (available: http://www.epa.gov/air/criteria.html, March 2008); State – Vermont Air Pollution Control Regulations Subchapter III, Section 5-301 through 5-312; Monitored Data – USEPA AIRData Website (http://epa.gov/air/data - measured concentration values accessed March 20, 2008).

3.5 Noise and Vibration

A detailed noise and vibration assessment was prepared for the proposed freight rail and highway alternatives, including the no-build alternative. Noise and vibration measurements were obtained along the proposed alternatives corridors, the existing rail line and existing US 7 to describe the existing conditions against which the proposed project related noise levels were compared to determine impact.

3.5.1 Noise

This section provides a discussion of the noise metrics used in the analysis, and a description of the existing measured noise levels within the project area. Measured noise levels include both 24-hour noise measurements at representative residential receptor locations along the rail corridor within the project area, and peak-hour traffic noise measurements at representative residential receptor locations along US 7.

3.5.1.1 Noise Monitoring Methods

The noise analysis was performed in accordance with the methodology contained in the FTA's *Transit Noise and Vibration Impact Assessment*[5] guidelines, VTrans's *Noise Analysis and Abatement Policy* (July, 1997), and the FHWA's *Abatement of Highway Traffic Noise and Construction Noise* (23 CFR Part 772, dated 1982; revised 1997) and *Traffic Noise Model* (TNM) version 2.5. The FTA methods and criteria were used to assess the noise and vibration levels from freight rail operations; the FHWA and VTrans methods and criteria were used to assess the noise levels from truck operations; and the FTA measurement procedures are also applicable to background measurements required for the new FRA freight horn impact model. In general, FTA noise criteria are based on the existing background noise levels. As a result, the first phase of this analysis process was to determine the existing noise levels along the project area's roadway and railroad corridors. Noise measurements were obtained at a number of representative noise-sensitive receptor locations along the freight rail corridor in the project area to determine the existing noise environment.

The existing noise environment is described for the various land uses as defined by the FTA and FHWA. The FTA land uses are described as follows: Category 1

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[5] "Transit Noise and Vibration Impact Assessment", Federal Transit Administration, (FTA-VA-90-1003-06), May 2006

receptors are tracts of land where quiet is an essential element in their intended use (such as outdoor amphitheaters); Category 2 receptors include residences and buildings where people normally sleep and where nighttime sensitivity to noise is assumed to be of utmost importance; and Category 3 receptors include institutional receptors (such as schools and churches) with primarily daytime and evening use. These land-use categories are similar to those identified by the FHWA. The FHWA's corresponding land-use categories are described as follows: Category A are lands on which serenity and quiet are of the utmost importance; Category B receptors include residences, schools, hospitals, churches, hotels, playgrounds, parks, and libraries; and Category C receptors include developed lands used for commercial or industrial purposes.

3.5.1.2 Noise Metrics and Measurement

"Noise" is defined as "unwanted sound." Sounds are described as noise if they interfere with an activity or disturb people hearing them. Sound is measured in a logarithmic unit called a decibel (dB). Since the human ear is more sensitive to middle and high frequency sounds than it is to low frequency sounds, sound levels are weighted to reflect human perceptions more closely. These "A-weighted" sound levels are measured using the decibel unit dBA. Noise that is transmitted through the air is referred to as "airborne noise."

Sound levels fluctuate with time depending on the sources of the sound audible at a specific location. In addition, the degree of annoyance associated with certain sounds can vary by time of day, depending on other ambient sounds affecting the listener and the activities of the listener. Because the time-varying fluctuations in sound levels at a fixed location can be quite complex, they typically are reported using statistical or mathematical descriptors that are a function of sound intensity and time. A commonly used descriptor of noise is the Leq, which represents the equivalent or steady A-weighted noise level that contains the same acoustic energy as the time varying noise level. In areas where sleep activity takes place, the day-night equivalent, or Ldn is frequently used. The Ldn considers the fact that sounds are more annoying during the nighttime hours, and adds a 10 dB "penalty" to the measured sound level between 10:00 PM and 7:00 AM.

Following the FTA methodology, 24-hour day-night Ldn noise levels are used to characterize the existing background at Category 2 residential receptors while peak-hour or "Leq(h)" noise levels are used for Category 1 and Category 3 receptors. Because residential receptors are most noise sensitive during the nighttime hours, the day-night noise level is used to describe impact to account for sleep disturbances. At non-residential, or institutional receptors such as schools, libraries, and churches, adverse noise impacts are assessed during the daytime when these receptors or facilities are most likely to be occupied.

In accordance with FHWA guidelines, existing hourly Leq(h) noise levels were measured at representative noise sensitive receptor locations along US 7.

3.5.1.3 Existing Noise Sources

Ambient noise in rural areas can come from a variety of sources. Highway and local street traffic, train passbys, aircraft flyovers, neighbors mowing their lawns, outdoor construction activity, commercial business operations, birds, and insect noise can all contribute to the noise in a rural area. The relative intensity and annoyance produced by each noise can vary due to location, intensity, and time of day. Pure tone sources such as fans and air compressors can be considerably more annoying than sources that produce a wider broadband spectrum of noise at a similar level, such as motor vehicles.

Noise sources within the project area are primarily due to local street traffic, traffic along US 7, and freight train operations along the Vermont mainline rail corridor. In particular, large trucks on US 7 and freight train operations along the rail corridor have a substantial contribution to noise within the project area. The noise levels also vary over a 24-hour period; they tend to peak during the morning and evening rush hours, and during periods when there are freight train passbys.

3.5.1.4 Noise Measurement Locations

Based on the results of a site visit, thirteen measurement locations were initially selected to be representative of the various residential areas in the project area (Table 3.5-1 and Figure 3.5-1). In general, commercial receptors are less sensitive to noise. Noise measurement locations were selected based on several criteria such as a receptor's location relative to other noise sources (such as highway traffic) that could affect the receptor's existing noise environment, and the distribution of the measurement locations within the project area, in order to provide a representative description of the existing noise environment in areas where sensitive receptors are located. An additional noise measurement location was selected along Foote Street (R14) near the Omya quarry facility to determine noise levels from the existing quarry operations. In addition, on-site noise measurements from truck loading operations were also obtained for use in modeling noise at the proposed transload facility for alternative TR-1.

Table 3.5-1 Noise Monitoring Locations in the Project Area

No.	Receptor Description	Rec. Type	FHWA Category[1]	FTA Category[2]	Meas. Type
R1	Upper Middle Road, Middlebury	Res.	B	2	24 Hr
R2	US 7 North of Route 125, Middlebury	Res.	B	2	Pk Hr
R3	Creek Road, Middlebury	Res.	B	2	24 Hr
R4	Halladay Road, Middlebury	Res.	B	2	24 Hr
R5	Dewey Road and Old Jerusalem Road, Salisbury	Res.	B	2	24 Hr
R6	US 7 near Maple Road, Salisbury	Res.	B	2	Pk Hr
R7	US 7 North of East Road, Leicester	Res.	B	2	Pk Hr
R8	Railroad Avenue and Union Street, Brandon	Res.	B	2	24 Hr
R9	US 7 North of 73, Brandon	Res.	B	2	Pk Hr
R10	US 7 in Downtown Brandon	Res.	B	2	Pk Hr
R11	US 7 at Country Club Road, Brandon	Res.	B	2	Pk Hr
R12	Kendall Hill Road near the RR Crossing, Pittsford	Res.	B	2	24 Hr
R13	West Creek Road South of Kendall Hill Road, Pittsford	Res.	B	2	Pk Hr
R14	330 Foote Street, Middlebury	Res.	B	2	24 Hr
Quarry	Omya quarry near truck loading area	Source	Source		20 Min

1. FHWA land-use categories include only residential (Category B) receptor types for peak-hour Leq noise measurements.
2. FTA land-use (L.U.) categories include only residential (Category2) receptor types for 24-hour Ldn noise measurements.

Measurement location R1 is at a residential receptor on Middle Road along the proposed RS-3 rail spur alignment that has since been dropped from further analysis. Measurement location R3 is at a residential receptor on Creek Road along the proposed RS-1 rail spur alignment. Measurement location R4 is at a residential receptor on Halladay Road along the proposed RS-1 rail spur alignment. Measurement locations R5 (Dewey Road), R8 (Railroad Avenue), and R12 (Kendall Hill Road) are at residential receptors along the existing rail corridor. In accordance with FTA guidelines, noise measurements at these six locations were obtained over a 24-hour period to determine the existing Ldn noise levels at these residential locations along the rail corridor.

Measurement locations R2, R6, R7, R9, R10, and R11 are at residential receptor locations along US 7. Measurement location R13 is along West Creek Road at the residential area just south of Kendall Hill Road. In accordance with FHWA requirements, noise measurements at these seven locations were peak-hour Leq(h) noise levels which is the noise metric used to assess traffic noise impacts. During each of the noise measurements along US 7, concurrent traffic volume data and speeds were also obtained for calibration of the FHWA's TNM.

Noise monitoring was conducted between October 27 and November 3, 2005, using CEL Sound Level Analyzers which meet or exceed ANSI Standards for Type 1 quality and accuracy. During the measurement program, the sound level analyzers were calibrated before and after each measurement period using a CEL Calibrator. For the long-term 24-hour noise measurements, the sound level analyzers were enclosed in an environmental weatherproof case, with the microphone located on a tripod at a height of approximately 5 feet above ground level.

3.5.1.5 Noise Measurement Results

The measured existing 24-hour Ldn noise levels are shown in Table 3.5-2. The Ldn noise levels range from 51.4 dBA on Upper Middle Road in Middlebury to 65.5 dBA along Kendall Hill Road in Pittsford. For receptor locations along the proposed rail spur alignment RS-1, the measured Ldn noise levels at measurement locations R3 and R4 were 57.5 dBA and 58.6 dBA respectively. Noise measurements at receptor locations along the existing Vermont mainline rail corridor ranged from 62.0 dBA at receptor location R5 on Dewey Road in Salisbury, to 65.5 dBA at receptor location R12 on Kendall Hill Road in Pittsford. The measured Ldn noise level at receptor location R14 on Foote Street near the Omya quarry facility was 63.5 dBA.

The measured peak hour Leq(h) noise levels are shown in Table 3.5-3. Along US 7, the measured traffic Leq(h) noise levels ranged from 63.8 dBA in downtown Brandon to 73.8 dBA in Salisbury, where the traffic speeds are considerably higher. Along West Creek Road in Pittsford, where the traffic volumes and speeds are lower than on US 7, the measured Leq(h) noise level was 49.6 dBA. These are typical noise levels near roadways of this size and traffic volume.

Table 3.5-2: Measured Existing 24-Hour Ldn Noise Levels (dBA)

No.	Receptor Description	Ldn
R1	Upper Middle Road, Middlebury	51.4
R3	Creek Road, Middlebury	57.5
R4	Halladay Road, Middlebury	58.6
R5	Dewey Road and Old Jerusalem Road, Salisbury	62.0
R8	Railroad Avenue and Union Street, Brandon	64.2
R12	Kendall Hill Road near the RR Crossing, Pittsford	65.5
R14	330 Foote Street, Middlebury	63.5

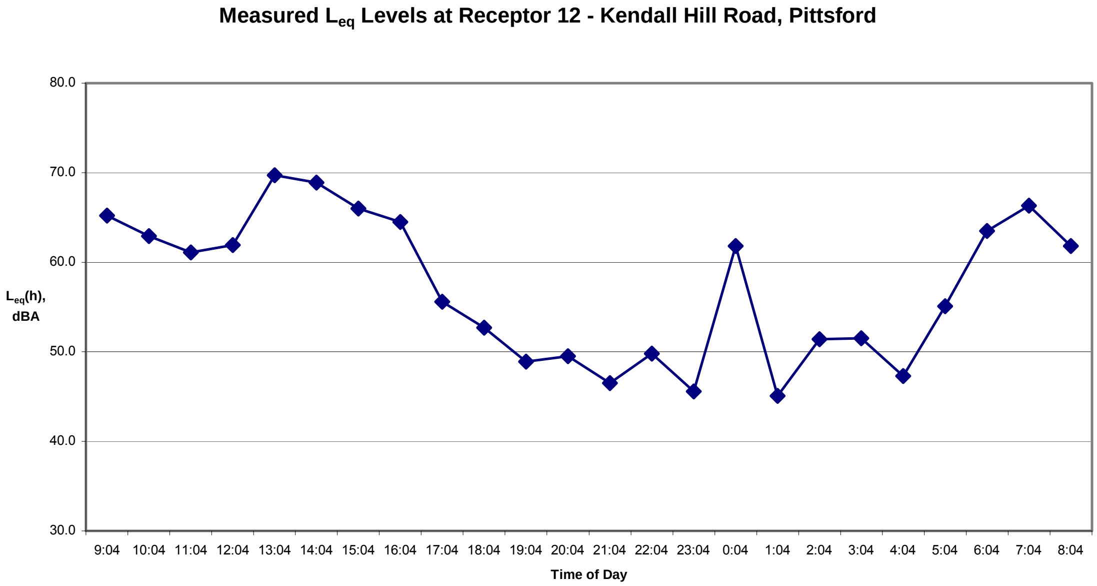
Noise measurements obtained at the Omya quarry facility during truck loading operations resulted in a measured Leq noise level of 70.8 dBA at a distance of approximately 150 feet. Front end loaders operating from a stock pile were used to load the trucks for transport of material from the quarry to the processing plant.

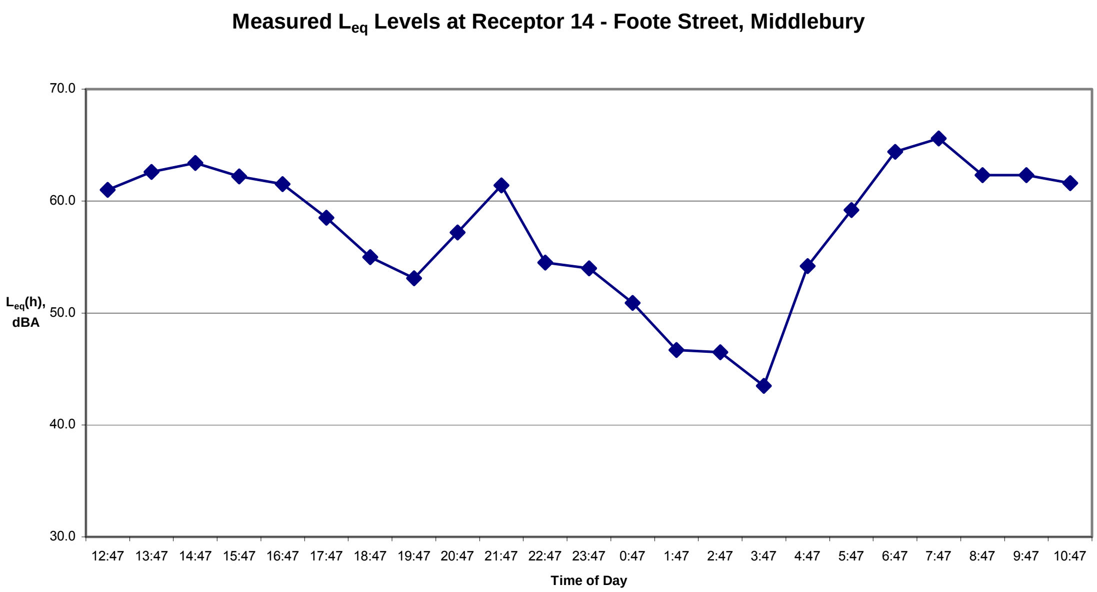
Table 3.5-3: Measured Existing Peak-Hour Leq Noise Levels (dBA)

No.	Receptor Description	Leq
R2	US 7 North of Route 125, Middlebury	68.1
R6	US 7 near Maple Road, Salisbury	73.8
R7	US 7 North of East Road, Leicester	71.4
R9	US 7 North of 73, Brandon	68.5
R10	US 7 in Downtown Brandon	63.8
R11	US 7 at Country Club Road, Brandon	66.9
R13	West Creek Road south of Kendall Hill Road, Pittsford	49.6
Quarry	Omya quarry near truck loading area	70.8

Table 3.5-4 shows the measured hourly Leq noise levels over a 24-hour period at two of the measurement locations within the project area. The observed variations in the noise levels between the two receptors are due to variations in noise level from differing traffic passby volumes, speeds, and vehicle mix, differing distances to US 7 and the nearby freight line, differing land uses,

Table 3.5-4 Measured Hourly Leq(h) Noise Levels over a 24-Hour Period





differing levels of nearby nighttime activity, and variations in terrain between the sound analyzers and sources. Of special note is the unexpected Leq(h) peak at approximately midnight at the Kendall Hill Road receptor, which is near the rail line. This peak could be attributed to a nighttime freight train or some other unidentified noise source. However, because the noise monitors were unattended during the nighttime hours an accurate identification of the noise source is not possible.

3.5.2 Vibration

This section provides a discussion of the measured vibration levels within the project area. Measured vibration levels were obtained for both freight train passbys along the mainline railroad and truck/traffic passby measurements at residential locations along US 7.

3.5.2.1 Methods

The FTA criteria were used to assess annoyance due to vibration from freight rail and heavy truck operations. The vibration criteria levels are defined in terms of human annoyance for different land use categories such as high sensitivity (Category 1), residential (Category 2), and institutional (Category 3). In general, the threshold of human perceptibility of vibration is 65 vibration decibels or VdB (the average of vibration fluctuations over an hour). It is extremely rare for vibration from train operations or highway truck operations to cause any sort of damage, even minor cosmetic damage. Although there is sometimes concern about damage to fragile historic buildings located near the ROW, even in these cases, damage is unlikely except when the track will be very close to the structure.

3.5.2.2 Vibration Metrics and Measurements

Ground-borne vibration is a small, rapidly fluctuating motion transmitted through the ground, which diminishes or “attenuates” fairly rapidly with distance. Ground-borne vibrations levels tend to vary from site to site for identical vibration sources because of different ground propagation characteristics of different soil types. For example, vibration levels will be higher in stiff clay-type soils than in loose sandy soils.

Environmental vibration and its associated potential perception by humans or adverse effects on buildings can be generated by transportation systems (such as automobiles and trucks), construction activities (such as heavy earth moving equipment, blasting, pile driving), power generation or other large mechanical system, or by actual seismic activities. While vibrational motion can be generated in the longitudinal, lateral, and vertical directions, traditionally only the vertical component is measured during environmental studies because this component usually has the highest magnitude and is the most easily measured.

When vibrational forces excite a surface, any given vibrating point can be described by its instantaneous acceleration, velocity, or displacement relative to some equilibrium neutral position. Due to perception sensitivity, ease of quantifiable measurement, and the fact that the velocity component is the most linear component within the low frequencies of interest (10 to 1000 cycles per second (Hz)), velocity has been standardized as the metric for evaluating environmental vibration impacts. As such, vibration results are usually expressed in units of inches per second (ips). However, due to the very large velocity range over which vibration energy can be found (0.0001 ips to 1.0 ips), a more convenient decibel scale has been adopted allowing compression of this large velocity range into a more practical scale through the following equation, where the reference velocity level, V_o, is 1 micro-inch per second.

$$\text{Vibration Velocity Level (in VdB)} = 20\ \text{LOG}_{10}(V/V_o)$$

Typical measured vibration levels range between 40 – 120 VdB, with levels of 50 – 90 VdB being typical of measured transit vibration levels. Vibration levels can be quantified using the different measurement metrics described below:

> **Peak Particle Velocity, or PPV** represents the maximum instantaneous positive or negative peak motion of a vibrating surface. The PPV is appropriate for evaluating impulsive vibration sources, such as blasting or pile driving, and the resulting stresses potentially damaging to buildings. Consequently, the PPV is usually selected when evaluating construction vibration impact. PPV is typically expressed in units of inches per second, although it can also be expressed in VdB.
>
> **Root Mean Square, or RMS** represents a mathematically averaged level that is more proportional to the energy-of-motion generated by a vibrating surface. The RMS vibration velocity level has been shown to better simulate the human body's sensitivity to vibration when computed with a one-second averaging time. The RMS velocity level is preferred when evaluating transit-induced operational impact and is usually expressed in units of VdB.

3.5.2.3 Existing Vibration Sources

Ambient vibration can be caused by a variety of sources. Motor vehicle and rail passbys and industrial and commercial mechanical equipment can contribute to perceived vibration in an urban area. In a rural area, vibration can also be caused by agricultural equipment in addition to the above-mentioned sources. The relative intensity and annoyance produced by each vibration source can vary due to location, intensity, and time of day. Vibration sources in the project area are primarily due to heavy trucks on US 7 and train passbys along the existing rail corridor.

3.5.2.4 Vibration Measurement Locations

Vibration levels were measured at the receptor locations identified in Table 3.5-5 (shown in Figure 3.5-1) to determine existing vibration levels generated by freight train operations along the Vermont mainline corridor and heavy truck passbys on US 7. These measured vibration levels are expected to be similar to those associated with the proposed RS-1 and TR-1 alternatives. As a result, these measured vibration levels were used for comparison with estimated future vibration levels at receptor locations along the alternatives corridor.

Table 3.5-5: Vibration Monitoring Locations

No.	Receptor Description	Rec. Type	FTA Cat.[1]	Meas. Type
R5	Dewey Road and Old Jerusalem Road, Salisbury	Res.	2	Freight Train Passby
R7	US 7 North of East Road, Leicester	Res.	2	Truck Passby
R8	Railroad Avenue and Union Street, Brandon	Res.	2	Freight Train Passby
R10	US 7 in Downtown Brandon	Res.	2	Truck Passby
R12	Kendall Hill Road near the RR Crossing, Pittsford	Res.	2	Freight Train Passby
R13	West Creek Road South of Kendall Hill Road, Pittsford	Res.	2	Truck Passby

1. FTA land-use categories include only residential (Category2) receptor types.

Existing vibration levels were measured for 20-minute periods for freight train passbys at three sensitive residential receptor locations between October 27 and October 29, 2005. The intent of this action was to quantify existing, or baseline, vibration levels of passing freight trains and to serve as a comparison for estimating the relative impact of the increase in rail traffic expected from the proposed project. In addition, ambient vibration levels were also measured for 20-minute periods for traffic passbys at three sensitive residential areas along US 7. The intent of this action was to quantify existing, or baseline, vibration levels of the numerous large trucks traveling along US 7.

Vibration monitoring was conducted using a CEL Sound Level Analyzer configured to measure vibration, a PCB Seismic Piezoelectric Accelerometer, and a CEL Electronic Integrator. During the measurements, the PCB Seismic

Piezoelectric Accelerometer was either secured directly to the ground by either mounting on top of a metal stake driven into the ground or placing the accelerometer under a sandbag to ensure good coupling with the ground. When necessary, the meter and electronic integrator were enclosed in an environmentally weatherproof case, with the accelerometer located as mentioned above. The output signal was fed through the electronic integrator to yield a signal proportional to velocity. The CEL meter was configured to measure and record a stream of RMS values averaged over a one-second response time.

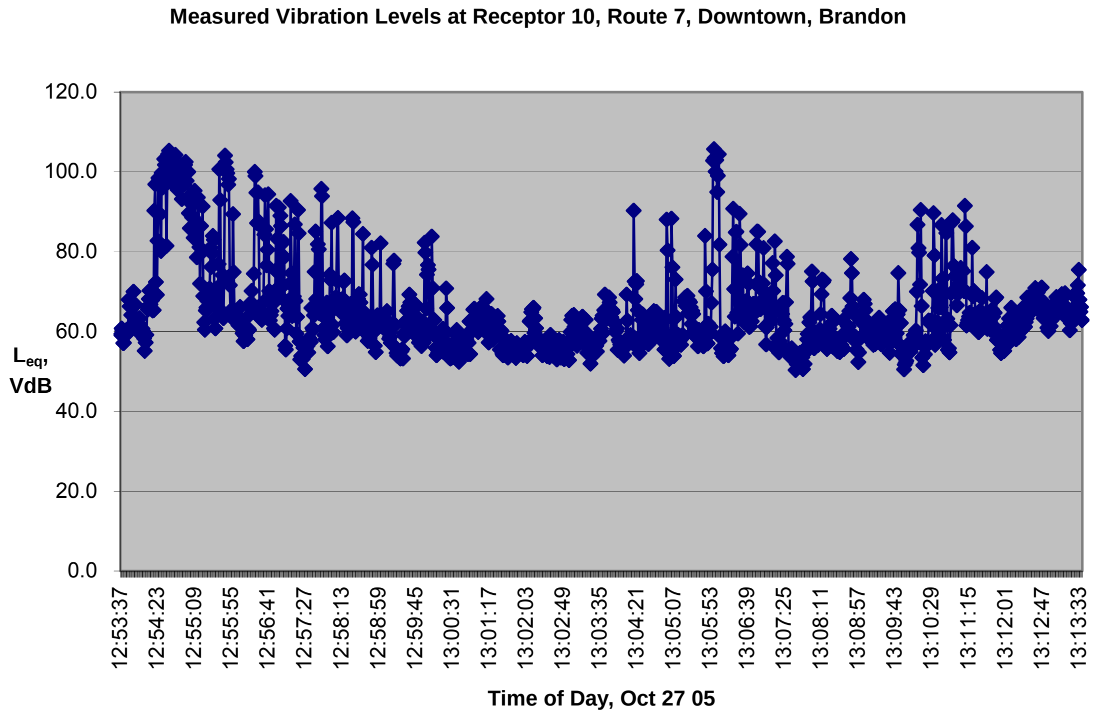
3.5.2.5 Vibration Measurement Results

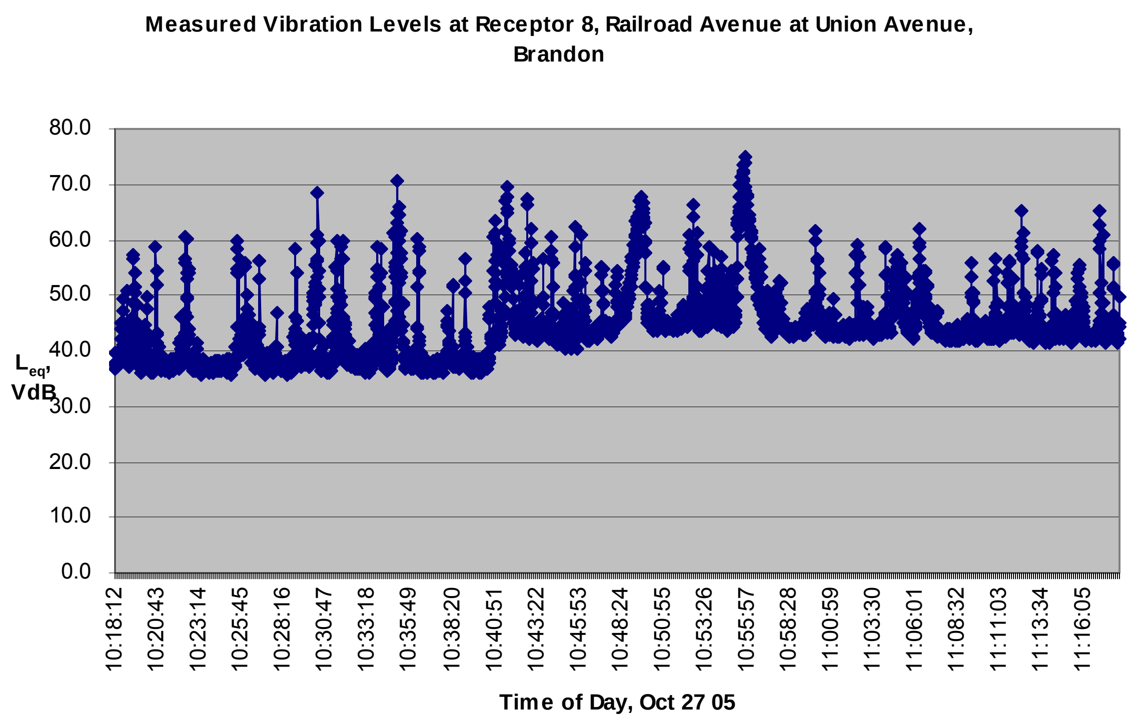
The measured existing RMS vibration velocity average and peak levels are shown in Table 3.5-6. The average vibration levels range from 51.0 to 82.5 VdB, depending upon location. The locations with the highest vibration levels were at Receptor 5 located at Dewey Road near Old Jerusalem Road in Salisbury and Receptor 10 located in downtown Brandon on US 7. Receptor 5 was located on a farm in rural Vermont 365.8 yards from the rail line and experienced little traffic, however, normal farming activity occurred in this and neighboring farms. Receptor 10 was located at the village green in downtown Brandon and experienced a large amount of heavy truck passbys. The location with the lowest levels was Receptor 7 located off of US 7 (approximately 40 feet) just north of East Road in Leicester. Receptor 7, while a considerable distance from the rail line, experienced a large number of truck passbys. Typical measured vibration levels for rail line and traffic passbys are shown in Table 3.5-7.

Table 3.5-6 Measured Existing Vibration Levels (VdB)

No.	Receptor Description	Peak Level L_{max} (VdB)	Average Level L_{eq} (VdB)
R5	Dewey Road and Old Jerusalem Road, Salisbury	102.0	64.5
R7	US 7 North of East Road, Leicester	69.5	48.7
R8	Railroad Avenue and Union Street, Brandon	80.9	56.7
R10	US 7 in Downtown Brandon	105.7	82.5
R12	Kendall Hill Road near the RR Crossing, Pittsford	94.5	70.6
R13	West Creek Road South of Kendall Hill Rd, Pitts.	85.1	51.0

Table 3.5-7: Measured Vibration Levels for Rail Line and Traffic Passbys





3.6 Wildlife, Fisheries, and Vegetation

3.6.1 Wildlife and Significant Natural Communities

3.6.1.1 Introduction

The federal Fish and Wildlife Coordination Act (16 U.S.C. 661-666) requires federal agencies to consult with the USFWS (U.S. Fish and Wildlife Service), the National Marine Fisheries Service (in some instances), and state fish and wildlife agencies when streams or water bodies are proposed to be impounded, diverted, or otherwise modified. Full consideration is to be given to USFWS recommendations to protect and increase game and fur-bearing animals and study the effects of pollution on the wildlife. Rare, threatened, and endangered species are regulated under the Endangered Species Act and state laws, described in Section 3.6.3 below.

Act 250, where applicable, regulates wildlife and wildlife habitat under Criterion 8(A). This criterion requires applicants to show that projects will not have an “undue adverse effect” on “necessary wildlife habitat and endangered species.”

3.6.1.2 Wildlife Habitats

The habitat within and around the alternatives corridor was reviewed during field investigations conducted primarily on May 11 and 12, 2005; October 2 through 6, 2005; May 8, 2006, June 25, 2006, October 25-28, 2006, September 26-27, 2007, and October 31, 2007. Habitat types, dominant plant species, and animal species observations were noted. Animal species observed within or near the alternatives corridor are listed in Table 3.6-1. Additionally, requests for information about rare species and important wildlife habitats were sent to the USFWS, VFWD, and NNHP. Relevant correspondence is in Appendix A.

General Habitat Conditions and Context

The alternatives corridor, surrounding land, and important habitat features are shown on an aerial photograph base in Figures 3.6-1 and 3.6-2. (Some residential development has occurred subsequent to the DEIS and does not show up on figures, but has been taken into account in the FEIS analysis.) The alternatives corridor lies within a predominantly agricultural landscape, about one mile south of downtown Middlebury and one mile west of the Green Mountains.

Table 3.6-1 Species Observed within or Near the Alternatives Corridor*

Common Name	Scientific Name
Reptiles and Amphibians	
Gray Treefrog	*Hyla versicolor*
Northern Green Frog	*Rana clamitans melanota*
Northern Leopard Frog	*Rana pipiens*
Wood Frog	*Rana sylvatica*
Blue-Spotted or Jefferson Salamander or hybrid**	*Ambystoma laterale* or *jeffersonianum***
Eastern Garter Snake	*Thamnophis sirtalis sirtalis*
Eastern Milksnake	*Lampropeltis triangulum*
Birds	
American Crow	*Corvus brachyrhynchos*
American Goldfinch	*Carduelis tristis*
American Robin	*Turdus migratorius*
Baltimore Oriole	*Icterus galbula*
Barn Swallow	*Hirundo rustica*
Barred Owl	*Strix varia*
Black and white Warbler	*Mniotilta varia*
Black-Capped Chickadee	*Poecile atricapilla*
Blue Jay	*Cyanocitta cristata*
Bobolink	*Dolichonyx oryzivorus*
Cedar Waxwing	*Bombycilla cedrorum*
Common Grackle	*Quiscalus quiscula*
Common Merganser	*Mergus merganser*
Downy Woodpecker	*Picoides pubescens*
Eastern Kingbird	*Tyrannus tyrannus*
European Starling	*Sternus vulgaris*
Gray Catbird	*Dumetella carolinensis*
Great Crested Flycatcher	*Myiarchus crinitus*
Herring Gull	*Larus argentatus*
House Sparrow	*Passer domesticus*
Killdeer	*Charadrius vociferous*
Birds, continued	
Mallard	*Anas platyrhynchos*
Mourning Dove	*Zenaida macroura*
Northern Cardinal	*Cardinalis cardinalis*
Northern Flicker	*Colaptes auratus*
Northern Harrier**	*Circus cyaneus***
Ovenbird	*Seiurus aurocapilla*
Pileated Woodpecker	*Dryocopus pileatus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	*Agelaius phoeniceus*
Scarlet Tanager	*Piranga olivacea*
Solitary Sandpiper	*Tringa solitaria*
Song Sparrow	*Melospiza melodia*
Tree Swallow	*Tachycineta bicolor*
Turkey Vulture	*Cathartes aura*
Warbling Vireo	*Vireo gilvus*
White-breasted Nuthatch	*Sitta carolinensis*
Wild Turkey	*Meleagris gallopovo*
Willow Flycatcher	*Empidonax traillii*
Wood Duck	*Aix sponsa*
Wood Thrush	*Hylocichla mustelina*
Yellow Warbler	*Dendroica petechia*
Yellow-throated Vireo	*Vireo flavifrons*
Mammals	
American Beaver	*Castor Canadensis*
Northern Raccoon	*Procyon lotor*
Coyote	*Canis latrans*
Fisher	*Martes pennanti*
Muskrat	*Ondatra zibethicus*
White-tailed Deer	*Odocoileus virginianus*
Woodchuck	*Marmota monax*

** Wildlife observations include species seen, species heard singing or calling, or tracks or other indirect evidence.*

*** Blue-Spotted Salamander, Jefferson Salamander, and Northern Harrier are listed as "Special Concern" species on the State of Vermont's Rare and Uncommon Native Animals of Vermont list (February 2008).*

The general area also includes residential, commercial and industrial land use areas, forested blocks, the mainline railroad, and roadways. US 7, a major north-south highway flanked by commercial development, bisects the alternatives corridor, as do three town roads. Otter Creek and its associated floodplain lie in the western part of the alternatives corridor. The farmlands include hedgerows, scattered patches of forest "islands", and adjacent larger blocks of forested land.

While the alternatives corridor includes several habitat types and connections to large blocks of undeveloped land, its position relative to downtown Middlebury and the presence of US 7 limit the alternatives corridor's potential value as a regional wildlife corridor. The habitat value of these landscape components is described below.

Agricultural Fields

The habitat value of agricultural fields depends in large part on the kind of farming and management practices used. West of Otter Creek, and east of Otter Creek south of the alternatives corridor, the fields are used to pasture farm animals, and some of the fields are also cut for hay. This relatively low intensity use probably supports a larger number of wildlife species than higher intensity uses such as cropland. Milk snakes (*Lampropeltis triangulum*) were found in a hay pile within one of these fields. Species such as northern leopard frogs (*Rana pipiens*), pickerel frogs (*Rana palustris*), smooth green snakes (*Opheodrys vernalis*), common garter snakes (*Thamnophis sirtalis*), woodchucks (*Marmota momax*), white-tailed deer (*Odocoileus virginianus*), small mammals, and grassland birds such as bobolinks (*Dolichonyx oryzivorus*) may also be found in these areas. Northern harriers, a Vermont Special Concern species, were on two occasions observed foraging over agricultural fields and along hedgerows between Halladay Road and Creek Road.

Cropped farmland is found along the alternatives corridor just east of Creek Road and in most of the fields east of US 7. The fields just west of Halladay Road are also reportedly cropped occasionally. Cropland may provide foraging habitat for species such as deer, raccoons (*Procyon lotor*), small mammals, Canada geese (*Branta canadensis*), and wild turkeys (*Meleagris gallopavo*), but is of limited value for most native species, and presents a travel barrier for many.

Most other farm fields in the alternatives corridor appear to be fallow. North of the proposed TR-1 transload facility (roughly RS-1 Sta. 30+00 to 55+00), are fields which in recent years had been used as sheep pasture and are now the location of a large subdivision a portion of which is under construction. Between Halladay Road and US 7 are fields that also appear to be fallow. Fallow farm fields typically have thicker, taller, and more diverse vegetation than actively managed fields. This "early successional" habitat is important to certain species (green, garter, and black rat snakes (*Elaphe obsoleta*), cottontail rabbits

(*Sylvilagus* sp.), deer, weasels (*Mustela* sp.), many songbirds, and other species) and is declining regionally.

Hedgerows and Habitat Islands

Hedgerows are narrow strips of vegetated land that typically grow along fences or property lines between farm fields. There are many hedgerows in the alternatives corridor, ranging from broken rows of low shrubs to thickly vegetated tall shrub and tree areas. Hedgerows can be important habitat and corridors for species requiring vegetated cover. Where hedgerows connect large blocks of forested or wetland habitat, hedgerows can be very important in maintaining the viability of regional populations by replenishing populations and allowing genetic interchange among subpopulations and colonization of habitat islands. The hedgerows within the alternatives corridor which appear to have the greatest potential wildlife corridor value are those west of Halladay Road which run between the forested ridge line habitat to the north and the large wetland to the south. These hedgerows connect the forested uplands and ridge lines to the north with the very large forested block to the south. Migrating salamanders and frogs, milk snakes (*Lampropeltis triangulum*), rabbits, bobcat (*Lynx rufus*), coyote (*Canis latrans*), and many other species may use these hedgerows as travel corridors.

Small blocks of forest land within the agricultural land use matrix can be important refuges or “stopover” places for certain animal species. Sometimes these refuges are stepping stones from one habitat to another, and sometimes they may support small populations of certain species (such as amphibians or breeding birds). Two such refuges lie along the alternatives corridor east of US 7. About halfway up the quarry access road, on the east side of the road, is a 4-acre patch of deciduous and evergreen upland forest. Closer to the quarry, along the west side of the access road, is a 10-acre area of mixed upland and wetland forest. The relatively limited amount of forested habitat near these two patches limits their overall habitat value. A few species, such as woodchucks, raccoon, deer, and redback salamanders (*Plethodon cinereus*) may use these forested patches.

Wetlands and Waterways

Wetlands are described in detail in Section 3.10. Wetlands within the alternatives corridor include wet meadow farm fields, ditched or channelized streams and drainages in farm fields, and small pockets of forested or shrub wetland. Much larger forested wetlands occur south of the alignment between Creek Road and Halladay Road. The habitat value of the ditches and drainageways are limited by their narrow dimensions, limited vegetation structure, farmed surroundings, and compromised water quality due to farm field runoff. However, they may provide travel corridors for smaller aquatic and semi-aquatic species (certain small rodents, eastern ribbonsnakes (*Thamnophis* *sauritus*), and green frogs (*Rana clamitans*), for example), particularly near the larger wetlands in the alternatives corridor.

The extensive wetland to the south of the alternatives corridor, with its large size, extensive forested areas, and presence of adjacent forested upland areas, is likely important habitat for a wide variety of wildlife species. Several frog species (wood, green, leopard, spring peeper (*Hyla crucifer*), etc.), salamanders, garter snakes, deer, moose (*Alces alces*), mink (*Mustela vison*), fisher (*Martes pennanti*), many birds (including thrushes, warblers, vireos, woodpeckers, among other groups), and many other species are likely found there. The area where this wetland and the rocky ridge to the north of the alternatives corridor meet probably supports a variety of amphibian and snake species, and the hedgerows and drainages between the two habitats may be active corridors for these species, as described above.

Otter Creek

Within the alternatives corridor, Otter Creek lies between the railroad to the west and Creek Road to the east. Just upstream (to the south), there is pasture west of the creek and a very large forested wetland to the east. Where the alternatives would cross the Creek, there is pasture to the west and cropland to the east, with a narrow band of floodplain trees along the riverbanks. Downstream (to the north), Otter Creek closely follows the railroad line, with cropland along the east side, and then passes through an area with important forested upland and wetland habitat on both sides of the river.

River corridors are considered important habitat corridors for a variety of aquatic and semi-aquatic species. Species such as beaver (*Castor canadensis*), river otter (*Lutra canadensis*), mink, raccoon, and many kinds of wading birds, ducks, reptiles, and amphibians likely use this habitat corridor. Here, Otter Creek also serves to connect important forested upland and wetland habitats to the north and south, and therefore is itself an important wildlife corridor. However, its value is limited somewhat by the narrow width of natural vegetated cover along the banks.

Forested Ridges

North of the alternatives corridor between Creek Road and Halladay Road are several north-south trending ridges. Ridges are often travel corridors for a variety of wildlife species, particularly mammals such as coyote, bobcat, and fisher. The rocky outcrops, particularly the south-facing portions, can provide microhabitat for a variety of reptiles and amphibians, such as spotted salamanders (*Ambystoma maculata*), blue-spotted or Jefferson salamanders or their hybrids (*Ambystoma laterale* or *A. jeffersonianum*) (both Vermont Special Concern species found along the west side of the ridge during this study), wood frogs (*Rana sylvatica*), gray treefrogs (*Hyla versicolor*), ringneck snakes (*Diadophis punctatus*), and milk snakes, and also for bobcat.

Railroad Corridor

The mainline railroad corridor generally is a 66-foot wide ROW with railroad tracks, stone ballast, embankments, and a mixture of dense vines, shrubs, and trees on each side of the tracks. Railroad lines can serve as travel corridors for certain wildlife species (such as moose, deer, and coyote), and dispersal corridors for plant species. Railroads can also function as barriers for certain animal species, such as salamanders and turtles. The railroad line within the alternatives corridor traverses an active horse farm with a mixture of pasture, hedgerows, trees, and shrubs. This habitat mosaic, along with the adjacent Otter Creek, provides a variety of habitat and cover opportunities for species moving north-south along the river or rail corridor, enhancing the overall corridor value.

Other Habitats along the Alignments

Other habitats within the alternatives corridor are human-altered habitats, including mowed lawns (along portions of Halladay Road and US 7), commercial and residential structures and parking areas, and Omya's quarry. These areas typically provide habitat for common species such as robins (*Turdus migratorius)*, house wrens (*Troglodytes aeon*), and eastern gray squirrels (*Sciurus carolinensis*). The habitat value of these habitats is limited by the lack of vegetated cover, by their disturbed conditions, and by frequent human activity.

Significant Natural Communities and Habitats in the General Area

The Vermont NNHP has mapped two Significant Natural Communities or "Significant Habitats" south of the alternatives corridor, between Creek Road and Halladay Road (Figures 3.6-3 and 3.6-4). Both are associated with the large wetland complex generally bounded by Halladay Road, Creek Road, the alignments, and Three Mile Bridge Road. The habitats include "Valley Clayplain Forest" and "Red or Silver Maple-Green Ash Swamp".

Valley Clayplain Forest occurs in two upland forest areas adjacent to the large wetland south of the alignments. According to NNHP's *Wetland, Woodland, Wildland*[6] publication and the Champlain Valley Clayplain Forest Project (www.clayplain.org), Valley Clayplain Forests are characterized by a warm valley climate, high fertility clay soils, and moderate to poor soil drainage. Plant diversity can be high, and dominant trees include white oak, red oak, red maple, white pine, shagbark hickory, and white ash, with several other species of oak,

6 Thompson, E.H. and E.R. Sorenson. 2005. Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont. Nongame and Natural Heritage Program. Waterbury VT.

maple, and ash. The mast-producing trees, proximity to water and wetlands, and moderate climate can support a diverse animal community, including small mammals, deer, songbirds, certain amphibian species, insects, and other species.

Much of the original Valley Clayplain Forest has been converted to agriculture, and most of the remaining habitat occurs in scattered patches across the landscape. NNHP lists Valley Clayplain Forest as S2: "rare in the state, occurring at a small number of sites or occupying a small total area in the state."

Most of the large wetland south of the alignments is mapped as Red or Silver Maple-Green Ash Swamp. According to NNHP's *Wetland, Woodland, Wildland*, these swamps "are found primarily in the Champlain Valley and are associated with the lake or large rivers. They experience extended periods of spring flooding and typically have organic soils." They are structurally similar to floodplain forests, and support a variety of songbirds, red-shouldered hawk, wood ducks, and other species. NNHP's publication notes that: "The natural fluctuations of these water bodies cause flooding regimes that are critical for maintaining the species composition and ecological characteristics of these swamps." NNHP lists Red or Silver Maple-Green Ash Swamp as S3: "high quality examples are uncommon in the state, but not rare…"

Deer Wintering Areas

No deer wintering areas are mapped within or adjacent to the alternatives corridor, and while evidence of deer was observed in several areas, no areas with characteristics typical of important deer wintering areas (e.g., dense conifers on south-facing slopes) were observed. The closest mapped deer wintering area is over one mile east of the alternatives corridor.

3.6.2 Fisheries

Otter Creek is designated as warm water fish habitat under Vermont's Water Quality Standards.[7] The Vermont Rivers Study (1986) lists warm water species such as Largemouth Bass (*Micropterus salmoides*), Smallmouth Bass (*Micropterus dolomieu*), and Northern Pike (*Esox lucius*) as occurring in Otter Creek. The value of the fish habitat in Otter Creek may be limited by water quality problems (see Section 3.9).

Other surface waters found within the alternatives corridor are all intermittent streams, and do not appear suitable to support fish species. Aquatic invertebrate species typically found in intermittent streams include mayflies (Ephemeroptera),

7 Vermont Water Quality Standards, Appendix A, part A.3.(j).

midges (Chironomidae), water beetles (Coleoptera), and caddisflies (Trichoptera).

3.6.3 Threatened and Endangered Species

3.6.3.1 Introduction

The federal government regulates rare plants and animals under the federal Endangered Species Act (16 U.S.C. § 1531-1534). The federal program is administered by the USFWS and the National Marine Fisheries Service (for marine species). A species (see below) may be classified for protection as "endangered" when it is in danger of extinction within the foreseeable future throughout all or a portion of its range. A "threatened" classification is provided to those animals and plants likely to become endangered within the foreseeable future throughout all or a portion of their ranges.

Vermont's Endangered and Threatened Species statute (Title 10 V.S.A. Chapter 123) regulates taking of wildlife or plant species that are listed as endangered or threatened in Vermont. Endangered species are those in immediate danger of becoming extirpated in the state; threatened species are those with a high possibility of becoming endangered in the near future. Special Concern species do not have legal protection, but their status is tracked by NNHP either because their populations have experienced a decline or because they occur in such small numbers that they could easily become threatened. NNHP, which is part of the VFWD, ranks species according to relative rarity. NNHP maintains an *Endangered and Threatened Animals of Vermont* list, last updated February 3, 2008, which includes all species designated endangered or threatened in the State of Vermont. NNHP also maintains a list of *Rare and Uncommon Native Animals of Vermont*, last updated February 3, 2008. This list includes threatened, endangered, and Special Concern species, along with other species that may be uncommon, extirpated, or have other designations indicating some level of rarity.

3.6.3.2 Rare Species in the Alternatives Corridor

As noted previously, information requests were sent to the USFWS, Vermont Department of Fish and Wildlife (VFWD), and NNHP. Responses are in Appendix A. USFWS noted that the federally listed endangered Indiana bat (*Myotis sodalis*) is known to occur in the general area, along with "occasional, transient" bald eagles (*Haliaeetus leucocephalus*). NNHP provided data showing occurrences of upland sandpipers (*Bartramia longicauda*) and grasshopper sparrows (*Ammodramus savannarum*) in the general area; the creek heelsplitter mussel (*Lasmigona compressa*) downstream in Otter Creek, and Significant

Habitat to the south and west of the alternatives corridor. (Significant Habitats were described in Section 3.6.1.2 above.) In a letter dated June 20, 2006, VFWD stated that two "reproductive" adult female Indiana bats had recently been captured within the 120-acre forest block on the north side of the alternatives corridor just west of Halladay Road. There was additionally further correspondence with NNHP and VFWD regarding the potential occurrence of rare grassland bird species and appropriate study methods, as described further below.

The habitat within the alternatives corridor was reviewed during field investigations conducted primarily on May 11 and 12, 2005; October 2 through 6, 2005; May 8, 2006; October 25 through 28, 2006; September 26-27, 2007, and April 15, 2008. During these visits, potential habitat for the rare species listed above was noted. A survey for rare grassland bird breeding activity was conducted on June 25, 2006.

Indiana Bat

Indiana bats are known to roost in deciduous, coniferous, and dead trees with peeling bark in open upland forests in west-central Vermont, including Middlebury, with the nearest known roost site about 1.5 miles south of the alternatives corridor. Roost tree species may include live or dead shagbark hickory (*Carya ovata*), black locust (*Robinia pseudoacacia*), or silver maple (*Acer saccharinum*), and dead or dying white pine (*Pinus strobus*), American elm (*Ulmus americanus*), or other species with exfoliating bark, crevices, or dead limbs. In Vermont, Indiana bats have been found roosting in forested blocks that are over 30 acres in size, and have avoided smaller forest patches and hedgerows for roosting, although the importance of forest patch size is not known with certainty.

Within the alternatives corridor, there are large forest blocks over 30 acres in size north and south of the alternatives corridor between Creek Road and Halladay Road. The forests to the north contain many shagbark hickories and scattered dead trees that could provide roosting habitat for Indiana bats. VFWD reports that two reproductive female Indiana bats were captured within the forest block in 2006. VFWD reports that "ensuing roost tree location work suggests these bats move between forested areas north and south of the proposed route" (alternatives corridor). The forested land to the south, predominantly wetland with upland pockets, may also have suitable roosting trees. Both of these forested areas, and possibly other nearby, smaller forest patches, also appear to be suitable foraging habitat. The smaller forested areas along the quarry access road and other hedgerows and forest patches within the alternatives corridor did not, based on their small size or narrowness, appear to be suitable roosting habitat.

Upland Sandpiper

The following information is based on a literature review appearing in The Birds of North America[8]. Upland sandpipers use habitat “with low to moderate forb cover, low woody cover, moderate grass cover, moderate to high litter cover, and little bare ground.” For nesting, upland sandpipers have been found to use areas with relatively low vegetation height dominated by grasses. In North Dakota, the vegetation height around most nests was 10–64 cm, and the average at another North Dakota location was 26 cm. Areas with shorter, less dense vegetation are used for foraging. The available scientific literature shows that in central Minnesota, upland sandpipers may use plowed and seeded fields, nesting in the spring in old fields, pastures, and meadows with vegetation up to 30 cm high. For brood-rearing, it prefers overgrazed pastures with vegetation less than 10 cm high, and in late summer, flying young move to mowed fields with vegetation 2.5 to 15.0 cm high. In Kansas, upland sandpipers prefer grasslands of at least 40 acres in size, while in New Jersey home ranges were found to be 216 acres per nesting pair.

There are no records of upland sandpipers within the alternatives corridor, but upland sandpipers have been identified to the west approximately 1.5 miles from the alternatives corridor. The suitability of the alternatives corridor for upland sandpiper nesting or foraging is uncertain. East of US 7 (Lots 8077.200, 8107.000, 8117.000, 8119.001, and 8075.000 on Figure 3.6-3), the fields appear to be frequently plowed and planted or mowed, and therefore generally unsuitable for upland sandpipers. Between US 7 and Halladay Road (primarily Lot 8153.000), the fields appear to be fallow, with tall grasses and forbs, and therefore unsuitable.

West of Halladay Road, there are relatively large areas of contiguous fields, with some of the fields planted in corn, some cut for hay, some primarily pasture, and some apparently fallow. Because of the large contiguous acreage of fields and the variety of management practices, it is possible that portions of this area could be suitable upland sandpiper habitat at certain times of the year. Areas of corn and hay production are unlikely to be suitable breeding habitat, but may occasionally be suitable foraging habitat for upland sandpipers.

Just west of Halladay Road, extending approximately one-half mile to the west, is an area of contiguous hayfields approximately 155 acres in size (Lots 8211.200 and 8196.000). Although some of these fields are occasionally planted in corn and there are areas of unsuitable sandpiper habitat such as hedgerows and wet meadows, most of this area is open hayfields and could serve as upland sandpiper foraging habitat. It is unlikely to provide breeding habitat. Further west, along the south side of the alignments and the north side of the large

[8] Houston, C. S., and D. E. Bowen, Jr. 2001. Upland Sandpiper (Bartramia longicauda). In The Birds of North America, No. 580 (A. Poole and F. Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

forested wetland (Lot 7003.301), are hayfields and pasture which are mostly wetland, and therefore likely unsuitable breeding habitat. Along the north side of the alignments (most of Lot 7003.300) are former pastures and hayfields that are now fallow, where vegetation is currently too tall to support upland sandpiper breeding or foraging. A portion of these fields is being developed as a mixed use residential subdivision. The western part of Lot 7003.300 and Lot 7003.400, extending west to Creek Road, are cornfields that are unlikely to support upland sandpiper use.

On June 25, 2006, a grassland bird survey was conducted along the alignment centerline from Halladay Road to the mainline railroad. Although weather conditions were favorable and recordings of upland sandpiper territorial songs were played, no upland sandpipers were seen or heard. Based on these findings, along with the habitat considerations described above, it is believed that the alternatives corridor, under existing conditions, does not support breeding upland sandpipers. If field management practices change and habitat conditions become more favorable for this species, breeding upland sandpipers could possibly be found in the alternatives corridor. Portions of the large contiguous hayfields immediately west of Halladay Road are potential upland sandpiper foraging habitat (as shown on Figures 3.6-3 and 3.6-4).

Grasshopper Sparrow

Grasshopper sparrows inhabit dry, relatively sparsely vegetated grassland areas. The grasshopper sparrow feeds exclusively on the ground, and tends to inhabit areas with an abundance of bare ground. In the eastern United States, grasshopper sparrows tend to avoid areas with thick shrub vegetation. As with the upland sandpiper, there are no records of grasshopper sparrows nesting within the alternatives corridor, but there are records of grasshopper sparrows in Cornwall to the west, approximately 1.5 miles from the alternatives corridor. The alternatives corridor does not appear to have the dry, sparsely vegetated areas required by grasshopper sparrows, so it is unlikely they would be found there.

On June 25, 2006, simultaneous with the upland sandpiper survey, a survey was conducted for breeding grasshopper sparrows. No grasshopper sparrows were seen or heard. Because the sparse vegetation preferred by grasshoppers is uncommon in these fertile clay soils, the alternatives corridor appears to be less suitable for this species, for either breeding or foraging. However, there may be certain periods of time when tillage practices temporarily result in suitable grasshopper sparrow habitat, and the species may be found foraging or breeding in the general area. This would be an unlikely and very infrequent event, however.

Bald Eagle

USFWS also stated that the federally threatened bald eagle may be found within the alternatives corridor on an "occasional, transient" basis. Although bald eagles are often found along large rivers and water bodies such as the Connecticut River, NNHP did not indicate any records near the alternatives corridor. Furthermore, there are no large "super-canopy" trees – trees that stand above the surrounding canopy – along Otter Creek within the alternatives corridor. For these reasons, the alternatives corridor is unlikely to be important habitat for bald eagles.

Creek Heelsplitter

The creek heelsplitter, a freshwater mussel, has been found downstream in Otter Creek. It is listed as "S2" in Vermont: "Rare, generally 6 to 20 occurrences believed to be extant and/or some factor(s) making it vulnerable to extirpation in the state." In Vermont, creek heelsplitters are found in "headwater streams of the St. Lawrence drainage."[9] In the Midwest, their habitat is described as "creeks and the headwaters of small to medium rivers in fine gravel or sand. Rarely found in larger rivers."[10] NNHP did not request a survey for this species, but the low-gradient condition of Otter Creek within the alternatives corridor suggests the substrate would be too fine-grained for this species.

Other Rare Species

In May and October 2006, blue-spotted or Jefferson salamanders (Ambystoma laterale or A. jeffersonianum) or their hybrids were encountered along the forested ridge line on the north side of the alternatives corridor and in wet meadows within the corridor, about halfway between Halladay Road and Creek Road. These species, which hybridize frequently and typically cannot be identified to species without chromosomal analysis, are both listed as Special Concern on NNHP's list of *Rare and Uncommon Native Animals of Vermont*. It appears the salamanders breed in the springtime in the forested wetlands south of the alternatives corridor and spend the rest of the year in forested uplands in the immediate area, particularly the forested ridgeline to the north. In April 2008, eggs of Jefferson or blue-spotted salamanders or their hybrids were found in a vernal pool within forest just south of the alternatives corridor, between US7 and Halladay Road.

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9 Fichtel, C. and D.G. Smith. 1995. The Freshwater mussels of Vermont. Nongame & Natural Heritage Program Technical Report 18. Leahy Press, Montpelier VT.

10 Cummings, K.S., and C.A. Mayer. 1992. Field guide to freshwater mussels of the Midwest. Illinois Natural History Survey Manual 5. 194 pp.

In October 2005 and April 2008, a northern harrier (*Circus cyaneus*) was observed foraging over the fields and hedgerows in the same area, about halfway between Halladay and Creek Roads. The harrier is also listed as a Vermont Special Concern species. It is likely the harrier was a migrant (and not nesting) in this area.

3.7 Land Resources

3.7.1 Bedrock Geology

The bedrock geology of the alternatives corridor is characterized by Cambrian and Ordovician marine deposits, laid down when what is now Vermont was on the shoreline of a large landmass. These sedimentary rocks later metamorphosed, due to tectonic movement, into marble and limestone.[11] The dominant formations in the alternatives corridor are in the Beekmantown Group, which are light colored, buff or gray limestones or marble with layers of slate, or phyllite (see Figures 3.7-1 and 3.7-2). East of this formation are narrower bands of Clarendon Springs, Ticonderoga, and Rock River Dolomites (grouped as one band); Winooski dolomite, Monkton quartzite, and Dunham dolomite.

Historically, mining of the marble, limestone, and slate deposits in western Vermont have played important roles in the economy of this region. There were 50 operational marble and limestone quarries in Vermont.[12] Of these, nine are current producers. There were historically 55 slate quarries in the state, of which 35 are now closed. Although many of the deposits have been depleted, the Omya quarry in Middlebury is one of several operational marble, limestone, and slate quarries in the state.

3.7.2 Surficial Geology

Following the most recent glaciation, approximately 12,000 years ago, the southern Champlain Valley (including the alternatives corridor) lay at the bottom of a large glacial lake known as Lake Vermont. This lake encompassed a broad area including what is now Lake Champlain, the western part of the Town of Middlebury, and an extended region south of Middlebury. Over a period of several hundred years, fine sediments were deposited on the lakebed from streams flowing into the lake from the hills to the east. Sand and gravel, being coarser and heavier, were deposited along the lakeshore, in East Middlebury. Finer silt and clay particles were carried further west until they eventually settled

[11] "Geologic History of the Champlain Valley" Shelburne Landscape Change (n.d.) 29 August 2005. <http://www.uvm.edu/shelburnelandscape/nature/geology.html>>
[12] "Mineral Resource Data System" United States Geological Survey (http://tin.er.usgs.gov/mrds/)

on the lakebed. Subsequently, about 10,000 years ago, the freshwater lake drained, and the area was inundated by sea water. The inland sea lasted approximately 2,000 years. As the land rebounded isostatically, the land rose above sea level, and the sea drained, leaving behind marine clay deposits. The lakebed deposits are up to 100 feet thick in some places.[13]

Within the alternatives corridor, the surficial geology is dominated by the glacial lakebed in the western part, and by the limestone and marble ridges to the north and east.

3.7.3 Soils

3.7.3.1 Introduction

Soils are regulated indirectly through Vermont state wastewater permitting, and through farmland soil regulations administered by the USDA (see Section 3.8 below). Vermont's Act 250, where applicable, regulates impacts to primary and secondary agricultural soils and forest soils (see Section 3.8).

3.7.3.2 Soils within the Alternatives Corridor

Soil series found in the alternatives corridor are shown on Figures 3.7-3 and 3.7-4. In general, soils in the proglacial Lake Vermont region are inceptisols, which are mineral soils that show minimal soil development. Inceptisols lack differences in horizons that have resulted from weathering, illuviation (deposition of humus, chemical substances, or minerals in the lower layers of a soil profile from the upper layers due to the movement of water) or eluviation (removal of humus, chemical substances, and minerals from the upper layers of a soil profile to the lower layers by water movement).

The Covington, Panton, Livingston, and Vergennes soils were formed from lacustrine (lake-bottom) and estuarine (mixed fresh and salt water) sediments, and have high contents of calcium, magnesium, and potassium. These soils have high clay content, and/or are underlain at a depth two to three feet by clay.[14] Because of their high clay contents, none of the soils are well drained.

Floodplains within the alternatives corridor are dominated by Hadley, Winooski, and Limerick soils. These soils have a high proportion of fine sand, as well as

[13] Addison County Soil Survey, USDA, SCS, October 1971 (p. 112)
[14] Addison County Soil Survey, USDA, SCS, October 1971 (p. 112)

silt, gravel, and stone fragments. Seasonal deposition of these materials is ongoing.

3.8 Agricultural Resources

3.8.1 Introduction

The federal Farmland Protection Policy Act (FPPA), which was passed in 1981, provides that federal agencies protect farmland from unnecessary development. FPPA defines important farmland soils as follows:

> (A) Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion, as determined by the Secretary. Prime farmland includes land that possesses the above characteristics but is being used currently to produce live stock and timber. It does not include land already in or committed to urban development or water storage;
>
> (B) Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high quality or high yields of specific crops when treated and managed according to acceptable farming methods. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables; and
>
> (C) farmland, other than prime or unique farmland, that is of statewide or local importance for the production of food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency or agencies, and that the Secretary determines should be considered as farmland for the purposes of this subtitle;[15]

The designation of Prime, Unique, Statewide, or locally important soils is carried out by the USDA NRCS office.

[15] 7 USC 4201 Section 2, (c) (1)

Act 250 (where applicable) also recognizes the importance of farmland soils, as follows:

> “Primary agricultural soils" means soils which have a potential for growing food and forage crops, are sufficiently well drained to allow sowing and harvesting with mechanized equipment, are well supplied with plant nutrients or highly responsive to the use of fertilizer, and have few limitations for cultivation or limitations which may be easily overcome. In order to qualify as primary agricultural soils, the average slope of the land containing such soils does not exceed 15 percent, and such land is of a size capable of supporting or contributing to an economic agricultural operation. If a tract of land includes other than primary agricultural soils, only the primary agricultural soils shall be affected by criteria relating specifically to such soils.[16]

Soil units that meet the criteria for Prime or for statewide designation will also meet the state criteria for Primary Agricultural Soils, if the land area is large enough to contribute to an agricultural operation. NRCS determines whether an area is large enough to meet the size criteria.

3.8.2 Designated Farmland Soils within the Alternatives Corridor

The NRCS has not identified any “unique” farmland soils in Vermont. However, most of the alternatives corridor has soils of statewide importance, and there are also several areas of prime farmland soils, as shown in Figures 3.8-1 and 3.8-2.

Prime Farmland Soils within the alternatives corridor are:

ElB, Elmwood Fine Sandy Loam, Coarse Variant, 0 to 8 Percent Slopes
Hh, Hadley Very Fine Sandy Loam, Frequently Flooded
MrB, Melrose Fine Sandy Loam, 3 to 8 Percent Slopes
Wo, Winooski Very Fine Sandy Loam

Statewide Soils within the alternatives corridor are:

Cw, Covington and Panton Silty Clays
Cv, Covington Silty Clay, Flooded
Le, Limerick Silt Loam
VgB, Vergennes Clay, 2 to 6 % slopes
VgC, Vergennes Clay, 6 to 12 % slopes
VrC, Vergennes Rocky Clay, 6 to 12 % slopes

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[16] V.S.A. 001 (15)

The Important Farmland classifications are made for soils units in the NRCS soil survey. If a soil unit has inclusions that would not meet the criteria for that classification, it is still considered in the higher classification. However, if an area mapped as Prime, Statewide, or Locally Important is “Urban” or “built up”, it is no longer considered Important Farmland, and that soil unit’s classification may be changed on the official soil map, at the discretion of NRCS. Although some of the areas identified as Statewide or Prime farmland soils have changed usage, and are paved or otherwise unsuitable for farming, their official designations have not changed.

3.8.2.1 Active Agricultural Operations

The Champlain Valley, with its rich, level soils, is host to numerous agricultural enterprises, most of which are dairy farms. The number of farms has been declining since records have been kept. In 1870, there were 2,824 farms in Addison County. The most recent data available, from 2002, indicates that there were 676 active farm operations in Addison County. (A farm has been defined by the USDA since 1975 as "any establishment from which $1,000 or more of agricultural products were sold or would normally be sold during the year".[17])

Within the alternatives corridor, there are several active agricultural enterprises. Adjacent to the quarry are agricultural fields owned by Omya and farmed by Foster Brothers Farm. Further to the south, east of US 7, are active farm fields owned by Foster Brothers Farm. Between US 7 and Halladay Road, there is an inactive pasture. To the west of Halladay Road, there are fields and pastures owned by several different owners, and maintained in some cases by others. The proposed transload facility for TR-1 would be located along the northern edge of pasture land owned by the owners of the adjacent farm to the south and the southern edge of cropland and fallow farmland which was under construction as the South Ridge Subdivision as of 2008. To the west of the proposed transload facility is cropland, and on the west side of Otter Creek, there are pasture and hayfields owned and maintained by an equestrian enterprise.

[17] U.S. Census Bureau

3.9 Water Resources

3.9.1 Groundwater Resources

3.9.1.1 Introduction

Pursuant to V.S.A. Title 10 Chapter 48, the VANR DEC manages a groundwater protection program for the state. Only public water supplies are regulated. Under Vermont law, "Public water supply" means a water supply system with ten or more connections. Vermont law provides that groundwater may be classified as Class I, Class II, Class III, or Class IV, depending on its value as a groundwater resource. By default, all groundwater resources in Vermont are Class III, which is defined as “groundwater that has been classified by the statute or reclassified by the Secretary and that is suitable as a source of water for individual domestic water supply, irrigation, agricultural use and general industrial and commercial use” (Groundwater Protection Rule and Strategy, Rule # 99-P35, Chapter 2, 12-201 (9)). The law further provides goals for each of the classes of groundwater.

> “Class III Goals:
> (1) To maintain potable water quality for Class III groundwater by:
> (a) Issuing permits for activities regulated under existing authorities;
> (b) Monitoring groundwater quality as appropriate; and
> (c) Issuing Risk Advisories when appropriate.”[18]

Vermont’s Chapter 21 Water Supply Rules (2005) regulate all drinking water systems in Vermont under the authority of the federal Safe Drinking Water Act (42 U.S.C. 300 and 40 CFR Parts 141, 142, and 143) under an agreement with the US EPA, by which Vermont has primary enforcement authority; and under the authority of 10 V.S.A. 48 and other state statutes. The purpose of the Water Supply Rules is to maintain clean and safe drinking water by enforcing the above laws and statutes. The focus is regulation of proposed and existing water supply systems.

Under Vermont’s Act 250 (where applicable), groundwater resources and quality may be regulated under Criterion 1 (pertaining to undue water pollution, including a provision regarding areas supplying “significant” amounts of recharge to aquifers) and Criterion 3 (pertaining to burdens on existing water supplies).

[18] Groundwater Protection Rule and Strategy, Rule # 99-P35, Chapter 212-306.

3.9.1.2 Aquifers

Aquifers in the alternatives corridor, shown on Figures 3.9-1 and 3.9-2, are limited to deep bedrock sources. A map entitled "Ground-Water Favorability Map of the Otter Creek Basin, Vermont", published by the Vermont Department of Water Resources in 1967, indicates that the land underlying the alternatives is of low groundwater potential. The eastern side of the alternatives corridor is "underlain by deposits of unstratified glacial drift ('hardpan') and bedrock ('ledge')**.** In general, wells in till or bedrock will yield only enough water for domestic or light commercial use."[19] The western part of the alternatives corridor is "underlain by fine-grained stratified glacial drift and swamp. These areas generally will yield sufficient water for domestic wells only. In places, thin lenses of gravel with higher yields may underlie these deposits, but these lenses may not have adequate storage or recharge to produce high yields on a sustained basis."[20] Sand and gravel deposits in the eastern side of town, outside of the alternatives corridor, provide the water supply for the town in two public wells. These wells are located in areas with excellent groundwater potential, and are underlain by thick deposits of coarse-grained stratified glacial drift.

3.9.1.3 Public Wells

The Addison County Regional Plan identifies four public wells in Middlebury, three of which have defined wellhead protection areas. None of the public wells or their wellhead protection areas lie within the alternatives corridor.

3.9.1.4 Private Wells

According to data provided by VANR, there are seven private wells within the alternatives corridor, although none are in the path of the proposed alignments. VTrans would also verify the presence of any private wells during any ROW acquisition stage.

[19] "Ground-Water Favorability Map of the Otter Creek Basin, Vermont", Vermont Department of Water Resources, 1967
[20] "Ground-Water Favorability Map of the Otter Creek Basin, Vermont", Vermont Department of Water Resources, 1967

3.9.2 Surface Water

3.9.2.1 Introduction

Navigable Waters – Section 10

The Army Corps of Engineers (ACOE) has jurisdiction over navigable waters under Section 10 of the Rivers and Harbors Act of 1899, which states, in part: "That the creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any waters of the United States is hereby prohibited".[21] The ACOE issues permits for the obstruction, excavation, filling, or any construction affecting navigable waters. In addition, under Section 404 of the Clean Water Act, the ACOE regulates the discharge of dredged or fill materials into waters of the United States. Otter Creek is considered a navigable water up to mile 63.8 in Proctor, which includes the alternatives corridor. The ACOE administers the Section 10 program with a General Permit for projects meeting certain criteria, and with Individual Permits for projects that do not meet these criteria.

The U.S. Coast Guard, which is now under the Department of Homeland Security, also regulates navigable waters. The Coast Guard regulates the construction of new bridges over navigable waters. However, based on initial discussions with the Coast Guard, it is not anticipated that a Coast Guard bridge permit would be needed at the proposed crossing location.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act of 1934 and amendments provides that if a stream or waterbody is to be "impounded, diverted… or otherwise controlled or modified"[22] by a federal action, the USFWS must be consulted for the purpose of preventing loss of and damage to wildlife resources.

Wild and Scenic Rivers

The Wild and Scenic Rivers Act allows for rivers to be nominated for protection. Under NEPA, federally funded projects that involve impacts to Wild and Scenic Rivers must be coordinated with the National Park Service. There are no designated Wild and Scenic Rivers in the State of Vermont. Related to the Wild and Scenic Rivers Act, the National Park Service has compiled a list of river segments that potentially qualify as national wild, scenic or recreational river

[21] 33 U.S.C. 403, Chapter 425
[22] Fish and Wildlife Coordination Act (16 U.S.C. 661-667e; the Act of March 10, 1934; Ch. 55; 48 Stat. 401)

areas, known as the "Nationwide Rivers Inventory". Federal agencies must take care to avoid or mitigate adverse effects on these river areas. Prior to taking actions which could affect wild, scenic or recreational status for rivers on the inventory, all agencies are required to consult with the National Park Service. Portions of Otter Creek are identified in the NRI as eligible for wild and scenic status, including a 25 mile segment from Middlebury to Florence. This segment of the river is recognized for the following features:

> Botanic - (Cornwall Swamp is a vast swamp forest which represents the only sizeable swamp forest of its type in the state.)
>
> Hydrologic - (The last remaining relatively undeveloped free-flowing river in the section.)
>
> Historic - (Corridor contains 7 historic covered bridges, the distribution and density of which is unique to the northeast region.)

Water Quality Certification

Section 401 of the Clean Water Act provides that states have the authority to review activities that are subject to federal permits to ensure that they comply with the state's water quality standards. In Vermont the water quality certification program is administered by the VANR Water Quality Division.

Vermont law classifies all of the state's surface waters as Class A or Class B, with Class A waters being of the higher quality.[23] All public water supplies are designated as Class A waters, and all other waters are Class B. All surface waters within the alternatives corridor are Class B.

Impaired Water Bodies

The State of Vermont is required under the Clean Water Act to report biennially a list (the "State of Vermont 303(d) list"[24] of impaired surface waters that are not meeting the above standards. Within the alternatives corridor, Otter Creek, a Class B water body, was identified on the 2006 303(d) list as an impaired surface water. The river has levels of E. coli that exceed the maximum allowable. Sources of the pollutant are either from agricultural runoff or failed septic systems.

There is currently a permitted National Pollutant Discharge Elimination System (NPDES) discharge in Middlebury into Otter Creek for the sewage treatment plant (#3-1210) downstream of the alternatives corridor.

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[23] 10 V.S.A. 47, 1252
[24] http://www.anr.state.vt.us/dec//waterq/planning/docs/pl_2006.partA.pdf, accessed May 2008

Stream Alteration Permit

Alterations to streams with watersheds greater than ten square miles are regulated under a state program administered by VANR.[25] The Stream Alteration Program regulates bridge construction, stream bank stabilization, road construction adjacent to streams, and other activities that impact streams. Under Title 19 of V.S.A. Chapter 1, Section 10(12), VTrans is required to coordinate with VANR when engaging in activities that involve streams, ponds, or lakes.

3.9.2.2 Surface Waters within the Alternatives Corridor

Surface waters within the alternatives corridor are shown on Figures 3.9-3 and 3.9-4 and are described below.

Otter Creek

Otter Creek is the major surface water resource in the vicinity of the alternatives corridor. Otter Creek originates in Dorset, to the south, and flows north through the Champlain Valley, and into Lake Champlain in Ferrisburg, to the north. Several tributaries feed the creek, including the Middlebury River, which joins Otter Creek approximately one mile south of the alternatives corridor. Otter Creek is a Class B water body (described previously), and is a warm water fishery. Within the alternatives corridor, the shoreline has a fringe of silver maple (*Acer saccharinum*), shagbark hickory (*Carya ovata*), and other trees and shrubs. The substrate of the river is mud. The USGS gage station data (in Middlebury Village, approximately 1.9 miles downstream of the alternatives corridor) for Otter Creek indicates that the Creek averages 484 cubic feet/second over an 89 year period. The watershed of Otter Creek upstream of the alternatives corridor is approximately 628 square miles.

Streams

There are several small tributaries to Otter Creek within the alternatives corridor. There are ditch lines in the agricultural fields within the alternatives corridor that flow directly into Otter Creek, on the east side of the river in the vicinity of the proposed RS-1 and TR-1 trestle, and on the west side of the river near where the trestle would meet the mainline railroad tracks.

To the east, between Otter Creek and the Omya quarry, there are five small tributaries that cross the alternatives corridor. All of these have been ditched to some extent, and they are all intermittent in nature. They all generally flow south and west, with the three westernmost drainages flowing towards the large

[25] 19 V.S.A. Section 10(12)

forested wetland west of Halladay Road, and the two easternmost drainages flowing into the Middlebury River.

3.9.3 Floodplains and Floodways

3.9.3.1 Introduction

Federal regulations (23 CFR 650, 44 CFR 9) and Executive Order 11988 provide that federal projects must address impacts to floodplains and floodways. For the purposes of federal regulations, the 100-year floodplain is the regulated floodplain, which is defined as follows:

Base Flood means the flood which has a one percent chance of being equaled or exceeded in any given year (also known as a 100-year flood). This term is used in the National Flood Insurance Program (NFIP) to indicate the minimum level of flooding to be used by a community in its floodplain management regulations. *Base Floodplain* means the 100-year floodplain (one percent chance floodplain).[26]

The regulatory floodway is defined in FEMA's regulations as:

> "… the flood-plain area that is reserved in an open manner by Federal, State or local requirements, i.e., unconfined or unobstructed either horizontally or vertically, to provide for the discharge of the base flood so that the cumulative increase in water surface elevation is no more than a designated amount (not to exceed 1 foot as established by the Federal Emergency Management Agency (FEMA) for administering the National Flood Insurance Program)".[27]

State regulations do not directly regulate floodplains, but Act 250 (Criterion 1(D), where applicable, provides jurisdiction over floodways. Under Act 250, the floodway is defined as follows:

> "Floodway" means the channel of a watercourse which is expected to flood on an average of at least once every 100 years and the adjacent land areas which are required to carry and discharge the flood of the watercourse, as determined by the Secretary of Natural Resources with full consideration given to upstream impoundments and flood control projects.[28]

[26] 44 CFR 9.4
[27] 23 CFR 650.105
[28] VSA 10 Chapter 151, 1, 6001

> "Floodway fringe" means an area which is outside a floodway and is flooded with an average frequency of once or more in each 100 years as determined by the Secretary of Natural Resources with full consideration given to upstream impoundments and flood control projects.

3.9.3.2 Floodplain Occurrence

Within the alternatives corridor, floodplains have been mapped by FEMA for the NFIP. The floodplain of Otter Creek, shown on Figures 3.9-5 and 3.9-6, extends east and west of the river and intersects all of the alternatives. The floodplain elevation changes only slightly from the northern limits of the alternatives corridor (349.5 feet NGVD) to the southern limits (350.5 feet NGVD). The floodplain boundaries were interpolated on two-foot contour maps by following the floodplain elevation between 350.5 feet and 349.5 feet. Floodplains extend north from the large swamp to the south to a point just south of the proposed alignments (within the alternatives corridor), and extend across an area approximately 1500 feet wide along Otter Creek.

Floodways within the alternatives corridor are confined to the Otter Creek floodway, on the western side of the alternatives corridor. The floodway is approximately 800-1000 feet wide, and is approximately 900 feet wide at the proposed RS-1 and TR-1 alignment location.

3.10 Wetlands

3.10.1 Introduction

Section 404 of the federal Clean Water Act provides that discharges of dredged or fill materials into waters of the United States require a permit from the ACOE. Waters of the United States include any non-isolated wetlands that meet the three parameters (hydrology, soils, and vegetation) as defined in the 1987 ACOE Wetlands Delineation Manual.[29] Federal Executive Order 11990, issued in 1977, is intended to "minimize the destruction, loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands". The Order requires federal agencies to consider alternatives to wetland impacts and to limit potential damage if an activity affecting a wetland cannot be avoided. The Order applies to federal activities and programs affecting land use.

[29] U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers Waterways Experiment Station. Vicksburg, MS

Vermont's Wetland Rules distinguish between Class One, Class Two, and Class Three wetlands, with Class One wetlands being of the highest value. The regulations also protect upland buffers around Class One and Class Two wetlands. The Vermont Wetland Rules provide that wetlands that appear on the NWI maps (published by the USFWS) are presumed to be Class Two wetlands. The State of Vermont publishes "Vermont Significant Wetland Inventory" (VSWI) maps based on the NWI maps. All wetlands identified as Class One or Class Two wetlands, and all wetlands contiguous to Class One or Class Two wetlands on the VSWI maps are protected as "significant" in the Vermont Wetland Rules.

Vermont's Act 250, where applicable, regulates impacts to "significant" wetlands under Criterion 1(G). Other wetlands (i.e., Vermont Class Three wetlands) are regulated under Criterion 8, which provides that projects "Will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites or rare and irreplaceable natural areas."

3.10.2 Description of Wetlands

The alternatives corridor lies within the Otter Creek watershed. Three drainages that traverse the eastern part of the alternatives corridor, east of Lower Foote Street, drain south into the Middlebury River, which in turn flows into Otter Creek at a point south (upstream) of the alternatives corridor. Several other drainages, in various locations from Lower Foote Street and extending nearly to Creek Road, drain into an extensive forested wetland just south of the alternatives corridor; this wetland in turn drains to Otter Creek. On both sides of Otter Creek, in the western part of the alternatives corridor, there are wet meadows and ditches in the floodplain that drain into Otter Creek.

For the DEIS, wetlands were sketched based on existing wetland and soils mapping, and on a field review conducted in September 2005. For the FEIS, wetlands in the alternatives corridor were delineated in October 2006 and September 2007 according to ACOE methods[30], which also meet the Vermont standards. For the delineation, wetland limits were mapped using a Trimble GPS unit accurate to within one meter.

Wetland resources within the alternatives corridor include wet meadows and farmed wetlands in the heavy clay soils close to Otter Creek, drainages, forested wetlands, and man-made ponds. Wetlands are described below, federal and Vermont classifications are listed in Table 3.10-1, and the wetlands are shown on Figures 3.9-3 and 3.9-4. Functions and values are described in Section 3.10.3 below. The descriptions start at the quarry and follow the alignment to the

[30] Environmental Laboratory. (1987). "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Corps of Engineer Waterways Experiment Station, Vicksburg, Miss.

mainline. All wetlands described below are believed to be subject to ACOE Section 404 jurisdiction.

Table 3.10-1 Wetlands within the RS-1 and TR-1 Corridor

Wetland ID	Vermont Class	Cowardin Wetland Classification	Key to Cowardin[31] Classification
1	Two	PEM1/SS1C	P= Palustrine (vegetated or shallow water) EM = Emergent Vegetation 1 = Persistent SS= Scrub Shrub Vegetation 1 = Broad Leaved Deciduous FO = Forested 1 = Broad Leaved Deciduous Vegetation 4 = Needle Leaved Evergreen Vegetation C = Seasonally Flooded d = Partially Drained/Ditched f = farmed R= Riverine 2 = Lower Perennial UB = Unconsolidated Bottom 3 = Mud 4 = Intermittent SB = Streambed 1= Cobble 5 = Mud 7 = Vegetated
2	Two	PEM1Cd/R4SB5d	
3	Two	PFO1/4	
5	Two	PEM1Cd/R4SB5d	
6	Three	PEM1Cd - R4SB5d	
7	Three	PEM1Cd	
8	Three	PEM1Cf	
9a	Three	PEM1Cf	
9b	Three	PEM1Cf - R4SB5d	
9c	Three	PEM1Cf - R4SB5d	
10a	Three	PEM1Cd	
10b	Three	PEM1C	
10c	Three	PEM1Cd – R4SB1	
11	Three	PEM1Cf	
12	Two	PEM/SS1Cd - R4SB7	
13	Two	PEM/FO1Cf R4SB7	
14	Three	PEM1Cf	
15	Two	PEM1Cf	
16	Three	PEM1Cf	
17	Two	PEM/FO1Cf	
18a	Two	PEM1Cf	
18b	Three	PEM1Cf	
19	Two	PEM1Cf - R4SB5	
20	Three	PEM1Cf	
Otter Creek	-------	R2UB3	

Wetland 1

North of the quarry is an extensive wet meadow (Vermont Class Two), measuring approximately seven acres, that supports cattails (*Typha latifolia*), reed canarygrass (*Phalaris arundinacea*), and shrubs such as red-twig dogwood (*Cornus stolonifera*), alders (*Alnus spp.),* and witherod (*Viburnum cassinoides*). The wetland drains to the north and eventually into the Muddy Branch, and then into the New Haven River. Soil in this wetland is identified in the Addison County

[31] Cowardin, Lewis M. et al. Classification of Wetlands and Deepwater Habitats of the United States (Washington D.C., U.S. Fish and Wildlife Service, U.S. Department of the Interior, 1979) 131 p

Soil Survey as Livingston Clay, which is very poorly drained. This wetland may support a variety of songbirds, although its habitat value may be limited somewhat by the adjacent quarry activity.

Wetland 2

South of the quarry, two lateral ditches flow towards the east and into a larger ditch that eventually flows into Beaver Brook to the south. The lateral ditches are approximately 750' long and 900' long, and the longitudinal ditch is approximately 850' long. The ditches vary from approximately 10' to 20' wide. These ditches support cattails and other herbaceous vegetation (grasses and sedges) along their margins. It is not known whether the ditches were originally excavated on dry land, but their size suggests there was some natural drainage in the area. The ditches and associated wetlands along their banks are Vermont Class Two wetlands, due to their connection to a VSWI wetland downstream. Soil is mapped as Vergennes clay, which is moderately well drained with minor components of Covington (poorly drained), Livingston (very poorly drained) and Panton (poorly drained) soils. The habitat value of these wetlands is limited by their disturbed condition and agricultural surroundings, although they likely support certain songbirds (such as red-winged blackbirds (*Agelaius phoeniceus*)), amphibians, and aquatic invertebrates (see Section 3.6).

Wetland 3

To the west of Omya's access road, just south of the quarry, is a forested area with upland and wetland inclusions (Vermont Class Two), approximately five acres in size. Soil in the wetland is mapped as Livingston clay. Vegetation includes green ash (*Fraxinus pensylvanica*), yellow birch (*Betula alleghaniensis*), hemlock (*Tsuga canadensis*) and red maple (*Acer rubrum*), with touch-me-nots (*Impatiens sp*), sedges, horsetails (*Equisetum sp.*), ferns (*Dryopteris sp.*), asters (*Aster sp*.), and grasses in the herbaceous layer. Wetland portions of the forested area exhibit pit and mound topography. The forested wetland drains to the south and to the east, and eventually into a ditch that flows under the Omya access road (Wetland 2). This wetland, as discussed in Section 3.6.1.2, is a forest "island" within an agricultural landscape, and may serve as a refuge for certain species (raccoon, deer, possibly amphibians).

Wetland 4 (non-wetland)

The area identified in the DEIS as Wetland 4 was identified as wetland on VSWI maps, and superficially appears to have evidence of wetland indicators. Closer investigation revealed that soils over nearly the entire area were non-hydric, vegetation included both upland and facultative wetland indicators, and what appeared to be pit-and-mound microtopography was from ground disturbance. The area was reviewed in the field with ACOE and VANR wetlands regulatory staff, and was determined to be non-wetland.

Wetland 5

West of Wetland 4 is a ditched drainage in an agricultural field approximately 30 feet wide (Vermont Class Two). The portion in the alternatives corridor is approximately 690 feet long. Wetland 5 drains southeast into Beaver Brook, which in turn drains into the Middlebury River. Soils in this wetland are mapped as Vergennes and Livingston clays. The habitat value is limited by its disturbed condition and agricultural surroundings.

Wetland 6

On the north side of the access road, a broad cattail and Phragmites (*Phragmites australis*) dominated ditch flows south from the dairy barn north of the alternatives corridor for approximately 2,400 feet before meeting the access road. This wetland has no direct hydrologic connection to any Class Two wetland, and is therefore Class Three. A narrower ditch, approximately 700' long, parallels this broad ditch and joins it near the road. Soil in this wetland is mapped as Livingston clay. As with Wetland 5, the habitat value is limited by the disturbed setting.

Wetland 7

Wetland 6 drains under the access road into Wetland 7, a small pocket of forested and scrub shrub wetland measuring approximately one-third of an acre, which in turn flows into a vegetated swale measuring approximately 800' long. This wetland has no direct connection to any Class Two wetland (except via culverts and long ditches, as described below under Wetland 9), and is therefore Class Three. The swale is mowed, and supports herbaceous vegetation such as grasses and sedges. A detention basin to the east feeds into the swale. The area around the detention basin is maintained as a lawn, and supports reed canarygrass, sedges, and other vegetation. Soils in the wetland are mapped as Livingston and Vergennes clays. Although this wetland has some structural diversity, its value is limited by its disturbed condition and surroundings, including lawn and roadways.

Wetland 8

On the east side of US 7, behind the former Standard Register building, is a wet meadow supporting reed canarygrass, broadleaved cattails, smartweed (*Polygonum sp.*), and millet (*Echinochloa crus-galli*) measuring approximately 1.7 acres. This is a Class Three wetland. The wet meadow lies within a farm field and appears to be farmed occasionally. Ditches parallel the edge of pavement for the parking lot of Standard Register both north and south of the wet meadow. The ditches appear to drain to dry ditches south of Standard Register and along US 7, and ultimately to the wetlands west of US 7. Soil in the wetland is mapped as Vergennes clay. The farmed wet meadow and man-made ditches have minimal habitat value.

Wetland 9

Wetland 7 flows southeast through a culvert under US 7 and into a broad cattail dominated swale that is the eastern-most portion of Wetland 9. North of the cattail swale, the wetland is characterized as a wet meadow, supporting reed canarygrass, asters, goldenrod (*Solidago spp.*), with a ditch running through it (Wetland 9a). Southwest of the wet meadow, the slope becomes steeper, and the drainage becomes deeply incised (Wetland 9b). The drainage is fed by another stream to the south, which flows through a well vegetated area supporting basswood (*Tilia americana*), buckthorn (*Rhamnus frangula*), gray birch (*Betula populifolia*), river grapes (*Vitis riparia*), red osier dogwood, and herbaceous vegetation such as sensitive fern (*Onoclea sensibilis*), boneset (*Eupatorium perfoliatum*), asters, and rough stemmed goldenrod (*Solidago rugosa*). The ditch then flows under Halladay Road and into a broad wet meadow (Wetland 9c) dominated by goldenrod, asters, and reed canary and other grasses. The meadow grades into a broad leaved cattail marsh south of the alternatives corridor. Soil in wetland 9 is mapped predominantly as Vergennes clay, with a small area of Nellis stony loam (well drained) at the southern end of the alternatives corridor. Total acreage of wetland 9 is approximately 15 acres. West of Halladay Road, Wetland 9 is connected to the large Class Two wetland to the south by a long, broad swale, so this portion of Wetland 9 is Class Two. The Class Two wetland continues east of Halladay Road and terminates at the junction of two small stream channels. East and upslope of this point, the wetland becomes too narrow to qualify as Class Two; therefore it is Class 3. The wet meadow area may support blackbirds, green frogs, and certain other species. The habitat value of the swales and ditches are limited by their disturbed condition and relatively linear form.

Wetland 10

Roughly paralleling Wetland 9 is a drainage extending from the northern edge of the alternatives corridor to the southern edge. North of Middle Road it is a broad (approximately 130 feet wide) ditch dominated by narrow-leaved cattails (*Typha angustifolia*) (Wetland 10a). This swale flows under Halladay Road into a small forested wetland pocket, with green ash, elm, river grapes, and wetland shrubs (Wetland 10b). The stream then crosses under Middle Road and becomes a narrower (approximately 20' wide) rocky stream with forested banks for approximately 200 feet before it opens up into a farm field (Wetland 10c). Soil in wetland 10 is mapped as Vergennes clay. The stream may provide habitat for certain amphibians and aquatic invertebrates, as described in Section 3.6.1.2 above. Because of the lack of a connection to any Class Two wetland other than the ditch, Wetland 10 is also a Class Three wetland.

Wetland 11

Wetland 11 is a broad, shallow depression in Covington and Panton silty clays (both poorly drained) that lies within a hayfield and drains to the south to wetland 13. This wet meadow supports a mixture of grasses, sedges, and other herbaceous species, and is similar in character and habitat to the upland portion of the hayfield. Its habitat value is limited somewhat by its small size, farmed condition. Wetland 11 has a direct hydrologic connection to a Class Two wetland, and is therefore also Class Two.

Wetland 12

In the agricultural fields that lie west of Halladay Road, ditches have altered the hydrology of the site. Wetlands are currently linear in nature and found only along the margins of the ditch line, whereas before the fields were ditched the wetlands probably extended beyond the ditches. Several small longitudinal ditches feed into a lateral ditch, measuring approximately 1,900 feet long, which in turn feeds into the large wetland to the south. Many of these ditches are dominated by reed canarygrass. In some cases the ditch lines are vegetated with small trees and shrubs, such as common buckthorn, red osier dogwood, and gray birch. The soils around the ditch lines vary from the well drained Nellis and Elmwood, moderately well drained Vergennes, and poorly drained Covington, to very poorly drained Livingston. As with other ditches and swales in the area, the disturbed condition and surroundings of these areas limits their habitat value. Because of the direct hydrologic connection with Wetland 13 (described below), this is a Class Two wetland.

Wetland 13

South of the proposed alignments between Creek Road and Halladay Road is a large forested wetland that extends south to Three Mile Bridge Road. The northernmost fringes of the swamp, which are in pasture or cut for hay, extend into the alternatives corridor (Wetlands 17 and 13). This swamp ultimately outlets to Otter Creek to the west, via ditched stream channels. Soils in this portion of the wetland are mapped as Covington and Panton silty clays. The forested wetland provides important habitat for a variety of forest and wetland wildlife species. The northern, wet meadow fringes of this wetland are disturbed by farming or grazing and have less structural diversity, but nevertheless may support certain songbirds, amphibians, and reptiles (see Section 3.6.1.2).

Wetland 14

To the west of Wetland 12 are several small wetlands (some isolated) in depressions in the pasture that generally drain southward. Wetland 14 is a broad swale in a field, measuring approximately two acres, supporting reed canarygrass, *Scirpus*, boneset, bugleweed (*Lycopus americanum*), and sedges.

Soils in Wetlands 14 are mapped as Covington and Panton silty clays and Vergennes clays. The habitat value is limited by the low structural diversity and farmed surroundings, but the wetland may support grassland wildlife species such as deer, bobolinks, or green snakes. These pockets lack a hydrologic connection to any Vermont Class Two wetlands, and are therefore Class Three.

Wetland 15

A drainage fed by several smaller connected drainages lies to the west of Wetland 14, flowing south towards the large forested wetland. These drainages, totaling approximately six acres, are swales dominated by reed canarygrass, with woolgrass (*Scirpus cyperinus*), boneset, bugleweed, and other herbaceous vegetation. Soils in Wetland 15 are mapped as Vergennes clay and Vergennes rocky clay. The habitat value is similar to other ditches and swales in the area, described above. This wetland is directly connected to Wetland 17, and is therefore Class Two.

Wetland 16

West of Wetland 15 are several small wetland pockets within a pasture, also in Vergennes clay. In terms of vegetation and habitat, these wetland pockets are similar to Wetlands 14 and 15. Soil in Wetland 16 is Vergennes clay. These pockets lack a hydrologic connection to any Vermont Class Two wetlands, and are therefore Class Three.

Wetland 17

As mentioned above, Wetland 17 is the northern end of an extensive forested wetland (Vermont Class Two), which is mostly within the 100 year floodplain of Otter Creek. A small man-made farm pond sits within the proposed TR-1 transload facility, at the northern end of Wetland 17. Wetland 17 is several hundred acres, and only the northern fringe (25 acres) lies within the alternatives corridor. The portion of Wetland 17 that lies within the alternatives corridor is vegetated with grasses, sedges, asters, goldenrod, and other herbaceous vegetation.

Wetlands 18a and 18b

On the eastern side of the river there is an agricultural field (Wetland 18a) that has retained hydric soils, although it is used to grow corn. Approximately ten acres of the field lie within the alternatives corridor. Wetland 18a is identified on the VSWI, and is therefore Class Two. Soils in the field are identified as Limerick silt loam and Livingston clay. West of Wetland 18a is a narrow strip of farmed wetland (Wetland 18b) along Creek Road that extends to the north. (Wetland 18b is Vermont Class Three.) The habitat value is limited primarily to those species which may be found within croplands, such as Canada geese and woodchucks.

Wetland 19

On the west side of the river, within the Otter Creek floodplain, is a large, (approximately 22 acres within the alternatives corridor) ditched wet meadow with small patches of upland inclusions. The ditch is approximately six feet wide and supports a mixture of wetland shrubs and red maple saplings along its banks. Wet meadow areas support a mixture of grasses, sedges, and herbaceous vegetation such as buttercups (*Ranunculus sp.*), vervain (*Verbena hastata.*), and sensitive fern. Upland inclusions support common milkweed (*Asclepias variegata*), plantain (*Plantago major*), and other upland vegetation. Soils in this area are Limerick silt loams, which are deep, poorly drained, and loamy. Along the banks of the river, there are fringes of floodplain forest supporting silver maple, shagbark hickory, American elm, green ash, and herbaceous vegetation such as ostrich fern (*Matteuccia struthiopteris*), violets (*Viola sp.*), arrowwood (*Viburnum recognitum*), false nettles (*Boehmeria cylindrica*), horsetails, and grapes. The association of this wetland with the railroad corridor and the Otter Creek corridor indicate it is part of an important habitat corridor. Wetland 19 is a Vermont Class Two wetland.

Wetland 20

South of the access road is an area measuring less than an acre, most of which is currently under cultivation for corn, which exhibits hydric soils and wetland hydrology. Soil in the wetland is mapped as Vergennes clay. This wetland drains via overland flow to a network of ditches to the south, and eventually to Beaver Brook. Wildlife habitat is limited to species that inhabit or visit cropland, such as Canada geese, woodchucks, raccoons, blackbirds, and small mammals.

3.10.3 Wetland Functions and Values

Wetland functions and values were evaluated using the descriptive approach of the ACOE's *Highway Methodology Workbook Supplement*[32] and in consideration of the provisions of the Vermont Wetland Rules regarding wetland functions and values. In general, the ditches provide water quality functions as their primary functions, and the forested and scrub shrub areas provide wildlife habitat as their primary functions. A summary of the functions and values is listed in Table 3.10-2. Brief descriptions of the types of wetlands found in the alternatives corridor, and the functions they provide, are listed below.

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[32] US Army Corps of Engineers New England District. 1999. *Highway Methodology Workbook Supplement: Wetland Functions and Values, a Descriptive Approach*. NAEEP-360-1-30a.

Forested Wetlands (PFO1/4C)

Forest land in the alternatives corridor is limited to unfarmable areas such as wetlands and steeper terrain. Wetland 3 and most of Wetlands 13 and 17 are forested wetlands (PFO1/4C). These are typically seasonally flooded wetlands with some degree of pit-and-mound microtopography. Plant species include red maple trees and saplings, green ash, high bush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), arrowwood, cinnamon fern (*Osmunda cinnamomea*), and sensitive fern. Soils range from mineral hydric to organic. Forested wetlands may provide habitat for certain animal species (e.g., northern waterthrush (*Seiurus motacilla)*, Canada warbler (*Wilsonia canadensis*), veery (*Catharus fuscescens*), garter snake, and white-tail deer). Wetland 3, which is a forested "island" surrounded by open fields, probably provides cover and refuge for many species. The variable microtopography and erect vegetation may store or slow floodwater flows. The degree of sediment, toxicant, and nutrient retention depends on the surrounding land use, outlet type, and other features.

Wet meadows (PEM1Cf)

Wet meadows are usually found where wet areas are used for pasture or cropland, or are otherwise mowed or maintained in low vegetation. Several large wet meadow wetlands occur within the alternatives corridor, including most or all of Wetlands 9a, 9b, 9c, 11, 12, 14, 15, 16, 19, and 20; and the northern portions of the large forested Wetlands 13 and 17. Typical vegetation includes sedges, soft rush (*Juncus effusus*), reed canarygrass, asters, willows (*Salix spp.),* meadowsweet (*Spirea latifolia*), goldenrod, silky dogwood (*Cornus amomum*), and many other species. Generally, these wetlands are marginally wet; soils are mineral hydric with depleted B horizons or low-chroma redoximorphic features, and water regimes are seasonally flooded or saturated with infrequent standing water during the growing season. Most of the wet meadows in the alternatives corridor have been altered by ditching.

Wet meadows used for pasture can provide important water quality functions. The wetland vegetation may help bind the frequently disturbed soil, reducing erosional potential. The vegetation may also help trap sediments and absorb nutrients, particularly important considering the enrichment from livestock fecal matter. Wetlands adjacent to croplands perform a similar function, helping filter the relatively heavy sediment and nutrient loads from cropland runoff. Wetlands that are regularly tilled (such as Wetlands 18a and 18b), however, typically do

Table 3.10-2 Wetland Functions and Values

Wetland ID	1	2	3	5	6	7	8	9a	9b	9c	10a	10b	10c	11	12	13	14	15	16	17	18a	18b	19	20
Groundwater Recharge/ Discharge																x				x				
Floodflow Alteration																				P	P	P	P	
Fish and Shellfish Habitat																								
Sediment/ Toxicant/ Pathogen Retention	P	P	x	x	P	x	x	P	x	x	P	x	P	x	x	P	x	x	x	x	x	x	x	x
Nutrient Removal/ Retention/ Transfor-mation	P	P	x		P	x				x	P	x	P	x	x	P	x	x		P	x	x	P	x
Production Export														x		x				x	x	x	x	
Sediment/ Shoreline Stabilization		x			x	x																		
Wildlife Habitat	x	x	P	x	x	x		x	x	x	x	P	x	x	x	P	x	x	x	x	x	x	P	x
Recreation																							x	
Educational/ Scientific Value																								
Uniqueness/ Heritage																x				x				
Visual Quality/ Aesthetics																x							x	
Threatened or Endangered Species Habitat																								

Key to Wetland Functions:

P: Functions listed as "P" are principal functions of a wetland, that is, they have important or multiple factors contributing to that particular function.

x: Functions listed as "x" are present in the wetland but have less important or fewer factors contributing to that particular function.

No designation means the function is not present in the wetland, or has minimal value in the wetland.

not develop thick native vegetation and are therefore less effective at these functions. Tilled wetlands have limited wildlife habitat value, although certain species (such as cowbirds (*Molothrus ater*), star-nosed mole (*Condylura critata*), deer, and garter snakes) may use these habitats. Other wetland functions and values are limited by the disturbed condition of the wetlands. Some of the wet meadows within the alternatives corridor, such as Wetland 9a, 14, and 15, have been fallow for a few years, and are starting to develop early successional vegetation. These areas provide more structural diversity for wildlife than more frequently mown meadows such as Wetland 19.

Ditches (PEM/SS1Cd, R4SB7)

Because of the heavy clay soils in the alternatives corridor, much of the farmland has been ditched and drained to facilitate farming. Under Vermont law if the areas surrounding the ditches retain wetland characteristics (soils and vegetation) they are regulated under the Vermont Wetlands Program. Ditches that were created in wetlands and that retain wetland characteristics are also regulated under Section 404 of the Clean Water Act. Jurisdictional ditches in the alternatives corridor include both emergent vegetation (PEM1C) and scrub-shrub areas (PSS1C). Well-vegetated ditches typically filter stormwater runoff and thereby improve water quality, although there may be little time for water to stand and for contaminants to settle out. The vegetation may also help anchor the substrate and reduce the erosional potential of stormwater runoff. Wildlife habitat value, floodwater storage capacity, and other wetland functions in ditches are typically negligible. However, in the alternatives corridor, some of the ditches lie along hedgerows that provide important cover for birds, amphibians, and mammals, and that link larger forested areas.

Disturbed Wetlands /Invasive Species (PEM1Cd)

Some of the alternatives corridor wetlands (Wetlands 2, 6,10a) are dominated by monocultures of aggressive or invasive species. These species colonize areas with appropriate conditions, usually wet meadow, marsh, or sometimes scrub-shrub wetlands, and aggressively spread through the wetland, crowding out established species. The result is a wetland with fewer plant species and little structural diversity, providing limited wildlife habitat. These aggressive or invasive species include the following:

Phragmites *(Phragmites australis):* Also called common reed or giant reed, Phragmites is a very tall (up to 8 feet or more) and very aggressive plant that forms thick monocultural stands. The roots are large and deep in the substrate, so the plant is extremely difficult to eradicate. It does particularly well in brackish areas, i.e., where salt is present from either road runoff, sea water, or from agricultural operations. Phragmites is prevalent in the northern portions of Wetland 6, possibly due to salt in the runoff from the barn to the north.

Cattails *(Typha latifolia, T. angustifolia):* Broadleaf and narrowleaf cattail are both native species that can aggressively colonize large areas of marshland. They typically grow in standing water and can form large monocultural stands. They also have habitat value, however, and are a favorite food source of muskrats. Thick cattail stands will typically attract muskrats, which thin the stands and help maintain habitat diversity. Broad-leaved cattail is more common; narrow-leaved cattail usually grows where the water is somewhat brackish, such as around road runoff discharge points or downstream of agricultural operations. Wetlands 2, 6, and 10a are dominated by cattails.

Reed canarygrass (*Phalaris arundinacea*): Reed canarygrass is a species that has historically been planted for stabilization of ditch banks and as a forage grass. However, it out-competes native grass species, and its value as a forage grass when fresh is limited. Its status as a native or non-native species is debatable, but it is likely that the cultivars that invade wetland areas are a result of agronomic breeding that have been developed for drought tolerance and vigor. Most of the wet meadows and ditches within the study area feature reed canarygrass.

3.11 Historic and Archaeological Resources

3.11.1 Introduction

Historic and archaeological resources are protected through Section 106 of the National Historic Preservation Act of 1966 and its amendments, Section 4(f) of the Department of Transportation Act of 1966 (described in Section 3.2.5), and 22 V.S.A. Chapter 14, The Vermont Historic Preservation Act of 1975. This section describes known or potential historic and archaeological resources within the project's Area of Potential Effect (APE). "The Area of Potential Effect is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" [36CFR Part 800.16(d)]. For this project, the APEs for historic and archaeological resources are different, as described below.

3.11.2 Archaeological Resources within the Alternatives Corridor

3.11.2.1 Methods

Archaeological resources were identified in two stages. Prior to the DEIS, an Archaeological Resources Assessment (ARA) was first carried out to identify "archaeologically sensitive areas", or portions of the project's APE that have the potential for containing precontact and/or historic archaeological sites. The APE is the area that could potentially be disturbed by the project; for the Middlebury Spur, the APE is the same as the alternatives corridor. Following the initial ARA, and following publication of the DEIS, a Phase I archaeological survey was conducted to determine whether archaeological resources are present in sensitive areas. Because the sensitive areas are extensive and there was concern about gaining access to land and imposing on landowners, the survey was conducted on a representative subset of the sensitive areas. The purpose was to confirm the validity of the sensitivity model without more fieldwork than necessary or imposition on landowners. Methods are described below.

Archaeological Resources Assessment

An ARA is accomplished through a "background search" and a "field inspection" of the alternatives corridor. For this study, reference materials were reviewed following established guidelines. Resources examined included the National Register of Historic Places ("National Register" or NR) files; the Historic Sites and Structures Survey; and the USGS master archaeological maps that accompany the Vermont Archaeological Inventory (VAI). Relevant town histories and nineteenth-century maps also were consulted. Based on the background research, general contexts were derived for precontact and historic resources in the vicinity of the alternatives corridor. Investigators used an archaeological sensitivity model developed by the Vermont Division for Historic Preservation to identify areas sensitive for the presence of archaeological resources. Findings are described in the report entitled *Archaeological Resources Assessment for the Middlebury ST SPUR(2) - Environmental Impact Statement, Addison County, Vermont*, included in Appendix D.

Phase I Archaeological Survey

The Phase I study involved subsurface testing to determine if the archaeologically sensitive land identified in the ARA has buried and intact artifacts and features from historic or pre-contact sites. A sample of five areas of varying sensitivity were sampled by digging several series of test pits along transects within the APE. Areas sampled, transect locations, and findings are described in the report entitled *Preliminary Archaeological Phase I Site Identification for the Middlebury ST SPUR(2) - Environmental Impact Statement, Addison County, Vermont*, included in Appendix D.

3.11.2.2 Known Prehistoric Archaeological Sites

A review of the state's VAI files indicate that there are two previously identified sites located within the proposed project's APE and an additional four located nearby, within 500 meters (1,640 feet) of the alternatives corridor (see Figures 3.11-1 and 3.11-2). Site VT-AD-245 was previously identified from the surface recovery of a triangular, rhyolite projectile point and three lithic flakes from an area 10 ft in diameter during a Phase I study for a proposed alignment of the Middlebury By-Pass (Thomas and Robinson 1980). The style of projectile point is similar to Levanna style projectile points which were used by Native Americans during the Middle to Late Woodland periods (ca. 100 B.C. – A.D.1600). The location of site VT-AD-245 is approximately 50 m (164 ft) north of the centerline of the alternatives corridor, 460 m (1,500 feet) west of Halladay Road, and just south of Middle Road (see attached report). The area is characterized by a series of low level floodplains along several small, north-south trending streams. It appears that site VT-AD-245 was identified in a fallow hay field that had not recently been plowed. No subsurface test pits were excavated at site VT-AD-245 and therefore the limits of this site were never determined.

Site VT-AD-465 was previously identified from lithic debitage and tools recovered from the surface of a plowed field located along the southern boundary of the proposed project's APE during the Phase I study (a reconnaissance level survey to determine whether deposits may be present) for the Champlain Pipeline (Robinson et al., 1992). The site is located 600 m (1970 ft) northeast of US 7 and 370 m (1,200 ft) east of Lower Foote Street. It is also 2.1 km north of the Middlebury River within a field that borders a small north-south trending tributary of Beaver Brook. In addition to over 50 pieces of debitage, three lithic tools could be dated to the Middle and Late Woodland periods (ca. 100 B.C. – A.D.1600).

Approximately 250 m (820 ft) to the southeast another previously identified precontact Native American site, VT-AD-468 was located in a field bordering this same tributary. Much of this same tributary, and others, of Beaver Brook cut through the eastern portion of the proposed project's APE, just south of the Omya quarry.

Three additional previously identified precontact period Native American sites are known from the area around the limits of the proposed project's APE. These include sites VT-AD-244, 246, and 247 (Figures 3.11-1 and 3.11-2). These sites were located within or adjacent to the modern, active floodplain of Otter Creek. This topographic location is identical to areas just downstream that would be disturbed at the end point of the alternatives.

3.11.2.3 Known Historic Archaeological Sites

No known historic period resources are located within the APE of any of the proposed alignments. An overlay of the proposed alternatives corridor over the historic 1871 Beers map (see Appendix D) and the historic 1905 USGS map (both in Appendix D) indicate that only two historic period farms lie within the proposed corridor. South of the Omya quarry, the proposed RS-1 alignment cuts through what once was the L.P. Boardman farmstead. This historic period farmstead has been disturbed since its 19th Century occupation, and is currently the location of the VNAP facility, which has disturbed the ground through leveling, the construction of warehouse structures, and the processing of manure.

Along the proposed alternatives corridor, near the location of the proposed TR-1 transload facility, a farmstead attributed to J. W. Morse would be bisected. Currently a wooden shack exists in the general vicinity of the Morse farmstead, but this wooden shack is unlikely to be related to the historic Morse Farmstead. No historic documents revealed a connection between the Morse farmstead and the shack. In addition, construction elements of the shack, such as a concrete chimney suggest a more recent date of construction. Finally, aerial photographs of this area from 1962 indicate that the construction of what appears to be a private air strip oriented north-south, and other leveling and filling activities have disturbed this portion of the farmstead.

As a result, important historic archaeological deposits are not expected within the proposed project's APE.

3.11.2.4 Results of ARA Field Inspection

A field inspection of the proposed project's APE was undertaken on December 6 and 7, 2005. The overall alternatives corridor received a combined sensitivity score of 64 based on the variables in the "Environmental Predictive Model for Locating Precontact Archaeological Sites," since portions of the APE are located on various alluvial terraces, within 90 m (295 ft) of the Otter Creek and various permanent streams, brooks, and creeks, as well as within 90 m (295 ft) of wetlands, and/or within 90 m (295 ft) of the confluence of several intermittent streams. The sensitivity scoring was devised by the Vermont Division for Historic Preservation (VDHP). In this system, a score above 32 is sensitive, and below 32 is not. Scoring is based on a series of location characteristics: proximity to water (streams, heads of draw, rivers, lakes, etc.), large concentrations of sites, ancient terraces, and other factors. In addition, the overall alternatives corridor is located within an area of relatively high density precontact Native American occupation.

Numerous areas were identified as sensitive for prehistoric Native American sites due to the alternatives corridor's large size and varied topography. These sensitive areas are either associated with recent and ancient terraces of Otter Creek, as in the west along the proposed alternatives corridor and the proposed TR-1 transload facility location; or terraces associated with several tributaries of Otter Creek, as along the proposed alternatives corridor and the proposed RS-1 transload facility location. Many of the larger sensitive areas are located in actively plowed fields, such as those along the floodplains and lower terraces of the Otter Creek. As a result of being actively plowed, surface survey is possible in those fields. In most of the other sensitive areas, however, fields are in pasture, hay, or in areas that may never have been plowed. As a result, subsurface testing will be required in those areas. In the case of the lower floodplains of Otter Creek, backhoe trenching will be necessary to determine the history of soil deposition along the floodplain and to identify possible buried cultural occupations.

3.11.2.5 Results of Phase I Survey

As a result of the Phase I survey, three prehistoric archaeological sites were discovered (VT-AD-1493, VT-AD-1494, and VT-AD-1495; see Figures 3.11-1 and 3.11-2), two of which were within the Eddy Farm property. VT-AD-1493 (on the Eddy Farm property) yielded artifacts in four test pits, including a broken biface fragment, a processing tool, and two specimens of lithic debitage (waste pieces from stone tool making). Four test pits in Site VT-AD-1494 contained prehistoric artifacts, including two fire affected rocks and 20 lithic chert debitage specimens. Site VT-AD-1495, east of Otter Creek and north of the proposed alignment, yielded 72 lithic artifacts. None of the artifacts from any of these sites were temporally diagnostic, and could only be dated to the general prehistoric time period 9500 B.C. – A.D. 1600.

The Phase I survey revealed that several areas of sensitivity identified in the ARA did not contain archaeological resources and are no longer considered sensitive. These include areas adjacent to Halladay Road and areas east of Lower Foote Street. Nevertheless, the report identified an additional area of sensitivity (where the alignment borders the South Ridge Subdivision property), and recommended that further Phase I or Phase II testing will be needed in other sensitive areas. Figures 3.11-1 and 3.11-2 have been updated for the FEIS to reflect the results of the Phase I survey.

3.11.2.6 Summary of Archaeological Resources

A field inspection, combined with background research, identified areas sensitive for precontact Native American sites within the proposed project's APE (alternatives corridor). These sensitive areas range in size from small, discrete level areas approximately 20 x 20 m (65 x 65 ft), to much larger areas occupying large, level terraces of Otter Creek. The largest of the archaeologically sensitive areas corresponds to modern corn cultivation. The smaller, discrete terraces and promontories were, more often than not, either cultivated in hay or have never been plowed.

A Phase I site identification survey was carried out on a subset of the archaeologically sensitive areas to confirm the ARA findings without more fieldwork than necessary or imposition on landowners. The Phase I survey yielded three new prehistoric archaeological sites, all in the Otter Creek floodplain area. The survey also identified areas that are no longer considered sensitive for archaeological resources, areas where further Phase I subsurface testing will be required to test for the presence or absence of prehistoric Native American sites, and areas where Phase II investigation will be needed to determine the extent and nature of prehistoric sites. No important historic archaeological deposits are believed to occur within the proposed project's APE.

3.11.3 Historic Resources

3.11.3.1 Methods

The purpose of this section is to identify historic resources on or eligible for listing on the National Register within the project's APE. For purposes of historic resource impacts, the APE is the alternatives corridor and adjacent areas that could be affected by the alternatives under consideration. The determination of National Register eligibility follows the guidelines established in *National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation*, published by the National Park Service.

National Register and Vermont State Register (SR) files were reviewed to identify listed sites located in the project area. Site visits were made in August and September, 2005, at which times photographs were taken. Additional properties that appear to be over 50 years old but are not listed on the SR were identified and evaluated for eligibility to the National Register.

A property is evaluated for significance and eligibility to the National Register of Historic Places based one or more of the following Criteria:

- Criterion A: Event, association with events or broad patterns of history,
- Criterion B: Person, association with the lives of "significant" people,
- Criterion C: Design/Construction, architectural distinction, and
- Criterion D: Information Potential, ability to yield information important in history or prehistory.

Additionally, to be eligible for listing on the National Register, a property must exhibit a high degree of historic integrity, or the ability to convey its significance. The aspects of historic integrity include location, design, setting, materials, workmanship, feeling and association. Unless otherwise noted, the sites discussed in this report that appear to be eligible for listing on the NR appear to be eligible under Criterion C: Design/Construction.

In the following discussion, "vernacular architecture" is defined as having few of the architectural elements or ornamental details that characterize a particular architectural style (The Historic Architecture of Addison County, Vermont Division for Historic Preservation, 1992). Vernacular buildings were commonly constructed in Vermont throughout the 19th and 20th centuries and are an important contribution to the architectural history and social development of the state. A vernacular building that is over 50 years old is considered to be historic if its historic form, massing, materials and context are for the most part intact, and legible.

The historic property type "Historic Farmstead" is described in "Multiple Properties Documentation Form: Agricultural Resources in Vermont". Historically, a farmstead in Vermont usually included a farmhouse, a main barn, a series of outbuildings, a well or springhouse, barn and farm yards, orchard, vegetable garden, farm dump, paths and roads, natural source(s) of water, and outlying meadows, pastures and woodlots bounded by fencing and hedgerows. Generally farmsteads are sited close to the road. Occasionally, a farmstead is representative of a specific period of significance. More typically, a farmstead has evolved, and includes buildings constructed over a period of time, for a variety of purposes. Frequently, buildings constructed for a specific use become obsolete, as farming practices change. Buildings no longer in use are not always maintained and are therefore threatened.

In order to be eligible for listing on the National Register as a Farmstead, the property must include all or some of the following: a farmhouse, a main barn, outbuildings, and a surrounding parcel of land historically associated with the farm. The farm must be over 50 years old and must exhibit sufficient historic integrity so that the evolution of the farmstead is clearly recognizable and understood.

The following is a summary of the findings of the investigation. Findings, including historic resources within the No Build Alternative corridor, are described in more detail in the Historic Resource Identification Report in Appendix E.

3.11.3.2 Historic Resources within the APE

As described above, the APE includes the alternatives corridor and adjacent areas that could be affected by proposed project improvements – for example, by the sight, sound, smell, vibration, or frequency of traffic. The historic resource survey was conducted within this APE along both sides of the following roads:

- South Street Extension from the height of land west of Otter Creek to approximately 0.5 mile south of the proposed mainline/rail spur junction.
- Creek Road from US 7 south to approximately 0.5 mile south of the proposed mainline/rail spur junction.
- Halladay Road, approximately 0.3 mile north and south of the intersection with South Middle Road.
- US 7 from Cady Cross Road to the intersection of South Middle Road and Foote Street.
- Foote Street from US 7 to intersection of Foote Street and Lower Foote Street.
- Lower Foote Street from Foote Street to Cady Cross Road.
- Cady Cross Road from Lower Foote Street to US 7.

Properties reviewed within the APE are described below. Refer to Figures 3.11-1 and 3.11-2 for locations of resources. Photographs of the properties are included in the attached Historic Resources Identification Report (Appendix E).

Site M12
The c. 1930, cross-gable plan, Colonial Revival style house on the west side of US 7 is not listed on the SR. Although the historic portion of the building retains its form, massing and some materials, the architecturally incompatible rear addition is larger than the original house. Therefore the building does not appear to be eligible for listing on the NR. Photo 161.

Site M13
The small 3 x 1 bay, eaves-front house on the west side of US 7 and its associated early 20th century garage are over 50 years old but are not listed on the SR. The house lacks architectural distinction and does not appear eligible for listing on the NR. The associated garage is a typical example of its type but does not appear to be individually eligible for listing on the NR. Photos 162 – 163.

Site M14
The gable-roofed field building on the west side of 7, opposite the Omya road, does not appear to be eligible for listing on the NR. Photo 164.

Site M15

The c.1850 Classic Cottage on the west side of US 7 is listed on the SR (Middlebury SR #84). The house retains its mid-19th century massing, clapboards, brick chimney, historic wood sash, and granite foundation. The shed dormer with 3/1 sash, the front porch and the rear shed extension probably date from the Colonial Revival period in the early 20th century. The associated c.1930 gambrel-roofed Ground Level Stable barn is not listed on the SR but is a very good example of its type, and with increasing age, is now considered to be historic. The barn is also of significance because it includes a c.1950 gable-roofed addition and three concrete stave silos. The house and barn appear to be eligible for listing on the NR with statewide significance, as they retain significance of location, design, setting, materials and workmanship. The property does not appear to be eligible for listing on the NR as a Farmstead because its historic context has been lost. Photos 165 – 168.

Site M16

The large, 2-story house on the west side of US 7 is listed on the SR (Middlebury SR #85). The early building (c.1830) is a Vernacular/Federal style structure that retains historic form and massing, as well as slate roof, brick chimneys, clapboards, wood trim and granite foundation. The house is also highlighted by an intact Queen Anne period porch on the south gable end. The historic sash windows have been replaced and the fenestration pattern on the east elevation has been seriously compromised by the apparent removal of the front door from the middle bay and the installation of an incompatible, projecting bay window. Clapboard in fill can be seen below the added bay window. Although the east elevation is substantially altered, the house is otherwise generally intact, and due to its age, appears to be marginally eligible for listing on the NR with local significance. The building retains integrity of location, setting, and workmanship. The associated gable-roofed carriage barn is also listed on the SR but has lost integrity due to the introduction of the very large garage door opening on the primary elevation. Photos 169 – 171.

Site M17

The c.1860/c.1920 house on the west side of US 7, immediately north of South Middle Road, is listed on the SR (Middlebury SR # 86) but does not appear to be individually eligible for listing on the NR due to the construction of the large enclosed entry on the primary elevation, several additions and loss of historic materials. Photo 172.

Site M18

The former school, on the east side of US 7 immediately north of Foote Street, was constructed c.1850 and is listed on the SR (Middlebury SR # 83). The large banks of windows are probably historic openings added in the early 20th century but the existing sash in the openings are not historic. The interior of the school has been altered by the removal of historic finishes. Regardless, the historic form and massing are intact so that the clapboarded building is clearly recognizable as a school. The building appears to be eligible for listing on the NR under Criterion A: Event, because of its role in the history and development of Middlebury. The building retains integrity of location, design, workmanship, feeling and association. Photos 173 – 174.

Site M19
The small, c.1800 house on the east side of Foote Street, immediately south of the intersection of Foote Street and Lower Foote Street, is listed on the SR (Middlebury SR #77). The house is composed of a 1½ story, 3 x 2 bay, eaves-front (west), main block with a shorter gable-roofed ell projecting from its rear elevation. A Colonial Revival period porch has been constructed in the rear interior corner between the main block and the ell. The house is sheathed with vinyl but retains its historic form and massing, as well as historic 2/2 sash, front door with deep reveal and unusual, early fanlight. The brick chimney is historic but may not be original, although the owner reports that there is no chimney mass from an earlier, larger chimney in the basement. The property includes an early gable-front (north) barn with 12-light and 6/6 sash windows and a peaked lintel over the gable entry, and a mid 19th century gable-front (east) carriage barn/garage. The early barn remains in agricultural use as part of the dairy operated by Foster Brothers Farm. While not eligible as a Farmstead, because the land historically associated with the buildings is no longer apparent, the house and barns appear eligible for listing on the NR with local significance as they retain integrity of location, materials, setting, workmanship, feeling and association. Photos 175 – 180.

Site M20
The c.1800 Cape Cod style house is located on the east side of Lower Foote Street, south of the intersection of Lower Foote and Foote streets. The building is a 1½ story, 5 x 3 bay, eaves-front (west) main block with a single story ell projecting from its rear (east) elevation. The house is not listed on the SR but its form and massing suggest that it may have been constructed in the late 18th or early 19th century. The owner reports that it may be older than the c.1800 house on the opposite side of Lower Foote Street (Site M19) and that it was moved to its current location historically, over 50 years ago. In addition to its form and massing, the house retains clapboard siding, some historic wooden sash, a stone foundation, and for the most part, its historic fenestration patterns. The front dormer was reportedly added about 20 years ago and is therefore also not historic. The porch posts and deck are not historic but the shape of the roof suggests that the porch was constructed c.1900. The brick exterior chimney and the front door are not historic. Although some of its materials have been altered, the building is probably quite old and retains integrity of location, design, setting, most materials, workmanship and feeling, and therefore appears to be eligible for listing on the NR with local significance. Photos 181 – 182.

Site M 21

The farm complex on the east side of Lower Foote Street is listed on the SR (Middlebury SR # 76), although the State Register map shows the property further north on Lower Foote Street than its actual location. The property includes a c.1850, 1 ½ story Greek Revival style house composed of a 5-bay wide main block and a shorter rear ell. The west-facing main block features an intact Queen Anne style front porch and slate roof, although it is sided with vinyl and has replacement sash. The rear ell retains historic materials including clapboard siding, wood sash and slate roof. The historic form and massing of the house are for the most part intact.

The historic granary, corn crib, bull barn/seed processing barn, and forge are located just south and east of the house, and are nearly unaltered from their 19th century appearance. The bull barn was reportedly moved to its currant location early in the 20th century. The c.1910 barn and c.1920 shop included in the 1992 SR listing are no longer standing. Two mid-20th century barns, a 1956 Ground Level Stable Barn and a c.1960 gambrel-roofed milking parlor with attached, gable-roofed calf barn ell, are located just south of the 19th century buildings. Several newer non-contributing agricultural buildings now associated with the farm's compost production business, have been constructed south of the stable and milking parlor, so that the evolution of the complex is clearly recognizable and understood.

Although the Ground Level Stable, which is nearly 50 years old, no longer houses cows, most of the typical metal stanchions are still in place. A portion of the stable now serves as offices for the compost production business. The property remains in agricultural use, although the dairy operation is now housed in the non-historic free-stall barns north of the farmhouse. The historic agricultural buildings are now used for storage associated with the farm's compost production business, or are unused. The complex of buildings includes connecting paths and dirt roads. The associated fields are under cultivation. The complex retains integrity of location, design, setting, materials, workmanship, feeling and association and appears to be eligible for listing on the NR as a Farmstead. Photos 183 – 191.

Site M22

The c.1880, 1½ story Vernacular house on the east side of Lower Foote Street is composed of a gable-front (west) main block with a 1½ story ell projecting from its south elevation and is listed on the SR (Middlebury SR # 75). The historic form and massing of the simple house are generally intact, as is a Queen Anne style bay window on the front gable elevation but the front elevation of the ell has been modified by the installation of a skylight on the west roof slope and alteration of the historic fenestration pattern. The enclosed second story staircase on the south elevation is also not historic. The house could be considered as marginally historic, especially when viewed in association with the adjacent Ground Level Stable Barn, but recently obtained information that the house was moved from the southeast corner of US Route 7 and Cady Cross Road in 1973 make it ineligible for listing on the National Register. The house is ineligible because the relocation occurred less than 50 years ago and therefore not historically.

The associated gambrel-roofed Ground Level Stable barn and concrete stave silos are not included in the State Register but now are considered to be historic. The owner reports that the southern 100 foot section of the barn was constructed in 1950 to replace a 1936 barn that was destroyed in the hurricane of that year. Wood from the1936 barn was used in the construction of the existing barn. The northern 50 foot section was added in 1969. The barn is a good example of a mid-20th century stable, and although not a rare property type, appears eligible for listing on the National Register with local significance. The barn retains integrity of location, design, setting, materials, and workmanship. Photos 192 – 194.

Site M23
The farm on South Street Extension is listed on the SR (Middlebury SR #100). The c.1860 house and collection of agricultural buildings that date from the second half of the 19th century and early 20th are very well preserved, having changed very little from their period of significance. The buildings are connected by barnyards delineated by fences, and surrounded by pastures and fields. The farm remains in agricultural use and appears to be eligible for listing on the NR as a Farmstead. The property retains integrity of location, design, setting, materials, workmanship and feeling. Photos 195 – 200.

Site M24
The farm identified as Creek Road Farm, on the east side of Creek Road, south of the proposed RS-1/TR-1 alignment, is not listed on the SR. The complex includes a main house, a single story, hip-roofed secondary dwelling, a main barn, and two machine sheds. The eaves-front house was probably built in the second half of the 19th century, but has lost architectural integrity due to the construction of non-historic additions on the front and rear elevations, as well as a non-historic enclosed porch across the width of the front elevation. The house is covered with vinyl, most historic sash have been replaced, and a non-historic exterior chimney has been built against the west gable end. Similarly, any historic materials on the smaller house have also been replaced. Novelty siding on the smaller machine shed suggests that it was constructed early in the 20th century. The main barn is a very large c.1930-40 gambrel roofed Ground Level Stable with a gable roofed wing projecting from the west third of its south eave elevation. Each slope of the barn's roof is defined by five small, shed-roofed dormers. There is a tile silo against the north elevation and a concrete stave silo on the south elevation. The barn is now sheathed with sheet metal that is probably not original. The roof is also covered with metal. The sag in the ridge of the wing suggests that it may be older than the Ground Level Stable, but non-historic, residential scale doors and windows have been added to the front and

south elevation. The wing is also sheathed with replacement clapboards and rests on a poured concrete foundation or a concrete slab. Although the Ground Level barn is legible and prominent in the landscape, the loss of original siding and the non-historic changes to the wing have diminished the barn's architectural integrity. Because the barn is not particularly old and is not a rare type, these changes make it appear to be individually ineligible for listing on the NR. The property remains in agricultural use and the surrounding fields are open, but the farm does not appear to be eligible for listing on the NR as a Farmstead because the form, massing and materials of the farmhouse have been substantially altered. Photos 201 – 206.

Site M25
The large, c.1800 house in the southwest quadrant of Halladay Road and South Middle Road is listed in the State Register (Middlebury SR #89). When the property was surveyed for the SR in 1992, it was recorded as a farm complex that included a number of historic agricultural buildings. Presently, only the house, a c.1925 shed with exposed rafter tails, and an outhouse are still standing. The five bay wide Federal style house features a Gothic Revival front porch as well as slate roof, brick chimneys, clapboard siding and historic sash windows and front door. The form and massing of the main block remain intact. The house retains integrity of location, design, setting, materials, workmanship and feeling, and appears to be eligible for listing on the NR with statewide significance. The associated buildings appear to be eligible for listing on the NR as part of the complex. Photos 207 – 210.

Site M26
The house is located on the west side of Halladay Road and is the sixth property north of the intersection with South Middle Road. The original section of the house appears to be a c.1850 Greek Revival style Classic Cottage. The house is not listed on the SR and does not appear to be eligible for listing on the NR due to the construction of several large, incompatible additions, and loss of historic materials. Photo 211.

Site M27
The Vernacular house on the east side of Halladay Road, approximately three-tenths of a mile south of South Middle Road, was probably constructed in the last decade of the 19th century or early in the 20th century. The house is not listed on the SR and does not appear to be eligible for listing on the NR due to loss of historic materials and construction of several non-historic additions and an enclosed porch. Photos 212 – 213.

Site M28
The c.1885 Italianate style house and associated agricultural buildings on Creek Road, north of the proposed RS-1/TR-1 alignment, are listed in the State Register as a farm (Middlebury SR # 102). When it was listed on the State Register in 1992, the property included the house, a c.1910 shed, c.1930 garage,

c.1890 granary, c.1925 chicken coop and c.1930 milk house. Currently it appears that the garage and milk house are no longer standing. The farmhouse is a 2½ story gable-front main block with a 1½ story ell projecting from its south elevation. The historic form and massing appear unaltered. The house retains its brick chimneys, clapboard siding, wooden trim, including scroll sawn brackets at the corners, Italianate style ell porch, historic doors, and stone foundation. The three remaining agricultural buildings also appear to be nearly unaltered. The large, single-story gable-roofed barn was probably constructed in the 1960s or 70s and therefore is not yet considered to be historic. Its presence on the farm does help to describe the evolution of the farm. Although the property lacks a historic main barn, the collection of historic buildings is legible so that the evolution of the farm can be understood. The property appears to be in agricultural use and the surrounding fields are under cultivation. The farm retains integrity of location, design, materials, and workmanship, and appears to be eligible for listing on the NR as a Farmstead. Photos 214 – 217.

3.11.3.3 Summary

In summary, sites listed on or that appear to be eligible for listing on the the National Register of Historic Places within the APE include:

M15 House, c.1850 and Ground Level Stable Barn, c.1920/1950
M16 House, c.1830
M18 School, c.1850
M19 House, c.1800, Barn, c.1840, Carriage Barn, c.1860
M20 House, c.1800
M21 Farmstead, c.1850
M22 Farmstead, House, c.1880, Ground Level Stable Barn, c. 1930
M23 Farmstead, c.1860
M25 House, c.1800, and outbuildings
M28 Farmstead c. 1885

3.12 Hazardous Materials

3.12.1 Introduction

Hazardous waste sites are regulated by both the federal Resource Conservation and Recovery Act of 1980 (RCRA) (40 CFR Part 261 C) and the Comprehensive Environmental Response, Compensation, and Liability Act of 1986 (CERCLA). The Vermont Hazardous Waste Management Regulations incorporate by reference 40 CFR Parts 260 – 270 (hazardous wastes). The regulations include procedures for identifying hazardous waste, requirements for generators and transporters of hazardous waste, requirements for treatment, storage, and disposal (TSD) facilities, and other provisions.

3.12.2 Methods

A Hazardous Materials Survey was conducted for the alternatives corridor in 2005. The objective of the survey was to preliminarily assess environmental conditions in the alternatives corridor and within one mile of the alternatives corridor boundary for the presence of oil and/or hazardous materials (OHMs or hazmat) that could affect the project. This hazardous materials study area is intended to capture any hazardous materials that could possibly have an effect on any project improvements.

Task 1 – Identification of Sites

Sites were identified based on a database search and an on-ground survey. The consultant obtained a regulatory database search report from Environmental Data Resources, Inc. (EDR) of Milford, Connecticut. The EDR report, dated July 12, 2005, lists all known contaminated sites, hazardous waste generators, registered underground storage tanks (USTs), etc. within the hazmat study area and within one mile of the study area boundary. The consultant also conducted an on-ground survey of the study area. A windshield survey was performed in conjunction with transect walks in areas not accessible by vehicle. In addition, the railroad was walked from milepost 84.28 to 87.39 (i.e., Three Mile Bridge Road north to VT Route 30) to identify potential sources of OHM.

Task 2 - Regulatory File Review

Several sites were identified and selected for a regulatory file review. The consultant visited VANR to review files maintained at DEC with respect to hazardous waste, USTs, aboveground storage tanks (ASTs), site remediation, and solid waste.

Task 3 – Initial Site Assessments (ISA)

The consultant performed reconnaissance of selected sites including walking the interior and exterior portions of the sites and documenting evidence of OHM and/or potential impacts to the alternatives corridor. No formal ISAs were conducted.

3.12.3 Site Identification: Database Results

The following is a summary of findings from the above database searches, file reviews, and on-site reviews.

3.12.3.1 Databases with Negative Findings

No facilities were identified on any of the following lists within the search radii of one mile from the center line of the alternatives corridor:

Federal ASTM Standard

- NPL - National Priority List
- Proposed NPL - Proposed National Priority List Sites
- CERCLIS - Comprehensive Environmental Response, Compensation, and Liability Information System
- CERC-NFRAP - CERCLIS No Further Remedial Action Planned
- CORRACTS - Corrective Action Report
- RCRA-TSDF - Resource Conservation and Recovery Act Information
- RCRA-LQG - Resource Conservation and Recovery Act Information
- ERNS - Emergency Response Notification System

State - ASTM Standard

- SWF/LF - Landfills and Transfer Stations

Federal ASTM Supplemental

- CONSENT - Superfund (CERCLA) Consent Decrees
- ROD - Records Of Decision
- Delisted NPL - National Priority List Deletions
- HMIRS - Hazardous Materials Information Reporting System
- MLTS - Material Licensing Tracking System
- MINES - Mines Master Index File
- NPL Liens - Federal Superfund Liens
- PADS - PCB Activity Database System
- DOD - Department of Defense Sites
- INDIAN RESERV - Indian Reservations
- UMTRA - Uranium Mill Tailings Sites
- US ENG CONTROLS - Engineering Controls Sites List
- ODI - Open Dump Inventory
- FUDS - Formerly Used Defense Sites
- RAATS - RCRA Administrative Action Tracking System
- TRIS - Toxic Chemical Release Inventory System
- TSCA - Toxic Substances Control Act
- SSTS - Section 7 Tracking Systems
- FTTS INSP FIFRA/TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

State or Local ASTM Supplemental

- DRYCLEANERS - Drycleaner Facilities List

EDR Proprietary Historical Databases

- Coal Gas Former Manufactured Gas (Coal Gas) Sites

Brownfields Databases

- US BROWNFIELDS - A Listing of Brownfields Sites
- US INST CONTROL - Sites with Institutional Controls
- BROWNFIELDS - Brownfields Site List

3.12.3.2 Databases with Positive Findings

The following is a summary of facilities identified on the searched lists within the search radii of one mile from the center line of the alternatives corridor. Each of the facilities listed below is located in the Town of Middlebury.

RCRAInfo - Resource Conservation and Recovery Act Information System

The RCRA database is the EPA's database of registered hazardous waste generators. The RCRAInfo maintains a list of facilities or businesses in the state that generate greater than 10-kilograms (22-pounds) per month of hazardous wastes and are regulated under RCRA. Five properties were identified as RCRA generators within the search radius of the alternatives corridor. The facilities are listed as small quantity generators, generating less than 100 kg/month of hazardous waste.

Each of the listed facilities is located in the Town of Middlebury. Based on the EDR report, each of the RCRA generators have achieved compliance with applicable rules. Four of the five facilities were either in compliance or had no violations, and were outside the hazmat study area. One of the facilities has had multiple violations and is within the study area but is currently believed to be in compliance.

Facility Index System (FINDS)

The FINDS contains both facility information and pointers to other sources of information that contain more detail, including Resource Conservation and Recovery Information System, Permit Compliance System, and several others. The database identified six FINDS facilities within the search radius of the alternatives corridor. Five of these are identical to those on the RCRA list and are described above. The sixth site is within the alternatives corridor, but no additional information was available on this source, based on the EDR report, and the site was not on the state list described below.

State Hazardous Waste Sites

The State Hazardous Waste Sites (SHWS) database is a VANR database of sites identified for cleanup using state funds and/or potentially responsible party funds. The site within the area that was identified on the RCRA and FINDS databases was not identified as in the SHWS database. The database identified 12 SHWS sites within the search radius of the alternatives corridor. Seven of the 12 sites listed in the SHWS database have been closed by VANR (i.e., are considered to be in compliance). It is noted that VANR will close sites with known residual contamination if the contamination is contained within the property boundary and notice of the contamination is filed with the land records. Of the active sites, none are located within 0.5 miles of the alternatives corridor, and they do not appear likely to pose a risk to the alternatives corridor.

Spill Reports

One spill was identified within the search radius of the alternatives corridor. Based on the magnitude of the spill and the response time, this release would not be anticipated to adversely impact subsurface conditions at the site.

Vermont Underground Storage Tank List

The UST list is a database of registered underground storage tanks maintained by the VANR. The database report identified 12 registered UST facilities within the search radius of the alternatives corridor.

Based on the UST facilities' hydrogeologic settings relative to the site, potential releases from these UST facilities are not expected to adversely impact subsurface conditions at the site, with the possible exception of one facility located within the hazmat study area. A release of petroleum product from this facility would have the potential of impacting work on the alternatives corridor. It is noted that this facility does not appear on the SHWS, Leaking Underground Storage Tank (LUST), Spills, or other active or historic remediation databases.

Vermont Leaking Underground Storage Tank List

The LUST list is an VANR database of reported leaking USTs. The database report identified nine LUST facilities within the hazardous materials study area. None of the listed LUST facilities are in a location relative to the alternatives corridor that would suggest they would likely contribute to OHM presence within the corridor.

Vermont Leaking Aboveground Storage Tank (LAST) List

The LAST list is an VANR database of reported leaking ASTs. The database report identified nine LAST facilities within the search radius of the alternatives corridor. None of the listed LAST facilities are in a location relative to the proposed alternatives corridor that would suggest they would likely contribute to OHM presence within the corridor.

Orphan Facilities

The EDR report lists Orphan facilities that do not have specific physical addresses in the government databases searched by EDR. The consultant attempted to locate each of the Orphan facilities during the windshield survey performed on July 20 and 21, 2005. Based on the information obtained from the EDR report and the on-the-ground survey, none of the listed Orphan facilities are in a location relative to the alternatives corridor that would suggest they would likely contribute to OHM presence within the corridor.

3.12.4 Administrative File Review

Town of Middlebury Municipal Offices

According to the FIRM, Community-Panel No. 500008 0003 A, Revised January 3, 1985, viewed online at the FEMA website[33], the alternatives corridor is located in a combination of Zone A7 (areas within the 100-year floodplain); Zone B (areas between the 100-year and 500-year flood zones, or areas within the 100-year flood zone where the average depth is less than one foot or where the contributing drainage area is less than one square mile, or areas protected by levees from the base flood); and Zone C (areas of minimal flooding).

Several documents on file at the Middlebury Town Clerk's office were reviewed. There was no documentation indicating the presence of OHM, other than that previously listed in this report on facilities within or near the hazmat study area that would potentially impact the alternatives corridor. A discussion with the Town Planner and Zoning Administrative Officer, Mr. Fred Dunnington, on December 19, 2005, did not reveal any information pertaining to issues related to OHM in the area of the alternatives corridor.

The Middlebury Fire Department Fire Chief Richard Cole was interviewed on December 19, 2005. Chief Cole stated that he did not recall any emergency

[33] http://msc.fema.gov/

responses in the alternatives corridor or the surrounding area relating to OHM or other possible incidents that would potentially have an impact on the corridor.

VANR File Review

Files at the VANR DEC, Waste Management Division, were reviewed on August 4, 2005. The facilities reviewed were based on the results of the EDR report and the on-ground survey. Files reviewed included UST files, UST closure reports, RCRA generator files, site remediation files, and solid waste (for VNAP only). The specific information obtained during the VANR file review were comparable to the information provided by EDR and summarized above.

3.12.5 Site Identification: Windshield Survey and Transect Walk

On July 20 and 21, 2005, a windshield survey and transect walk in the alternatives corridor were performed. US 7, Middle Road, Creek Road, and other area roads were driven to observe potential OHM facilities not listed in the EDR report as well as to identify and locate Orphan facilities. Initial site screening forms were completed and photographs were taken of selected facilities in the alternatives corridor. No additional OHM facilities were identified near the corridor, other than those previously discussed.

The transect walk was conducted through fields, wooded areas, and the Omya quarry in areas not accessible by vehicle. No evidence of OHM was observed during the transect walk.

The area between milepost 84.28 to 87.39 (i.e., Three Mile Bridge Road north to VT Route 30) on the railroad was searched for the presence of OHM. No overt evidence of OHM was observed near the edge of the railroad. An area near the southern end of the railroad walk, on the west side of the railroad, was observed to contain what appeared to be wood debris on private property. The area was near the southern extent of the alternatives corridor and downgradient of the proposed work. Three areas where apparently unused railroad ties were stockpiled were observed along the rail line from milepost 84.28 to 87.39. In the event that the railroad ties are no longer deemed suitable for use by VTrans, it may be necessary to evaluate potential OHM content for disposal in accordance with VANR guidelines.[34]

[34] Vermont Department of Environmental Conservation Waste Management Division. 2003. *Managing Treated Wood Waste*. VANR DEC Publication #WM-1001.

3.12.6 Summary

There are two facilities within or adjacent to the alternatives corridor that have the potential to have resulted in OHM within the corridor and may require further investigation. One of these facilities contained storage containers, empty USTs, and other materials of possible concern. The second facility was the subject of RCRA violations over the past 20 years, although all violations had been rectified as of the most recent inspection (2002). One UST and an AST were observed on this property, and the EDR report indicates the facility has had additional USTs on site, previously removed.

In the future, as project design moves forward, it may be advisable to obtain an additional EDR report and/or local regulatory review in order to capture sites or contamination that may have come into existence since the initial review was completed.

4 Environmental Consequences

This chapter describes the likely impacts of the reasonable alternatives outlined in Section 2.6 (No Build, RS-1 rail spur, and TR-1 truck to rail) on the resources described in Chapter 3. Although RS-1 is the preferred alternative, impacts of the TR-1 alternative are included below for comparison purposes. The TR-1 impacts are based on the TR-1 alignment and footprint as described in the DEIS and in Section 2.6 above. Because TR-1 is not the preferred alternative and is not expected to be implemented, the alignment and footprint have not been modified to reduce impacts, as have portions of the RS-1 alternative. The modified trestle alignment in particular, if incorporated in the TR-1 alternative, would result in reduced impacts to certain resources. This is noted in the appropriate sections below. Mitigation measures are described below for the preferred alternative only.

For purposes of EIS studies, a future year is selected as a baseline for comparison of the impacts of build and no-build alternatives. For this EIS, the year 2030 was selected as the future year for comparison of impacts. Analysis was also conducted for the year when the proposed facility was expected to commence operations (though not necessarily to the level of operations expected in future year 2030). The DEIS projected the facility would commence operations in 2010. At this time, it is unlikely that any facility would be constructed and operational by 2010. However, the 2010 analysis has been retained as a point of comparison to reflect the lower levels of operation upon opening the facility.

The principal guidance for this impact assessment is the FHWA *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* (T 6640.8A, 1987). Each section below begins with an introductory narrative stating what resources are being considered and, where applicable, any regulatory controls. This is followed by sections describing the impact assessment methods, the quantitative or qualitative impacts, and possible mitigation measures.

The following substantive revisions have been made to this chapter since the publication of the DEIS:

- *The text and impact tables have been updated to reflect changes in the proposed RS-1 alignment, Halladay Road options, and trestle structure options.*
- *The text has been modified where appropriate to reflect land use changes west of Halladay Road (South Ridge Subdivision) and at the former Standard Register Company building on US 7.*
- *Floodplain impacts have been updated based on a hydraulic study conducted for the project.*
- *Refinements made to the wetland mapping have changed impacts to this resource for all the build alternatives.*

- *Wetland mitigation has been more clearly defined; a preferred site has been identified to compensate for RS-1 impacts, and additional details about the site are provided.*
- *The archaeological survey has been advanced and details about the next level of survey are provided.*
- *The FEIS includes a section summarizing measures proposed to mitigate impacts associated with the preferred alternative (Section 4.21).*

4.1 Traffic and Transportation

This section summarizes the effects of the No Build, RS-1, and TR-1 alternatives on traffic and the transportation system, including both roadway and rail transportation.

4.1.1 Freight Transportation

The following sections describe the impacts to freight transport, traffic, and safety on area roadways and the Vermont Railway mainline as a result of the alternatives. See Figures 2.6-1 through 2.6-17 for details of RS-1 and TR-1. (All figures referenced in this section are in Volume IIA.)

4.1.1.1 Freight Transportation by Roadway

4.1.1.1.1 No Build Alternative

Act 250 Land Use Permits limit the number of trucks Omya may use to ship marble out of their Middlebury quarry. However, it is reasonable to assume that in the future, Omya would develop a means to accommodate further growth in shipment volumes, by securing a new Act 250 permit, using larger trucks, extending hours of operation, etc. The volume of freight shipments from the Middlebury quarry under the No Build Alternative is listed in Table 4.1-1. Combined with continued regional economic growth and increases in freight shipments, there would be more trucks on US 7 and other roads in the region. The No Build Alternative would not provide any new means for moving freight in and out of the Middlebury region.

4.1.1.1.2 Alternatives RS-1 and TR-1

The effects of RS-1 and TR-1 on freight transportation would be similar, as shown in Table 4.1-1. Both RS-1 and TR-1 would provide a new means for transporting freight in and out of the Middlebury region. They could accommodate a portion of current freight traffic and additional increases in freight traffic due to growth in the region.

Table 4.1-1. Truck and Rail Traffic Associated with Project Alternatives

Alternative	Daily Truck Traffic (Round Trips)		Daily Rail Traffic (Round Trips)	
	2010	2030	2010	2030
No Build	115 (6 days/wk)	138 (6 days/wk)	0	0
RS-1	5* (5 days/wk)	10* (5 days/wk)	2 trains of 20-21 cars (5 days/wk)	2 trains of 20-22 cars (6 days/wk)
TR-1	143* (5 days/wk)	148* (6 days/wk)	2 trains of 20-21 cars (5 days/wk)	2 trains of 20-22 cars (6 days/wk)

** RS-1 and TR-1 truck traffic would travel to transload facility only.*

4.1.1.1.3 Summary and Mitigation of Freight Transportation Impacts

The No Build Alternative would not provide any new means for moving freight in and out of the Middlebury region, and compared to the build alternatives would result in more trucks on US 7 and other roads in the region. RS-1 and TR-1 would address the purpose and need of providing efficient transportation of freight to and from Middlebury by providing an alternative to US 7, and would reduce truck volumes on area roadways. Because this impact is beneficial, no mitigation is necessary.

4.1.1.2 Freight Transportation by Rail

4.1.1.2.1 No Build Alternative

There would be no project-related change to the rail system or rail usage in the region as a result of the No Build Alternative. The mainline rail corridor would continue to serve its existing freight customers and would probably experience modest growth in freight shipments. Rail infrastructure improvements unrelated to this project would proceed with planning, design, and implementation. The volume of freight on existing railroad tracks under the No Build Alternative in year 2010 is shown in Figure 4.1-1.

4.1.1.2.2 Alternative RS-1

Proposed Rail System Ownership and Operator

The ownership of the proposed RS-1 alternative has not yet been determined. Rail traffic would likely be operated by VTR.

Proposed Rail Usage: 2010

The proposed rail usage for the year 2010 for RS-1 would involve two 20-car sets of side dump railcars to be used between the Omya quarry in Middlebury and the Omya plant in Florence. In addition, the transload facility for other shippers is anticipated to generate additional rail traffic in the amount of five cars per week in 2010. The operations, as described in Chapter 2, would require a locomotive set of equipment headquartered at the quarry, moving two sets of loaded and unloaded ore cars, one round trip each day per set, for five days per week. This represents about 1,000,000 tons of marble product or 1.6 MGT per year that would be moved over the spur and the mainline from Middlebury to Florence, and over the Florence Branch to Omya's Verpol plant.

An expected increase in production at the Omya Verpol plant by or after 2010 as a result of increasing shipments from the Middlebury quarry would cause an increase in the MGT figures shown for the 2010 No Build Alternative in Figure 4.1-1. The anticipated increase in production has been used to pro-rate an associated increase in the MGT figures for the Florence Branch, and Florence/Rutland and Rutland/Whitehall line segments. The anticipated increases in annual MGT moved by rail within the project area in 2010 are shown in Figure 4.1-2. The increase in MGT figures is based on the assumption that all of the increases in tonnage would be handled over the route from Florence to Rutland and then to Whitehall, New York. This assumption is consistent with current traffic flows, and is considered to be conservative because it concentrates the increased shipments.

In 2010, the most freight (maximum MGT figure) on the VTR Northern Main would be between the connection of the rail spur to the Northern Main (just south of Middlebury) to Florence. There would be about 2.81 MGT of freight transported along this portion of the mainline representing approximately 95 rail cars on average each day. The movement of marble from the quarry to Florence would consist of 2 sets of 20 cars each making 2 round trips per day, a total of 80 rail car trips each day. There may be an additional rail car added to this train to accommodate volume from shippers other than Omya. This level of freight movement is considered to be well within the capacity of a single track mainline.

Proposed Rail Usage: 2030

The projected rail usage for the Year 2030 is based on a number of assumptions. Based on discussions with the VTR, it has been determined that freight rail increases of five percent a year have been experienced and can be anticipated in the future. This projected increase depends on the continuation of the current favorable market in the rail industry. Based on this information, an increase of five percent per year has been applied to the 2010 MGT figures shown in Figure 4.1-2.

In addition to this average increase per year, it has been assumed that Omya's Verpol plant would increase its current operations by approximately 20 percent by the year 2030, resulting in increased freight shipments between Middlebury and Florence. It is assumed these increase shipments would be handled by a sixth day of operation each week. Also, the other rail shippers on the spur could be generating two rail car shipments per day, five days per week.

These assumptions have been used to project MGT figures for the VTR and surrounding system for 2030. These figures are shown on Figure 4.1-3, the MGT for projected year 2030. Based on this projection, the line segment between the connection of the spur to the mainline (just south of Middlebury) and on to Florence would transport 5.95 MGT of freight annually. The figure of 5.95 MGT represents approximately 200 rail cars moving over the line segment on average each day. The projected movement of marble from the quarry to Florence would consist of two round trip sets of rail cars each day, a total of up to 80 rail car trips each day, 6 days per week. This level of freight movement is also considered to be well within the capacity of a single track mainline.

4.1.1.2.3 Alternative TR-1

Proposed Rail System Ownership and Operator

TR-1 includes a similar, but shorter rail spur that would be approximately 0.6 miles in length from the mainline to the truck to rail transload facility. Like RS-1, the ownership of the TR-1 rail is yet to be determined, and would likely be operated by VTR. The roadway portion of TR-1 would likely be a public road, however, its ownership and maintenance is uncertain at this time.

Proposed Rail Usage

The rail operations for TR-1 would be identical to those for RS-1 with the exception that the rail line would end at the transload facility instead of the quarry. The amount of freight transported on the mainline would be identical to RS-1 and is represented in Figures 4.1-2 and 4.1-3. As with RS-1, the expected levels of freight movement are considered to be well within the capacity of a single track mainline.

4.1.1.2.4 Summary and Mitigation of Rail System Impacts

As described above, the level of freight movement expected in 2010 for either RS-1 or TR-1 is considered to be well within the capacity of a single track mainline. In 2030, the expected additional freight traffic from the quarry would likely be handled by operating at the same daily volume for a sixth day each week. Including increases in freight shipments on the mainline unrelated to this project, the overall level of freight movement is still expected to be well within the capacity of a single track mainline. Therefore, no mitigation measures are needed for effects on the rail system.

4.1.2 Roadway System

4.1.2.1 Traffic Impacts

US 7 is currently congested in certain areas (e.g., Brandon and Middlebury Villages) and has a larger percentage of trucks than other similar highways in Vermont. Lower Foote Street, Halladay Road, and Creek Road are local Middlebury streets that are not currently congested and do not experience high volumes of truck traffic. Chapter 3 (Section 3.1.1) describes existing and projected growth of traffic volumes on the existing roadway network. The following sections describe how these roadways would be impacted by project alternatives.

4.1.2.1.1 No Build Alternative

There would be little change to traffic conditions on Creek Road, Halladay Road, US 7, or Lower Foote Street, other than growth in traffic unrelated to this project. The No Build Alternative includes other independently planned projects in the area. As discussed in Section 2.6.1, other rail and roadway changes and improvements may be implemented that would affect traffic volumes in the area. However, as growth occurs and traffic volumes increase, the continued use of US 7 as the primary freight corridor in the region may worsen traffic in some areas. The truck trips between the quarry and the processing plant would continue to contribute to congestion in the region. The congestion associated with growth will also have a negative effect on the ability of trucks to efficiently move freight along the US 7 corridor. The Level of Service (LOS) on US 7 currently varies throughout the Middlebury region depending upon the volume of traffic and whether it is rural or urban in character. The continued growth in the region could result in a 35% increase in traffic by 2030, as described in Section 3.1.1.4. This growth would be expected to worsen the LOS along US 7 by 2030.

4.1.2.1.2 Alternative RS-1

Although RS-1 begins at the mainline tracks and terminates at the quarry, it will be described starting at the quarry and moving west, because operations begin and end at the quarry.

Lower Foote Street

As described in Section 2.6.2.4, there were two options under consideration for the crossing of Lower Foote Street by RS-1. RS-1 crosses Lower Foote Street about 25 feet below the existing elevation of the road. The first option would sever Lower Foote Street where the rail spur crosses (see Figure 2.6-6). Vehicles that currently use this portion of Lower Foote Street would have to use US 7. Residents who currently access US 7 from Lower Foote Street or Cady Road would continue to do so. Farm vehicles that currently travel down Lower Foote Street to access farmland to the south and east would have to travel on US 7 or farm roads to access the fields. Travel on US 7 would be an inconvenience to farm vehicle operators, who may experience delays getting on and off of US 7, and to travelers on US 7, who may be slowed by farm vehicles. However, the volume of farm vehicle traffic is expected to be light, and the inconvenience occasional. Lower Foote Street currently has a light volume of traffic that operates at LOS A. Severing Lower Foote Street would add travel time for current users of the roadway but would not affect the LOS of US 7 if this option was included as part of the preferred alternative.

The second option would construct a bridge to carry Lower Foote Street over the rail spur (Figure 2.6-7). Local and farm related traffic could then continue to use Lower Foote Street. In addition, trucks heading to the transload facility from the south could use Lower Foote Street instead of the quarry access road. This could increase the volume of traffic on Lower Foote Street. However, Lower Foote Street would continue to operate at LOS A as a result of the bridge option, which is now a component of the preferred alternative.

US 7

US 7 would be grade separated over the rail spur on its existing alignment. There would be a reduction in the number of trucks on US 7 as a result of RS-1. Currently, Omya has an Act 250 permit allowing up to 115 truck round trips per day carrying marble out of its quarry. RS-1 would remove these and potentially other trucks from US 7 and the material would be transported via the rail spur. The transload facility could generate local truck traffic from other shippers. The assumed use of the transload facility by shippers other than Omya would be expected to add 5 local truck round trips per day in 2010 and 10 local truck round trips per day by 2030.

The LOS along US 7 varies throughout the Middlebury region depending upon the volume of traffic and whether it is rural or urban in character. RS-1 would be expected to help improve the operation of US 7 by removing large trucks from the corridor. US 7 would continue to operate at its current LOS as a result of RS-1 in 2010. However, the growth expected along US 7 by 2030 is projected to increase congestion beyond the benefit resulting from RS-1 and the LOS along US 7 will worsen.

There would be one additional impact to US 7 due to the Halladay Road Relocation Option described below. This option includes an additional intersection on US 7 for the new connection for the southern portion of Halladay Road. This option is not part of the preferred alternative.

Halladay Road

As described in Section 2.6.2.3 three options were considered for the crossing of Halladay Road by RS-1. The RS-1 Grade Separated over Halladay Road Option is part of the preferred alternative and would have the least impact to traffic on Halladay Road of the three options. Under this option there would be a bridge carrying the rail spur over Halladay Road. The bridge would completely span Halladay Road and provide the required clearance for vehicles to pass under. Traffic on Halladay Road would continue to move as it does with the No Build because the rail spur would be separated from the roadway. Halladay Road currently operates at LOS A and would continue to operate at LOS A as a result of the RS-1 grade separated option.

The RS-1 At-Grade with Halladay Road Option, which is not part of the preferred alternative, would create a rail crossing of the rail spur with Halladay Road. There would be a quiet-zone system placed at the crossing to provide warning and protection to traffic. The operations of the rail spur are expected to result in four crossings of Halladay Road each week day by a train in 2010 and four crossings six days per week by 2030. There would be up to a two to three minute wait for traffic on Halladay Road during each train crossing. The overall LOS for Halladay Road would continue to be LOS A as a result of the at-grade option, however, there would be delays during those times the train would cross.

The Halladay Road Relocation Option, also not part of the preferred alternative, would eliminate the crossing by realigning the southern portion of Halladay Road and placing a cul-de-sac on the northern portion. Access to Halladay Road north of the rail spur would only be through the existing intersection with US 7 and would not affect travel times. This intersection would have less traffic as a result of this option. The southern portion of Halladay Road would be re-connected to US 7 by a new roadway that would parallel the rail spur (See Figure 2.6-5).

Residents along this southern portion of Halladay Road would have access to US 7 in a different location, about 0.6 miles south of the current access location. This new intersection would have a negligible effect on travel time. Halladay Road would continue to operate at LOS A as a result of the relocation option.

Creek Road

RS-1 includes a grade separation of the rail spur crossing over Creek Road. The structure would completely span Creek Road and provide sufficient clearance for vehicles to pass under. Traffic on Creek Road would continue to flow as it does with the No Build with no change in traffic volume as a result of the project. Creek Road currently operates at LOS A and would continue to operate at LOS A as a result of RS-1. However, Creek Road is within the floodplain associated with Otter Creek and becomes impassable during flood events. During these closures, at least one local resident traverses the adjoining farm fields to exit or access their property. RS-1 would not impede this access or affect the resident’s ability to continue this practice.

4.1.2.1.3 Alternative TR-1

As with RS-1, TR-1 will be described starting at its eastern terminus and moving westward.

Lower Foote Street

TR-1 would follow the existing quarry access road east of US 7. There would be no direct impact to Lower Foote Street as a result of TR-1. However, the two options for Halladay Road would have different effects on the traffic on Lower Foote Street and the existing quarry access road. For the TR-1 Grade Separated over Halladay Road Option, other shippers would have to use Lower Foote Street and the existing quarry access road to access the transload facility west of US 7. For the grade separated option, the assumed use of the transload facility by shippers other than Omya would be expected to add 10 local truck trips per day in 2010 and 20 local truck trips per day by 2030 onto Lower Foote Street. These additional truck trips would not be expected to reduce the LOS of Lower Foote Street.

The TR-1 At-Grade with Halladay Road Option would allow other shippers to have the option of using either Halladay Road or Lower Foote Street to access the transload facility. It is expected that trucks coming from the north on US 7 would use Halladay Road to access the transload facility, and trucks coming from the south would use Lower Foote Street. For the at-grade option, the assumed use of the transload facility by shippers other than Omya would be expected to add 10 local truck trips per day in 2010 and 20 local truck trips per day by 2030. These local truck trips would be accommodated by both Halladay Road and

Lower Foote Street. These additional truck trips would not be expected to reduce the LOS of Lower Foote Street

US 7

TR-1 would include US 7 bridging over the truck to rail roadway, with no other permanent change to US 7. There would be a reduction of about 230 truck trips per day in 2010 and 276 truck trips per day in 2030 on US 7 as a result of TR-1. The trucks carrying marble out of the quarry would use the truck to rail roadway rather than US 7. There could be an increase in other truck trips in the region for users of the rail spur accessing the transload facility from US 7. The assumed use of the transload facility by shippers other than Omya would be expected to add 10 local truck trips per day in 2010 and 20 local truck trips per day by 2030.

The LOS along US 7 varies throughout the Middlebury region depending upon the volume of traffic and whether it is rural or urban in character. TR-1 would be expected to help improve the operation of US 7 by removing large trucks from the corridor. US 7 would continue to operate at its current levels of service as a result of TR-1 in 2010. However, the growth expected along US 7 by 2030 is projected to increase congestion beyond the benefit resulting from TR-1, and as a result the LOS along US 7 will worsen.

Halladay Road

As described in Section 2.6.3.3, two options were considered for the crossing of Halladay Road by TR-1. Each option has different impacts to traffic on Halladay Road.

The TR-1 Grade Separated over Halladay Road Option would have the least impact to traffic on Halladay Road of the two options. Under this option there would be a bridge carrying the truck to rail roadway over Halladay Road. Trucks using TR-1 would not directly impact traffic on Halladay Road. The bridge would completely span Halladay Road and provide sufficient clearance for vehicles to pass under. Traffic on Halladay Road would continue to flow as it does with the No Build (LOS A) with no change in traffic volume as a result of the project.

The TR-1 At-Grade with Halladay Road Option would create a four-way intersection with Halladay Road and the truck to rail roadway. Traffic on Halladay Road would continue to have the ROW with stop control for the truck to rail approaches to the intersection. The intersection would allow trucks to use Halladay Road to access the transload facility to the west. Trucks carrying marble from the quarry would cross Halladay Road at the intersection but would not need to use Halladay Road. There could be as many as 286 crossings of Halladay Road by trucks every day in 2010 and as many as 296 by 2030. Halladay Road is expected to continue to operate at LOS A, however.

Creek Road

The impacts to Creek Road would be the same for TR-1 as they would be for RS-1 because the alternatives are exactly the same in this area – a grade separation of the rail spur crossing over Creek Road. The structure would completely span Creek Road and provide the required clearance for vehicles to pass under. Traffic on Creek Road would continue to flow as it does with the No Build with no change in traffic volume as a result of the project. Creek Road currently operates at LOS A and would continue to operate at LOS A as a result of TR-1. However, Creek Road is within the floodplain associated with Otter Creek and becomes impassable during certain times of the year due to flooding. During these closures, at least one local resident traverses the adjoining farm fields to exit or access their property. The design of TR-1 would not impede this access or affect the resident's ability to continue this practice.

4.1.2.1.4 Summary and Mitigation of Traffic Impacts

The No Build does not address the purpose or need to provide efficient transportation of freight to and from Middlebury. US 7 would continue to be the primary means for moving freight, with the expected growth in the region resulting in increased congestion and decreased levels of service. Trucks would have no choice but to continue traveling through the village centers of Pittsford, Brandon and Middlebury.

RS-1 would address the purpose and need of providing efficient transportation of freight to and from Middlebury by providing an alternative to US 7. Removing trucks from US 7 would reduce congestion. It could allow for economic growth in the region by capitalizing on the underutilized rail corridor. RS-1 would also eliminate over half of the heavy trucks and nearly a third of all truck traffic from Brandon Village in 2010.

Like RS-1, TR-1 would remove trucks from US 7 and would reduce congestion and maintain an acceptable level of service for a longer period of time. TR-1 could also allow for economic growth in the region by capitalizing on the underutilized rail corridor and eliminating a large volume of large industrial trucks from traveling through village centers. However, compared to RS-1, TR-1 would not meet the project purpose to provide for the efficient transportation of freight to and from Middlebury.

Although the RS-1 preferred alternative would result in small increases in truck traffic on local Middlebury roads and minor delays with at-grade options, no reduction in LOS is anticipated and no formal mitigation is necessary.

4.1.2.2 Safety Impacts

This section describes the impacts to traffic safety on area roadways as a result of the range of reasonable alternatives.

4.1.2.2.1 No Build Alternative

The No Build Alternative would propose no new facilities for moving freight in and out of the Middlebury Region. As growth continues in the region there would be increased pressures placed on the existing transportation system. Increased growth will further compound congestion. As stated in Section 3.1.1.2, congestion appears to be a factor in many of the rear-end and sideswipe crashes that occur along US 7. The No Build Alternative would not reduce the crash rate along portions of US 7 and the situation would likely become worse.

4.1.2.2.2 Alternative RS-1

Lower Foote Street

There were two options for the crossing of Lower Foote Street. The first option, which is not part of the preferred alternative, would close Lower Foote Street between Cady Road and the quarry access road. The small volume of traffic currently using this portion of Lower Foote Street would have to use US 7 instead. This is a safety concern because this portion of the roadway is used by farm machinery that may have to use US 7. US 7 has a high volume of traffic traveling at higher speeds, and having slow moving farm machinery use this same roadway could increase the potential for conflicts.

The second option is part of the preferred alternative and would construct a bridge to carry Lower Foote Street over the rail spur, allowing vehicles, including the farm machinery, to continue using Lower Foote Street as they do presently. This option would also allow shippers, particularly those coming from the south and traveling north on US 7, to access the rail spur's transload facility via Lower Foote Street and the quarry access road. This would increase the number of trucks traveling on Lower Foote Street from US 7 to its intersection with the quarry access road. This could pose safety concerns since this segment of Lower Foote Street currently has mostly residential traffic that could conflict with large industrial trucks.

US 7

RS-1 would remove freight trucks from US 7 and place the freight on rail cars. The removal of this freight traffic would reduce congestion along portions of US 7 and could reduce vehicle conflicts.

All options for RS-1 include US 7 bridging over the rail spur, which would avoid any possible conflict between vehicles and trains. The Halladay Road Relocation Option, which is not part of the preferred alternative, would create a new intersection along US 7 where the relocated southern portion of Halladay Road would re-connect with US 7. This would result in three “T” type intersections, at Cady Road, relocated Halladay Road, and the quarry access road, along a 750-foot stretch of US 7. This could increase the potential for conflicts with vehicles turning, accelerating and decelerating at three points in such a short distance.

Halladay Road

The three RS-1 options for Halladay Road have different safety issues. The RS-1 Grade Separated over Halladay Road Option, which is part of the preferred alternative, would be the safest type of crossing because it would eliminate any possible conflict between automobiles and trains.

The RS-1 At-Grade with Halladay Road Option would use a quiet-zone warning signal with flashing lights and cross bars. Although signals provide warning and control at these crossings, at-grade rail crossings pose a safety concern because cars and trains would use the same infrastructure. The FRA’s and FHWA’s policies are to avoid at-grade rail crossings when possible.

The Halladay Road Relocation Option would eliminate the crossing by relocating Halladay Road. This option would avoid any possible conflict between vehicles and trains, although it would create a new intersection on US 7, as discussed above.

Creek Road

RS-1 would include a rail spur bridge over Creek Road, creating a grade separation between vehicles and trains. Grade separations are the safest type of crossings because they eliminate any possible conflict between vehicles and trains. A crossing of the rail spur would be provided near Creek Road to safely accommodate local residents who must traverse the farm fields during periods of flooding.

4.1.2.2.3 Alternative TR-1

Lower Foote Street

Lower Foote Street and the quarry access road would have increased truck traffic under the TR-1 alternative. The quarry access road would continue to be used to carry marble from the quarry. Expectations are that the number of trucks heading to the transload facility would increase beyond the current volume of trucks from the quarry. Other shippers would also use Lower Foote Street and the quarry access road to access the transload facility. However, the number of trucks would differ depending upon the Halladay Road option chosen.

The TR-1 Grade Separated over Halladay Road Option would place more traffic on Lower Foote Street and the quarry access road because these roads would provide the only access to the transload facility. The TR-1 At-Grade with Halladay Road Option could place less traffic on Lower Foote Street and the quarry access road because other US 7 users could also use Halladay Road to access the transload facility. Additional truck traffic on Lower Foote Street and Halladay Road could pose safety concerns since these roads have some residential development.

US 7

TR-1 would remove the freight trucks from US 7 and place them on a dedicated industrial road. The removal of these trucks would reduce congestion along portions of US 7 and could reduce the number of vehicular conflicts.

TR-1 would include US 7 bridging over the truck to rail roadway, avoiding any possible conflict between vehicles on US 7 and industrial trucks. TR-1 also would eliminate an intersection on US 7. The quarry access road connection to US 7 would be eliminated and would avoid the 115 trucks per day that must cross northbound US 7 traffic and then accelerate to head south. The elimination of the intersection would reduce the number of conflict points along US 7 and could reduce the number of crashes.

Halladay Road

The two TR-1 options for Halladay Road have different safety issues. The TR-1 Grade Separated over Halladay Road Option would provide a grade separation between Halladay Road and the truck to rail roadway. The grade separation eliminates any possible conflict between local vehicular traffic and industrial truck traffic.

The second TR-1 option, TR-1 At-Grade with Halladay Road, would have an at-grade intersection for the industrial truck to rail road crossing Halladay Road. The trucks carrying freight to the transload facility would cross Halladay Road after stopping at a stop sign. Sight distance would be adequate to allow the trucks to safely cross. Halladay Road would experience more truck traffic because it would provide other shippers access to the transload facility under this option. This could pose safety concerns since Halladay Road currently has mostly residential traffic that could conflict with large industrial trucks.

Creek Road

TR-1 includes a rail spur bridge over Creek Road creating a grade separation between vehicles and trains. Grade separations are the safest type of crossings because they eliminate any possible conflict between automobiles and trains.

4.1.2.2.4 Summary and Mitigation of Safety Impacts

The No Build would not reduce the crash rate along portions of US 7. The crashes appear to be caused by local congestion, and the No Build would not relieve the existing congestion nor prevent the increase in congestion expected from continued growth.

Compared to the No Build Alternative, RS-1 would reduce the volume of existing and future truck traffic along US 7 in the region, and therefore could reduce the number of crashes. Most of the local road crossings of RS-1 would be grade separated and would not pose a safety concern. However, the At-Grade with Halladay Road Option would create an at-grade rail crossing, which would result in the potential for train-automobile conflicts. The crossing would be a “quiet zone”, in which trains are not permitted to use their horns, and gates are installed to prevent train-vehicle collisions. RS-1 would also likely result in increased truck traffic on the residential area on Lower Foote Street, which shippers might use to access the transload facility. No formal mitigation is warranted, but the town may consider measures such as reduced speed limits or requirements that shippers use alternate routes (such as accessing the road to the transload facility via US 7 rather than Lower Foote Street).

Compared to the No Build, TR-1 would also reduce existing and future truck traffic volumes along US 7 in the region, and therefore could reduce the number of crashes. Most of the local road crossings of TR-1 would be grade separated and would not pose a safety concern. However, the TR-1 At-Grade with Halladay Road Option proposes an at-grade intersection that could result in conflicts between freight and other local traffic. Freight traffic crossing Halladay Road would be controlled with stop signs, and additional signage on both roads could minimize potential safety concerns. Additionally, Halladay Road and Lower Foote Street would likely have increased truck traffic as access routes to the transload facility.

4.1.3 Pedestrians and Bicyclists

Impacts to the current and anticipated use of pedestrian and bicyclist facilities are discussed for each alternative below.

4.1.3.1 No Build

The No Build would not address the safety concerns that exist for pedestrians and bicyclists due to the relatively high volumes of trucks traveling on US 7, some local roads and through the village centers. These safety concerns could increase in the future as the volume of traffic increases. Transportation improvements unrelated to this project, however, may incorporate safety improvements for pedestrians and bicyclists.

4.1.3.2 Alternative RS-1

RS-1 would remove approximately 230 truck trips per day in 2010, and 276 truck trips per day in 2030, from US 7, local roads, and Brandon Village. This reduction in the number of large trucks on these roadways would reduce the safety concerns for pedestrians and bicyclists. There could be a small increase in truck traffic on some local streets like Lower Foote Street due to shippers accessing the transload facility. This traffic volume would be light, and these roads appear to have little pedestrian and bicycle traffic, so safety concerns should be minimal.

Additionally, alternatives that cut off Lower Foote Street or Halladay Road could disrupt a small amount of pedestrian and bicycle traffic. On both roadways, pedestrian and bicycle traffic is believed to be very light, so cutting them off would affect few people. Bicyclists could access the severed portions of these roads via US 7.

4.1.3.3 Alternative TR-1

TR-1 would remove approximately 230 truck trips per day in 2010, and 276 truck trips per day in 2030, from US 7, local roads, and Brandon Village. This reduction in the number of large trucks on these roadways would reduce the safety concerns for pedestrians and bicyclists. There could be an increase in truck traffic on some local streets, particularly Lower Foote Street or Halladay Road, due to shippers accessing the transload facility. As with RS-1, the low truck, pedestrian, and bicycle traffic volumes suggest safety concerns would be minimal. Restrictions on truck travel routes could reduce or eliminate these concerns. TR-1 would not sever local roads, so pedestrian and bicycle traffic would not be disrupted, except while trucks are crossing the roads.

4.1.3.4 Summary and Mitigation of Pedestrian and Bicyclist Impacts

Both RS-1 and TR-1 would reduce the number of large trucks on US 7 and local roadways, reducing safety concerns for pedestrians and bicyclists. The increases in truck traffic on Lower Foote Street and Halladay Road are not expected to cause safety concerns. RS-1 options that sever local roads would disrupt a small amount of pedestrian and bicycle traffic, although bicyclists could travel on US 7 to access the severed portions of these roads. The preferred alternative would not sever any local roads.

Since pedestrian and bicyclist impacts are expected to be minimal, no formal mitigation is proposed. However, the town may consider measures such as reduced speed limits or the requirement that truckers use alternative routes.

4.2 Social and Economic Resources

This section of the report reviews the social and economic impacts of the No-Build, RS-1 and TR-1 alternatives.

4.2.1 Economic Development

Omya ships marble from its Middlebury quarry approximately 23 miles by truck over US 7 to its processing plant in Florence. Each year, 750,000-850,000 tons of raw material are processed at the Florence plant, where the raw material is crushed into finely ground calcium carbonate. This annual volume is about 20% less than the plant's capacity.

Omya Middlebury Quarry

Omya Florence Processing Plant

The Florence processing plant, built in the 1970s, is one of six plants Omya operates in North America. The finished product, a fine calcium carbonate powder or slurry, is then shipped, by rail and truck, from the Florence facility to users throughout North America. The Middlebury quarry provides approximately 80 percent of the raw material processed in Florence, with the balance coming from quarries in South Wallingford and Florence.

Currently, an average of 105 trucks per day, five days per week, completed a round trip between the Omya quarry in Middlebury and the Omya plant in Florence. It is assumed under both the build and no-build scenarios that by 2010 the Omya shipments from Middlebury will rise to 115 round trips per day, six days per week, or 1,000,000 tons per year, which is the equivalent of the limitations imposed by the current Act 250 permit for shipments from the Middlebury quarry. From 2010 to 2030, the shipments would grow an additional 20%, which could be accommodated at the Florence plant by improved efficiencies or modest improvements. In conjunction with that assumption, it is reasonable to assume that Omya would develop a means to accommodate these volumes under the no-build scenario, by securing a new Act 250 permit, using larger trucks, extending hours of operation, etc. As such, the assumption is that future Omya shipment volumes would be the same under the build and no-build alternatives.

4.2.1.1 No Build Alternative

Interviews with Omya officials indicate that the Act 250 constraint is not currently limiting production at either the quarry or the Florence plant. However, current operations are approaching the Act 250-imposed constraint. If permit restrictions related to truck traffic are not relaxed, it could restrict Omya's future growth.

Heavy truck traffic in Brandon Village adversely affects the village's aesthetic and therefore its economic environment. The volume of Omya trucks along US 7 and particularly in downtown Brandon was one of the factors the District Environmental Commission cited in limiting Omya to 115 trips per day, and is one of the considerations leading to this study of build alternatives. The issue is of particular importance in downtown Brandon Village. Brandon Village is an attractive, quaint, historic setting with a variety of shops, restaurants and lodging facilities. The Act 250 permit (#9A0107-2-EB) ruling was driven, in part, by the effects of marble trucks on the downtown Brandon environment. Finding of Fact #67 of that permit notes that: "The noise from Omya's trucks has many unpleasant and harmful effects on the community of Brandon. It destroys the character of an historic Vermont village, it discourages tourism, and it degrades the quality of life…" Also cited in the Findings of Fact are concerns about "…pollution, congestion, and other problems that are caused by the

existing truck traffic in Brandon." These concerns were seen as impairing downtown Brandon's economic performance. With 105 round trips per day in 2007, there were 210 trucks passing through downtown Brandon each day, with an average of approximately one trip every three minutes during their hours of operation.

The No Build alternative would fail to address this issue, which detracts from the investment climate, job creation and tax base enhancement in downtown Brandon.

The No Build Alternative would have a low capital cost and would not alter existing traffic patterns. However, the No Build Alternative would result in greater wear and tear on US 7 from Omya truck traffic than would build alternatives. Many studies have shown the substantial impacts to existing pavements from increased truck volumes. Asphalt pavements and concrete bridge decks are subject to fatigue from repetitive loadings. Increasing the frequency or weight of the heavy traffic loads results in increased pavement distress and structural damage. At the very least, an increase in heavy truck volumes will result in a decrease in time between required maintenance cycles along the route. In the long term, an increase in heavier truck volumes will result in moving forward the date at which the pavement or bridge structure will require replacement or extensive rehabilitation.

4.2.1.2 Alternative RS-1

Alternative RS-1 would remove Omya truck traffic from US 7 and downtown Brandon, except possibly during unusual circumstances such as a closure of the rail line. This would improve Brandon's aesthetic and economic environment and its investment climate.

Alternative RS-1 could benefit Omya by removing current limitations on marble shipments from its Middlebury quarry. RS-1 could result in more efficient and economical operations, avoiding the costs of truck transportation. This improved cost efficiency may result in more economically secure operations for Omya or possibly encourage expansion of operations beyond that in the No Build Alternative.

This alternative would pass through farmland owned and operated by VNAP and the Foster Brothers Farm, and could negatively impact their operations. RS-1 would consume a portion of their active farmland; would bisect existing fields, possibly making access more difficult and affecting the viability of some fields; and would affect drainage along the alignment, possibly affecting immediately adjacent land. (Agricultural impacts are addressed in more detail in Section 4.8.)

There were two options available for the crossing of Lower Foote Street. Under the first option, a bridge would be constructed over the rail spur allowing Lower Foote Street vehicles to cross over the rail spur. This would not disrupt Lower Foote Street traffic, but at an estimated cost of at least $760,000 to build the bridge. Under the second option, Lower Foote Street would end in a cul-de-sac both north and south of the spur. This would inconvenience vehicular traffic along Lower Foote Street and further disrupt the operations of VNAP and Fosters Brothers Farm, whose vehicles frequently travel along Lower Foote Street.

The three Halladay Road/rail spur crossing options would all adversely affect the access to parcels which are bisected by the RS-1 alignment.

The RS-1 transload facility would be available to shippers other than Omya. Two firms, VNAP and JP Carrara, indicated the possibility that the transload facility would be useful for receiving raw materials or shipping finished products at some unspecified point in the future. However, no firms are willing or able to commit to utilize the freight rail facility at this time. The economic scenario assumes these or other firms would ship or receive an additional 5 rail cars per week in 2010 and 10 rail cars of material in 2030.

The removal of truck traffic from US 7 would help reduce the adverse effects of truck traffic on Brandon Village discussed in Section 4.2.1.2 above. This could improve the investment climate, create jobs, and enhance the tax base in downtown Brandon.

4.2.1.3 Alternative TR-1

Like RS-1, Alternative TR-1 would remove Omya truck traffic from US 7 and downtown Brandon, improving its aesthetic and economic environment.

Alternative TR-1 could also benefit Omya by removing current limitations on marble shipments from its Middlebury quarry. However, TR-1 would incur the costs of two modes of transportation and multiple handling of raw materials.

TR-1 would not adversely affect the operation of VNAP and the Foster Brothers Farm, which lies east of the alignment.

The TR-1 Grade Separated over Halladay Road Option would result in the new roadway being elevated both east and west of Halladay Road, which could cause some difficulties for agricultural operations. This disruption would be mitigated by compensation to landowners whose property is cut by the new roadway. It is understood that the roadway will not be fenced from abutting land uses and crossing will be possible unless prohibited by the elevation of the roadway. Impacts on farmlands are discussed in Section 4.8.

The TR-1 At-Grade with Halladay Road Option would be somewhat less disruptive to abutting land than a bridged crossing, because the new roadway would not be elevated, particularly west of Halladay Road. It would be more disruptive to property values, however, because the stopping and starting trucks would generate more noise, one of the nuisance factors that can lower property values.

The TR-1 transload facility would be available to shippers other than Omya, although none of the firms contacted expressed an immediate interest in utilizing the freight rail facility, as described above for RS-1.

As with RS-1, the removal of truck traffic from US 7 would help reduce the adverse effects of truck traffic on Brandon Village discussed in Section 4.2.1.2 above. This could improve the investment climate, create jobs, and enhance the tax base in downtown Brandon.

4.2.2 Employment

Omya employs approximately 170 people in its Florence plant. In addition, approximately 150 subcontractors are based out of the Florence plant and are on site on a regular basis. Omya contracts Middlebury quarry mining operations to the Shelburne Limestone Company, which has approximately 25 employees at the quarry. Omya also maintains a portion of its operations in Proctor, Vermont. There are approximately 100 Proctor employees. All told, the Omya Vermont payroll is approximately $15.9 million annually.

Materials are transported from the quarry to the processing plant by L.F. Carter, Inc., which has 35 +/- employees. The Omya contract is the major source of revenues for L.F. Carter, Inc.

4.2.2.1 No Build Alternative

The No Build Alternative would retain the 35 jobs at its trucking contractor, L.F. Carter, Inc., but would not generate jobs related to rail operations. The presumed 20% increase in Omya shipments would increase the number of trucking jobs to 45 by 2030. The No Build would not improve the economic climate in Brandon Village.

4.2.2.2 Alternative RS-1

RS-1 is likely to have a more pronounced job impact than TR-1. This alternative would, under normal circumstances, eliminate all trucking of Omya's materials, because the material would be loaded directly onto rail cars at the quarry. Trucking operations currently employ 35 people and would add 10 additional jobs to accommodate anticipated growth through the year 2030 (Table 4.2-1). All of these jobs would be eliminated under this option.

Table 4.2-1 Year 2030 Employment Impact RS-1

	No Build	RS-1	Difference
Trucking jobs in 2030	45*	0	-45
Rail Jobs	0	4	4
Transload Jobs Increase	0	0	0
Total Direct Jobs	45	4	-41
Indirect Jobs	23**	2	-21
Total Regional Jobs Supported	**68**	**6**	**-62**

** 35 current jobs, plus 10 jobs to accommodate anticipated growth*
*** 0.5 indirect jobs for each direct job*

There would also be fewer positions necessary for the movement of materials onto the rail cars than in TR-1. In Alternative TR-1, material would be loaded onto trucks at the quarry, offloaded from trucks at the transload facility near Otter Creek, and then loaded onto rail cars at the transload site. In contrast, under Alternative RS-1, the material would be loaded directly onto rail cars at the quarry, requiring no more employees for this function than the No Build alternative.

All told, for Alternative RS-1, a reduction of 41 direct jobs and a total regional job loss of 62 jobs is expected in the year 2030 compared to the No Build Alternative. Without demeaning the significance of this loss to the job holders, the loss of 62 jobs would be imperceptible in Addison County, which has a job base of over 13,000 jobs, or in Middlebury, which has 7,400 jobs.

This job loss could be partially offset by the use of the transload facility by other employers. Interviews were conducted with managers of existing firms in the general vicinity of the Middlebury quarry, which are possible candidates to utilize the transload facility. The firms interviewed included:

- VNAP, which produces "Moo Doo", a soil enrichment product, and the associated Foster Brothers Farm, a dairy operation;
- JP Carrara, a manufacturer of pre-cast concrete panels and redi-mix concrete; and

- Specialty Filaments, a manufacturer of filaments for use in the production of brushes. (Specialty Filaments has since changed ownership.)

Two of the firms indicated the possibility that they might use the facility at some unspecified point in the future. However, no firms are willing or able to commit to utilize the freight rail facility at this time. The economic scenario assumes these or other firms would ship or receive 5 additional rail cars per week in 2010 and 10 rail cars of material in 2030.

The removal of truck traffic from US 7 could be a positive factor in helping Brandon expand its employment base. The introduction of small businesses as a result of the improved investment climate could partially offset the projected loss of jobs as a result of the implementation of Alternative RS-1.

4.2.2.3 Alternative TR-1

Under Alternative TR-1, some, but not all, of the trucking-related jobs would be retained. Because of the shorter distance traveled, each truck would be able to make more trips per day. With a trip of about 3.4 miles, fewer truckers would be needed (although loading and off-loading time would remain essentially the same). It is estimated that it would take 50% fewer truckers in 2030 under the TR-1 alternative (23) than under the No Build Alternative (45) (Table 4.2-2).

Table 4.2-2 Year 2030 Employment Impact TR-1

	No Build	TR-1	Difference
Trucking jobs in 2030*	45*	23	-22
Rail Jobs	0	4	4
Transload Jobs Increase	0	6	6
Total Direct Jobs	45	33	-12
Indirect Jobs**	23**	17	-6
Total Regional Jobs Supported	**68**	**50**	**-18**

** 35 current jobs, plus 10 jobs to accommodate anticipated growth*
*** 0.5 indirect jobs for each direct job*

The loss of trucking jobs would be partially offset by jobs created to move the materials by rail, including employees on the train and employees at the new transload facility. Based on discussions with the consultant team's rail consultant, it is estimated that four rail jobs would be created. An additional six jobs would be created at the transload facility.

Overall, measured against the No Build Alternative in the year 2030, TR-1 would have 12 fewer direct jobs and 6 fewer indirect jobs, or 18 fewer jobs total. (Direct jobs are those that are a direct result of the project, such as truckers; indirect jobs are a result of the income produced by the direct jobs.)

As with RS-1, despite the significance of this loss to the job holders, the loss of 18 jobs would be imperceptible in Addison County, which has a job base of over 13,000 jobs, or in Middlebury, which has 7,400 jobs.

This job loss could be partially offset by the use of the transload facility by other employers, as discussed above under RS-1.

The removal of truck traffic from US 7 could be a positive factor in helping Brandon expand its employment base, which could partially offset the projected loss of 18 jobs as a result of TR-1.

4.2.3 Acquisition and Relocation

4.2.3.1 No Build Alternative

No acquisitions or relocations would be necessary as a result of the No Build Alternative, except for those that may be associated with independently planned transportation improvements.

4.2.3.2 Alternatives RS-1 and TR-1

There are no residences or other structures located within the proposed acquisition area. Table 4.2-3 includes a summary of ROW acreage impacts by parcel and alternative.

All three RS-1 options would require acquisition of portions of 16 parcels. The acreage to be acquired would be approximately 53 to 59 acres, with the Halladay Road Relocation Option requiring the most acreage overall. Both TR-1 options would require acquisition of portions of 14 parcels and approximately 49 acres of land (slightly less if the TR-1 alignment was modified similar to RS-1), with TR-1 At-Grade with Halladay Road requiring slightly more acreage than TR-1 over Halladay Road. Some compensation for the impacts of severing parcels is likely as parcels are bisected by the proposed roadway and rail lines. Care will need to be taken to allow appropriate crossing opportunities.

Table 4.2-3 Parcel Impacts: Acreage of Right of Way to Be Acquired for Each Alternative and Option*

		RS-1			TR-1	
Parcel Number	**Total Acreage of Lot**	**Grade Separated Over Halladay Road**	**At-Grade with Halladay Road**	**Halladay Road Relocation**	**Grade Separated Over Halladay Road**	**At-Grade with Halladay Road**
8077.200	115.9	11.19	11.19	11.19		
8107.000	676.07	17.88	17.88	17.88		
8075.000	83.58	0.61	0.61	0.61		
8117.000	35.28	2.10	2.10	2.10	1.82	1.82
8118.000	19.23				0.55	0.55
8119.001	8.15	0.19	0.19	0.19		
8236.000	9.47	2.43	2.43	2.43	0.30	0.30
8153.000	91.27	4.10	4.52	8.42	4.51	4.51
8211.000	10.96	0.61	0.51	0.65	0.12	0.12
011	0.19	0.16	0.11	0.19	0.13	0.13
8212.000	4.88	0.31	0.24	1.76	1.12	1.12
8211.200	115.72	5.69	4.03	3.81	4.27	5.49
8196.000	106.46	2.48	2.26	2.21	4.20	4.20
7003.100	18.36				1.86	1.86
7003.301	55.61	4.14	4.15	4.14	0.81	0.81
7003.300	59.97	0.29	0.29	0.29	24.62	24.62
7003.400	66.43	2.16	2.16	2.16	3.05	3.05
7026.000	152.52	0.91	0.91	0.91	1.21	1.21
Total Impact		**55.25**	**53.58**	**58.94**	**48.57**	**49.79**

**Note: The table above represents the acreage of each parcel that falls within the ROW of each alternative. The ROW is approximate, and adjustments may be made during future design development.*

4.2.4 Land Use Planning

The Addison County Regional Plan, the Middlebury Town Plan (2007) and the Brandon Town Plan (2002) all cite either limiting truck traffic or, more specifically, utilizing rail to move materials from the Omya quarry to Florence.

4.2.4.1 No Build Alternative

The No Build Alternative is inconsistent with the Middlebury and Brandon Town Plans, and the Addison County Regional Plan, which favor a rail spur to alleviate truck traffic on US 7. To the extent that the No Build Alternative detracts from the investment/reinvestment climate in downtown Brandon, and, to a lesser degree, within the US 7 corridor between the Middlebury quarry and the Florence plant, it is also inconsistent with local plans.

4.2.4.2 Alternative RS-1

Alternative RS-1 is generally consistent with the Middlebury and Brandon Town Plans and the Addison County Regional Plan. The 2007 Middlebury Town Plan, in Section 11.9, addresses the proposed rail spur. The Middlebury Town Plan shows the approximate RS-1 alignment on the *Middlebury Transportation and Major Traffic Volumes* map on page 147, and calls it “the least environmentally damaging and most practicable alignment…” It also cites the economic development benefits of the project for the region.

On page 124, the Middlebury Town Plan states “This Plan supports rail system improvements in general and specifically endorses the Middlebury Spur route as shown in the appendix to this Plan. In order for the rail spur project to conform to the Town Plan, benefits to businesses must clearly be shown and the following standards must be met…” These standards are listed below, followed by FEIS responses.

Town Plan Standard #1

> *The project must include adequate mitigation, including conservation easements for the open land on the west side of Rt. 7 and adjacent to residences, tree planting, and where necessary, supplementary compensation for the effects upon the property values of adjacent owners;*

Town Plan Standard #2

> *In exchange for the rail corridor through Middlebury Area Land Trust existing recorded conservation easements, new conservation easements for the area around US Rt 7 must be established. Additional mitigation to the land owners and MALT must be examined and assessed;*

FEIS Response to Standards #1 and #2

Conservation easements are recognized interests in land and will be further considered during the project's right-of-way acquisition stage. Typically, conservation easements include language addressing how the proceeds of eminent domain damage awards must be allocated between the fee owner and the holder of the conservation easement. Moreover, they usually require the holder of the conservation easement to apply its share of the proceeds of an eminent domain award toward protection of similar resources. In the case of the properties that are proposed to be affected by the rail spur, the provisions in the easements vary. Easement language is summarized in Appendix I. Privately owned lands with conservation easements are shown on Figures 4.2-1 and 4.2-2.

Tree planting and other landscaping will be designed and incorporated into plans during future design phases. Landscaping measures are cited in Sections 4.3 and 4.11 of this FEIS as possible mitigation measures for visual and historic resource impacts.

Just compensation for property acquisition is addressed in Section 4.2.5. Neither supplementary compensation (Standard #1) or additional mitigation (Standard #2) is being proposed. However, this would not preclude the town from pursuing this should they so desire.

Town Plan Standard #3

> *OMYA and Vermont Railway must assure that A) highway/rail crossings shall be separated, B) there will be no undue burden to the Town for bridge maintenance, and C) any rail right-of-way maintenance by herbicides or other health and environmental hazards, present or future, are adequately minimized and corrected;*

FEIS Response to Standard #3

The preferred alternative includes grade separated crossings of all local roads. Bridges would be maintained by the ultimate owner of each bridge. The Lower Foote Street bridge would most likely be owned by the Town of Middlebury, and therefore the town's responsibility to maintain. The US 7 roadway bridge would be owned and maintained by the State of Vermont. The Halladay Road, Creek Road, and Otter Creek bridges would be railroad bridges and maintained by the bridge owners. Ownership of the railroad bridges has not yet been determined, but ownership and maintenance would most likely not be the Town of Middlebury's responsibility. Herbicides and "other health and environmental hazards" have been adequately minimized and are addressed in other sections of this FEIS.

Town Plan Standard #4

> *Proposed aesthetic and pedestrian crossing recommendations at the public highway and Otter Creek bridges must be developed through site visits and local public hearings.*

FEIS Response to Standard #4

Both site visits and public input have been considered in developing aesthetic and pedestrian crossing recommendations in this FEIS. Specific aesthetic considerations, such as visual appearance of structures and landscaping treatments, will be addressed during final design, during which it is expected that there will be an opportunity for public input. As noted in Section 4.1.3.4, impacts may not warrant pedestrian crossing measures, but the town can independently pursue these or similar measures in the future.

Brandon's 2002 Town Plan (page 42) notes that Brandon "…experiences adverse impacts to the public's health and safety in the form of noise, dust, air quality impairment, vibrations and congestion which is related to truck traffic… The State of Vermont is exploring means by which carriage of freight by rail may be increased and the Town supports those efforts." One of the "Transportation Recommendations" in the Brandon Town Plan (page 45) is: "Support increased use of rail for passenger and freight transportation." It is concluded, therefore, that the proposed RS-1 alternative is consistent with the Brandon Town Plan.

The Addison County Regional Plan (last adopted by the Addison County Regional Planning Commission in 2005) supports the use of rail for freight transport, and supports the reduction of truck conflicts in village centers. Specifically, the Plan states, under "Transportation Recommendations": "New rail spurs should be investigated for the shipment of extracted materials, such as quarry materials and sand and gravel. In particular, rail alternatives should be vigorously explored for OMYA Corporation which currently uses US Route 7 for the shipment of material". The plan also states, under "Promotion and Marketing": "Rail freight service should be investigated in the economic development plans for the region. Incentives should be provided for the use of rail freight by local industries… Opportunities should be investigated for the transfer between rail and truck modes. Rail siding locations may be suitable for intermodal freight transfer." In Chapter 5 (Economy), one of the Plan's "Recommended Actions" is to "Support improvements to and expansion of the rail system in Addison County including…" construction of a rail spur from the quarry to the mainline. As such, the proposed RS-1 rail spur is consistent with the Regional Plan.

4.2.4.3 Alternative TR-1

Alternative TR-1 would be consistent with local and regional plan goals relating to economic development and freight shipment by rail, but unlike the rail spur alternative, is not explicitly supported by the plans. Both the Middlebury Town Plan and Addison County Regional Plan make reference to rail spur alternatives, as described above.

4.2.5 Summary and Mitigation of Social and Economic Impacts

Table 4.2-4 summarizes the socio-economic impacts as set forth in the preceding paragraphs.

The principal social and economic impacts and the possible mitigation measures (where warranted) are:

- *Economic Development*: Heavy truck traffic in Brandon Village associated with the No Build Alternative adversely affects the village's aesthetic and therefore its economic environment. The build alternatives would positively affect Brandon's economic environment. Impacts to property access may be mitigated by constructing access (such as farm crossings) across the new alignments, if warranted.

- *Employment:* The RS-1 Alternative and the TR-1 alternative would both result in the loss of trucking and other jobs, ranging from 18 for TR-1 to 62 jobs for RS-1, including indirect job losses. Some of these losses may be partially offset by an improved investment climate generated by the removal of Omya trucks from US 7. This is particularly likely in downtown Brandon, whose investment climate is generally perceived as being negatively impacted by Omya trucking. There may be jobs created at facilities of other shippers that may use the transload facility under these alternatives. Measured at the regional economy's level, these job losses will be negligible in an economy that supports 13,000 jobs. No mitigation is proposed.

Table 4.2-4 Summary of Social and Economic Impacts

Factor:	**No Build**	**Rail Spur Alternative (RS-1)**	**Truck To Rail Alternative (TR-1)**
Population	No measurable impact	No measurable impact	No measurable impact
Economic Development	Some negative impact generally along the US 7 corridor. Negative impacts in downtown Brandon. Possible negative impact on Omya.	Positive impact on Brandon Village. Potential positive impact on Omya. Possible disruption of farming activities due to acquisition and access to farm fields.	Positive impact on Brandon Village. Potential positive impact on Omya. Possible disruption of farming activities due to acquisition and access to farm fields.
Employment			
Trucking jobs in 2030	45	0	23
Rail Jobs	0	4	4
Transload Jobs Increase	0	0	6
Total Direct Jobs	45	4	33
Indirect Jobs*	23	2	17
Total Regional Jobs Supported	*68*	*6*	*50*
Acquisition and Relocation	No impact	Portions of 16 parcels would be acquired, totaling approximately 53 to 59 acres of acquisition, depending on option. No relocation anticipated. Compensation for acquisitions and severance damages likely.	Portions of 14 parcels would be acquired, totaling approximately 49 acres of acquisition. No relocation anticipated. Compensation for acquisitions and severance damages likely.
Land Use Planning	Inconsistent with Middlebury and Brandon Town Plans and Addison County Regional Plan, which support rail spur.	Mostly consistent with Middlebury and Brandon Town Plans and Addison County Regional Plan.	Mostly consistent with Middlebury and Brandon Town Plans and Addison County Regional Plan.

** Calculated at 50% of direct employment impact (1.5 regional employment multiplier)*

- *Land Acquisition:* Portions of an estimated 16 parcels would be acquired for RS-1, including approximately 55 acres for the preferred alternative. An estimated 14 parcels and 48 to 50 acres would be acquired for TR-1. Landowners would be compensated, at fair market value, for the land taken and for any "uneconomic remnants" (portions of property which would have little or no value or utility to the owner following acquisition). The acquisition program will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, without discrimination.

- *Land Use Planning*: The Addison County Regional Plan, the Middlebury Town Plan (2007) and the Brandon Town Plan (2002) all cite either limiting truck traffic or, more specifically, utilizing rail to move materials from the Omya quarry to Florence. The project substantially conforms with the Middlebury Town Plan but is inconsistent in the following two areas. First, "supplementary compensation" and "additional mitigation" as described in the Town Plan are not being proposed in addition to just compensation for acquired properties. In addition, there may be some town responsibilities for maintaining the bridge at Lower Foote Street.

  No mitigation is proposed.

4.2.6 Public Lands and Recreational Resources

Impacts to public lands and recreational resources may be regulated through Section 4(f) and Section 6(f), as described in Chapter 3. Section 4(f) regulates "use" of the resource, which may include acquisition, alteration, or other direct effects on the resource. Section 4(f) is addressed in Chapter 5.

4.2.6.1 Impacts

No Build

There are no public lands that would be directly affected by the No Build.

RS-1

There are no public lands within the RS-1 corridor. As discussed in Section 3.2.5, RS-1 would cross a private (but publicly accessible) snowmobile trail between US 7 and Halladay Road. RS-1 would be at least 15 feet below the elevation of the trail. In addition, the Halladay Road Relocation Option would cross the snowmobile trail again on the relocated Halladay Road.

TR-1

There are no public lands within the TR-1 corridor. TR-1 would cross the private snowmobile trail, and would be about 10 feet below the elevation of the trail at the crossing.

4.2.6.2 Summary and Mitigation of Impacts to Public Lands and Recreational Resources

No public lands would be affected by the project. Therefore, no mitigation is warranted. However, consideration may be given to maintaining the integrity of the private recreational trails during the design process, within the parameters of the project's cost and design constraints.

4.3 Visual Resources

This section describes potential visual impacts of project alternatives.

4.3.1 Impact Assessment Methods

Visual impacts associated with the proposed Middlebury Spur would be generated primarily by the introduction of a new rail spur or the combination of a rail spur and dedicated truck to rail roadway. The first step in evaluation of these impacts is determining the degree of contrast the change creates to the existing landscape. Factors such as land use, land form, and vegetation are taken into consideration, as well as viewing distance and the extent, angle, and duration of views. The scenic quality of the landscape in which the changes would be seen is also an important factor in the evaluation of impacts. (Views with high "scenic quality", as defined in Section 3.3, are generally those with a high degree of landscape diversity, and with little or no landscape degradation.) Consideration also needs to be given to the visual impact of the introduction of trains, trucks, and other mobile equipment that are part of each alternative.

Several methods have been employed in the evaluation and comparison of potential visual impacts. To understand what post-construction conditions would look like, aerial orthophotos, conceptual design plans, and existing survey information were all closely studied. Field visits were conducted and viewpoint locations (i.e., locations of primary visual access to the proposed alternatives corridor, where visual impacts might occur) were documented with photos, global positioning system (GPS) locational data, and field notes. Finally, in order to fully understand the visual implications of the proposed alternatives, photo-realistic images of post-construction conditions were created using a three-dimensional computer model of the proposed improvements. The alternatives and options simulated were those presented in the DEIS. While RS-1 alignments and options have been modified since that time, the difference in their visual appearance are believed to be negligible, so the photo-simulations are the same as presented in the DEIS. The locations of viewpoints and photo-simulations are shown in Figures 4.3-1 through 4.3-3. Existing conditions and corresponding photo-simulations are shown in Figures 4.3-4 through 4.3-40.

To best portray the visual analysis and conclusions of the visual impacts, each component of the spur will be discussed in relation to a road crossing, similar to the description of the existing conditions in Chapter 3. However, it is first important to understand the visual impact associated with the vehicles and activities associated with each alternative.

4.3.2 Visual Impacts of Vehicles and Activities

4.3.2.1 No Build Alternative

The No Build Alternative involves no changes to current freight transportation activities, other than growth or other changes independent of this project, in the project area. Movement of heavy trucks carrying marble along US 7, through Brandon Village, and along local roads would continue. This traffic has generated concerns over air, noise, and vibration impacts (see Sections 4.4 and 4.5 below) and the general aesthetics of Brandon Village in particular. These conditions would continue and could get worse as more or larger trucks are allowed to travel through the Village.

4.3.2.2 RS-1

To best understand the visual impact of RS-1 and TR-1, they must be understood in terms of their active, working states. Both of the build alternatives would have train and truck traffic and other associated activities.

Alternative RS-1 would include construction of a rail spur from the existing mainline railroad, west of Otter Creek, to the marble quarry, east of US 7. It is anticipated that this alternative would involve two trains per day or four one way trips in both 2010 and 2030. Loading of materials from the quarry would happen within the existing quarry where similar activities are in current operation. A transload facility would be constructed south of the quarry for the loading and unloading of materials from other regional businesses. Initial shipments from these other businesses are expected to amount to five rail cars per week, initially increasing to ten per week in 2030. There would be a major reduction of truck traffic entering and exiting US 7 at the curb cut of the existing quarry access road. Currently, Omya's Act 250 permit allows for 115 truck round trips per day to and from the quarry. Other businesses utilizing the transload facility would utilize the access road to deliver and receive goods and materials there.

The introduction of two trains per day (four one way trips) would be considered infrequent and take up a small portion of each day when viewed from locations along the proposed rail spur. Train activity would likely occur between the hours of 9 AM and 9:10 PM, Monday through Friday (and Saturday by 2030). The infrequency of trains would only result in occasional visual and audible impacts from the RS-1 alternative. The locations of quarry loading operations and the transload facility are such that they would not produce adverse visual impacts. The general perception of the RS-1 alternative would be that of a predominantly dormant track.

4.3.2.3 TR-1

In Alternative TR-1, a truck to rail roadway would be constructed connecting with the existing quarry access road midway between Lower Foote Street and US 7, and continue west to a transload facility that would be constructed east of Otter Creek and the adjacent floodplain. From the transload facility a short rail spur would then head west and connect with the mainline railroad in the same configuration as the RS-1 alternative.

For the rail portion of this alternative, the same scenario of two round trip trains per day are expected as the frequency in both 2010 and 2030, with no additional trains needed to ship goods and materials of other surrounding businesses. The quarry access road would be disconnected from US 7, although traffic on Lower Foote Street and/or Halladay Road would be likely to increase from other businesses bringing materials to the transload facility.

In 2010, the number of trucks transporting materials from the marble quarry to the transload facility on the truck to rail roadway is expected to be approximately 138 round trips per day, 5 days per week (6 days per week in 2030). As with RS-1, the material would be accommodated by the two trains per day carrying Omya's marble shipments. Trucks would transport materials between the hours of approximately 7 AM and 5 PM, Monday through Friday (and Saturday in 2030). This would translate to an average of one truck every two to three minutes in 2010 and 2030. Other shippers using the transload facility could result in additional truck traffic, assumed to be 5 trucks (round trips) per day in 2010 and 10 per day in 2030.

The location of the transload facility would introduce a new activity into that area. The facility would be much larger than the transload facility proposed in the RS-1 alternative because it would also need to accommodate shipments of marble from the quarry. Trucks would unload material, and front end loaders would load the material onto the trains. In addition, a new residential development is under construction as of 2008 just north of the transload facility, so the TR-1 facility would ultimately be closer to residences than the RS-1 transload facility.

The frequency of truck trips would contribute to the overall visual impact of the TR-1 alternative. Trucks would be a relatively constant element during times of operation and viewing of their movement within the landscape would increase the visual prominence of the proposed truck to rail roadway in the TR-1 alternative. Activities associated with the transload facility would also add to the visual impacts. The activities and associated noise would draw attention to the facility.

4.3.3 Visual Impacts of Infrastructure

The following section is organized according to road crossings, which provide the primary viewpoints of the proposed project. Alternatives RS-1 and TR-1 are described separately under each road crossing section.

4.3.3.1 No Build Alternative

The No Build Alternative does not involve any changes to existing infrastructure, so there would be no new project-related impacts. Existing infrastructure may have visual impacts, and other independently planned improvements along the roadway corridors may affect the visual environment.

4.3.3.2 Lower Foote Street

RS-1

Two options have been developed for the rail spur (RS-1) crossing of Lower Foote Street. (See Figures 4.3-4 through 4.3-8.)

In the first option, through traffic on Lower Foote Street would be cut off. The north section would terminate at the existing quarry access road, and the section south of the proposed alignment, north of Cady Road, would terminate in a cul-de-sac. The second option would retain through traffic by constructing a bridge over the rail spur.

North of the Lower Foote Street intersection, with the RS-1 alignment, land uses are predominantly industrial and agricultural, including the Standard Register Building, now Connor Homes (to the far west, fronting US 7), VNAP, open fields, and the Omya quarry to the east. South of the proposed alignment, land use is primarily composed of agricultural fields; there are also three residences north of the intersection with Cady Road and Foster Motors (again fronting US 7), which may have views into this area. The industrial uses to the north are visually compatible with the proposed railroad. More concern is given to potential visual impacts from the perspective of the residential uses south of the project.

West of Lower Foote Street, the proposed rail spur would run within a deep cut, crossing under US 7. It would continue to run in an excavated channel to a point east of Lower Foote Street, where the rail spur would turn north towards the Omya quarry, transitioning to the top of a four-to-six foot tall fill section. Views of the rail, and also the trains, would be largely screened due to the deep cut within which the rail line would be sited. Of more concern would be views of the rail as it transitions from the cut onto the fill section further west. Views from residences near Cady Road, however, would be blocked by a height of land located between the residences and the rail. Figures 4.3-4 and 4.3-5 help to illustrate the potential changes associated with RS-1 in this area.

The most apparent change would be the removal of a section of trees from a forest stand east of Lower Foote Street and south of the access road. The difference in visual appearance of the project between the Halladay Road Relocation Option and the Grade Separated over Halladay Road Option is that travelers proceeding north and south on Lower Foote Street would be in direct proximity to the rail spur when crossing the bridge, with brief exposure to views down the length of the proposed cuts. Views would be similar to those represented in Figures 4.3-7 and 4.3-8, looking northeast from US 7 along the proposed RS-1 alignment.

Effectively, visual impacts in the vicinity of Lower Foote Street would be minimal, due to the siting of the rail line to pass under US 7. Areas that may have greater visual impacts are limited to views directly into the cut.

TR-1

In the truck-to-rail alternative (TR-1), improvements begin to the west of the intersection of Lower Foote Street; therefore no visual analysis of this intersection was completed for TR-1.

4.3.3.3 US 7

US 7 is the most heavily used resource in the project area that would have unobstructed views of the project. The *2007 Middlebury Town Plan* (page 77) cites the “critical importance of preserving the attractiveness of the entrance to Middlebury.” In the build alternatives, a grade-separated crossing would occur where the proposed alignments cross US 7. Either the proposed rail spur in RS-1 or the truck to rail roadway in TR-1 would pass beneath US 7, with the RS-1 crossing slightly to the south of the existing quarry access road, retaining the access road. The TR-1 alignment would utilize the existing access road, and remove the curb cut onto US 7. However, there are several options for RS-1 and TR-1 that would create differences in the visual appearance.

4.3.3.3.1 US 7: North or South Approach

Similar to views from Lower Foote Street, a large extent of the proposed improvements would be screened from travelers approaching the alignments due to the fact that they would be concealed in a deep cut. As illustrated in Figures 4.3-9 (existing conditions) and 4.3-10 (proposed conditions), looking north up US 7, little of the RS-1 alternative is visible due to the oblique angle of the view. There would be additional guide and bridge railings, which would have minimal effect on the visual appearance of the crossing. Views from over 800 feet north or south of the alignments would have a similar appearance for both alternatives.

Approaching the proposed crossing, the visual change to the landscape becomes much more apparent. For a relatively short distance (approximately 600 to 800 feet to either side of the crossing along US 7), extended views of the project would be possible. The relatively deep cuts in this section would be noticeable and would not fit in well visually with the adjacent landscape.

4.3.3.3.2 US 7: Views toward Lower Foote Street

As travelers pass the crossing, there would be direct views down the alignments into the cuts, including views west to Lower Foote Street.

RS-1

Figure 4.3-6 shows existing conditions, and Figures 4.3-7 and 4.3-8 simulate proposed conditions, looking northeast along the RS-1 alternative toward Lower Foote Street. Both options for Lower Foote Street are shown to allow consideration of these options as they would be most visible from this location. There is low-to-moderate quality of the existing view to the northwest from this location, which is further compromised by the adjacent industrial and commercial development. The views represented in the Figures 4.3-7 and 4.3-8 are also at an angle close to 90 degrees from US 7, a view not within the driver's typical cone of vision.

Although the view resulting from the addition of RS-1 would result in a substantial change, the visual results do not appear to present a diminished visual quality. It should be noted that the mature vegetation that breaks the horizon line to the north of the cut for RS-1 is shown as being retained. This and other measures to minimize visual impacts are discussed below in Section 4.3.5.

TR-1

Views to the northeast for Alternative TR-1 would be similar to those represented in RS-1; however, any impacts would be reduced, since the proposed roadway in TR-1 would be replacing the existing quarry access road. Changes would also be limited to a short section of new road, as the proposed truck roadway would connect with the existing access road midway between US 7 and Lower Foote Street.

4.3.3.3.3 US 7: Views to the West

Views west of US 7 have a slightly higher level of visual quality compared with views to the east. This can be attributed to the composition of agricultural remnants, the historic farm house on Halladay Road, a stand of mature vegetation to the south, and the layered ridges in the distance. A curve in the alignments west of US 7 also allows for more revealing views of proposed changes. Travelers proceeding north would be provided with the best vantage point. This particular view would be possible for only a very brief duration. The five different options at Halladay Road also create a varying degree of visibility, based on differences in post-construction elevations and positioning. A series of simulations from Viewpoint 10 have been created to best illustrate and assess the visual changes for views to the west from US 7. (The locations of all viewpoints are shown on Figures 4.3-1, 4.3-2, and 4.3-3.)

RS-1

The three options associated with the RS-1 crossing at Halladay Road create a varying degree of change on the landscape as perceived when viewed from Viewpoint 10 (Figures 4.3-11 through 4.3-16). While the rail would not be visible directly adjacent to US 7 from this vantage point, it would become visible as the alignment curves prior to crossing Halladay Road and transitions from being located within an excavated cut to the top of a fill embankment. Figure 4.3-11 shows existing conditions from this viewpoint. Figure 4.3-12, which simulates the Grade Separated over Halladay Road Option shows the option with the highest proposed elevation, designed to allow clearance for vehicles traveling on Halladay Road. The result is slightly more visibility of the rail compared to the RS-1 At-Grade with Halladay Road (Figure 4.3-13) and Halladay Road Relocation (Figure 4.3-14) Options, in which the rail line would be built at lower elevations. The Halladay Road Relocation Option introduces a new section of road that would alter access to Halladay Road south of the crossing by diverting traffic directly to US 7. Visually, this creates the most noticeable change to views from US 7. The proposed road would essentially parallel the RS-1 alignment and create a new curb cut onto US 7 just south of the crossing.

TR-1

The alignment of Alternative TR-1 differs from RS-1 because the location of the crossing under US 7 shifts to the north and the orientation of the proposed truck road west of US 7 helps to screen views. The two Halladay Road options for TR-1 include an At-Grade with Halladay Road crossing and a Grade Separated over Halladay Road option. In both options, a small intervening hill would block views to the alignment from Viewpoint 10, in contrast to the views allowed in the RS-1 alternative. Visibility of TR-1 will be most obvious as travelers proceed over the bridge, where views directly down the alignment will be possible. From Viewpoint 10, only an obscure view of the embankment created by the cut would be visible (Figures 4.3-15 and 4.3-16).

4.3.3.4 Halladay Road

The crossing at Halladay Road and adjacent areas contains the greatest number of proposed options. This is in part due to the conditions that need to be addressed at this location, including changes in elevation, continued connection of Halladay Road, and concerns about visual prominence of the project. There are four to five residences in close proximity that will have views of the project, one of which is on the State Register of Historic Places and is eligible for the National Register (see Section 3.11).

4.3.3.4.1 Views North and South Along Halladay Road

RS-1

The difference in the proposed elevation of the tracks in each of the three options at the Halladay Road crossing will produce a varying degree of visual change in the landscape. The existing conditions from Viewpoints 13 and 14 are shown in Figures 4.3-17 and 4.3-20, respectively. Simulations from Viewpoints 13 and 14 have been prepared to illustrate views looking both south and north along Halladay Road. Views from the historic house on the west side of Halladay Road just north of the alignment (see Figures 4.3-30 through 4.3-37) are discussed in more detail in Section 4.11.

The *RS-1 Grade Separated over Halladay Road Option* involves a new bridge over Halladay Road. The bridge, although only in a conceptual design stage, would be simple in design and would not dominate the view (Figures 4.3-18 and 4.3-21). The roadway's drop in elevation diminishes the dominance of the bridge in either views, from the north or south. The rail line would be built at the highest elevation of the options under consideration, and on either side of the bridge would run on considerably high fill sections.

In the *RS-1 At-Grade with Halladay Road Option*, the rail would cross Halladay Road close to the existing grade. This option was simulated from Viewpoint 14 (Figure 4.3-22). The rail would be sited at the lowest elevation of all the RS-1 options, and would include the addition of crossing signals and gates. The At-Grade with Halladay Road Option would create the least amount of visual disturbance, although the addition of crossing gates and lights would detract from the visual appearance along Halladay Road.

The *RS-1 Halladay Road Relocation Option* includes a cul-de-sac at the proposed terminus of the northern section, and for the southern section, a new segment of road would turn towards the northwest as shown in Figure 4.3-23. The rail line is shown at a slightly higher elevation than that of the At-Grade with Halladay Road Option, as illustrated in the simulations from Viewpoint 14, but is substantially lower than the Grade Separated over Halladay Road Option (Figure 4.3-21). Figures 4.3-18 and 4.3-19 from Viewpoint 13 show the difference in elevations between the Halladay Road Relocation and Grade Separated over Halladay Road Options. The new section of roadway that would connect with US 7 would be highly visible and less attractive than the existing view. The red house as shown in Viewpoint 13 would have additional visual impacts, as the road would run directly north of the house, through currently open fields.

In summary, the introduction of either an elevated or at-grade crossing, or the disconnecting of Halladay Road, would all result in obvious changes to the landscape. The most intrusive of the options would be the Grade Separated over Halladay Road Option, due to the mass of an overpass bridge and the elevated height of the rail line passing over Halladay Road. In review of the simulations illustrating the bridge options, however, the visual change is not shocking, and the degree of contrast with the surrounding landscape is not severe.

TR-1

Two options have been proposed for the truck-to-rail Alternative. The first would be the *Grade Separated over Halladay Road Option* (Figure 4.3-24) that would be similar to the RS-1 Grade Separated over Halladay Road Option. Differences would include the addition of guard rails on TR-1 and substantially increased width to accommodate two travel lanes. Fill sections would still be necessary on either side of the proposed bridge to bring the alignment to an elevation allowing required clearance for vehicles on Halladay Road. The natural valley where the alignment is sited helps diminish the prominence of the proposed bridge.

The *At-Grade with Halladay Road Option* would introduce a new vehicular intersection with Halladay Road. It is anticipated that the truck to rail roadway would be required to stop and yield to traffic on Halladay Road. The visual effect of the TR-1 At-Grade with Halladay Road Option provides the least disturbance to the visual landscape as shown in Figure 4.3-25. However, consideration should be given to the visual prominence and frequency of either trucks or trains.

As with RS-1, the elevated and at-grade crossings would both result in obvious changes to the landscape, but the most intrusive option would be the grade separated option. However, the simulations show that the visual change is not shocking, and the degree of contrast with the surrounding landscape is not severe.

4.3.3.5 Creek Road and Otter Creek

One of the more obvious changes to the landscape would be a rail trestle introduced on the western end of the project; the trestle would cross the low-lying fields east of Otter Creek, the creek itself, additional fields on the west side of the creek, and then connect with the existing railroad. Both RS-1 and TR-1 would have trestles in this area, although the trestle alignment and structure have been modified since publication of the DEIS. The rail trestle would be mostly viewed by travelers on Creek Road and recreational users of Otter Creek. The simulations described below are based on the DEIS trestle alignment and structure. The modifications would have a negligible effect on visual impacts.

Two simulations from Creek Road were produced to represent views of the trestle. The first simulation from Viewpoint 17 is approximately 600 feet from the crossing of Creek Road and helps illustrate the scale of the trestle as travelers would approach at a relative close distance from the north (Figures 4.3-26 and 4.3-27). The second simulation, from Viewpoint 20, is over 1,000 feet from the proposed alignment and allows a full view of the extent of the trestle east of Otter Creek (Figures 4.3-28 and 4.3-29).

The trestle would be approximately 2,050 feet long and transition to the ground east of Creek Road where the land rises out of the floodplain. The majority of the trestle would likely be reinforced concrete on piers, with the exception of the span over Otter Creek, which would most likely be a through plate girder bridge.

While intrusive to the landscape, there are many elements that help to tie the trestle to the landscape. This area is designated as the Flood Hazard District as per the town’s Land Use District map. Development is not allowed in this area immediately east of Otter Creek and it is likely agricultural practices will remain. The industrial nature of the trestle may be seen as compatible with the farm complex to the south in both of these views, although others may view it as incompatible.

The placement of the creek crossing also helps minimize visual impacts. The bridge will cross Otter Creek at a section that has a sharp right bend just north of the trestle and another bend just south of the crossing. There is also mature vegetation along most of the creek banks through the study area. The positioning of the crossing in combination with the existing vegetation would greatly reduce any distant views of the trestle for users on the creek.

4.3.3.6 Middle Road North

Another area that was investigated to assess potential visual impacts is located halfway between Halladay Road and Creek Road. Viewpoint 31, taken to document this area, is within close proximity to Middle Road North, a Class 4 town road. However, the road is nearly undetectable near this viewpoint and is mainly utilized as a snowmobile trail in the winter. This viewpoint was analyzed because the property north of the alignments is under construction as of 2008 as a residential mixed-use subdivision, with future plans to further subdivide and develop the property. The proposed transload facility in alternative TR-1 would also be on the southern fringes of this property.

The area (see Figure 4.3-38) primarily consists of open agricultural fields, some of which appear not to have been cultivated for several years. A dense forest stand exists east of viewpoint 31. Open fields to the south and east allow for views to the farm complex located along Creek Road, also seen in the in the simulations created from Creek Road. Simulations were created from Viewpoint 31 looking southwest depicting conditions for both the RS-1 and TR-1 alternatives (Figures 4.3-39 and 4.3-40).

RS-1

For the RS-1 alternative, the Grade Separated over Halladay Road Option at Halladay Road was used to model the proposed rail in the simulation. All of the options at Halladay Road would have a similar appearance in this location as the grades transition back to existing, although each would have minor differences. The tracks would run close to existing grade through the extent of the view shown in Viewpoint 31, as opposed to the large embankments shown in simulations from the Hathaway residence. The spur would transition onto the trestle further west.

The rail spur would be visible (Figure 4.3-39) but would comprise only a small portion of the view. The rail line would be located in the middle of the fields to the south and west and would not impede the existing character of the view. Views to the trestle in the west are blocked by intervening hills and vegetation. Other views within this general area would most likely allow visibility of the trestle, however the vantage point would be looking down upon the rail line and the structural portion of the trestle would not be predominant. The RS-1 alternative, therefore, results in only minor visual impacts from this viewpoint.

TR-1

For the TR-1 alternative, the transload facility would be located south of Viewpoint 31 (see Figures 4.3-38 and 4.3-40), at the terminus of both the truck to rail roadway and rail spur. The transload facility would contain marble stockpiles, train cars, and equipment necessary for handling materials and loading the train cars. Initially there would be two twenty-car trains kept on rail sidings of the facility to be utilized by Omya and possibly additional cars for other goods and materials. Not included in this view would be a building to service and store locomotives and house an office for the rail operators. The roadway would encircle the entirety of this facility. The transload facility would encompass approximately 2,600 feet east to west and 400 feet north to south.

The combinations of uses and equipment associated with the transload facility would make the TR-1 alternative very prominent through this area. As illustrated in Figure 4.3-40, the storage of trains, stockpiling of marble, and presence of other equipment will block views to the far side of the fields, as shown in the existing conditions photo (Figure 4.3-38). As discussed earlier in this section, the activity during operating hours would add to the visual impacts from the introduction of this facility.

4.3.4 Summary and Mitigation of Visual Impacts

Summary of Impacts

Introduction of either build alternative for the Middlebury Spur project will have some degree of visual impact onto the immediate surrounding areas of the alternatives. The visual impacts would vary through the project area depending on the existing conditions of each area and specific conditions of the build alternative at each location.

Quarry to US 7

In general, impacts to the area from the marble quarry to US 7 would be limited. The presence of scattered development along US 7 and the relative lack of scenic quality in these areas greatly attribute to the lessened degree of visual impacts.

Halladay Road

Further to the west, views from Halladay Road and nearby residences display a higher degree of scenic quality based on the diversity of the landscape. Impacts would have a varying intensity, depending on the options for either build alternative. However, the landform in this area allows the alignment to run through a small valley that greatly helps to de-emphasize any of the build options and reduce the degree of visual impacts. Options to bridge over Halladay Road would result in greater impacts and increase the visual prominence of proposed conditions west of Halladay Road. This area would have an elevated degree of visual impact compared to existing conditions.

East of Otter Creek

Impacts to the area east of Otter Creek would differ greatly between the RS-1 and TR-1 alternatives. The addition of a rail spur seems to present minimal visual impacts, however the addition of the TR-1 transload facility would result in substantially greater impacts. The TR-1 alternative would add an industrial activity and visually prominent facility into an area that exhibits a quiet and rural character. The activity and visual prominence would create an obvious change to the landscape and would result in substantially higher degrees of visual impact compared to existing conditions or the RS-1 alternative.

Creek Road and Otter Creek

Otter Creek appears to be the most valuable natural and recreational resource along the proposed route of either alternative. A trestle would cross both the creek and surrounding floodplains and would be similar for RS-1 and TR-1. The introduction of a trestle through the agricultural fields east of Otter Creek would create a potential visual impact on existing views. However, the repetition of piers, rail segments, and train cars (when present) do mimic the repetition of farm fields, and certain aspects of farming activities are not out of character with the proposed rail spur. Recreational activities, including fishing and canoeing, are evident through this stretch of Otter Creek. The style and materials of the span crossing the Creek will create a change to the landscape, but the trestle will be similar to other farm structures that are adjacent to the creek in this general area. There is not a sense of remoteness through this stretch of the creek, and the surrounding area exhibits the character of rural agricultural development. Additionally, the crossing is located in a short stretch between bends that will avoid extended views when navigating the creek. Visual impacts would be minimal at the crossing of Otter Creek.

Mitigation

To help offset visual impacts, a variety of mitigation practices can be utilized. The following is a list of mitigation concepts that could be implemented for the Middlebury Spur project.

- *Option Modification:* Physical aspects of alternatives (such as the steepness of cut and fill slopes) may be modified to further minimize visual impacts.

- *Landscape Screening*: Plantings, including a mix of evergreen and deciduous trees and shrubs, could effectively eliminate unwanted views of the project or at the least soften views. Strategically placed plants not only block views, but also reorient focus within a view. Proposed plantings should be evaluated at each specific area where appropriate.

- *Retention of Vegetation:* Many times excessive clearing can be a cause of visual prominence of a project. Although the majority of this project runs through open fields, there are a few specific locations within the project area where careful planning and the implementation of tree preservation methods could reduce and save existing vegetation and help reduce visual impacts. An example of this would be where the rail spur crosses Otter Creek.

- *Landform*: Due to the large amount of soil removal necessary to bring either alternative under US 7, manipulation of the existing topographic configurations are a potential means of mitigation. This could include berms to help block views of the project, including locations near the US 7 crossing. It could also include softening slopes along the side of embankments of elevated alignments, such as west of the Halladay Road crossing. These elements should not result in an artificial appearance, but should create natural forms that will blend with the landscape.

- *Design Features:* Project elements can be designed so they are more visually compatible with the landscape. For example, the bridge over Otter Creek could be constructed as a through plate girder structure and could utilize weathering steel that would rust initially to provide a protective coating and would not need painting. The rusted appearance of the bridge would help blend the structure into the rural setting of the area. The final design process would involve a public process and opportunities for public input into design elements.

4.4 Air Quality

This section describes the estimated air quality impacts of the project alternatives. The potential air quality impacts of the project focus only on the emissions from trucks, freight rail locomotives, and front-end loaders. The project alternatives differ from each other in the amount of operational activity by each of these components. Since the region is classified by the EPA as in attainment for all criteria pollutants, the Transportation Conformity Rule (40 CFR Part 51 Subpart T and Part 93 Subpart A) and its air quality requirements do not apply to the project. However, for the purpose of comparing impacts in this DEIS, the project-related emissions for each of the alternatives have been assessed. Since the project will not increase street traffic congestion in the project area, a localized hotspot assessment - typically conducted for congested intersections in CO nonattainment areas - is not included in the air quality analysis.

The air quality analysis consists of a regional impact assessment based on emission inventories. The region is defined as the project corridor for purposes of the air quality analysis. The emissions evaluations were conducted for the future No Build Alternative, and the two build alternatives, RS-1 and TR-1. All of the alternatives were evaluated for the year 2010 and the project design year of 2030. Emissions were assessed for Omya-related operations and for other potential shippers that may use the proposed rail spur, truck access road, and/or transload facility. Although there are no commitments at this time, a modest amount of operations from other shippers have been assumed for each of the build alternatives.

The analyses were performed in accordance with guidance issued by the EPA, FHWA, and VANR DEC's Air Pollution Control Division (APCD). The remainder of this section describes the methods and results of the air quality analysis.

4.4.1 Emissions Inventory Methods

Emission inventories estimate the quantities (in mass units) of pollutants emitted over a given time period, and provide information about contributions from various sources. Emissions are estimated by multiplying emission factors by source activity levels. An emission factor is the emissions from a single source for a unit of time or distance (e.g., grams of nitrogen oxides per vehicle-mile-traveled). The source activity for such a factor would be the number of vehicle-miles-traveled (VMT) by roadway segment in a given time period, such as one day.

The emission inventories were developed for Omya and other shippers' truck traffic, freight rail locomotives, and front-end loaders. The emission inventories were prepared in accordance with guidelines issued by APCD and EPA. Because Ultra-Low Sulfur Diesel (ULSD) will be in use by 2010 for both highway vehicles and non-road engines, the use of ULSD was accounted for in the modeling.

Trucks

The emission factors that were used to estimate the emissions from the trucks were calculated using the EPA MOBILE6.2 program. The specific MOBILE6.2 input values were developed from APCD data. All trucks were assumed to be diesel-powered and to have gross weights of greater than 60,000 pounds, corresponding to the FHWA/EPA classification HDDV8B in MOBILE6.2. The exact age of the trucks that Omya would use is not certain, therefore the composition of the truck fleet by model year was assumed to be the same as the EPA national average data (MOBILE6.2 default values).

It is expected that by 2010, Omya shipments will reach the capacity of the current processing plant (approximately 1,000,000 tons per year), which is equivalent to the limit of truck shipments in their Act 250 permit, or 115 round trips per day. By 2030, an additional 20% increase in the volume of Omya shipments is assumed reasonable. Shippers other than Omya are assumed to ship the equivalent of 5 rail cars per week in 2010 and 10 rail cars per week in 2030 in each of the build alternatives. The number of other shippers' trucks accessing the rail spur or transload facility is assumed to be equal to 5 trucks per rail car, or 25 truck round trips per week in 2010 and 50 trucks per week in 2030. Table 4.4-1 shows the truck activity levels for each of the alternatives.

Emissions from trucks were calculated for each roadway segment along the truck routes by multiplying the projected number of daily truck trips (two-way volumes) on the segment by the distance traveled (roadway segment length) to calculate daily VMT. The daily VMT were multiplied by the number of operating days per year to calculate annual VMT. The annual VMT were then multiplied by the MOBILE6.2 emission factor for the average truck speed on that roadway segment, to yield the emissions for each segment. The emissions for each segment were summed to yield the average annual emission inventories.

Locomotives

Emissions from diesel-fueled freight rail locomotives were calculated based on projected fleet and operations data in accordance with EPA guidance on emissions inventory preparation. For purposes of emission factor development, for the year 2010, the locomotives are assumed to be the same as those that are currently in use: GP-38-2 locomotives equipped with EMD model 16-645E, 2000 horsepower engines built in 1980. By the year 2030, according to VTR (D. Wulfson, President, pers. comm.), one of the current locomotives will have a re-manufactured engine and a new locomotive will have been purchased.

The applicable EPA emission standards (codified at 40 CFR 92) for locomotives vary according to the engine model year or year of re-manufacture. An EPA study[1] conducted to support the current emission standards was used in conjunction with the year of manufacture or re-manufacture and the type of locomotive engine to determine the applicable emission factors for each of the

[1] *Regulatory Announcement - Final Emission Standards for Locomotives*, United States Environmental Protection Agency Office of Mobile Sources, December 1997; and *Technical Highlights - Emission Factors for Locomotives,* United States Environmental Protection Agency Office of Mobile Sources, December 1997.

Table 4.4-1 Forecast Activity Levels for Project-Related Equipment

Description (Unit)	2010			2030		
	No Build	RS-1	TR-1	No Build	RS-1	TR-1
Trucks						
Omya Volume (round trips/day)	115	0	138	138	0	138
Other shippers' Volume[1] (round trips/day)	0	5	5	0	10	10
Route (start and end points)	Quarry, plant	n.a.	Quarry, transload facility	Quarry, plant	n.a.	Quarry, transload facility
Operating Days per Year	300	250	250	300	250	300
Trains						
Volume (round trips/day)	0	2	2	0	2	2
Route (start and end points)	n.a.	Quarry, plant	Transload facility, plant	n.a.	Quarry, plant	Transload facility, plant
Locomotives[2] (units/train)	n.a.	2	2	n.a.	2	2
Operating Days per Year	n.a.	250	250	n.a.	300	300
Front-End Loaders						
Volume (number of loaders)	4	4	6	4	4	6
Operating time (engine-on hours/day per loader)	10	12	12	12	12	12
Operating Days per Year	300	250	250	300	300	300

[1]Shippers other than Omya operate trucks 250 days per year for each applicable alternative.
[2] According to Vermont Railway, Inc., the two locomotives in use in 2010 will be GP-38-2 models; by 2030, one of the current locomotives will have a re-manufactured engine and one new locomotive will have been purchased.

locomotives. The EPA support document[2] provides the cycle-weighted power (based on default average time-in-throttle-notch) for line-haul (long hauls on mainline tracks) and switch duty (shorter switching operations) cycles, and weighted emission factors for various locomotive engines, including those expected to be in use for this project. These emission factors were compared to the applicable EPA locomotive emission standards for the years 2010 and 2030.

Since the emission factors were derived from actual locomotive data, they were used for the analysis where appropriate. The emission factors tended to be lower than the emission standards, except for certain emission standards for the year 2030. Where 2030 emission standards were lower than locomotive-derived emission factors, the lower standards were used as emission factors, since locomotives would be required to meet that standard by 2030. The EPA emission factors/standards in grams per brake horsepower hour were converted to units of grams per engine operating hour by using the average cycle-weighted power.

For analysis year 2010, the locomotive engines are assumed to be model year 1980. These engines are subject to compliance with the EPA "Tier 0" emission standards in 40 CFR 92. For analysis year 2030, the new locomotive and the re-manufactured existing locomotive engine are subject to compliance with the "Tier 2" emission standards. The locomotives were assumed to operate according to the duty cycles specified in the EPA guidelines. Locomotives on the proposed rail spur and on the mainline were assumed to operate on the EPA line-haul duty cycle, and locomotives moving cars between the mainline and the Omya Verpol plant in Florence were assumed to operate on the EPA switching duty cycle.

The project-related trains are estimated to make two round-trips per day for 5 days per week in 2010. These shipments are equivalent to the same amount of material shipped by Omya-trucks in the 2010 No Build Alternative. In the 2030 build alternatives, the train shipments will occur 6 days per week, which again is equivalent to the material shipped by the trucks in the 2030 No Build Alternative. As with trucks, the daily locomotive operations levels were used to derive annual operations for the emissions calculations. Based on these assumptions and locomotive emission factors/standards compiled by EPA, emission inventories for locomotives were estimated. Table 4.4-1 shows the train activity levels.

Front-End Loaders and Other Equipment

Omya currently uses two front-end loaders at the quarry to load rock onto trucks. Two front-end loaders are also used at the plant in Florence. For the No Build Alternative and Alternative RS-1, it was assumed that the existing number and types of equipment would continue without change in 2010. For Alternative TR-

[2] *Locomotive Emission Standards - Regulatory Support Document*, United States Environmental Protection Agency, Office of Mobile Sources, April 1998.

1, two additional front-end loaders would be used at the transload facility. Because the loaders will be moving the same amount of material for each of the alternatives in 2010, the engine-on operating time per day is dependent upon the operating days per year. Because the number of operating days per year for the build alternatives is less than the number of operating days for the No Build Alternative, the operating time per day was increased for the build alternatives, since ultimately, the loaders would be moving the same amount of material for each alternative. These same assumptions were made for each of the 2030 alternatives, with the exception that all alternatives would have loading operations occurring 300 days per year. Table 4.4-1 shows the activity levels forecast for the front-end loader operations.

Emission factors for front-end loaders (in grams per engine operating hour) were estimated with the EPA's NONROAD2005 model. The loader makes, model years, and average operating power levels were assumed to be the same as the EPA national average data (NONROAD2005 default values). Total emissions for front-end loaders were calculated by multiplying the emission factors by the total operating hours for the loaders.

4.4.2 Results: Regional Emissions

A summary of the emission inventories is presented in Table 4.4-2, which shows the estimated emissions by pollutant, project alternative, and year.

No Build Alternative

Emissions of VOC, NOx, CO, PM10 and PM2.5 were estimated for the No Build Alternative in 2010 and 2030, and the results are presented in Table 4.4-2. These emissions are from the trucks and the front-end loaders. These relatively low levels of emissions reflect the forecast 115 truck round trips per day, which were estimated for the transport of 1,000,000 tons of material per year. By 2030, the forecast number of truck trips increase by twenty percent to account for the increase of 200,000 tons per year being shipped from the quarry. However, the emissions estimated for 2030 do not show a twenty percent increase, but decrease for all pollutants. Emissions do not increase from 2010 to 2030 because over time older, higher-emitting trucks would be replaced by newer trucks that have lower emission rates as required by the Federal Motor Vehicle Emission Control Program mandated in the CAA. The decreases in average emission rates more than offset the increase in truck VMT from 2010 to 2030.

Alternative RS-1

Emissions of VOC, NOx, CO, PM10 and PM2.5 were estimated for Alternative RS-1 in 2010 and 2030, and the results are presented in Table 4.4-2. Compared to the No Build Alternative in 2010, emissions with Alternative RS-1 increase slightly for VOC and PM but decrease for NOx and CO. This alternative has a complete replacement of the truck operations with trains. The trains will ship the same amount of Omya-related material as in the No Build Alternative plus a modest amount of additional material from other shippers. In 2030, Alternative RS-1 results in slightly higher emissions of all pollutants than with the No Build Alternative. The net emission increases from the No Build Alternative to Alternative RS-1 occur because the locomotive emission rates are relatively high and are forecast to decrease more slowly over time than are the truck fleet emission rates due to less stringent EPA-mandated emission control standards for the locomotives. The decrease in emissions for Alternative RS-1 between 2010 and 2030 is due to the purchase of a new locomotive and the remanufacturing of one of the existing locomotive engines.

Table 4.4-2 Emission Inventories for Project Alternatives

	Total Project-Related Emissions by Alternative In tpy (tons per year)					
	2010			2030		
Pollutant	**No Build**	**RS-1**	**TR-1**	**No Build**	**RS-1**	**TR-1**
Volatile Organic Compounds	1.19	1.59	1.92	0.76	1.07	1.26
Nitrogen Oxides	26.20	25.54	30.30	3.33	13.27	13.41
Carbon Monoxide	6.83	6.15	8.32	0.95	3.29	3.39
Particulate Matter – 10 Microns (PM10)	0.99	1.14	1.43	0.22	0.44	0.45
Particulate Matter – 2.5 Microns (PM2.5)	0.90	1.14	1.42	0.14	0.44	0.44

Alternative TR-1

Emissions of VOC, NOx, CO, PM10 and PM2.5 were estimated for Alternative TR-1 in 2010 and 2030, and the results are presented in Table 4.4-2. This alternative will transport the same amount of material as Alternative RS-1. Compared to the No Build Alternative, emissions with Alternative TR-1 increase slightly for all pollutants, reflecting the replacement of most truck VMT by trains, plus the additional front-end loader operations. Likewise, in 2030, Alternative TR-1 results in higher emissions of all pollutants than with the No Build Alternative. As with Alternative RS-1, these net increases relative to the No Build Alternative occur because the locomotive emission rates are relatively high when compared to the truck fleet emission rates, and because two additional front-end loaders will be put in operation at the new transload facility. Also like Alternative RS-1, the purchase of a new locomotive and the remanufacturing of one of the existing locomotive engines will reduce emissions for Alternative TR-1 between 2010 and 2030.

Compared to Alternative RS-1, Alternative TR-1 results in slightly higher emissions of all pollutants, in both 2010 and 2030. Although train emissions are lower in Alternative TR-1, more truck VMT and the additional front-end loader operations at the transload facility result in the higher overall emissions.

4.4.3 Mobile Source Air Toxics

In accordance with the FHWA's guidelines on air toxics, a qualitative assessment of Mobile Source Air Toxics (MSATs) is also included.

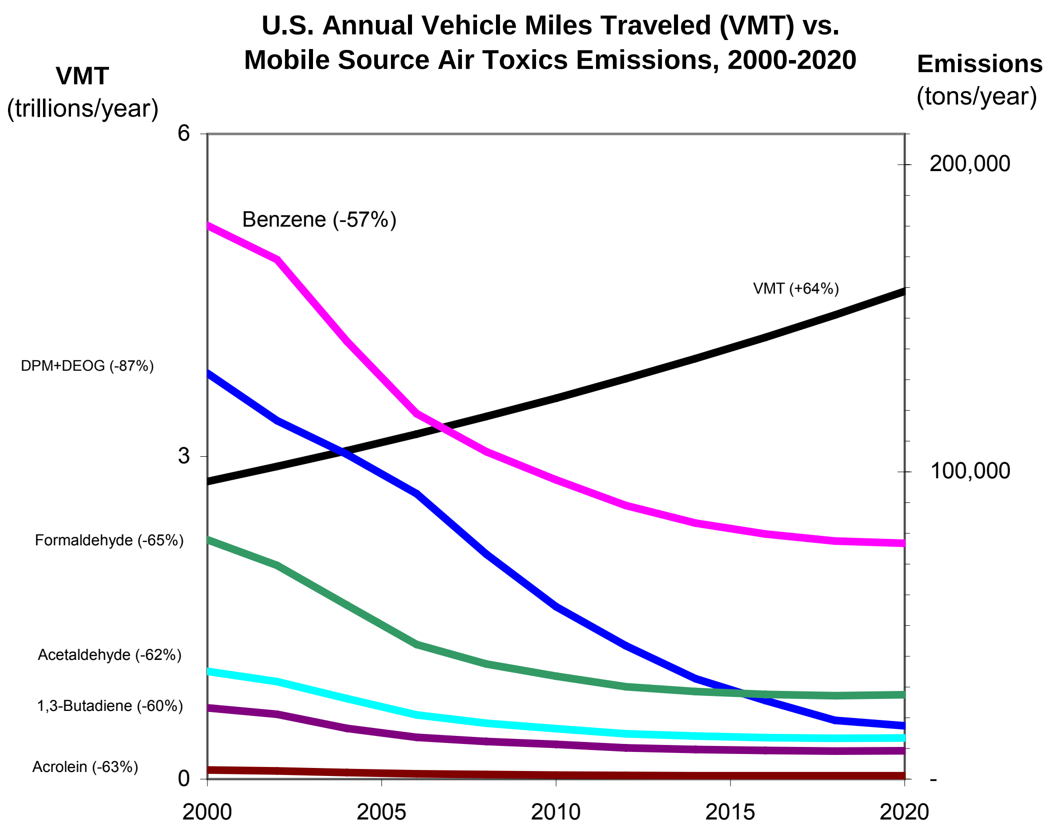
4.4.3.1 Background: Mobile Source Air Toxics and Their Regulation

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. MSATs are a subset of the 188 air toxics defined by the CAA. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries). The MSATs are compounds emitted from highway vehicles and non-road mobile equipment. The EPA currently includes 21 air toxics in its full list of MSATs, and identifies six of those as primary MSATs. The six primary MSATs are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust gases, acrolein, and 1,3-butadiene. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. There currently are no established federal ambient air quality standards for MSATs.

The EPA is the lead Federal agency for administering the CAA and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule (66 FR 17229) on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources on March 29, 2001. This rule was issued under the authority in Section 202 of the CAA. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline program, its national low emission vehicle standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. As shown in the figure on the following page, by 2020, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, acetaldehyde, and diesel PM and exhaust gas emissions, even for those projects that have a VMT increase.

As a result, EPA concluded that no further motor vehicle emission standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full 21 and the primary six MSATs.

Because MSAT science is evolving and there are uncertainties with analyzing MSATs for transportation projects, FHWA's "*Interim Guidance on Air Toxic Analysis in NEPA Documents*" includes language, reproduced and adapted for this project below, that describes the limitations associated with analyzing MSATs for highway projects.



Notes: For on-road mobile sources. Emissions factors were generated using MOBILE6.2. MTBE proportion of market for oxygenates is held constant, at 50%. Gasoline RVP and oxygenate content are held constant. VMT: Highway Statistics 2000, Table VM-2 for 2000, analysis assumes annual growth rate of 2.5%. "DPM + DEOG" is based on MOBILE6.2-generated factors for elemental carbon, organic carbon and SO4 from diesel-powered vehicles, with the particle size cutoff set at 10.0 microns.

Source: Interim Guidance on Air Toxic Analysis in NEPA Documents, FHWA, February 3, 2006.

4.4.3.2 Unavailable Information for Project Specific MSAT Impact Analysis

This EIS includes a basic analysis of the likely MSAT emission impacts of this project. However, technical tools are not available to predict the project-specific health impacts of the emission changes associated with the alternatives in this EIR. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

1. Emissions: The EPA tools to estimate MSAT emissions from motor vehicles are not sensitive to key variables determining emissions of MSATs in the context of highway projects. While MOBILE6.2 is used to predict emissions at a regional level, it has limited applicability at the project level. MOBILE6.2 is a trip-based model – emission factors are projected based on a typical trip of 7.5 miles, and on average speeds for this typical trip. This means that MOBILE6.2 does not have the ability to predict emission factors for a specific vehicle operating condition at a specific location at a specific time. Because of this limitation, MOBILE6.2 can only approximate the operating speeds and levels of congestion likely to be present on the largest-scale projects, and cannot adequately capture emissions effects of smaller projects. For particulate matter, the model results are not sensitive to average trip speed, although the other MSAT emission rates do change with changes in trip speed. Also, the emissions rates used in MOBILE6.2 for both particulate matter and MSATs are based on a limited number of tests of mostly older-technology vehicles. Lastly, in its discussions of PM under the conformity rule, EPA has identified problems with MOBILE6.2 as an obstacle to quantitative analysis.

   These deficiencies compromise the capability of MOBILE6.2 to estimate MSAT emissions. MOBILE6.2 is an adequate tool for projecting emissions trends, and performing relative analyses between alternatives for very large projects, but it is not sensitive enough to capture the effects of travel changes tied to smaller projects or to predict emissions near specific roadside locations.

2. Dispersion. The tools to predict how MSATs disperse are also limited. The EPA's current regulatory models, CALINE3 and CAL3QHC, were developed and validated more than a decade ago for the purpose of predicting episodic concentrations of carbon monoxide to determine compliance with the NAAQS. The performance of dispersion models is more accurate for predicting maximum concentrations that can occur at some time at some location within a geographic area. This limitation makes it difficult to predict accurate exposure patterns at specific times at specific highway project locations across an urban area to assess potential health risk. The NCHRP is conducting research on best practices in applying models and other technical methods in the analysis of MSATs. This work also will focus on identifying appropriate methods of documenting and communicating MSAT impacts in the NEPA process and to the general public. Along with these general limitations of dispersion models, there is also a lack of monitoring data in most areas for use in establishing project-specific MSAT background concentrations.

3. Exposure Levels and Health Effects. Finally, even if emission levels and concentrations of MSATs could be accurately predicted, shortcomings in current techniques for exposure assessment and risk analysis preclude us from reaching meaningful conclusions about project-specific health impacts. Exposure assessments are difficult because it is difficult to accurately calculate annual concentrations of MSATs near roadways, and to determine the portion of a year that people are actually exposed to those concentrations at a specific location. These difficulties are magnified for 70-year cancer assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over a 70-year period. There are also considerable uncertainties associated with the existing estimates of toxicity of the various MSATs, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population. Because of these shortcomings, any calculated difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with calculating the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against other project impacts that are better suited for quantitative analysis.

4.4.3.3 Summary of Existing Credible Scientific Evidence Relevant to Evaluating the Impacts of MSATs

Research into the health impacts of MSATs is ongoing. For different emission types, there are a variety of studies that show that some either are statistically associated with adverse health outcomes through epidemiological studies (frequently based on emissions levels found in occupational settings) or that animals demonstrate adverse health outcomes when exposed to large doses. Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency released the 1999 National Air Toxics Assessment (NATA) in 2006 that evaluates modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris. The following toxicity information for the six prioritized MSATs was taken from the IRIS database *Weight of Evidence Characterization* summaries. This information is taken verbatim from EPA's IRIS database and represents the Agency's most current evaluations of the potential hazards and toxicology of these chemicals or mixtures.

- **Benzene** is characterized as a known human carcinogen.
- The potential carcinogenicity of **acrolein** cannot be determined because the existing data are inadequate for an assessment of human carcinogenic potential for either the oral or inhalation route of exposure.
- **Formaldehyde** is a probable human carcinogen, based on limited evidence in humans, and sufficient evidence in animals.
- **1,3-butadiene** is characterized as carcinogenic to humans by inhalation.
- **Acetaldehyde** is a probable human carcinogen based on increased incidence of nasal tumors in male and female rats and laryngeal tumors in male and female hamsters after inhalation exposure.
- **Diesel exhaust** (DE) is likely to be carcinogenic to humans by inhalation from environmental exposures. Diesel exhaust as reviewed in this document is the combination of diesel particulate matter and diesel exhaust organic gases.

- **Diesel exhaust** also represents chronic respiratory effects, possibly the primary non-cancer hazard from MSATs. Prolonged exposures may impair pulmonary function and could produce symptoms, such as cough, phlegm, and chronic bronchitis. Exposure relationships have not been developed from these studies.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

Some recent studies have reported that proximity to roadways is related to adverse health outcomes – particularly respiratory problems[3]. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable a more comprehensive evaluation of the health impacts specific to this project.

4.4.3.4 Relevance of Unavailable or Incomplete Information to Evaluating Reasonably Foreseeable Significant Adverse Impacts on the Environment, and Evaluation of Impacts Based upon Theoretical Approaches or Research Methods Generally Accepted in the Scientific Community

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. While tools are available to reasonably predict relative emissions changes between alternatives for larger projects, the amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. (As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects.) Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

[3] South Coast Air Quality Management District, Multiple Air Toxic Exposure Study-II (2000); Highway Health Hazards, The Sierra Club (2004) summarizing 24 Studies on the relationship between health and air quality); NEPA's Uncertainty in the Federal Legal Scheme Controlling Air Pollution from Motor Vehicles, Environmental Law Institute, 35 ELR 10273 (2005) with health studies cited therein.

As discussed above, technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. However, even though reliable methods do not exist to accurately estimate the health impacts of MSATs at the project level, it is possible to qualitatively assess the levels of future MSAT emissions under the project. Although a qualitative analysis cannot identify and measure health impacts from MSATs, it can give a basis for identifying and comparing the potential differences among MSAT emissions – if any – from the various alternatives.

For the Middlebury Rail Spur Project, the change in the amount of MSATs emitted between the No Build and build alternatives will be proportional to the change in the amount of VOC and PM emissions. The differences in emissions between the No Build and build alternatives will be due to the removal of a large number of heavy-duty diesel vehicles on the roadways and the addition of train operations and, in Alternative TR-1, the addition of front-end loader operations. These project-related changes result in very slight (less than one ton per year) increases in VOC and PM emissions. As fractions of the total VOC and PM emissions, individual MSAT emissions increases would be much lower. Although the project alternatives may result in slightly increased exposure to MSAT emissions in certain locations, the concentrations and duration of exposures are uncertain, and because of this uncertainty, the health effects from these emissions cannot be estimated.

4.4.4 Summary and Mitigation of Air Quality Impacts

The air quality analysis has demonstrated that both Alternative RS-1 and Alternative TR-1 would increase emissions compared to the No Build Alternative for all pollutants, except for NOx and CO, which decrease with Alternative RS-1 in 2010. Among all project alternatives, Alternative TR-1 results in the highest emissions of all pollutants. Although the project is exempt from State Implementation Plan conformity requirements because it is located in an attainment area for all pollutants, as a general comparison, the minor increases in emissions in the build alternatives are well below their respective General Conformity de minimis threshold levels (40 CFR Part 51 Subpart W and Part 93 Subpart B). For example, the greatest increase in any pollutant emissions among all the alternatives is 10 tons of NOx with the 2030 TR-1 Alternative. The General Conformity de minimis threshold for NOx in a moderate ozone nonattainment area is 100 tons per year. Given the relatively small size of the increases, neither build alternative is expected to result in adverse air quality impacts for the region. No mitigation is necessary for potential air quality impacts. Vermont Railway has expressed an interest in upgrading their locomotive fleet to lower their emissions. However, such an upgrade would not be enforceable.

4.5 Noise and Vibration

A detailed noise and vibration assessment was prepared for the proposed freight rail and highway alternatives, for the year 2004, the year 2010 and the future year 2030 for the No Build and project build alternatives. The project corridor extends approximately 23 miles from the Omya quarry facility in Middlebury, Vermont, to the Omya processing plant in Florence. The noise assessment also evaluated the No Build Alternative for the future years 2010 and 2030 that included an increase in truck operations along US 7 as a result of anticipated growth in the region.

This section describes the evaluation criteria used in the noise and vibration assessment, the modeling methodologies, the basic assumptions used in the noise and vibration impact assessment, a description of the impacted areas, and recommended mitigation measures.

4.5.1 Methods

The noise and vibration analyses were performed in accordance with the methods contained in the FTA's *Transit Noise and Vibration Impact Assessment*[4] guidelines, the FHWA's *Abatement of Highway Traffic Noise and Construction Noise* (23 CFR Part 772, dated 1982; revised 1997), and the VTrans's *Noise Analysis and Abatement Policy* (July, 1997). The FTA methods and criteria were used to assess the noise and vibration levels from the freight rail operations associated with the various project rail alternatives. The FHWA and VTrans methods and criteria were used to assess the traffic noise levels from the increase or decrease in truck operations associated with the various project roadway alternatives. FHWA and VTrans do not have vibration impact criteria.

The FTA and FHWA regulations and guidance set forth the basic concepts, methods, and procedures for documenting the extent and severity of noise and vibration impacts from rail and highway projects. In general, FTA noise impact criteria are based on the measured existing background noise levels. As a result, the initial phase of this analysis consisted of measurements of the existing noise levels along the proposed alternatives corridor at representative sensitive receptor locations and the existing traffic noise levels along US 7. The results of these measurements are presented in Section 3.5.

4.5.2 Impact Criteria

The criteria contained in the FTA guidance manual were used to evaluate rail noise and vibration impacts at sensitive receptor locations along the alternatives corridor, while FHWA and VTrans criteria were used to assess the changes in traffic noise levels along US 7 and the other project access and connector roads

[4] "Transit Noise and Vibration Impact Assessment", Federal Transit Administration, (FTA-VA-90-1003-06), May 2006.

(such as the TR-1 access road from the Omya Quarry to the transload facility, and Kendall Hill Road and West Creek Road from US 7 to the Omya processing plant) due to the increase or decrease of project related truck activity. The following sections describe the noise and vibration evaluation criteria used in the impact assessment for the proposed project alternatives.

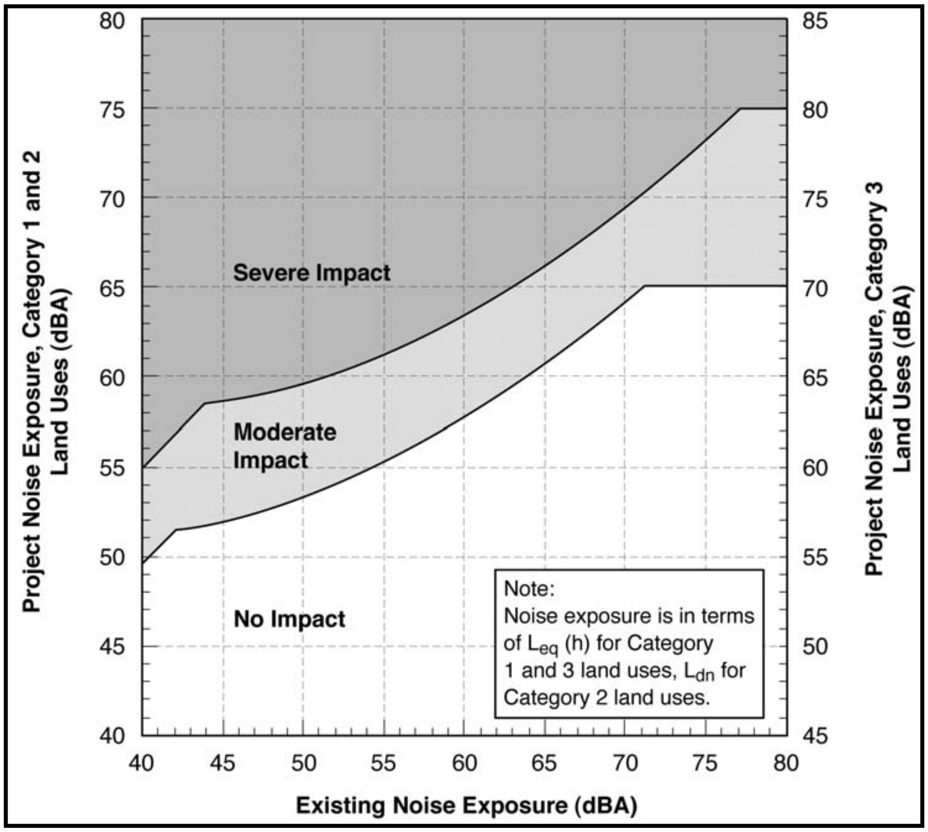
4.5.2.1 Rail Noise Criteria

For each identified noise-sensitive receptor location along the alternatives corridor, future year 2010 and 2030 predicted project noise levels were compared to the FTA noise criteria to determine impact. The FTA's *Transit Noise and Vibration Impact Assessment*[5] guidance manual sets forth the basic concepts, methods and procedures for evaluating the extent and severity of noise impacts from transit projects, including rail. The FTA guidelines assess noise impacts based on the selected land use's sensitivity to noise. For example, the day-night noise level (or Ldn) is the noise metric used to assess project impacts at residential receptors while the hourly Leq(h) noise level is used to assess impacts at non-residential and institutional receptors. The hourly Leq, or equivalent sound level, is the steady A-weighted sound level that has the same acoustic energy as the fluctuating noise during that one-hour period. The Ldn level is a cumulative descriptor of sound over a 24-hour period. Ldn also uses an energy equivalent concept, except that a 10-dBA penalty is assessed to the nighttime hours (between 10 PM and 7 AM) to account for people's increased sensitivity to noises that occur during these hours. The FTA does not consider most commercial and industrial receptors sensitive to train-related noise.

As shown in the graph below, the FTA noise impact criteria are defined by two curves that allow increasing project noise levels as existing noise increases up to a point, beyond which impact is determined based on project noise alone. The FTA noise criteria are delineated into two categories: moderate and severe impact. The moderate impact threshold defines areas where the change in noise is noticeable but may not be sufficient to cause a strong, adverse community reaction. The severe impact threshold defines the noise limits above which a greater percentage of the population would be highly annoyed by new noise.

[5] "Transit Noise", Ibid.

FTA Noise Impact Criteria for Transit Projects



Source: "Transit Noise and Vibration Impact Assessment", Federal Transit Administration, Washington, D.C., May 2006.

Category 1 receptors (such as serene parks) are represented along the left axis of the graph above in terms of the hourly Leq noise metric. Category 2 receptors (such as residences, hotels, and hospitals) are also represented along the left axis but in terms of the 24-hour Ldn noise metric. Finally, Category 3 institutional receptors (such as schools and churches) are represented along the right axis in terms of the hourly Leq noise metric. The FTA land-use categories and noise metrics are described in Table 4.5-1.

Table 4.5-1: FTA Land-Use Categories and Noise Metrics

Land-Use Category[1]	Noise Measure[2]	Description
1	Leq(h)	Tracts of land set aside for serenity and quiet, such as outdoor amphitheaters, concert pavilions, and historic landmarks.
2	Ldn	Buildings used for sleeping include residences, hospitals, hotels and other areas where nighttime sensitivity to noise is of utmost importance.
3	Leq(h)	Institutional land-uses with primarily daytime and evening uses include schools, libraries, churches, museums, cemeteries, historic sites and parks, and certain recreational facilities used for study or meditation.

1. *Land-Use categories are based on sensitivity to noise intrusions.*
2. *The criteria threshold noise limits include an hourly equivalent noise level (or Leq(h)) for Category 1 and 3 receptors or the day-night noise level (or Ldn) for Category 2 receptors. The FTA noise impact criteria, which are based on the existing background levels, are determined using empirical formulas shown graphically in the accompanying figure.*

The measured Ldn noise levels obtained along the proposed rail spur and mainline railroad corridor presented in Section 3.5 and the FTA moderate impact and severe impact curves shown in the graphic below were used to determine the project noise impacts. The FTA noise criteria used to determine impacts at residential receptor (Category 2) locations in the project area are shown in Table 4.5-2. The FTA criteria limit for receptor locations R3 and R4 were used to assess impacts along the RS-1 rail spur alignment. The FTA criteria limits for receptor locations R5, R8, and R12 were used to assess impacts along their corresponding sections of the mainline rail corridor.

Table 4.5-2 FTA Noise Criteria Used in the Impact Assessment

Receptor No.	Location	FTA Category	Existing Ldn Noise Level (dBA)	FTA Moderate Impact Criteria (dBA)	FTA Severe Impact Criteria (dBA)
R3	Creek Road, Middlebury	2	57.4	57	62
R4	Halladay Road, Middlebury	2	58.6	58	63
R5	Dewey Road, Salisbury	2	62.0	59	64
R8	Railroad Avenue, Brandon	2	64.2	61	65
R12	Kendall Hill Road, Pittsford	2	65.5	62	67

4.5.2.2 Traffic Noise Criteria

At noise-sensitive receptor locations along the US 7 corridor, predicted traffic noise levels for the base year 2004, and the future years 2010 and 2030 for the No Build and build alternatives were obtained using the FHWA's TNM Version 2.5. The FHWA Noise Abatement Criteria (NAC), which is incorporated in the VTrans *Noise Analysis and Abatement Policy*, was used to assess impacts at noise-sensitive receptor locations along the US 7 corridor. Predicted traffic noise levels for peak-hour traffic conditions in the base year 2004 and for future years 2010 and 2030 for the No Build and build alternatives were compared to the FHWA/VTrans noise criteria to determine if there is a potential for impact. As shown in Table 4.5-3, an impact occurs if the predicted traffic noise level approaches (within one decibel) or exceeds 67 dBA for a residential receptor (Category B), and 72 dBA for a commercial receptor (Category C). In addition, VTrans noise policies provide for identifications of noise impacts in situations where predicted noise levels substantially exceed existing noise levels. The VTrans policy includes a progressive scale for determining the effects of increases in noise levels relative to existing conditions. In situations where existing noise levels are already 70 dBA or higher, an increase of 3 dBA or more is considered a substantial increase. In situations where the existing noise level is 60 dBA, an increase of 12 dBA or more is considered substantial. In situations where the existing noise level is 40 dBA, an increase of 18 dBA or more is considered substantial.

Table 4.5-3 FHWA Traffic Noise Abatement Criteria

Agency	Land-Use Category[1]	Noise Level[2]	Description
FHWA NAC	A	57 Leq(h)	Lands on which serenity and quiet are of extraordinary significance.
	B	67 Leq(h)	Residences, hotels, schools, churches, libraries, hospitals, parks and other recreational areas.
	C	72 Leq(h)	Developed lands, properties, or activities not included in Categories A and B above.
	D	--[3]	Undeveloped lands.
	E[4]	52 Leq(h)	Indoor: Residences, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

1 Land use categories are based on sensitivity to noise intrusions.
2 The criteria threshold noise limits are represented by the hourly equivalent noise level (or Leq(h)) for both the FHWA and VTrans at all noise-sensitive receptor locations.
3 Indicates no criteria limit applies to this type of land use.
4 The criterion for interior locations is given for various receptor types.

4.5.2.3 Vibration Criteria

The FTA criteria were used to assess annoyance due to vibration and ground-borne noise from train operations. The FTA vibration criteria for evaluating ground-borne vibration and noise impacts from train passbys at nearby sensitive receptors are shown in Table 4.5-4. These vibration criteria are related to ground-borne vibration levels that are expected to result in human annoyance, and are based on root mean square (or RMS) velocity levels expressed in decibels (or VdB) relative to one micro-inch per second (μ-ips). The FTA's experience with community response to ground-borne vibration indicates that when there are only a few train events per day, it would take higher vibration levels to evoke the same community response that would be expected from more frequent events. This is accounted for in the FTA criteria by distinguishing between projects with frequent (more than 70 train events per day), occasional (between 30 and 70 train events per day), and infrequent events (less than 30 train events per day). The vibration criteria levels shown in Table 4.5-4 are defined in terms of human annoyance for different land-use categories such as high sensitivity (Category 1), residential (Category 2), and institutional (Category 3). In general, the threshold of human perceptibility of vibration is 65 VdB.

Table 4.5-4 FTA Ground-Borne Vibration and Noise Impact Criteria for Annoyance

Land Use Category Description	Ground-Borne Vibration Levels (VdB)[1]			Ground-Borne Noise Levels (dBA)[2]		
	Frequent Events[3]	Occasional Events[4]	Infrequent Events[5]	Frequent Events[3]	Occasional Event[4]	Infrequent Event[5]
Category 1: Buildings where low vibration is essential for interior operations.	65	65	65	N/A[6]	N/A[6]	N/A[6]
Category 2: Residences and buildings where people normally sleep.	72	75	80	35	38	43
Category 3: Institutional buildings with primarily daytime use.	75	78	83	40	43	48

1 RMS vibration velocity levels are reported in decibels (or VdB) referenced to 1 micro inch per second (μ-ips).
2 Ground-Borne noise levels are reported in A-weighted decibels (dBA) referenced to 20 micro Pascals.
3 "Frequent Events" is defined as more than 70 vibration events per day.
4 "Occasional Events" is defined as between 30 and 70 vibration events per day.
5 "Infrequent Events" is defined as less than 30 vibration events per day.
6 N/A means "not applicable". Vibration-sensitive equipment is not sensitive to ground-borne noise.

The vibration levels shown in Table 4.5-4 are well below the vibration threshold criteria for minor cosmetic damage (cracks in plaster walls) of 100 VdB for fragile buildings and 95 VdB for extremely fragile historic buildings. It is extremely rare for vibration from train operations to cause building damage, even minor cosmetic damage. Impacts from freight train operations are determined based on the vibration levels from a single train event passby.

While vibration criteria are generally used to assess annoyance from train operations at the exterior facade of a receptor building, ground-borne noise, or the rumbling sound due to vibrating room surfaces, is typically assessed indoors. In general, the relationship between vibration and ground-borne noise depends on the dominant frequency of the vibration and the acoustical absorption characteristics of the receiving room. Due to the limited data available regarding soil and ground propagation characteristics, average or typical soil conditions were assumed everywhere along the project corridor. According to the FTA guidelines, the dominant vibration frequency from train passbys along typical ground and soil conditions generally occurs in the 30-60 Hz range.

4.5.3 Impact Assessment

The noise and vibration analyses were performed using the appropriate FTA and FHWA prediction models described in Section 4.5.1. These predicted noise and vibration levels were compared to the FTA criteria described in Section 4.5.2 to determine impact. The predicted traffic noise levels at receptor locations along the project roadways were compared to both types of VTrans noise impact criteria described in Section 4.5.2 to determine impact.

4.5.3.1 Rail Noise Impacts

The FTA noise model contains mathematical algorithms used to calculate project-generated train noise levels at receptor locations along the project rail corridor. The model requires input data consisting of reference noise levels at a distance of 50 feet for the various train noise sources such as the locomotives, rail cars, and warning horns. The reference source noise levels used in this analysis are from the FTA guidance manual and are shown in Table 4.5-5.

Additional input data required for the noise modeling analysis included project related train operations (the number of daytime and nighttime operations), train consist (the number of locomotives and rail cars per train), and travel speeds along the project corridor. In the year 2010, it is assumed that Omya rail operations would consist of two round trip operations per day five days per week along the rail spur alignment RS-1 and the mainline railroad to the Omya processing plant in Florence. Each train would consist of two locomotives and 20 rail cars. Train speeds along the project rail corridor would be 25 mph on RS-1, and 40 mph on the mainline. In the year 2030, Omya train operations are expected to remain at two round trip operations per day but would increase to 21 rail cars per trip operating six days per week.

Table 4.5-5 FTA Reference Rail Noise Sources Used in the Noise Modeling Assessment

			Noise Level[1]	
Source Description	**Type[2]**	**Location**	**Lmax**	**SEL**
Passbys – Diesel Locomotive	Mobile	Alignment	88	92
Passbys – Rail Car	Mobile	Alignment	80	82
Horns – Locomotive	Mobile	Alignment	105	108
Grade Crossing Signal	Stationary	Grade Crossings	73	109

1 *Reference FTA maximum noise levels (or Lmax) or sound exposure levels (or SEL) are reported in A-weighted decibels (dBA) at a reference distance of 50 ft and 50 mph (for mobile sources only).*

2 *Moving transit sources are modeled as mobile or line sources while stationary sources are modeled as stationary or point sources.*

Other potential users of the rail spur would add an additional 1 rail car per day in 2010, and increase to 2 rail cars per day in 2030. These rail cars would be added to the proposed Omya trains so that additional train operations would not be required. The number of rail cars used in the noise modeling assessment was adjusted to account for these other users.

The freight locomotive warning horns are sounded at all grade crossings along the mainline corridor. However, along the rail spur alignment RS-1, the use of warning horns would not be required. Trains on the rail spur alignment (RS-1) and the rail spur portion of TR-1, would sever or travel under Lower Foote Street; travel under US 7; relocate or travel over Halladay Road (or cross it with an at grade quiet zone crossing); and travel over Creek Road. In general, the locomotive warning horns are sounded within a ¼-mile of a grade crossing. As shown in Table 4.5-5, the FTA maximum noise level (Lmax) from the warning horns is 105 dBA at a distance of 50 feet. As a result, the use of train warning horns represents the major noise source along the mainline rail corridor.

For each of the residential receptors along the mainline rail corridor, the FTA noise model was used to calculate project Ldn noise levels. The calculated noise levels were then compared to the FTA noise criteria shown in Table 4.5-2 to determine impact. The results of the rail noise modeling analysis are shown in Table 4.5-6.

Table 4.5-6 Summary of FTA Noise Impacts along the Mainline Rail Corridor for RS-1 and TR-1

Year	Operations	FTA Moderate Impacts	FTA Severe Impacts	FTA Total Impact
2010	2 Round Trips per Day (5 days per week)	13	0	13
2030	2 Round Trips per Day (6 days per week)	13	0	13

For year 2010, with Omya freight rail operations at two round trip operations per day, a total of 13 moderate noise impacts and no severe impacts are expected to occur along the mainline rail corridor as a result of the project. All of these project impacts along the mainline corridor are due to the increased use of the warning horns at the grade crossings. Noise impacts are not predicted to occur along the rail spur portion of RS-1. As shown in Table 4.5-7, the predicted Ldn noise levels at these impacted receptor locations range from 59 dBA to 63 dBA.

The locations of these 13 moderate noise impacted receptors (identified by their specific receptor identification numbers) are shown in Figures 4.5-1 through 4.5-4. For the year 2030, Omya rail operations are expected to remain essentially the same (two round trips per day), except that the number of rail cars per train will increase from 20 to 21, and the number of days of operation will increase from 5 to 6 days per week. Because there is essentially no change in daily rail operations in year 2030, the modeled Ldn train noise levels are identical to those modeled for year 2010. As a result, the number of moderate noise impacts for year 2030 remains at 13, with no severe impacts.

4.5.3.2 Traffic Noise Impacts

For the traffic noise assessment, the FHWA's TNM Version 2.5 was used to predict traffic noise levels along the Omya truck route that includes US 7, Kendall Hill Road, West Creek Road, and the off-site transload facility truck haul road associated with the TR-1 alternative. Using traffic volume data categorized into automobiles, medium trucks (vehicles with two axles and six tires), and heavy trucks (vehicles with three or more axles), and travel speeds along each roadway segment, the TNM noise model was used to calculate traffic noise levels at receptor locations along the Omya truck route.

Table 4.5-7 FTA Rail Noise Analysis Results at Impacted Receptors along the Existing Rail Corridor

ArcView Receptor ID*	Existing Measured Ldn Noise Level (dBA)	FTA Moderate Impact Criterion (dBA)	FTA Severe Impact Criterion (dBA)	Distance From rail Corridor (feet)	Train Speed (mph)	Modeled Project Ldn Noise Level (dBA)	FTA Impact Condition
22	62	59	64	56	40	62	Moderate
23	62	59	64	46	40	63	Moderate
27	62	59	64	65	40	61	Moderate
28	62	59	64	72	40	60	Moderate
44	62	59	64	87	40	59	Moderate
60	62	59	64	88	40	59	Moderate
69	62	59	64	90	40	59	Moderate
80	62	59	64	87	40	59	Moderate
81	62	59	64	83	40	59	Moderate
103	62	59	64	55	40	62	Moderate
145	62	59	64	93	40	59	Moderate
182	62	59	64	60	40	62	Moderate
194	62	59	64	81	40	59	Moderate

** All receptors along the project rail corridor were given specific identification numbers for the noise modeling analysis. The locations of these impacted receptors are shown in Figures 4.5-1 through 4.5-4 and are identified by their identification number.*

As part of the noise modeling analysis, the TNM noise model was calibrated by comparing the measured and predicted Leq(h) traffic noise levels at each of the measurement locations described in Section 3.5. Using the traffic volume counts obtained during the measurement program, the results of the TNM model calibration are shown in Table 4.5-8. These results are within three decibels and represent good agreement between the measured and modeled traffic noise levels. Therefore, no adjustment factors to the TNM noise model are required.

Table 4.5-8 TNM Model Calibration Comparison of Measured and Modeled Noise Levels

Receptor No.	Location	Measured Leq Noise Level (dBA)	Modeled Leq Noise Level (dBA)	Difference
R2	US 7 North of Route 125, Middlebury	68.1	68.1	0
R6	US 7 near Maple Road, Salisbury	73.8	73.3	-0.5
R7	US 7 North of East Road, Leicester	71.4	71.5	+0.1
R9	US 7 North of VT 73 West, Brandon	68.5	67.9	-0.6
R10	US 7 in Downtown Brandon	63.8	61.5	-2.3
R11	US 7 at Country Club Road, Brandon	66.9	67.2	+0.3
R13	West Creek Road, Pittsford	49.6	51.0	+1.4

Using traffic volume data for the year 2004 and the future years 2010 and 2030, the TNM noise model was used to calculate traffic noise levels at all receptor locations along the Omya truck route. The traffic volume data was adjusted to account for the Omya heavy truck operations associated with the base year and the future year no build and build alternatives. For example, for the 2004 base year, the heavy truck volumes used in the TNM noise modeling analysis include the Omya truck operations which account for 100 round trip operations per day, or 200 passbys per day which results in an average of 25 additional heavy truck operations per hour based on an 8-hour work day.

For the year 2010 No Build Alternative, Omya heavy truck operations are expected to increase to 115 round trip operations per day (or 230 total truck operations) that result in an average of 28.75 operations per hour. For the 2010 RS-1 alternative, the Omya heavy trucks were removed from the traffic noise modeling analysis. For the year 2030 No Build Alternative, Omya heavy truck operations are expected to increase to 138 round trip operations per day (or 276 total truck operations) which result in an average of 34.5 operations per hour. For the 2030 rail spur build alternative, the Omya heavy trucks were removed from the traffic noise modeling analysis.

The predicted traffic noise levels at each receptor location in the project area were compared to the FHWA and VTrans noise criteria discussed in Section

4.5.2.2 to determine impact. The results of the TNM traffic noise modeling analysis are presented in Table 4.5-9. All traffic noise impacts are along US 7, and specific impact locations are shown in Figures 4.5-5 through 4.5-10 (existing/2004); Figures 4.5-11 through 4.5-17 (2010 No Build); Figures 4.5-18 through 4.5-24 (2030 No Build); Figure 4.5-25 through 4.5-31 (2010 build alternatives); and Figures 4.5-32 through 4.5-38 (2030 build alternatives).

Table 4.5-9 Number of Receptors Impacted by Traffic Noise along US 7

Impacted Receptors	2004 Base Year	2010 No Build	2010 Build	2030 No Build	2030 Build
Residential	47	56	34	77	58
Commercial	2	2	0	7	3
Total	49	58	34	84	61

As shown in Table 4.5-9, for the 2004 base year condition, there are a total of 49 impacted receptors (47 residential and 2 commercial impacts) along US 7. For the year 2010 No Build Alternative, the increase in traffic volume on US 7 along with the increase in Omya truck operations, is expected to result in a total of 58 impacted receptors (56 residential and 2 commercial impacts) along US 7. This is an increase of 9 additional impacts over the base year condition. For the year 2010 build alternative, with the Omya heavy trucks removed from the TNM noise modeling analysis, the number of total noise impacts along US 7 is expected to decrease to 34 residential impacts. This is a decrease of 24 impacts over the 2010 No Build Alternative and a decrease of 15 impacts of the year 2004 condition. The receptors which would no longer be impacted under the build alternatives are scattered along the entire project corridor. In Brandon Village, 4 receptors would be impacted under the No Build, and none under the build alternatives. In general, the removal of the Omya trucks from US 7 in year 2010 is expected to result in an average of 1 dBA decrease in the traffic noise levels along US 7. Changes of this magnitude are considered to be imperceptible to the human ear.

For the year 2030 No Build Alternative, the increase in traffic volume on US 7 along with the increase in Omya truck operations, is expected to result in a total of 84 impacted receptors (77 residential and 7 commercial impacts) along US 7. This is an increase of 26 impacted receptors over the 2010 No Build Alternative, and an increase of 35 impacts over the 2004 base year condition. For the year 2030 build alternative, with the Omya heavy trucks removed from the TNM noise modeling analysis, the number of total noise impacts along US 7 is expected to decrease from 84 to 61 impacted receptors (58 residential and 3 commercial impacts). This is a decrease of 23 impacts (19 residential and 4 commercial) over the year 2030 No Build Alternative, an increase of 3 impacts over the 2010 No Build Alternative, and an increase of 12 impacts over the 2004 base year condition. Compared to the year 2010 RS-1 and TR-1 alternatives, the number of noise impacts along US 7 is expected to increase from 34 to 61 impacts based on the expected increase in traffic volume on US 7 between the years 2010 and 2030. In general, the removal of the Omya trucks from US 7 in year 2030 is expected to result in an average of 1 dBA decrease in the traffic noise levels along US 7. A change of 1 dBA is considered imperceptible.

Along the TR-1 road to the off-site transload facility, the predicted truck noise levels at the nearest receptors will not exceed either of the VTrans noise impact criteria. Because of the lower speeds and the distance of the receptors from the roadway alignment, typical hourly Leq(h) noise levels from the Omya truck operations on TR-1 for the year 2010 with 138 round trip truck operations per day are expected to be 52 dBA at the nearest residential receptor. In the year 2030, Omya truck operations are expected to remain at 138 round trip operations per day so that the hourly Leq(h) noise levels at the nearest residential receptor will remain unchanged at 52 dBA. These noise levels are well below the FHWA impact noise criteria of 67 dBA for residential receptors, and below the VTrans relative noise increase of 15 dBA above the measured background noise level.

For the base year 2004, the Omya truck operations (100 round trips per day) on Kendall Hill Road and West Creek Road for trucks traveling from US 7 to the Omya processing plant are predicted to generate traffic noise levels ranging from 50 to 60 dBA. For the year 2010, the increase in Omya truck activity (115 round trips per day) along these roads is expected to increase traffic noise levels by 0.5 dBA. (Changes in noise levels of less than 3 dBA are just barely perceptible to the human ear.) For the year 2030, when the volume of Omya trucks is expected to increase to138 round trips per day, the traffic noise levels are expected to increase by approximately 1 dBA. However, these predicted noise levels are below the FHWA impact noise criteria and the VTrans relative noise increase criteria.

Noise levels from the train loading operations at the off-site transload facility for the TR-1 alternative were estimated from measured noise levels obtained at the Omya quarry during truck loading operations. The measured Leq noise level from the truck loading operation, which consisted of front end loaders and idling trucks, was 72 dBA at a distance of 150 feet, with intermittent Lmax noise levels of 75 to 85 dBA when the quarry rock is dropped into an empty truck. The train loading operations at the transload facility are expected to occur during daytime hours only. The nearest residential receptor to the transload facility is a farm on Creek Road located approximately 1,200 feet from the proposed facility. At this distance, the expected Leq noise level from the train loading operations is predicted to be 54 dBA, with typical intermittent Lmax noise levels ranging from 60 to 70 dBA. Typical measured daytime Leq noise levels at this location ranged from 45 to 55 dBA. Since the predicted Leq noise level from the train loading operation is not expected to exceed the VTrans relative noise increase criteria, noise impacts are not expected from this activity. Noise levels at the proposed transload facility associated with alternative RS-1 just south of the quarry are expected to be similar to the existing noise levels from the truck loading operations at the quarry.

4.5.3.3 Summary and Mitigation of Noise Impacts

Rail Noise

As discussed in Section 4.5.3.1, the noise impacts associated with the additional freight rail operations are due to the increased use of the warning horns at the grade crossings along the mainline rail corridor. As a result of the build alternatives, the cumulative increase in noise exposure near the grade crossings is expected to result in a total of 13 FTA moderate noise impacts for both year 2010 and 2030. However, it should be noted that these receptors are currently impacted by the warning horns from the existing freight rail operations along the mainline corridor. The additional freight rail operations from the Omya facility would result in noise levels that are the same as those that currently occur along the mainline corridor. However, the number of noise events from the warning horns would increase due to the additional two round trip freight operations per day.

Possible noise mitigation measures to reduce the number of noise impacts from the warning horns could include noise barriers or the use of quad-gates that would eliminate the use of warning horns at the grade crossing. In addition, local communities could petition the FRA to establish “quiet zones” at grade crossings. These mitigation measures are described in more detail in the FRA’s *Use of Locomotive Horns at Highway-Rail Grade Crossings – Final Rule* (49 CFR Parts 222 and 229; April 2005).

As shown in Figures 4.5-1 through 4.5-4, the impacted receptors are not clustered, but rather dispersed along the project corridor. To be effective in reducing the noise levels from warning horns located at the top of the locomotive, a typical noise barrier would have to be approximately 20-feet high and at least 150 feet long at each impacted receptor. As a result, noise barriers would not meet the VTrans cost effectiveness criterion of $20,000 per impacted receptor. In addition, the use of quad-gates (approximately $175,000 to $300,000 per crossing) would also not be a cost effective mitigation measure given the small number of impacted receptors at each grade crossing. As a result, noise barriers and quad-gates are not recommended for this project.

Traffic Noise

As discussed above in Section 4.5.3.2, the following traffic noise impacts were predicted:

- For the 2004 base year condition, there are a total of 49 impacted receptors along US 7.

- For the year 2010 No Build Alternative, the increase in traffic is expected to result in a total of 58 impacted receptors along US 7, an increase of 9 additional impacts over the base year.

- For the year 2010 RS-1 or TR-1 build alternative, with the Omya heavy trucks removed, the number of total noise impacts along US 7 is expected to be 34 residential impacts, a decrease of 24 impacts from the 2010 No Build Alternative and a decrease of 15 impacts from the year 2004 condition.

- For the year 2010 build alternatives, the number of noise impacts in Brandon Village would decrease from 4 receptors under the No Build Alternative to none under the Build Alternative.

- For the year 2030 No Build Alternative, the increase in traffic is expected to result in a total of 84 impacted receptors along US 7, an increase of 26 impacted receptors over the 2010 No Build Alternative and 35 impacts over the 2004 base year condition.

- For the year 2030 rail spur build alternative, with the Omya heavy trucks removed, the number of total noise impacts along US 7 is expected to total 61 impacted receptors, a decrease of 23 impacts from the year 2030 No Build Alternative.

- Even with the benefit of the build alternatives in removing trucks from the US 7 corridor, the number of noise impacts along US 7 for the build alternatives is expected to increase from 34 to 61 impacts based on the expected increase in traffic volume on US 7 between the years 2010 and 2030.

- Along the TR-1 road to the off-site transload facility, the predicted truck noise levels at the nearest receptors will not exceed either of the VTrans noise impact criteria in either 2010 or 2030.

- Omya truck operations on Kendall Hill Road and West Creek Road for trucks traveling from US 7 to the Omya processing plant are predicted to be below the FHWA impact noise criteria and the VTrans relative noise increase criteria.

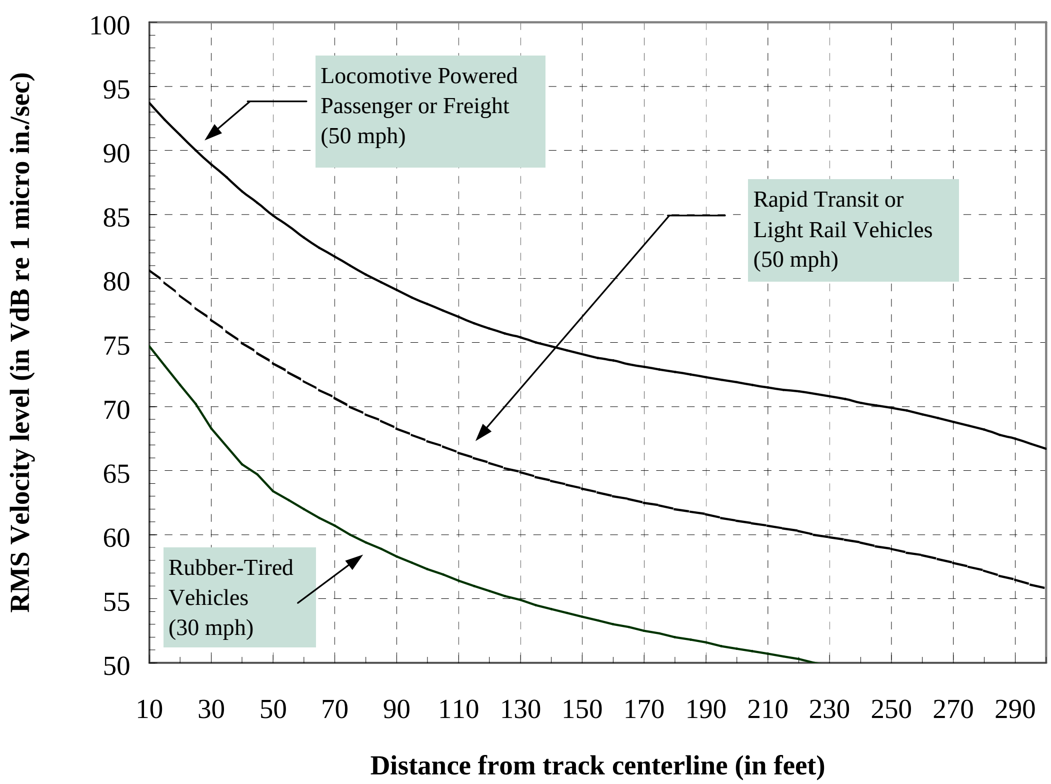
- Noise levels from the train loading operations at the off-site transload facility for the TR-1 alternative are not expected to exceed the VTrans relative noise increase criteria, so noise impacts are not expected from this activity. Noise levels at the proposed RS-1 transload facility south of the quarry are expected to be similar to the existing noise levels from the truck loading operations in the quarry.

Because the build alternatives would not result in traffic noise impacts, no formal traffic noise mitigation is proposed.

4.5.3.4 Vibration Impacts

The methods described in the FTA guidance manual were used to predict vibration levels at receptor locations along the alternatives corridor and the mainline corridor. The FTA vibration model uses various algorithms to estimate train vibration levels for average ground propagation characteristics. As shown in the graph below, the FTA surface vibration curve for a locomotive was used to predict ground-borne vibration and noise levels from train passbys at sensitive receptor locations along the project rail corridor. Input data into the FTA vibration model included the receptor distance from the nearest track and the train speed along the rail corridor.

FTA Generalized Ground-Surface Vibration Curves



Source: "Transit Noise and Vibration Impact Assessment", Federal Transit Administration, Washington, D.C., May 2006.

The train speeds used in the vibration modeling analysis were 25 mph along the alternative RS-1 and TR1 rail spur alignment, and 40 mph along the mainline rail corridor. The model computes the RMS vibration velocity level as well as the ground-borne noise level at each receptor location for a single-event train passby. These computed vibration levels were then compared to the FTA ground-borne vibration impact criteria described in Section 4.5.2.3 to determine the onset of impact. For residential receptors, the FTA's vibration annoyance criterion is 80 VdB for infrequent events.

Although the vibration effects of the freight trains traveling over switches, track crossovers, and other special track work was not included in this analysis, there are no sensitive receptors near the proposed RS-1 and TR1 rail spur switch required for the OMYA freight trains to enter the Vermont mainline rail corridor. Trains traveling over these track discontinuities can increase vibration levels by up to 10-VdB.

The vibration levels from freight trains are expected to be similar to the vibration levels currently experienced along the mainline rail corridor from existing freight rail operations. The results of the vibration modeling analysis indicate that under the build alternatives, vibration impacts are predicted to occur at five residential receptor locations along the project mainline corridor. However, these five receptors are already currently impacted by the existing freight rail operations on the mainline corridor. These receptors are located within 65 feet of the track with predicted vibration levels of 80 to 83 VdB as shown in Table 4.5-10. The locations of these impacted receptors are shown in Figures 4.5-39 through 4.5-42. No vibration impacts are predicted to occur along the alternatives corridor. In addition, ground-borne noise impacts are not expected to occur from this project.

However, the additional trains will add four more train passby events per day in year 2010 and 2030. As a result, the five residential receptors currently impacted by freight train operations on the mainline corridor will be impacted more frequently by the additional freight train operations from the Middlebury Spur project.

Table 4.5-10 FTA Vibration Analysis Results at Impacted Receptor Locations (Build Alternatives, Years 2010 and 2030)

ArcView Receptor ID	Receptor Distance from Rail Corridor	Modeled Vibration Level (VdB)	FTA Criterion For Infrequent Events (VdB)	Vibration Level Above FTA Criterion (VdB)
22	56	82	80	2
23	46	83	80	3
27	65	80	80	0
103	55	82	80	2
182	60	81	80	1

4.5.3.5 Summary and Mitigation of Vibration Impacts

As described in Section 4.5.3.4, the results of the vibration modeling analysis indicates that the build alternatives are expected to result in FTA vibration impacts at five residential receptor locations along the mainline rail corridor. However, it should be noted that these receptors are currently impacted by existing freight rail operations along the mainline rail corridor. The increased freight rail operations from the Omya facility would result in vibration levels that are the same as those that currently occur at these receptor locations from the existing freight operations. However, the number of vibration events would increase due to the additional two round trip freight operations per day.

An effective vibration mitigation measure could consist of installing ballast mats under sections of track to reduce vibration levels. Ballast mats have been shown to reduce vibration levels by up to 10 VdB, depending on the frequency content of the vibration, the method of installation, and ground conditions. However, ballast mats are relatively costly and typically have less effect on vibration than other factors, such as wheel maintenance. VTrans currently does not have criteria in place for determining the reasonableness of vibration mitigation; however, VTrans and FHWA have determined that, for purposes of this project, the general premise of reasonableness developed for noise mitigation is also appropriate for vibration mitigation. Specifically, noise (or vibration in this case) mitigation measures costing in excess of $20,000 per impacted receptor are not considered reasonable. A preliminary estimate shows that the cost of installing ballast mats as part of the Middlebury Spur project to mitigate rail vibration impacts would exceed the VTrans reasonableness criteria that were developed for noise mitigation.

Nevertheless, ballast mat costs could possibly be reduced by modifying the length or design of ballast mats, or by constructing them as part of independent mainline improvement projects. Improvements to the mainline are included in the Draft 2009-2012 State Transportation Improvement Program (STIP), and it is expected that installation of ballast mats would be most cost-effective if constructed as part of those improvements. Further research into the cost, reasonableness, and effectiveness of ballast mats as vibration mitigation will therefore be undertaken during the design of mainline improvement projects. At that time, an updated cost estimate for installing ballast mats would be made and a decision on whether or not to implement the mitigation will be made by FHWA and VTrans.

In addition, the installation of any new switches and crossovers, which can increase vibration levels by up to 10 VdB, should not be located within 200 feet of sensitive receptors. This distance was determined from the figure above by increasing the vibration levels along the vertical axis by 10 VdB to account for the increase in vibration level generated by a locomotive traveling over a switch or a crossover. The curve is then used to determine the approximate distance at which the locomotive vibration level would exceed the FTA impact criterion of 80 VdB for infrequent train operations. No new crossovers are currently planned. New switches would be needed for RS-1 in the vicinity of the quarry and adjacent transload facility, where the spur would join the mainline, and possibly at the Florence processing plant. No receptors are located within 200 feet of these locations. A receptor is located within 200 feet of an existing switch at the Florence yard, but this receptor was found not to be impacted by vibration from current or proposed train passbys. Vibration impacts of trains passing over existing switches and crossovers was not determined.

4.6 Wildlife and Fisheries

Impacts to wildlife and wildlife habitats are regulated directly or indirectly under various state and federal statutes and regulations. The Fish and Wildlife Coordination Act (16 U.S.C. 661-666) requires federal agencies to consult with federal and state fish and wildlife agencies when streams or water bodies are proposed to be modified. Full consideration is to be given to USFWS recommendations to protect and increase game and fur-bearing animals and study the effects of pollution on the wildlife.

Act 250, where applicable, under Criterion 8(A) requires applicants to show that projects will not have an “undue adverse effect” on “necessary wildlife habitat and endangered species.”

Wetlands, water quality, and other resource protection statutes and regulations also have provisions relating to wildlife and fisheries habitat, as described elsewhere in this document. Requirements relating to rare species are addressed in Section 4.6.3 below.

The impact assessments for wildlife and fisheries resources are divided into three categories below: wildlife habitats, fisheries, and threatened and endangered species.

4.6.1 Wildlife Habitats

4.6.1.1 Impact Assessment Methods

Impacts were measured as the overlap of each alternative’s footprint with identified wildlife habitat. The effects of habitat fragmentation, barriers to wildlife movement, and other less direct impacts are also described. The proposed alternatives locations with respect to wildlife habitats are shown on Figures 3.6-1 and 3.6-2.

4.6.1.2 Impacts

No Build

The No Build Alternative would essentially maintain existing conditions, and would not directly affect wildlife habitats. The continued truck traffic on roadways may continue to have an effect on wildlife attempting to cross the roads, potentially affecting wildlife populations along the roadways.

RS-1

RS-1 would traverse farmland (both upland and wetland), hedgerows, ditched intermittent streams, forested land, and roads. The acreages of broad habitat types impacted are listed in Table 4.6-1. RS-1, depending on the option, would impact from 29.9 to 34.9 acres of open field habitat (including wet meadows, ditches, hedgerows, and other farm field features) and approximately 0.9 acres of forested land. RS-1 Grade Separated over Halladay Road would affect slightly more open field habitat overall (34.9 acres) than RS-1 Halladay Road Relocation (34.1 acres), and RS-1 At-Grade with Halladay Road would affect the least open field habitat (29.9 acres).

Table 4.6-1 Wildlife Habitat Impacts (Acres)

	RS-1			TR-1	
	Grade Separated over Halladay Road	**At-Grade with Halladay Road**	**Halladay Road Relocation**	**Grade Separated over Halladay Road**	**At-Grade with Halladay Road**
Potential Upland Sandpiper or Grasshopper Sparrow Foraging Habitat	9.75	8.29	8.10	28.10	28.80
Other Open Fields	25.17	21.65	25.99	6.10	6.70
Total Open Field Habitat	**34.92**	**29.94**	**34.09**	**34.20**	**35.50**
Isolated Forest Patches	0.86	0.86	0.86	0.00	0.00
Indiana Bat Habitat	0.00	0.00	0.00	1.10	1.10
Total Forested Habitat	**0.86**	**0.86**	**0.86**	**1.10**	**1.10**

East of Lower Foote Street, the RS-1 alignment would affect active cropland, one hedgerow, three intermittent stream/ditches, and a forested area. The cropland has value for a limited range of birds and small mammals. The alignment's close proximity to the existing quarry access road in this area minimizes the amount of habitat that would be fragmented by the alignment.

Most of the small patch of forested land just east of the quarry access road would be eliminated by this alternative (see Figure 3.6-1). While this area has some value as a habitat "refuge" for wildlife species needing forest cover, there is little similar habitat nearby, and therefore little opportunity for this area to serve as a refuge or a wildlife corridor.

Between Lower Foote Street and US 7, the affected habitat is currently disturbed (ditched and partially mowed) and fragmented by roads, and the RS-1 alignment would not eliminate important habitat or increase fragmentation to any degree.

Between US 7 and Halladay Road, RS-1 would directly impact and bisect a patchwork of fallow upland and wet meadow habitat with ditches and intermittent streams. Although this "early successional" habitat is valuable, it is already partially fragmented by the surrounding roads, and no important wildlife corridors are present. Approximately 20 acres of habitat (mostly open fields) would be left between Middle Road South and the alignment, with a larger amount to the open field and an extensive forested area remaining to the south. Because of the depth of the cuts in this area, the RS-1 alignment would be a relatively impermeable barrier to most species of wildlife.

West of Halladay Road, the RS-1 alignment would pass through active cropland, pasture, and fallow farm fields. The alignment crosses a large area of undeveloped land, although much of the alignment would be constructed at grade and would be permeable (would not be a barrier) to most species. The alignment would traverse a wildlife corridor about 2,200 feet west of Halladay Road (shown as the area with three vertical arrows in Figures 3.6-1 and 3.6-2). This is an area of fields, hedgerows, and drainages between forested ridges to the north and the very large forested wetlands to the south. The alignment would eliminate hedgerows and culvert drainages that may serve as travel corridors for a variety of reptiles, amphibians, and small mammals. Although most species could cross the rail alignment in this area, some species such as salamanders find railroads impermeable, and some avoid crossing open areas.

To the west, RS-1 would pass through additional farm fields with upland fields, hedgerows and wet meadows, but the wildlife corridor value appears to be lower, and again, the alignment would be permeable to most species found in these fields. By fragmenting these fields, RS-1 could affect grassland bird species (discussed in Section 4.6.3), which require large open grasslands. However, the railroad is mostly at grade through this area, so it would not be a travel barrier or fragmenting for most bird species.

Approaching Otter Creek, RS-1 would be constructed on trestle totaling 2,050 feet long with up to 23 feet clearance underneath, allowing most wildlife species to move freely under the alignment. Vegetation along the banks of Otter Creek would be removed in the footprint of the bridge, but most, if not all, of the numerous species traveling up and down the creek and adjacent habitat would not find this a barrier. The trestle would continue to the mainline railroad tracks. Where the spur ties into the mainline, existing shrubby habitat would be eliminated on the east side of the tracks, but there is similar habitat along the west side, and wildlife species using the railroad line as a travel corridor would probably not be adversely affected.

TR-1

Like RS-1, TR-1 would traverse farmland (both upland and wetland), hedgerows, ditched intermittent streams, forested land, and roads. The impact acreage on broad habitat types (Table 4.6-1 above) shows that the habitat impacts would be greater than RS-1's impacts, due primarily to the larger footprint of the transload facility. The TR-1 Grade Separated over Halladay Road Option would have a slightly smaller footprint than the at grade option and would affect 34.2 acres of open field habitat (including wet meadows, ditches, hedgerows, and other farm field features) versus 35.5 acres for TR-1 At-Grade with Halladay Road. (These impacts would be slightly lower if the modified RS-1 trestle alignment were incorporated into TR-1.) The two TR-1 options would have identical impacts to forested land (1.1 acres).

No new construction would be needed for TR-1 east of Lower Foote Street. There would be increased truck traffic on the quarry access road, but this is mostly cropland and not an important habitat area, and the traffic would not affect most of the wildlife species found in this area.

The cut section just east of US 7 would affect mostly previously disturbed and fragmented habitat (lawns and ditches). West of US 7, the effect would be comparable to that for RS-1. Although TR-1 would require a less deep cut section, resulting in less of a barrier to wildlife than RS-1, there would be more frequent traffic than on RS-1, and so more chances for wildlife-vehicle conflicts. Like RS-1, TR-1 would isolate about 20 acres of open fields north of the alignment in this section.

West of Halladay Road, the effects would be comparable to RS-1. Again, TR-1 would require smaller fill sections than RS-1, but would involve more frequent traffic. This would not be a barrier to most species, but certain slow-moving species (such as amphibians), or species that avoid open spaces (such as certain amphibians and small mammals) could be affected. Because the traffic volume would be relatively low (approximately 120 daily round trips in 2010 and 148 in 2030), the likelihood of frequent wildlife-vehicle conflicts would be small.

The transload facility would affect approximately 24 to 25 acres of habitat in what is now a mixture of mostly pasture, fallow fields, and cropland. It would not be located in an important habitat corridor. As with RS-1, the greatest concern in this area may be the effect on grassland bird species, which is discussed in more detail in Section 4.6.3. The larger footprint of the transload facility compared to the RS-1 alternative in this area, along with the noise and visual disturbance from the more frequent trips required for trucking and the transload operational activities, suggest TR-1 would have a greater effect on grassland bird species than RS-1.

However, because the habitat types in question are relatively common in the general area, the impacts are not substantial.

4.6.1.3 Summary and Mitigation of Wildlife Habitat Impacts

RS-1, depending on the option, would impact from 29.9 to 34.9 acres of open field habitat (including wet meadows, ditches, hedgerows, and other farm field features) and approximately 0.9 acres of forested land. The Grade Separated Over Halladay Road Option would affect slightly more open field habitat overall (34.9 acres) than Halladay Road Relocation (34.1 acres), and RS-1 At-Grade with Halladay Road would affect the least open field habitat (29.9 acres). The most notable habitat impacts are to areas that provide wildlife corridors and connectivity between habitats: the various hedgerows and fallow farmlands; the wildlife corridor about 2,200 feet west of Halladay Road; and the Otter Creek corridor.

TR-1’s total habitat impact acreage would be greater than RS-1’s impacts, due primarily to the larger footprint of the transload facility. The TR-1 Grade Separated over Halladay Road Option would have a slightly smaller footprint than the at grade option and would affect 34.2 acres of open field habitat (including wet meadows, ditches, hedgerows, and other farm field features) versus 35.5 acres for TR-1 At-Grade with Halladay Road. The two TR-1 options would have identical impacts to forested land (1.1 acres). The most notable impacts would be the wildlife corridor about 2,200 feet west of Halladay Road and the approximately 25 acres of mostly open farmland to be impacted for the transload facility, east of Creek Road.

Mitigation includes avoidance, minimization, and compensation for project impacts. Wildlife habitat impacts have been avoided to the extent practicable by avoiding important habitats such as large forest blocks or large wetlands.

Measures to minimize and compensate for these impacts will include:

- In areas of important habitat, minimize the project footprint by constructing 2:1 side slopes, if feasible.

- Minimize loss of adjacent hedgerows and drainages where feasible.
- In wildlife corridor areas, consider plantings along road or rail embankments that will allow wildlife to cross the alignment with minimal exposure to open spaces.
- Structures in the wildlife corridor area west of Halladay Road will be designed to allow for passage of terrestrial and aquatic species.

4.6.2 Fisheries

No Build Alternative

No change to fisheries resources is expected under the No Build Alternative.

RS-1 and TR-1

Both RS-1 and TR-1 would cross several intermittent streams, but the affected streams do not appear to support fish populations. The intermittent stream associated with Wetland 5 would have to be diverted along the alignment and discharged further to the west. Wetland 5 currently drains into Beaver Brook (and eventually into the Middlebury River and Otter Creek), and its watershed constitutes about 7% of Beaver Brook's 2,963-acre watershed. Diversion of Wetland 5 is unlikely to have any measurable effect on aquatic life in Beaver Brook, for two reasons. First, Beaver Brook's watershed is large enough to support perennial flow without the contribution of Wetland 5. Second, Beaver Brook downstream of the project passes through an almost entirely open, agricultural landscape, so any fish supported by the brook are likely to be common warm water species of little recreational importance.

Stormwater runoff from TR-1 in particular could result in warmer water carrying contaminants such as copper and zinc being discharged to the intermittent streams. However, the streams that would receive runoff from TR-1 west of US 7 all drain first to the very large wetland west of Halladay Road, which in turn drains to Otter Creek. Because of the very large size, dense vegetation, and diffuse nature of flow through this wetland, sediments and other pollutants in runoff would be retained in the wetland, and temperatures would be moderated, with little net effect on the wetland or downstream surface waters, including Otter Creek.

Construction of the structure over Otter Creek, for either RS-1 or TR-1, would require removal of vegetation along the banks. The resulting loss of shading would be balanced to some degree by the addition of shading under the new bridge. The project is expected to have little or no effect on fisheries in Otter Creek.

4.6.2.1 Summary and Mitigation of Fisheries Impacts

Both RS-1 and TR-1 would cross several intermittent streams, but the affected streams do not appear to support fish populations. Any stormwater runoff would pass through a series of intermittent streams and wetlands before entering surface waters with potential fisheries, so no impacts are expected. Because impacts to fisheries are expected to be negligible, no mitigation other than standard stormwater management measures are proposed.

4.6.3 Threatened and Endangered Species

Under Section 7 of the federal Endangered Species Act (ESA), federal agencies must consult with the appropriate Service when any activity permitted, funded or conducted by that agency may affect a listed species or designated critical habitat, or is likely to jeopardize proposed species or adversely modify proposed critical habitat. Section 9 of the ESA prohibits the taking of federally listed animals without appropriate authorization.

Under Vermont's Endangered and Threatened Species statute, a taking of state-listed species requires an Endangered and Threatened Species Permit. This permit specifies a plan for conservation or mitigation of the species impacted, probable impact of the proposed action, as well as the method and equipment to be used in the taking.

Act 250, where applicable, under Criterion 8(A) requires applicants to show that projects will not have an "undue adverse effect" on "necessary wildlife habitat and endangered species."

4.6.3.1 Impact Assessment Methods

Impacts were measured as the overlap of each alternative's footprint with potential rare species habitat. The effects of habitat fragmentation, barriers to wildlife movement, and other less direct impacts are also described below.

4.6.3.2 Impacts

No Build

No change to threatened or endangered species is expected under the No Build Alternative.

RS-1 and TR-1

RS-1 and TR-1 would have similar effects on rare species habitat, and therefore are discussed together here. Both alternatives would pass through farm fields which have the potential to support rare grassland bird species, notably the state-listed upland sandpiper and grasshopper sparrow. None of the fields appear to be suitable upland sandpiper or grasshopper sparrow nesting habitat, and no nesting upland sandpipers or grasshopper sparrows were found in field surveys (as described in Chapter 3). However, west of Halladay Road, the farm fields could possibly be used by these species for foraging. RS-1 would directly impact between 8.1 and 9.75 acres, out of a total of 186 contiguous acres, of potential foraging habitat in this area. TR-1, with the transload facility in part of this area, would directly impact between 28.1 and 28.8 acres of potential foraging habitat in that area.

The fragmentation of habitat that would occur from the construction of the alternatives would likely have a greater impact than the footprint of the alternatives. Upland sandpipers and grasshopper sparrows prefer large open fields, and construction of a rail line or truck roadway through grassland habitat may affect the viability of that particular patch of grassland. Immediately west of Halladay Road, RS-1 would be on a fill section which would present a visual barrier between the fields north and south of the alignment, reducing the amount of contiguous open habitat available to the upland sandpiper. TR-1 would be constructed mostly at grade here, resulting in less of a visual barrier and therefore presumably less of a fragmenting effect. Further west, both alignments would be constructed close to the existing grade, and therefore are unlikely to function as a barrier to upland sandpipers or grasshopper sparrows. However, the TR-1 transload facility would consume approximately 24 to 25 acres of mostly open land, and its size could make it a fragmenting feature as well.

The fields affected by this project do not appear to be suitable upland sandpiper or grasshopper sparrow breeding habitat, and no nesting pairs were found there in a June 2006 field survey. Because of wetness, presence of hedgerows, cropping on some fields, and fallow land on other fields, the fields also have limited potential value as foraging habitat. Furthermore, the fields are a small proportion of the amount of open land in the general area. In Addison County, for example, according to 1997 census data there are approximately 204,985 acres of farmland. While not all of this land is suitable upland sandpiper or grasshopper sparrow foraging habitat, there appears to be a large amount of such habitat available. For these reasons, the project alternatives are not expected to have an adverse effect on upland sandpipers or grasshopper sparrows.

West of Halladay Road, TR-1 and its transload facility would affect the southern tip of a forested ridge that has conditions favorable to the federally endangered Indiana bat, i.e., a south-facing slope in a large forest patch with shagbark hickory trees. Reproductive female Indiana bats were recently captured in this forest patch, and may roost and/or forage there. They may also use the affected forested peninsula as a travel corridor between forest patches north and south of the proposed alignment. RS-1 would not directly affect this habitat, passing just south of a forested area with no large dead trees but many young shagbark hickories (up to approximately 12 inches in diameter). The possible effect of rail traffic on bat foraging or use of roost trees is not known, but because most train traffic would be during daytime hours, the effect is likely to be negligible. TR-1 would affect a larger portion of this woodland (1.1 acres), including several shagbark hickory trees up to approximately 12 inches in diameter. The total size of this forested area is approximately 120 acres. No other portions of RS-1 and TR-1 would directly affect habitat suitable for Indiana bat roosting.

4.6.3.3 Summary and Mitigation of Threatened and Endangered Species Impacts

Because upland sandpipers and grasshopper sparrows were not found nesting in the affected habitat, and because the habitat has limitations as foraging habitat, the impacts to these species are considered inconsequential, and no formal mitigation measures are proposed. Coordination with USFWS and the Vermont NNHP will continue in future design and permitting phases.

The VFWD has indicated, in reference to potential Indiana bat habitat, that: “Clearly RS-1 Alternative avoids any direct impacts to these forest patches [near the alignment west of US 7]” (letter from S. Darling dated 6/20/2006; see Appendix A). Under the preferred alternative, no potential Indiana bat roost trees would be affected. Coordination with USFWS and the VFWD will continue.

4.7 Land Resources

4.7.1 Introduction

Vermont’s Act 250, where applicable, regulates earth resources under two criteria. Lands with earth resource potential can only be developed or subdivided when that development does not interfere with the subsequent extraction of those resources. The Act also regulates extraction of earth resources, requiring that the processes used not have undue harm on the environment, and requiring that the site be rehabilitated subsequent to the completion of the operation.

4.7.2 Bedrock Geology

The major bedrock resource in the alternatives corridor is the marble in the vicinity of the quarry. The rail spur is not expected to increase the rate at which stone is removed from the quarry. Construction of the build alternatives may involve other impacts to bedrock geology. Some of the cut sections for either the rail spur or truck to rail alternatives may require blasting to remove bedrock, although the need to blast would not be known until test borings are made.

4.7.3 Surficial Geology

Impacts to the surficial geology of the alternatives corridor would occur in the areas that would require cuts for the rail spur. Specifically, the RS-1 Grade Separated over Halladay Road Option would require cuts from just south of the proposed transload facility to just east of Halladay Road, a distance of approximately 4,700 feet. At US 7, the cut would be at its deepest, at 28 feet below the existing grade. Volumes of excavated material are summarized in Table 4.7-1. The disposal site for this material has not been determined; some may be used in project fill areas.

Table 4.7-1 Cubic Yards (CY) of Material to be Excavated

	RS-1			TR-1	
Location	**Grade Separated over Halladay Road (1.5% grade)**	**At-Grade with Halladay Road (1.33% grade)**	**Halladay Road Relocation (1.5% grade)**	**Grade Separated over Halladay Road**	**At-Grade with Halladay Road**
Total Cubic Yards Excavated	**314,308**	**359,408**	**373,172**	**117,200**	**178,600**

The rail spur would require fill material to construct. Some of this material may come from project cut sections, but some may need to come from off-site. Off-site supply areas would be determined later in project development, so the amounts and locations cannot be specified at this time.

TR-1 would involve much smaller impacts to surficial geology because the horizontal and vertical geometry of roadways is more flexible than railways, so that roadways can more closely follow existing topography, with smaller cuts and fills, than railways may require. There would be a major cut under US 7, and otherwise the impacts would be minimal.

The potential impacts of material supply and disposal (waste and borrow areas) are addressed in the construction impacts section (4.15.2).

4.7.4 Erodible Soils

Impacts to soils are addressed in part in Section 4.7.3 (surficial geology) and Section 4.8.1 (important farmland soils). This section describes the acreages of erodible soils that would be excavated or exposed by the project.

The alternatives' footprints would intersect the following erodible soil series. All are designated "Potentially Highly Erodible" by NRCS, except for one designated "Highly Erodible", as identified below.

NsC – Nellis extremely stony loam 3 to 15 % HEL Class 2
ElB – Elmwood fine sandy loam, coarse variant, 0 to 8% slopes HEL Class 2
FaC – Farmington extremely rocky silt loam, 5 to 20% slopes Class 2
VgB – Vergennes Clay, 2 to 6% slopes HEL Class 2
VgC - Vergennes Clay, 6 to 12 % slopes HEL Class 2
VgD - Vergennes Clay, 12 to 25 % slopes HEL Class 1 (*Highly Erodible*)
VrC – Vergennes rocky clay, moderately shallow variant, 6 to 12% slopes Class 2

The acreage of erodible soils that would be excavated or exposed is summarized in Table 4.7-2. Highly erodible soils make up a small portion (0.21 acres) of the soils to be affected by the alignments. Potentially erodible soils make up the majority of the soils proposed to be affected. Proper erosion controls and other best management practices would be used to minimize any erosion and sedimentation during construction.

4.7.5 Summary and Mitigation of Land Resource Impacts

Construction of the build alternatives may result in blasting and removal of bedrock, the extent of which is not yet known. Cut sections will require removal of existing surficial materials, and fill sections would require depositing fill material. The suitability of excavated material for fill sections is not yet known.

Most of the soils to be excavated or exposed by the project are classified as Potentially Highly Erodible by NRCS.

Proper erosion and sediment controls will be necessary for any exposed soils, including any off-site material supply or disposal areas.

Table 4.7-2 Exposure of Erodible Soils (Acres)

	RS-1			TR-1	
	Grade Separated over Halladay Road	At-Grade with Halladay Road	Halladay Road Relocation	Grade Separated over Halladay Road	At-Grade with Halladay Road
Highly Erodible Soils	0.21	0.21	0.21	0	0
Potentially Highly Erodible Soils	20.92	20.63	24.04	29.11	30.37

4.8 Agricultural Resources

This section describes impacts to important farmland soils and active agricultural lands. The Farmland Protection Policy Act, which was passed in 1981, provides that federal agencies protect farmland from unnecessary development. Federally funded projects that convert agricultural land to non-agricultural uses are subject to review by the USDA NRCS. NRCS is charged with ensuring that the extent to which the federal government contributes to the unnecessary and irreversible conversion of important farmland to nonagricultural uses is minimized.[6]

Act 250 provides that where projects are subject to Act 250 review, areas with primary agricultural soils can only be developed when certain conditions are met.

4.8.1 Impacts to Important Farmland Soils

The No Build Alternative would not affect important farmland soils.

The RS-1 and TR-1 alternatives are discussed together in this section because their impacts are similar in size and location. Almost the entire alternatives corridor has soils classified by NRCS as being of “Statewide Importance” to agriculture, including soil series identified as Vergennes, Limerick, Livingston, and Covington.

Additionally, the proposed alignments cross three soil units identified as prime farmland soil. South of the quarry access road and east of Lower Foote Street, a

[6] Farmland Protection Policy Act 523.01

prime farmland soil area also has soils identified as MrA, or Melrose fine sandy loam, 0 to 3 percent slopes. To the west of Halladay Road, the alignment crosses the southern part of a prime soil unit identified as Elmwood Fine Sandy Loam. Along Otter Creek, the alignment crosses two adjacent prime soil units identified as Hadley very fine sandy loam and Winooski very fine sandy loam. Impacts to Prime and Statewide Farmland Soils for each alignment are quantified in Table 4.8-1.

Table 4.8-1 Impacts to Prime and Statewide Farmland Soils (Acres)

	RS-1			TR-1	
	Grade Separated over Halladay Road	**At-Grade with Halladay Road**	**Halladay Road Relocation**	**Grade Separated over Halladay Road**	**At-Grade with Halladay Road**
Prime Farmland Soils	1.40	1.30	1.22	0.68	0.68
Statewide Farmland Soils	24.89	24.76	27.62	32.14	33.46
Total Prime and Statewide	26.29	26.06	28.84	32.82	34.14
Farmland Conversion Form Score*	151.03	153.10	157.33	146.58	143.57

Score is the total score on the Farmland Conversion Impact Rating form (see Appendix G). Since TR-1 is not the preferred alternative, its scores have not been updated since the DEIS.

Wetland mitigation measures (see Section 4.10) may also affect important farmland soils, as some of the potential mitigation measures involve converting existing farmland to wetland. In most cases, the subject farmland is already somewhat “wet” and has marginal farmland value. Farmland impacts of wetland mitigation cannot be quantified at this time, but will be an important consideration in selection and design of wetland mitigation sites.

A Farmland Conversion Impact Rating Form (AD-1006) was partially completed for this project based on the RS-1 alternatives as currently proposed, and appears in Appendix G. (The TR-1 alternative, with no impacts east of Lower Foote Street, had substantially lower scores than the RS-1 alternatives, as documented in the DEIS.) Project impacts are summarized on this form in terms of acreage affected, relative importance of the farmland, and other factors. The result is a score that indicates the relative severity of impact. The scores are listed in Table 4.8-1 and range from 151.03 to 157.33. Under Farmland Protection Policy Act regulations (7 CFR 658.4), “sites receiving a total score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated”. In other words, farmland impacts do not need to be considered further as a basis for selection of alternatives.

4.8.2 Impacts to Active Agricultural Operations

Both of the proposed alignments would cross through several active or recently active agricultural operations. Impacts vary only slightly by alignment, so the differences in impacts are minor. The primary impacts to agricultural land, besides the direct impacts from the footprint of the alignments, are bisecting fields and isolation of small portions of agricultural land, rendering them less efficient to farm. Impacts to each lot by alignment are summarized in Table 4.8-2, and illustrated on Figures 4.8-1 and 4.8-2. Impacts are described below.

Starting at the eastern end of the alignments in the vicinity of the quarry, lot 8077.200, owned by Omya, would be bisected by the rail alignment. This 115-acre lot is partially actively mined, partially forested and partially active agricultural land. A total of about 11 acres of this lot would be taken for a transload facility and associated land use. Just to the south, land owned by Foster Brothers Farm, an active dairy operation, would be impacted by RS-1, but not by TR-1. This is a 676-acre lot (8107.000) used to grow alfalfa, hay, and corn that extends west across Foote and Lower Foote Streets, south to encompass the existing quarry access road, and east well beyond the study area limits. This lot, already divided by public roads and farm roads, would be further divided by the rail alignment. The greater part of the lot would remain on the eastern side of the rail line, and large parcels would also remain west of the alignment. The fields most likely to be adversely affected by RS-1 are those lying between the current quarry access road and the proposed rail line (see Figure 4.8-1).

South and west of Lot 8107.000, three lots that are in active agricultural use, Lots 8075.000 (east of Lower Foote Street), 8117.000 (west of Lower Foote Street and encompassing the quarry access road), and Lot 8119.001 (west of Lower Foote Street south of the access road), would have peripheral impacts from the RS-1 alignment. The impacts are minimized because the rail alignment would not isolate large portions of the fields.

Table 4.8-2. Impacts to Agricultural Fields (Acres)

		RS-1			TR-1		
Lot	**Total Calculated Acreage of Lot***	**Grade Separated over Halladay Road**	**At-Grade with Halladay Road**	**Halladay Road Relocation**	**Grade Separated over Halladay Road**	**At-Grade with Halladay Road**	**Impact to Agricultural Operation**
8077.200	**115.9**	11.19	11.19	11.19	no impact	no impact	Lot is partially active quarry, partly active agricultural land. Agricultural land will be divided roughly in half.
8107.000	**676.07**	17.88	17. 88	17. 88	no impact	no impact	Large lot will be divided by RS-1, access will be necessary for far side
8075.000	**83.58**	0.61	0.61	0.61	no impact	no impact	Impact to the northwest corner of the lot
8117.000	**35.28**	2.10	2.10	2.10	no impact	no impact	Isolates southeast corner of the lot
8119.001	**8.15**	0.19	0.19	0.19	no impact	no impact	Impacts northwest lot corner
8153.000	**91.27**	4.10	4.52	8.42	4.49	4.49	Isolates 18 acres in northwest corner of lot
8211.000	**10.96**	0.61	0.51	0.65	0.12	0.12	Southern boundary affected
8212.000	**4.88**	0.31	0.24	1.76	1.12	1.12	Northern boundary affected
8211.200	**115.72**	5.69	4.03	3.81	4.23	5.46	Isolates 7 acres of large hayfield
8196.000	**106.46**	2.48	2.26	2.21	3.92	3.92	Divides lot into three pieces
7003.301	**55.61**	4.14	4.15	4.14	0.78	0.78	Impacts northern portion of lot
7003.300	**59.97**	0.29	0.29	0.29	24.25	24.25	RS-1 impacts southern lot border - TR-1 impacts large portion of lot
7003.400	**66.43**	2.16	2.16	2.16	2.98	2.98	Alignment divides lot in half, but is trestled
7026.000	**152.52**	0.91	0.91	0.91	1.20	1.20	Isolates 1.4 acre portion of lot
Total		**52.66**	**51.04**	**56.32**	**43.09**	**44.32**	

** Lot acreage is "calculated" acreage provided with Town of Middlebury electronic lot data, and may differ from "listed" lot acreage.*

To the west of US 7, both TR-1 and RS-1 pass through a fallow pasture, Lot 8153.000, measuring 91 acres. The alignments would isolate a small portion in the northwest corner of the lot, approximately 18 acres.

West of Lot 8153.000 along the east side of Halladay Road, the alignments cross approximately along the boundary between 8211.000 (4.5 acres, on the north side) and 8212.000 (approximately 5 acres, on the south side). Both of these lots have been used for pasture. By crossing on the boundary, the impacts to the individual lots would be minimized.

West of Halladay Road, the alignments pass along the northern border of lot 8211.200, isolating approximately 7 acres of a 115-acre lot. This lot is used primarily for hay production.

To the west of Lot 8211.200, the alignments pass through Lot 8196.000, an odd-shaped lot spanning the Middle Road ROW and measuring approximately 106 aces. The configurations of the alignments would isolate two portions of this lot; one measuring approximately 6 acres, and one measuring approximately 7acres. The viability of the remaining portions of the lot for farming is uncertain, though they could probably be farmed in conjunction with farming on the adjacent lots.

To the west of Lot 8196.000, the alignments pass through lot 7003.300, a 60-acre lot with a corn field and fallow former pasture land (and the location of the South Ridge Subdivision, under construction as of 2008). The alignment of the preferred alternative, RS-1, has been modified since publication of the DEIS to avoid the South Ridge Subdivision, and would skirt the southern edge of this lot. If TR-1 were similarly modified to avoid this development, the impacts to this lot might be substantially lower, but impacts to lot 7003.301 would be much higher due to the footprint of the transload facility.

Directly south of lot 7003.300 is another lot used for pasture and hay production, the 56-acre lot 7003.301. Both the RS-1 and TR-1 alignments will pass through the northern edge of this lot. As described in the preceding paragraph, the preferred alternative has been shifted south to avoid the South Ridge Subdivision, increasing impacts to this lot compared to the DEIS. If TR-1 were also modified, it would affect a larger portion of this lot.

West of Lot 7003.300, the rail alignment for both TR-1 and RS-1 would divide lot 7003.400, a 66-acre lot along Creek Road that is currently used for hay and corn production, into a 21-acre piece to the south and a 43-acre piece to the north. Given that this portion of the alignment would be on a trestle, access between the two portions of the lot would probably not be an issue, as the span between the trestles would be wide enough and high enough to allow a tractor or other farm equipment to pass through. However, the farmland directly underneath the trestle and its piles would probably no longer be viable farmland.

Finally, to the west of Otter Creek, Lot 7026.000, a 153-acre lot used for pasture and hay production would have a 1.4-acre portion in the northwest corner of the lot isolated from the rest of the field. Again, this portion of the rail would be on a trestle, and so access to that portion of the lot might not be precluded by the construction of the rail line, but there would be impacts from the pile locations and the shadow of the trestles.

Wetland mitigation measures (see Section 4.10) may result in additional impacts to active agricultural lands. In most cases, the subject farmland is already somewhat “wet” and has marginal farmland value, and the farmers are interested in negotiating sales of the properties. Farmland impacts will be an important consideration in selection of wetland mitigation sites.

4.8.3 Summary and Mitigation of Agricultural Resource Impacts

Due to the agricultural landscape that dominates the alternatives corridor, impacts to important farmland soils and active farmlands would be impossible to avoid entirely. The No Build Alternative would not affect important farmland soils. Almost the entire alternatives corridor has soils classified by NRCS as being of “Statewide Importance” to agriculture, and all build alternatives and options would impact between 26 and 34 acres of prime and important farmland soils combined. RS-1 At-Grade with Halladay Road would affect the least total acreage, while the TR-1 At-Grade with Halladay Road Option would affect the most. Impacts to prime farmland soils would be relatively small; the RS-1 options would affect about twice as much (1.22 to 1.40 acres) as the TR-1 options (0.68 acres). Wetland mitigation measures may also affect important farmland soils.

Impacts to active farmland operations have been minimized in part by locating the alignments along property boundaries where possible. The No Build Alternative would not affect active agricultural operations. Both RS-1 and TR-1 would pass through a landscape dominated by agricultural land, although several fields are fallow. Impacts vary only slightly by alignment option, so the differences in impacts are minor. The primary impacts to agricultural land, besides the direct impacts from the footprint of the alignments, are bisecting fields and isolation of small portions of agricultural land, rendering them less efficient to farm. The principal differences between RS-1 and TR-1 are the effects of RS-1’s new alignment and transload facility east of Lower Foote Street; and the large footprint of TR-1’s transload facility in active pasture, active cropland, and fallow farmland east of Creek Road.

Landowners would be compensated for any land that may be taken in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 as amended (the Uniform Act). Impacts would further be minimized by accommodating farmers with rail or road crossings to access portions of fields that would be divided.

There will be continued coordination with USDA and the Vermont Agency of Agriculture, Food & Markets regarding agricultural resource impacts as the project moves forward.

4.9 Water Resources

4.9.1 Groundwater

Groundwater impacts are regulated through several programs administered by the VANR Water Supply Division. It does not involve separate permits for groundwater protection, but rather implements protection through other existing regulatory programs.

4.9.1.1 Aquifers

Because of the heavy clay soils, aquifers in the alternatives corridor are limited to areas of low groundwater potential with low transmissivity. The eastern portion of the alternatives corridor is characterized by unstratified glacial drift, and the western portion by stratified glacial drift. The acreage of each alternative's footprint in the two mapped aquifer areas is summarized in Table 4.9-1. The elevated rail area is quantified based on the footprint of the rail. Because of the very low transmissivity of the fine-grained clay soils within the alternatives corridor, surface runoff from the alternatives would drain into surface drainageways (ditches, streams, and wetlands). The runoff would percolate very slowly, if at all, into the groundwater, and the clay particles are likely to remove most contaminants associated with the runoff. For the reasons described above, impacts to groundwater aquifers are not expected.

Table 4.9-1 Overlap of Alignments with Mapped Aquifer Areas (Low Groundwater Potential) (Linear Feet)

	RS-1	**TR-1**
Unstratified Glacial Drift	10,550	4,100
Stratified Glacial Drift	6,330	10,400

4.9.1.2 Public Wells

There are no public wells in the alternatives corridor.

4.9.1.3 Private Wells

There are eight private wells identified within or near the alternatives corridor, although none fall within the path of the proposed footprint of the alternatives. The closest wells are on either side of Halladay Road, south of the alignments. Distances of private wells from the alignments, measured by distance from the toe of slope, are summarized in Table 4.9-2. Direct impacts to private wells are not anticipated from any of the proposed alignments.

4.9.1.4 Summary and Mitigation of Groundwater Resource Impacts

For the reasons described above, no impacts to groundwater resources are expected. However, VTrans policy is to monitor wells that could potentially be affected by construction. Should private wells be affected, owners would be compensated by replacing affected wells, or by connecting affected property owners to public water supplies where possible.

4.9.2 Surface Water

Surface water impacts are regulated through a variety of federal (Clean Water Act) and state (Stream Alteration Permit, Lake Encroachment Permit, wetlands permitting, state water quality regulations, and Act 250, where applicable) laws and regulations.

4.9.2.1 Water Body Modifications

Direct water body impacts are limited to small streams that would be crossed by the proposed alignments. Otter Creek, the largest water body in the alternatives corridor, would not be directly affected by the proposed bridge, which would span the entire river channel (approximately 111 feet). Small streams that would be impacted by the proposed alignments include seven intermittent streams (all of which have already been altered by ditching), summarized in Table 4.9-3 below. Impacts to these streams will include culverting and redirection. In fill sections and shallow cut sections, streams would be culverted, and the length of culverts would be approximately equivalent to the linear feet of impact shown in the table.

Table 4.9-2. Distances of Private Wells from Toe of Slope of Alternatives (Feet)

	RS-1			TR-1	
	Grade Separated over Halladay Road	At-Grade with Halladay Road	Halladay Road Relocation	Grade Separated over Halladay Road	At-Grade with Halladay Road
EAST OF LOWER FOOTE STREET, NORTHEAST OF VERMONT NATURAL AG PRODUCTS	1316	1316	1316	2361	2361
WEST OF LOWER FOOTE STREET, ON STANDARD REGISTER PROPERTY	996	996	996	835	835
BETWEEN HALLADAY ROAD AND US 7, NORTH OF ALIGNMENTS.	1111	1109	1104	1226	1226
EAST OF HALLADAY ROAD, SOUTH OF ALIGNMENTS	567	583	156	459	444
WEST OF HALLADAY ROAD, SOUTH OF ALIGNMENTS	247	219	213	206	182
WEST OF HALLADAY ROAD, NORTH OF ALIGNMENTS	903	905	897	812	787
NORTH OF TR-1 TRANSLOAD	990	990	990	421	427
SOUTH OF TR-1 TRANSLOAD, ASSOCIATED WITH FARM.	699	699	699	649	649

In deeper cut sections, streams may be diverted to flow along the rail line and be discharged at a different location downslope. This is most likely with the streams associated with Wetlands 5 (for RS-1); and Wetlands 9a and 9b (for both RS-1 and TR-1), all of which are located in areas of relatively deep cut sections. (Wetland locations and limits of work are shown on Figures 4.10-1 through 4.10-5.) They would most likely be discharged along Halladay Road at the point where Wetlands 9a and 9b currently discharge. Under RS-1, the stream associated with Wetland 5 would thus be diverted from the Beaver Brook watershed to a drainage flowing to the large wetland west of Halladay Road. The Wetland 5 stream's watershed constitutes about 7% of Beaver Brook's 2,963-acre watershed. Diversion of Wetland 5 is unlikely to have any measurable effect on stream flow in Beaver Brook, since the brook's watershed is large enough to support perennial flow without the contribution of Wetland 5.

Table 4.9-3 Stream Impact (Linear Feet)

	RS-1			TR-1	
	Grade Separated over Halladay Road	**At-Grade with Halladay Road**	**Halladay Road Relocation**	**Grade Separated over Halladay Road**	**At-Grade with Halladay Road**
Ditch / intermittent stream south of the Omya quarry (Wetland 2)	53	53	53	No Impact	No Impact
Ditch / intermittent stream south of Omya access road (Wetland 5)	128	128	128	No Impact	No Impact
Ditch / intermittent stream west of US 7 (Wetland 9a)	145	150	153	311	354
Ditch / intermittent stream feeding into Wetland 9b	147	93	119	115	157
Ditch / intermittent stream just east of Halladay Road (Wetland 9b)	136	77	63	97	185
Ditch / intermittent stream west of Halladay Road (Wetland 10c)	132	81	62	74	145
Ditch / intermittent stream west of Halladay Road (Wetland 12)	92	74	67	75	116
Total linear feet of stream channel impact	**833**	**656**	**645**	**672**	**957**

4.9.2.2 Water Quality

Vermont regulations provide that Class B water bodies: 1) provide high quality wildlife habitat, 2) exhibit good aesthetic value, 3) are suitable for use as a public water supply with filtration and disinfection, 4) are suitable for crop irrigation, 5) are suitable for swimming, and 6) are suitable for boating and fishing (in some Class B waters).

As an impaired surface water, new discharges to Otter Creek would not be permitted to exceed current levels of the pollutants for which it is impaired.

Potential water quality impacts from the proposed project include impacts associated with the increase in impervious area; the potential for road salt and sand impacts from roadways; the use of herbicides to control vegetation; and the potential for impacts from fuel, grease, or other fluids associated with the trains on RS-1 or the truck traffic on the RS-1 transload access road or TR-1.

No Build

Water quality under the No Build scenario would essentially be the same as existing conditions. The possible water quality effects of existing freight traffic traveling along existing roadways have not been assessed.

RS-1

Because rail lines are underlain with a rock bed, the RS-1 rail spur would involve very small increases in impervious surfaces. The proposed RS-1 would have a transload facility and access drive that would involve approximately 2.61 acres of impervious surface. Water quality impacts from RS-1 would include the potential for fuel, grease, or other fluids associated with the trucks and trains to enter adjacent streams, or impacts of creosote weathering from railroad ties.

As discussed in section 3.9.2, Otter Creek is an impaired water body, with E. coli exceeding the maximum allowable for a Class B water body. In this location, E. coli is associated with farming operations or failed septic systems, and is not associated with increases in impervious surface.[7] Runoff from RS-1's paved transload facility and access drive would pass through a network of ditches before reaching Beaver Brook, the Middlebury River, and ultimately Otter Creek.

The Federal Railroad Administration (FRA) requires railroads to control vegetation on or immediately adjacent to the railroad roadbed. Control of vegetation relies on mechanical methods (i.e., tree and brush cutting), as well as herbicides. It is not anticipated that herbicides will be used to control vegetation in the elevated trestle sections of the rail spur. In Vermont, use of herbicides by

[7] "State of Vermont 2006 303(d) List of Waters". VT Department of Environmental Conservation Water Quality Division, 2007.

utilities and railroads for right-of-way vegetation control is regulated by the Agency of Agriculture, Food and Markets, under 6 V.S.A. Chapter 87 (Control of Pesticides) and the Agency's "Vermont Regulations for the Control of Pesticides." These regulations require use of licensed applicators, as well as annual permits. The application of herbicides in accordance with all applicable regulations is not expected to result in an adverse impact.

TR-1

TR-1 would involve an increase of 8.52 acres of impervious surface for the roadway. The proposed transload would involve an additional 16.87 acres of gravel surface, which would be less pervious than the existing field, but slightly more pervious than pavement. Runoff from these impervious and gravel surfaces would result in contaminants typical of roadway stormwater runoff, i.e., sediments, copper, zinc, hydrocarbons, phosphorus, and possibly others[8]. Stormwater runoff would also be warmer than runoff from undeveloped land.

Stormwater runoff from TR-1 would be treated by appropriate best management practices, such as grass swales or detention basins, before being discharged to existing receiving waters. East of Lower Foote Street, existing conditions would not change, and runoff would continue to drain off the quarry access road into upland and wetland ditches and swales, then via a series of ditches, wetlands, and intermittent streams to Beaver Brook, the Middlebury River, and Otter Creek. Although TR-1 would result in more truck traffic on this road, the length and nature of flow suggest there would be adequate treatment of runoff before it enters Beaver Brook and other downstream waters. From a stormwater runoff perspective, this is little change from existing conditions.

West of Lower Foote Street, TR-1 would drain to the west, through ditches, wetlands, and intermittent stream channels to the large forested wetland west of Halladay Road. Between US 7 and Halladay Road, the stream channels are relatively deeply incised, and roadway drainage would need to be designed to minimize erosional potential.

West of Halladay Road, the long ditches and swales combined with the very large wetland to the south suggest there would be adequate treatment of stormwater runoff. Nevertheless, stormwater best management practices would be employed to ensure minimal impact.

As discussed in Section 3.9.2, Otter Creek is an impaired water body, with E. coli exceeding the maximum allowable for a Class B water body. E. coli is associated with farming operations or failed septic systems, and to a lesser extent associated with increases in impervious surface. Runoff from TR-1's

[8] U.S. Environmental Protection Agency. 2002. Stormwater Effects Handbook: A Toolbox for Watershed Managers, Scientists, and Engineers. CRC Press. http://www.epa.gov/ednnrmrl/publications/books/handbook/index.htm

paved surfaces and transload facility would pass through the large wetland to the south before reaching Otter Creek.

As discussed above under RS-1, herbicides may be used to control vegetation along the project's rail spur segments, but would be applied in accordance with all applicable regulations and therefore is not expected to result in an adverse impact.

4.9.2.3 Summary and Mitigation of Surface Water Impacts

Direct water body impacts are limited to seven intermittent streams, all of which have already been altered by ditching. These streams would be culverted or redirected. Diversion of Wetland 5 is unlikely to have any measurable effect on stream flow in Beaver Brook. Because of the small and disturbed nature of these streams, no mitigation other than standard stream crossing practices is proposed. Otter Creek would not be directly affected by the proposed rail bridge, which would span the entire river channel.

Water quality under the No Build scenario would essentially be the same as existing conditions. The RS-1 rail spur would involve very small increases in impervious surfaces and therefore little stormwater runoff. The proposed RS-1 transload facility and access drive would involve 2.61 acres of impervious surface. Runoff from this area would pass through a network of ditches before reaching Beaver Brook, the Middlebury River, and ultimately Otter Creek. TR-1 would involve an increase of 8.52 acres of impervious surface for the roadway and an additional 16.87 acres of gravel surface that would be slightly more pervious than pavement.

Impacts associated with increased stormwater runoff from the transload facility and impervious roadways proposed for RS-1 would be mitigated by using Best Management Practices, such as grass-lined swales or detention basins, for treating stormwater runoff from the proposed facilities. Runoff from the transload facility would most likely be treated with a detention basin, and the proposed project right of way is sufficient to accommodate a detention basin. Detailed stormwater treatment measures will be developed in the final design process.

4.9.3 Floodplains and Floodways

Executive Order (EO) 11988, *Floodplain Management*, which applies to the project, was issued "…to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative…". It requires, at a minimum, that federal agencies design their facilities in a manner consistent with the intent of the NFIP.

Deviations from the standards are only allowed if they are shown to be demonstrably inappropriate for the facility in question. If a facility must be located in a floodplain, it must be designed to minimize harm to or within the floodplain. FEMA is the principal federal agency in charge of evaluating floodplain and floodway impacts.

Vermont's Act 250, where applicable, regulates floodways as follows:

> (D) **Floodways.** A permit will be granted whenever it is demonstrated by the applicant that, in addition to all other applicable criteria:
>
> (i) the development or subdivision of lands within a floodway will not restrict or divert the flow of flood waters, and endanger the health, safety and welfare of the public or of riparian owners during flooding; and
>
> (ii) The development or subdivision of lands within a floodway fringe will not significantly increase the peak discharge of the river or stream within or downstream from the area of development and endanger the health, safety, or welfare of the public or riparian owners during flooding.[9]

4.9.3.1 Floodplain and Floodway Impacts

The No Build Alternative for this project would not involve infrastructure changes (except for independently planned projects) and would not therefore affect floodplains and floodways.

The 100-year floodplain and regulatory floodway within the alternatives corridor is primarily limited to the areas closest to Otter Creek. Both RS-1 and TR-1, as proposed, would span essentially the entire floodplain and floodway with a trestle from the mainline to Otter Creek, a bridge over Otter Creek, and a trestle over the floodplain east of Otter Creek. The trestle and bridge would be constructed along a skewed, curved alignment. The structure concept consists of a multi-span, a 2,050-foot railroad trestle that would include a steel through plate girder (TPG) structure that spans the Otter Creek channel, and a series of short-span precast concrete trestle elements that span Creek Road and cross the floodplain. (For the purposes of quantifying floodplain impacts, it is assumed the span of the trestle elements will be approximately 34 feet between bents, supported by either two columns or three piles.) Direct impacts in terms of surface area were evaluated by overlaying the project limits of work and associated pier footprints onto floodplain mapping. The 100-year floodplain surface area impact, based on the modified RS-1 alignment, would be:

[9] VSA 10 Chapter 151, 4, 6086

66,626 square feet (1.53 acres) with three square piles
67,461 square feet (1.55 acres) with two cylindrical columns

Ice jamming and debris accumulation have the potential to increase flooding upstream of the proposed structure. These concerns will be studied during permitting and final design.

Macro-scale hydraulic modeling performed for the DEIS indicated that the trestles and the bridges could create a backwater effect upstream of these structures, and raise peak flood levels. A more refined model using three dimensional modeling was performed for the FEIS. The potential hydraulic backwater effect of RS-1 was modeled using the U. S. Army Corps of Engineers' Hydrologic Engineering Center's River Analysis System (HEC-RAS) software (Version 3.1.3). The model used peak discharge data from Middlebury Village (the closest available) and modeled both the DEIS and modified RS-1 trestle alignments. The model also included several different pier and bent span configurations: a 69 foot span with two cylindrical five-foot diameter columns at each bent, a 34-foot span with three square 20-inch piles, and a 34-foot span with two four-foot diameter cylindrical columns at each bent. (The 69-foot bent spacing was studied with the goal of minimizing the hydraulic impact.) The results of this study, entitled "Hydraulic Memorandum: Proposed Railroad Bridge and Trestle over Otter Creek", is available as a technical report accompanying this FEIS. The hydraulic study shows that the estimated backwater above the existing level at the 100-year flood stage for any option would be only 0.01 feet. The negligible backwater effects of the pier type and span configurations can be attributed to the wide floodplain and low velocities within this reach of Otter Creek. The proposed bridge and trestle alignments and configurations therefore have essentially no impact to the Otter Creek floodplain and floodway elevations and meets the VTrans and National Flood Insurance Program (NFIP) requirement of no backwater effect during the base Q100 flood event.

CFR Title 44 directs an applicant to inform FEMA of the flood damage potential and associated geometric and flood stage adjustments associated with constructing a new bridge in a floodplain. FEMA has a number of map amendment protocols that are commensurate with the magnitude of the proposed adjustments, including a Conditional Letter of Map Revision (CLOMR) and a Letter of Map Revision (LOMR). However, because there are no impacts to floodplain storage or to the estimated backwater, neither a CLOMR nor a LOMR is anticipated to be needed.

4.9.3.2 Summary and Mitigation of Floodplain and Floodway Impacts

The No Build Alternative (except for independently planned projects) would not affect floodplains and floodways. Both RS-1 and TR-1 would fill relatively small amounts of 100-year floodplain but would span essentially the entire floodplain and floodway with trestle and bridge structures. A detailed hydraulic study was performed which showed that the backwater effect would be about 0.01 feet above the existing floodwater levels. This effect is negligible, and meets the National Flood Insurance Program requirement of no backwater effect.

The preferred alternative minimizes impacts to floodplains. The trestle concept would minimize floodplain and floodway encroachments by avoiding the substantial fill that would be required to build the new rail on a fill section. The trestle would further provide waterway vertical clearance between 4 and 15 feet above the estimated FIS 100-year flood water surface elevation, and may incorporate the use of driven pile bent-style piers that do not require substantial foundation excavation. Because of these efforts, there will be minimal impact to floodplain storage and a negligible change to the backwater effect. Therefore, no mitigation is necessary.

4.10 Wetlands

Federal Regulations

Under NEPA, impacts to wetlands must be quantified for each alternative. Section 404 of the Clean Water Act provides that discharges of dredged or fill materials into waters of the United States require a permit from the ACOE. Activities regulated under Section 404 of the Clean Water Act include filling wetlands for development or infrastructure, construction of dams or levees, and mining activities. The ACOE will issue a permit for such activities only after the applicant has shown that wetland impacts have been avoided and minimized to the extent possible, and that any remaining unavoidable impacts have been mitigated.

Federal Executive Order 11990 provides that for federally funded projects, unavoidable impacts to wetlands must include a finding that there are no practicable alternatives and that harm to wetlands has been minimized to the extent possible.

State of Vermont Regulations

Impacts to wetlands or their regulatory buffers also require a Conditional Use Permit from the VANR.

4.10.1 Impact Assessment Methods

Wetland boundaries were delineated and surveyed in the field since publication of the DEIS in order to identify existing wetland resources and quantify impacts,. Functions and values of the wetlands in the alternatives corridor are identified in Chapter 3 of this document, and are included below in wetland impacts tables. Acreage of wetland impacts for each alternative was quantified by overlaying the footprint, to the toe of slope, over the wetland. In some cases, cut sections adjacent to wetlands may drain portions of the adjacent wetland. It was estimated that such cut sections would drain, on average, approximately 30 feet of adjacent wetland. Therefore impact areas were extended an additional 30 feet beyond the limits of work in these areas. This was applied to impacts to portions of Wetlands 5, 7, 9a, 9b, and 20. At Wetland 7, only a small fringe of wetland would remain beyond the slope limits, and the remaining portion is unlikely to retain wetland features and functions, so the entire wetland was considered impacted. (Figures 4.10-1 through 4.10-5 show wetlands and slope limits.)

Wetlands were classified as Vermont Class Two or Vermont Class Three, and impacts to Vermont Class Two buffers were also quantified. Along the western portion of the alignments, where both build alternatives would involve a rail spur elevated on a trestle, the impact area was measured as the area to be disturbed to install the pile, and the pile itself. Areas where material would be piled or from where equipment would be operated were counted as temporary impacts, and areas that would be impacted by the piles and associated backfill were counted as permanent impacts. In general, the temporary impact area included the footprint or "dripline" of the trestle, plus a 20-foot wide corridor along one side of the trestle, but not including the footprint of the individual piles, which were counted as permanent impacts.

4.10.2 Impacts

4.10.2.1 No Build

No direct impacts to wetlands are anticipated for the No Build Alternative.

4.10.2.2 RS-1

Wetland locations are shown on Figures 4.10-1 through 4.10-5. Impacts for RS-1 are summarized in Table 4.10-1 and are listed for each option, with functions and values, federal classifications, and Vermont wetland classes in Tables 4.10-2, 4.10-3, and 4.10-4. No impacts are expected to Wetlands 1, 3, 6, 8, 14, 16, or 18b.

Wetland 2

Wetland 2 would be crossed in two places, across two lateral ditches that run from Wetland 3 to the east, through farm fields to the main channel of Wetland 2 to the west. The total square footage of direct impact would be 0.59 acres for all RS-1 options. The functions of the affected wetland are limited by the wetland's disturbed condition and linear form.

Wetland 4

The area identified as Wetland 4 in the DEIS was determined to be non-wetland, as described in FEIS Chapter 3.

Wetland 5

Wetland 5 is a broad, swale-like landform that is partially ditched and is within an agricultural field. The proposed rail line would affect a small amount of wetland (0.32 acres), primarily on the north side of the access road, where the wetland is narrow and ditched. The functions of the affected wetland are limited by the wetland's disturbed condition and linear form.

Because this portion of the project is a cut section, the stream associated with Wetland 5 north of the alignment would have to be diverted along the alignment and discharged further to the west. Wetland 5 has a watershed of approximately 214 acres at the proposed RS-1 crossing. It currently drains into Beaver Brook and eventually into the Middlebury River, which in turn flows into Otter Creek. The drainage would be diverted from its current watershed to a point west of Halladay Road, where the proposed grade matches the existing grade, and subsequently into the large swamp to the south. The Wetland 5 stream's watershed constitutes about 7% of Beaver Brook's 2,963-acre watershed. Diversion of Wetland 5 is unlikely to have any measurable effect on stream flow in Beaver Brook, since the brook's watershed is large enough to support perennial flow without the contribution of Wetland 5.

Wetland 7

RS-1 would impact 0.94 acres of Wetland 7. The portion of the wetland that would be directly impacted by the alignment footprint includes two segments of a grassed swale and a small area of scrub shrub wetland south of the quarry access road. Because of the deep cuts involved in this portion of RS-1, adjacent portions of Wetland 7 were included as impacts. The functions of the affected wetland are limited by the wetland's disturbed condition.

Wetland 9

Wetland 9 is a network of intermittent stream channels and wet meadows within fallow farm fields, identified as Wetlands 9a, 9b, and 9c on Figure 4.10-2. Large cuts would be required within Wetland 9a, and would drain portions of the adjacent wetland, eliminating wetland hydrology. To account for this expected impact, the limits of impacts are extended thirty feet beyond the footprint of the alternative. In the case of the Halladay Road Relocation, the remaining wetland between the alignment footprint and the realigned road was counted as an impact. The three different RS-1 options would affect Wetland 9 to differing degrees, as summarized in Table 4.10-1. RS-1 Grade Separated over Halladay Road would impact 1.33 acres of the wet meadow and ditch portion of Wetland 9a. The RS-1 At-Grade with Halladay Road would impact 1.46 acres of Wetland 9a, and the RS-1 option that includes the relocation of Halladay Road would impact 2.39 acres of Wetland 9a, including impacts to the cattail ditch along US 7 and to the wet meadow to the west of that ditch.

To the west, where Wetland 9 becomes a deeply incised ditch (Wetland 9b), the RS-1 alignment would cross the wetland in two places, involving 0.14 acres (RS-1 Grade Separated over Halladay Road), 0.21 acres (RS-1 At-Grade with Halladay Road), or 0.38 acres (RS-1 Halladay Road Relocation). The Halladay Road Relocation would involve three crossings of the ditch/intermittent stream. Wetland buffer impacts for all three options would be around 0.25 acres.

West of Halladay Road, RS-1 would impact 0.12 acres (RS-1 Grade Separated over Halladay Road), 0.08 acres (RS-1 At-Grade with Halladay Road), or 0.09 acres (RS-1 Halladay Road Relocation). The alignment requires fill instead of a cut here, so the impact was calculated as the footprint of the alignment, and does not include any additional area. The portion of Wetland 9c that would be affected is the fringe of a wet meadow/swale; this impact would not involve a stream crossing.

The most notable functional impact to Wetlands 9a, 9b, and 9c would be to sediment/toxicant retention, which is a principal function of Wetland 9a. Wildlife habitat would also be affected.

Wetland 10

The portion of Wetland 10 that would be affected by the RS-1 alternative is Wetland 10c, which is a channelized stream/ditch and associated emergent wetland along the banks. RS-1 would cross Wetland 10c. RS-1 Grade Separated over Halladay Road would impact 0.27 acres or Wetland 10c (0.31 acres buffer); RS-1 At-Grade with Halladay Road would impact 0.16 acres of wetland (0.19 acres buffer), and RS-1 Halladay Road Relocation would impact 0.13 acres of wetland (0.14 acres buffer). The functions of the affected wetland are limited by its disturbed condition and linear form.

Wetland 11

Wetland 11, a broad wet hayfield, would have 0.34 acres of impact (0.28 acres of buffer impact) for the Grade Separated over Halladay Road option, 0.22 acres of impact (0.17 acres of buffer impact) for the At-Grade with Halladay Road option, and 0.19 acres of impact (0.15 acres of buffer impact) for the Halladay Road Relocation option. Functions affected would include sediment and toxicant retention and nutrient attenuation.

Wetland 12

The network of ditches collectively identified as Wetland 12 would be impacted by one crossing involving 0.05 acres of impact (0.11 acres of buffer impact) for all three RS-1 Halladay Road options. The portion of the wetland that would be affected is part of an east-west flowing ditch. As with most other affected wetlands, the affected functions are limited by the wetland's ditched condition.

Wetland 13

The northern portion of Wetland 13, which consists of ditched wetlands and stream channels in farm fields, would be crossed by the RS-1 alignment with a resultant 0.06 – 0.09 acres of impact and 0.15 - 0.20 acres of buffer impact. The crossing would require a culvert. Functions affected are limited by the wetland's disturbed condition, although it is possible that the ditchline may be currently used as a travel corridor for wildlife species.

Wetland 15

Wetland 15 is a network of swales and wet meadows within fallow farm fields. It would be crossed by the RS-1 alignment at the point where it meets Wetland 17 to the south. The portion of Wetland 15 that would be affected is a broad swale, flowing out of a hedgerow between agricultural fields. The proposed alignment would involve 0.70 acres of impact and 0.78 acres of wetland buffer impact for all three options. The impact would affect water quality-related and wildlife habitat functions.

Wetland 17

The northern tip of the large wetland complex Wetland 17, in an area with wet meadow and a ditch that flows south towards the larger wetland, would be crossed by the RS-1 alignment, involving 0.51 acres of wetland impact and 0.22 acres of buffer impact for all three options. The affected portion of the wetland provides sediment/toxicant and nutrient retention, wildlife habitat, production export, and limited floodflow alteration functions. These functions, along with groundwater recharge and uniqueness/heritage functions, have greater importance in the larger, forested portion of Wetland 17 to the south, which will not be directly affected.

Wetland 18a

The rail spur pilings would permanently impact 0.01 acres of wetland and about 60 square feet of buffer of Wetland 18a, an actively used, ditched corn field. The rail spur would be constructed on a trestle through this section, minimizing impacts to most functions. The principal function affected would be floodflow alteration, and as described in Section 4.9, these impacts are negligible. There would be approximately 0.42 acres of temporary impacts during construction from the pile driver and other construction equipment, under and near the trestle. Temporary impacts would involve the placement of geotextile fabric and stone over the wetlands to support the weight of the pile driver. In addition, there would be effects from the partial shading of the elevated rail spur, on the order of 0.17 acres measured by the “drip line” of the rail line. Given the height of the rail spur and the nature of the existing wetlands (active corn field), the effect of the rail line shadow on this wetland’s functions is anticipated to be negligible.

There would be no impacts to Wetland 18b.

Wetland 19

The trestle would affect approximately 250 square feet (less than 0.01 acres) of Wetland 19, a wet meadow used for hay production and pasture, and about 24 square feet of wetland buffer. As with Wetland 18a, the trestle would minimize effects to most functions, and the principal function affected would be floodflow alteration. In addition to the permanent impacts, there would be temporary impacts to 0.31 acres of wetlands for the trestle construction. As with Wetland 18a, impacts would involve the temporary placement of geotextile fabric and stone over the wetland. There would be additional effects of the rail line shadow over the wetland, on the order of 0.12 acres (measured by the “drip line” of the rail line).

Wetland 20

As described in Chapter 3, Wetland 20 is a small farmed wetland, adjacent to Lower Foote Street, which had not been identified in the DEIS. The primary function of Wetland 20 is sediment and nutrient attenuation. RS-1 would impact about 0.5 acres of Wetland 20. On the north side of Wetland 20, the deep cuts required to construct this part of the rail spur along with construction impacts will likely dry out or otherwise adversely affect a portion of the remaining wetland to the north. As explained in Section 4.10.1 above, an additional 30 feet of impact was used when calculating wetland impacts in cut sections.

Table 4.10-1 Summary of Wetland Impacts (Acres): RS-1*

	RS-1 Grade Separated Over Halladay Road			RS-1 At-Grade with Halladay Road			RS-1 Halladay Road Relocation		
Wetland Number	**Class Three**	**Class Two**	***Class Two Buffer Impacts***	**Class Three**	**Class Two**	***Class Two Buffer Impacts***	**Class Three**	**Class Two**	***Class Two Buffer Impacts***
2	0.59			0.59			0.59		
5	0.32			0.32			0.32		
7	0.94			0.94			0.94		
9a	1.33			1.46			2.39		
9b	0.06	0.08	*0.25*	0.14	0.07	*0.27*	0.35	0.03	*0.26*
9c		0.12	*0.20*		0.08	*0.16*		0.09	*0.23*
10c		0.27	*0.31*		0.16	*0.19*		0.13	*0.14*
11		0.34	*0.28*		0.22	*0.17*		0.19	*0.15*
12		0.05	*0.14*		0.05	*0.14*		0.05	*0.14*
13		0.09	*0.20*		0.07	*0.15*		0.06	*0.15*
15		0.70	*0.89*		0.70	*0.89*		0.70	*0.89*
17		0.51	*0.22*		0.51	*0.22*		0.51	*0.22*
18a		0.01	*0.00*		0.01	*0.00*		0.01	*0.00*
19		0.01	*0.00*		0.01	*0.00*		0.01	*0.00*
20	0.49			0.49			0.49		
Totals	**3.73**	**2.18**	***2.49***	**3.94**	**1.88**	***2.19***	**5.08**	**1.78**	***2.18***
Total Wetland Impact	**5.91**			**5.82**			**6.86**		

** This table includes only permanent wetland impacts. Temporary impacts are expected to total approximately 0.73 acres, as described for Wetlands 18a and 19 above, and in Section 4.15.*

Table 4.10-2 Wetland Impacts (Acres): RS-1 Grade Separated over Halladay Road

Wetland Number	Wetland Functions	Cowardin Classification of Affected Wetland	Class Three	Class Two	*Class Two Buffer Impacts*
2	ST, NR, ss, wh	PEM1Cd/ R4SB5d	0.59		
5	st, wh	PEM1Cd/ R4SB5d	0.32		
7	st, nr, ss, wh	PEM1Cd	0.94		
9a	ST, wh	PEM1Cf	1.33		
9b	st, wh	PEM1Cf R4SB5d	0.06	0.08	*0.25*
9c	st, nr, wh	PEM1Cf R4SB5d		0.12	*0.20*
10c	ST, NR, wh	PEM1Cd R4SB1		.027	*0.31*
11	st, nr, pe, wh	PEM1Cf		0.34	*0.28*
12	st, nr, wh	PEM/SS1Cd R4SB7		0.05	*0.14*
13	gr, ST, NR, WH, pe, uh, vq	PEM1Cf		0.09	*0.20*
15	st, nr, wh	PEM1Cf		0.70	*0.89*
17	gr, FA, st, NR, pe, wh, uh	PEM1Cf		0.51	*0.22*
18	FA, st, nr, pe, wh	PEM1Cf		0.01	*0.00*
19	FA, st, NR, pe, WH, r, vq	PEM1Cf R4SB5		0.01	*0.00*
20	st, WH	PEM1Cf	0.49		
Totals			**3.73**	**2.18**	***2.49***
Total Wetland Impact			**5.91**		

Key to Functions:

Note: Functions listed in CAPITALS are principal functions and values of the wetland. Functions and values listed in lower case letters are secondary functions of the wetland.

FA	*Floodflow Alteration*	*WH*	*Wildlife Habitat*
ST	*Sediment/Pathogen/Toxicant Retention*	*R*	*Recreation*
NR	*Nutrient Removal/Retention/Transformation*	*UH*	*Uniqueness/Heritage*
PE	*Production Export*	*VQ*	*Visual Quality*
SS	*Sediment/Shoreline Stabilization*	*GR*	*Groundwater recharge*

Table 4.10-3 Wetland Impacts (Acres): RS-1 At-Grade with Halladay Road

Wetland Number	Wetland Functions	Cowardin Classification of Affected Wetland	Class Three	Class Two	*Class Two Buffer Impacts*
2	ST, NR, ss, wh	PEM1Cd/ R4SB5d	0.59		
5	st, wh	PEM1Cd/ R4SB5d	0.32		
7	st, nr, ss, wh	PEM1Cd	0.94		
9a	ST, wh	PEM1Cf	1.46		
9b	st, wh	PEM1Cf R4SB5d	0.14	0.07	*0.27*
9c	st, nr, wh	PEM1Cf R4SB5d		0.08	*0.16*
10c	ST, NR, wh	PEM1Cd R4SB1		0.16	*0.19*
11	st, nr, pe, wh	PEM1Cf		0.22	*0.17*
12	st, nr, wh	PEM/SS1Cd R4SB7		0.05	*0.14*
13	gr, ST, NR, WH, pe, uh, vq	PEM1Cf		0.07	*0.15*
15	st, nr, wh	PEM1Cf		0.70	*0.89*
17	gr, FA, st, NR, pe, wh, uh	PEM1Cf		0.51	*0.22*
18a	FA, st, nr, pe, wh	PEM1Cf		0.01	*0.00*
19	FA, st, NR, pe, WH, r, vq	PEM1Cf R4SB5		0.01	*0.00*
20	st, WH	PEM1Cf	0.49		
Totals			**3.94**	**1.88**	***2.19***
Total Wetland Impact			**5.82**		

Key to Functions:

Note: Functions listed in CAPITALS are principal functions and values of the wetland. Functions and values listed in lower case letters are secondary functions of the wetland.

FA	*Floodflow Alteration*	*WH*	*Wildlife Habitat*
ST	*Sediment/Pathogen/Toxicant Retention*	*R*	*Recreation*
NR	*Nutrient Removal/Retention/Transformation*	*UH*	*Uniqueness/Heritage*
PE	*Production Export*	*VQ*	*Visual Quality*
SS	*Sediment/Shoreline Stabilization*	*GR*	*Groundwater recharge*

Table 4.10-4 Wetland Impacts (Acres): RS-1 Halladay Road Relocation

Wetland Number	Wetland Functions	Cowardin Classification of Affected Wetland	Class Three	Class Two	*Class Two Buffer Impacts*
2	ST, NR, ss, wh	PEM1Cd/ R4SB5d	0.59		
5	st, wh	PEM1Cd/ R4SB5d	0.32		
7	st, nr, ss, wh	PEM1Cd	0.94		
9a	ST, wh	PEM1Cf	1.46		
9b	st, wh	PEM1Cf R4SB5d	0.35	0.03	*0.26*
9c	st, nr, wh	PEM1Cf R4SB5d		0.09	*0.23*
10c	ST, NR, wh	PEM1Cd R4SB1		0.13	*0.14*
11	st, nr, pe, wh	PEM1Cf		0.19	*0.15*
12	st, nr, wh	PEM/SS1Cd R4SB7		0.05	*0.14*
13	gr, ST, NR, WH, pe, uh, vq	PEM1Cf		0.06	*0.15*
15	st, nr, wh	PEM1Cf		0.70	*0.89*
17	gr, FA, st, NR, pe, wh, uh	PEM1Cf		0.51	*0.22*
18a	FA, st, nr, pe, wh	PEM1Cf		0.01	*0.00*
19	FA, st, NR, pe, WH, r, vq	PEM1Cf R4SB5		0.01	*0.00*
20	st, WH	PEM1Cf	0.49		
Totals			**5.08**	**1.78**	***2.18***
Total Wetland Impact			**6.86**		

Key to Functions:

Note: Functions listed in CAPITALS are principal functions and values of the wetland. Functions and values listed in lower case letters are secondary functions of the wetland.

FA	*Floodflow Alteration*	*WH*	*Wildlife Habitat*
ST	*Sediment/Pathogen/Toxicant Retention*	*R*	*Recreation*
NR	*Nutrient Removal/Retention/Transformation*	*UH*	*Uniqueness/Heritage*
PE	*Production Export*	*VQ*	*Visual Quality*
SS	*Sediment/Shoreline Stabilization*	*GR*	*Groundwater recharge*

4.10.2.3 TR-1

Because the TR-1 alignment starts near US 7 and uses the existing access road to the quarry for the remainder of the alignment, TR-1 would not impact Wetlands 1 through 8. Wetlands 10a, 10b, 13, 14, 16, and 18b would also be unaffected. Impacts for the truck to rail alignments are summarized in Table 4.10-5 and are listed for each option, with functions and values, federal classifications, and Vermont wetland classes in Tables 4.10-6 and 4.10-7. As with the RS-1 alignment alternatives, where there would be cuts involved, the impact was extended 30 feet beyond the footprint of the alternative.

Wetland 9

Wetland 9 is a network of intermittent stream channels and wet meadows within fallow farm fields, identified as Wetlands 9a, 9b, and 9c on figures. Wetland 9 will be affected in three places by the TR-1 alignments: along the northeastern ditched portion of the wetland (Wetland 9a, 0.58 acres for either TR-1 option); to the west, along the southerly portion of Wetland 9b (0.13 acres wetland and 0.07 acres buffer impact from TR-1 over Halladay Road, and 0.15 acres wetland and 0.05 acres buffer impact from TR-1 At-Grade); and in the wet meadow to the west of Halladay Road, Wetland 9c (0.31 acres impact from TR-1 over Halladay Road and 0.20 acres from TR-1 At-Grade). The most notable functional impact to Wetlands 9a, 9b, and 9c would be to sediment/toxicant retention, which is a principal function of Wetland 9a. Wildlife habitat would also be affected.

Wetland 10c

The intermittent stream/ditch and associated emergent wetlands in the northern part of Wetland 10c will be impacted by the TR-1 alignment (0.20 acres of wetland and 0.21 acres of buffer impact). Functions affected include sediment/toxicant retention, nutrient retention, and wildlife habitat, although the functions are limited by the wetland's disturbed condition.

Wetland 11

The edge of Wetland 11, a farmed wet meadow, would be affected by the TR-1 alternative, involving 0.13 acres of wetland and 0.20 acres of buffer impact. Principal affected functions include floodflow alteration and sediment/toxicant retention.

Wetland 12

The network of ditches collectively identified as Wetland 12 would be impacted by one crossing, with 0.04 acres of wetland and 0.20 acres of buffer impact. The functions of the affected wetland are limited by its disturbed and linear condition.

Wetland 13

The northern portion of Wetland 13, which consists of ditched wetlands and stream channels in farm fields, would be crossed by the TR-1 alignment with a resultant 0.04 acres of wetland and 0.21 acres of buffer impact. Functions affected are limited by the wetland's disturbed condition.

Wetland 15

Wetland 15 is a network of swales and wet meadows within fallow farm fields. A portion of Wetland 15 would be affected by the transload facility. This would involve 2.58 acres of impact to a broad swale and to scrub shrub wetland along a hedgerow, and 2.54 acres of buffer impact. The impact would affect water quality-related and wildlife habitat functions.

Wetland 17

The northern portion of the large wetland complex Wetland 17, in an area with wet meadow and a ditch that flows south towards the larger wetland, would be filled for the TR-1 transload facility, involving 1.34 acres of impact to wet meadow, a scrub shrub wetland along a ditch line, and a very small, man-made farm pond. There would be an additional 1.44 acres of buffer impact.

Wetland 18a

Wetland 18a is an actively farmed corn field with hydric soils, wet meadow areas, and ditches. Impacts to Wetland 18a would be 0.01 acres of wetland and 60 square feet of buffer impact. The rail spur would be constructed on a trestle through this section, minimizing impacts to most functions. The principal function affected would be floodflow alteration. There are no impacts anticipated to Wetland 18b. There would be an additional 0.42 acres of temporary impact for trestle construction, assuming the modified RS-1 trestle alignment were used for TR-1. Also as with RS-1, there would be approximately 0.17 acres of wetland affected by the trestle's "shadow effect" on the wetland.

There would be no impacts to Wetland 18b.

Wetland 19

The trestle would affect 0.01 acres of Wetland 19, a wet meadow used for hay production and pasture, and 24 square feet of wetland buffer. As with Wetland 18a, the trestle would minimize effects to most functions, and the principal function affected would be floodflow alteration. Also as with RS-1, there would be approximately 0.31 acres of temporary impact and 0.12 acres of shadow effect on the wetland.

Table 4.10-5 Summary of Wetland Impacts (Acres): TR-1*

	TR-1 Grade Separated over Halladay Road			TR-1 At-Grade with Halladay Road		
Wetland Number	**Class Three**	**Class Two**	***Class Two Buffer Impacts***	**Class Three**	**Class Two**	***Class Two Buffer Impacts***
9a	0.58			0.58		
9b	0.13		*0.07*	0.15		*0.05*
9c		0.31	*0.29*		0.20	*0.24*
10c		0.20	*0.21*		0.20	*0.21*
11		0.13	*0.20*		0.13	*0.20*
12		0.04	*0.20*		0.04	*0.20*
13		0.04	*0.21*		0.04	*0.21*
15		2.58	*2.54*		2.58	*2.54*
17		1.34	*1.44*		1.34	*1.44*
18a		0.01	*0.00*		0.01	*0.00*
19		0.01	*0.00*		0.01	*0.00*
Total Acreage:	**0.71**	**4.66**	***5.16***	**0.73**	**4.55**	***5.09***
Total Wetland Impact:	**5.37**			**5.28**		

** This table includes only permanent wetland impacts. Temporary impacts are expected to total approximately 0.73 acres, as described for Wetlands 18a and 19 above, and in Section 4.15.*

Table 4.10-6 Wetland Impacts (Acres): TR-1 Grade Separated over Halladay Road

Wetland Number	Wetland Functions	Cowardin Classification of Affected Wetland	Class Three	Class Two	*Class Two Buffer Impacts*
9a	ST, wh	PEM1Cf	0.58		
9b	st, wh	PEM1Cf R4SB5d	0.13		*0.07*
9c	st, nr, wh	PEM1Cf R4SB5d		0.31	*0.29*
10c	ST, NR, wh	PEM1Cd R4SB1		0.20	*0.21*
11	FA, ST, pe, wh	PEM1Cf		0.13	*0.20*
13	gr, ST, NR, WH, pe, uh, vq	PEM1Cf		0.04	*0.20*
12	st, nr, wh	PEM/SS1Cd R4SB7		0.04	*0.21*
15	st, nr, wh	PEM1Cf		2.58	*2.54*
17	gr, FA, st, NR, pe, wh, uh	PEM1Cf		1.34	*1.44*
18	FA, st, nr, pe, wh	PEM1Cf		0.01	*0.00*
19	FA, st, NR, pe, WH, r, vq	PEM1Cf R4SB5		0.01	*0.00*
Total Acreage:			**0.71**	***4.66***	***5.16***
Total Wetland Impact:			**5.37**		

Key to Functions:

Note: Functions listed in CAPITALS are principal functions and values of the wetland. Functions and values listed in lower case letters are secondary functions of the wetland.

FA	*Floodflow Alteration*	*WH*	*Wildlife Habitat*
ST	*Sediment/Pathogen/Toxicant Retention*	*R*	*Recreation*
NR	*Nutrient Removal/Retention/Transformation*	*UH*	*Uniqueness/Heritage*
PE	*Production Export*	*VQ*	*Visual Quality*
SS	*Sediment/Shoreline Stabilization*	*GR*	*Groundwater recharge*

Table 4.10-7 Wetland Impacts (Acres): TR-1 At-Grade with Halladay Road

Wetland Number	Wetland Functions	Cowardin Classification of Affected Wetland	Class Three	Class Two	*Class Two Buffer Impacts*
9a	ST, wh	PEM1Cf	0.58		
9b	st, wh	PEM1Cf R4SB5d	0.15		*0.05*
9c	st, nr, wh	PEM1Cf R4SB5d		0.20	*0.24*
10c	ST, NR, wh	PEM1Cd R4SB1		0.20	*0.21*
11	FA, ST, pe, wh	PEM1Cf		0.13	*0.20*
12	st, nr, wh	PEM/SS1Cd R4SB7		0.04	*0.20*
13	gr, ST, NR, WH, pe, uh, vq	PEM1Cf		0.04	*0.21*
15	st, nr, wh	PEM1Cf		2.58	*2.54*
17	gr, FA, st, NR, pe, wh, uh	PEM1Cf		1.34	*1.44*
18a	FA, st, nr, pe, wh	PEM1Cf		0.01	*0.00*
19	FA, st, NR, pe, WH, r, vq	PEM1Cf R4SB5		0.01	*0.00*
Total Acreage:			**0.73**	**4.55**	***5.09***
Total Wetland Impact:			**5.28**		

Key to Functions:

Note: Functions listed in CAPITALS are principal functions and values of the wetland. Functions and values listed in lower case letters are secondary functions of the wetland.

FA	*Floodflow Alteration*	*WH*	*Wildlife Habitat*
ST	*Sediment/Pathogen/Toxicant Retention*	*R*	*Recreation*
NR	*Nutrient Removal/Retention/Transformation*	*UH*	*Uniqueness/Heritage*
PE	*Production Export*	*VQ*	*Visual Quality*
SS	*Sediment/Shoreline Stabilization*	*GR*	*Groundwater recharge*

4.10.3 Summary and Mitigation of Wetland Impacts

Total Wetland Impacts of Alternatives

The No Build Alternative would not directly affect wetland resources. The RS-1 Halladay Road Relocation Option would have the greatest impacts of the build alternatives, with 6.86 acres of total wetland impact, followed by RS-1 Grade Separated over Halladay Road (5.91 acres) and RS-1 At-Grade with Halladay Road (5.82 acres). The TR-1 alternatives are slightly lower, with 5.37 acres (Grade Separated) or 5.28 acres (At-Grade) of total wetland impact. However, RS-1 would have greater impacts east of Lower Foote Street, while TR-1 would have greater impacts west of Halladay Road, because of the proposed transload facility. These impacts include direct fill and also areas where cut sections are expected to eliminate wetland hydrology in a portion of adjacent wetlands (specifically, 30 feet beyond the proposed project slope limits in Wetlands 5, 9a, 9b, and 20). RS-1 would also result in the diversion of the stream associated with Wetland 5, as discussed above, but effects on the Beaver Brook drainage system are expected to be negligible.

Impacts to Wetland Types

The great majority of wetlands that would be impacted by the build alternatives are excavated drainage ditches and swales in farm fields and farmed wet meadows. These are predominantly emergent wet meadow wetlands, with small inclusions of scrub-shrub and mixed scrub-shrub and emergent wetland. Most of the affected wetlands also include intermittent stream channels. No perennial streams would be directly affected.

Impacts to Wetland Functions

RS-1

The primary wetland functions that would be impacted by the RS-1 alternative include water quality related functions, wildlife habitat, and because of the hydrologic diversion, potential off-site impacts to fisheries and wildlife habitat. Functional impacts of RS-1 are described below.

- Wildlife habitat: All affected wetlands provide some level of wildlife habitat value. Wetlands 18a and 19 are within the Otter Creek floodplain and are part of an important riparian corridor, but the proposed trestles would minimize direct impacts and preserve the corridor function. Impacts to other wetlands, which are mostly ditch lines and hedgerows, would have limited effect on the wildlife corridor function of the wetlands, most notably at Wetland 12.

- Sediment/pathogen/toxicant retention, nutrient retention/transformation, and sediment stabilization: All of the affected wetlands provide sediment/pathogen/toxicant retention, and most provide nutrient retention as well. These functions are present because of the agricultural setting and the associated fertilizer, pesticides, and sediments in runoff. Wetlands 2 and 7 also provide sediment/shoreline stabilization.
- Floodflow alteration: Wetlands 17, 18a, and 19 are in the Otter Creek floodplain and provide primary floodflow alteration functions. Only the fringes of Wetland 17 would be affected, while trestle and bridge structures would carry the rail spur over the floodplain elevation in Wetlands 18a and 19, so impacts to this function are negligible. (Section 4.9.3.1 provides additional detail on impacts to floodplains and floodways.)
- Production export: Wetlands 17, 18a, and 19 also provide the production export function, but impacts to this function would be negligible.
- Recreation and visual quality: Wetland 19, in a broad horse pasture on the west side of Otter Creek, provides these functions. The proposed rail spur would limit the recreational use of a portion of the pasture, and would adversely affect its visual quality.
- Groundwater recharge and uniqueness/heritage: While Wetland 17 has the groundwater recharge function and uniqueness/heritage value, the affected portion of the wetland contributes minimally to these functions.

TR-1

The proposed TR-1 would impact similar functions, with the following differences:

- Wildlife habitat: Wildlife habitat would be affected to a lesser extent because there would be no impacts to Wetlands, 2, 5, and 7, and greater impact to Wetland 15, which provides limited wildlife habitat and corridor value.
- Sediment/pathogen/toxicant retention, nutrient retention/transformation, and sediment stabilization: TR-1 would affect fewer wetlands with sediment/pathogen/toxicant retention and nutrient retention functions, and would not affect wetlands with the sediment/shoreline stabilization function.
- Floodflow alteration and production export: TR-1 would have greater impact than RS-1 to Wetland 17, and similar impacts to Wetlands 18a and 19, all of which are in the Otter Creek floodplain and provide primary floodflow alteration and secondary production export functions.

Potential Mitigation Measures

Section 404 of the Clean Water Act and Executive Order 11990 require that impacts to wetlands be mitigated by avoiding impacts where possible, minimizing impacts that can’t be avoided, and compensating for wetland functions lost. The alternatives were configured to minimize impacts to the extent practicable. Efforts to avoid and minimize wetland impacts will continue during the design process. For example, slopes could be steepened to reduce the project footprint, or drainage could be modified to maintain wetland hydrology.

Compensation for impacts to wetlands from the project may be composed of several components, such as constructing new wetland to replace lost wetland acreage and functions; restoring former wetlands; enhancing existing, degraded wetlands; constructing stormwater treatment measures that replace lost wetland functions; preserving important wetland or wetland buffer habitat; or other measures.

Potential wetland mitigation measures were discussed with resource agency staff (ACOE, VANR wetlands office, EPA, and others). The mitigation measures and conclusions regarding their viability are described below.

- Many of the wetlands in the alternatives corridor surround ditches that drain agricultural land. It may be possible to broaden and stabilize ditches to provide additional treatment for existing agricultural runoff. Specifically, Wetlands 9a and 9b, which are proposed to be affected by the build alternatives, include a deeply cut ditch. Restoration efforts could include improvement and stabilization of the portions of this channel that are not affected by the alignments. This measure may help minimize impacts of the project, but would not substantially compensate for impacts.

- Ditches could be blocked to create wet meadows or scrub shrub wetlands in portions of farm fields along the alternatives corridor that may need to be abandoned because they would become less efficient to farm. These wetlands would create additional wildlife habitat as well as additional water quality treatment. In addition, vegetated buffers could be provided along existing streams and ditches to provide wildlife habitat and water quality protection. This option is considered less desirable than larger mitigation sites along Otter Creek.

- Gravel pits, because of their heavily disturbed condition and relatively low ecological value, can be appropriate sites for wetland mitigation. There are several gravel pits that lie along the foothills of the Green Mountains to the east of the alternatives corridor. A review of aerial photographs reveals twelve gravel pits of varying sizes and in varying states of active use in the general area (the eastern side of Middlebury and immediately adjacent areas in Bristol and Salisbury) (Figures 4.10-6, 4.10-7, and 4.10-8). Field review of most of these sites revealed that the pits are excavated into the foothills of the Green Mountains, and topography is general hilly. This means substantial earthwork would be needed to construct wetlands. Evidence of suitable hydrology was scant, and visible in only the most deeply excavated areas. These sites do not appear to be suitable wetland mitigation sites.

- There are many farm fields within the floodplain of Otter Creek and its tributaries which have high wildlife habitat value and provide buffers for the rivers and streams. These fields or their development rights could be purchased to preserve the habitat and buffer. Where fields are ditched and partially wet, plugging ditches could provide wetland creation or enhancement. Potential sites identified for this project are discussed further below.

Wetland Mitigation Site Review

Potential mitigation sites were identified through conversations with the ACOE, VANR, and NRCS staff and local landowners; a review of USGS topographic maps and aerial photographs; a review of the Lake Champlain Basin Wetland Restoration Plan; and by looking for sites during field investigations. Many sites were identified within the floodplain of Otter Creek and its tributaries that appeared to have good potential for wetland mitigation. These were typically large parcels with existing wetlands and uplands, river frontage, maintained ditches, and active farm fields.

The following three sites were identified as having relatively high mitigation potential. The Bridport Lemon Fair River Site is the preferred wetland mitigation site at this time.

Bridport Lemon Fair River Site

A site recommended by NRCS is a ditched complex of fields along the Lemon Fair River in Bridport, a portion of which is currently being used for hay. (Figure 4.10-9 shows the site on an aerial photo base and an inset map showing the site location.) Wetlands on this site could be preserved and perhaps restored or enhanced by blocking ditches to restore hydrology. Although it is actively being farmed, NRCS has indicated that the owners may be willing to sell parts of the lots for a wetland mitigation site. This was confirmed in a conversation with one of the landowners.

Resource agency staff previously expressed concerns over the potential for future disturbance of this lot, as it is well away from public roadways. However, the site appears to have several advantages for wetland mitigation, including sufficient acreage, a riparian setting, extensive ditching, evidence of sufficient hydrology, and areas of no or marginal farmland value. For these reasons, this site is identified as the preferred wetland mitigation site.

Soils

Soils at the site, as mapped by the Addison County Soil Survey, include Covington silty clay, flooded, and Livingston clay, flooded. These soils are derived from silt and clay deposits of glacial Lake Champlain and floodplain soils along the Lemon Fair River. Covington silty clay, flooded, is a poorly to somewhat poorly drained soil that, according to the soil survey, is covered with floodwater every year. Livingston clay, flooded, is a very poorly drained soil that is also covered with floodwater every year.

Ownership

The proposed field complex is comprised of three parcels owned by two different entities. The total acreage of the three parcels is 472 acres, although the main area of interest is approximately 200 acres. It is assumed that only a portion of this acreage would be used for wetland mitigation purposes.

Current Land Use

The site includes hay fields, wet meadows, marshy areas, small patches of forest, and ditches. Most of the land is cut for hay when conditions allow, but much of the land is too wet to cut in most years.

Hydrology

The Lemon Fair River abuts the property on the west side. The ditches that run through the field are large and appear to be perennially wet. It appears that the water table is at or near the surface for most of the year in much of the site. Portions of the site are seasonally flooded.

Functions

Because the site is surrounded by active agricultural land use, the existing wet meadows and wet hay fields provide an important water quality improvement function. The site also contributes to wildlife habitat and floodflow attenuation functions. Wildlife tracks were observed along the banks of the Lemon Fair River, and despite the farming activities the river probably serves as a travel corridor for animals such as raccoons, mink, certain amphibians, and other species.

Proposed Conditions

There appears to be sufficient acreage at this site to meet the ACOE recommended mitigation ratios through wetland preservation (15:1 ratio). The existing wetland could also be enhanced by blocking some or all of the ditches currently draining into the Lemon Fair River. Doing so would enhance the water quality improvement function and increase flood storage of the fields.

Wetland mitigation at this site could affect existing wildlife habitat, wetlands, floodplains, important farmland soils, active farm fields, archaeological resources, and perhaps other resources. Presumably existing habitat, wetlands, and floodplains would be enhanced by restoring wetland hydrology, establishing a riparian buffer, and improving floodwater storage. Care would need to be taken to avoid adversely affecting the more productive farmlands on this or adjacent parcels. It is expected that at least Phase I archaeological survey will need to be conducted to identify existing deposits, and there will be continued consultation with interested parties, as described in Section 4.11.1 below. Coordination with resource agencies will continue concerning wetland, floodplain, farmland, or other resource impacts, as appropriate.

Cornwall Otter Creek Site

The Cornwall site (Figure 4.10-10) is located north of Swamp Road and west of Otter Creek, which comprises the town line between Cornwall and Salisbury. The site under consideration is an agricultural field with a network of drainage ditches, and is associated with several other fields along the creek. The entire field complex measures approximately 129 acres and is made up of portions of five lots. The lot of primary interest is 22.3 acres and in private ownership. The fields front Otter Creek for approximately 1.2 miles, and vary from 600 to 1,000 feet wide. The land is low-lying and wet, and was ditched to make it farmable. Historically, the fields were cropped, but currently are cut for hay. The fields support a variety of wetland grasses, sedges, and herbaceous vegetation, including reed canary grass, woolgrass, sensitive fern, sedges, boneset, goldenrod, and other species. To the west of the hay fields is an extensive forested wetland dominated by red maple. The watershed of the site extends to low lying ridges approximately two miles west of the site. Beyond these ridges, the land slopes off to the west and drains towards the Lemon Fair River.

Resource agency staff have expressed interest in this site, but also concerns about whether wetland enhancement would have enough of an effect on the site to compensate for the project impacts. This site may be considered, most likely in combination with other mitigation sites, if the preferred site proves insufficient or unavailable.

Soils

Soils at the site, as mapped by the Addison County Soil Survey, include Limerick silt loams, Winooski very fine sandy loam, and Hadley very fine sandy loam. These soils are associated with the silt and clay deposits of the glacial Lake Champlain and with the floodplain of Otter Creek. Limerick soils are generally low lying and submerged for a portion of the spring. Winooski soils are deep and moderately well drained, and may also be submerged for periods of one or two weeks in the early spring. Hadley soils are well drained, and frequently flooded, with ongoing deposition of soils from flooding.

Ownership

The proposed field complex is comprised of five parcels, under the ownership of the Nature Conservancy, the State of Vermont, and one individual. The single lot under private ownership (lot 27) is the lot of interest for project mitigation purposes. The Nature Conservancy owns lot 38, closest to the road, which measures 25.1 acres. To the north of this lot is a large lot owned by the State of Vermont (lot 4, 801.5 acres), only a small portion of which lies in the proposed mitigation area. A ditch runs between lot 38 and lot 4. North of lot 4 is lot 28, also owned by the Nature Conservancy, measuring 24.2 acres. North of lot 28 is lot 27, which measures 22.3 acres, under private ownership. To the north of this is a lot measuring approximately 50 acres owned by the State of Vermont. Lots under state ownership in and around the proposed mitigation area are part of the Cornwall Swamp Wildlife Management Area, which is managed by the VFWD.

Current Land Use

The site was historically used for cropland, and is currently farmed for hay. The land is probably all jurisdictional wetland, and portions are submerged for a period of time in the early spring. There is an existing wooded buffer along the margin of Otter Creek supporting silver maple, red maple, and other species.

Hydrology

Otter Creek abuts the property on the east side, and a large forested wetland lies along the west side of the site. The ditches that run through the field are perennially wet. To date, no test pits have been dug, but it appears that the water table is at or near the surface for most of the year. Portions of the site are seasonally flooded.

Functions

The existing wet hayfield provides some water quality improvement, wildlife habitat, and floodflow attenuation. Leopard frogs were observed in the field, and chickadees, blue jays, and a raven were observed in the adjacent red maple swamp. Wood ducks were observed in Otter Creek adjacent to the proposed mitigation site. The Cornwall Swamp Wildlife Management Area is maintained for deer habitat, and also provides habitat for a variety of other mammals, reptiles, amphibians, and birds.

Proposed Conditions

The existing wetland could be enhanced by blocking some or all of the ditches currently draining into Otter Creek. Doing so would enhance the water quality improvement function currently being provided by the farm fields, and increase flood storage of the fields. Additionally, the microtopography could be altered to create pools or pits and mounds to increase the habitat diversity of the site. Most of the proposed field complex is already under public ownership or protected as private conservation land.

As with the Bridport and Pittsford sites, wetland mitigation at this site could affect existing wildlife habitat, wetlands, floodplains, important farmland soils (but not active farmland), archaeological resources, and perhaps other resources. Presumably existing habitat, wetlands, and floodplains would be enhanced by restoring wetland hydrology and improving floodwater storage. It is possible that at least Phase I archaeological survey would need to be conducted to identify existing deposits, and there will be continued consultation with interested parties, as described in Section 4.11.1 below. Coordination with resource agencies will continue concerning wetland, floodplain, farmland, or other resource impacts, as appropriate.

Pittsford Otter Creek Site

In Pittsford, another potential site which is partially in active agricultural use lies between the railroad tracks and Otter Creek (Figure 4.10-11). Otter Creek wraps around the site and surrounds it on the north, west, and south. A ditch approximately five feet wide parallels the railroad tracks. The watershed of the site extends across the railroad tracks to the hills east of the site. No major drainages flow into Otter Creek at the site.

Since publication of the DEIS, a portion of this site was tentatively committed to provide mitigation for an adjacent transportation project (a railroad bridge replacement). Resource agency staff have expressed interest in other portions of this site, but also concerns about its value as wetland mitigation. Specifically, existing wet areas are already productive wetland, and existing farmlands are prime farmland soils. This site may be considered if the preferred site proves insufficient or unavailable.

Soils

Soils at the site, as mapped by the NRCS Rutland County Soil Survey, are all floodplain soils that grade from very poorly drained to well drained, including Saco mucky silt loam, and Tioga, Teel and Limerick silt loam. Saco mucky silt loams are deep, very poorly drained floodplain soils that are frequently flooded for brief periods in fall, winter, and spring. Tioga silt loams are well drained floodplain soils, and Teel silt loams are very deep, and are moderately to somewhat poorly drained. Limerick silt loams are poorly drained floodplain soils.

Ownership

The lot extends over the railroad tracks to the east. Lot 2-1 is a 150 acre lot, 16 acres of which lies between the railroad tracks and Otter Creek, and would be the target of the mitigation effort. A second lot, under different ownership (Lot 7N-28), is 107 acres, 39 acres of which lies to the south of lot 2-1 (between the railroad tracks and Otter Creek). The portions of this second lot to the east of the railroad tracks may also be considered as mitigation sites, but the landowner reportedly would like to continue farming portions of the lot.

Current Land Use

Lot 2-1 is maintained as a hayfield, in part, supporting reed canary grass, joe-pye weed, sensitive fern, sedges, and other herbaceous wetland vegetation. The western portion of lot 2-1 has grown into a red maple swamp. A wide ditch extends from the railroad tracks to Otter Creek to the southwest, dividing lot 7N-28 and lot 2-1. The southern portion of lot 7N-28, approximately twenty acres, has been recently under cultivation as a cornfield. The remainder of this lot (south of the rail line) is prime farmland soils and is maintained for hay, and a series of parallel ditches traverses the hayfield.

Hydrology

Otter Creek abuts the property on two sides, much of the property appears to be wetland, and large ditches traverse the fields. While no test pits have been dug, it appears that the water table is at or near the surface for most of the year.

Functions

Similar to the Cornwall site, the Pittsford site currently provides water quality improvement, floodflow alteration, and wildlife habitat. The fields probably provide habitat for small mammals, grassland birds, birds of prey, amphibians such as leopard frogs and red spotted newts, and mammals such as deer, fox, and coyote. The adjacent red maple swamp likely provides habitat for a variety of songbirds, mammals such as raccoons and otters, and amphibians and reptiles.

Proposed Conditions

Large portions of the proposed site are existing wetland. Possible enhancements include blocking the ditches in the hayfields to improve the water quality functions and increase flood storage capacity. Changes could be made to the microtopography to create pit and mound habitat. The site could be enhanced with shrub plantings to increase habitat diversity and food value for songbirds and mammals. Although it is unlikely that the site would be subject to development because much of it is probably already jurisdictional wetland, it could be protected by easements to preserve it in perpetuity. Consideration would have to be given to access to farm fields in the back of Lot 7N-28.

As with the Bridport site, wetland mitigation could affect existing wildlife habitat, wetlands, floodplains, important farmland soils, active farm fields, archaeological resources, and perhaps other resources. Presumably existing habitat, wetlands, and floodplains would be enhanced by restoring wetland hydrology, establishing a riparian buffer, and improving floodwater storage. Care would need to be taken to avoid adversely affecting the more productive farmlands on this or adjacent parcels. It is expected that at least Phase I archaeological survey would need to be conducted to identify existing deposits, and there will be continued consultation with interested parties, as described in Section 4.11.1 below. Coordination with resource agencies will continue concerning wetland, floodplain, farmland, or other resource impacts, as appropriate.

Next Steps for Wetland Mitigation

There appear to be mitigation sites available that would adequately compensate for this project's wetland impacts. Following issuance of the ROD for this project, in order to obtain necessary permits (such as federal Section 404 and Vermont Conditional Use Determination permits), mitigation site review and evaluation will continue. Additional data will be gathered at preferred mitigation sites to determine the extent of existing wetlands, vegetation communities, habitats, soils, hydrology, and other features of the sites. The type and amount of wetland creation, enhancement, restoration, or preservation will be estimated, and conceptual site plans will be developed. Throughout the process, there will be close coordination with resource and regulatory agencies to ensure the proposed mitigation meets their requirements. Final mitigation plans must be developed in order to obtain a Section 404 permit.

4.10.4 Only Practicable Alternative Finding

This project has been carefully evaluated with respect to its effects on wetlands, practicable alternatives to such impact and practicable mitigation measures as is required under the provisions of Executive Order 11990, Protection of Wetlands.

The build alternatives, RS-1 and TR-1, were selected for detailed study following a comprehensive screening process. Most of the preliminary alternatives considered during screening involved substantially greater wetland impacts than RS-1 and TR-1 and also required crossing Otter Creek. Because wetlands are found throughout the alternatives corridor, wetland impacts could not be avoided. Because Otter Creek lies east of the mainline railroad tracks, between the quarry and the mainline, its crossing could not be avoided.

Mitigation for wetland impacts followed a sequential approach of avoidance, minimization, and compensation. Avoidance of wetland impact, addressed throughout project development, was a primary concern in the screening of alternatives, as described in Chapter 2 of this FEIS. The decision to limit detailed study to the RS-1/TR-1 alternatives corridor was in part due to the greater expected wetland impacts, along with greater farmland and other resource impacts, of most of the other build alternatives studied during the screening process.

Based on field-delineated wetland boundaries, the RS-1 Grade Separated over Halladay Road, which is the preferred alternative, would involve 5.91 acres of wetland impact. The RS-1 Halladay Road Relocation Option would impact 6.86 acres of impact, and RS-1 At-Grade with Halladay Road would impact 5.82 acres. The TR-1 alternative would impact either 5.37 acres (Grade Separated) or 5.28 acres (At-Grade) of wetlands. The great majority of wetlands that would be impacted by the build alternatives are excavated drainage ditches and swales in farm fields and farmed wet meadows. Most of the affected wetlands also include intermittent stream channels, but no perennial streams would be directly affected. The primary wetland functions that would be impacted by either RS-1 or TR-1 alternatives include water quality related functions and wildlife habitat.

After a thorough analysis of all environmental, social and economic impacts; input received from local, state and federal agencies; input received from the Advisory Committee; and input gathered from the public, VTrans and FHWA identified RS-1 with the Grade Separated over Halladay Road and Lower Foote Street Bridge options as the preferred alternative. The No Build Alternative does not satisfy the project purpose and need, and TR-1 has inherent inefficiencies by requiring additional material handling steps and two modes of transportation (truck and rail). Although TR-1 would require less new alignment than RS-1, the transload facility would be larger, so that expected impacts to natural and cultural resources are generally comparable to impacts expected from RS-1. The resource agencies support the selection of RS-1 as the preferred alternative.

Efforts to minimize wetland impacts will continue during the design process. For example, slopes could be steepened to reduce the project footprint, or drainage could be modified to maintain wetland hydrology. Mitigation measures are proposed to compensate for the preferred alternative’s unavoidable wetland impacts by replacing lost functions and values, including wildlife habitat. There has been extensive coordination in this regard with federal and Vermont resource agencies. There has been agreement among FHWA, VTrans, and the resource agencies regarding the nature of the proposed impacts and the kinds of mitigation that would adequately compensate for wetland impacts. During FEIS studies it has been clearly documented that there are multiple mitigation sites that could compensate for project impacts. These sites, including the preferred site in Bridport, are primarily partially wet, heavily ditched farmland and wet meadows along river floodplains. There will be continued coordination with resource agencies regarding mitigation site final selection and design.

Based upon the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands which may result from such use.

4.11 Historic and Archaeological Resources

Impacts to historic and archaeological resources are regulated by the following federal and state laws and regulations.

Federal

Historic and archaeological resources are protected through Section 106 of the National Historic Preservation Act and through Section 4(f) of the Department of Transportation Act of 1966. Section 106 requires that for federal actions, the effects on properties on or eligible for the National Register of Historic Places (National Register or NR) must be taken into account. The lead federal agency (FHWA) evaluates the resources and makes a determination on the effects of the actions on those resources after consultation with the State Historic Preservation Officer (SHPO). In Vermont, a Programmatic Agreement between the FHWA, VTrans, the Advisory Council on Historic Preservation (an independent federal agency), and the Vermont SHPO delegates authority to a VTrans staff historian and staff archaeologist to each serve as a Deputy SHPO. The Programmatic Agreement specifies the responsibilities of the Deputy SHPO, including requirements for findings of No Historic Properties Affected, No Adverse Effect, and Adverse Effect. Adverse Effect findings may be approved with standard mitigation measures or may require a Memorandum of Agreement among FHWA, VTrans, and SHPO. FHWA may coordinate with the Advisory Council on Historic Preservation prior to preparation of an Adverse Effect Memorandum of Agreement.

Archeological sites on or eligible for the NR that are threatened with destruction or damage are also protected. Archaeological resources that are protected under the law are defined as “the place or places where the remnants of a past culture survive in a physical context that allows for the interpretation of these remains."[10]

Section 4(f), as described in Section 3.2.5.1 of this document, requires that no approval can be given for a transportation project that involves the use of a public park, recreation area, wildlife area, or historic site (if the historic site is adversely affected by such use), unless there is no feasible alternative, and all possible planning to minimize harm to the resources has been undertaken. Chapter 5 addresses Section 4(f) requirements and impacts in greater detail.

[10] National Register Bulletin 36, "Guidelines for Evaluating and Registering Historical Archeological Sites and Districts," 1993, p. 2

State of Vermont

Vermont's Act 250, where applicable, provides that a land use permit will be issued when no undue adverse effects to historic resources will be incurred.

The Vermont Historic Preservation Act provides that when a state agency is involved with a project, the VDHP reviews the project for potential impacts to historic resources. As mentioned above, VTrans also has a Historic Resources Team charged with evaluating potential impacts to historic and archaeological resources from federally funded transportation projects, and providing recommendations for avoiding, minimizing or mitigating those impacts.

Projects that have a potential for impacts to archaeological resources undergo a screening process that involves several phases. An Archaeological Resource Assessment (ARA) is the first phase and involves review of existing resources and previous studies as well as a field review, with no subsurface investigation. If any portion of the Area of Potential Effect (APE) is archaeologically sensitive, a "Phase I" study occurs, involving subsurface testing to look for buried and intact artifacts and features from historic or pre-contact sites. If any such features are found, a Phase II study is conducted to determine if the site is eligible for the National Register. A Phase III study involves complete excavation, documentation, and curation of the artifacts recovered from the site.

4.11.1 Archaeological Resources

4.11.1.1 Impacts

An ARA was conducted for the project to identify archaeologically sensitive sites during the development of the DEIS. Chapter 3 details the methods and findings of this review. Subsequently, to provide some field verification, a partial Phase I study was conducted in the APE. The results of this study resulted in confirmation of the sensitivity of some areas, lack of sensitivity in other areas, and the overall validity of the initial sensitivity assessment. The potential impacts of each alternative on archaeological resources were determined by overlaying each alternative alignment's slope limits on the Historic and Archaeological Resources map (Figures 3.11-1 and 3.11-2). Archaeological resources on these figures include archaeologically sensitive areas, previously tested archaeologically sensitive areas, and known archaeological sites. The footprint of the various alternatives was overlaid onto archaeologically sensitive areas and was measured to determine potential impacts. The footprint included the "dripline" of the trestle, and the cut and fill slope limits elsewhere.

Potential impacts of each alternative are summarized in Table 4.11-1.

Table 4.11-1 Potential Impacts to Archaeologically Sensitive Areas (Acres)

	RS-1 Grade Separated over Halladay Road	RS-1 At-Grade with Halladay Road	RS-1 Halladay Road Relocation	TR-1 Grade Separated over Halladay Road	TR-1 At-Grade with Halladay Road
Archaeologically Sensitive Areas	8.22	8.52	10.42	20.77	21.47

4.11.1.2 Summary and Mitigation of Archaeological Resource Impacts

The No Build Alternative would involve traffic on existing roads and would not therefore affect archeological resources or archeologically sensitive areas.

The RS-1 alternatives involve from 8.22 to 10.42 acres of archaeologically sensitive land, with the preferred alternative having 8.22 acres of involvement. The estimated impacts have decreased since the DEIS because certain areas were investigated and found to lack archaeological resources.

The TR-1 alternatives have higher potential involvement with archaeologically sensitive areas, primarily because of the sensitivity of the area of the proposed TR-1 transload facility. The Phase I studies conducted following publication of the DEIS resulted in identification of additional sensitive land in this area, so the estimate of TR-1 alternatives' total impact acreage has actually increased since the DEIS. TR-1 At-Grade with Halladay Road had the most extensive potential involvement.

Based on the limited field testing, it is not expected that archaeological sites are important to preserve in place. Instead, the mitigation of impacts to archaeological resources may be achieved through the recovery of information through excavation and documentation, through avoidance and minimization of impacts, through burial in place of resources, or through public outreach and education. Recovery of archaeological resources would occur under an approved plan which would provide for the reporting and dissemination of results, as well as the curation of artifacts.

Next Steps for Archaeological Study

As described in Section 3.11.2.3, during Phase 1 testing of the APE, a subset of five archaeologically sensitive areas was tested to determine the presence of archaeological resources. As a result of this study, three areas were identified for Phase II evaluation. Further Phase I testing will be conducted in all the sensitive areas following conclusion of the NEPA process and acquisition of involved land. As information on archaeological resources becomes available, there will be continued consultation with interested parties, including ten federally recognized Native American tribes.

4.11.2 Historic Resources

This section includes descriptions and opinions of potential effects on historic resources listed on or eligible for listing on the NR that were identified in the project's APE. The APE is "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties… The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." [36 CFR Part 800.16(d)] Under the regulations of Section 106 of the National Historic Preservation Act, an "adverse effect" occurs when a federal undertaking alters characteristics of a historic property that qualify it for inclusion in the NR. Specific criteria for what constitutes an "adverse effect" are found in the regulations (36 CFR Part 800.5). More detailed findings may be found in the *Historic Resource Preliminary Assessment of Potential Effects* report found in Appendix F.

4.11.2.1 No Build

Under the No Build scenario, freight transportation would continue to use US 7 and local roads, and no improvements would be made to address the needs outlined for the project. Sixty-two buildings and structures that are listed on or that appear to be individually eligible for listing on the NR (excluding Brandon Village) were identified in the No Build's APE. Most of those buildings and structures are located along the No Build APE, immediately adjacent to and accessed from US 7 and local roads in Florence. Under the No Build Alternative, freight would continue to pass through Brandon Village, which is listed on the National Register as a historic district. Of the 245 contributing structures in the historic district, 102 are located along US 7/Main Street.

The Middlebury Spur Project was initiated in part because of concerns about the impact of the heavy truck traffic in the US 7 corridor and in the village centers through which it passes. An Omya truck currently passes along US 7 approximately every three to five minutes during the hours of operation. Along rural stretches of the highway, trucks traveling at the posted speed limits pass very close to a number of 19th century buildings. The impacts of high-speed truck traffic on the rural portions of US 7 have not been studied but dust and exhaust may have some effect on these structures. The heavy truck traffic also negatively affects the rural character of the built environment.

Brandon Village is made up of a dense concentration of 19th and 20th century historic buildings, many of which are constructed of brick. Residents and town officials have long expressed concern about any impacts that may be caused by the frequent truck traffic that winds through the community. These concerns include impacts from noise, vibration, dust, and acids. Heavy traffic may also affect the economy of the village as it could discourage tourism. Results of noise and vibration studies for the project may be found in Section 4.5 of this document. The impacts of heavy traffic on the quality of the human environment, both social and physical, may be more difficult to assess.

The US 7 traffic also passes through Leicester Four Corners, a small rural community that developed around the intersection of two major roads. Three buildings that are individually listed on the National Register of Historic Places are located around the four corners. The buildings are representative of religious, civic and social activities that were the mainstay of 19th century life in Vermont. The setting and feeling of Leicester Four Corners is affected by the heavy volume of traffic on US 7. It is unknown if the physical integrity of the buildings is being affected.

The truck traffic also affects the small hamlet of Florence. Although the trucks move slowly, the frequency and scale of the truck traffic negatively affects the rural character of the village.

The No Build would not address, and in some cases would increase, the concerns regarding air quality, noise, and vibration in the village centers. The continued use of US 7 for freight transport in the region, along with the increased congestion associated with continued growth in the region, would only make these issues of greater concern.

4.11.2.2 RS-1

Descriptions and preliminary assessments of potential effect under Section 106 are provided below for RS-1. Locations of sites referenced below may be found on Figure 3.11-1.

Foote and Lower Foote Streets – Sites M19, M20, M21 and M22

Foote Street is a north to south road that intersects US 7 just north of the RS-1 crossing of US 7. Lower Foote Street is generally a north to south road that branches off from US 7 south of Middlebury, intersects with Cady Road and travels north to Foote Street.

1. Site M19. No Adverse Effect

The c.1800 house and mid-19th century carriage barn are located on the east side of Foote Street, immediately south of the Lower Foote Street Y-intersection. The RS-1 Alternative would not alter the physical characteristics that make this complex appear to be eligible for listing on the National Register. Additionally, the property's integrity of location, design and workmanship would not be altered. Although the integrity of the property's setting, or its physical environment, may be diminished by the introduction of a deep, wide, artificial landscape feature, the distance of the alignment from the property minimizes the effect. Therefore, it appears the RS-1 Alternative would have No Adverse Effect.

2. Site M20. No Adverse Effect

The c.1800 Cape Cod style house on the east side of Lower Foote Street is not listed on the State Register but despite a few non-historic alterations appears to be eligible for listing on the NR. The RS-1 Alternative will not alter the physical characteristics of this building. The impact of the cut would not substantially diminish its historic integrity due to the distance between the house and the alignment. Therefore, it appears the RS-1 Alternative would have No Adverse Effect.

3. Site M21. No Adverse Effect

The farm complex on the east side of Lower Foote Street is listed on the State Register (Middlebury SR#76) and appears to be eligible for listing on the NR as a Farmstead. A portion of the RS-1 Alternative would be constructed on land owned by Foster Brothers, including land historically associated with the Farmstead. The transload facility would probably not be visible from Lower Foote Street but may be illuminated at night. An analysis of the noise and vibration impacts generated by the transload facility is provided in Section 4.5.

The RS-1 rail spur and transload facility could be accessed by other shippers. A farm crossing for Foster Brothers may be retained along the at-grade section of RS-1. It is also possible that the cut and embankment would create a barrier that would require Foster Brothers to travel around the spur and the quarry to access their property east and south of the alignment.

The RS-1 Alternative would not alter the physical characteristics of the historic buildings but it would physically alter the land historically associated with the Farmstead. Land that is historically associated with a Farmstead is considered to be a contributing element of the resource. The proposed cut and embankment would amount to physical damage to the land. Physical damage to any characteristic of a historic property that qualifies the property for listing on the National Register in a manner that diminishes the property's historic integrity may be considered an adverse effect.

The RS-1 Alternative would alter the integrity of the farm's setting or physical environment, and feeling, or ability to express the sense of its period of significance (1866-1939), because, despite the introduction of non-historic buildings and structures, the area surrounding the complex of historic buildings remains generally in agricultural use. The contemporary agricultural buildings at the south end of the complex are larger in scale but their recognizable function is in keeping with the intended function of the historic buildings. The Farmstead's setting, or physical environment, has evolved over time but the historic character of the building complex has been retained. Similarly, the property retains sufficient physical features, including the land, that taken together, convey the property's historic character.

The construction of a deep, wide cut (up to 160' wide and 28' deep) and a 10' tall, 2,000' long earthen embankment across the open land would appear as an unnatural, incompatible landscape feature, so its introduction would diminish the integrity of the property's setting and feeling.

However, because of the cumulative effect of the existing quarry road that bisects the historic parcel, the location of the RS-1 Alternative at a considerable distance from the historic buildings, and the fact that the portion of the alternative that would occur on the land associated with the Farmstead would not be visible from the farm buildings, it appears the RS-1 Alternative would have No Adverse Effect.

4. Site M22. No Adverse Effect
As described in Chapter 3, the house associated with M22 was relocated within the last 50 years and therefore is not eligible for listing on the National Register. The associated intact 1950 Ground Level Stable Barn is not listed on the State Register but it has gained sufficient age to be considered historic. The barn is located on the east side of Lower Foote Street approximately 1,200' south of the proposed alternative. The current use of the access road impacts the setting of the farm to some extent, due to the frequency and nature of the truck traffic. The RS-1 Alternative would not alter the physical characteristics of the barn. Although the deep cut would be an unnatural feature in the landscape, site visits suggest that the distance between the cut and the barn would be sufficiently far so that the integrity of the property's setting would not be substantially diminished. The amount of truck traffic on the access road adjacent to the barn would be reduced because the Omya trucks would be eliminated. Other shippers would access the new transload facility via Lower Foote Street and the quarry access road, thus increasing the amount of traffic on Lower Foote Street. Cumulatively, it appears the RS-1 Alternative would have No Adverse Effect.

US 7 – Sites M15, M16 and M18

These properties are located on US 7 north of the RS-1 crossing.

5. Site M15. No Adverse Effect

The c.1850 house on the west side of US 7 is approximately 800’ north of the existing quarry access road and the proposed spur where it would pass under the highway. The house is listed on the State Register (Middlebury SR#84) and appears to be eligible for listing on the National Register. The c.1930/1950 Ground Level Stable barn was not included in the SR listing but is now over 50 years old and is also considered NR eligible as a very good example of the type. The property is the first north of the alignment but the historic context of the house and barn has been affected by development along US 7, widening of the road and increased traffic. The land immediately south and west of the buildings, the path of the proposed rail spur, remains as open fields. The RS-1 Alignment will not alter the physical characteristics of the buildings. Construction of the spur would eliminate the frequent stopping, turning, and accelerating of the marble trucks at the quarry access road just south of the property. The embankment west of Halladay Road and all Halladay Road crossing options would be visible from the property but at a distance. Site visits suggest that the rail spur in the bottom of the cut would be visible from the property, but the alignment would be located far enough away from the buildings that it would not substantially further diminish the integrity of the setting. Therefore, it appears the RS-1 Alternative would have No Adverse Effect on the property.

6. Site M16. No Adverse Effect

The c.1830 house and associated carriage barn on the west side of US 7 are listed on the State Register (Middlebury SR#85) and appears to be marginally eligible for listing on the National Register. The buildings are located approximately 1,000’ north of the spur alignment. The house is located very close to the edge of the highway. The alternative would not alter the physical characteristics of the buildings. The integrity of the early house’s historic setting has been diminished by the development along US 7, widening of the road and increased traffic. Although there is open land to the rear and southwest of the house and barn, any view of the embankment at the Halladay Road crossing would probably be impeded by the slight rise in the land west of Middle Road South. Site visits suggest that views of the spur at the bottom of the cut from the property would be limited. Therefore it appears the RS-1 Alternative would have No Adverse Effect on the property.

7. Site M18. No Adverse Effect

The former District # 3 school (Middlebury SR # 83) is located on the east side of US 7 approximately 1,400’ north of the proposed spur alignment and the new highway bridge. The rail spur would enter the cut east of Halladay Road and re-emerge above ground east of Lower Foote Street. Portions of the cut would be visible from the school but it is unlikely that the rail spur in the bottom of the cut would be visible. It is also unlikely that the above-grade spur in the vicinity of Halladay Road would be visible from the school building. The RS-1 Alternative would not alter the physical characteristics of the school building. The integrity of the 19th century rural district school's physical environment has been diminished by development and increased traffic along US 7. The construction of the spur would not diminish the integrity of the building's location, design, workmanship, feeling and association. Therefore, it appears the RS-1 Alternative would have No Adverse Effect.

Halladay Road – Site M25

The property is located on the west side of Halladay Road directly opposite the end of Middle Road South. RS-1 passes south of the property. None of the options under consideration would directly affect the property.

8. Site M25.

Potential Adverse Effect (RS-1 Grade Separated over Halladay Road)
No Adverse Effect (RS-1 At-Grade, Halladay Road Relocation)

The c.1800 Federal style house, c.1925 shed-roofed barn and outhouse are listed on the State Register (Middlebury SR#89) and appear to be eligible for listing on the National Register. The house sits at an elevation of approximately 410', 500' north of the rail alignment. The front elevation faces Halladay Road and South Middle Road with views to the east across fallow fields to US 7. The land to the south of the property drops away into a small gully and open fields. The gully broadens to the southwest with additional views of fields and forested areas. The fields on the east side of Creek Road and the gable peak of a barn on South Street Extension Site (M23) can be seen to the west behind the house. Due to its siting, much of the rail spur would be visible from the house, from fields east of Otter Creek to US 7.

The barn is located only 250' north of the spur alignment, at an elevation of 405'. Just south of the barn, Halladay Road follows the contour of the land and drops down into the gully. The elevation of Halladay Road at its low point in the gully is approximately 380', or 30' below the elevation of the house. The spur embankment would intersect Halladay Road at its low point. The size of the embankment in the vicinity of Halladay Road would vary with each of the three crossing options.

Each of the three options for crossing Halladay Road has the potential to affect Site M25. The house is sited so that it would look out over and down on a substantial portion of the elevated alignment, so the potential impact of the RS-1 Alternative on the resource, regardless of which option is selected for the Halladay Road crossing, is considerable. The potential impacts of the alternative and the crossing options are increased by the fact that the house is only 500' away from the alignment.

Simulations were prepared to represent the RS-1 alternative for each of the three Halladay Road crossing options (Figures 4.3-31, 4.3-32, 4.3-33, 4.3-35, 4.3-36, and 4.3-37). It is evident that all options would be visible from Site 25, although they would have varying degrees of visual prominence.

The Grade Separated over Halladay Road Option has the greatest potential to affect the property because the option requires the tallest and widest embankment. This option would be carried on an embankment that would begin to climb 3,300’ west of the crossing. One thousand feet west of Halladay Road the embankment would be nearly 40’ tall and 80’ wide at its base. The embankment would be 25’ tall at Halladay Road, or 5’ below the elevation of the historic house. At an elevation of 400’ to 405’, the option would alter and/or eliminate views from the house, and would also affect views of the property from US 7, Halladay Road, South Middle Road and adjoining properties. The simulations from Viewpoint 27 looking west (Figure 4.3-31) and Viewpoint 28 looking south (Figure 4.3-35) help illustrate the height of the embankments. Compared to the existing view, the height of the embankment shown in the simulation from Viewpoint 27 dominates the middle ground of the photo. Almost all perception of the current agricultural activities would be blocked by the rail line and embankment. Similarly, in Viewpoint 28 (Figure 4.3-35) the rail line becomes the dominant feature in the view, although not quite as pronounced as Viewpoint 27 (4.3-31), due to the natural drop in elevations at the crossing of Halladay Road.

The At-Grade with Halladay Road Option would result in the lowest embankment. The existing grade of Halladay Road would need to be elevated approximately 5’ so that the road and the spur would be at the same elevation. The embankment west of the at-grade crossing would be 15’ to 18’ tall at its tallest. The embankment would be 8’ tall on the west side of the road crossing and 13’ tall on the east side. Simulations from Viewpoint 28 show that the rail line would be completely screened by the land just beyond the edge of the driveway in the At-Grade with Halladay Road Option (Figure 4.3-36),

The Halladay Road Relocation Option would eliminate the road crossing from the design and would therefore allow the rail spur to be constructed on a shallower grade. The required embankment for the Halladay Road Relocation Option would be approximately 5’ taller than the at-grade embankment along its length. The rail line would be screened almost in its entirety for the Halladay Road Relocation Option (Figure 4.3-37).

The At-Grade with Halladay Road and the Halladay Road Relocation Options would be at elevations of 390’ and 395’ respectively at the intersection, and although lower than the Grade Separated over Halladay Road Option, would also affect the views from and views of the house and barn.

The RS-1 Alternative would not alter the physical characteristics of the buildings that appear to make them eligible for listing on the National Register. The RS-1 Alternative could alter the historic characteristics of the resources that appear to make them eligible for listing on the NR because the introduction of the embankment could diminish the integrity of the property's setting or physical environment, and feeling or ability to convey its historic character.

Railroads carried on constructed earthen embankments and rail underpasses are part of Vermont's historic landscape. The setting and feeling of the landscape associated with Site M25, through which the RS-1 Alternative would pass, has been altered repeatedly over time but to date the natural landscape and the manmade features within it remain human in scale. No one feature dominates the landscape. Unlike photo-simulations that are static or fixed in place, human experience of a landscape is active. Similarly, the RS-1 embankment would not be a structure isolated in a specific location but would have a perceptibly unending presence in the landscape in which it would be constructed. The RS-1 embankment would be constructed as a 2:1 slope along its length, resulting in a monolithic, repetitive form. The embankment would be in the viewshed from Site M25 from US 7 in the southeast, through the fields to the south and southwest, and to the west nearly to Otter Creek. The RS-1 alignment as it passes south of Site M25 would also be visible from US 7, Halladay Road and South Middle Road.

The At-Grade with Halladay Road and the Halladay Road Relocation Options would affect the integrity of the historic property's setting and feeling because each would introduce a landscape feature that would pass through the views from and of the property. Photo-simulations and site visits suggest that size of the embankments required for the At-Grade with Halladay Road and the Halladay Road Relocation Options would alter but would not eliminate the middle distance views to the south and southwest from the house. A small hill would be retained in either of these options, increasing the extent of screening, as illustrated by the train replicated in each simulation. The difference in visual prominence between these two options is modest; when comparing these two options with the simulation created for the Grade Separated over Halladay Road Option (Figure 4.3-35), the difference is considerable.

In reviewing the simulations from in front of the house, on Halladay Road (Figures 4.3-30 through 4.3-33), there is once again an apparent reduction in the visual prominence of changes to the landscape for the At-Grade with Halladay Road and Halladay Road Relocation Options as compared to the Grade Separated over Halladay Road Option. As views migrate to the west from the Hathaway house, grades drop at a more modest and even rate and the rail line would become visible. Although the rail line would be visible, the reduction in the size of the embankment would allow views of the agricultural fields and better retain the visual quality of the existing view. The simulations in Figures 4.3-32 and 4.3-33 indicate that these two options would have a scale more compatible with the existing landscape character and would become part of the landscape. The repetitive form of the shorter embankments would not dominate visual experience of the resource or its environment. Therefore, it appears that the At-

Grade with Halladay Road Option and the Halladay Road Relocation Option would have no adverse effect on the resource because they would not substantially diminish the integrity of the property's setting and feeling.

Photo-simulations (Figure 4.3-31) and site visits indicate that the size of the embankment required by the Grade Separated over Halladay Road Option would eliminate the existing middle distance view from Site M25 to the south and southwest. Those views instead would be filled by a manmade feature that would be much greater in scale than other features in the landscape. Similarly, the large embankment would also affect views of the resource. The huge scale and monolithic, repetitive form of the embankment would physically dominate the environment through which it would pass, thus diminishing the historic integrity of the setting of Site M25. The embankment would also be visually incompatible with the existing natural and manmade environment of the property, thus diminishing the integrity of the feeling or historic character of the property. Therefore it appears the Grade Separated over Halladay Road Option would have an Adverse Effect on the resource.

Creek Road – Site M28

9. Site M28. No Adverse Effect
The farm complex is located on Creek Road (Middlebury SR # 102), approximately 0.7 miles north of the RS-1 alignment. The farm is sited low on the land, just above the floodplain. The trestle and a portion of the embankment for RS-1 would be visible from the property. The spur would not alter the physical characteristics of the farm but may affect the integrity of the property's setting and feeling because it would introduce modern materials and artificial shapes into its agricultural environment. Site visits suggest that the perceived scale and massing of the spur from the farm would be diminished by the property's siting, its distance from the alignment, and the undulations of the fields between the two. Therefore it appears the RS-1 Alternative would have No Adverse Effect on Site M28.

South Street Extension – Site M23

10. Site M23. No Adverse Effect
The property is located on the west side of Otter Creek, immediately west of the mainline. Pasture land that is apparently associated with the property lies between the building complex and the mainline track. The land west of Otter Creek is elevated above the stream and the open farmland to the east, so that the east and southeast views from the property beyond the mainline are expansive.

The farm complex on South Street Extension is listed on the Vermont State Register (Middlebury SR#100) and appears to be eligible for listing on the National Register as a Farmstead. The buildings that comprise the complex appear to date from the second half of the 19th and early 20th centuries so it is likely that the existing mainline railroad pre-dated the farm in its current configuration.

The proposed spur would branch away from the mainline towards the northeast approximately 600' south of the farm. The trestle and much of the embankment would be visible from the property. The RS-1 Alternative would not alter the physical characteristics of the individual buildings or of the complex that make it appear eligible for listing on the NR, but may affect the Farmstead's integrity of setting and feeling. The construction of the elevated railroad trestle and tall earthen embankment would alter the physical environment of the historic property because the modern materials, calculated shape of the alignment, and artificial embankment would appear out of context with the agricultural lands they would pass through. Similarly the historic feeling, or the property's ability to express the sense of its period of significance, would also be altered. The mainline has probably been part of the environment of the farm since the farm was first established. The trestle would move away from the property as it drops down to meet the embankment. The property is elevated above the spur so that the view of the alignment would flatten as it proceeds east through the fields towards Halladay Road. Overall, the proposed structures would diminish the setting and feeling of the historic resource, but not to the degree that it would constitute an Adverse Effect. Therefore, it appears the RS-1 Alternative would have No Adverse Effect on Site M23.

4.11.2.3 TR-1

Foote Street and Lower Foote Streets - Sites M19, M20, M21 and M22

1*. Site M19. No Adverse Effect*
The TR-1 Alternative would not alter the physical characteristics that make this complex appear to be eligible for listing on the National Register. Additionally, the property's integrity of location, design and workmanship would not be altered. The integrity of the property's setting, or its physical environment, would not be substantially diminished because the construction associated with the alternative ends west of Lower Foote Street. Therefore it appears the TR-1 Alternative would have No Adverse Effect.

2. Site M20. No Adverse Effect
The TR-1 Alternative would not alter the physical characteristics of this building. Additionally, the property's integrity of location, design and workmanship would not be altered. The integrity of the property's setting would not be substantially diminished because the construction associated with the alternative ends west of

Lower Foote Street. Therefore it appears the TR-1 Alternative would have No Adverse Effect.

3. Site M21. No Adverse Effect
The constructed portion of the TR-1 Alternative would stop 600' east of US 7 and would not alter the physical characteristics that make the Farmstead appear eligible for listing on the National Register. The access road and heavy truck traffic amount to an existing condition. It can be assumed that the volume of truck traffic on the access road would increase. Other shippers would access the truck road from Lower Foote Street, thus increasing the traffic on that road as well. The volume and nature of the existing and potential truck traffic would affect the historic setting and feeling of the Farmstead, but would not substantially diminish the property's eligibility for listing on the National Register. Therefore, it appears the TR-1 Alternative would have No Adverse Effect.

4. Site M22. No Adverse Effect
As described in Chapter 3, the house associated with M22 was relocated within the last 50 years and therefore is not eligible for listing on the National Register. The associated intact 1950 Ground Level Stable Barn is not listed on the State Register but it has gained sufficient age to be considered historic. The barn is located on the east side of Lower Foote Street approximately 1,200' south of the proposed alternative. The alternative would not alter the physical characteristics of the barn. The current use of the access road impacts the setting of the farm to some extent, due to the frequency and nature of the truck traffic. The potential increase in the amount of traffic on the access road and on Lower Foote Street could further diminish the integrity of the barn's setting. Site visits suggest that the distance between the access road and the barn is sufficient enough so that the integrity of the barn's setting would not be substantially affected if the volume of traffic does not increase substantially. Therefore, it appears the TR-1 Alternative would have No Adverse Effect.

US 7 – Sites M15, M16 and M18

5. Site M15. No Adverse Effect
The TR-1 alignment would not alter the physical characteristics of the buildings. Construction of the truck road would eliminate the frequent stopping, turning, and accelerating of the ore trucks at the quarry access road just south of the property, but much of that noise would be relocated to the new road adjacent to the buildings. The Grade Separated over Halladay Road option could be visible from the property. The 40' wide, 20' deep cut that would take the truck road under US 7 would be visible from the property. Site visits suggest that the road in the bottom of the cut would also be visible. The impact of the alternative on the character of the setting, or physical environment of the house and barn would be reduced because the truck road would be below grade when it is adjacent to the property, and because the historic context along US 7 has been previously

affected. Therefore it appears the TR-1 Alternative would have No Adverse Effect.

6. Site M16. No Adverse Effect
The impact description for Site M15 would be the same for this site. Therefore it appears the TR-1 Alternative would have No Adverse Effect on the property.

7. Site M18. No Adverse Effect
The truck road would enter the cut east of Halladay Road and would re-emerge above ground 600’ east of US 7. Portions of the cut would be visible from the school but it is unlikely that the road in the bottom of the cut would be visible. It is also unlikely that the above-grade truck road in the vicinity of Halladay Road would be visible from the school building. The TR-1 Alternative would not alter the physical characteristics of the school building. The construction of the new road and cut would not diminish the integrity of the building’s location, design, workmanship, feeling and association. Therefore, it appears the TR-1 Alternative would have No Adverse Effect.

Halladay Road

8. Site M25. No Adverse Effect
The truck road would be built generally at-grade west of Halladay Road. It is possible that the transload facility may be visible from the property. The cut east of Halladay Road would be visible. The TR-1 At-Grade with Halladay Road Option would not alter the physical characteristics of the property that make it appear to be eligible for listing on the National Register. The frequency and speed of the truck traffic on the road could create an impact on the integrity of the property’s setting and feeling but would not make it ineligible for the NR. Therefore it appears the TR-1 At-Grade with Halladay Road Option would have No Adverse Effect.

The TR-1 Grade Separated over Halladay Road Option would have a much greater impact on the historic house because the bridge would be elevated on an embankment to carry it over Halladay Road. The embankment would vary in height between 19’ and 25’. The elevation of the bridge deck would be 400’, or 10’ below the ground elevation of the house. The elevated bridge would not alter the physical characteristics of the buildings, but it would affect the integrity of the property’s setting and feeling. From its higher vantage point the house would look out over and down on the bridge, but this view would be limited to the crossing. Unlike the RS-1 Alternative’s continuous embankment, the TR-1 truck bridge and embankment would be approximately 900’ long. A structure of this scale would be much more compatible with and understandable in this landscape. The frequency and speed of the truck traffic on the road could affect the integrity of the property’s setting and feeling but would not adversely affect the qualities that make it eligible for the NR. Therefore it appears the TR-1 Grade Separated over Halladay Road Option would have No Adverse Effect.

Creek Road

9. Site M28. No Adverse Effect
The transload facility and elevated rail line may be visible from the property. The amount and nature of any anticipated noise, dust and other indirect impacts generated by the transload facility are unknown. The TR-1 Alternative would not alter the physical characteristics of the farm but may affect the integrity of the property's setting and feeling because it may introduce noise and negative visual impacts into its environment. Site visits suggest that the perceived scale and massing of the alternative when viewed from the farm would be diminished by the property's low elevation, its distance from the alignment, and the undulations of the fields between the two. Therefore it appears the TR-1 Alternative would have No Adverse Effect on the farm.

South Street Extension

10. Site M23. No Adverse Effect
TR-1 in the vicinity of this property is identical to RS-1 and the expectation of no adverse effect is the same.

4.11.2.4 Summary and Mitigation of Historic Resource Impacts

Under the No Build scenario, freight transportation would continue to use US 7 and local roads, passing through Brandon Village, which is listed on the National Register as an historic district and has 102 contributing structures located along US 7/Main Street. Another 62 buildings and structures that are listed on or that appear to be individually eligible for listing on the NR occur elsewhere in the No Build's APE. Residents and town officials have expressed concern about impacts from noise, vibration, dust, and acids. Heavy traffic may also affect the economy of the historic village as it could discourage tourism. The truck traffic also passes through Leicester Four Corners, with three buildings that are individually listed on the NR, and the small hamlet of Florence, negatively affecting the rural character of these villages.

The RS-1 Alternative would have No Adverse Effect on Sites M15, M16, M18, M19, M20, M21, M22, M23, and M28. The RS-1 At-Grade with Halladay Road and Halladay Road Relocation Options would have No Adverse Effect on Site M25 (the house and associated barn on Halladay Road). The RS-1 Grade Separated over Halladay Road Option would have an Adverse Effect on Site M25. This option appears to have an Adverse Effect on the historic resource because the size, scale and form of the embankment required for the option would dominate the landscape and would therefore diminish the integrity of the property's setting and feeling.

The TR-1 Alternative, including both Halladay Road options, would have No Adverse Effects to historic resources, including Sites M15, M16, M18, M19, M20, M21, M22, M23, and M28. Although the size and scale of the embankment required to carry the truck road over Halladay Road would be large, it would not alter the characteristics that make Site M25 appear eligible for listing on the National Register. Bridge abutments and embankments are common features in historic landscapes. The materials and design of bridges, abutments and approaches have evolved but the basic form remains the same.

Mitigation measures for effects on historic resources will be addressed in more detail in future design phases; following are mitigation measures that are proposed to be used after consultation with affected parties.

Screening

Screening is typically recommended as mitigation for the introduction of visual elements that are out of character with historic resources. The RS-1 Grade Separated over Halladay Road option appears to have an adverse effect on Site M25 in part because it would eliminate a substantial portion of the view from the property. Screening could reduce the severity of the view of the embankment from the historic house but is not recommended as mitigation because it would only further isolate the property from its environment. The property owners may support the concept of screening.

Plantings

The RS-1 Grade Separated over Halladay Road option appears to have an adverse effect on Site M25 in part because the size, scale and monolithic form of the embankment would introduce an incompatible element into the property's environment. Limited, irregular plantings of wildflowers and native shrubs that occur naturally in open fields on the embankment slopes, in the vicinity of Halladay Road, may help to mitigate the adverse effect because they would add texture, relief and color to the otherwise repetitive surface of the slopes.

4.12 Hazardous Materials

This section describes the project's potential involvement with hazardous materials.

4.12.1 Impacts

The No Build Alternative does not have any involvement with hazardous materials.

Since RS-1 and TR-1 follow the same general alignment, their potential involvement with hazardous materials is similar. As described in Section 3.12, there are two facilities within or adjacent to the study area that have the potential to have resulted in OHM within the proposed corridor and may require further investigation. One of these facilities contained storage containers, empty USTs, and other materials of possible concern. The second facility was the subject of RCRA violations over the past 20 years, although all violations had been rectified as of the most recent inspection (2002). The original business has ceased operations, and the facility now houses a different business. One UST and an AST were observed on this property, and the EDR report indicates the facility has had additional USTs on site, previously removed.

4.12.2 Summary and Mitigation of Hazardous Materials Impacts

There are two facilities within or adjacent to the study area that have the potential to have resulted in OHM within the proposed corridor and may require further investigation. Subsurface borings, groundwater monitoring well installations, and groundwater sampling may be appropriate at or around these two sites to determine the extent, if any, of subsurface contamination related to the facility operations. If any OHM is found within the vicinity of the proposed construction, the project will be designed to minimize impacts. Hazardous material contaminants will be characterized and studies will be performed with the assistance of hazardous materials specialists and governmental agencies as appropriate.

An additional database search for OHM is proposed to be conducted prior to construction, to capture any possible new OHM sites.

4.13 Energy

Energy usage would be required to construct and maintain the RS-1 and TR-1 Alternatives. Diesel and gasoline fuels would be consumed by power equipment to move earth, construct bridges, grade roadways and track beds, place rail, and pave roadways. Fuels would also be expended for the maintenance of new facilities including plowing, mowing, bridge and drainage system maintenance, and roadway surface repairs. While the No Build Alternative would not involve the immediate consumption of energy, the continued maintenance of the roadways to accommodate the transport of freight would of course consume energy.

The proposed build alternatives are intended to improve the efficiency of freight transport in the Middlebury area. However, in 2010, both build alternatives would remove an estimated 115 truck round trips from public roads between Middlebury and Florence. The mainline railroad currently transports relatively low volumes of freight. In addition to reducing traffic volumes, a multi-modal approach that includes rail may reduce congestion and improve traffic flow, resulting in more efficient transportation and possibly lower energy consumption. The TR-1 alternative would require two modes of transportation (trucking and rail) and an additional material handling operation, making it less efficient than RS-1 and also presumably the No Build. For both RS-1 and TR-1, the marble would be loaded at the quarry onto railcars or trucks. For TR-1, the marble would also be transferred from trucks to railcars at the transload facility. This second unloading/loading operation would be performed using power equipment that would consume energy.

4.14 Environmental Justice

The National Environmental Policy Act of 1969 calls for the assessment of impacts of a project on “the human environment.” The Executive Branch of the Federal Government has affirmed its commitment to this principle through the implementation of Executive Order 12898 (Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), which ordered each federal agency to incorporate environmental justice in its programs. Environmental justice is the term that describes adherence to these Federal mandates. Environmental Justice requires that minority and/or low-income communities do not receive an unfair burden of negative impacts associated with federal development projects.

Based on census data, public participation, and observations of the general area, there do not appear to be any identifiable populations of minority or low-income groups within the alternatives corridor. Furthermore, the build alternatives would affect only a few residential properties, and would not result in any takings of residences. For these reasons, it appears that there would be no disproportionate impacts to minority or low-income communities associated with any of the build alternatives for this project.

4.15 Construction Impacts

4.15.1 Potential Impacts of Construction Activities

Activities associated with construction of RS-1 or TR-1 could cause impacts to various resources including air quality, the noise environment, water quality, wildlife, wetlands, and aesthetics, in addition to impacts to traffic. These construction impacts are temporary and come from two main sources: construction equipment and exposed soils from earth-moving activities.

Construction activities would impact traffic and traffic circulation in the Middlebury area. Construction vehicles would use existing streets and roads to move material and supplies in the area. There would be detours and closures of roads to allow for the construction of bridges. All build alternatives include a bridge on US 7 that would require a detour or phased construction to construct. The Lower Foote Street option to construct a bridge over the rail spur would require a detour and closure of Lower Foote Street. This detour would likely include a speed restriction on US 7 for about half a mile. Short-term closures or one lane of alternating traffic with flagger control could be required on other area roadways.

Construction will result in a temporary increase in construction-related employment in the Middlebury area. The activities are not expected to affect access to stores or commercial enterprises in the area. The visual and aesthetic character of the region would be affected by the construction activities.

Power equipment used to move earth, construct bridges, grade roadways and track beds, place rail, and pave roadways produce emissions of carbon monoxide, nitrogen oxide, hydrocarbons, and particulate matter. There may be temporary elevated levels of these air pollutants in the immediate vicinity of construction activities, but there is not expected to be a substantial impact. Dust would also be emitted into the air as a result of earth-moving activities.

Temporary noise impacts would occur as a result of construction activities. Construction equipment would be the predominant source of the noise. Blasting of rock and pile driving may be required and would result in substantial increases in noise levels over short periods of time.

In addition to wildlife habitat impacts described in Section 4.6, the noise, dust, human activity, and other factors may temporarily affect wildlife. The major impact would be to species utilizing the grassland habitat in the alternatives corridor. Grassland bird species in particular may be affected by construction noise; for example, grassland birds may be discouraged from nesting near the alignment during construction. Because no rare grassland bird species have been found within the corridor, there is not likely to be any effect on bird populations. The federally endangered Indiana bat has been found in woodlands along the corridor. It is not clear what effect construction activities may have on this species, but with measures such as daytime construction, impacts are expected to be negligible or non-existent

Construction activities are unlikely to substantially affect farmland soils or agricultural operations.

Work will be necessary within the 100-year floodplain and regulatory floodway, but construction activities are not expected to affect flood storage or flood flows.

Earth-moving activities would expose soils, the largest portion of which are classified as “Potentially Highly Erodible”, and leave them susceptible to erosion.

The erosion could be a source of sediments that could affect water quality or vegetation communities of waterways, wetlands, and other areas.

Construction activities may result in temporary impacts to surface waters and wetlands. Construction of the trestle will involve movement of heavy equipment, drilling and excavation to place columns or piles, temporary fill to provide a stable surface for equipment, and possibly other activities within wetlands. It is assumed that an area equivalent to the trestle width (13 feet) plus an additional 20 feet on one side of the trestle will be temporarily impacted for trestle construction. This amounts to approximately 0.73 acres of temporary wetland impact.

Construction activities may temporarily affect the visual setting, noise, dust, and other aspects in the vicinity of historic resources. Because these activities are temporary, they will not result in adverse effects on the resources.

4.15.2 Material Supply and Disposal Areas

As described in Section 4.7.3, RS-1 would require between 314,000 and 373,000 cubic yards of excavation, while TR-1 would require between 117,000 and 179,000, depending on option. Lesser amounts of fill would be needed for either alternative, and it may be possible to use the excavated material for the fill. However, the soils in the area are fine-grained clays, and it has not been determined whether they may be suitable for the project's fill requirements.

Locations for excess material disposal and sources of fill material have not been identified and typically would not be identified until the project is close to construction. Areas of disturbed ground, such as staging, material supply, and material disposal areas, will have to be reviewed for archeological sensitivity, with Phase 1 investigations as necessary to determine whether historic or prehistoric remains are present. VTrans will require the contractor to follow VTrans' May 29, 1991 "Material Supply and Disposal Area Memorandum of Understanding" with the Vermont Environmental Board (now the Vermont Natural Resources Board). This MOU incorporates by reference sections of the Agency's Standard Specifications for Construction, which include provisions for management of material supply and disposal areas.

4.15.3 Summary and Mitigation of Construction Impacts

Construction activities would impact traffic and traffic circulation in the Middlebury area, with possible delays, detours, and road closures. Construction will result in a temporary increase in construction-related employment in the Middlebury area. There may be temporary elevated levels of air pollutants such as carbon monoxide and dust, as well as temporary noise impacts, in the immediate vicinity of construction activities. The noise, dust, human activity, and other factors may also temporarily affect wildlife, but construction impacts to rare grassland birds or Indiana bats are expected to be negligible. Construction activities may result in erosion and sedimentation in surface waters and wetlands.

Mitigation measures to avoid and minimize construction impacts are described below.

Detours and traffic control will be designed to minimize disruption of the local transportation system. Mitigation measures to control dust caused by construction activities include the application of water, calcium chloride, or other substances as appropriate. To mitigate potential sedimentation impacts from exposed soils, an erosion control plan will be developed. This Stormwater Pollution Prevention Plan (SWPPP) will need to meet the requirements of the National Pollutant Discharge Elimination System General Permit for Stormwater Runoff from Construction Sites. The SWPPP would include Best Management Practices such as silt fences and sedimentation basins.

Specific construction mitigation measures will be identified and designed during final design. These could include, for example, time of year restrictions to protect wildlife; time of day restrictions to reduce noise effects; or placement of construction fencing around wetlands, important habitats, or other resources needing special consideration. Additionally, measures must be taken to ensure continued access for emergency vehicles and access to public buildings. Access to farm fields will be maintained throughout construction.

Materials and equipment needed for construction will be placed within the floodplain or floodway for the minimum time necessary, and consideration will be given to potential flooding conditions during the period of construction.

Staging, material supply, and material disposal areas will be reviewed when they are identified. Appropriate mitigation measures, consistent with those described above, will be applied where appropriate.

4.16 Indirect Effects and Cumulative Impacts

This section addresses the Middlebury Spur project’s potential indirect and cumulative effects.

Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1500 -1508) provide that indirect and cumulative effects must be considered in the NEPA process. CEQ regulations (40 CFR § 1508.7 and 1508.8) define direct, indirect, and cumulative effects as follows:

> Direct effects… are caused by the action and occur at the same time and place. (40 CFR § 1508.8)
>
> Indirect effects… are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems. (40 CFR § 1508.8)
>
> “Cumulative impact” is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR § 1508.7)

Note that “effects and impacts as used in these [CEQ] regulations are synonymous”. (40 CFR §1508.8)

According to FHWA’s *Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process*, indirect effects are caused by another action or actions that would not occur except for the implementation of a project. These actions are therefore often referred to as “but for” actions.

Cumulative effects analysis is resource-focused, considering the total of all impacts to a particular resource that have occurred, are occurring, and will likely occur as a result of any action, including the proposed project. Only cumulative effects to resources directly affected by the project are considered.

Both indirect and cumulative effects analyses consider “reasonably foreseeable” future actions and effects. According to FHWA’s *Questions and Answers*, “reasonably foreseeable events, although still uncertain, must be probable... This means that those effects that are considered possible, but not probable, may be excluded from NEPA analysis. There’s an expectation in the CEQ guidance that judgments concerning the probability of future impacts will be informed, rather than based on speculation.”

4.16.1 Indirect Effects

4.16.1.1 Screening of Activities for Consideration of Indirect Effects

The need for indirect effects analysis is determined on a case by case basis for each project and resource. The National Cooperative Highway Research Program (NCHRP) *Desk Reference for Estimating the Indirect Effects of Proposed Transportation* Projects (Report 466) lists three considerations to aid in determining whether indirect effects analysis is appropriate for a particular action and resource. These considerations include:

1. Confidence that direct or indirect impacts are likely to occur.
2. Can impacts be sufficiently described and specified now for a useful evaluation?
3. If impacts are not evaluated now, will future evaluation be irrelevant? That is, will the impacts result in irreversible or irretrievable impacts to the environment?

These considerations are addressed below for activities with potential indirect effects.

Potential indirect effects of the Middlebury Spur project may occur because of expansion of Omya's quarry, expansion or modification of Omya's processing plant activities, and the effects of other freight shippers' increases in operations. Note that this section addresses only those indirect actions that may be considered "reasonably foreseeable", as defined above.

4.16.1.2 Middlebury Quarry

For purposes of the DEIS studies, it has been assumed that Omya will be able to increase marble ore shipments from the Middlebury quarry and ore processing capacity at its Florence plant regardless of which alternative is selected – No Build, RS-1, or TR-1. Each scenario includes an assumed 20% increase in shipment volumes between 2010 and 2030. Therefore, the RS-1 and TR-1 alternatives would not result in any more quarrying or processing activity than the No Build, so the environmental effects of increased quarry or processing activities would not be an indirect effect of this project. In any case, if ore extraction from the quarry were accelerated, the effects would be minimal, and long term net impacts would be the same regardless of the rate of extraction. Omya has indicated that expansion of the quarry to increase capacity would initially be downward, with possible expansion to the north or south in the longer term future. Further excavation downward in the quarry would not affect resources (beyond the effects of current operations). Because expansion to the north or south is uncertain, it cannot be considered “reasonably foreseeable”, and has not been quantified here.

4.16.1.3 Florence Processing Facility

Trucks deliver quarry rock to the Omya processing plant in Florence, where it is crushed and fine-ground. Products shipped out include finely ground calcium carbonate powder or wet slurry. Omya would have to make changes to the Verpol plant infrastructure to accommodate the switch from truck to rail shipments. Any modifications or expansion of the processing facility will occur within the existing industrial complex on already disturbed ground, in a former quarry. Based on discussions with Omya personnel and a brief field review of the area in question, it does not appear there are resources present which would be substantially affected. In 2010, it is expected that the processing plant will be running at full capacity, processing approximately 1,000,000 tons/year. By 2030, Omya is expected to increase their volume to approximately 1,200,000 tons/year, resulting in increased processing needs and possible changes in infrastructure. Potential environmental impacts include air, water, and noise pollution as detailed below. Any improvements or changes will be subject to Act 250 and other permits such as air quality and wastewater. Information for this section was obtained from Omya and from existing permits.

Erosion and Runoff

The processing plant is located on a former quarry, now an industrial site. Portions of the site are bedrock outcroppings, so there is limited potential for soil erosion. Nevertheless, best management practices including hay bale check dams, regular mulching, and seeding would be needed to limit erosion during construction activities.

Existing runoff of rainwater flows to the north into two abandoned quarries. Overflow from the abandoned quarries passes northward along the railway bed before entering a drainage ditch on the side of the road (Land Use Permit (LUP) #1R0271-6). The stormwater treatment system is currently permitted under a Stormwater Discharge Permit. Modification to accommodate rail could result in more impervious surface (stockpile pads, buildings, etc.), resulting in more runoff.

Noise

Noise is generated when trucks dump their quarry rock into the hopper. Truck loads arrive daily between 7 AM and 3:30 PM. Dumping continues through the night by a bucket loader removing quarry rock from a nearby stockpile. The facility operates up to 24 hours per day and up to seven days per week (LUP #1R0271-7, 1988). Rail cars would replace trucks if the proposed project were constructed. The bucket loaders would continue to operate up to 24 hours/7 days per week, with potentially more loaders, more product moved, and more noise.

Lighting

Pole lights, necessary for security, are visible from the village of Florence (LUP #1R0271-6). This will not change as a result of the project.

4.16.1.4 Other Freight Shippers

The Spur facility could allow other freight shippers to increase their freight shipments or change their shipment schedules or transportation modes. For purposes of estimating the noise, vibration, and other direct effects of the project, it has been assumed other shippers would constitute the equivalent of one additional rail car per day in 2010 and two additional rail cars per day in 2030 via the new facility. However, while it may be reasonable to assume this level of activity, it cannot be determined at this time which shippers would use the facility, and therefore what activities might take place that would contribute to indirect effects. Because it is uncertain if indirect effects will occur, and because the effects cannot be “sufficiently described and specified now for a useful evaluation”, the indirect effects of other shippers’ activities will not be assessed here.

4.16.2 Cumulative Impacts

4.16.2.1 Selection of Resources for Cumulative Impacts Analysis

Cumulative impacts are addressed in this section for resources which would be negatively affected by the project. Impacts that are positive (such as traffic); minor or negligible (such as employment or air quality); or that are not easily quantified (such as visual resources) are not addressed in this analysis. Also, certain resources with similar characteristics (such as wildlife and rare species) have been combined for purposes of this analysis. The following resources are being considered in the cumulative impacts analysis:

- Land Use and Development
- Wildlife Habitat/Threatened and Endangered Species
- Active Agricultural Operations and Important Farmland Soils
- Surface Waters/Wetlands
- Floodplains and Floodways
- Historic Resources

General stressors affecting the above resources in the vicinity of the alternatives corridor, including past, present, and foreseeable future activities, include: agricultural practices (for example, alterations or removal of vegetation, ditching of existing wetlands, use of chemical fertilizers and pesticides, use of mechanized equipment); residential development and associated transportation infrastructure (increase in human presence, increase in impervious area, fragmentation of the landscape, impacts from automobiles); and commercial and industrial development (increase in impervious area, increased traffic). Given the agrarian history of the region, the predominant past stressor to resources is agricultural land use.

4.16.2.2 Land Use and Development

The primary cumulative impacts issue associated with land use and development is the availability of developable land and the appropriateness of land use within the zoning districts described in Middlebury's 2007 Town Plan. The geographic scope for the analysis is the Town of Middlebury. The time frame for the analysis is roughly the middle of the 20^{th} century, when Middlebury's population began to increase more rapidly, to the near-term future (2020 to 2030), which is the planning time frame of the town plan.

The Middlebury 2007 Town Plan, Section 2.3, describes the past and current land use setting and trends of the town:

> The aerial photographs of the town in 1962, 1974, 1987 and 1995… graphically illustrate the changes the town has experienced, including suburban-type development around the village and into the rural areas of town and the increasingly commercialized US 7 corridor.
>
> Industries have come to Route 7, Route 116 and to the industrial park. A major marble quarry has expanded operations east of Foote Street. The downtown has gone from a quiet village to a bustling downtown with traffic congestion. There are fewer working farms and more land has reverted to brush and woods.
>
> With these changes and growth have come an expanded economy, along with increased demands for services and higher taxes and water and sewer rates. Although concerns have been raised about increasing socio-economic problems, decreasing diversity, the health of the downtown and sprawl, the Town of Middlebury's efforts to maintain its quality of life enjoy broad and increasing support.

> Middlebury is a desirable and attractive community. There will be pressures for further change...

Most of the land that the proposed alignments would pass through is zoned Agricultural/Rural Residential. Near US 7, the alignments cross land that is zoned Protected Highway District, and at the location of the TR-1 transload, the land is zoned Medium Density Residential and Agricultural Rural/Residential. Close to Otter Creek, where the build alternatives would be elevated on a trestle, the land is zoned as Flood Hazard District. For the purposes of cumulative land use and development impacts, the geographic area being considered includes the areas in the Town of Middlebury with similar zoning.

The greater part of the town is zoned Agricultural/Rural Residential (ARR). Middlebury's 2007 Town Plan provides that in areas zoned ARR, "The low-density rural, predominantly agricultural character of this district should be maintained. It is especially important that the Zoning and Subdivision Regulations minimize unnecessary conversion of farmland and other open lands." Most of the land area in Middlebury has traditionally been in agricultural and rural residential land use. Based on 1962 aerial photographs, before large subdivisions had been developed in town, approximately half of the land area of the town (the total land area is 25,280 acres) was in agricultural and rural residential land use. Based on 2004 air photos, approximately 2-4% of the agricultural land has been converted to residential, commercial, or industrial land use or reverted to forest. The agricultural areas, most of which are now zoned ARR, have remained largely intact, with most of the development occurring in and around the village or along major roads in areas now zoned High Density Residential, Medium Density Residential, or Protected Highway District. The Middlebury Spur RS-1 preferred alternative would consume approximately 46 acres of the 11,313 acre ARR zone. Although two large subdivisions are under construction or planned north of the alternatives corridor, they are not in the ARR district. It is expected that incremental development will continue within this district in the future, though the rate of change is impossible to forecast. Development within the ARR land use zone is likely to continue incrementally. Because of the small impact acreage of this project relative to the overall size of this land use zone, no formal mitigation for cumulative impacts to the ARR zone is proposed . Cumulative impacts on agriculture and farmland soils are addressed later in this section.

Within the Protected Highway District, which includes the land around the Standard Register (Connor Homes) building, Foster Motors, and other businesses along US 7, Middlebury's zoning provides that development "will not impede the safe flow of traffic" and will "provide a well-planned, attractive entrance to Middlebury". As with development in the ARR district, change in the Protected Highway District has been incremental. The TR-1 and RS-1 alternatives would be consistent with the Town's intent for this zone. Based on the visual analysis (Section 4.3), the alternatives will not adversely affect the appearance of this area. Furthermore, they would reduce the truck traffic volume on US 7, thereby improving the "safe flow of traffic". Therefore, the project would not contribute to adverse cumulative impacts to the Protected Highway District.

On the north side of the alignment, east of Creek Road, zoning was recently changed from ARR to Medium Density Residential. Middlebury zoning provides that in areas zoned Medium Density Residential, "Appropriate mixed uses may be allowed on a conditional use basis." A large subdivision (South Ridge Subdivision) is under construction as of 2008 in this area, with additional development planned in adjacent land. Another large subdivision has been constructed to the north (Middlebury South Village), outside of the alternatives corridor. Following publication of the DEIS, the RS-1 alignment was modified to minimize impacts on the South Ridge Subdivision, which reduced impacts on this land use zone to the very southern fringe of this zone. Furthermore, this project would have a minor impact relative to the other proposed developments within this zone. For this reason, no mitigation is proposed for this project's cumulative impacts to this zone.

The Flood Hazard District includes areas that are subject to a 1% or greater chance of flooding in any year. According to the Town Plan, "new development in the [Flood Hazard District] can be hazardous to human life and extremely costly in terms of property damage and public safety services. Development of new structures should continue to be prohibited in this district, and substantial improvements to existing structures must comply with National Flood Insurance Program requirements." The possible cumulative impacts on floodplains and floodways are addressed in the *Floodplains and Floodways* section below.

4.16.2.3 Wildlife Habitat/Threatened and Endangered Species

The key cumulative impacts issue for wildlife resources is the continued viability of habitats within and around the alternatives corridor to support wildlife for all of their habitat needs, including foraging, breeding, daily or seasonal movements, etc. For the purposes of the cumulative impacts analysis, the study area includes the Town of Middlebury and surrounding areas dominated by an agricultural landscape with low rolling farm fields, hedgerows, river and stream channels and riparian habitat, large forested wetlands, scattered forested uplands, and developed lands. The time frame is roughly the mid-20th century to the future year 2030.

Major impacts to wildlife habitat in the specified study area and time period include ongoing impacts from active agricultural operations (tilling, mowing, ditching, planting, harvesting crops); residential and commercial development, with loss of habitat and increased fragmentation and human activity; road construction; and other land use changes such as abandonment of farmland. These changes do not affect all wildlife species equally, and may be beneficial to certain species. Within and adjacent to the alternatives corridor, the South Ridge Subdivision recently affected farmland and forested areas. Development and land use change continues incrementally in the broader study area as well.

The habitats affected by project alternatives include farmland (pasture, hay fields, cropland, and fallow fields); intermittent drainages and wetlands within farm fields; small amounts of forest land, including potential habitat for the endangered Indiana bat; and developed land (mostly lawn). Impacts are described in detail in Section 4.6.

The cumulative impacts of the project and other changes in the landscape affect the viability of wildlife species in many ways. Destruction of habitat reduces the total amount of habitat available and therefore limits wildlife population levels. Habitat alteration can change the suite of wildlife species able to use a habitat. Fragmentation of habitat can limit animal migration from one habitat to another, which in turn can result in local extirpation of sub-populations and lower genetic diversity of remaining populations. As development and other land use changes continue, habitat and wildlife populations will be affected. For most species, however, there are still broad areas of similar habitat found through much of the Champlain Valley, so for the near term, these habitats and populations appear to be stable. Furthermore, this project will consume a relatively small portion of the habitat within the cumulative impacts study area. Therefore, no mitigation is proposed for cumulative impacts on wildlife habitat.

Rare species, and particularly rare grassland bird species, occur in low numbers and may be more vulnerable to land use changes than other species. Nevertheless, as described in more detail in Section 4.6, the project's impacts on rare species are expected to be negligible, so project contributions to cumulative impacts are negligible and do not require mitigation.

4.16.2.4 Active Agricultural Operations and Important Farmland Soils

As discussed in sections 3.8 and 4.8, the alignments traverse several active agricultural operations and areas of important farmland soils. The key cumulative impacts issue for agriculture is the continued strength and viability of agriculture in the region. The geographic area for purposes of cumulative impacts to agricultural operations and important farmland soils is the Town of Middlebury, which has extensive areas of farmland similar to that found in the alternatives corridor. Similar landforms and agricultural uses cover broad areas of the entire Champlain Valley. The time frame for the analysis is roughly the middle of the last century to the planning time frame for this project (2030). Other, non-project-related actions affecting agricultural operations over this time frame include residential and other forms of development, transportation infrastructure, and economic factors.

The Middlebury 2007 Town Plan, Section 3.8, describes the status of agricultural land use in the town:

> Agricultural land and working farms dominate the rural landscape of Middlebury. Farming a variety of agricultural products is a crucial component of the heritage character and economy of the Town. A Land Evaluation and Site Assessment (LESA) Study completed in 1989 identified 8,865 acres in active agricultural use, including some 735 agricultural fields on a total of 114 separate properties. The LESA study identified 15 owner-operated farms that are wholly or partly in Middlebury. Although the number of dairy farm units has decreased significantly in recent years, much of the farm land in Middlebury is still farmed, either by incorporation into larger farms or by rental. There has been some diversification from dairy including small beef, fallow deer, sheep, and vegetable farms. Two horse farms and an orchard are in operation…
>
> Middlebury's zoning ordinances have supported agriculture by establishing an Agricultural Rural Residential Zone. This zone includes the important and economically viable farm land identified in the LESA Study. The zoning ordinances were strengthened in 1990 by establishing the ARR Zone as a "right to farm" district where housing and other buildings must be sited to minimize unnecessary loss of agricultural use…

The Town has enacted a number of other programs to support agriculture, including a land trust fund to permanently preserve open space in key areas of the Town through outright purchase of land or development rights. Such preservation efforts will also benefit wildlife species that use fields or other farmland habitat. The Town Plan notes, however, that “external economic forces, particularly in the dairy industry, have the greatest impact on the financial viability of farming.” These external economic forces and their effects on farming are difficult to predict, and are beyond the scope of this study.

The past impacts of development, transportation, and economic factors on agriculture in Middlebury and the broader region are difficult to quantify. Because of their physical characteristics and their general predominance in the Champlain Valley, important farmland soils are vulnerable to development. Areas in this region that do not have farmland and important farmland soils tend to be steeper, wetter, or rockier, and are therefore less conducive to development. The utility of important farmland soils can be diminished through paving, stripping, fragmentation, or transformation from agricultural land to lawn. Examples of recent impacts to farmlands and important farmland soils include scattered residential development, the Middlebury Middle School on Middle Road, industrial development along US 7, and the Middlebury South Village and South Ridge Subdivision developments.

Within the alternatives corridor, there are croplands, hay lands, horse pastures, fallow farmland (some of which is slated for development), and a commercial composting operation. This appears to be a cross section that is fairly typical of the broader town and regional agricultural setting. The Middlebury Spur project will directly affect these farmlands by altering land, acquiring ROW, and bisecting or fragmenting farm fields. In terms of impacts to important farmland soils, the preferred alternative would impact approximately 24.9 acres of Soils of Statewide Importance, and 1.4 acres of Prime Farmland Soils. These impacts affect relatively small or fringe components of most landowners' farmlands, and therefore are not, in and of themselves, expected to directly affect the viability of the farm operations. The impacts make up a relatively small fraction of the total farmland acreage in the area (estimated in 1989 to be 8,865 acres in Middlebury[11], and in 2002 to be 193,376 acres in Addison County[12]).

The South Ridge Subdivision is under construction as of 2008 to the north of the proposed alignments in an area that is partly in farm fields. Other future impacts, though difficult to predict, will probably follow population trends. As the population increases, residential development and associated services will continue to occur in farmlands and areas of important farmland soils. In combination with ongoing development pressure, external economic forces, and other factors, the cumulative effect on farm operations may be substantial. For the foreseeable future, farming should continue to be economically viable in the region, but the total amount of available farmland will likely decline, and the long-term future of this important resource remains uncertain.

Because the project's impacts to farmlands and important farmland soils are a very small proportion of the agricultural lands within the general area, this project's contribution to cumulative impacts is expected to be minimal. Therefore, no mitigation is proposed for cumulative impacts to agricultural resources.

4.16.2.5 Surface Waters and Wetlands

The key cumulative impacts issue for surface waters and wetlands is the continued physical and functional integrity of the resources in the area. For the purposes of the cumulative impacts analysis, the study area includes the watersheds of the streams and wetlands that will be crossed by the alignments. The time frame is roughly the mid-20th century to the year 2030.

Historical impacts to the wetlands and streams in the study area are predominantly agricultural impacts: ditching, vegetation manipulation, nutrient

[11] Middlebury Town Plan, 2005
[12] Bureau of Economic Analysis, Bureau of Labor Statistics, National Agricultural Statistics Service, National Center for Health Statistics, U.S. Census Bureau. (http://www.fedstats.gov/qf/states/50/50001.html).

loading, erosion, and farm road crossings. There have also been public road crossings, commercial development, quarrying, and associated impacts. Given the poor drainage of the clay soils in the Champlain Valley, it is likely that the ditching of the wetlands began well before mechanized agriculture began in Vermont (and well before the time frame of this cumulative impacts analysis). Future foreseeable impacts within the watersheds of the proposed alignments include future phases of the South Ridge Subdivision development. Other future impacts are likely to differ in nature from past agricultural impacts, and may be more related to secondary impacts related to development than to direct impacts from dredging or filling.

The current condition of the streams and wetlands within the alternatives corridor were described in Section 3.10. The proposed alignments will cross seven intermittent streams and Otter Creek, and there will be no direct impacts to Otter Creek. With the exception of the stream associated with Wetland 5, all streams will be along or across the proposed alignments and discharged into the same stream channel, maintaining the general drainage patterns of the area. The stream associated with Wetland 5 would be intercepted and diverted along the alignment to discharge west of Halladay Road rather than directly to the south to the Beaver Brook watershed. These streams are all small and intermittent, and historically disturbed by ditching and farming.

The preferred alternative would result in approximately 5.9 acres of impacts to wetlands. The great majority of impacts would be to ditches, swales, and wet meadows in agricultural or developed land. The total wetland acreage within the watersheds of most of these wetlands has not been mapped, and cannot be determined from NWI maps, so the impact acreage in relation to the overall wetland acreage cannot be determined. Reasonably foreseeable future wetland impact is proposed for the future phases of the South Ridge Subdivision.

Future stream and wetland impacts in the area will probably be incremental, as agricultural land is converted to residential, commercial, or other uses. Filling of wetlands, stormwater discharged into wetlands, culverting of streams for road crossings, and other impacts will likely continue to occur. The several fallow fields within the alternatives corridor suggest farm-related impacts, such as ditch maintenance, fertilizer application, and tilling, will decrease in future years. The capacity for streams and wetlands to continue to perform their functions will depend both on the development pressure in the region and the regulatory environment in which development takes place. No mitigation is proposed for cumulative impacts to wetlands and streams because the project’s impacts are moderate (the affected wetlands and streams are relatively disturbed), and proposed mitigation is expected to adequately compensate for direct impacts.

4.16.2.6 Floodplains and Floodways

The key cumulative impacts issue for floodplain and floodway impacts is the continued ability of these areas to provide for floodwater storage and flow, so that adjacent and downstream roads and property are not adversely affected. Otter Creek has an extensive floodplain and floodway extending many miles upstream and downstream of the alternatives corridor; for the purposes of this analysis, the study area is the floodplain and floodway in the immediate vicinity of the proposed project. The time frame is the mid-20th century to 2030.

There appears to have been little historical impacts to floodplains in this area over this time period. Farm-related activities such as ditch maintenance and tree clearing have probably had negligible effects on floodplains and floodways here. No reasonably foreseeable future impacts are expected, as the South Ridge Subdivision is outside the floodplain, although that project may result in preservation of land that is within the floodplain. Other future development within the floodplain will be limited by both federal and state regulations.

As discussed in Section 4.9.3.1, the preferred alternative will impact approximately 1.5 acres of 100-year floodplain. Considering the very extensive amount of floodplain in this area (see Figures 3.9-5 and 3.9-6), this impact would be negligible. The project's potential effect on the base flood elevation was modeled, and results are described in Section 4.9.3. It was found that RS-1 would result in an increase of only 0.01 foot in the base flood elevation. Because there will be minimal impact to floodplain storage and a negligible change to the backwater effect, no mitigation for either direct or cumulative impacts is necessary.

Future floodplain impacts will be limited by state and federal regulations, by local zoning, and by restrictions due to conservation easements on property within the floodplain. In addition, broad stretches of the floodplain of Otter Creek are also jurisdictional wetland. State and federal regulations will likely prevent the development of these areas, and the floodplain will retain its capacity to store floodwaters. Change is likely to be incremental, and as with wetland impacts, will be linked to the regulatory environment in which the development takes place.

4.16.2.7 Historic Resources

The key cumulative impacts issue for historic resources is the continued integrity of historic structures, farmsteads, and other resources in the area. For the purposes of the cumulative impacts analysis, the study area includes the APE (the alternatives corridor), and the time frame is the mid-20th century to the year 2030.

Other actions and stresses affecting these resources are general land use development trends. Most historic resources are located along area roadways, where the most rapid development is occurring. Historic structures may be modified, eliminated, or otherwise altered such that the contributing elements are no longer present and the structures are no longer eligible for the National Register. Several structures (see Section 3.11) within the study area are over 50 years old but have been modified to the extent they have lost their historical integrity. Structures or farmsteads that have retained their integrity remain vulnerable to structural modification, removal in favor of other structures, and to modification of their settings. For example, buildings historically associated with Site M25 (along Halladay Road) have been demolished, and vinyl siding has been added to one of the buildings in the M21 complex. There is some regulatory protection for these resources in the form of Section 106 and Act 250, but these regulations do not extend to all projects and modifications. The RS-1 preferred alternative would have an adverse effect on one historic structure (M25), as described in Section 4.11.2. Other RS-1 options and TR-1 would have no adverse effect on this resource. The alternatives and options would have no adverse effect on several other historic resources as well.

Aside from the adverse effect determination, the cumulative impacts of historical land use changes and the proposed project would be continued changes in the setting of the historic resources. At some point these changes may cumulatively alter the setting or feeling of structures to the extent they are not eligible for the NR. Structural modifications of historic resources will also continue. In an effort to minimize the project's contribution to cumulative impacts on historic resources, during final design measures will be proposed to minimize impacts to the setting of historic resources within the alternatives corridor. Possible mitigation measures for project-related impacts is discussed in Section 4.11.2. The mitigation of the project's direct effects are suitable for mitigating any cumulative effects as well.

4.17 Relationship between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity

Construction of RS-1 would meet the project purpose of providing for the safe and efficient transportation of freight to and from Middlebury, Vermont. Construction activities associated with either RS-1 or TR-1 would include local short-term impacts and the use of resources but would enhance the long-term productivity of the Middlebury region. The short-term impacts would be associated with the construction and include noise, air quality, disturbance of soils, sedimentation, visual impacts and traffic delays. There are short-term benefits of the construction including additional construction employment and material supply.

The project represents a transportation improvement that is the result of a long range comprehensive planning process undertaken by VTrans, VTR and local communities. Present and future freight transport requirements have been considered together with present and future land use to determine that the enhancement of long-term productivity would be served by the short-term commitment of resources and impacts required to construct the project.

4.18 Irreversible and Irretrievable Commitments of Resources

Implementation of either build alternative would involve a commitment of a range of natural, physical, human and fiscal resources. Land used in the construction of the proposed facility would be considered an irreversible commitment during the time period that the land is used for freight transport. However, if a greater need arises for use of the land or if the freight facility is no longer needed, the land could be converted to another use. At present, there is no reason to believe such a conversion would be necessary or desirable. In addition, impacts to important farmland soil for construction of the RS-1 alternative would be an irreversible commitment of resources. Recovered topsoil could be used on the side slopes of the proposed railroad or roadway, or off-site. Bedrock excavated from the marble quarry would not be recoverable once it is removed and shipped out, but will be a useful resource elsewhere.

Considerable amounts of fossil fuels, labor, and construction materials such as cement, aggregate, and bituminous material will be expended during construction. Additionally, large amounts of labor and natural resources are used in the fabrication and preparation of construction materials. These materials are generally not retrievable. However, they are not in short supply and their use will not have an adverse effect upon continued availability of these resources. Any construction will also require a substantial one-time expenditure of both State of Vermont and federal funds which are not retrievable.

The commitment of these resources is based on the concept that residents in the Middlebury area, state, and region will benefit by the improved quality and efficiency of the transportation system. These benefits will consist of improved accessibility and safety, savings in time, and greater availability of quality services which are anticipated to outweigh the commitment of these resources.

4.19 Summary of Resource Impacts

Table 4.19-1 below lists the quantifiable natural, historic, and archaeological resource impacts expected from each of the alternatives and options.

Table 4.19-1 Summary of Resource Impacts

	No Build	RS-1 (Preferred Alternative)	TR-1
Traffic and Transportation			
Freight Transportation	The mainline rail corridor may experience modest growth in freight shipments.	Freight shipments from the quarry and other sources are expected to be well within the mainline track's capacity through at least 2030.	Freight shipments from the quarry and other sources are expected to be well within the mainline track's capacity through at least 2030.
Roadway Traffic	US 7 would continue to be the primary means for moving freight, with expected growth resulting in increased congestion and decreased levels of service, and continued truck traffic in village centers.	Provides freight alternative to US 7, reducing congestion generally and reducing truck traffic in Brandon Village. Would result in small increases in truck traffic on local Middlebury roads.	Provides freight alternative to US 7, reducing congestion and reducing truck traffic in Brandon Village. Would result in small increases in truck traffic on local Middlebury roads.
Safety	Would not reduce the crash rate along portions of US 7.	Could reduce the number of crashes on US 7; likely to result in increased truck traffic on Lower Foote Street; Grade Separated option would avoid train-vehicle conflicts.	Could reduce the number of crashes on US 7; likely to result in increased truck traffic on Lower Foote Street; possible truck and local vehicle conflicts at intersections.
Pedestrians and Bicyclists	Would not address the safety concerns that exist for pedestrians and bicyclists, and concerns could increase in the future as the volume of traffic increases.	Would reduce the number of large trucks on US 7 and local roadways, reducing safety concerns. Preferred alternative would not disrupt pedestrian or bicycle traffic by severing local roads.	Would reduce the number of large trucks on US 7 and local roadways, reducing safety concerns.

(continued)

Table 4.19-1 Summary of Resource Impacts, continued

	No Build	RS-1 (Preferred Alternative)	TR-1
Social and Economic Resources			
Population	No measurable impact	No measurable impact	No measurable impact
Economic Development	Some negative impact generally along the US 7 corridor. Negative impacts in downtown Brandon. Possible negative impact on Omya.	Positive impact on Brandon Village. Potential positive impact on Omya. Possible disruption of farming activities due to acquisition and access to farm fields.	Positive impact on Brandon Village. Potential positive impact on Omya. Possible disruption of farming activities due to acquisition and access to farm fields.
Employment			
Trucking jobs in 2030	45	0	23
Rail Jobs	0	4	4
Transload Jobs Increase	0	0	6
Total Direct Jobs	45	4	33
Indirect Jobs**	23	2	17
Total Regional Jobs Supported	*68*	*6*	*50*
Acquisition and Relocation	No impact	Portions of 16 parcels would be acquired, totaling approximately 53 to 59 acres of acquisition, depending on option. No relocation anticipated. Compensation for acquisitions and severance damages likely. Appropriate crossings may be needed.	Portions of 14 parcels would be acquired, totaling approximately 49 acres of acquisition. No relocation anticipated. Compensation for acquisitions and severance damages likely. Appropriate crossings may be needed.
Land Use Planning	Inconsistent with Middlebury and Brandon Town Plans and Addison County Regional Plan, which support rail spur.	Mostly consistent with Middlebury and Brandon Town Plans and Addison County Regional Plan.	Mostly consistent with Middlebury and Brandon Town Plans and Addison County Regional Plan.
Visual Resources			
	No project-related change in the visual environment.	West of Halladay Road, the preferred alternative would result in a higher embankment with greater visual impacts than other options. The trestle would impact views, but would not be completely out of character. Visual impacts would be minimal at the crossing of Otter Creek.	West of Halladay Road, Grade Separated option would result in greater visual impacts than At-Grade. The TR-1 transload facility would result in substantially greater impacts east of Otter Creek than RS-1 or existing conditions. The trestle and Otter Creek crossing would be similar to RS-1.

(continued)

Table 4.19-1 Summary of Resource Impacts, continued

	No Build	RS-1 (Preferred Alternative)			TR-1	
		Grade Separated over Halladay Road (Preferred)	At-Grade with Halladay Road	Halladay Road Relocation	Grade Separated over Halladay Road	At-Grade with Halladay Road
Air Quality - Total Project-Related Emissions by Alternative In tpy (tons per year)						
*Projection for 2010**						
VOC	1.19	1.59	1.59	1.59	1.92	1.92
NOx	26.20	25.54	25.54	25.54	30.30	30.30
CO	6.83	6.15	6.15	6.15	8.32	8.32
PM10	0.99	1.14	1.14	1.14	1.43	1.43
PM2.5	0.90	1.14	1.14	1.14	1.42	1.42
*Projection for 2030**						
VOC	0.76	1.07	1.07	1.07	1.26	1.26
NOx	3.33	13.27	13.27	13.27	13.41	13.41
CO	0.95	3.29	3.29	3.29	3.39	3.39
PM10	0.22	0.44	0.44	0.44	0.45	0.45
PM2.5	0.14	0.44	0.44	0.44	0.44	0.44
Noise – FTA Noise Impacts along the Mainline Rail Corridor						
Projection for 2010						
FTA Moderate Impacts		13	13	13	13	13
Projection for 2030						
FTA Moderate Impacts		13	13	13	13	13
Noise – Receptors Impacted by Traffic Noise along US 7						
Projection for 2010						
Residential	56	34	34	34	34	34
Commercial	2	0	0	0	0	0
Total	**58**	**34**	**34**	**34**	**34**	**34**
Projection for 2030						
Residential	77	58	58	58	58	58
Commercial	7	3	3	3	3	3
Total	**84**	**61**	**61**	**61**	**61**	**61**
Vibration						
	5**	5	5	5	5	5

** Key to air pollutants: VOC = Volatile Organic Compounds*
NOx = Nitrogen Oxides
CO = Carbon Monoxide
PM10 = Particulate Matter – 10 Microns (PM10)
PM2.5 = Particulate Matter – 2.5 Microns (PM2.5)

*** All five receptors impacted by build alternatives are affected by existing rail freight operations*

(continued)

Table 4.19-1 Summary of Resource Impacts, continued

	No Build	RS-1 (Preferred Alternative)			TR-1	
		Grade Separated over Halladay Road (Preferred)	At-Grade with Halladay Road	Halladay Road Relocation	Grade Separated over Halladay Road	At-Grade with Halladay Road
Wildlife and Threatened and Endangered Species Habitat (Acres)						
Potential Upland Sandpiper or Grasshopper Sparrow Foraging Habitat	no impact	9.75	8.29	8.10	28.10	28.80
Other Open Fields	no impact	25.17	21.65	25.99	6.10	6.70
Total Open Field Habitat	**no impact**	**34.92**	**29.94**	**34.09**	**34.20**	**35.50**
Isolated Forest Patches	no impact	0.86	0.86	0.86	0.00	0.00
Indiana Bat Habitat	no impact	0.00	0.00	0.00	1.10	1.10
Total Forested Habitat	**no impact**	**0.86**	**0.86**	**0.86**	**1.10**	**1.10**
Surficial Geology						
Material to be excavated (cubic yards)	no impact	314,308	359,408	373,172	117,200	178,600
Highly Erodible Soils (Acres)	no impact	0.21	0.21	0.21	0	0
Potentially Highly Erodible Soils (Acres)	no impact	20.92	20.63	24.04	29.11	30.37
Important Farmland Soils and Agricultural Fields (Acres)						
Prime Farmland Soils	no impact	1.40	1.30	1.22	0.68	0.68
Statewide Farmland Soils	no impact	24.89	24.76	27.62	32.14	33.46
Agricultural Fields	no impact	52.66	51.04	56.32	43.09	44.32

(continued)

Table 4.19-1 Summary of Resource Impacts, continued

	No Build	RS-1 (Preferred Alternative)			TR-1	
		Grade Separated over Halladay Road (Preferred)	At-Grade with Halladay Road	Halladay Road Reloca-tion	Grade Separated over Halladay Road	At-Grade with Halladay Road
Stream Channels						
Stream Channel Impact (Linear Feet)	no impact	833	656	645	672	957
Floodplains and Floodways						
Floodplain impact (acres)	no impact	1.55	1.55	1.55	1.55	1.55
	no impact	Backwater from the floodplain obstructions was determined to be <0.01 feet for the 100 year flood.				
Wetlands						
Wetlands (Vermont Class Three) (acres)	no impact	3.73	3.94	5.08	0.71	0.73
Wetlands (Vermont Class Two) (acres)	no impact	2.18	1.88	1.78	4.66	4.55
Total Wetlands (acres)	**no impact**	**5.91**	**5.82**	**6.86**	**5.37**	**5.28**
Vermont Class Two Regulatory Buffer Impacts (acres)	no impact	2.49	2.19	2.18	5.16	5.09
Historic and Archaeological Resources						
Archaeologic-ally Sensitive Land (Acres)	no impact	8.22	8.52	10.42	20.77	21.47
Historic Structures	Many	Adverse effect (one property)	No adverse effect	No adverse effect	No adverse effect	No adverse effect
Historic Districts	Brandon Village					
Section 4(f) Resources	no use	no use	no use	no use	no use	no use

4.20 Regulatory Requirements

Construction of the rail spur will require compliance with a variety of federal, state, and local laws, and the acquisition of various federal, state, and local permits as outlined in the previous sections of Chapter 4. Permitting will follow the issuance of a Record of Decision, which is subsequent to the FEIS.

In summary, the following permits and/or clearances will be required:

Federal

- Clean Water Act Section 404 (Wetlands dredge or fill): Issued by the ACOE for the filling of wetlands and waterways.
- Farmland Protection Policy Act – Farmland Conversion Impact Rating Form: Prepared by lead federal agency in association with the USDA NRCS when project involves conversion of farmland from agricultural use to non-agricultural use.
- Conditional Letter of Map Revision (CLOMR), if required.
- Section 10 of the Rivers and Harbors Act (if applicable).
- Clean Water Act Section 401 Water Quality Certification: Issued by VANR for discharges to Waters of the U.S., including wetlands and waterways.
- National Pollutant Discharge Elimination System construction site runoff permit: Issued by VANR.

State

- Conditional Use Determination for wetland impacts: Issued by VANR.
- Stream Alteration Permit: Issued by VANR for stream alterations.
- Vermont's Land Use and Development Law (Act 250): Applicability of Act 250 has not been determined. If applicable, a Land Use Permit would have to be obtained from the Vermont Natural Resources Board.
- Stormwater Discharge Permit: Permit program based on Vermont state statute, issued by VANR for stormwater discharges.

4.21 Summary of Proposed Mitigation Measures and Other Commitments

The Council on Environmental Quality's regulations for implementing NEPA require that Environmental Impact Statements provide mitigation for unavoidable impacts. The regulations state that agencies shall "include appropriate mitigation measures not already included in the proposed action or alternatives" (40 CFR 1502.14). The regulations define mitigation (at 40 CFR 1508.20) as avoiding impacts; minimizing impacts; "repairing, rehabilitating, or restoring the affected environment"; preservation or maintenance; or compensation by providing "substitute" resources. Guidance accompanying the regulations states that all relevant mitigation measures should be identified, even if they are outside of the jurisdiction of the lead agency and thus would not be committed as part of the Record of Decision.

In accordance with CEQ regulations and guidance, this document provides mitigation for unavoidable impacts, and identifies the implementing agency when it is not the FHWA. This section also describes any other environmental commitments proposed as part of this project.

4.21.1 Mitigation Measures and Commitments by Resource

The following bullet list is a summary of proposed mitigation measures, by resource. The list does not include measures which may be independently undertaken by others, such as the Town of Middlebury, to mitigate project-related impacts. Resources for which no impact is anticipated, or for which there is a proposed improvement, do not have mitigation associated with them. Mitigation is described in greater detail at the end of each of the resource sections above.

Freight Transportation *(no mitigation necessary)*

Rail System Impacts *(no mitigation necessary)*

Traffic Impacts *(no mitigation necessary)*

Safety Impacts *(no mitigation necessary)*

Pedestrian and Bicyclist Impacts *(no mitigation necessary)*

Social and Economic Impacts
- Property access may be mitigated, if warranted, by constructing access (such as farm crossings) across the new alignments.

- Landowners would be compensated, at fair market value, for the land taken and for any “uneconomic remnants” (portions of property which would have little or no value or utility to the owner following acquisition).

Public Lands and Recreational Resources *(no mitigation necessary)*

Visual Resources
- Design modifications
- Landscape screening
- Retention of vegetation
- Landform
- Design features for bridge type selected using public process

Air Quality Impacts *(no mitigation necessary)*

Noise Impacts
No mitigation necessary, but the following measures may be considered:

Rail Noise:
- Lower sound level warning horns on the train locomotives
- Stationary warning horns at the grade crossings

Traffic Noise: (no mitigation necessary)

Vibration Impacts *(no mitigation necessary)*

Hazardous Materials
- An additional database search for OHM is proposed to be conducted prior to construction, to capture any possible new OHM sites

Wildlife Habitat
- Construct 2:1 side slopes, if feasible.
- Minimize loss of adjacent hedgerows and drainages where feasible.
- In wildlife corridor areas, consider plantings along road or rail embankments
- Design structures in the wildlife corridor area west of Halladay Road to allow for passage of terrestrial and aquatic species.

Threatened and Endangered Species
- No mitigation is anticipated, but coordination with USFWS and the VFWD will continue during final design to ensure impacts are minimized or compensated for.

Farmland Soils and Active Farmlands
- Impacts to active farmland have been minimized in part by locating the alignments along property boundaries where possible.

- Impacts would further be minimized, if warranted, by accommodating farmers with rail or road crossings to access portions of fields that would be divided.
- Project impacts will be discussed with USDA and the Vermont Agency of Agriculture, Food & Markets as the project moves forward into final design.

Groundwater *(no mitigation necessary)*

- VTrans policy is to monitor wells that could potentially be affected by construction. Should private wells be affected, owners would be compensated by replacing affected wells, or by connecting affected property owners to public water supplies where possible.

Surface Water

- Impervious roadways would be mitigated by using Best Management Practices, such as grass-lined swales, for treating stormwater runoff from the proposed roadway.
- Runoff from the proposed transload facility would likewise be treated by appropriate means, such as swales or detention basins.

Floodplains *(no mitigation necessary)*

Wetlands

- Efforts to avoid and minimize wetland impacts will continue during the design process. For example, slopes could be steepened to reduce the project footprint, or drainage could be modified to maintain wetland hydrology.
- Wetland mitigation is expected to be a combination of wetland preservation, restoration, enhancement, and creation activities, likely on existing farmlands bordering Lemon Fair River or Otter Creek. Proposed mitigation will provide the requisite acreage to compensate for wetlands affected by the project.

Archaeology

The extent of mitigation has not yet been determined, pending legal access to properties to complete archaeological studies. Impacts to archaeological resources will be mitigated through the following measures:

- Avoidance and minimization of impacts
- Recovery of information through excavation and documentation
- Public outreach and education

Historic

- Screening
- Plantings

Construction Impacts

- Control dust
- Erosion control
- Time of year restrictions to protect wildlife
- Time of day restrictions to reduce noise effects
- Placement of construction fencing around wetlands, important habitats, or other resources needing special consideration
- Maintenance of farm field access
- Design of detours and traffic control to minimize disruption of local transportation system
- Restoration of temporary wetland impacts

5 Section 4(f)

5.1 Introduction

Section 4(f) of the U.S. Department of Transportation Act of 1966 states that "special effort should be made to preserve the natural beauty of the countryside and public park and recreation lands, wildlife and waterfowl refuges, and historic sites". The Act was recodified in 1983, and a Final Rule was issued in 2008 which clarified the 4(f) approval process, simplified its regulatory requirements, and moved the Section 4(f) regulation to 23 CFR 774. At 23 CFR 774, it states:

> *The Administration may not approve the use, as defined in §774.17, of Section 4(f) property unless a determination is made under paragraph (a) or (b) of this section.*
>
> *(a) The Administration determines that:*
>
> > *(1) There is no feasible and prudent avoidance alternative, as defined in §774.17, to the use of land from the property; and*
> >
> > *(2) The action includes all possible planning, as defined in §774.17, to minimize harm to the property resulting from such use; or*
>
> *(b) The Administration determines that the use of the property, including any measure(s) to minimize harm (such as any avoidance, minimization, mitigation, or enhancement measures) committed to by the applicant, will have a de minimis impact, as defined in §774.17, on the property.*

23 CFR 774.17 defines "use":

> *…a "use" of Section 4(f) property occurs:*
>
> > *(1) When land is permanently incorporated into a transportation facility;*
> >
> > *(2) When there is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose as determined by the criteria in §774.13(d); or*
> >
> > *(3) When there is a constructive use of a Section 4(f) property as determined by the criteria in §774.15.*

Constructive use (§774.15) is further defined as impacts where land from the property is not incorporated into the project, but where "the project's proximity impacts are so severe that the protected activities, features, or attributes that qualify the property for protection under Section 4(f) are substantially impaired."

The FHWA published the *Section 4(f) Policy Paper* in 2005, which states that:

> *Publicly owned land is considered to be a park, recreation area or wildlife and waterfowl refuge when the land has been officially designated as such by a Federal, State or local agency and the officials of these governmental entities, having jurisdiction over the land, determine that one of its major purposes and functions is for park, recreation or as a refuge. Incidental, secondary, occasional or dispersed park, recreational or refuge activities do not constitute a major purpose.*

Historic districts, individual properties, and archaeological sites that are eligible for or listed on the National Register of Historic Places are also protected under Section 4(f). Archaeological sites are only considered Section 4(f) resources if their value lies in leaving the resource intact in place. If the archaeological value is what can be learned by data recovery, then the resource is not a Section 4(f) resource.

5.2 Section 4(f) Historic Properties

5.2.1 Descriptions of Properties

Ten properties within or near the alternatives corridor are on or eligible for the National Register. Descriptions and preliminary assessments of potential effect are provided in Chapters 3 and 4 for these Section 4(f) properties. The resources include:

M15 House, c.1850 and Ground Level Stable Barn, c.1930/1950
M16 House, c.1830
M18 School, c.1850
M19 House, c.1800, Barn, c.1840, Carriage Barn, c.1860
M20 House, c.1800
M21 Farmstead, c.1850
M22 Ground Level Stable Barn, c. 1950
M23 Farmstead, c.1860
M25 House, c.1800, and outbuildings
M28 Farmstead c. 1885

The proposed alignment will require a taking of a part of a parcel that is under the same ownership as M25, the Hathaway property along the west side of Halladay Road. The portion of the parcel that will be taken is on the east side of the road. There are no buildings on the eastern parcel. The house on the west side of the road is eligible for the NR because it retains integrity of location, design, setting, materials, workmanship and feeling of a farmhouse of its period (c. 1800). The associated buildings, a shed built in approximately 1925 and an outhouse, appear to be eligible for listing on the NR as part of the farm complex. The property is a former farm, but does not meet the criteria for farmsteads under the National Register. Because it is not a farmstead, only the buildings, and not the associated land, are eligible to be listed on the NR, and would qualify as Section 4(f) resources. Therefore the taking of a portion of the parcel (east of Halladay Road) for the alignment does not constitute a use under Section 4(f).

Under Section 106, an adverse effect determination was made for M25 for the RS-1 Grade Separated over Halladay Road Option, because of visual impacts to the setting of the structure. However, it was determined by FHWA that the visual effects would not constitute a constructive use under Section 4(f). (See letter from FHWA in Appendix H.)

5.3 Section 4(f) Archaeological Resources

5.3.1 Descriptions of Resources

Archaeological resources are summarized in Chapter 3 of this document and described in more detail in the Archaeological Resources Assessment (ARA) report and the *Preliminary Archaeological Phase I Site Identification* report (Appendix D). As described in Section 3.11.2, there are two previously identified prehistoric Native American sites located within the proposed project's Area of Potential Effect (equivalent to the alternatives corridor), and four located nearby, within 500 meters (1,640 feet) of the Area of Potential Effect. None of the previously identified sites fall within the footprint of the proposed alignments.

A Phase I site identification survey was carried out on a subset of the archaeologically sensitive areas identified in the ARA. The Phase I survey yielded three new prehistoric archaeological sites, all in the Otter Creek floodplain area. The survey also identified areas that are no longer considered sensitive for archaeological resources, areas where further Phase I subsurface testing will be required to test for the presence or absence of prehistoric Native American sites, and areas where Phase II investigation will be needed to determine the extent and nature of prehistoric sites.

No important historic archaeological deposits are believed to occur within the proposed project's APE.

The results of further testing will in part determine whether subsurface resources are present that may meet criteria for Section 4(f) regulation. As stated above, archaeological resources are only 4(f) resources if their value lies in preserving them in place, intact.

5.4 Section 4(f) Recreational Resources, Wildlife and Waterfowl Refuges

There are no Section 4(f) recreational resources within the study area. There is a snowmobile trail that crosses the alignment that is maintained by a private snowmobiling club. The trail is used by landowner consent, and there is no public ownership of the trail. Therefore, it is not a Section 4(f) resource. There are no wildlife or waterfowl refuges within the alternatives corridor.

5.5 Summary

Neither build alternative involves a use of a Section 4(f) property.

6 List of Preparers

The following pages list the principal preparers of the EIS, including job titles, qualifications, and responsibilities on the Middlebury Spur EIS.

MIDDLEBURY ST SPUR (2)
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT

LIST OF PREPARERS

Personnel	Title	Qualifications	Responsibilities
McFarland-Johnson, Inc.			
Mr. Jed Merrow	Project Manager	M.S. in Natural Resources Science from the University of Rhode Island and over 17 years experience in environmental consulting, specializing in wetlands and non-game wildlife.	Consultant team manager and chief editor of EIS. Prepared Chapter 1, wildlife sections, and miscellaneous other portions of EIS.
Mr. Gene McCarthy, P.E.	Senior Transportation Engineer	BSCE in Civil Engineering from San Jose State University and over 17 years experience in transportation engineering, design, and planning.	Oversaw highway and rail design aspects of project. Prepared Chapter 2 and transportation sections (other than rail) of Chapters 3 and 4.
Ms. Victoria Chase	Environmental Analyst	M.S. in Resource Management from Antioch New England and 9 years experience in environmental work, including wetlands, botany, and rare species.	Prepared natural resources and public lands sections of Chapters 3 and 4, and miscellaneous other sections.
Mr. Brian Bennett, P.E.	Senior Engineer	B.S. in Civil Engineering from Clarkson University and M.S. in Civil Engineering with specialization in hydraulics. Over 20 years experience in civil engineering design, including hydraulic analysis.	Conducted hydraulic study and authored hydraulic report.
TranSystems			
Mr. Gary J. Bua, P.E.	Railroad Track and Railroad Bridge Engineer	B.S. and M.S. in Civil Engineering and over 15 years of experience in track, bridge and civil design.	Oversaw the development of the railroad track alignments for alternatives and assisted on operations issues.
Mr. John H. Read, P.E.	Railroad Track, Railroad Bridge, and Railroad Operations	B.S. and M.S. in Civil Engineering and Mechanical Engineering and over 30 year experience in track and bridge design for railroad projects. Former Head of Structures for Guilford Railroad.	Coordinated with railroad on railroad operations issues and assisted in technical writing for Chapters 2, 3 and 4.

KM Chng			
Mr. Richard Letty	Senior Noise and Vibration Consultant	M.S. in Aeronautics from the Massachusetts Institute of Technology and over 30 years of experience in noise and vibration assessments for rail, highway, and airport transportation projects.	Authored the noise and vibration section.
Mr. Timothy Lavelle	Senior Air Quality Consultant	M.E. in Civil Engineering from Texas A&M University and 17 years of experience in air quality assessments for rail and transit, highway, and other development projects.	Authored the air quality section.
TJ Boyle			
Mr. Michael J. Buscher	Landscape Architect	Bachelor of Landscape Architecture from Pennsylvania State University and 9 years experience in Landscape Architecture and related studies.	Authored visual sections and provided overview and direction for creation of Photographic Simulations.
Mr. Jeremy B. Owens	Landscape Architect	Bachelor of Landscape Architecture from the University of Georgia and 2+ years of experience in Landscape Architecture and related studies.	Created Photographic Simulations.
Mary Jo Llewellyn, Historic Preservation Consultant			
Mary Jo Llewellyn	Architectural Historian	M.S. in Historic Preservation from the University of Vermont and 18 years experience in Historic Preservation practices.	Authored Historic Resources sections.
Applied Economic Research			
Mr. Russ Thibeault	Economist/Land Use	Masters in Regional Planning from University of North Carolina and over 35 years experience in regional economic/land use analysis. Certified General Appraiser State of NH. Past President NH Planners Association. Past Board Member Plan NH.	Authored socio-economic impact sections of analysis.

University of Vermont, Consulting Archaeology Program			
Dr. Charles L. Knight	Archaeologist	Ph.D. in Anthropology from the University of Pittsburgh and 19 years experience in archaeology.	Authored archaeology section, supervised ARA and Phase I archaeological studies, and authored respective reports.
Nobis Engineering			
Mr. David Gorhan	Environmental Scientist	B.A. Environmental Studies from New England College and 5 years environmental site assessment, site remediation, and GIS systems.	Collection and reduction of research data, field evaluations, preparation of the report and figures.
Mr. Robert Kleiner, P.G.	Project Manager	B.S. Geology from Bridgewater State College and over 13 years of hazardous waste and petroleum site assessment and site remediation; Licensed Professional Geologist (NH).	Co-author of the report, technical direction of the project, management and coordination of the project schedule, and budget management.
Mr. Thomas Bobowski, P.E., P.G.	Senior Project Manager	B.S. Geological Engineering from Michigan Technological University and over 22 years of environmental engineering experience, environmental site assessment, and site remediation; Professional Engineer (NH) and Licensed Professional Geologist (NH).	Senior technical oversight of the project, QA/QC.
Vermont Agency of Transportation			
Mr. Alan Neveau	Local Transportation Facilities Program Manager	Associates Degree in Civil Engineering Vermont Technical College and 39 years experience with the Agency. 20 Years in Highway Planning and Programming, 19 Years in Project Development and Engineering.	Reviewed and commented on all Chapters.
Mr. John K. Dunleavy	Vermont Assistant Attorney General	J.D. from Boston University and 32 years legal experience, including 24 years' experience in transportation law.	Reviewed draft document; provided input on legal issues
Mr. Dennis Benjamin	Environmental Specialist Supervisor	HS and VTrans Career Development and 38 years experience including ROW, Project Planning and Development, and Environmental Permitting.	Environmental document development oversight, review and approval; consultant contract management.

Vermont Agency of Transportation (continued)			
Mr. Glenn Gingras	Environmental Biologist	B.S. in Environmental Science from Norwich University and 8 years reviewing and preparing technical resource documents for various transportation projects.	Responsibilities - Review Natural Environment Section, Mitigation analysis, and participated in wetland identification field work.
Mr. Scott Newman	Historic Preservation Officer	M.S. in Conservation of the Built Environment, University of Montreal. 10 Years in private historic preservation consulting for government and individual clients, 9 years as VTrans Historic Preservation Officer interpreting and applying state and federal HP regulations to transportation related projects.	Reviewed sections related to historic resources and provided general input on potential effects on historic resources.
Dr. Duncan Wilkie	Archaeologist for Vermont Agency of Transportation	Ph.D. in Anthropology from Case Western Reserve University and 26 years experience in private consulting and teaching, 6 years as archaeologist for VTrans.	Reviewed sections related to archaeology and provided general input on potential effects on archaeological resources.
Mr. Richard D. Hosking	VTrans Rail Operations Program Manager	B.S. Civil Engineering University of Vermont 39 years at VTrans, including time in Structures, Construction, Maintenance, District Transportation Administrator and Rail Program Manager.	Reviewed and provided input on all sections.
Mr. Charles F. Miller	VTrans Rail Operations Manager	25 years experience as general manager for a private company, 8 years experience at VTrans in the Rail Operations Unit.	Principal Reviewer of all sections, key input to rail related sections.
Ms. Susan Scribner	VTrans Project Manager	B.S. Civil Engineering from Tufts University and 24 years experience at VTrans with experience in Planning, Traffic & Safety, Structures and general project development.	VTrans Project Manager and principal reviewer of all sections.
Federal Highway Administration			
Mr. Kenneth R. Sikora	FHWA Environmental Program Manager and ROW Program Mgr.	B.S. Civil Engineering from the University of Vermont and 23 years with FHWA including 10+ years with Environmental.	Overall NEPA/ Section 4(f)/ Section 106 responsibilities.
U.S. Army Corps of Engineers			
Ms. Martha Lefebvre	Senior Project Manager/Environmental Protection Specialist	A.S. in Studies in Water Resources from Community College of VT; 32 years experience in wetlands and water resources in Corps of Engineers Regulatory.	Reviewer of all sections with emphasis on wetlands and water resources.

7 Comments and Coordination

This project has involved extensive coordination with regulatory and resource agencies, local officials and businesses, and the public. The coordination goes well beyond minimum NEPA requirements (23 CFR 771) and has provided ample opportunities for interested parties to comment and participate. The major coordination activities are listed below.

7.1 Regulatory and Resource Agency Coordination

VTrans and the consultant corresponded with resource agency representatives frequently and met with them on several occasions. (Available minutes of these meetings are in Appendix A.) The agencies included were:

State Agencies

- Vermont Agency of Agriculture, Farm and Markets
- VANR Planning Division
- VANR Department of Environmental Conservation (DEC), Water Quality Division, Wetlands Section
- VANR DEC, Water Quality Division, Rivers Management Section, Stream Alteration
- VANR DEC, Water Quality Division, Rivers Management Section, Floodplain Management
- VANR Fish and Wildlife Department, District Biologist
- VANR Fish and Wildlife Department, Nongame and Natural Heritage Program

Federal Agencies

- Army Corps of Engineers
- Environmental Protection Agency
- USDA Natural Resources Conservation Service
- U.S. Fish and Wildlife Service

The meetings are listed on the following page, and meeting minutes are reproduced in Appendix C. The meetings included:

Date	**Topic**
November 18, 2004	Initial resource agency coordination meeting to introduce project and discuss project purpose, range of alternatives to study, and cooperating agencies.
March 11, 2005	Discussion of alternatives screening: use of a two-step screening process, physical and operational screening, resource impact screening, screening methodology.
April 13, 2005	Discussion of methodology of resource screening, identification of reasonable range of alternatives.
December 14, 2005	Discussion of additional screening of alternatives and elimination of RS-3.
October 31, 2007	Field meeting to discuss wetland jurisdiction issues with ANR and ACOE representatives
December 12, 2007	Natural resource agency meeting at VTrans to present proposed mitigation for wetland impacts
May 7, 2008	Field meeting to investigate wetland mitigation sites with ACOE, EPA, and NRCS representatives
July 31, 2008	Field meeting to review impacted wetlands and potential wetland mitigation site

7.2 Advisory Committee Coordination

At the kickoff meeting in August, 2004 with representatives from VTrans, it was determined that an advisory committee should be organized for the project. The purpose of the Middlebury Spur Advisory Committee is to provide local feedback, advise on important project issues, and help with public participation strategies. The Advisory Committee is made up of representatives of town governments, regional planning commissions (Rutland and Addison Counties), state agencies, the Addison County Economic Development Corp., VTR, and Omya. Also invited to participate were representatives of Vermont Natural Ag Products, Inc., the Conservation Law Foundation, the Rutland Economic Development Corp., and the Rutland Redevelopment Authority.

The Advisory Committee met on the dates listed on the following page. (Minutes of these meetings are in Appendix B.) Separate meetings with Fred Dunnington (a committee member and Middlebury Town Planner) were also held.

Date	Topic
December 6, 2004	Project and process overview, project team, work plan, and schedule. Role of advisory committee, discussion of preliminary alternatives.
March 16, 2005	Discussion of Purpose and Need Statement, preparation of next public scoping meeting, review of alternatives screening to date.
May 3, 2005	Review of alternatives screening process and results, review of March 31 Public Meeting, discussion of upcoming Public Meeting, scoping report, alternatives report.
November 9, 2005	Detailed discussion of RS-1, RS-3, TR-1, discussion of Halladay Road options, discussion of preferred alternatives, preparation for public meeting.

7.3 Public Participation

The public participation included three public meetings and a meeting with the Middlebury Selectboard. Summaries of the public meetings are reproduced in Appendix E. The meetings were advertised in local newspapers, press releases were issued to media outlets, notices were placed at town halls, and notices were mailed to those who signed up for mailings at prior meetings.

These meetings were as follows:

Date	Location
January 20, 2005	Public meeting to introduce project and discuss scoping issues. Held in Middlebury Municipal Building Gymnasium and televised on Middlebury Community Television (MCTV).
March 31, 2005	Public meeting to discuss tentative scoping results, range of reasonable alternatives, and preliminary impacts. Held at American Legion Post 55, Brandon.
December 13, 2005	Meeting with Middlebury Selectboard to present project and discuss involvement with local transportation system. Held in Middlebury Municipal Building Conference Room and televised on MCTV.
January 12, 2006	Public meeting to describe results of scoping and present range of reasonable alternatives. Held in Middlebury Municipal Building Gymnasium and televised on MCTV.
June 7, 2007	Public hearing to present the Draft Environmental Impact Statement and provide an opportunity for the public to comment. Held in Middlebury Municipal Building Gymnasium and televised on MCTV.

7.4 Other Meetings

In addition to the regulatory/resource agency, Advisory Committee, and public meetings, several meetings were held with other parties. Those meetings were as follows:

Date	Topic
September 23, 2004	Initial project meeting with Omya, Inc.
November 5, 2004	Series of meetings with various parties regarding Rutland Railyard Relocation, other potential rail shippers, Omya Middlebury quarry operations, Omya Verpol plant operations, and Vermont Marble Exhibit
March 11, 2005	Meetings with Army Corps and Omya to discuss Environmental Impact Statement process, Purpose and Need Statement, and to review of range of alternatives being considered
May 12, 2005	Meeting with Omya to explain impact information needed from Omya
August 31, 2005	Meeting with Omya regarding alignment, loading and transload issues associated with bringing a rail spur into the quarry; tour of yard, operational scenarios
December 13, 2005	Meeting with Foster Brothers Farm and Vermont Natural Ag Products to discuss alternatives and options under consideration in the vicinity of Foster Brothers/VNAP property and operations
May 15, 2006	Meeting with Omya regarding quarry and plant operations, projections, and permits
August 1, 2007	Meeting with Addison County Regional Planning Commission, Natural Resources Committee to discuss project impacts
December 13, 2007	Meeting with Omya regarding potential wetland mitigation sites and for operational details for responding to DEIS comments
January 16, 2008	Meeting with Addison County Regional Planning Commission, Transportation Advisory Committee to discuss miscellaneous project questions and clarifications

7.5 Summary of Coordination Activities

The project team coordinated with resource agency staff and the Advisory Committee in several meetings and miscellaneous correspondence to discuss the project purpose and need, preliminary alternatives, alternatives screening, the range of alternatives to study in detail, permitting, public participation, local road impacts, and other issues. Opportunities for public input were provided on scoping issues, alternatives screening results, range of alternatives for detailed study, and other issues. Meetings were held with other parties, including potentially affected landowners and other parties.

7.6 FEIS Distribution List

Federal Agencies and Government Contacts

Executive Director
Advisory Council on Historic Preservation
Old Post Office Building
1100 Pennsylvania Ave., NW
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Washington, DC 20004

Environmental Protection Agency
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Suite 1100
Boston, MA 02114-2023

Regional Director – Region I, Room 462
Federal Emergency Management Agency
99 High Street, 6th Floor
Boston, MA 02109

Federal Railroad Administration
Office of Economic Analysis
Economic Studies Division (RRP-32)
400 Seventh St., S.W.
Washington, DC 20590

Regional Administrator
Federal Transit Administration
DOT Transportation Systems Center
Kendall Square
Cambridge, MA 02142

National Oceanic and Atmospheric
Administration
Brett Howe
National Geodetic Survey
SSMC3 8622, NOAA,
N/NGS 1315 East West Highway
Silver Spring, MD 20910

Office of Economics, Environmental
Analysis, and Administration
Section of Environmental Analysis
Surface Transportation Board
395 E Street, SW
Washington, DC 20423-0001

U.S. Army Corps of Engineers
Environmental Analysis Branch
New England Division
696 Virginia Road
Concord, MA 01742-2751

U.S. Army Corps of Engineers
Vermont Project Office
8 Carmichael St. Suite 205
Essex Junction, VT 05452

U.S. Department of Agriculture
Natural Resource Conservation Service
1 Burlington Square, Suite 205
Burlington, VT 05401

Office of NEPA Oversight
Department of Energy
Room 3E-080
1000 Independence Ave, S.W.
Washington, DC 20585

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Environmental Quality Activities
Office of the Secretary
U.S. Deptartment of Agriculture
Washington, DC 20250

Regional Director - Region I
U.S. Dept. of Housing and Urban Devt.
Thomas P. O'Neill, Jr. Federal Building
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U.S. Department of Transportation
Office of the Secretary
400 7th St., S.W.
Washington, DC 20590

U.S. Department of the Interior
Office of Environmental Project Review
Room 4239
18th and C Streets NW
Washington, DC 20240

U.S. Environmental Protection Agency
Office of Federal Activities
EIS Filing Section
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1200 Pennsylvania Avenue, NW
Washington, DC 20460

United States Coast Guard
Commander
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408 Atlantic Avenue
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U.S. Department of the Interior
Office of the Secretary
Office of Environmental Policy and Compliance
408 Atlantic Avenue, Room 142
Boston, MA 02210-3334

U.S. Department of the Interior
U.S. Fish and Wildlife Service
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70 Commercial St., Suite 300
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United States Geological Survey
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State Agencies and Government Contacts

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State of Vermont
Office of the Attorney General
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Montpelier, VT 05609-1001

State of Vermont
Office of the Governor
109 State Street
Montpelier, VT 05609-0101

State of Vermont
State Library
109 State Street
Montpelier, VT 05753

State of Vermont
Agency of Agriculture, Food & Markets
116 State Street, Drawer 20
Montpelier, VT 05620-2091

Vermont Natural Resources Board
District Commission
440 Asa Bloomer Building, 4th Floor
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Vermont Natural Resources Board
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111 West St.
Essex Junction, VT 05452

State of Vermont
Agency of Commerce & Community Development
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State of Vermont
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Center Building
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8 Abbreviations, Acronyms, and Symbols

The following acronyms and abbreviations are used throughout the document:

AADT	Annual Average Daily Traffic
ACOE	U.S. Army Corps of Engineers
Act 250	Vermont's Land Use and Development Law
ANSI	American National Standards Institute
APCD	VANR Air Pollution Control Division
APE	Area of Potential Effect
ARA	Archaeological Resources Assessment
AS	Associate of Science
AST	Aboveground Storage Tanks
ATRS	Automatic Traffic Recorder Stations
BA	Bachelor of Arts
BFE	Base Flood Elevations
BS	Bachelor of Science
BSCE	Bachelor of Science in Civil Engineering
C-1	Conveyor Alternative 1
CAA	Clean Air Act
CAP	UVM Consulting Archaeology Program
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1986
CFR	Code of Federal Regulations
CL & P	Clarendon and Pittsford Railroad
CLF	Conservation Law Foundation
CLOMR	Conditional Letter of Map Revision
CO	Carbon Monoxide
CWR	Continuous Welded Rail
dB	Decibel
dBA	A-weighted Decibels
DEC	VANR Department of Environmental Conservation
DEIS	Draft Environmental Impact Statement
DMV	Department of Motor Vehicles
EDR	Environmental Data Resources, Inc.
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FINDS	Facility Index System

FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FPPA	Farmland Protection Policy Act
FRA	Federal Railroad Administration
FTA	Federal Transit Administration
GIS	Geographic Information Systems
H_20	Water
HB-1	Highway Bypass Alternative 1
HB-2	Highway Bypass Alternative 2
HB-3	Highway Bypass Alternative 3
HB-4	Highway Bypass Alternative 4
HB-5	Highway Bypass Alternative 5
HEC-RAS	Hydrologic Engineering Center's River Analysis System
HS	High School
ISA	Initial Site Assessments
JD	Doctor of Law
LAST	Leaking Aboveground Storage Tank
Ldn	Day/Night Noise Level
LEDPA	Least Environmentally Damaging Practicable Alternative
Leq	Steady A-weighted Noise Level
Leq (h)	Hourly Noise Level
Lmax	Maximum Noise Level
LOMR	Letter of Map Revision
LOS	Level of Service
LUST	Leaking Underground Storage Tank
LWCF	Land and Water Conservation Fund
MCTV	Middlebury Community Television
ME	Mechanical Engineering
MGT	Million Gross Tons
MJ	McFarland-Johnson, Inc.
MS	Master of Science
MSD	Material Supply and Disposal
MVM	Million Vehicle Miles
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHS	National Highway System
NHPA	National Historic Preservation Act
NNHP	Vermont Nongame and Natural Heritage Program
NO	Nitric Oxide
NO_2	Nitrogen Dioxide
NOI	Notice of Intent
NOx	Nitrogen Oxides

NPDES	National Pollutant Discharge Elimination System
NRCS	USDA Natural Resources Conservation Service
NR	National Register of Historic Places
NTU	Nephelometric Turbidity Units
NWI	National Wetlands Inventory
O_3	Ozone
OHM	Oil and/or Hazardous Materials
PA	Programmatic Agreement
Pb	Lead
PE	Professional Engineer
PG	Professional Geologist
PhD	Doctor of Philosophy
PM10	Particulate Matter
PM2.5	Fine Particulate Matter
PPV	Peak Particle Velocity
QA/QC	Quality Assurance and Quality Control
RCRA	Resource Conservation and Recovery Act of 1980
RMS	Root Mean Square
ROD	Record of Decision (for EIS)
RRIF	Railroad Rehabilitation and Improvement Financing Program
RS-1	Rail Spur Alternative 1
RS-1/4	Rail Spur Alternative 1 / 4
RS-2	Rail Spur Alternative 2
RS-3	Rail Spur Alternative 3
RS-4	Rail Spur Alternative 4
RS-5	Rail Spur Alternative 5
RS-6	Rail Spur Alternative 6
SEL	Sound Exposure Level
SHPO	State Historic Preservation Office or Officer
SHWS	State Hazardous Waste Site
SO_2	Sulfur Dioxide
STB	Surface Transportation Board
SWPPP	Stormwater Pollution Prevention Plan
TNM	Traffic Noise Model
TPG	Through Plate Girder
TR-1	Truck to Rail Alternative 1
TR-2	Truck to Rail Alternative 2
TR-3	Truck to Rail Alternative 3
TR-4	Truck to Rail Alternative 4
TR-5	Truck to Rail Alternative 5
TR-6	Truck to Rail Alternative 6
TR-7	Truck to Rail Alternative 7
TSD	Treatment, Storage, and Disposal
TSP	Total Suspended Particulates

UA	The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act)
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
UVM	University of Vermont
VAI	Vermont Archaeological Inventory
VANR	Vermont Agency of Natural Resources
VCGI	Vermont Center for Geographic Information
VdB	Vibration Velocity Level in Decibels
VDHP	Vermont Division for Historic Preservation
VELCO	Vermont Electric Power Company
VFWD	Vermont Fish and Wildlife Department
VMT	Vehicle Miles Traveled
VNAP	Vermont Natural Ag Products, Inc.
VOC	Volatile Organic Compound
VSA	Vermont Statutes Annotated
VSWI	Vermont Significant Wetland Inventory
VTR	Vermont Railway, Inc.
VTrans	Vermont Agency of Transportation
µg/m3	Microgram per Cubic Meter
(µ-ips	Micro-inch per second

Project #16474.00

December 15, 2004

Mr. Everett Marshall
Nongame and Natural Heritage Program
Vermont Agency of Natural Resources
103 South Main Street
Waterbury, VT 05671-0301

Re: Middlebury ST Spur(2); Middlebury, Salisbury, Brandon, Leicester, and Pittsford, Vermont

Dear Mr. Marshall:

McFarland-Johnson, Inc. is writing an Environmental Impact Statement in support of the project listed above. We request your assistance in identifying the presence of known significant natural communities or rare, threatened, or endangered animal or plant species within the study area shown on the enclosed map.

The map encompasses a broad area in order to include all the possible alternatives currently being considered, and to guide our choice of other alternatives not currently on the map.

Thank you for your time and consideration of this request. If you have any questions, please contact me at (603) 225-2978.

Sincerely,

Vicki Chase
Environmental Analyst

Enclosure

\\MJNH-FS\M\1647400 Midd Spur\ENVR\NHI letter.doc

Project #16474.00

December 15, 2004

Ms. Susi von Oettingen
U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord NH 03301-5087

Re: Middlebury ST Spur(2); Middlebury, Salisbury, Brandon, Leicester, and Pittsford, Vermont

Dear Susi:

McFarland-Johnson, Inc. is writing an Environmental Impact Statement in support of the project listed above. We request your assistance in identifying the presence of known significant natural communities or rare, threatened, or endangered animal or plant species within the study area shown on the enclosed map.

The map encompasses a broad area in order to include all the possible alternatives currently being considered, and to guide our choice of other alternatives not currently on the map.

Thank you for your time and consideration of this request. If you have any questions, please contact me at (603) 225-2978.

Sincerely,

Vicki Chase
Environmental Analyst

Enclosure

\\MJNH-FS\M\1647400 Midd Spur\ENVR\FWSletter.doc

McFarland-Johnson, Inc.

Engineering, Planning, Surveying, and Construction Administration

Established in 1946

E-Mail: mcfarland@mjinc.com
www.mjinc.com

Concord Center
10 Ferry Street, Unit 11
Suite 210
Concord, NH 03301-5022

Tel: **603-225-2978**
Fax: 603-225-0095

16474.00

John Austin
Vermont Agency of Natural Resources
Fish and Wildlife Department
5 Perry Street, Suite 40
Barre, Vermont, 05641

August 29, 2005

Dear John,

As you know, the Vermont Agency of Transportation (VTrans) is studying improvements to freight transportation in the Middlebury, Vermont area. McFarland-Johnson, the lead consultant for the project, is preparing an Environmental Impact Statement (EIS) that will describe the potential impacts from each alternative under consideration. The EIS will document the existing wildlife resources, including habitat types, unfragmented habitat, wildlife corridors, and known species occurrence, and will discuss potential impacts of each alternative. Threatened and endangered species will be discussed in another section of the EIS, and potential impacts to these species will be studied. We are coordinating with the Natural Heritage Program and U.S. Fish and Wildlife Service regarding rare species impacts.

We are requesting your assistance in the documentation of existing wildlife resources in the study area. Existing resources that we intend to use include:

- The Vermont Center for Geographic Information website, which provides totals for bear kills, moose mortality, and total numbers of species of mammals, reptiles and amphibians, and fish species.
- The "Vermont Reptile and Amphibian Atlas", which gives more specific information on what reptile and amphibian species have been found in each town in Vermont.
- "Vermont Breeding Bird Atlas", which provides bird records by blocks within each USGS topographic quad.
- Aerial photographs and topographic maps, to identify regional habitat blocks and connections.

Our study area has been refined, and now includes only a portion of the Town of Middlebury. The enclosed map shows the area for which we are seeking information. If you have access to other or more specific species records or information, we would appreciate your sharing it with us. Furthermore, if you have other general habitat information for the study area, that would be helpful to us as well.

Thank you for your time and consideration. If you have any questions about the EIS, or about the information we are seeking, don't hesitate to call.

Sincerely,

Jed Merrow

Jed Merrow
Senior Environmental Analyst

cc: Sue Scribner, VTrans project manager

McFarland-Johnson, Inc.

Engineering, Planning, Surveying, and Construction Administration

Established in 1946

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10 Ferry Street, Unit 11
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Concord, NH 03301-5022

Tel: **603-225-2978**
Fax: 603-225-0095

16474.00

Chet Mackenzie
Vermont Agency of Natural Resources
Fish and Wildlife Department
271 North Main St. Suite 215
Rutland, Vermont, 05701

August 31, 2005

Dear Mr. Mackenzie,

The Vermont Agency of Transportation (VTrans) is studying improvements to freight transportation in the Middlebury, Vermont area. McFarland-Johnson, the lead consultant for the project, is preparing an Environmental Impact Statement (EIS) that will describe and quantify the potential impacts from each alternative under consideration. The EIS will document the existing fisheries and wildlife resources, including habitat types, unfragmented habitat, wildlife corridors, and known species occurrence, and will discuss potential impacts of each alternative. Threatened and endangered species will be discussed in another section of the EIS, and potential impacts to these species will be studied. We are coordinating with the Natural Heritage Program and with U.S. Fish and Wildlife Service for rare species impacts, and with the Vermont Fish and Wildlife Department regarding wildlife impacts.

We are requesting your assistance in the documentation of existing fishery resources in the study area. Otter Creek (a Class B stream, and a warm water fishery), is the dominant water resource in the area, and each of the alternatives under consideration proposes a new bridge over Otter Creek.

The enclosed map shows the area for which we are seeking information. The study area includes everything inside the dashed line (white on the aerial photograph base plan, and green on the U.S.G.S base plan). If you have access to species records, monitoring records for Otter Creek, or other information, we would appreciate your sharing it with us.

Thank you for your time and consideration. If you have any questions about the EIS, or about the information we are seeking, don't hesitate to call.

Sincerely,

Jed Merrow

Jed Merrow
Senior Environmental Analyst

cc: Sue Scribner, VTrans project manager

16474.00 GSM EWM MDL

State of Vermont

AGENCY OF NATURAL RESOURCES VPC

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conervation

Barre Regional Office
Department of Fish and Wildlife
5 Perry St., Suite 40
Barre, VT 05641-4266
802-476-0199

November 9, 2005

Mr. Jed Merrow
McFarland-Johnson, Inc.
Concord Center
10 Ferry Street, Unit 11, Suite 210
Concord, NH 03301-5022

Re: Middlebury Rail Spur Project. Middlebury, VT

Dear Mr. Merrow:

I am responding on behalf of John Austin, per your request for information regarding the presence of fish and wildlife habitat as needed for development of an Environmental Impact Statement (EIS) that is being prepared on behalf of the Vermont Agency of Transportation (Vtrans). Review of our database reveals potential issues with the presence of Otter Creek, several stream crossings and Class II wetlands.

To address potential impacts to streams and the Otter Creek, you should contact Brian Chipman, fisheries biologist in Essex Junction, to ensure that any fisheries concerns are addressed. Typically, we request 50-foot undisturbed, naturally vegetated buffers be incorporated on both sides of the stream starting at the *top-of-bank.* Stream Alteration Permits may need to be obtained from the Department of Environmental Conservation.

Any intrusion into a Class II wetland or its 50-foot buffer zone requires a Conditional Use Determination from the Department of Environmental Conservation. Alan Quackenbush of the Vermont Wetlands Office has been involved with this projects' wetland issues. The Department of Fish & Wildlife would like to review and comment with respect to the wildlife habitat functions on any wetlands that may be impacted by the proposed project. This can best be accomplished through the Conditional Use Determination application process. The alternative that impacts the least amount of wetland habitat will be preferred, with all else being equal.

The RS-1 / TR-1 routes have the potential to impact a large Class II wetland complex that consist of several significant natural communities, as well as a documented rare plant species. Your letter indicates that you are coordinating with the Natural Heritage Program and the U.S. Fish & Wildlife Service regarding rare, threatened and endangered species and significant natural communities.

Lastly, Vtrans is in possession of a database developed by the Vermont Department of Fish & Wildlife, in conjunction with Vtrans, that is a GIS-based, landscape-level identification of potentially significant wildlife linkage habitats associated with Vermont roadways. It is titled, *Vermont Wildlife Linkage Habitat Analysis*, and may be meaningful in an analysis of regional habitat blocks and connections, and wildlife road crossings.

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McFARLAND-JOHNSON, INC.
CONCORD, NH

If you have any questions or concerns, please feel free to contact me, or John Austin, at (802) 476-0199.

Sincerely,

Timothy J. Appleton

Timothy J. Appleton
Fish & Wildlife Specialist

cc: John Austin, Wildlife Biologist
Brian Chipman, District Fisheries Biologist
Alan Quackenbush, VT Wetlands Office
Everett Marshall, NNHP

Project #16474.00

May 22, 2006

Mr. Everett Marshall
Nongame and Natural Heritage Program
Vermont Fish and Wildlife Department
103 South Main Street
Waterbury, VT 05671-0301

Re: Middlebury ST Spur (2) Rare Species Issues

Dear Everett:

We are proceeding with preparation of the Middlebury Spur EIS, and are requesting your input on rare bird species issues. In previous correspondence, you noted the potential for rare grassland birds within the project area, and we agreed that McFarland-Johnson (MJ) should review the area for potential habitat before conducting formal surveys for the species in question. We have completed this review, and have made some preliminary conclusions regarding the potential value of the habitat for grassland birds. Attached are figures and selections from the draft text for the Draft EIS. It would be helpful if you could review these materials and let us know if you agree with the conclusions. At that point we can discuss potential project impacts and what, if any, follow-up work may be appropriate this field season.

Thanks for your assistance. If you have any questions, please contact me at (603) 225-2978.

Sincerely,

Jed Merrow
Project Manager

Enclosures

Cc: Susan Scribner, VTrans Project Manager

M:\1647400 Midd Spur\ENVR\CORRESP\Agencies\2006-05-22 NHI letter.doc

Project #16474.00

May 22, 2006

Mr. Scott Darling
Vermont Fish and Wildlife Department
271 North Main Street, Suite 215
Rutland, VT 05701

Re: Middlebury ST Spur (2) Indiana Bat Issues

Dear Scott:

We are proceeding with preparation of the Middlebury Spur EIS, and are requesting your input on the federally endangered Indiana bat. In previous discussions, you noted the potential for Indiana bat habitat (forest stands over roughly 30 acres in size with mature shagbark hickories, silver maples, or dead trees with exfoliating bark) within the project area, and we agreed that McFarland-Johnson (MJ) should review the area for potential habitat before conducting formal surveys for the species in question. We have completed this review, and have made some preliminary conclusions regarding potential project impacts. Attached are figures and selections from the draft text for the Draft EIS, along with a map showing forest block size around the study area. It would be helpful if you could review these materials and let us know if you agree with the conclusions. At that point we can discuss potential project impacts and what, if any, follow-up work may be appropriate this field season.

Thanks for your assistance. If you have any questions, please contact me at (603) 225-2978.

Sincerely,

Jed Merrow
Project Manager

Enclosures

Cc: Susan Scribner, VTrans Project Manager

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State of Vermont
AGENCY OF NATURAL RESOURCES

Department of Fish and Wildlife
Department of Forest, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council

Vermont Department of Fish and Wildlife
271 North Main St, Suite 215
Rutland, VT 05701-2423
Tel: (802) 786 - 0040
FAX: (802) 786 - 3870

16474.00
GSM
VPC

June 20, 2006

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McFARLAND-JOHNSON, INC.
CONCORD, NH

Jed Merrow
McFarland-Johnson, Inc.
Concord Center
10 Ferry Street, Unit 11, Suite 210
Concord, NH 03301 – 5022

RE: Middlebury ST Spur Indiana Bat Issues

Dear Mr. Merrow:

I have reviewed the draft text of the Draft EIS that you sent to me in May and wish to offer the following comments specific to the project's potential impacts to Indiana bats (*Myotis sodalis)*.

First, it should be noted that Indiana bats do utilize both deciduous and coniferous trees as roost trees, although a preponderance of roost trees identified in Vermont are, in fact, deciduous. Roost trees are either dead/dying and exhibit exfoliating bark or crevices, or are live trees of the species shagbark hickory (*Carya ovata)* or black locust (*Robinia pseudoacacia)*.

Second, the 30-acre threshold for forest patch size needed to support Indiana bats is merely a subjective opinion and scientifically untested in Vermont or elsewhere. While I appreciate your responsiveness to my experiences with this species in Vermont, I suggest it needs more scientific scrutiny before it is used as a definitive threshold in determining presence or absence. In general, it appears that Indiana bats tend not to be found in small, isolated forest patches. While I concur that the 4 and 10 acre patches identified on your maps are not likely to support Indiana bats, I am less confident about the 22 acre patch found directly north of the proposed route.

Third, recent surveys resulted in the capture of two reproductive female Indiana bats within the 120 acre forest patch just north of the proposed route. This is a significant finding for your project. One of the two bats was radio-tagged and ensuing roost tree location work suggests these bats move between forested areas north and south of the proposed route. As a result, it now seems more likely that Indiana bats utilize many of the surrounding forest patches west of Route 7 and shown on your maps.

Lastly, it is my opinion that any of these forest patches located west of Route 7 are likely to serve as roosting and/or foraging habitat for Indiana bats. Clearly RS-1 Alternative avoids any direct impacts to these forest patches. However, TR-1 Alternative does directly impact part of the forest patch within which Indiana bats were captured. The actual acreage of impact should be determined. While the portion of the patch directly impacted by the project appears small, it does encompass a forested peninsula that may, in fact, provide greater connectivity with the forested area to the south.

I hope these comments are helpful in your preparation of the EIS. Please do not hesitate to contact me should you have any questions.

Sincerely,

Scott R Darling

Scott R. Darling
Wildlife Biologist

C.c. Everett Marshall, Nongame and Natural Heritage Program Biologist
Julie Moore, VT Agency of Natural Resources
Susi von Oettingen, Endangered Species Biologist, USFWS

STATE OF VERMONT

AGENCY OF AGRICULTURE, FOOD & MARKETS

16474.00
GCM
UPG

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MAR 3 1 2005

Jed Merrow, Project Manager
McFarland-Johnson, inc.
Concord Center (Ste. 210)
10 Ferry St (Unit 11)
Concord, NH 03301-5022

28 March 2005

Re: Middlebury Rail Spur EIS
Draft Resource Screening
Comment on agricultural soils & farming

I reviewed the alternatives included in your March 24th memo and I want to contribute the Agency of Agriculture's comments on farms, farming and primary agricultural soils.

Jumping to the Screening Methodology, there is a significant amount of privately conserved farmland in the area (I quickly referenced a five year old Vermont Land Trust atlas). I suggest you contact the Vermont Land Trust at 802-223-5234 and they will direct you to the proper person.

Finally, when you say "USDA/NRCS Prime Farmland Soils" is this actually "Primary" which includes soils rated by USDA/NRCS as both Prime and Statewide? If not, since the entire category of "Primary" is what is considered by Act 250 Criterion 9(B) I want to suggest that you broaden the category such that agricultural values 1 through 7 are identified, not just 1 & 3.

Using the criteria with the above limitations, I suggest you examine RS-2 and RS-4 since they cross a significant amount of "Prime" agricultural soils--- only 1.56% of the State is "Prime." RS-1 and TR-1 both appear to skirt the edge of conserved farmlands and prime soils. TR-2 and HB-3 both cross prime agricultural soils. *With a swath 100 feet wide, that means twelve acres of farmland is lost for every mile taken.*

Thank you for the opportunity of commenting. Please contact me if you have additional questions (802-828-5434).

Sincerely,

Marian White
Policy Analyst

SEAL OF QUALITY Vermont. AGENCY OF AGRICULTURE

McFarland-Johnson, Inc.

Concord Center, Suite 210
10 Ferry Street, Unit 11
Concord, NH 03301-5022
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Middlebury ST SPUR (2) – Middlebury Rail Spur EIS

Initial Resource Agency Coordination Meeting – November 18, 2004

MEETING MINUTES

DATE: December 8, 2004

DATE OF MEETING: November 18, 2004

LOCATION OF MEETING: VTrans Materials and Research Facility
Berlin, VT

ATTENDED BY: Name Affiliation

Marty Lefebvre, U.S. Army Corps of Engineers
Mike Adams, U.S. Army Corps of Engineers
Beth Alafat, EPA Water/Wetlands
Bill Neidermyer, US Fish and Wildlife Service
Alan Quackenbush, VANR Wetlands Office
Rob Sikora, Federal Highway Administration (FHWA)
Lisa Thaxton, FHWA
Sue Scribner, Project Manager, VTrans
Charlie Miller, VTrans
Al Neveau, VTrans
Garrett Dague, Addison County Regional Planning Commission
Gary Bua, TranSystems
Jed Merrow, MJ
Vicki Chase, MJ

MEETING MINUTES:

The list of attendees, agenda, and meeting handouts (schedule and alternatives map) are attached. The minutes follow the order in which items were discussed.

Following introductions, Jed Merrow provided background on the project. An Environmental Impact Statement (EIS) is being prepared because of the likelihood of future federal funding for the project. The EIS process, according to National Environmental Policy Act (NEPA) regulations, requires that a “reasonable range of alternatives” be identified and studied equally. This means that alternatives in addition to those studied in the “Least Environmentally

Damaging Practicable Alternative" (LEDPA) study may be considered. Some of these alternatives may not be considered "reasonable" and therefore may not be carried through the EIS process. Although Alternative A-1 is preferred by some parties, it cannot at this time be considered the preferred alternative under NEPA.

The NEPA classification was discussed. Some parties reportedly believed it could be handled as a Categorical Exclusion or Environmental Assessment. Because of the apparent significance of potential impacts – a long floodplain crossing, historical resources, farmlands, wetlands, and other impacts (adverse or beneficial) – it was believed an EIS is required. Some of the alternatives would more clearly have significant impacts than others.

Marty Lefebvre asked who the applicant would be. Since the build alternative would be a state-owned railway or highway, the State (represented by VTrans) would be the applicant. Marty noted that in 2001 Vermont Railway became the applicant, and the LEDPA letter (dated May 8, 2002) referred to a "rail-based" system. Since VTrans will be the applicant and the project is not limited to a rail solution, the project purpose may change. The Corps-designated project purpose is included in the LEDPA letter.

[A copy of this letter was provided following the meeting and is attached to these minutes. It states: "Basic project purpose determined in 1996 to be to 'Provide an alternative means of transporting materials from OMYA's Middlebury, Vermont quarry to their Florence, Vermont processing and distribution plant'."]

The resource agency coordination schedule was discussed. Meetings will be held with resource agencies at key decision points (such as determining the reasonable range of alternatives). Agencies will also be invited to attend at least some of the public meetings to convey their regulatory constraints and opinions on project elements. Agencies will be asked to review important documents. Agencies may be provided with a review copy of the Draft EIS (or sections thereof), but should not distribute it to others, to avoid confusion with the published DEIS. Agencies will only be asked to review sections relevant to their expertise.

Marty Lefebvre will be on vacation the second half of December, and on extended leave from late January through February and possibly March, so Mike Adams should be copied on all correspondence with the Corps.

Marty Lefebvre stated the project will follow the Highway Methodology (for joint processing of projects under NEPA EIS and Section 404). The Highway Methodology allows for joint coordination of public comment, but does not necessarily involve additional meetings. Agency input will be requested on the project purpose and Purpose and Need Statement; this can be handled through correspondence rather than an additional meeting. Marty noted that the Corps' project purpose may differ from the NEPA Purpose and Need Statement. The Section 404 permit application is typically submitted around the time the DEIS is made public, followed by a joint public hearing.

Cooperating agencies were discussed. Any agency that has approval action related to the project could be "cooperating". This would include federal resource agencies and possibly the Federal Railroad Administration (FRA). There was uncertainty regarding the Surface Transportation Board's (STB) role. State agencies are sometimes considered cooperating agencies. Rob will send out letters to certain agencies requesting participation as cooperating agencies.

The idea of a formal agreement among project proponents and cooperating and resource agencies was discussed. An example is a Partnership Agreement in which the parties agree to certain conditions and ground rules, such as timely review of documents. Bill Neidermyer noted that such an agreement would be redundant with the Highway Methodology, and Beth Alafat and Marty Lefebvre agreed. Rob Sikora noted that formal agreements can sometimes help facilitate projects, like this project, that have expedited schedules. It was decided that no such formal agreement was desired for this project.

Possible project alternatives were discussed and a map showing preliminary alternatives was handed out. The Brandon bypasses are shown as a preliminary alternative because they were studied for a recent Route 7 study, and the OMYA truck traffic could possibly make such a bypass feasible. Impacts of truck traffic on Brandon Village are one of the principal reasons for the Spur project. Other alternatives, not shown on the plans, may also be considered. Some of the alternatives may be screened out early in the process and not carried through the EIS studies. Highway alternatives will be considered without prejudice, on a par with rail alternatives. A conveyor system was considered in previous studies but rejected due to factors such as cost and visual impacts. Gary Bua said conveyors are more expensive and have maintenance problems. Marty Lefebvre raised the possibility of an alternative that would truck to the existing rail line near Brandon, carry it around Brandon and back to a truck, and thence to the plant in Florence. It was felt this alternative would not likely be practicable. Rob Sikora raised the possibility of locating a processing plant at the Middlebury quarry.

Charlie Miller noted there are potential users of a rail spur besides OMYA, such as Vermont Natural Agricultural Products (makers of “moo doo”).

Beth Alafat asked whether the existing rail line would be affected by the increased freight rail traffic. Because the existing line is under-utilized, there is existing infrastructure adequate to accommodate the freight traffic without improvements other than normal maintenance. It was acknowledged that the increased traffic could result in more frequent future maintenance of the rail line, but the work would still be routine maintenance. There was some discussion of whether routine maintenance needs to be considered as a project impact in the EIS. The consensus seemed to be that it could be an indirect impact, and that the impacts of additional trips will be considered. The project team will consult with Vermont Railway and consider how increases in traffic would affect track maintenance. It was noted that the switch from truck to rail transport may have benefits to resources along Route 7 (such as Brandon Village).

Beth Alafat asked about the potential for hazardous waste involvement. Jed Merrow noted that potential hazardous waste sites will be identified during the EIS process, and the extent of possible involvement described. Beth also asked about consideration of grease or other substances from train operations. She also noted that stormwater laws and regulations have changed and may need to be considered. Gary Bua said he thought no drainage improvements other than maintenance would be needed for this project.

Action Items

Rob Sikora will send out letters to certain agencies requesting participation as cooperating agencies.

Enclosures:
- List of attendees (sign-in sheet)
- Agenda
- Alternatives Map
- Schedule

Cc: Attendees and:
Tim Timmerman, EPA NEPA Unit
Mark Yachmetz, Federal Railroad Administration
Keith Hartline, USDA Natural Resources Conservation Service (Addison Co.)
Bill Forbes, USDA Natural Resources Conservation Service (Rutland Co.)
Marian White, VT Dept. of Agriculture, Food & Markets
Carl Pagel, VANR Wetlands Office
Fred Nicholson, VANR Stream Alteration Program
John Austin, VANR Fish and Wildlife
Karl Jurentkuff, VANR Floodplains
Everett Marshall, VANR Nongame and Natural Heritage Program
Sam Lewis, VTrans
Dennis Benjamin, VTrans
Greg Riley, VTrans
Tamsen Benjamin, VTrans
Gene McCarthy, MJ

Submitted by:
Jed Merrow, Project Manager
McFarland-Johnson, Inc.

Middlebury ST SPUR(2) Resource Meeting - November 18, 2004

Attendee Sign-In Sheet

Name	Mailing Address	E-mail Address	Phone Number
Marty Lefebvre	US Army Corps of Engineers 8 Carmichael St, Suite 205 Essex Jct, VT 05452	Martha.a.lefebvre @usace.army.mil	802 872-2893
Michael Adams	SAME	MICHAEL. S. ADAMS @ USACE. ARMY. MIL	"
Rob Sikora	FHWA PO Box 568 Montpelier, VT 05601	Kenneth.Sikora @fhwa.dot.gov	(802) 828-4423
Alan Quackenbush	103 S Main St. Waterbury 05671-0408	alan.quackenbush @anr.state.vt.us	241-3761
GARY BUA	One Cabot Road Medford, MA 02155	gjbua@transystems.com	(781) 396 7775
Beth Alafat	US EPA Region I 1 Congress St Ste 1100 Boston MA 02203	Alafat.Beth@EPA.gov	617-918-1399
Bill Neidermyer	US. Fish and Wildlife 70 Commercial St. Concord, NH 03301	william_neidermyer@fws.gov	603-223-2541
Al Neveau	VTRANS		

Middlebury ST SPUR(2) Resource Meeting - November 18, 2004 **Attendee Sign-In Sheet**

Name	Mailing Address	E-mail Address	Phone Number
Jed Merrow	McFarland-Johnson 10 Ferry St. Concord NH 03301	jmerrow@mjinc.com	603-225-2978
Vicki Chase	"	vchase@mjinc.com	"
Lisa Thaxton	PO Box 508 montpelier VT 05001	lisa.thaxton@fhwa.dot.gov.	802 828-4423
GARRETT DAGUE	ACRPC 79 COURT ST., MIDDLEBURY	GDAGUE@SOVER.NET	802-388-3141
Charlie Miller	VTRANS		
Sue Scribner	VTrans		

McFarland-Johnson, Inc.

Concord Center, Suite 210
10 Ferry Street, Unit 11
Concord, NH 03301-5022
Phone: (603) 225-2978
Fax: (603) 225-0095
www.mjinc.com

Middlebury ST SPUR (2) – Middlebury Spur EIS

Army Corps Meeting to Discuss Alternatives Screening

March 11, 2005

MEETING MINUTES

DATE: March 31, 2005

DATE OF MEETING: March 11, 2005

LOCATION OF MEETING: Vermont Agency of Transportation National Life Building, Montpelier, VT

ATTENDED BY:

Name	Affiliation
Sue Scribner	VTrans
Dennis Benjamin	VTrans
Gil Newbury	VTrans
Charlie Miller	VTrans
Al Neveau	VTrans
Tamsen Benjamin	VTrans
Jed Merrow	McFarland-Johnson
Vicki Chase	McFarland-Johnson
Jim Bush	VTrans
Rob Sikora	FHWA
Marty Lefebvre	ACOE
Mike Adams	ACOE
Greg Riley	VTrans

MEETING MINUTES:

The meeting opened with a discussion of the Purpose and Need Statement. Marty Lefebvre expressed that she felt that the P&N was too broad, and that the real purpose should be to move freight from Middlebury to Florence. Jed explained that the idea was to broaden the purpose to include other users besides just Omya. There was general consensus that it would be acceptable to proceed as we had been with the P&N. Marty will prepare a revised project purpose for purposes of Army Corps Section 404 permitting. Marty expressed that she would like to be invited to internal meetings.

There was a brief discussion of the terminus of RS-3, where MJ showed an alternative alignment with a turn to the south, so that the spur rail traffic would be heading southerly onto the mainline. Because the radius of the curve appeared to be too small, it was agreed that the spur terminus would be redirected to the north, as originally proposed.

There was a discussion of the screening criteria. Marty felt that the screening process needed more clear-cut criteria in order to screen out alternatives. She felt there should be operational criteria that would provide a baseline for what would be a workable alternative from a logistical standpoint. Such criteria would not include resource impacts, but could include factors such as grade, curve radii, or other basic factors for roadways or railway. The example of the Rutland Railyard was brought up, and Charlie Miller said he would provide a copy of their criteria.

There was brief discussion of the southern truck to rail routes and whether they could be screened out based on their inefficiency as part of the operational screening. It was agreed that if there were criteria specifying a level of efficiency that would be a minimum that it would be acceptable to screen out alternatives on that basis. There was also a brief discussion of the northern routes, and Dennis said that the ratio of truck traffic to the south of downtown Middlebury was much higher than to the north, so that for example the Middlebury bypass would be a less effective means of relieving truck traffic on Route 7.

Marty also stated that she felt that the resource impact screening matrix should provide data that had been gathered using the same methods for all alternatives, and that the data used by previous studies for wetlands, for example, should not be used, since it is not available for all alternatives. She also said that the resource agencies needed constraints mapping to review, and that it would be helpful to have the mapping 2-3 weeks before the next meeting. It was decided that the operational criteria and resource mapping would be provided to the resource agencies by the week of March 21st for their review prior to the April 13 meeting.

<u>Action Items</u>

Marty will prepare a revised project purpose for purposes of Army Corps Section 404 permitting.

The project team will develop more detailed operational screening criteria; consistent resource impact data; and resource mapping for distribution in advance of the proposed April 13 meeting.

Cc: Attendees

McFarland-Johnson, Inc.

Concord Center, Suite 210
10 Ferry Street, Unit 11
Concord, NH 03301-5022
Phone: (603) 225-2978
Fax: (603) 225-0095
www.mjinc.com

Middlebury ST SPUR (2) – Middlebury Spur EIS

Resource Agency Alternatives Screening Meeting

April 13, 2005

MEETING MINUTES

DATE: April 22, 2005

DATE OF MEETING: April 13, 2005

LOCATION OF MEETING: Vermont Agency of Transportation National Life Building, Montpelier, VT

ATTENDED BY:

Name	Affiliation
Sue Scribner	VTrans
Charlie Miller	VTrans
John Narowski	VTrans
Dennis Benjamin	VTrans
John Lepore	VTrans
Scott Newman	VTrans
Duncan Wilkie	VTrans
Rob Sikora	FHWA
Marty Lefebvre	Army Corps
Mike Adams	Army Corps
Bill Neidermyer	U.S. Fish and Wildlife Service
Beth Alafat	U.S. Environmental Protection Agency
Christopher Brunelle	ANR – River Management Program
Julie Moore	ANR – Planning Division
Shannon Morrison	ANR – Wetlands
Everett Marshall	Vermont Fish & Wildlife Dept. – Natural Heritage Program
Jed Merrow	McFarland-Johnson
Vicki Chase	McFarland-Johnson
Gene McCarthy	McFarland-Johnson
Gary Bua	TranSystems

MEETING MINUTES:

The primary purpose of this meeting was to screen alternatives to get down to the "reasonable range of alternatives" that must be studied in detail in the Environmental Impact Statement (EIS). Draft screening materials had been previously mailed to attendees. The screening is a two-step process: first, all possible alternatives are screened for physical and operational viability, to determine whether they can meet basic design criteria, can be effective, and can meet the project purpose and need. The alternatives that pass the physical and operational screening are then screened for resource impacts, based on existing, "macro-level" resource mapping. A decision is then made regarding which alternatives should be considered as the reasonable range for detailed study in the EIS.

The meeting opened with a brief review of the project background, including previous studies, Federal Highway Administration (FHWA) involvement, and the need for an EIS.

Purpose and Need Statement

There was discussion of the Purpose and Need Statement (P&N). Marty Lefebvre thinks the P&N is too broad, and that the purpose is to move freight from Middlebury to Florence. Jed explained that the purpose was deliberately made broad to include other users besides just Omya, and to allow consideration of other modes of transportation besides just rail. He also noted that the need section of the P&N includes specific need considerations which can be used to screen alternatives. There was consensus that the project purpose for Section 404 permitting does not have to be identical to the purpose developed for the EIS. Marty will prepare a revised project purpose for Section 404 permitting.

Alternatives Identification

Jed Merrow described how alternatives were identified, including those from the prior Omya/rail spur studies, the U.S. Route 7 Improvement Study (Pittsford-Brandon), and new alternatives developed for the current project. New alternatives were identified by looking at major constraints such as densely developed areas, topographic barriers (hills, ridges), and densely developed areas. Maps showing these major constraints in the northern part of the study area were shown. The project team identified all possible alternatives that avoided these constraints without an excessive amount of new alignment. Additionally, a member of the Advisory Committee recently suggested another rail spur alignment, which has been mapped as RS-6. The net result is the six rail spur alternatives, seven truck to rail alternatives, and five highway bypass alternatives shown on mapping. Everett Marshall noted that a direct connection between the eastern portion of RS-4 and the western portion of RS-1 would result in the most direct route, and asked that it be considered. Others asked whether RS-4 and RS-6 could be improved by moving the terminus to a less impacting area. MJ will investigate these options. No other alternatives or alignments were suggested at the meeting.

Physical and Operational Screening

Jed then described the methods and results of the physical and operational screening, as shown on the matrix and summary that were previously emailed to resource agency participants:

- The no build alternative is effective, but does not remove trucks from US 7, Brandon Village, or local roads. It must be studied in the EIS.

- The rail spurs meet all elements of the P&N, although RS-4 and RS-5 would require substantial cuts and fills, and RS-4 and RS-6 may affect Omya's future expansion. All of the rail spurs are recommended for resource screening.

- The truck to rail alternatives appear to be inefficient, since they involve two transportation systems (trucking and rail) and an extra material handling step (at a transload facility). They remove trucks from Brandon Village, but except for TR-1, they do not completely remove Omya's trucks from US 7, and require use of local roads. Because they have inefficiencies and only partly remove trucks from existing roads, TR-2 through TR-7 are not recommended for resource screening. TR-1 will continue to be studied, since FHWA would like to include at least one truck alternative in the study, and TR-1 is the most efficient and comes the closest to meeting the P&N of the truck to rail alternatives.

- The Middlebury Bypass is functionally, for purposes of this project, a truck to rail alternative. Although it would have the benefit of removing Omya's trucks from Brandon Village and all through traffic from Middlebury Village, it appears to be inefficient, and is not recommended for further screening.

- The Brandon highway bypass alternatives would be no more efficient than current operations, and would be relatively expensive to construct. They would remove Omya's trucks from Brandon Village, but not from US 7 or local roads. Because HB-2 and HB-3 have the benefit of removing all through traffic from Brandon Village, it will continue to be screened. HB-4 and HB-5 are well beyond the scope of this project.

- The conveyor appears to be inefficient, involving two transportation systems and a transload operation, and is limited to only Omya's use. It would, however, remove trucks from existing roadways. More information was requested regarding the viability of this alternative.

These conclusions were generally agreed to, although Marty felt the Brandon bypasses did not meet the Corps' project purpose. It is not clear why the bypasses were not studied further in the U.S. Route 7 Improvement Study, although a draft Section 4(f) document prepared for that study may shed light on this. Also, more justification for eliminating the conveyor alternative should be developed.

Macro-Level Resource Screening

The methods and results of the macro-level resource screening were discussed. A revised matrix was handed out (and is attached to these minutes), with the additions of Soils of Statewide Importance impacts, historic resource impacts, corrected RS-2 length, and miscellaneous other updates and corrections. It was noted that impacts of all alternatives are based on an assumed 100-foot wide footprint, and indirect or secondary impacts are not included. Updated resource mapping was also displayed.

The following discussion ensued:

- The significance of the Soils of Statewide Importance category was discussed. It was noted that this is a federal designation indicating a certain quality of farmland soil, and that most of the project area has this designation. There was discussion of how farmland impacts are mitigated.

- Waterway crossings are simply the number of crossings of waterways that show up on USGS maps. Chris Brunelle thought it would be helpful if the types or sizes of water bodies were indicated.

- Everett Marshall noted that some additional rare species considerations might be relevant, such as potential upland sandpiper use of farmland; Indiana bat habitat; and rare plant species in floodplains. MJ will coordinate with Everett regarding impact assessment of the reasonable range of alternatives.

- Duncan Wilkie noted that mapping of known archeological sites may be available digitally; that a statewide archeological sensitivity study would be completed in the fall; and that he has archeological studies of the Brandon bypass alternatives. MJ will contact him about obtaining these items.

- RS-1: RS-1 has substantial farmland impacts, but most other impacts are low or moderate in comparison with other alternatives.

- RS-2: The length of new alignment and the relatively high impacts to wetlands, farmland, undeveloped land, and parcels indicate this alternative is not viable in comparison to other alternatives, and need not be studied further.

- RS-3: As with RS-1, farmland impacts are substantial, but most other impacts are comparatively low or moderate.

- RS-4: This alternative has less farmland impact but much higher wetland impacts than RS-1, affects important historic resources, affects a high number of structures, including the Foster brothers dairy operation, and has five road crossings. The consensus was that this alternative need not be carried forward, although there were questions about whether it could be improved by changing the western terminus to avoid wetland and floodplain impacts, or by connecting it to RS-1. The consultant team will investigate these possibilities.

- RS-5: Although there would likely be less impact to archeologically sensitive land, the number of road crossings, high wetland acreage, and relatively large numbers of structures, parcels, and waterway crossings, along with large cuts and fills, indicate this alternative is not viable.

- RS-6: This alternative has less farmland impact than RS-1, but much higher wetland impacts, and has substantially larger cuts and fills. It would also affect more structures, parcels, and residences within 100 feet. As with RS-4, the consensus was that this alternative need not be carried forward, although there were questions about whether it could be improved by changing the western terminus. The consultant team will investigate this possibility.

- TR-1: It was noted that the segment of TR-1 east of US 7 is Omya's current access road, and therefore is already constructed. This translates into lower new impacts for that alternative. Although there are questions regarding the efficiency and effectiveness of this alternative, impacts (except for farmlands) are lower than most other alternatives, and it should be carried forward.

- TR-2: Although this alternative follows existing roadways most of its length, it would require a substantial upgrade of Three Mile Bridge Road and likely would have high wetland, floodplain, and archeologically sensitive land impacts. The area of impact is part of a large floodplain and wetland complex near the confluence of Otter Creek and the Middlebury River. It was not recommended for further study.

- HB-1: Although impacts would be lower than most alternatives, it was agreed this alternative would not meet the project purpose and need. It could also have substantial secondary impacts.

- HB-2 and HB-3: The screening shows relatively low to moderate impacts for these alternatives. However, those present felt there would be more wetland, deer habitat, and rare species impacts than indicated, along with very high potential secondary impacts. Furthermore, these alternatives do not meet the Corps project purpose, and would require an excessive amount of time and a relatively high cost to design and construct. For these reasons, the resource agencies thought these alternatives do not warrant further study. A Section 4(f) document prepared for the U.S. Route 7 Improvement Study may indicate why it was previously shelved.

Summary of Screening Decisions

The net result of the discussion was, from the resource agencies' perspectives, that RS-1, RS-3, and TR-1 should be carried forward as the "reasonable range of alternatives" in the EIS. RS-2, RS-5, TR-2 through TR-7, and HB-1 through HB-5 need not be studied further. RS-4, RS-6, and C-1 can tentatively be eliminated, but VTrans and MJ will investigate whether improvements in the RS-4 and RS-6 alignments could make them viable and whether RS-4 could be connected to RS-1. They will also review the screening of the C-1 (conveyor) alternative.

Action Items

Marty will prepare a revised project purpose for purposes of Army Corps Section 404 permitting.

The consultant team will investigate whether RS-4 and RS-6 could be improved by changing the western terminus.

The consultant team will investigate whether RS-4 could be connected to RS-1 in a new hybrid alternative.

The project team will investigate the feasibility of the conveyor alternative.

MJ will coordinate with Everett Marshall regarding impact assessment methods for the reasonable range of alternatives.

MJ will contact Duncan Wilkie about obtaining digital files of known archeological sites and Brandon bypass studies.

MJ will contact Scott Newman about obtaining the draft Section 4(f) study document completed for the Brandon bypasses.

Cc: Attendees
Tim Timmermann, US EPA
Keith Hartline, USDA NRCS (Addison County)
William Forbes, USDA NRCS (Rutland County)
Dave Hoyt USDA NRCS
John Austin, Vermont Fish & Wildlife Dept.
Fred Nicholson, ANR River Management Program
Carl Pagel, ANR Wetlands
Margaret Torizzo, ANR Floodplains
Marian White, Vermont Agency of Agriculture

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Middlebury ST SPUR (2) – Middlebury Spur EIS

Field Meeting to Discuss Wetland Delineation

October 31, 2007

MEETING NOTES

DATE: September 11, 2008

DATE OF MEETING: October 31, 2007

LOCATION OF MEETING: Middlebury Spur Alternatives Corridor
Middlebury, VT

ATTENDED BY:

Name	Affiliation
Marty Abair	Army Corps of Engineers (ACOE)
Mike Adams	ACOE
Alan Quackenbush	VT Agency of Natural Resources, Wetlands Office
Glenn Gingras	VTrans
John Lepore	VTrans
Jed Merrow	McFarland Johnson (MJ)

MEETING NOTES:

This meeting was held to review wetland delineations and discuss the Vermont and federal jurisdictional status of wetlands, and go over Corps Jurisdictional Determination form requirements. The minutes below are structured according to alignment segment. Refer to the attached plans for wetland and station locations.

The wetland delineation was reviewed beginning at Omya's quarry. The swale-like wetland along the east side of the quarry stockpile area (Wetland 2) was delineated and shown as a wetland in VELCO's permit. Omya has recently elevated the outlet of this culvert in order to increase settling of particulates in runoff from the quarry. Although the wetland may be man-made (it does not appear on historical air photos) and appears to be functioning as a drainage channel and runoff treatment basin, it was shown as wetland in VELCO's permit and therefore must remain as wetland. Immediately to the south, the channel has been partially cleaned out or excavated, with fill placed alongside the channel. MJ's delineation is wider than the VELCO delineation here, encompassing a cattail area.

Just downstream (Sta. 161+00), there is a small channel which carries drainage from a settling pond that treats water pumped out of the quarry. The small channel discharges to Wetland 2. This channel was not reviewed in the field, but was described by Jed. It does not appear on historical air photos, and appears to be man-made and to carry only settling pond discharge. Therefore it is considered non-jurisdictional.

Further downstream along Wetland 2, west of Sta. 151+00, the group stopped at a farm crossing over the stream channel. At this location, a small intermittent stream which drains the forested Wetland 3, along the west side of the quarry access road, enters Wetland 2. Wetland 2 in this area is a Relatively Permanent Waterway (RPW), while the Wetland 3 intermittent stream is not. Wetland 2 is a Vermont Class 3 wetland upstream of this farm crossing, and Class 2 downstream.

The group then visited the former Wetland 4, at Station 134+00. This area is shown as wetland on the National Wetlands Inventory/Vermont Significant Wetlands Inventory (NWI/VSWI) maps. Its jurisdictional status had been questioned during a previous resource agency meeting, and subsequent field work by MJ staff confirmed that is was non-wetland. After reviewing soils and vegetation, the group agreed with this determination. Wetland 4 is now considered neither state nor federal jurisdictional wetland.

Wetland 5, along the quarry access road at Station 130+00, was briefly reviewed. The delineation appeared appropriate. The stream channel may be a seasonal RPW, and the wetland in this area is Vermont Class 3.

Wetland 20 is at the corner of Lower Foote Street and the quarry access road, and was not identified as wetland in the DEIS. However, it meets wetland criteria. Because of its proximity to other wetlands and the existence of (non-wetland) drainage channels leading to Wetland 5, this wetland has a "significant nexus" with Waters of the U.S. and is a non-isolated federal jurisdictional wetland. It is a Vermont Class 3 wetland.

Wetlands 6 and 7 (between Lower Foote Street and US Route 7) were briefly reviewed and determined to be federal jurisdictional and Vermont Class 3.

Wetlands 9a, 9b, and 9c (between US 7 and Halladay Road and just west of Halladay Road) were reviewed. These were all determined to be federal jurisdictional wetland. Upstream of the confluence of Wetlands 9b and 9c (Station 95+00), the stream channels are non-RPWs and the wetlands are Vermont Class 3. Downstream of the confluence of Wetlands 9a and 9b, the stream channel is an RPW and the wetlands were tentatively determined to be Vermont Class 2. Jed was asked to do additional research (such as field or air photo review) to determine the nature of the connection between Wetland 9c and the larger wetland to the south and west. Jed later determined that the connection between the wetlands was large enough to constitute a single wetland complex, so Wetland 9c is considered Vermont Class 2 (downstream of the confluence with Wetland 9b).

Wetland 10c was described, and Jed's further review also determined this wetland to be Vermont Class 2.

Wetlands 12 and 13, a network of ditches, swales, and small streams, were then reviewed. It appeared that Wetland 12 upstream of and along Middle Road is a non-RPW, and downstream is an RPW. Wetlands 12 and 13 in this area are all Vermont Class 2.

No other wetlands were reviewed in the field. The wetlands further west in the alternatives corridor all have clear connections to the larger wetland to the south and/or Otter Creek, and therefore are federal jurisdictional and Vermont Class 2 wetlands.

There was also discussion regarding ACOE Jurisdictional Determination form requirements.

Cc: Sue Scribner, Project Manager, VTrans

From: Lepore, John
Sent: Thursday, December 13, 2007 10:09 AM
To: 'Lefebvre, Martha A NAE'
Cc: Scribner, Sue; Jmerrow@mjinc.com; Robie, Ken; Narowski, John; Gingras, Glenn; Fortney, Scott; 'Guadalupe, David'; Devlin, Jesse; Viani, Kevin; Lepore, John; Upmal, Ken; Ramsey, Jeff; Goldstein, Lee; Brunelle, Chris; Quackenbush, Alan
Subject: December 12.doc

Marty - Attached is the DRAFT meeting minutes form yesterday's meeting.

All - If you find errors in my DRAFT, please bring them to the attention of Marty (and me) as she will be finalizing the meeting minutes. This was a pretty productive meeting and I thank all of you for your participation. ~ John ~

December 12, 2007 Resource Coordination Meeting Minutes

Middlebury Rail Spur

Jed Merrow of McFarland-Johnson gave a project over-view to include the design shifts which are proposed to avoid a proposed housing development and detention basin, as well as the pasture of the horse farm which is on the western side of Otter Creek. In addition to the alignment shifts, Jed mentioned that the bent spacing for the proposed trestle was being re-evaluated to reduce the floodplain impacts.

The trans-load facility is also being shifted onto OMYA property and off of the Foster Brother's Farm. The trans-load facility will be used to load the trains leaving OMYA, but may also be used by others such as the Moo-Doo plant.

A meeting was held on Oct 31, 2007 with the regulators, but Jed has yet to finalize those meeting minutes. That meeting was for determining state and federal jurisdictions.

Outstanding Issues:

1) EPA commented that Stormwater BMP(s) could not be considered mitigation. COE concurred, but stated they could be viewed as acceptable minimization measures
2) Drainage Diversion from Foster Bros. Farm – Jed Merrow stated that due to the proposed excavation, a small portion of the drainage area which now feeds Beaver Brook will be diverted to the west. This is not expected to cause any impacts to the brook.
3) EPA asked to minimize / eradicate reed canary grass. Jed Merrow stated that it would be impossible to eradicate it as it is so wide-spread and well established, and is likely aiding in water quality treatment.
4) Mitigation – Several sites were briefly discussed, but much more information is needed to make decisions. Two sites are located in Pittsford and one is in Cornwall. Most agreed that the Cornwall site should the best initial promise of success. A site meeting will be required in the Spring of 2008.

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Middlebury ST SPUR (2) – Middlebury Spur EIS

Pittsford Wetland Mitigation Site Review

May 7, 2008

FIELD MEETING SUMMARY

DATE: May 28, 2008

DATE OF MEETING: May 7, 2008

LOCATION OF MEETING: Pittsford, Vermont

ATTENDED BY:

Name	Affiliation
Marty Abair	Army Corps of Engineers (ACOE)
Mike Adams	ACOE
Sally Eugair	Natural Resources Conservation Service (NRCS)
Beth Alafat	EPA
Vicki Chase	McFarland-Johnson, Inc.

MEETING MINUTES:

The purpose of this memo is to document the findings of a field meeting conducted on May 7, 2008, of two potential wetland mitigation sites in Pittsford, Vermont. As proposed in the FEIS, the Middlebury Spur would affect between five and seven acres of wetland, depending on the alternative. Because of the magnitude of the proposed impacts, it will require an individual permit from the U.S. Army Corps of Engineers (ACOE), and the impacts must be mitigated. ACOE has provided verbal guidance that the project must provide wetland mitigation acreage at least equaling the acreage lost, and that enhancements to riparian areas alone are not sufficient to mitigate for wetland impacts incurred by the Middlebury Spur.

To date, MJ has investigated gravel pits in East Middlebury, Bristol, and Salisbury and farm fields in Cornwall and Bridport for other wetland mitigation options. The gravel pits did not provide viable options. The Bridport site includes wetlands and active farmlands, and resource agencies considered the Cornwall and Pittsford sites higher priority. The Cornwall site is mostly ditched wetland and abuts Otter Creek and protected land, and may have mitigation potential.

The properties that were visited on May 7 were 1) property belonging to Robert Forrest, totaling approximately 130 acres, and 2) property belonging to Carmella Carter and her siblings, totaling approximately 39 acres. The attached photo log depicts conditions at the site on April 15, 2008, and May 7, 2008.

Robert Forrest Property

The Forrest property, identified as Lot 37-1 on the Pittsford tax map and listed at 147.5 acres, is situated between Depot Hill Road to the north, Town Hill Road to the south, Otter Creek to the west, and the mainline railroad to the east. A 22-acre portion of the property lies to the north of Depot Hill Road, and is hydrologically connected by a 10-foot diameter corrugated metal culvert (***photo 10***). Another portion of the property lies to the east of the railroad tracks.

Sally Eugair provided maps of the site that showed parcel lines, wetlands, surface waters, and ditch lines. The source of the wetland lines was the Vermont Significant Wetland Inventory (VSWI). The wetland lines provide a reasonable basis for estimating the extent of existing wetlands at the site.

Wetland Reserve Program

The property is of interest to the NRCS because they have been negotiating with Mr. Forrest to conserve the property through the Wetland Reserve Program. This federal program provides financial and technical assistance to landowners interested in preserving, restoring or enhancing wetlands on their property. The program is voluntary and allows landowners to sell easements on their property to the federal government. More information about the program can be found in the attached fact sheet.

Mr. Forrest is interested in selling the property. However, the Wetlands Reserve Program allows only for the purchase of an easement on the portions of the property that are predominantly wetland, and does not allow for purchase in fee simple of property. The proposed easement area encompasses approximately 133 acres of the 147.5 acres. The property was appraised for the purpose of selling an easement through WRP and the easement value was $85,000. The additional value for the deed on the 133 acre portion of the property was appraised at $15,000. Mr. Forrest, however, is seeking $130,000 for the property; or approximately $1000/acre. NRCS has negotiated with The Nature Conservancy to hold the deed on the property (if they can find a buyer) until the state could assume the deed.

Existing Conditions

The property has been farmed for many years. The majority of the property is jurisdictional wetland, exhibiting wetland hydrology, soils, and vegetation. Ditching in the large field between Depot Hill Road and Town Hill Road has altered the hydrology of the site (***photo 1***), as has the presence of Depot Hill Road. It is likely that Depot Hill Road acts as a dam, blocking overland flow of water that would otherwise flow north during periods of flooding.

On a visit to the site on April 15, 2008, the site was inundated by several feet of water (***photo 2***), and Depot Hill Road was closed to vehicular traffic. It is likely that this level of inundation occurs every spring. On May 7, there was still standing water on many parts of the site (***photos 3 and 4***). Wetter portions of the site support reed canarygrass and sedges, and feature soils that have higher clay contents. The upland portions of the site feature reed canarygrass as well as other species of grass, dandelions, plantain, clover, and cinquefoil. Soils in the areas closer to Otter Creek are sandier and better drained, have less standing water, and support upland vegetation. The attached soils drainage class map depicts soils as mapped on the site, and depicts the sandier, moderately well drained soils closer to the river. According to NRCS mapping, about 66% of the area proposed to be conserved features hydric soils. According to VSWI mapping, about 73% of the 133 acres is mapped as wetland. It does not appear that the ditching has altered the site sufficiently to make the areas near the ditch non-jurisdictional.

North of Depot Hill Road, wetlands do not dominate. The VSWI mapping depicts conditions at the site fairly accurately. At the time of the site visit, there was standing water in the areas mapped as wetland in this portion of the site.

A drainage ditch flows along the foot of the railroad embankment. The ditch is approximately ten feet wide, and the crossing under Depot Hill Road features a 30" corrugated plastic culvert (***photo 5***). A drainage ditch also parallels Depot Hill Road on the south side of the road (***photo 6***).

The riverbank along the western property edge is sandy with evidence of recent erosion over the past spring. A log jam along the western bank has directed water toward the east and scoured a large section of bank (***photo 7***). Along this section of riverbank, there is no riparian buffer. In other places, the existing riparian buffer is narrow, with a thin margin of trees along the riverbank (***photo 8***). Vegetation along the riparian buffer includes box elder and silver maple, with Ostrich fern, horsetails, and grass in the herbaceous layer.

The portion of the property east of the railroad tracks is maintained as horse pasture. This area is mapped by NRCS as Elvers silt loam, which is very poorly drained, and the area appears to be predominantly jurisdictional wetland, supporting wetland greases and sedges (***photo 9***).

Opportunities for Wetland Enhancement, Restoration, or Creation

Opportunities for wetland creation or restoration at the site may include filling the ditches in the portion of the property south of Depot Hill Road or partial excavation or introduction of microtopography on upland portions of the site. The riparian buffer could be enhanced through planting of vegetation along the banks, and the existing wetland areas could be enhanced through management of the reed canarygrass that dominates the site and planting of other native herbaceous, shrub, and tree species.

Summary

The Robert Forrest property, 133 acres of which is available for the WRP, is currently approximately 66% -73% wetland. Approximately 30-45 acres of the 133 are currently upland, most of which are found in sandier soils close to Otter Creek. Mitigation could be provided by either preserving existing wetlands and riparian land, enhancing existing wetlands, or creating new wetlands. From an ecological standpoint, preserving a riparian buffer close to the river would improve riparian functions whether or not this area was jurisdictional wetland. Wetlands could be enhanced or created by excavating uplands, constructing microtopography in existing wetlands, or blocking ditches. Existing ditches on both sides of Depot Hill Road could be blocked, the land on the north side of Depot Hill Road could be partially excavated, and riparian enhancements such as plantings could be made without excavation or soil disturbance close to the river.

Carmella Carter Property

North of the Robert Forrest property is a lot owned by Mrs. Carmella Carter and her two siblings. The property extends from Route 7 to the west across the railroad tracks and to Otter Creek. The portion of the property of interest as possible mitigation includes approximately 40 acres between the railroad tracks and Otter Creek. The property is described in Section 4.10.4.1 of the DEIS, and consists of two lots, identified on the Pittsford Tax Map as lots 2-1 (Buzzell) and lot 7N-28 (Rogosta, Carter). The northern lot, owned by Mr. Buzzell, is under agreement for mitigation with VTrans for wetland impacts associated with the reconstruction of the railroad bridge over Otter Creek that is directly north of the property. Preliminary discussions with Mrs. Carter about the southwestern portion of her lot indicate that she and her siblings are open to the possibility of selling their property.

Existing Conditions

The Carter property has been farmed for hay and corn, and probably used for pasture as well. A drainage ditch divides the Buzzell property form the Rogosta property. As with the Forrest property, the sandier, better drained soils are found closer to Otter Creek (***photo 11***), with poorly and very poorly drained soils as one moves east. Upland portions of the site support dandelions, grass, burdock, horsetails, thistle, goldenrod, and clover. Closest to the railroad tracks, a wetland scrub shrub area supports red osier dogwood, viburnums, willows, and sedges. This area slopes down and to the west to a large wert meadow, which was still inundated at the time of the field visit (***photo 12***). Further west, a field has been abandoned and is reverting to early successional forest (***photo 13***). Along the southwestern, upland portion of the site, there were pockets of standing water (***photo 14***). According to NRCS soils mapping, about 18 acres out of 40 acres, or 45%, have hydric soils. According to VSWI mapping, about 24.5 acres are mapped as wetland, or about 58%. As with the Forrest property, the hydric soils and VSWI wetlands do not correlate perfectly, and more detailed mapping would have to be conducted if this property were a viable mitigation option.

Opportunities for Wetland Enhancement, Restoration, or Creation

Opportunities for wetland restoration may include filling the broad ditch that divides the two properties, introducing microtopography to existing wetland, or by partial excavation of existing uplands. Because soils in the western portion of the site are prime agricultural soils, the property does not qualify for preservation under the WRP. The riparian buffer along Otter Creek is very narrow, and could be enhanced by planting or even by allowing natural succession to proceed, as there is good regeneration of silver maple and box elder in the grassy area closest to the river.

Summary

The Carter lot measures around 40 acres, and currently around half of that area is mapped as upland. In order to satisfy the no net loss directive, the topography in the upland could be manipulated to create the requisite acreage of wetland of between five and seven acres. The site has not been manipulated to the extent that the Forrest property has, and there are not the opportunities for blocking ditches and restoring hydrology that the Forrest lot provides. The area provides valuable wildlife habitat as is, and, with the adjoining property, supports diverse vegetation communities (wet meadow, early successional forest, scrub shrub, and floodplain forest). During the field meeting, Marty Abair offered the opinion that the property did not have great potential for providing mitigation for wetland impacts, given that the only upland portion of the site is prime farmland soils, and is actively farmed, and the one ditch was located in an existing wetland.

Next Steps

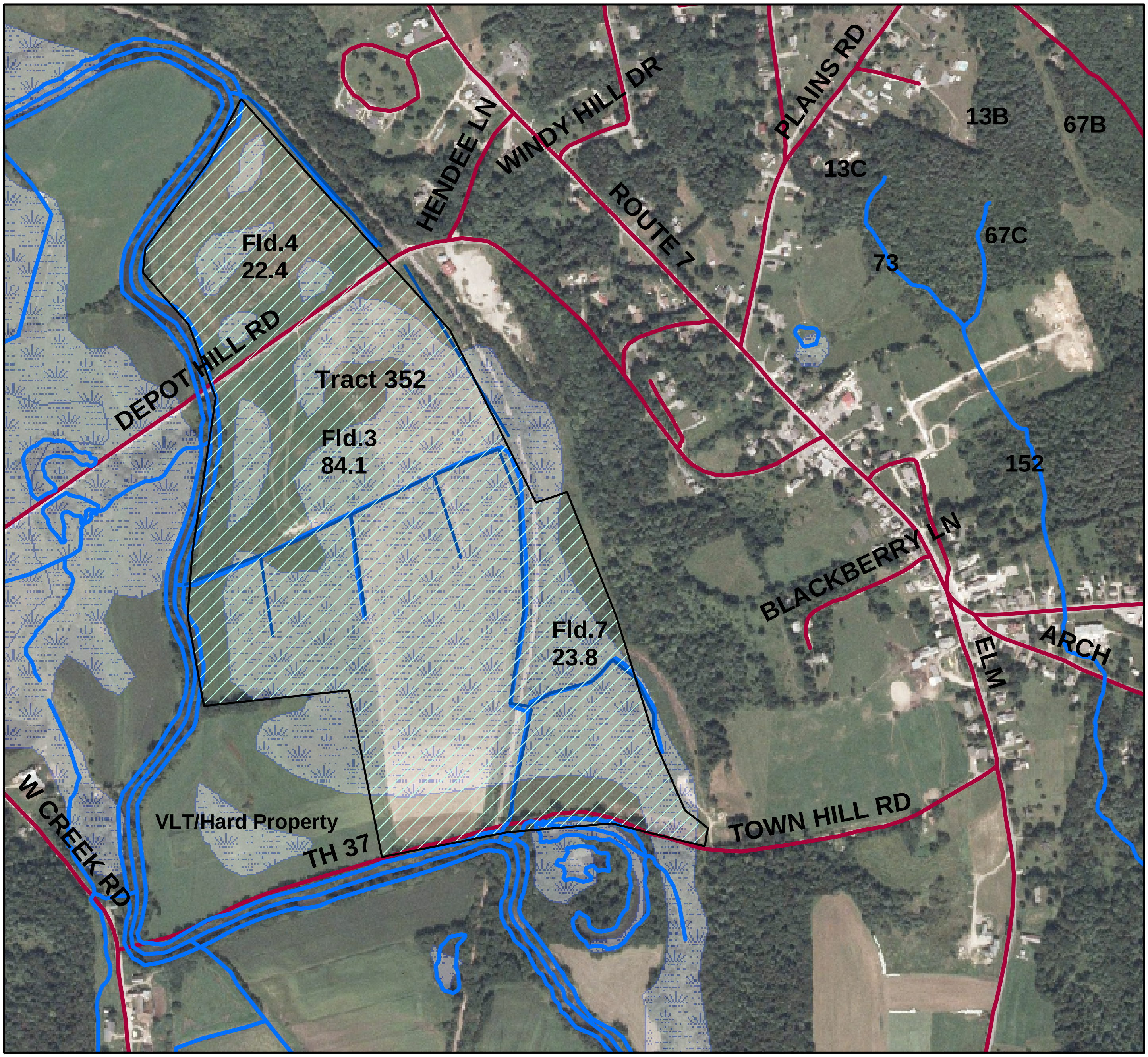
Both of the sites visited have potential, with enough topographical manipulation, to provide the requisite acreage of wetland. Because the Carter lot is smaller, has prime agricultural soils, is reverting on its own to a variety of habitat types, and has just one ditch along its northern property line, it appears to have lower value as potential mitigation than the Forrest lot. For the purposes of the FEIS, if consensus is achieved on the Forrest lot, a schematic design of a wetland mitigation area should be developed. Given the limited time frame, this design could use available published orthophotos for base mapping and available VSWI mapping for wetland mapping. For the purposes of the Section 404 permit, mitigation plans will need to be fully developed, including base survey, wetland delineation, and geotechnical investigations to determine the existing water table and soils conditions in the upland. Subsequently, a mitigation design would be developed, to include proposed contours, planting design, and all other elements of construction-ready plans. Negotiations with the landowner and coordination with NRCS would proceed after publication of the FEIS, but because of schedule restrictions for the WRP funding, communication should continue with NRCS throughout the process.

ROBERT FORREST PROPERTY

Date: 5/8/2008

Customer(s): ROBERT C FORREST
District: RUTLAND DISTRICT
Approximate Acres: 130.3

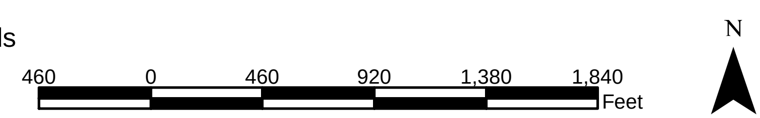
Field Office: RUTLAND SERVICE CENTER
Agency: USDA/NRCS
Assisted By: Sarah J Eugair
State and County: VT, RUTLAND
Land Units: Tract: 352 Field:



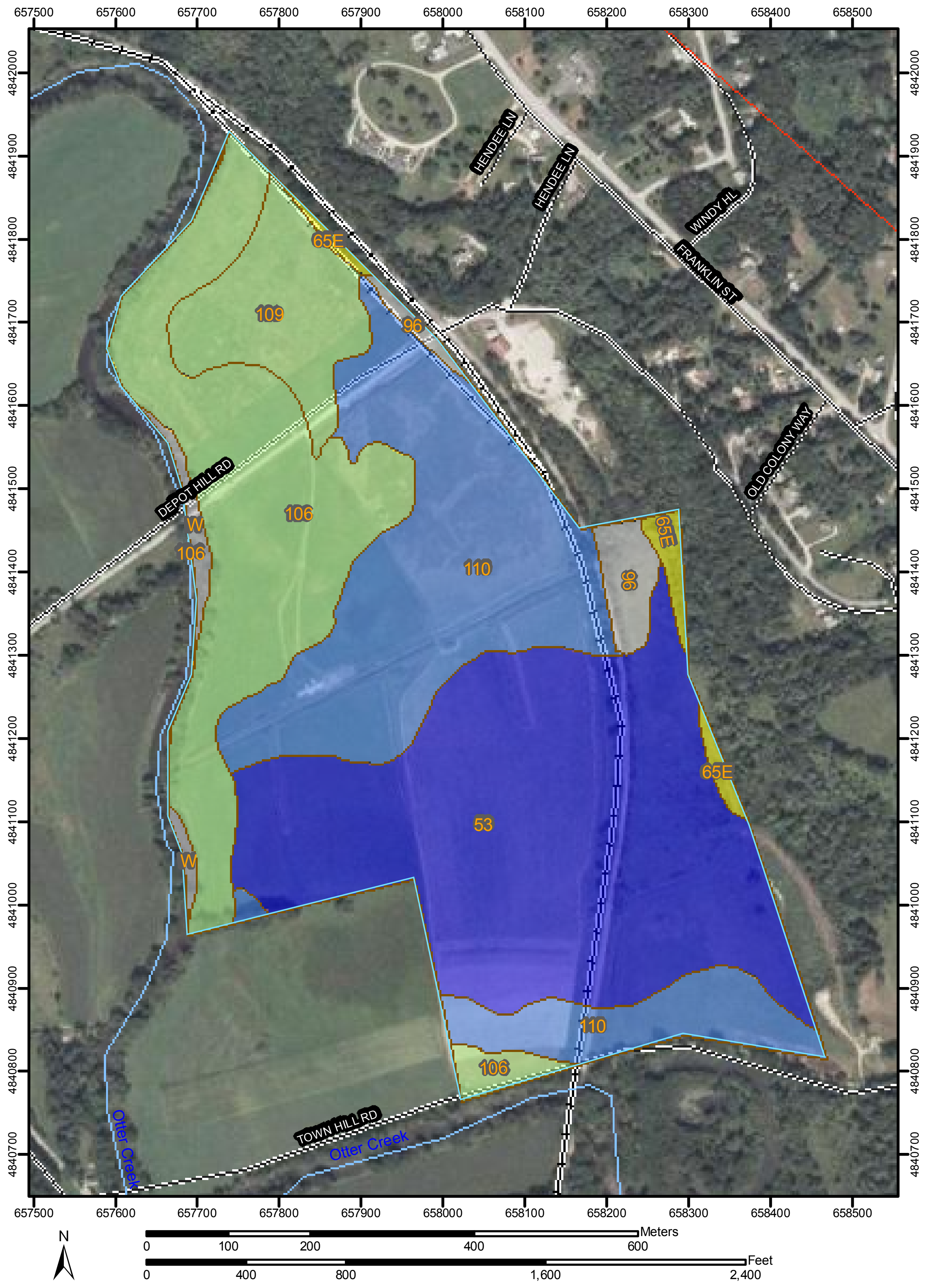
This is not a legal survey of the Forrest Property.

Legend

- Easement Area
- E911 Roads
- Wetlands
- Practices (lines)
- Surface Water VHD



Drainage Class–Rutland County, Vermont
(Robert Forrest Property Drainage Class)



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Soil Ratings
- Excessively drained
- Somewhat excessively drained
- Well drained
- Moderately well drained
- Somewhat poorly drained
- Poorly drained
- Very poorly drained
- Not rated or not available

Political Features

Municipalities
- Cities
- Urban Areas

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails

Roads
- Interstate Highways
- US Routes
- State Highways
- Local Roads
- Other Roads

MAP INFORMATION

Original soil survey map sheets were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. Please rely on the bar scale on each map sheet for proper map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Rutland County, Vermont
Survey Area Data: Version 12, Mar 17, 2008

Date(s) aerial images were photographed: 5/9/1994

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Drainage Class

Drainage Class— Summary by Map Unit — Rutland County, Vermont				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
53	Elvers silt loam	Very poorly drained	50.0	37.8%
65E	Stockbridge gravelly silt loam, 25 to 45 percent slopes, very stony	Well drained	2.0	1.5%
96	Udipsamments, nearly level		2.8	2.1%
106	Middlebury loam	Moderately well drained	29.5	22.3%
109	Teel silt loam, sandy substratum	Moderately well drained	9.6	7.3%
110	Limerick silt loam	Poorly drained	36.9	27.9%
W	Water		1.5	1.1%
Totals for Area of Interest (AOI)			132.3	100.0%

Description

"Drainage class (natural)" refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized-excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the "Soil Survey Manual."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

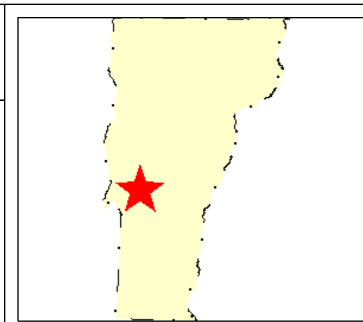
Tie-break Rule: Higher

VERMONT

Vermont Interactive Map Viewer

Vermont Center for Geographic Information (VCGI)

Carter lot, Pittsford



Legend

- Airports
- Interstates
- US Highways
- VT State Highways
- Rail Lines
- Town Boundaries
- Roads
  - Class 1-3
  - Class 4
  - Driveways
- Rivers and Lakes
- Streams
  - Intermittent
  - Perennial
  - Unassigned
- Wetlands - VSWI
- Cities
- VT State Boundary

0 600 1200 1800 ft.

Map center: 455751, 134942

VT State Plane Meters (NAD83)

N

Scale: 1:6,421

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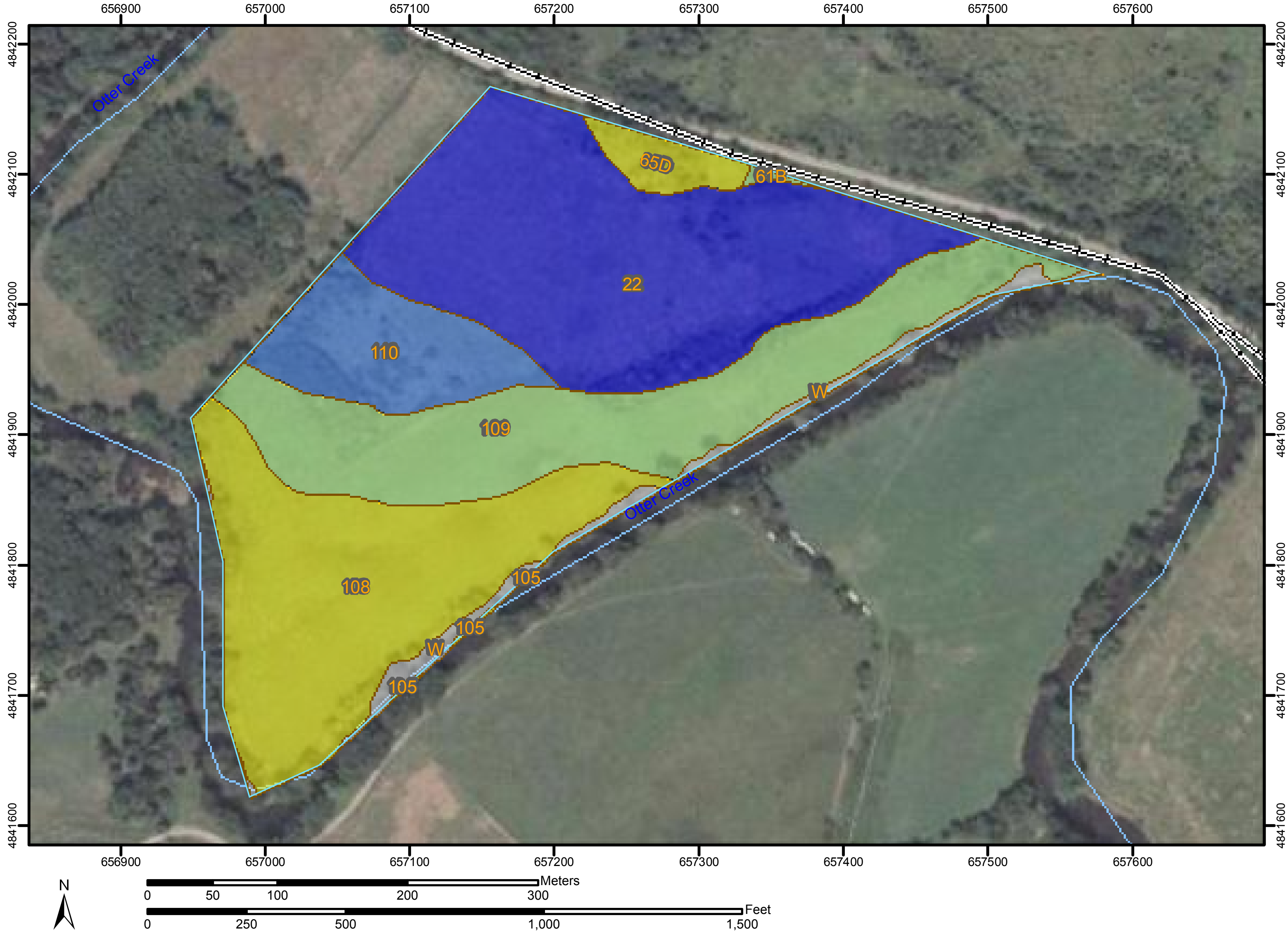
URL: http://maps.vermont.gov/imf/sites/VCGI_basemap/jsp/launch.jsp

VCGI

5/28/08

Drainage Class–Rutland County, Vermont
(Carmella Carter Lot Drainage Class)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- Excessively drained
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- Cities
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Date(s) aerial images were photographed: 5/9/1994

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Drainage Class

Drainage Class— Summary by Map Unit — Rutland County, Vermont				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
22	Saco mucky silt loam	Very poorly drained	14.2	35.2%
61B	Eldridge fine sandy loam, 3 to 8 percent slopes	Moderately well drained	0.1	0.2%
65D	Stockbridge gravelly silt loam, 15 to 25 percent slopes, very stony	Well drained	1.0	2.4%
105	Tioga fine sandy loam	Well drained	0.0	0.1%
108	Hamlin silt loam	Well drained	10.4	25.9%
109	Teel silt loam, sandy substratum	Moderately well drained	9.4	23.5%
110	Limerick silt loam	Poorly drained	3.8	9.4%
W	Water		1.3	3.2%
Totals for Area of Interest (AOI)			40.2	100.0%

Description

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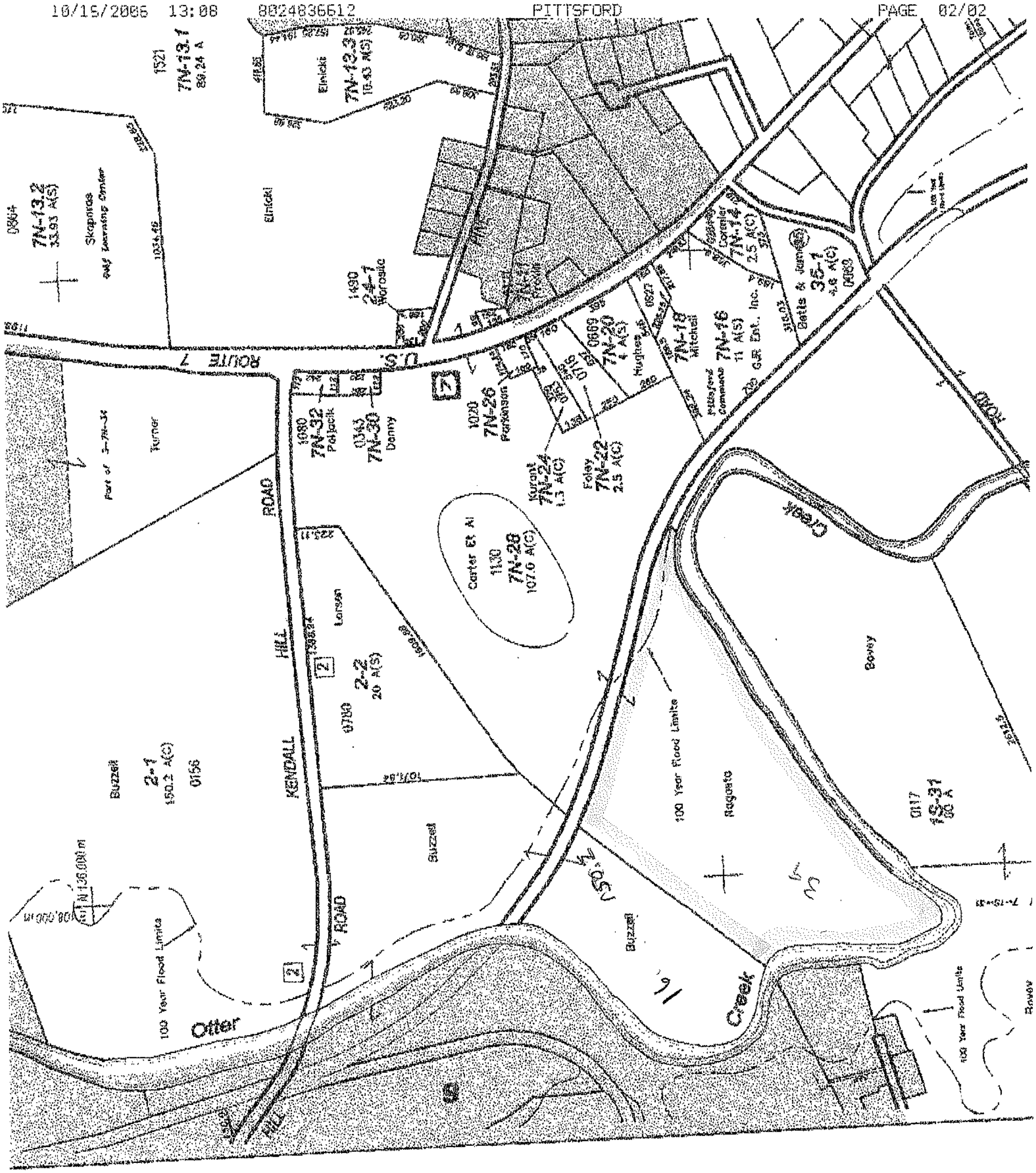
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: *None Specified*

Tie-break Rule: Higher



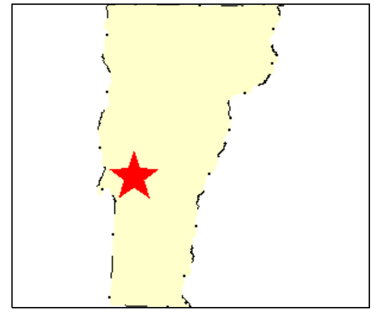
U.S. ROUTE 7
KENDALL HILL ROAD
Otter Creek
Creek
100 Year Flood Limits
7N-13.2
33.93 A(S)
Skaparas
7N-13.1
89.24 A
7N-13.3
Elnicki
24-1
Worosilo
7N-32
Poljack
7N-30
Denny
7N-26
Parkinson
7N-24
1.3 A(C)
7N-22
2.5 A(C)
Foley
7N-20
4 A(S)
Hughes
7N-18
Mitchell
7N-16
11 A(S)
G.R. Ent., Inc.
7N-14
2.5 A(C)
35-1
Batts & Jones
Carter Et Al
7N-28
107.0 A(C)
Larsen
2-2
20 A(S)
Buzzell
2-1
150.2 A(C)
Turner
Bovey
Ragosta
7S-31
90 A

VERMONT

Vermont Interactive Map Viewer

Vermont Center for Geographic Information (VCGI)

Carter lot Pittsford



Legend

- Airports
- Interstates
- US Highways
- VT State Highways
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  - Class 1-3
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- Wetlands - VSWI
- Cities
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VT State Plane Meters (NAD83)

N

Scale: 1:5,000

0 500 1000 1500 ft.

Map center: 455751, 134942

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URL: http://maps.vermont.gov/imf/sites/VCGI_basemap/jsp/launch.jsp

VCGI

5/28/08

Photo 3. Ditch in Farm Field, looking east

Photo 2. View west on Depot Hill Road on April 15, 2008.

McFarland Johnson	**Middlebury Rail Spur** **Wetland Review** **Pittsford, VT**	**PHOTO LOG** **PHOTOS 1 and 2**

Photo 3. Farm field, south side of Depot Hill Road, view south

Photo 4. Standing water with reed canarygrass

McFarland Johnson	**Middlebury Rail Spur** **Wetland Review** **Pittsford, VT**	**PHOTO LOG** **PHOTOS 3 and 4**

Photo 5. Ditch paralleling railraod tracks, north side of Depot Hill Road

Photo 6. Railroad ditch south of Depot Hill Road. Grassy area to right is upland.

McFarland Johnson	**Middlebury Rail Spur** **Wetland Review** **Pittsford, VT**	**PHOTO LOG** **PHOTOS 5 and 6**

Photo 7. Otter Creek, view north. Log jam at left of photo has caused erosion at right.
(North of Depot Hill Road)

Photo 8. Existing Buffer along Otter Creek (south of Depot Hill Road)

McFarland Johnson	**Middlebury Rail Spur** **Wetland Review** **Pittsford, VT**	**PHOTO LOG** **PHOTOS 7 AND 8**

Photo 9. Looking east at portion of lot east of railroad tracks

Photo 10. Culvert connecting north and south sides of Depot Hill Road

McFarland Johnson	**Middlebury Rail Spur** **Wetland Review** **Pittsford, VT**	**PHOTO LOG** **PHOTOS 9 & 10**

Photo 11. Southern portion of Carmella Carter lot, view west

Photo 12. Northern portion of Carter lot, view toward railroad track

McFarland Johnson	**Middlebury Rail Spur** **Wetland Review** **Pittsford, VT**	**PHOTO LOG** **PHOTOS 11 & 12**

Photo 13. Early successional vegetation in western portion of lot

McFarland Johnson

Middlebury Rail Spur
Wetland Review
Pittsford, VT

PHOTO LOG
PHOTOS 13 & 14

McFarland Johnson

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Middlebury ST SPUR (2) – Middlebury Spur EIS

Pittsford Wetland Mitigation Site Review

July 31, 2008

FIELD MEETING SUMMARY

DATE: September 11, 2008

DATE OF MEETING: July 31, 2008

LOCATION OF MEETING: Middlebury and Pittsford, Vermont

ATTENDED BY:

Name	Affiliation
Marty Abair	Army Corps of Engineers (ACOE)
Mike Adams	ACOE
Paul Minkin	ACOE
Beth Alafat	EPA
Erica Sachs	EPA
Alan Quackenbush	Vermont Agency of Natural Resources
Jed Merrow	McFarland Johnson

MEETING NOTES:

The purpose of this memo is to document the results of a field meeting conducted on July 31, 2008 to review wetlands proposed to be impacted for the Middlebury Spur project and visit the Forrest wetland mitigation site. This site is in Pittsford on Depot Hill Road, along the west side of the railroad tracks, and is owned by Robert Forrest. Other mitigation sites considered have been discussed with agency staff and documented in the FEIS and previous meetings.

Wetland Impacts

Existing wetlands were reviewed briefly along a portion of the Omya quarry access road and Halladay Road. As proposed in the FEIS, the Middlebury Spur preferred alternative would affect approximately 5.9 acres of wetlands. Nearly all of the wetland to be impacted is within active or fallow farmland, and includes ditches, swales, and small depressions. Most wetland is classified as palustrine emergent and would be considered wet meadow; intermittent stream channels and small amounts of scrub-shrub wetland would also be affected. The principal functions of most affected wetlands are nutrient removal/retention, sediment/pathogen/toxicant removal, and sediment stabilization. Some of the affected wetlands occur in floodplains along Otter Creek, in an important riparian habitat corridor.

Robert Forrest Property

The meeting then moved to the mitigation site known as the Forrest parcel. The parcel was viewed from Depot Hill Road, along a farm access road, and at the large ditch bisecting the main portion of the lot. Following are the main points of discussion:

Acreage: The available acreage is reportedly 133 acres out of a total parcel size of 147 acres. Based on the extent of hydric soils and wetlands mapped on NRCS soil survey and Vermont Significant Wetland Inventory mapping, there may be roughly 88 to 97 acres of existing wetlands on the property.

Invasive species: There are extensive stands of reed canarygrass on the site. There was discussion about whether it could or should be eradicated.

Riparian buffer: The land along the river could be planted with tree species to establish a natural riparian buffer.

Wetland restoration, enhancement, and creation: Ditches could be filled in, possibly with the old dredge spoils along the ditch banks, which could restore a more natural hydrology to the wetlands. The topography could also be manipulated to enhance or create additional wetlands.

Section 404 permitting implications: Since this site was not included in the original 404 notice, the project would need to be re-noticed. At least conceptual level plans would be needed to obtain a permit. It will be necessary to clear the site for Section 106 (mainly archeology) concerns.

Wetlands Reserve Program: The USDA Natural Resources Conservation Service (NRCS) had been trying to purchase the management rights to the site for the Wetlands Reserve Program (WRP), but the landowner was asking for more than the assessed value. According to prior discussions with Rob Sikora, FHWA might not necessarily be constrained by the assessed value. Further discussions with Sally Eugair of NRCS revealed that NRCS had just gotten approval for additional funding to purchase the management rights through the WRP, and the landowner later reportedly signed a sales agreement. Ms. Eugair is of the opinion that enhancements beyond those proposed for the WRP could be made to the property, thus contributing to the mitigation requirements of the Middlebury Spur project.

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Concord, NH 03301-5022
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Fax: (603) 225-0095
www.mjinc.com

Middlebury ST SPUR (2) – Middlebury Rail Spur EIS

Initial Advisory Committee Meeting – December 6, 2004

MEETING MINUTES

DATE: December 22, 2004

DATE OF MEETING: December 6, 2004

LOCATION OF MEETING: Middlebury Municipal Conference Room
Middlebury, VT

ATTENDED BY: Name Affiliation

Fred Dunnington, Town of Middlebury
Thomas Schmelzenbach, Town of Brandon
Helen McKinley, Town of Pittsford
Garrett Dague, Addison County Regional Planning Commission
Mark Blucher, Rutland Regional Planning Commission
Ed Fitzgerald, Vermont Rail System (representing Dave Wulfson of Vermont Railway)
John Kessler, Vermont Agency of Commerce and Community Devt.
Lee Khan, OMYA
Sue Scribner, Project Manager, VTrans
Anne Candon, VTrans (for Charlie Miller)
Alan Neveau, VTrans
Dennis Benjamin, VTrans
Greg Riley, VTrans
Jed Merrow, MJ
Gene McCarthy, MJ
Gary Bua, TranSystems

MEETING MINUTES:

The agenda and list of attendees are attached. Meeting handouts (Work Plan, schedule, Middlebury Spur Advisory Committee Participant List, and Preliminary Alternatives map) were previously emailed to the participants with the meeting announcement. The minutes follow the order in which items were discussed.

Project and Process Overview, Project Team, Work Plan, and Schedule

Following introductions, Jed Merrow provided background on the project, including an Act 250 permit limiting OMYA truck traffic, a 1999 Economic and Environmental Impact Study mandated by the state legislature, and the Least Environmentally Damaging Practicable Alternative (LEDPA) study produced in 2002 for Army Corps Section 404 permitting. An Environmental Impact Statement (EIS) is now being prepared because of the likelihood of future federal funding for the project. The EIS process involves a fresh look at potential project alternatives.

The EIS project team was introduced. The Federal Highway Administration (FHWA) is the lead federal agency; the Vermont Agency of Transportation (VTrans) is managing the project, with Sue Scribner as the VTrans project manager; and McFarland-Johnson (MJ) is leading the consultant team, with Jed Merrow as project manager.

The project was classified as an EIS under NEPA because of the potential for significant impacts (adverse or beneficial) from some of the alternatives. There are potential resource impacts such as long floodplain crossings, wetland fills, historical resource effects, and farmland losses, and potential impacts to transportation facilities such as U.S. Route 7.

The Work Plan and schedule were handed out and briefly discussed.

Advisory Committee Makeup and Role

The Advisory Committee list of participants was handed out and the committee makeup was discussed. It was asked whether Salisbury and Leicester were invited to attend. Sue Scribner said they will be contacted and invited to attend. There were no other comments on the roster of organizations/agencies or staff members on the list.

The purpose of the committee is to provide local feedback; advise on important project issues like alternatives; and help with public participation strategies. The committee will meet approximately two weeks prior to public meetings and at important decision points, such as the determination of the reasonable range of alternatives. The Advisory Committee will be added to the project schedule.

Public Participation Plan

The public participation strategy was discussed. There are proposed to be public meetings at four points: EIS scoping; during alternatives development; when major impact and mitigation information is available; and prior to publication of the Draft EIS. There will also be a public hearing following Draft EIS publication. The best time for public meetings is in the evenings starting at 7 or 7:30 (and possibly later during farming seasons). Fred Dunnington suggested Thursdays are best for Middlebury and Brandon; Thursdays are also good for Pittsford, except for the fourth Thursday of the month. Middlebury may be the best location for the initial public meeting, but future meetings could also be held in Brandon. The Middlebury Municipal Building conference room and gymnasium are available, and the college has excellent meeting facilities. Fred noted that there have been many meetings on this subject over the years, and some peoples' interest may have waned; he recommended combining meetings where appropriate.

Press releases will be sent to local newspapers. Suggested papers include the Addison Independent, Addison Eagle, Valley Voice, Rutland Herald (there is a Monday business section), and Brandon papers (contacts will be provided by Tom Schmelzenbach).

Jed Merrow asked whether the Middlebury town meeting would be an appropriate forum to display project information. We would have to contact the Town Moderator, Jim Douglas.

There are no plans to set up a project web site, but project information should be put on the VTrans web site, and town or regional web sites could include links to the VTrans web pages. Sue Scribner will check with the VTrans web site managers.

There is local public access television (MCTV). Richard Thodal (388-3062) is the contact.

The idea of setting up an email distribution list or listserve was raised. MJ and VTrans will look into this.

It was recommended that presentations be made to regional Transportation Advisory Committees (TACs) at their regular meetings to make them aware of the project and its progress.

Alternatives Development

The EIS process, according to National Environmental Policy Act (NEPA) regulations, requires that a "reasonable range of alternatives" be identified and studied equally. This means that alternatives in addition to those studied in the LEDPA study may be considered. Some of these alternatives may not be considered "reasonable" and therefore may not be carried through the EIS process. Although Alternative A-1 is preferred by some parties, it cannot at this time be considered the preferred alternative under NEPA.

Possible project alternatives were discussed and a map showing preliminary alternatives was handed out. The Brandon bypasses are shown as a preliminary alternative because they were studied for a recent Route 7 study, and the OMYA truck traffic could possibly make such a bypass feasible. Tom Schmelzenbach noted that bypasses around Brandon Village could improve conditions for many motorists and pedestrians in the Village, while a rail spur is perceived as having more limited benefit. Sue Scribner noted that alternatives will be weighed against the Purpose and Need Statement, which is currently being drafted, and will be circulated to the Advisory Committee participants, resource agency staff, and others for comment.

Other alternatives, not shown on the plans, may also be considered. Some of the alternatives may be screened out early in the process and not carried through the EIS studies. Highway alternatives, such as upgrades to US 7 or a truck to rail option on the A-1 alignment, will be considered without prejudice, on a par with rail alternatives. John Kessler stated that rail would alleviate problems associated with truck traffic and is preferable over the long term, and Fred Dunnington said the grades work well for rail and safety is better than a truck route. A conveyor system was considered in previous studies but rejected due to factors such as cost and impacts. However, a conveyor may not be unreasonable and could be considered in the EIS. Some residents are interested in the Three Mile Bridge truck route (the bridge burned in 1952), and the town would like another Otter Creek crossing. However, there would be substantial impacts.

Fred referred to the recent Chittenden County Circumferential Highway decision (pages 18-19) regarding the adequate range of alternatives. Jed Merrow noted that FHWA is the lead federal agency and has the final say, but the project team will try to reach a consensus among all parties on the reasonable range of alternatives. Dennis Benjamin noted that whether alternatives are reasonably practicable and feasible will determine their viability. Prior studies can be referenced to eliminate alternatives.

Next Steps

The public scoping meeting will be held in January (later set for January 20 at 7 PM). The next Advisory Committee meeting will be to discuss alternatives (possibly late January or February).

Action Items

The Advisory Committee and the public scoping meeting date will be added to the project schedule.

MJ will contact Salisbury and Leicester town representatives and invite them to attend Advisory Committee meetings.

Sue Scribner will check with the VTrans web site managers regarding posting project materials.

MJ and VTrans will consider contacting the local public access television (MCTV) about broadcasting meetings or project information.

MJ and VTrans will look into the idea of setting up an email distribution list or listserve.

Press releases will be sent to the local newspapers listed above.

Sue Scribner will check with the VTrans web site managers about adding project information.

MJ will contact TAC contacts (Tom Schmelzenbach and Garrett Dague) about making presentations at their regular meetings.

The Draft Purpose and Need Statement will be circulated to the Advisory Committee participants, resource agency staff, and others for comment.

Enclosures:
  List of attendees (sign-in sheet)
  Agenda

Cc: Attendees and:
Erik Bohn, OMYA
David Wulfson, Vermont Railway
Jamie Stewart, Addison County Economic Development Corporation
Keith Arlund, Town of Brandon
Mark Sinclair, Conservation Law Foundation
Adam Lougee, Addison County Regional Planning Commission
Susan Schreibman, Rutland Regional Planning Commission
Matt Sternberg, Rutland Redevelopment Authority
Bill McGrath, Rutland Economic Development Corporation
David Scott, VTrans
David Dill, VTrans
Sam Lewis, VTrans
Charlie Miller, VTrans
Tamsen Benjamin, VTrans
Rob Sikora, Federal Highway Administration
Vicki Chase, MJ

Submitted by:
Jed Merrow, Project Manager
McFarland-Johnson, Inc.

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Middlebury ST SPUR (2) – Middlebury Spur EIS

Advisory Committee Meeting

March 16, 2005

MEETING MINUTES

DATE: March 31, 2005

DATE OF MEETING: March 16, 2005

LOCATION OF MEETING: Neshobe Elementary School

ATTENDED BY:

Name	Affiliation
Sue Scribner	VTrans
Al Neveau	VTrans
Jed Merrow	McFarland-Johnson
Vicki Chase	McFarland-Johnson
Fred Dunnington	Middlebury Town Planner
Erik Bohn	Omya
Jack Beasley	Salisbury Selectman
Ken Babbitt	Salisbury Selectman and Conservation Commission
Gene McCarthy	McFarland-Johnson
Curt Carter	VT Agency of Commerce and Community Development
Gary Bua	TranSystems
Sandy Levine	CLF
Tom Schmelzenbach	Town of Brandon DPW
Helen McKinley	Town of Pittsford

MEETING MINUTES:

Sue opened the meeting by saying that she had invited Leicester to be on the Advisory Committee, and that they were interested but did not have anyone available to attend, but wanted to receive the minutes from the meeting.

Purpose and Need Statement

Jed handed out the current Draft Purpose and Need Statement. He reviewed, and provided responses to, comments previously provided by Advisory Committee members. He first explained that the P&N could not state that the solution had to be rail, because Rob Sikora of the Federal Highway Administration (FHWA) has said that we should not rule out other options.

Jed explained that economic development was intentionally left out of the P&N for the most part, since the purpose of the project is not economic development, although it was mentioned briefly in the last paragraph. Fred said that the new draft Middlebury town plan has more specific goals relating to the rail spur, and that he would provide MJ with a copy.

Fred said that he thought we should mention other users in the P&N by name. Jack Beasley stated that people from Salisbury see it as an Omya project, if other users are not included. Jed said that we do not yet have a documented need from other users. Fred reiterated that he thought other users could be mentioned by name, specifically Specialty Filaments, Standard Register, and Vermont Natural Agricultural Products. Potential other users will be contacted in an effort to determine their level of interest in or need for the project.

Sandy Levine said that we should not expand the need so that it shifts the focus from the principal user; that the need statement should be tailored to Omya.

Public Scoping Meeting

Fred said that he found the scoping maps too broad, that the public couldn't find local roads, and that the maps didn't have numbered alternatives. It was noted that the maps are being revised for the next public meeting, and will include road names and numbered alternatives. It was also noted that the intent of the public scoping meeting was to get input on EIS issues in general, that the focus of the meeting was not intended to be on alternatives. Fred said that he would like copies of the comments made by Middlebury residents. Sue said she would provide them for him.

Alternatives Screening

Fred Dunnington said that he thought the initial screening used very broad criteria, that a lot of discretion was exercised, and that the screening should be more systematic. Jed explained that we had received similar comments from the resource agencies and that we would be revising the initial screening accordingly.

Jed then reviewed the alternatives selection process and the February 11 screening memo. Fred stated that the screening had no input from local officials. Jed explained that these were recommendations, and that we are seeking input form the advisory committee, resource agencies, and the public on the alternatives. Fred asked what would be presented in the next public meeting. He said that the northern rail route went right through a residential neighborhood, and that there was a historically existing rail line northeast of the proposed alternative. Fred also stated that there are conservation lands other than those shown, and that he could provide them to us. He offered to meet with the project team to provide information and feedback on alternatives and resource issues. (A meeting was later agreed to for Monday March 21 at 10 AM in Fred's office.)

Jed then reviewed the initial screening conclusions to date, noting that the southern truck to rail alternatives are inefficient, and that even the Middlebury truck to rail routes require an extra handling step.

Fred provided some specific comments about the resource impact matrix. The resource matrix is a draft document, still under revision, and additional revisions will be made.

Tom asked about the Brandon bypass, and stated that it was his understanding that there were some upgrades being made to Route 7, and that the bypass had been eliminated as an option. Sue explained that this was true but that the upgrades would not include any additional capacity, so that it may still be warranted to consider the bypass.

Curt asked about efficiency, and why it was not on the matrix. Jed explained that efficiency would be included in a screening for operational criteria that MJ is developing.

Sue asked for feedback on the project in general. Curt said that he thought the usefulness had to come back to Omya, in that if an alternative was not useful to Omya, then it was not viable.

Fred stated that he felt HB-1 and RS-5 were more viable than RS-3 and RS-4.

<u>Action Items</u>

Fred Dunnington will provide MJ with a copy of the draft town plan.

Contact other users to establish whether they should be named in the Purpose and Need Statement.

Provide Middlebury residents' scoping comments to Fred Dunnington.

Continue to revise initial screening criteria and resource impact tabulations.

CC: Attendees
Dave Wulfson, Vermont Railway
Mark Blucher, Rutland Regional Planning Commission
John Kessler, Vermont Agency of Commerce and Community Development
Jamie Stewart, Addison County Economic Development Corporation
Keith Arlund, Town of Brandon
Dennis Benjamin, VTrans
Tamsen Benjamin, VTrans
William Finger, Town of Middlebury
Lee Khan, The Khan Partnership

Adam Lougee, Addison County Regional Planning Commission
Bill McGrath, Rutland Economic Development Corporation
Charlie Miller, VTrans
Gil Newbury, VTrans
Greg Riley, VTrans
Susan Schreibmen, Rutland Regional Planning Commission
Rob Sikora, Federal Highway Administration
Matthew Sternberg, Rutland Redevelopment Authority

McFarland-Johnson, Inc.

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Middlebury ST SPUR (2) – Middlebury Spur EIS

Advisory Committee Meeting

May 3, 2005

MEETING MINUTES

DATE: May 20, 2005

DATE OF MEETING: May 3, 2005

LOCATION OF MEETING: Middlebury Municipal Building Conference Room

ATTENDED BY:

Name	Affiliation
Sue Scribner	VTrans
Dennis Benjamin	VTrans
Greg Riley	VTrans
Rob Sikora	FHWA
Jed Merrow	McFarland-Johnson
Fred Dunnington	Middlebury Town Planner
Erik Bohn	Omya
Curt Carter	VT Agency of Commerce and Community Development
Rick Kehne	Addison County Regional Planning
Andy Lawton	TranSystems
Rob Chisholm	CLF
Marty Lefebvre	Corps of Engineers
Jackie English	Middlebury resident

MEETING MINUTES:

This meeting was called to go over the results of meetings and analysis since the last Advisory Committee meeting, and to obtain feedback on the proposed reasonable range of alternatives. **Please review these minutes carefully and let either Jed Merrow or Sue Scribner know if you have any comments, questions, or concerns about the proposed reasonable range of alternatives or other issues herein.**

Documents Distributed at Meeting

- Minutes of April 19, 2005 meeting project team meeting at VTrans
- Physical and Operational Screening Matrix with cost information, dated April 12, 2005
- Macro-Level Resource Screening Matrix, dated April 13, 2005
- Summary of March 31, 2005 Public Alternatives Meeting Comments and Questions

Review and Discussion of Prior Meetings and Decisions

There was a review and discussion of the recent Advisory Committee meeting (March 16), public alternatives meeting (March 31), resource agency meeting (April 13), and two project team meetings (April 19 and 26).

The two-step screening process was briefly reviewed. The first step was a physical and operational screening, which considered the viability of alternatives from a physical and operational standpoint, and in terms of the project purpose and need. For alternatives that passed this screening, a macro-level resource screening was conducted to assess the relative resource impacts of alternatives. The results of this screening process is summarized below.

<u>Truck-to-rail alternatives</u>: The truck-to-rail alternatives are inefficient, as they involve two transportation systems and extra material handling, and, except for TR-1, do not remove traffic from local roads and a portion of US 7. Cost information in the legislative study (shown at the bottom of the attached Physical and Operational Screening Matrix) shows that, with construction costs included, the annual costs of these alternatives would likely be higher than the no build alternative. No cost is available for TR-2, but its resource impacts would be substantially greater than other alternatives. TR-1 is the shortest truck to rail alternative, and does not involve use of US 7 or local roads. FHWA prefers having at least one alternative that involves roadway, and it was thought that TR-1 is the most likely truck to rail alternative to be viable. Therefore TR-1 is recommended for inclusion in the reasonable range of alternatives.

<u>Highway bypass alternatives</u>: The Middlebury US 7 bypass HB-1 is, for Omya, effectively a truck-to-rail option and appears to be the least efficient of the alternatives. Fred Dunnington noted that HB-1 has long been recommended in the Middlebury town plan and had some public support. He would like to see HB-1 included in the study to see what the issues will be. He asked whether the project would be delayed if, later in the process, the Town of Middlebury asked that this alternative be reconsidered. It was thought that it would cause delays if it came up later, and that the Town should comment now if they would like it considered. Fred intended to bring the issue up at the next Board of Selectmen's meeting. Rob Sikora stated that the bypass may more appropriately be studied as an independent project. Dennis Benjamin noted that including HB-1 might require revising the Purpose and Need Statement.

HB-4 and HB-5 are much larger projects than needed for this project's purpose and need, and are therefore considered beyond the scope of the project. HB-2 and HB-3 would remove through traffic from Brandon Village, but not from the remainder of existing US 7 or from local roads in Pittsford, and nor would they improve efficiency. The resource agencies believe there will be substantial secondary impacts as well. VTrans also believes HB-2 and HB-3 would be substantially more costly and require much longer to design and construct than other alternatives. The project team is looking into the cost and time to construct issues, and will document the findings. It is expected these alternatives will be eliminated from consideration.

Conveyor alternative: The conveyor alternative C-1 is inefficient, involving both conveyor and rail transportation and an extra material handling step. It is also likely to have greater resource impacts than truck to rail or rail spur alternatives, since it requires both a conveyor and a parallel access road for maintenance. Furthermore, it could only be used by Omya; other shippers would have to access the transload facility to access the rail line. Therefore it is not recommended for further study.

Rail spur alternatives: RS-2, RS-4, RS-5, and RS-6 would require substantially greater earthwork (as shown in a table near the end of the April 13 resource agency meeting minutes) and have substantially greater resource impacts than other alternatives. Specifically:

- RS-2 would affect relatively high amounts of undeveloped land, active agricultural land, and important farmland soils, along with fairly high wetland impacts and a high number of parcels.

- RS-4 would have 5 new road crossings, relatively high wetland impacts, and would affect 2 hazmat sites and 7 structures, including important historical resources and part of the Foster brothers' dairy operation. It would also cross the new Middle School recreational fields.

- RS-5 would have 6 new road crossings, high wetland impacts, 6 water body crossings, and would affect 12 structures, including 3 historic structures.

- RS-6 (recently suggested by Fred Dunnington), which would leave the quarry heading north, would have high wetland impacts, involve hazmat sites, and pass close to the new Middle School.

The resource agencies asked that alternative alignments at the terminus of RS-4 and RS-6 be considered to see if the impacts could be reduced enough to make RS-4 and RS-6 viable. The agencies also asked that an RS-1/RS-4 hybrid that includes the eastern portion of RS-4 and the western portion of RS-1 be considered. The project team investigated these possibilities and found that RS-4 and RS-6 could not be improved by modifying their termini, and the RS-1/RS-4 hybrid would have substantially greater earthwork than some alternatives and would still have substantial resource impacts.

RS-1 and RS-3 would have relatively high impacts to active agricultural land and important farmland soils, and RS-3 would pass close to the new Middle School, but otherwise these alternatives have relatively low resource impacts. They also require substantially less earthwork than other alternatives, although Fred questioned the RS-3 earthwork numbers. [The consultant team subsequently checked the earthwork calculations and found an error in previous estimates. The RS-2 figures will be recalculated, but it appears that it would still require substantially less earthwork than the other rail spur alternatives.] Therefore RS-1 and RS-3 are recommended for the reasonable range of alternatives.

Reasonable Range of Alternatives

The recommended reasonable range of alternatives includes RS-1, RS-3, TR-1, and the no-build.

It was noted that the eastern half of all three build alternatives follows essentially the same alignment, and that some may question whether these constitute true alternatives. It was agreed that these constitute true alternatives, and that other alternatives have been considered and duly studied.

Jed Merrow asked the Advisory Committee if they agree or disagree with the reasonable range of alternatives. There were no comments from the floor, and Jed stated we will assume there is a consensus. If any other comments arise after the meeting, send them to Jed or Sue Scribner.

Next Steps

The next tasks for the project were discussed, and include:

1. Tie up loose ends from screening:
   - Brandon bypasses: Research cost and time to construct issues and prepare memo with findings.
   - Conveyor: Document why it will not be studied further, as discussed above.

2. Prepare scoping report summarizing EIS scoping process and findings, including:
   - How the entire range of alternatives was determined
   - Scoping activities
   - Findings

3. Prepare alternatives report documenting how the reasonable range of alternatives was determined.

4. Begin EIS studies (develop alternatives in more detail, identify resources, determine resource impacts, etc.).

5. Hold public meeting(s): The current schedule calls for a public meeting to present project impacts, followed by another to present the preferred alternative. Since we are down to three build alternatives, the project team proposed combining these meetings and presenting the preferred alternative prior to Draft EIS preparation. The preferred

alternative could then be identified in the Draft EIS. We would meet with the Advisory Committee a few weeks before this meeting to discuss project findings, meeting format and presentation, etc.

6. Prepare and circulate Draft EIS (probably late summer or early fall).

7. Hold Public Hearing (combined NEPA EIS and Army Corps Section 404 hearing).

The Advisory Committee agreed to this proposed schedule of tasks.

Other Discussion

Fred Dunnington said there will be a public hearing on the draft town plan (which explicitly supports a rail spur on the RS-1 alignment) on Tuesday night. On June 14, the town has to adopt the new town plan or readopt the old one. Jed Merrow noted that the new town plan information will be added to the Purpose and Need Statement.

A resident who lives on Three Mile Bridge Road commented that she appreciated the "clear and open" process of studying and selecting alternatives.

There were no further comments or questions.

Action Items

The Advisory Committee will review these minutes and comment on the alternatives selection process.

MJ will incorporate the new town plan information, once adopted, into the Purpose and Need Statement.

Fred will discuss HB-1 at the next Board of Selectmen's meeting.

The project team will research the cost and time to construct issues and prepare memo with findings and recommendations regarding the Brandon bypasses.

The project team will prepare an EIS scoping report and an alternatives report.

Attachments (in addition to those listed above):

- Sign-in sheet
- Agenda

CC: Attendees and:
Dave Wulfson, Vermont Railway
Mark Blucher, Rutland Regional Planning Commission
John Kessler, Vermont Agency of Commerce and Community Development

Jamie Stewart, Addison County Economic Development Corporation
Keith Arlund, Town of Brandon
Tamsen Benjamin, VTrans
William Finger, Town of Middlebury
Lee Khan, The Khan Partnership
Adam Lougee, Addison County Regional Planning Commission
Bill McGrath, Rutland Economic Development Corporation
Charlie Miller, VTrans
Gil Newbury, VTrans
Susan Schreibman, Rutland Regional Planning Commission
Matthew Sternberg, Rutland Redevelopment Authority
Jack Beasley, Salisbury Selectman
Ken Babbitt, Salisbury Selectman and Conservation Commission
Gene McCarthy, McFarland-Johnson
Vicki Chase, McFarland-Johnson
Sandy Levine, CLF
Tom Schmelzenbach, Town of Brandon DPW
Helen McKinlay, Town of Pittsford
Town of Leicester (Attn. Donna)

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Middlebury ST SPUR (2) – Middlebury Spur EIS

Advisory Committee Meeting

November 9, 2005

MEETING MINUTES (REVISED)

DATE: December 6, 2005

DATE OF MEETING: November 9, 2005

LOCATION OF MEETING: Middlebury Municipal Building Conference Room

ATTENDED BY:

Name	Affiliation
Sue Scribner	VTrans
Charlie Miller	VTrans
Al Neveau	VTrans
Dennis Benjamin	VTrans
Rob Sikora	FHWA
Dave Wulfson	Vermont Railway
Fred Dunnington	Middlebury Town Planner
Helen McKinlay	Town of Pittsford
James Stewart	Addison Co. Economic Devt. Corp.
Erik Bohn	Omya
Don Burns	Omya
Lee Khan	Omya
Rick Kehne	Addison County Regional Planning
Jed Merrow	McFarland-Johnson
Gene McCarthy	McFarland-Johnson
Gary Bua	TranSystems
Mary Jo Llewellyn	Architectural Historian Consultant

MEETING MINUTES:

This meeting was called to review the alternative alignments, profiles, and options that are under consideration, and to discuss which should be carried forward. Please review these minutes carefully and let either Jed Merrow or Sue Scribner know if you have any comments, questions, or concerns. Items below are organized according to the agenda items.

1. Update on EIS Study Progress to Date

The meeting agenda was handed out, and discussion began with an overview of project activities since the previous Advisory Committee meeting (May 3, 2005). These activities included additional screening (physical, operational, and macro-level resource) of alternatives in order to get down to the reasonable range of alternatives; formally documenting the screening results and decisions regarding the reasonable range of alternatives; work on the remaining alternatives to determine the optimum alignments and profiles to study in the EIS; obtaining additional photogrammetric mapping and identifying existing resources; assessing the viability of RS-3; and beginning to assess impacts of alternatives.

The remaining alternatives were then discussed in detail, starting at the existing mainline railroad tracks.

2. Alternatives and Options

RS-1

Creek Road: The initial segment of RS-1 would be constructed on a trestle spanning the broad floodplain area both east and west of Otter Creek. RS-1 would cross Otter Creek on a bridge, and could either bridge over Creek Road or meet an elevated Creek Road at grade. The grade-separated crossing would require a higher trestle and a bridge over the road, and therefore probably greater expense, but would avoid the safety concerns of a grade crossing. The grade-separated crossing is in the town plan. The at-grade crossing would require a segment of Creek Road to be moved and raised to meet the rail spur. This would probably be less costly but would result in more floodplain, farmland, visual, and possibly wetland impact than the grade-separated crossing, and would result in safety concerns. It appears that the relatively small cost savings (if any) of an at-grade crossing do not justify the resource impacts and safety concerns, and attendees did not support further study of the at-grade option. Fred suggested the crossing should allow enough clearance for passage of firetrucks. The possibility of a trestle rather than bridge crossing was also raised.

From Creek Road to Halladay Road: The Perrin farm (Creek Road Farm) has deeded access to the Middle Road area north of RS-1, to allow passage when Creek Road is flooded. It is believed this could be accommodated with a farm crossing. No horns or flashers are needed for farm crossings.

Halladay Road and US Route 7: Halladay Road is approximately 60 feet lower than US 7, and there are limitations on the maximum grade of rail spurs (less than 1.0% is desirable, and up to 1.5% is acceptable). For these reasons, the rail spur would require either deep cuts at US 7 and to the east, or large fills at Halladay Road and to the west. All RS-1 options have the rail crossing under US 7 with an elevation difference of 28 feet to accommodate the vertical clearance required for the rail spur. With the top of rail 28 feet below the US 7 roadway, the grade west of US 7 at 0.6%, and the grade west of Halladay Road at 1.0%, there would be up to 34-foot high embankments west of Halladay Road. Steepening the rail grades would only lower the embankment heights a relatively small amount.

Fred noted that the town would prefer that the crossing be grade-separated, and asked about the possibility of raising Halladay Road and bridging over the rail spur. Gary Bua noted that this would result in a much greater cut to the east, but the consultant team will look at its feasibility.

If an at-grade crossing were constructed, it could be a quiet zone crossing with a four-quad gate signal system. No horns or whistles would be needed with a quiet zone crossing.

Fred raised the possibility of cutting off Halladay Road at the rail spur crossing, and relocating Halladay from the south with a new connector to US 7. It could be aligned with Cady Road, but the limited traffic on both roads probably does not warrant it. The new roadway could follow the rail spur closely, or could diverge. According to Fred, there is a fill area along Halladay Road that could be the most appropriate place to build the new roadway connection. A cul-de-sac would be necessary on Halladay Road north and/or south of the spur crossing.

The consultants will study four options: an at-grade quiet zone crossing; cutting off and relocating Halladay Road; a railroad bridge over Halladay Road; and a roadway bridge over the rail spur.

Lower Foote Street: East of US 7, the rail spur would climb at a 1.0% grade. The rail spur would be roughly 25 feet below Lower Foote Street, and Lower Foote Street would be cut off by the spur. The possibility of bridging over the railroad to maintain vehicular traffic was raised, and will be considered by VTrans and the consultant team if, based on traffic studies, local concerns, or other factors, it appears to be warranted.

Transload Facility: The RS-1/RS-3 transload facility is proposed to be constructed just south of the quarry, along the west side of the spur. This location keeps the facility and the train activity farther from US 7; avoids the rail spur cut and curve sections, which would be problematic for a transload facility; and keeps it on or adjacent to VNAP property. It was noted that this facility is farther from other users, and therefore a bit more difficult to access, than a location nearer US 7 would be. The possibility of locating the transload within the quarry was raised, but Omya representatives stated there was not sufficient space in the quarry for other users' operations. The proposed location also allows possible future expansion to the north, south, or west. A small building would be required for locomotive servicing and an office and bathroom. Fred asked that impacts to farmland be minimized.

The possibility of accessing the transload facility from the east via a farm road and VT Route 116 was discussed, but it appeared that access from VT 116 via Cady Road was nearly as efficient, and the farm road access need not be studied.

TR-1

The first segment of the truck to rail alternative would be essentially the same as the first segment of RS-1: a rail spur segment starting at the mainline tracks, spanning Otter Creek and Creek Road, with a trestle over the entire floodplain area. This rail segment would terminate in a proposed transload facility located approximately along the property line between the Perrins and Middle Road Ventures. The facility would have a 1,500-foot siding track with a roadway around it, and a smaller siding for users other than Omya. Attendees expressed concerns about noise effects of the transload facility and the truck traffic on existing and proposed neighborhoods. A berm may help shield neighbors from noise. At both Halladay Road and US 7, there could be at-grade or grade-separated crossings. The volume of traffic on US 7 makes grade separation there highly desirable. The consultant team will study both options at Halladay, and a grade-separated crossing at US 7.

The viability of TR-1 was discussed. It would be less efficient than a rail spur for Omya, may be more difficult for other users to access, and would not result in substantially lower resource impacts than RS-1 (based on a preliminary review of impacts to wetlands, floodplains, and farmland soils). The truck traffic and transload operations may also have greater noise effects. It was also noted that the RS-1 rail spur has support from the Army Corps and has federal funding. However, alternative TR-1 will not be dropped from consideration at this time.

Dave Wulfson recommended that the US 7 underpass be constructed as soon as possible, prior to NEPA/EIS or other approvals. Others noted that it would not be possible to get federal funding for the underpass, or even to commence final design, until the NEPA process is completed. Rob noted there are some situations where federal funding can be used earlier than normal, before NEPA is complete, but this work did not seem to fit those situations.

RS-3

The RS-3 alternative was discussed, including the original northern connection to the mainline tracks, and a newer southern connection. Both would pass through the proposed Middle Road Ventures development, which has received local planning commission approval; would pass close to several existing residences along Middle Road; and would be near the Middle School. The northern option would pass through a portion of the Middlebury South Village development, which is now under construction; over town recreational fields; across a pedestrian path; and across Otter Creek and associated wetlands and floodplain. The southern option would pass through (via trestle) large floodplain wetlands on both sides of Otter Creek. These wetlands are among the most valuable in the study area, and the wetland west of the creek is a study area for Middlebury College’s environmental studies program. RS-3 is also longer and moves south-bound freight in a northerly direction, making it more costly to construct and operate, and less efficient overall compared to RS-1.

3. Eliminate RS-3 from Consideration?

The possibility of eliminating RS-3 from consideration was raised, and was supported by attendees. Rob Sikora had consulted with others at FHWA and determined that there is no minimum number of alternatives which must be studied; if alternatives are determined to be unreasonable, they need not be studied further, even if it leaves only one or two build alternatives in the study.

4. Identify RS-1 as the Preferred Alternative?

A preferred alternative can be identified as such in the Draft EIS. Rob Sikora suggested, and others concurred, that if RS-1 is preferred, it should be identified as such in the DEIS. This is consistent with the findings of prior studies, including the Army Corps' determination that the RS-1 alignment was the Least Environmentally Damaging Practicable Alternative or "LEDPA".

5. Public Meeting

The purpose of the next public meeting will be to present the final results of the screening process and the reasonable range of alternatives. There will not be a detailed discussion of impacts (other than screening results), since the EIS and EIS public hearing will serve that purpose. Fred asked that effects on town roads be described. Thursday January 12, 2006 was identified as an appropriate public meeting date. [Fred Dunnington later arranged to have the gymnasium available for a 7 PM public meeting on that date.]

6. Other Questions/Comments

Fred asked that the current alternatives and options be presented to the Middlebury Selectboard, in particular to address effects on roads: Creek Road (clearance), Halladay Road (all options), US 7, and Lower Foote Street (closing). [Fred later confirmed that the project is on the agenda for Tuesday December 13.]

The timing of the next Advisory Committee meeting was discussed, and it was decided to determine this at a later date, depending on project progress and issues that arise. Dave Wulfson asked that the committee be allowed to comment on the Halladay Road relocation before it is presented to the Middlebury Selectboard.

The project team will contact the Fosters/VNAP to set up a meeting with them regarding impacts to their property, their future plans for their property, design preferences, etc. [This meeting will be held on the afternoon of December 13.]

There was a request for an updated project schedule.

Action Items

The consultants will study four Halladay Road options for the rail spur: an at-grade quiet zone crossing; cutting off and relocating Halladay Road; a railroad bridge over Halladay Road; and a roadway bridge over the rail spur.

For TR-1, the consultants will consider both at-grade and grade-separated crossings at Halladay Road, and a grade-separated crossing at US 7.

A memo will be prepared documenting why RS-3 should no longer be considered.

Options for the Halladay Road relocation will be sent to the Advisory Committee for comment before the options are presented to the Middlebury Selectboard.

An updated project schedule will be distributed to the Advisory Committee.

Attachments:

- Sign-in sheet
- Agenda

CC: Attendees and:
Bob Foster, VNAP
Mark Blucher, Rutland Regional Planning Commission
John Kessler, Vermont Agency of Commerce and Community Development
Keith Arlund, Town of Brandon
William Finger, Town of Middlebury
Adam Lougee, Addison County Regional Planning Commission
Bill McGrath, Rutland Economic Development Corporation
Jim Bush, VTrans
Gil Newbury, VTrans
Greg Riley, VTrans
Susan Schreibman, Rutland Regional Planning Commission
Matthew Sternberg, Rutland Redevelopment Authority
Jack Beasley, Salisbury Selectman
Ken Babbitt, Salisbury Selectman and Conservation Commission
Vicki Chase, McFarland-Johnson
Sandy Levine, CLF
Tom Schmelzenbach, Town of Brandon DPW
Town of Leicester (Attn. Donna)

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Public Scoping Meeting Comment Summary
Middlebury Municipal Building
January 20, 2005

The following summary is not presented in the order that comments were given. Comments that were repeated, or where the gist of the comment was repeated, are stated once and identified with a number to show how many times the comment was repeated. Comments are organized generally by category: Comments specific to Omya, comments about the Salisbury alternatives, comments about the Middlebury alternatives, and other general comments.

Salisbury
- There was no representation from Salisbury or Leicester on the advisory committee.
- Old houses in Salisbury will be impacted by the truck traffic.
- The Salisbury route will have an impact on wildlife.
- Morgan Road in Salisbury is a major amphibian crossing area.
- The proposed route will go by the new Salisbury Elementary school, which is an important community center and will endanger the children who go to the school. (3)
- The intersection near the Salisbury Elementary School is already a difficult intersection.
- The increase in truck traffic will devalue homes.
- Salisbury is a tourist destination spot, and the increase in truck traffic will negatively impact tourism.

Omya
- The purpose of the project seemed to be to allow Omya to increase production.
- Omya is not in compliance with the regulations of the Agency of Natural Resources. (3)
- The quarry is rumored to have only a 20 year life span remaining. (2)
- Omya should spread its production over a longer period of time.
- Omya has a poor environmental record.
- Omya's Act 250 permit was issued to protect the environment and moving the noise, traffic and exhaust to Salisbury will only transfer the problem to Salisbury.
- Allowing Omya to increase its production by providing an alternative will allow Omya to circumvent its Act 250 permit.
- Omya is planning to move its entire operation to Salisbury.
- If Omya is not in full compliance with its ACT 250 permit it should not be allowed to expand.
- Someone from Omya should be at the meeting.
- Why isn't Omya underwriting the project?

Middlebury
- The Middlebury alternative may impact conservation land.
- The Middlebury alternatives are not acceptable (no further details were given).

General Comments
- How and why were these particular alignments chosen?
- Is there an existing problem, or is there an anticipated increase that demands a change in freight transportation.
- How will the alternatives be reduced to 3 or 5 if the impacts of all the alternatives are not yet known?
- One person commented that she was angry with VTrans for allowing the project to move forward.
- The project will impact agriculture in Leicester, as tractors regularly use the proposed route.
- There was inadequate notice for he public meeting; it should have been further in advance, and should have been in more newspapers (the Burlington Free Press, the Salisbury Sentinel, and the Brandon dateline).
- Most of the proposals divert traffic to other routes.
- The rail is hardly used now, because trucks use Rte 7 to carry freight for short distances to local businesses, and these freight movers will not use the railway.

- Increased truck traffic will wear out the roads and make them require more upkeep. (2)
- Mass transit should be promoted.
- If VTrans was concerned about Rte 7, why were funds diverted from (repaving?)?
- The no build alternative should be pursued. (3)
- Who are the users of the rail now?
- How many train cars would pass on the tracks each day?
- Increased train traffic will increase the risks of cars being hit by trains.
- The rail spur is an example of silo thinking, and the regulatory agencies are not working in concert with each other.
- Vermont taxpayers should bot be paying for a rail spur when many Vermonters do not have health insurance.
- Taking the trucks off the road will have a positive impact on global warming.
- A rail spur will not help the traffic on Route 7.
- A rail spur could be built through the swamp in Leicester.
- The truck to rail routes will create work for litigators because of an increase in accidents.
- The consultants should come to the other towns to look at the alternatives and speak with the locals.
- A rail link to the quarry is the only one that makes any sense.
- There is existing rail access in Middlebury.
- There don’t need to be any more alternatives studied.

Middlebury Spur Public Meeting
March 31, 2005
American Legion Post 55, Brandon, Vermont

Summary of Public Comments and Questions

Prepared by McFarland-Johnson, Inc.
April 14, 2005; revised May 20, 2005

The following is a summary of comments and questions made by the public, and of responses by representatives of the Vermont Agency of Transportation (VTrans) and McFarland-Johnson, Inc. (MJ) at the public meeting held on March 31, 2005 to discuss the Middlebury Spur project alternatives. This is not a transcription. This summary was compiled from notes and from a cassette audiotape of the meeting. Questions and comments from the public are in italics. Responses from Jed Merrow (McFarland-Johnson), Sue Scribner (VTrans), and Dennis Benjamin (VTrans) are not italicized.

The meeting opened with a presentation by Jed Merrow (MJ), summarizing the project and the progress made to date. Briefly, the presentation summarized:

- The history of the project and previous studies
- The possibility of federal funding, and therefore the need to comply with NEPA
- EIS process to date
  - Purpose and Need Statement
  - Alternative identification and assessment process
  - Review of current alternatives
  - Alternatives screening process – physical and operational screening, resource screening

Following are the questions asked and answers provided during and after the presentation.

Q. How big are the cuts and fills?

A. For RS-4 and RS-5, the cuts are significant, between 40-50 feet.

Q. For whom are the rail spurs more cost effective?

A. The rail spurs are more cost effective for the likely shippers, principally Omya.

Q. Who would pay for the rail spur?

A. Cost is a separate issue; it may be that Omya pays a surcharge. Cost that is being discussed here is operational cost, not capital cost.

Q. Is the transfer for HB-1 in a currently industrial zoned area?

A. Yes

Q. Is the route anywhere near VELCO's transmission line?

A. No, it is west of VELCO's line.

Q. Is HB-1 less efficient than other alternatives because material has to go north?

A. In general, the further the material is trucked, the less efficient the alternative would be.

Q. In your consideration of alternatives, is one of your top priorities whether it will cost Omya more?

A. We have to look at whether the alternatives can be cost effective to the likely users.

Q. Will you be looking at the cost of my house and how a rail spur behind it will change the value?

(There was a brief discussion of right of way process and property acquisition.)

Q. Wouldn't the whole area go downhill with a rail spur?

A. The potential devaluation of properties is open to debate, as the rail spurs would create less noise than trucking alternatives.

Q. This is about Omya and what is best for Omya – resent the fact that alternatives that the community wants have been ruled out. Concerned about when construction starts and the effects of drilling, blasting, etc.

A. Omya is part of the need – another part is Brandon Village, impacts to US 7, and existing local roads.

Q. HB-1 – how does it reduce truck traffic?

A. Explanation that there is a truck to rail transload facility at the end of the bypass.

Q. Why isn't Middlebury getting trucks taken out of their village? What about the increased efficiency of the Omya plant, if they are allowed to increase their production? Is this increased efficiency being accounted for anywhere?

A. The purpose of this project was not to remove trucks from Middlebury Village. The need being considered was removing trucks from Brandon Village. Some alternatives are being considered for their ancillary benefits. We don't have the information about changes to the efficiency at Omya's plant.

Q. What percentage of the project will be borne by Omya, what percentage by federal highway, and what percentage by Vermont taxpayers?

A. No definite payment scenarios have been established. At this point it is premature to discuss cost structures.

Q. What is significance of RS-1 going through land trust land?

A. Discussion later when we discuss resources.

Q. HB-5 and HB-3, are they considered a non-priority?

A. HB-3 is under consideration, HB-5 is beyond the scope of this project.

Q. Where does HB-3 come out on US 7?

A. Approximately 1,500 feet south of Lover's Lane.

Q. Going through cemetery?

Q. For TR-2 the transload location is not zoned industrial – how could a transload be located there?

A. Explanation of right of way procedures; zoning would be considered.

Q. Would the project be subject to Act 250?

A. Yes

Q. Have some options been dropped? TR-5, TR-6?

A. All of the truck to rail have cost effectiveness problems, however, Federal Highway does not want to limit project to one transportation mode.

Q. Does HB-3 go through the cemetery?

A. Alignment came from US 7 improvement plan.

Q. Why 100 feet wide?

A. This width was recommended by the engineers as a general guideline. As we refine the alternatives we will have a better understanding of what the actual widths would be.

Q. Why is the impact area only 100 feet, particularly for cut areas under US 7?

A. Previous studies included qualitative impact assessments for each alignment. For this study, the number of residences within 100 feet was quantified in an attempt to represent potential air, noise, vibration, and aesthetic impacts.

Q. Concerned about structural damage to homes, to foundations and to wells, about radon gas. Does empathize with Brandon, but thinks Middlebury is just as bad. Doesn't think that the project is in the public interest.

A. Screening level review at this point – impacts will be studied in greater detail.

Further discussion of right of way and eminent domain process used by the Agency of Transportation. Impacts are compensated for – all the issues mentioned are "compensable" issues. The public good is for the travelling public using public infrastructure. There is a court process required to obtain a piece of property.

Q. Does eminent domain follow the 100' – 500' rule?

A. Before we get to that point we would have designed an alternative, we would have a much higher level of detail.

Should an improvement be built, Omya would likely benefit. VTrans became involved because Omya is a large mover of freight, so it is an opportunity to move a significant portion of the freight traffic off the roads.

We will have a variety of specialists involved when we have a narrower range of alternatives – trying now to screen out alternatives that don't make sense.

(Comment) Studies do not take into account neighborhood character – a rail spur would affect the whole area.

(Comment) Shouldn't consider potential development with the same weight you would consider an established neighborhood.

(Comment) We are kowtowing to a company that has big businesses all over the world. If Vermonters were polled, which would they choose, living in a pure environment over getting a few more tax dollars?

Q. Can subsequent meetings take place in Middlebury?

A. Recommendation from Advisory Committee was to spread meetings out to different towns. The next meeting will probably be in Middlebury.

(Comment) Most of the concerns focus on future impacts – Brandon is currently being impacted by trucks going through the village center. Brandon does not have a college that supports its economy. There are tremendous advantages to getting truck traffic off of US 7.

(Comment) People have invested money for their homes. We couldn't get a building permit until adjacent farmland was put into conservation. Why isn't study working in concert with US 7 upgrade? Make US 7 into four lanes, build two bypasses around Brandon and Middlebury, instead of building something that will benefit one company.

Comments on RS-1 – huge impact on wetlands, US 7 will continue to have an increase in truck traffic – some traffic will be eliminated now but truck traffic will still increase. A bypass would solve the problem – a rail link would solve it for a limited amount of time. People on Halladay Road don't want the quarry to be expanded. Property values and quality of life would be devastated. Residents of Middlebury pay very high tax rates for the privilege of living there. Over the years railroads have seen a decrease in their business – infrastructure will need substantial improvements, which will be expensive. Solution should be more forward looking, with the goal of improving the whole Route 7 corridor.

(Comment) Matt Sternberg has said that the rail spur is just a part of the puzzle, that the feds need other projects to justify the Rutland Rail switching yard. Extra federal dollars from the rail spur would be used for the Rutland rail yard. This is part of a much bigger state plan to develop rail traffic on the western side of the state.

Q. Has anyone done a cost benefit analysis of Omya's contribution vs. Omya's cost to the state?

A. Don't know if such a study has been done, however, there is a transportation gateway project, it is part of federal legislation to support these types of projects. Mr. Sternberg sees the railyard, the Middlebury Rail spur, and perhaps other components packaged together as one larger project. Our project is based on the purpose and need that we have presented. VTrans representatives at the meeting did not have knowledge of discussions about using funds from the rail spur for the Rutland rail yard.

Q. Are bypasses sanctioned by the state of Vermont?

A. Not aware of what the governor's position is – we are in a twenty-year time frame for getting bypasses built. Also, the longer bypasses (HB-4 and HB-5) are several orders of magnitude more expensive.

Q. Is there a transload for RS-1?

A. Explanation of where transloads would be.

Q. What is Natural Heritage and what is VCGI?

A. Explanation of the Natural Heritage Program and the Vermont Center for Geographic Information, brief discussion of Indiana bats, that they may be near RS-2 and TR-2.

Q. Passenger traffic?   Are improvements to rail being made in preparation for passenger rail?

(Comment) Matt Sternberg says there will be a spillover into improvements in passenger service.

A. VTrans was studying extending Champlain Flyer service from Charlotte to Middlebury when the Burlington-Charlotte service was dropped.

Middlebury Spur Public Meeting
January 12, 2006
Middlebury Town Offices, Vermont

Summary of Public Comments and Questions

Prepared by McFarland-Johnson, Inc.

The following is a summary of comments and questions made by the public, and of responses by representatives of the Vermont Agency of Transportation (VTrans), McFarland-Johnson, Inc. (MJ), and MJ's subconsultant TranSystems at the public meeting held on January 12, 2006 to discuss the reasonable range of alternatives. This is not a transcription. This summary was compiled from notes and from a videotape of the meeting. Questions and comments from the public are in italics. Responses from Jed Merrow (McFarland-Johnson), Gene McCarthy (McFarland-Johnson), Gary Bua (TranSystems) Sue Scribner (VTrans), Charlie Miller (VTrans) and Dennis Benjamin (VTrans) are not italicized. Comments from Erik Bohn of Omya and Fred Dunnington, Middlebury Town Manager, are identified.

The meeting opened with a presentation by Jed Merrow (MJ), summarizing the project and the progress made to date. Briefly, the presentation summarized:

- The history of the project and previous studies
- The possibility of federal funding, and therefore the need to comply with NEPA
- The EIS process to date
    - Alternative identification and assessment process
    - Elimination of alternatives, including RS-3
    - Review of reasonable range of alternatives
    - Review of road crossings and details of different options

Following are the questions asked and answers provided during and after the presentation.

Q. Will I be able to access my field on the north side of the railroad (for RS-1) or road (for TR-1)? (Question was asked by Mark Perrin, who owns land through which RS-1 would cross.)

A. Access for RS-1 has been discussed and it would be accommodated. For TR-1 it has not yet been discussed.

Q. Are the engineers aware that there is a pump station in the alignment on Halladay Road?

A. Yes, we are aware and it will have to be accommodated.

Q. For the TR-1 option, would local truck traffic other than Omya increase on Halladay Road?

A. If the TR-1 road were grade separated, local trucks (non-Omya trucks) would have to access the road via Lower Foote Street, and would not be using Halladay Road.

Q. Would the bridges be owned by the state?

A. It depends – on Route 7, the road bridge over the railroad would be owned and maintained by the state. On Lower Foote Street, if there were a bridge, it would be owned by the town. On Halladay Road, the bridge would be owned by the railroad.

Q. What is the length and type of bridge over Otter Creek?

A. The clearance would be 14.5', and the trestle would have 30-40' spaces between each span.

Q. Would farm equipment and horses be able to pass under the trestle? The floodplain on the west side of Otter Creek is hay land.

A. Providing a crossing would be important. The clearance needed for access to hay land would need to be considered.

Q. How high is the trestle?

A. The clearance is about 14', the track part of the trestle is 5' thick, and the total height is about 19'. It should be possible to accommodate a farm crossing.

Q. Maybe the rail should accommodate the residents instead of people having to accommodate the rail line.

A. If there is a need for crossings, it would be helpful to know now. The purpose of the public meeting is to learn about all the effects and implications of the proposed project.

Q. Who will own the rail spur?

A. The State of Vermont will own the rail spur, and it will be leased by Vermont Railway.

Q. Does this mean that the state is paying for it?

A. The plan right now is for the spur to be a public-private partnership with federal money, not state money.

Q. Is there any estimate of the cost involved?

A. Not yet, but we will be preparing cost estimates for the Draft EIS.

Q. If everything were to go smoothly, when would the spur be built?

A. The EIS process concludes with a Record of Decision identifying the preferred alternative. This is just the environmental stage, following which is the final design stage, right of way, etc. It could be several years before the rail spur is constructed.

Q. Who would be contacting the landowners?

A. VTrans would be making those contacts.

Q. When would those contacts be made?

A. After the EIS is completed the contacts would be made. The EIS process only provides the alignment. It is only conceptual at this point.

Comment (Fred Dunnington, Middlebury Town Manager) - I? recently met with the residents of Halladay Road about the relocation of Halladay Road. Both the Hathaways and the Taylors, the closest residents, liked the option of relocating Halladay Road. The Selectboard doesn't want to have to maintain any more bridges, and are in favor of the most direct route to Route 7. They prefer a direct connection to Cady Road.

Q. With Halladay Road being re-routed, will there be a change in emergency response time for residents of lower Halladay Road?

A. (Fred Dunnington) Good point, that had not been considered, it could be slightly longer.

Q. I own a right of way through my farm fields and need access to Middle Road.

A. The intent is to provide farm crossings where needed.

Q. Is the environmental impact to Halladay Road being considered? What about impacts to air quality, etc.

A. Yes, they will be studied. No alternatives are set in stone – they are all worthy of study, and there is a list of resources to be studied. Findings of those studies will be published as a draft EIS, following which will be a public hearing. The final EIS will consider all the information gleaned at the public hearing.

(Fred Dunnington) The no action alternative will also be compared with TR-1 and RS-1 for air pollution.

Q. How many train trips per day would there be? It seems the train would create less pollution than the truck traffic.

A. The plan now is to have two train trips per day, with twenty train cars per trip. Omya is currently permitted to run 115 trucks per day.

Q. Would Omya guarantee that they would no longer run trucks?

A. (VTrans) They would have to have the option to be able to run trucks

Q. How much does a train carry compared with a tractor trailer truck?

A. Fewer than 40 trains? would carry what they now ship.

Q. Would using trains allow production at Omya to increase?

A. Yes. Two trains per day with 20 cars per train? represents an increase in production.

Q. Why would they need trucks in addition to the rail?

A. They have always indicated that they wanted rail, and that they would use it if they had it.

Q. For the purposes of the EIS, wouldn't the trucks have to be eliminated?

A. There is also the ACT 250 Permit which could affect the number of trucks and railroad cars.

Q. Is the dust, noise, and light pollution at the transload facility for TR-1 being considered? What about the jobs that would be lost or gained?

A. Yes, these factors are being considered.

Q. What about the transportation cost of not building the spur? What about the wear and tear on Route 7 from the truck traffic?

A. Yes, these are being considered.

Q. What about the noise, air, visual pollution of the transload facility? Are they being considered?

A. Yes, noise, air and visual pollution will all be considered. Our subconsultants will create visuals to show what the alignments will look like on the landscape.

Q. Who asked for the project?

A. The legislature was responding to concerns from Vermont Railway, the Town of Brandon, and Omya. The extra capacity on the rail line has been recognized for some time.

Q. Who was the legislature responding to?

A. The idea is more than 20 years old; it is not known who asked for it originally, but certainly Vermont Railway had input, and Omya, being the primary shipper. There was also a Memorandum of Understanding in 1998 with Omya and the Conservation Law Foundation that supported a Middlebury Rail Spur.

Q. How will the funding work?

A. The plan is to have a public-private partnership between the shipper (Omya), Vermont Railway, and the federal government.

Q. *How many partners will there be?*

A. The public that uses Route 7 will benefit from the rail spur.

Q. Could any trucker that currently uses Route 7 use the rail spur? What about traffic heading north?

A. Yes, traffic heading north could also use the spur.

(Fred Dunnington) Omya is the primary beneficiary, but other shippers will have access to the transload facility. Discussions with other shippers are ongoing.

This portion of the project is an independent effort undertaken by VTrans, and is not yet a public-private partnership. This stage of the project is being funded by the State of Vermont, with [non-financial] input from Omya, Vermont Railway, and others.

Q. Where will the funding come from?

A. The recent federal transportation bill earmarked money for the rail spur – which could be used for final design. It cannot be used for the EIS.

Q. What is the total vehicular traffic on Route 7? What is the percentage of traffic that will be removed?

A. There are approximately 11,000 vehicles per day on Route 7 – and approximately 230 trucks per day. The traffic volume in Brandon is lower, with a higher percentage of trucks. Omya's trucks are heavier trucks.

Q. What is the weight of an 18-wheeler compared to one of Omya's trucks? If there is an available transload facility, will it increase truck traffic on Route 7 on its way to the transload?

A. We do not have information on the weight of an 18-wheeler right now. There is not anticipated to be a substantial increase in other shippers.

Q. What is the zoning for the alternatives? Will there be an industrial zone?

A. (Fred Dunnington) It's a road – roads are not required to comply with zoning requirements.

Q. What about the transload facility?

A. It would be in the same category as Omya.

Q. Why the uneasiness on the part of Omya to provide a guarantee that they would not use trucks on Route 7? It should be more than a belief that they would no longer use trucks – it should be clear.

A. There are never any guarantees with transportation facilities that they will be used. The quarry has enough material to mine for 75-100 years.

(Erik Bohn, Omya) Omya has committed that if the spur is built that they will use it. Truck shipments could still be necessary if the rail line is out of commission. The commitment has been in place since the MOU was signed. Omya has committed to funding the rail line, in part.

Q. No one is questioning whether the rail line would be used – why not be willing to sign something that they would commit to not using trucks in addition?

A. (Erik Bohn) It would make no sense to use both trucks and rail.

Q. Does the railroad need to be improved to accommodate the Omya shipments? Would it have to be upgraded to accommodate the double stacked cars?

A. The Omya shipments would have a minimal impact – the cars would not have to be double stacked. The railroad is currently an underutilized resource. The rail line is on a schedule of upgrades and maintenance.

Q. How does the project tie in with the Rutland Railyard relocation?

A. It is a separate project.

Q. The state should not be preparing an EIS without a guarantee that the rail would be used exclusively. Economic factors could change – the economic argument is not a valid argument. Omya is the exclusive user of the rail spur, and the spur is being built at the expense of the area. It seems odd to have to drive to the middle of an agricultural field to access a transload facility. When we get to an appropriate point, will Omya give us a guarantee?

A. (Erik Bohn) Omya has committed to using the rail exclusively. The issue of a guarantee will be brought to the president of Omya.

Q. Will there be heavier loads on the rail line than what is currently seen?

A. The loads on the rail line will still be below its capacity.

Q. Have the wetlands been mapped?

A. MJ has completed on the ground wetland surveys. They have been evaluated in the field, and the entire study area has been walked. The water resource maps show the limits of wetlands as they were mapped. These are approximate, and this is not a formal wetland delineation.

Q. Is a comprehensive wetland survey going to be done?

A. The Water Resource Map shows the lines that will be used to calculate resource impacts. After a preferred alternative is selected, when application is made to resource agencies for wetland impacts, a surveyed wetland delineation will be completed.

Q. Is that the same as a comprehensive wetland survey?

A. For permitting purposes, a delineation typically wouldn't include the entire perimeter of a wetland – just the area to be impacted.

Q. Will there be design features to lessen the impacts of the rail spur?

A. Yes, with all permitted wetland impacts, impacts must be avoided, minimized, and mitigated.

Q. The project proposes 2000 feet of trestle. Does anything like this exist anywhere else in Vermont?

A. Yes, there is a long trestle in Colchester Vermont. It is wooden and is an older design.

Q. If there are significant design changes during the process, what happens to the EIS?

A. If there were substantial changes you would have to modify the EIS before the Record of Decision were issued. During the EIS process it is typical to have design changes come and go – for example, there are several Halladay Road options that are being considered. If it were an entirely new alignment, it would be necessary to start from scratch comparing resource impacts.

Comment - Omya is responsible for 20 % of the truck traffic through Brandon, and the trucks have a large impact on Brandon Village. As a Brandon resident the efforts to see if a rail spur is a viable option is appreciated.

Q. Have wildlife corridors been considered?

A. Yes, they need to be addressed.

Q. Why is the rail line being considered for this location? Why not in Salisbury or Leceister? It seems that the rail spur is convenient for Omya, not for Vermonters. It is unfair, not right.

A. Other alternatives have been considered, and they would go through neighborhoods, too. Southern routes were considered, and were found to have inherent inefficiencies that made them not viable.

Comment – Omya is an outsider, foreign owned, and they shouldn't be displacing Vermonters.

A. (Fred Dunnington) The Middlebury Town Plan has recognized the rail spur. The houses closest to the rail spur are further than the houses in Green Mountain Place are from the railroad.

Q. Why was the plant built in Florence?

A. It wasn't known or anticipated at that time that there would be a greater need to ship material.

At the time the plant was built there were other sources of material – but now the Middlebury quarry is the primary source of material.

Comment - State dollars are being spent to investigate a rail spur for one company that is dependent on trucking. Transportation is being improved for Omya, and it is occurring because of their decision to build a plant in Florence.

Q. Will the cultural and human impacts be considered?

A. Yes.

Q. What about property values and aesthetic effects on property?

A. The direct impacts to property that will be affected will be considered, and the aesthetic effects to those that live nearby.

Comment - What about having tractor trailers on Halladay Road? Increased truck traffic may affect property values.

Q. What about the transition of the rail line onto the main line? Will it disturb Eddy Farm? Has there been a study of the potential for accidents on the rail line? What are reasonable assumptions about the potential for accidents?

A. The railroad has turnouts and switches all along the right of way – Vermont Railway operates under FRA regulations and guidelines.

Q. Is the proposed project exempt from the regulatory process? Act 250?

A. Our understanding is that the project would require an Act 250 permit. Vermont Railway is exempt from certain parts of Act 250, but life, health, and safety issues would still be addressed. Vermont Railway does have the right of eminent domain.

Q. Would the railroad be exempt from mitigation?

A. If it is a state project, it would not be exempt.

Q. How wide is the railroad right of way?

A. 66' for most of the corridor

Q. What would the ROW of the rail spur be?

A. It would vary with topography. The ROW would be much wider than 66' in some places.

Q. Is there anything guaranteeing the relationship with one corporation? What about the financial security of Omya?

A. The reason that Federal Highway and VTrans are the lead agencies is that they will provide infrastructure improvements. It is impossible to guess about the vagaries of the economy in the future.

Q. There is projected growth in the next 20 years, but what if the opposite were to happen? What if Omya folds and goes away? Are there provisions for an abandoned rail spur?

A. Our assumption would have to be that events would continue in their current direction. No one can say for sure what will happen in the future.

This meeting is part of an evaluation process – weight is given to what is said at meetings. Other alternatives that were considered did not make sense for many reasons.

Q. Could the project be combined to help Middlebury? What about fixing the [downtown] railroad bridges?

A. There has not been any money set aside for these projects right now. They are independent projects with different funding sources.

Q. There is a clear financial benefit to Omya – what are the dollar values of the financial benefits to others?

A. It would be impossible to quantify the benefits at this point.

The meeting was adjourned at approximately 9:30 pm.

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Note: The Middlebury Spur Draft Environmental Impact Statement public hearing was held on June 7, 2007. Public comments from the public hearing are reproduced in Appendix I. The full transcript of the hearing is available upon request.

Archaeological Resources Assessment for the Middlebury ST SPUR(2) - Environmental Impact Statement, Addison County, Vermont

Submitted to:

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Report No. 439

March 19, 2007

Revised Archaeological Resources Assessment for the Middlebury ST SPUR(2) - Environmental Impact Statement, Addison County, Vermont

Project Description

The Vermont Agency of Transportation (VTrans) proposes to develop an alternative route for the transport of calcium carbonate by Omya, Inc., from their quarry in Middlebury, Vermont to their processing plant in Florence, Vermont (Figure 1). This ARA (Archaeological Resources Assessment) inspected the alignments of two proposed Rail Spurs (RS-1 & RS-3) and one proposed Truck to Rail alternative (TR-1) covering an Area of Potential Effect (APE) of approximately 1,063 acres between the Omya rock quarry and the existing mainline railroad line along the west side of Otter Creek, Middlebury, Vermont (see Figure 2).

Note: This document was prepared prior to the elimination of RS-3 from the reasonable range of alternatives. Therefore, potential impacts to the RS-3 study area are included.

The proposed TR-1, RS-1, and RS-3 alignments are new build alternatives that trend west-east in a large U-shape (see Figure 2). RS-3 separates from TR-1 and RS-1 at a point that is located within a low-lying valley, immediately north of a large swamp/wetland, near known prehistoric Native American site VT-AD-245 (see Figure 1). The elements of these alignments will cross numerous drainages and elevated terraces that represent the remnants of Paleo-channels which drained into the Otter Creek channel. These Paleo-channels date to the period immediately after the retreat of the glaciers (ca. 10,000 B.C.), a period that saw the earliest human habitation of Vermont.

This study is part of the Middlebury ST SPUR(2) – Environmental Impact Statement (EIS), which identifies and evaluates the environmental effects of a reasonable range of alternatives for transporting large amounts of industrial materials between Middlebury, Vermont, and the hamlet of Florence in Pittsford, Vermont. Given the federal jurisdiction over the project, assessment of the project's potential impacts to cultural resources is required to comply with various provisions of the National Environmental Protection Act (NEPA) and Section 106 of the National Historic Preservation Act (NHPA) as amended.

Study Goal

The goal of an ARA is to identify portions of a specific project's APE that have the potential for containing precontact and/or historic archaeological sites. An ARA is accomplished through a "background search" and a "field inspection" of the project area. For this study, reference materials were reviewed following established guidelines. Resources examined included the National Register of Historic Places (NR) files; the Historic Sites and

Structures Survey; and the USGS master archaeological maps that accompany the Vermont Archaeological Inventory. Relevant town histories and nineteenth-century maps also were consulted. Based on the background research, general contexts were derived for precontact and historic resources in the vicinity of the study area.

Prehistoric Archaeological Site Potential

A review of the state's Vermont Archaeological Inventory (VAI) files indicate that there are four known sites located within the proposed project's APE (two within the RS-3 APE and two within the RS-1/TR-1 APE) and 10 located within 500 m (1,640 feet) of the APE limits (four within 500 m of RS-3, six within 500 m of RS-1/TR-1) (see Figure 1). Site VT-AD-245 was identified from the surface recovery of a triangular, rhyolite projectile point and three lithic flakes from an area 10 ft in diameter during a Phase I study for a proposed alignment of the Middlebury Bypass (Thomas and Robinson 1980). The style of projectile point is similar to Levanna style projectile points which were used by Native Americans during the Middle to Late Woodland periods (ca. 100 B.C. – A.D.1600). The location of site VT-AD-245 is approximately 50 m (164 ft) north of the centerline of the proposed Rail Spur (RS-1), 460 m (1,500 feet) west of Halladay Road, and just south of Middle Road (see Figures 1 & 2). The area is characterized by a series of low level floodplains along several small, north-south trending streams. It appears that site VT-AD-245 was identified in a fallow hay field that had not recently been plowed. No subsurface test pits were excavated at site VT-AD-245 and therefore the limits of this site were never determined. It is likely that with systematic test pitting across this field many more artifacts will be recovered and the site limits will be determined. It is very likely that portions of this site would be disturbed by the proposed TR-1 or RS-1 alignments.

Site VT-AD-465 was identified from lithic debitage and tools recovered from the surface of a plowed field located along the southern boundary of the proposed project's APE during the Phase I study for the Champlain Pipeline (Robinson et al., 1992). The site is located 600 m (1970 ft) northeast of VT Route 7 and 370 m (1,200 ft) east of Lower Foote Street. It is also 2.1 km (1.3 miles) north of the Middlebury River within a field that borders a small north-south trending tributary of Beaver Brook. In addition to over 50 pieces of debitage, three lithic tools could be dated to the Middle and Late Woodland periods (ca. 100 B.C. – A.D.1600). Approximately 250 m (820 ft) to the southeast another precontact Native American site, VT-AD-468 was located in a field bordering this same tributary. Much of this same tributary, and others, of Beaver Brook cut through the eastern portion of the proposed project's APE, just south of the Omya quarry. As a result it is likely that this portion of the proposed project will disturb areas sensitive for precontact Native American sites.

Finally, sites VT-AD-1361 and 1362 were identified from lithic artifacts recovered from the surface of a plowed field immediately west of Middle Road, east of east of Creek Road, and north of a small tributary of Otter Creek, along the centerline of the proposed RS-3 alignment

(Mandel & Crock 2006). Since the time when these two sites were initially studied and found not to be significant, and therefore ineligible for listing on the National and State Registers of Historic Places, the area has been severely disturbed due to the construction of a residential community, the Middlebury South Village. Nonetheless, the small drainage that these two sites were associated with continues to the southeast, cutting through a large portion of the proposed project's APE before entering Otter Creek. As a result, it is likely that additional precontact period sites will be located along this small drainage and would be disturbed by the RS-3 alignment.

In addition to these two precontact period Native American sites, 10 more are known from just beyond the limits of the proposed project's APE. Sites VT-AD-243, 244, 246, and 247 are located just beyond the southwest corner of the proposed project area, south of where RS-1 meets the main line (see Figures 1 & 2). These sites were located within the modern, active floodplain of Otter Creek. This topographic location is identical to areas just upstream that will be disturbed by the end point of RS-3 and the end point of RS-1. As a result, it is possible that additional sites exist within these floodplain environments of the Otter Creek that would be disturbed by the proposed project.

Historic Archaeological Site Potential

No historic period resources are located within the APE of any of the proposed alignments. An overlay of the proposed project corridor over the historic 1871 Beers' map (Figure 3) and the historic 1905 USGS map (Figure 4) indicate that only two historic period farmsteads lie within the proposed corridor. South of the modern Omya plant, the proposed RS-1 alignment cuts through what once was the L.P. Boardman farmstead. This historic period farmstead has been disturbed since its 19th century occupation, and is currently the location of the Vermont Natural Agricultural Products facility, which has disturbed the ground through leveling, the construction of warehouse structures, and the processing of manure.

Along the proposed alignments, near the location of the proposed TR-1 transload facility, a farmstead attributed to J. W. Morse will be bisected (see Figure 3). Currently a wooden shack exists in the general vicinity of the Morse farmstead, but this wooden shack is unlikely to be related to the historic Morse Farmstead. No historic documents revealed a connection between the Morse farmstead and the shack. In addition, construction elements of the shack, such as a concrete chimney suggest a more recent date of construction. Finally, aerial photographs of this area from 1962 indicate that the construction of what appears to be a private air strip oriented north-south, and other leveling and filling activities have disturbed this portion of the farmstead (Figure 5).

As a result, significant historic archaeological deposits are not expected within the propose project's APE.

Field Inspection

A field inspection of the proposed project's APE was undertaken on December 6 and 7, 2005 by Dr. Charles Knight, Assistant Director of the UVM CAP. The overall project area received a combined sensitivity score of 64 based on the variables in the "Environmental Predictive Model for Locating Precontact Archaeological Sites," since portions of the APE are located on various alluvial terraces, within 90 m (295 ft) of the Otter Creek and various permanent streams, brooks, and creeks, as well as within 90 m (295 ft) of wetlands, and/or within 90 m (295 ft) of the confluence of several intermittent streams. In addition, the overall project area is located within an area of relatively high density precontact Native American occupation.

Numerous areas were identified as sensitive for prehistoric Native American sites due to its large size and varied topography (Figure 6). These sensitive areas are either associated with recent and ancient terraces of Otter Creek, as in the west along the proposed RS-1/TR-1 alignments and the TR-1 Transload Facility, or terraces associated with several tributaries of Otter Creek, as along the proposed RS-1/TR-1 alignment and the RS-1 or RS-3 Transload Facility (see Figure 5). The final alignment selected for the proposed project will impact only a narrow corridor within the greater APE. As a result, it will be more productive to describe in detail the pertinent archaeologically sensitive areas after the final alignment has been selected. For the time being, however, many of the larger sensitive areas are located in actively plowed fields, such as those along the floodplains and lower terraces of the Otter Creek. As a result of being actively plowed, surface survey is possible in those fields. In most of the other sensitive areas, however, fields are in pasture, hay, or in areas that may never have been plowed. As a result, subsurface testing will be required in those areas. In the case of the lower floodplains of Otter Creek, backhoe trenching will be necessary to determine the history of soil deposition along the floodplain and to identify possible buried cultural occupations.

Conclusions and Recommendations

The UVM Consulting Archaeology Program carried out an ARA for the proposed Middlebury ST SPUR(2) rail alignment project in Middlebury, Addison County, Vermont. The Vermont Agency of Transportation (VTrans) proposes to develop alternative means for the transportation of calcium carbonate, and possibly other materials in the Middlebury, Vermont area. The portion of the proposed project under study here was limited to locations of the build alternatives in the Town of Middlebury, Vermont.

A field inspection, combined with historic background research, identified numerous areas sensitive for precontact Native American sites within the proposed project's APE. These sensitive areas range in size from small, discrete level areas approximately 20 x 20 m (65 x 65 ft), to much larger areas occupying large, level terraces of Otter Creek. The largest of the archaeologically sensitive areas corresponds to modern corn cultivation, and therefore could be surface surveyed in the future. The smaller, discrete terraces and promontories were, more often than not, either cultivated in hay or have never been plowed. In these areas subsurface testing will be required to test for the presence or absence of prehistoric Native American sites.

Background research indicates that no intact historic period cultural resources will be disturbed by the proposed project. The only two historic farmsteads that will be impacted by the proposed project had already been disturbed by various development activities throughout the Twentieth Century.

In sum, a Phase I site identification study, utilizing subsurface or surface testing, is recommended for all sensitive areas that cannot be avoided to determine the presence/absence of Native American archaeological sites. However, it is recognized that a final alignment will be selected, and that the proposed APE of that alignment will be considerably narrowed in scope. Nonetheless, all archaeologically sensitive areas within the final alignment will require a Phase I site identification survey, unless those sensitive areas can be avoided.

Charles Knight, Ph.D.
Assistant Director

February 22, 2006

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1905 NW/4 Middlebury 15” quadrangle. United States Geological Survey, Washington D.C.

1983 Middlebury 7.5” quadrangle. United States Geological Survey, Washington D.C.

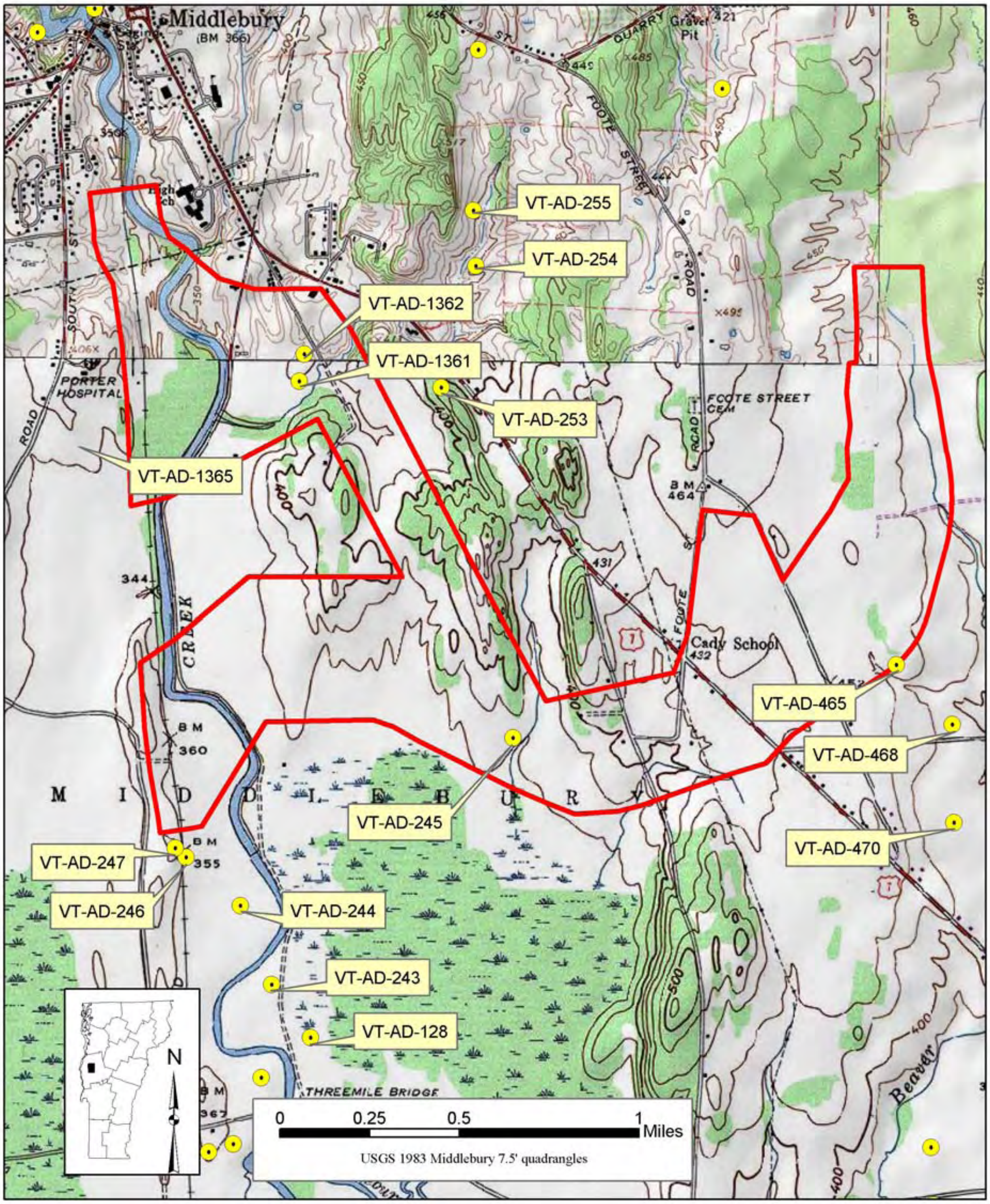


Figure 1. Map showing the location of the proposed Middlebury ST SPUR(2) Study Area, Middlebury, Addison County, Vermont.

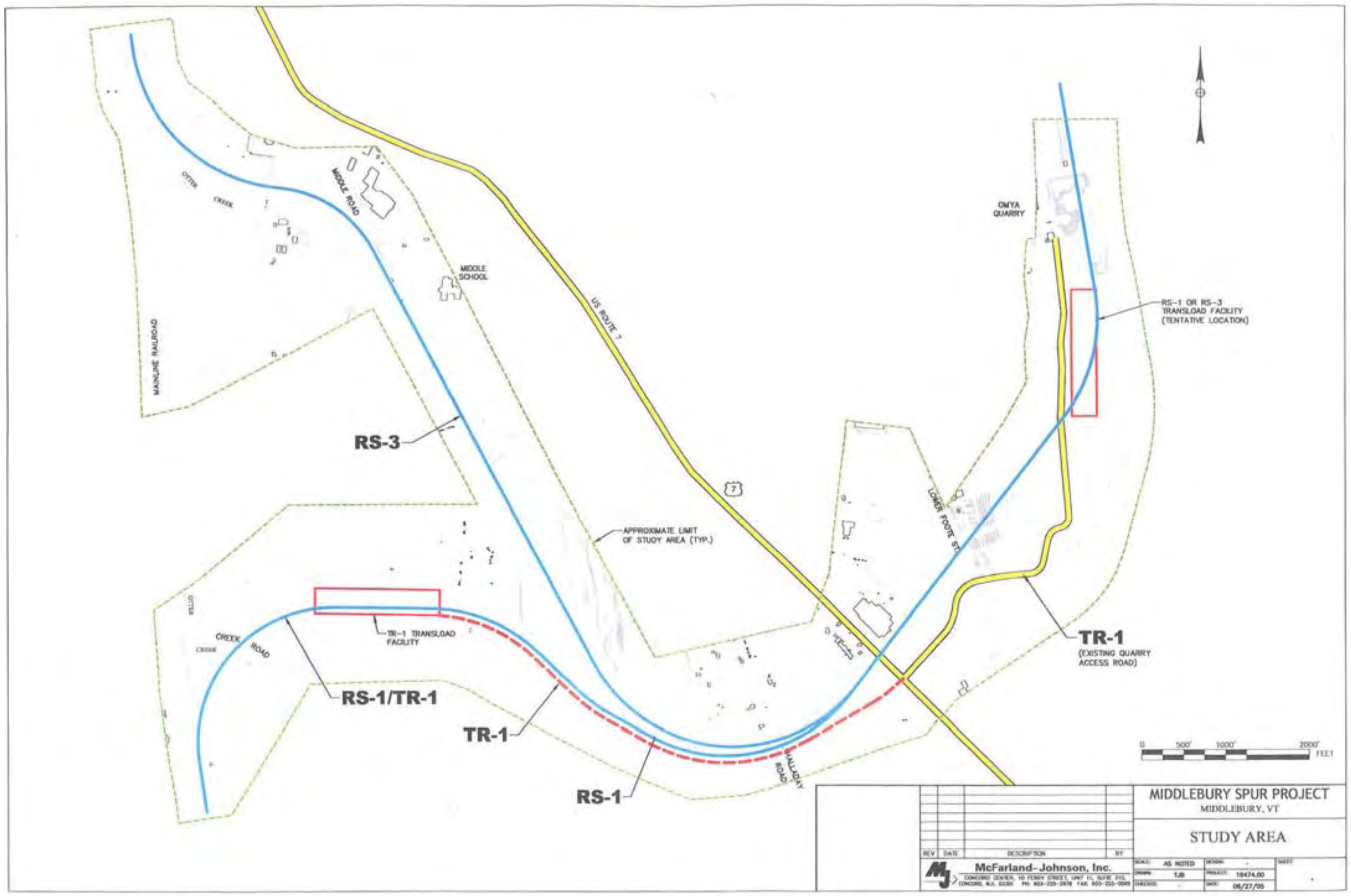
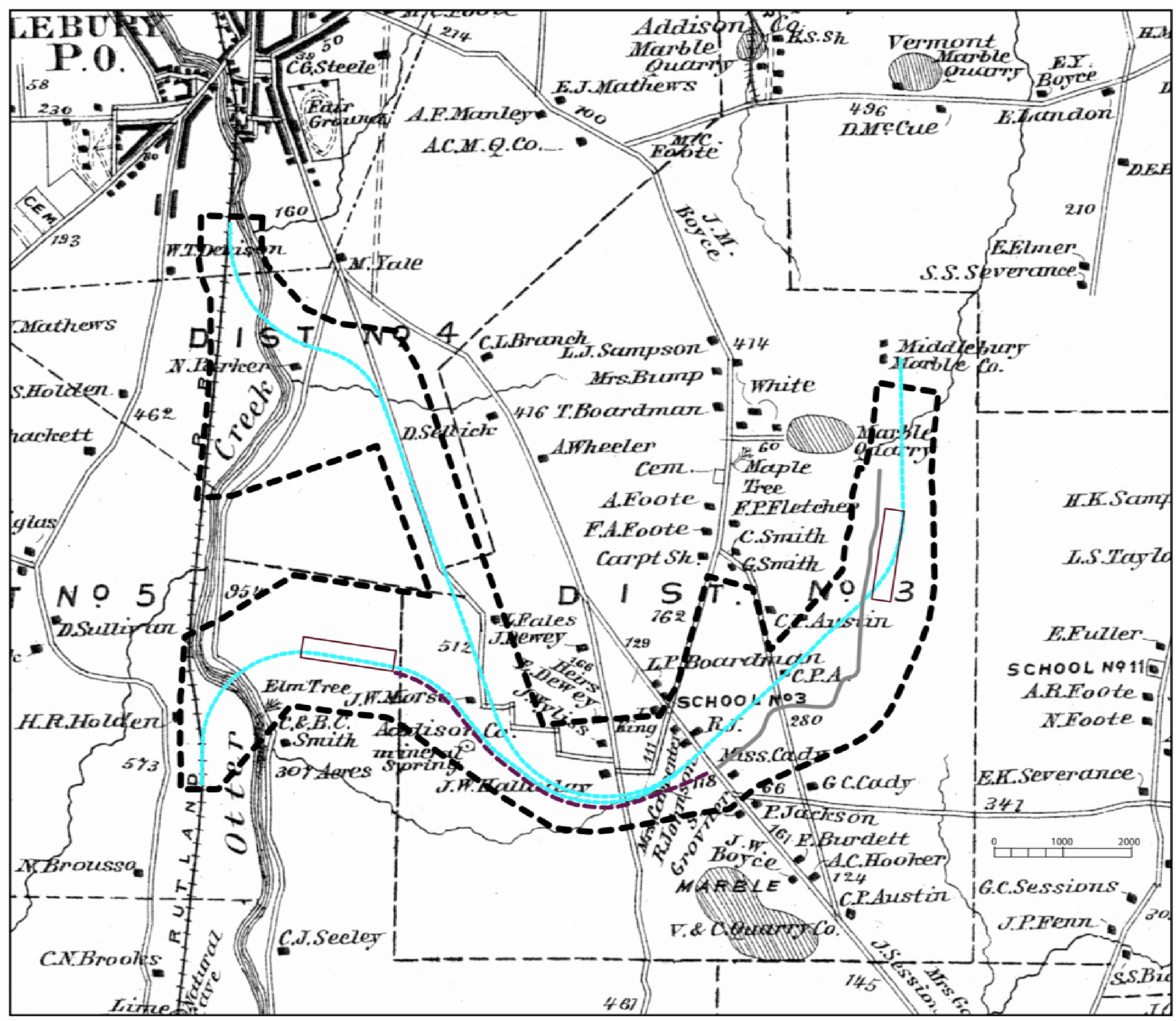
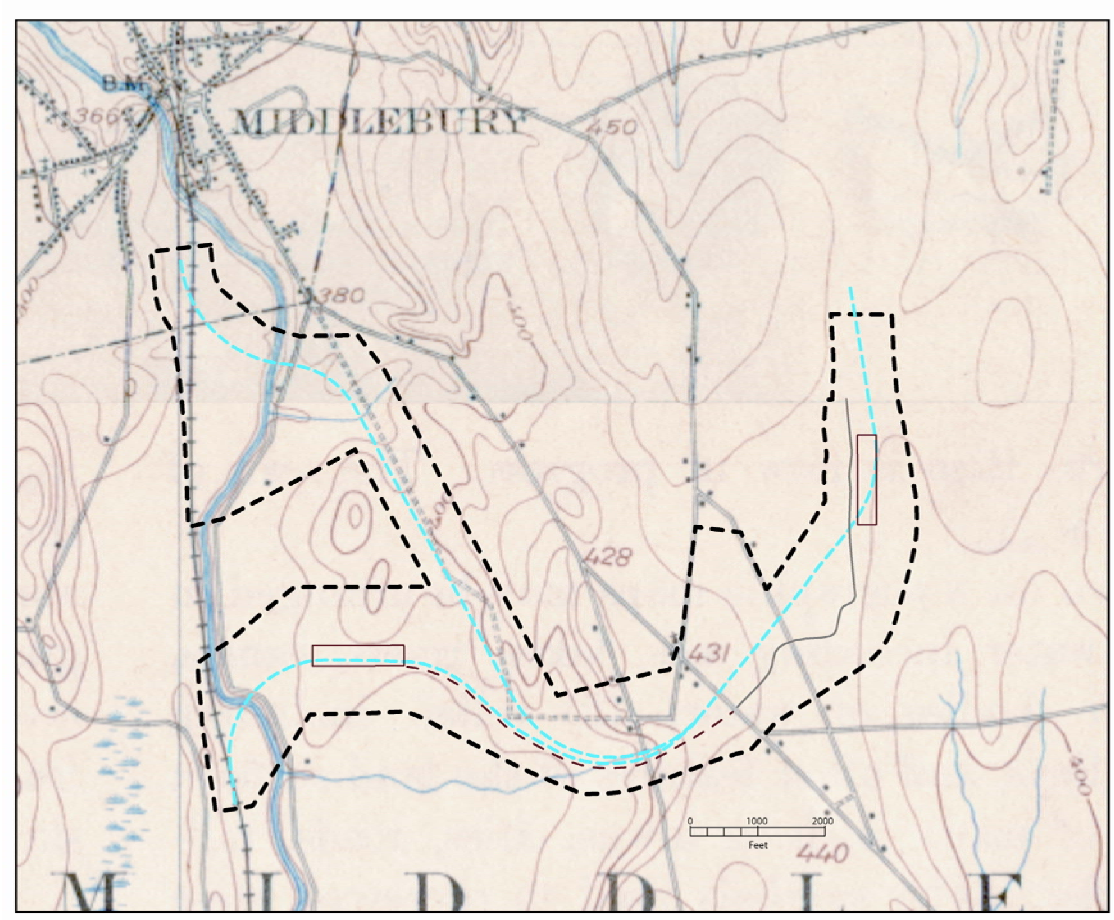


Figure 2. Map showing the locations of the proposed Middlebury ST SPUR(2) Rail Alignments, Middlebury, Addison County, Vermont.



Beers 1871

Figure 3. Historic 1871 map showing the location of the proposed Middlebury ST SPUR(2) Rail Alignment, Middlebury, Addison County, Vermont.



USGS 1905

Figure 4. Historic 1905 map showing the location of the proposed Middlebury ST SPUR(2) Rail Alignment, Middlebury, Addison County, Vermont.

1962 AeroGraphic Corp.

Figure 5. Historic 1962 aerial photographs showing the approximate location of identified wooden shack and the probable airstrip located nearby on what once was the historic Morse farm, within the APE of the proposed Middlebury ST SPUR(2) Rail Alignments, Middlebury, Addison County, Vermont.

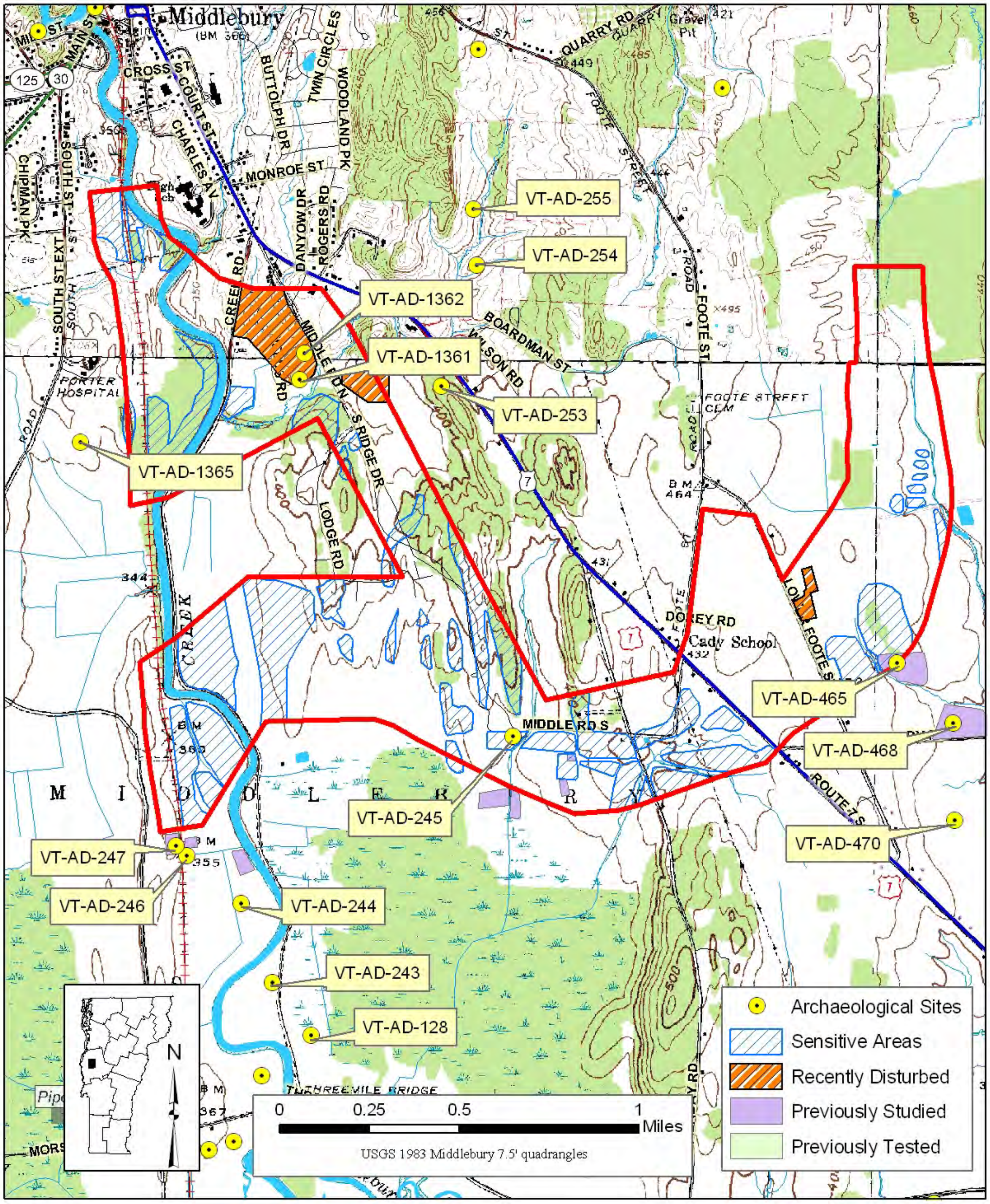


Figure 6. Map showing the location of the proposed Middlebury ST SPUR(2) Rail Alignment in relation to known prehistoric Native American sites and archaeologically sensitive areas, Middlebury, Addison County, Vermont.

PRELIMINARY ARCHAEOLOGICAL PHASE I SITE IDENTIFICATION FOR THE MIDDLEBURY ST SPUR(2) – ENVIRONMENTAL IMPACT STATEMENT, ADDISON COUNTY, VERMONT

Consulting Archaeology Program
University of Vermont
111 Delehanty Hall
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Burlington, VT 05405

Report No. 500
August, 2008

PRELIMINARY ARCHAEOLOGICAL PHASE I SITE IDENTIFICATION FOR THE MIDDLEBURY ST SPUR(2) – ENVIRONMENTAL IMPACT STATEMENT, ADDISON COUNTY, VERMONT

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August, 2008

ABSTRACT

The University of Vermont Consulting Archaeology Program (UVM CAP) conducted an archaeological Phase I site identification survey within five of ten areas determined to be sensitive for prehistoric Native American sites along the preferred Middlebury ST SPUR(2) Rail Alignment, located in Middlebury, Addison County, Vermont, in the autumn of 2007. The preferred alignment extends from the OMYA calcium carbonate quarry located in Middlebury. The alignment then crosses Lower Foote Street, continues southwest across Vermont Route 7 and Middle Road, and then turns northwest through agricultural fields, Halladay Road, several more fields before crossing the Otter Creek to connect with the existing railway line. A subset of all archaeologically sensitive areas was studied, in part, to test the areas archaeologically sensitivity as determined by the Vermont Division of Historic Preservation's predictive model of precontact Native American archaeological sites. As a result of the Phase I study, three previously unknown prehistoric Native American archaeological sites were identified within two of the archaeologically sensitive areas. These sites were designated VT-AD-1493, 1494 and 1495 in the Vermont Archaeological Inventory (VAI). A fourth site, designated VT-AD-1496, was identified outside of the preferred alignment. Given that no temporally diagnostic artifacts were recovered from any of these sites, they can only be attributed to the general prehistoric time period, ca. 9500 B.C. – A.D. 1600.

MANAGEMENT SUMMARY AND RECOMMENDATIONS

The archaeologically sensitive areas investigated during this study were identified along the preferred alignment of the Middlebury ST SPUR(2) – Environmental Impact Statement project as a result of an Archaeological Resources Assessment undertaken by Dr. Charles Knight of the University of Vermont's Consulting Archaeology Program (UVM CAP) (Knight 2006). The proposed project is sponsored by the Vermont Agency of Transportation (Vtrans) through the consulting firm of McFarland- Johnson, Inc., as part of the federal Section 106 permitting process. The proposed project has been revised several times, originally containing six rail alignments consisting of four elements. As a result, the ARA studied the alignments of two Rail Spurs (RS-1 & RS-3) and one proposed Truck Route (TR-1). These three alignments begin at the OMYA rock quarry in Middlebury and extend to the east to the existing mainline railroad along the west side of the Otter Creek which connects to the OMYA processing plant in Florence, Vermont.

The preferred alignment, RS-1/TR-1 will cross and disturb approximately 10 archaeologically sensitive areas, of which a subset of five was studied during the course of the Phase I site identification survey. Archaeologically sensitive landforms within each of these five areas were chosen to reflect areas of high and low sensitivity through the application of the Vermont Division for Historic Preservation's (VDHP) statewide Geographic Information System (GIS) predictive model of archaeological sensitivity. Additional archaeologically sensitive landforms may exist within each archaeologically defined area that have not be studied and may require additional archaeological study in the future. In the maps produced by this GIS, archaeological sensitivity is depicted by the presence of one or more overlapping factors, or types of archaeological sensitivity (e.g., proximity to drainage, wetland, water-stream confluence, wetland, head-of-draw, waterfalls, paleosols, floodplains, kame soils, and level terrain) (Knight 2007). This model was used as a guide to identify areas that would require more detailed analysis, which may include a site inspection.

Of the five areas chosen as the subset for the initial stage of Phase I testing, three (Areas 1, 4 and 5) were determined to be highly sensitive. Two areas, Areas 2 and 3 were predicted to have low archaeological sensitivity, but following a site inspection were determined to be sensitive. Area 1 is located in the modern floodplain along the western side of Otter Creek, within large pastures of a local horse farm. Area 2 is located on an elevated ridge and terraces on the east side of Otter Creek. Area 3 is located on a level field, at the toe-of-slope of a small bedrock exposure that overlooks broad wetlands to the west and south. Area four is located along a series of terraces overlooking several tributaries of the Otter Creek, on the east and west sides of Halladay Road. And finally, Area 5 is located immediately south of the OMYA rock quarry, on a series of four slight west-east trending ridges above small tributaries of Beaver Brook, within the Foster family farm.

Sites VT-AD-1493 and VT-AD-1494 are located in Area 1. As a result of the Phase I survey within this area, horizontal boundaries were not established for either site therefore, Phase II site evaluations are recommended prior to any proposed construction.

In addition, given the large expanse of Area 1, additional micro-topographical features located within the proposed alignment corridor such as relict river terraces will need to be studied prior to any proposed construction. In the case of VT-AD-1493, which is located on the active Otter Creek floodplain, archaeological resources have the potential to be deeply buried, although none were identified during the course of the initial Phase I study. A revised methodological approach, perhaps including the use of a backhoe to mechanically excavate a stratigraphic trench, may be needed in order to identify any deeply buried archaeological deposits. The stratigraphic sequence identified at site VT-AD-1494 indicates that deeply buried archaeological deposits are not likely to be encountered.

Site VT-AD-1495 is located in Area 2, on a high ridge/terrace overlooking Otter Creek which is approximately 250 m (820 ft) to the west. A relict channel of Otter Creek is present at the toe-of-slope of the ridge. This site was identified during a surface inspection of a fallow cornfield. The majority of the surface collected artifacts were identified within a dense cluster located from 40-50 m (131-163 ft) to the north of the proposed alignment centerline. Several artifacts, however, were collected from the area of the proposed transfer area, closer to the alignment. Given that the area was not plowed, a more precise determination of the site’s size cannot be ascertained and therefore, future archaeological study of this site may need to include thorough plowing. The minimal Phase I subsurface testing undertaken at this site, given the wet, clayey nature of the local soil, did not result in the identification of additional archaeological deposits.

Site VT-AD-1496 is located approximately 200 m (656 ft) south of site VT-AD-1496, and it was identified while accessing Area 2 from an existing farm road. Two lithic artifacts were collected from the unplowed surface of a cornfield. At present, the site is located far from the proposed alignment corridor, but should the existing farm road be utilized for access to the corridor, additional archaeological testing will be necessary.

The subsurface testing undertaken within Area 3 was focused on a slight rise overlooking expansive wetlands to the west. This testing was located approximately 150 m (492 ft) to the south of the proposed alignment, but falls within the overall sensitive area as defined within the ARA. No archaeological sites were identified in this portion of Area 3, and no further archaeological work is recommended in this particular area. Additional Phase I testing within the proposed Area 3 corridor, particularly between design stations 55+00 to 60+00 is recommended given that this area is also elevated and has a commanding view of the wetlands to the east.

The subsurface testing within Area 4 was focused across to ridge tops located on the east and west sides of Halladay Road. At project design station 89+00, the subsurface testing along a ridge overlooking a small Otter Creek tributary did not result in the identification of any archaeological sites. Likewise, subsurface testing in the vicinity of proposed design station 95+00 did not result in the identification of any archaeological sites. No further archaeological testing is recommended within these two discrete portions of Area 4. Phase I testing will be necessary from design stations 93+00 to 99+00 which are located on a series of knolls and terraces along the headwaters of the tributary.

No archaeological sites within Area 5, located on the Foster Family farm, were identified as a result of the Phase I testing. A proposed transfer station is to be located along the headwaters of several small Beaver Brook tributaries within Area 5. No further archaeological testing is recommended in this area prior to any proposed construction.

The utilization of the VDHP's predictive model, in conjunction with a site inspection of a subset of archaeologically sensitive areas within the proposed preferred alignment, resulted in the identification of four previously unknown prehistoric Native American archaeological sites. Additional Phase I archaeological study is necessary in four of the five archaeologically sensitive areas of the second subset which was not investigated during this study (one archaeologically sensitive area will not require testing due to previous testing in the area associated with the Champlain Pipeline Project). Finally, Phase II site evaluations are recommended at three of the four precontact Native American sites, VT-AD-1493, VT-AD-1494 and VT-AD-1495, identified during this study to better determine their size and significance and overall eligibility for inclusion on the National Register of Historic Places (NRHP).

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INTRODUCTION

A Phase I site identification study was undertaken from September 19 to October 10, 2007 by the University of Vermont Consulting Archaeology Program (UVM CAP) for the proposed Middlebury ST SPUR(2) – Environmental Impact Statement project located in Addison County, Vermont, as part of the Section 106 National Historic Preservation Act (NHPA) as amended, permitting review process (Figure 1). Prior to the Phase I study, an Archaeological Resources Assessment (ARA) and subsequent site inspection of the preferred alignment were conducted by the UVM CAP (Knight 2006, 2007). The preferred alignment, designated RS-1/TR-1, begins at the OMYA rock quarry located in Middlebury, Vermont, east of Vermont Route 7 (Figure 2). The alignment continues west, crossing Lower Foote Street approximately 300 m (984 ft) north of Cady Road, and continues southwest crossing Vermont Route 7 and Halladay Road (see Figure 2). The alignment then turns northwest, crossing meadows, wetlands and agricultural fields before turning west, across Middle Road, the Otter Creek, and two more large fields before connecting with the existing railway mainline.

To assist with the identification of prehistoric archaeological Native American sites, the Vermont Division for Historic Preservation's (VDHP) Geographic Information System (GIS) data base was employed to help better predict the presence/absence of sites along the preferred alignment corridor. Approximately twenty agricultural fields and/or terraces, together forming ten archaeologically sensitive areas were delineated based on the criteria of the VDHP predictive model (Figure 3). To test the predictive model, a subset of five archaeologically sensitive areas was chosen for Phase I sampling following a physical site inspection of these areas (Figure 4). These areas contained numerous archaeologically sensitive landforms, some of which were not tested during this study, as the aim of the study was to determine the presence/absence of sites along the proposed alignment. Therefore, several archaeologically sensitive landforms within each Sensitive Area, may require additional study in the future. In total, three areas, designated Areas 1, 2 and 4, were determined to be highly sensitive for containing precontact era sites, and two, Areas 3 and 5 scored low to moderate for potential archaeological sites (see Figure 3). Areas 6-10 are a second subset that were not investigated during this Phase I study.

As a result of the Phase I study of specific landforms within the subset of five archaeologically sensitive areas, three previously unknown prehistoric Native American sites were identified. Two sites, designated VT-AD-1493 and 1494 were identified in Area 1 through the use of subsurface test pit excavation (see Figure 4). A third site, designated VT-AD-1495, was identified in Area 2 during the course of a visual inspection of a fallow cornfield (see Figure 4). A fourth site, VT-AD-1496, was identified while accessing Area 2 in an area presently not within the proposed project's APE. The artifact inventory of all four sites consists of lithic debitage and/or lithic tools, none of which are temporally diagnostic. Based on the limited information garnered from these sites, each can only be ascribed to the general prehistoric time period, ca. 9500 B.C. to 1600 A.D. The identification of these four sites underscores the effectiveness of the predictive model and site inspection as a means to identifying potential topographic areas

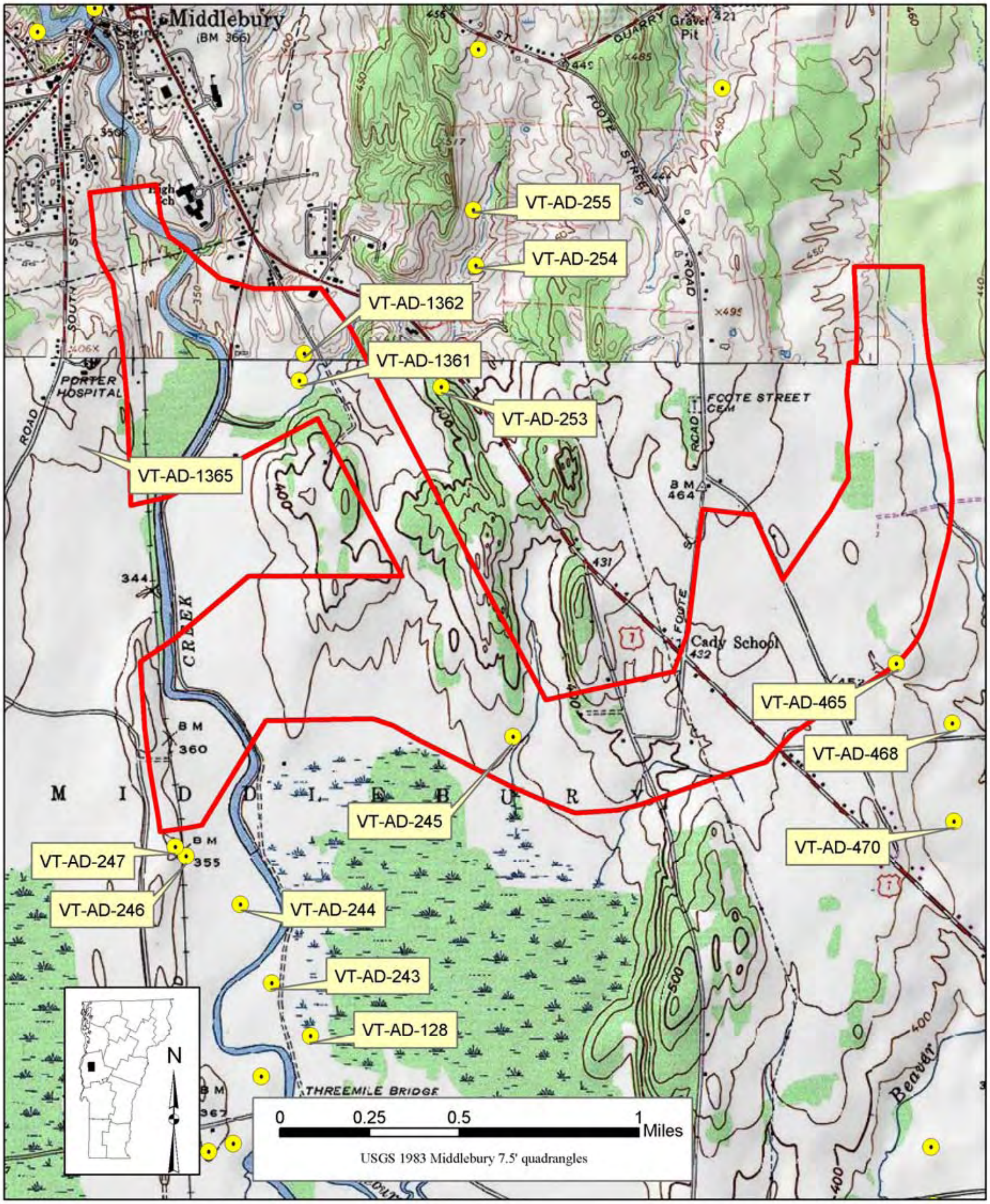

Figure 1. Map showing the location of the proposed Middlebury ST SPUR(2) Study Area, Middlebury, Addison County, Vermont (source: USGS 1983 Middlebury Quadrangle).

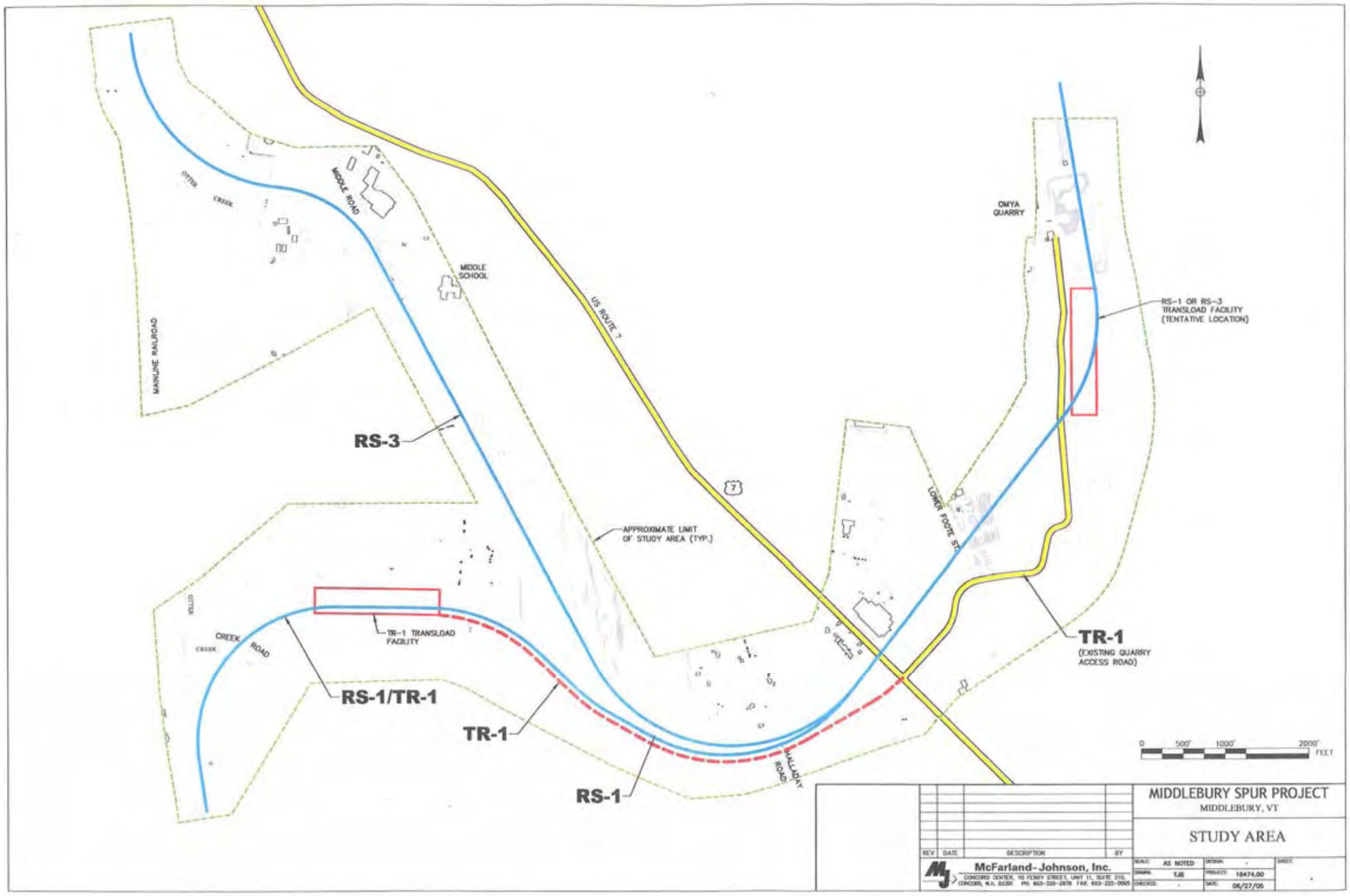

Figure 2. Map showing the locations of the proposed Middlebury ST SPUR(2) rail and truck alignments, Middlebury, Addison County, Vermont.

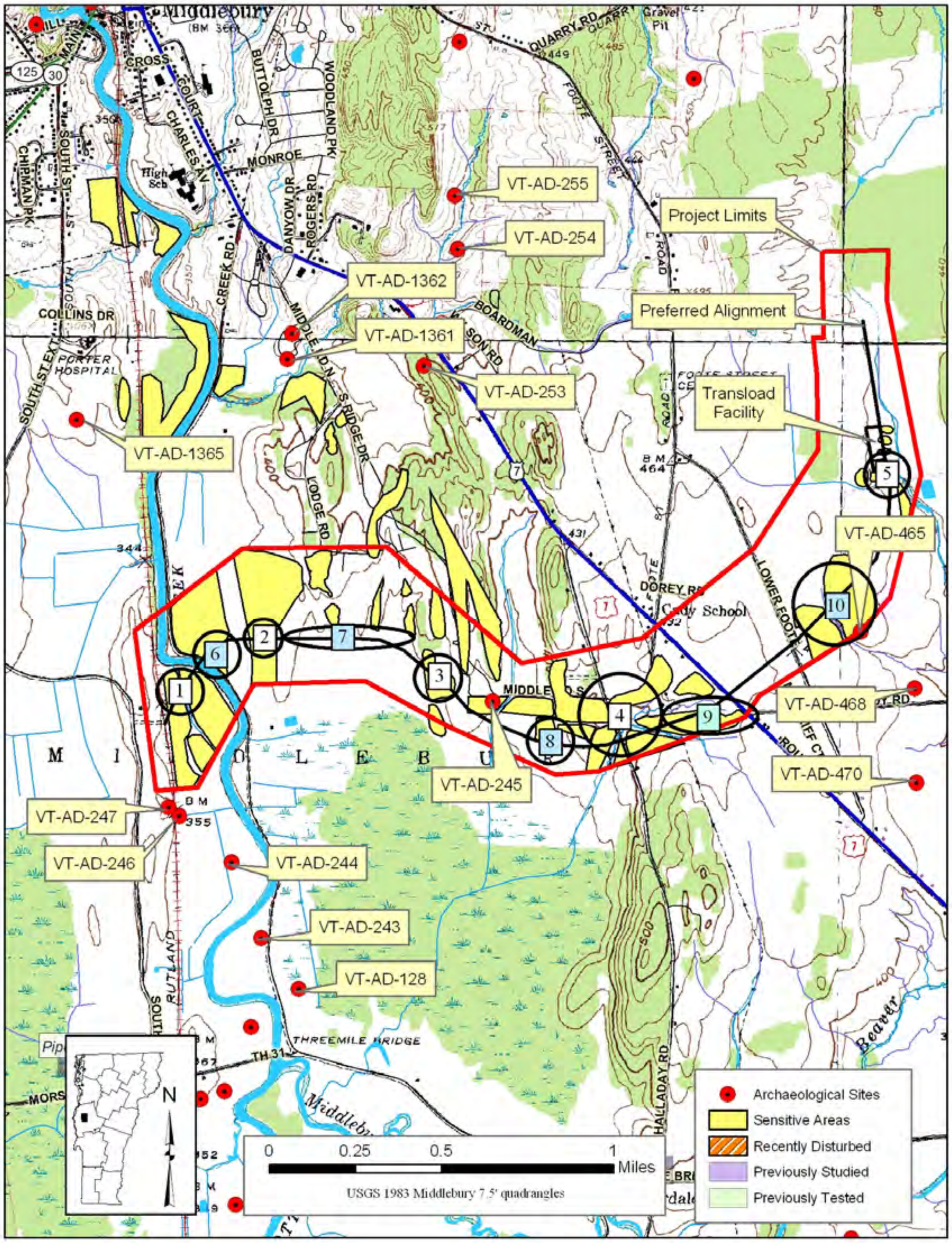

Figure 3. Map showing the location of the Middlebury ST SPUR(2) rail alignment in relation to known prehistoric Native American sites and archaeologically sensitive areas, Middlebury, Addison County, Vermont.

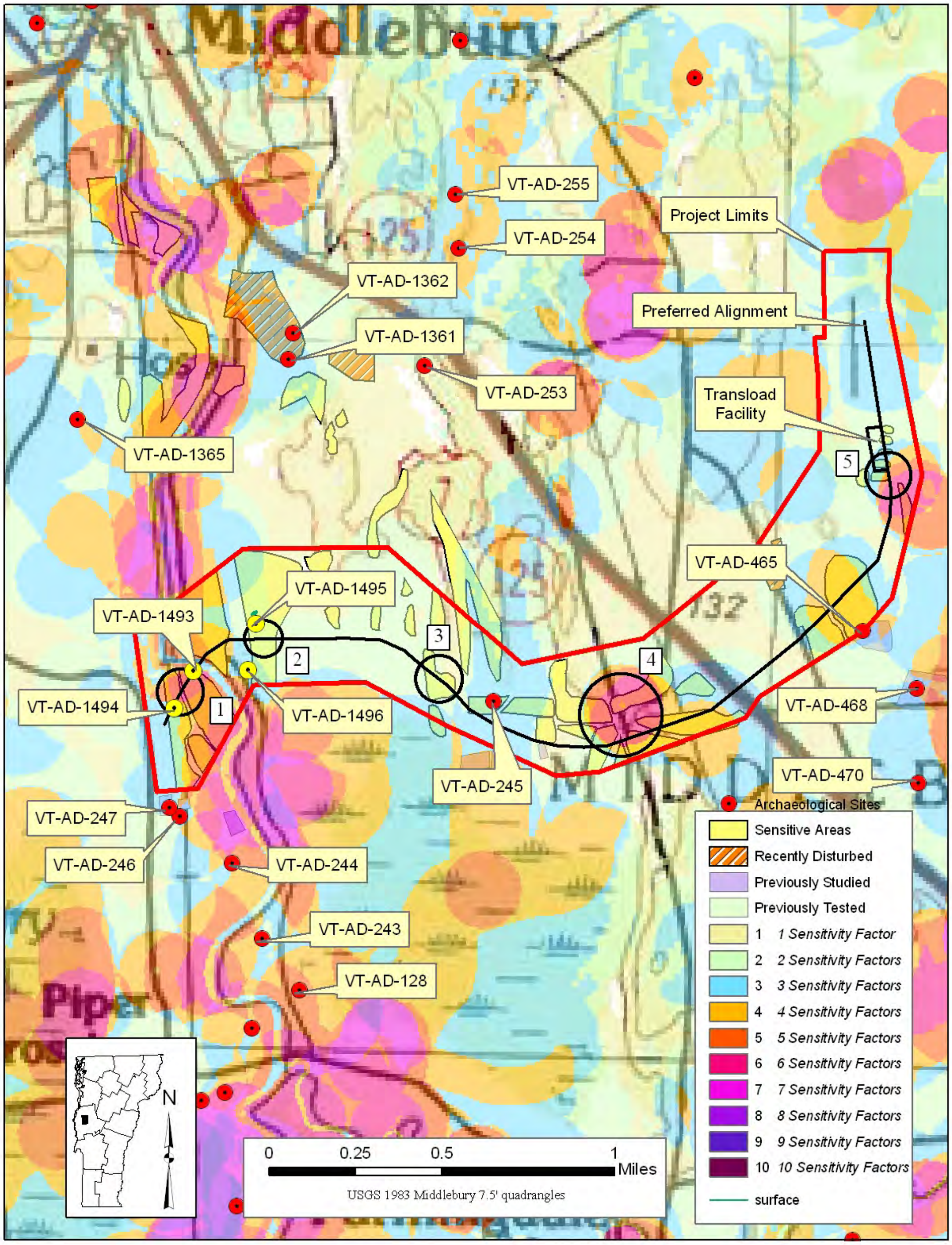

Figure 4. Map showing the location of the five sensitive subset areas and four newly Identified sites VT-AD-1493, 1494, 1495 and 1496, within the proposed Middlebury ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

containing sites, and as such, the remaining untested sensitive landforms within archaeologically Sensitive Area 1-5, in addition to sensitive Areas 6-10 will require Phase I examination before any proposed ground disturbance occurs within the project's APE. In addition, Phase II evaluations of sites VT-AD-1493, 1494 and 1495 are recommended prior to any proposed disturbance. Presently, no further archaeological work is recommended at site VT-AD-1496, given that is located outside of the proposed project's Area of Potential Effects (APE).

The archaeological studies reported here were conducted in accordance with federal laws and regulations, including Section 106 of the National Historic Preservation Act as amended through 1992 (16 U.S.C. 470), the National Environmental Policy Act of 1974 (16 U.S.C. 469), Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303), and the Advisory Council of Historic Preservation's *Protection of Historic Properties* (36 CFR Part 800). The study also followed the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716-44740), *Section 110 Guidelines: Guidelines for Federal Agency Responsibilities Under Section 110 of the National Historic Preservation Act* (53 FR 4727-4746), and the *Guidelines for Conducting Archaeology in Vermont* (Peebles 2002).

This report contains information on the environment and the types of prehistoric and historic period sites expected within the general project area, observations made during the field inspection, sampling methods and results of the Phase I site identification survey, conclusions and final recommendations, along with the appropriate appendices.

RESEARCH DESIGN

The study of archaeologically sensitive Areas 1-5 within the proposed preferred alignment of the Middlebury ST SPUR(2) – Environmental Impact Statement project was a process that consisted of several steps, each of which was reviewed by the VDHP. Each step had its own specific objectives, all of which worked towards the main goal of protecting and preserving as much of the identified sites as possible. The objectives of each phase of study are described below.

The initial step of archaeological study involved the utilization of the VDHP's GIS database, which includes all known archaeological sites, prehistoric and/or historic within the state of Vermont. The GIS database also includes critical environmental data related to topographic features such as elevation, water, wetland locations, and soil type classifications, among others. In addition, data specific to individual sites is also available, including artifact inventories, feature types, age, size, stratigraphy, integrity and overall significance. When GIS is used in conjunction with other archival resources such as historic maps, documents and technical reports, an efficient model of site predictability can be generated. However, in order to evaluate the predictive model, all topographic areas of sensibility, from low, medium and high should be sampled. The initial subset of five archaeologically sensitive areas within the proposed preferred alignment was chosen on this basis.

To further evaluate the archaeological sensitivity of the proposed preferred alignment, a site inspection of the corridor was conducted by Dr. Charles Knight, Assistant Director of the UVM CAP, on December 6 and 7, 2005 (Knight 2006). The overall project area received a combined sensitivity score of 64 based on the variables in the "Environmental Predictive Model for Locating Precontact Archaeological Sites". The preferred alignment and proposed transload facility will cross and disturb at least 20 agricultural fields and/or terraces, together forming ten archaeologically sensitive areas (Knight 2007). As a result of the site inspection, a subset totaling five of the sensitive areas was chosen for the initial Phase I site identification survey in order to reflect the range from low to high sensitivity within the proposed alignment corridor (Knight 2007).

Subsequently, a Phase I archaeological site identification survey was conducted in the five selected sensitive areas. Based on the *Guidelines for Conducting Archaeology in Vermont*, produced by the VDHP (Peebles 2002), the goals of the Phase I site identification survey are to: 1) identify archaeologically sensitive areas to be affected by the proposed project through environmental and historical background studies; 2) determine the existence and location of any prehistoric and/or historic sites within the project APE; and 3) present preliminary information that can form the basis and framework for a more intensive archaeological evaluation should a site be identified, if desired by the client.

As a result of the Phase I survey, four previously unknown prehistoric Native American sites were identified, designated VT-AD-1493, 1494, 1495 and 1496 in the

Vermont Archaeological Inventory (VAI). Three of the sites, VT-AD-1493, 1494 and 1495 were identified within two archaeologically sensitive areas, and the fourth, VT-AD-1496, was identified well beyond the proposed alignment corridor. Phase II evaluations are recommended at sites VT-AD-1493, 1494 and 1495 to better determine each site's significance, age, function(s), integrity and eligibility for inclusion on the NRHP. Given the results of the initial Phase I survey, it is highly likely that additional prehistoric Native American archaeological sites will be identified within all ranges of topographic sensitivity along the length of the proposed preferred alignment.

Specifically, the goals of the Phase II site evaluation are to: 1) obtain more detailed information on the integrity, condition, boundaries and size, stratigraphy, structure, function and context(s) of each site to sufficiently evaluate their significance and/or, to establish their lack of significance; 2) to specifically determine, based on the above information, whether or not the properties met the criteria for inclusion on the NRHP; and 3) if necessary, to provide for an adequate plan for mitigating, through avoidance and/or data recovery or other means, any adverse impacts to the archaeological properties (Peebles 2002).

ENVIRONMENTAL CONTEXT

The diversity of Vermont's ecology, geology and topography played an integral role in how and where Vermont's prehistoric populations lived. By considering this rich diversity archaeologists are better able to predict prehistoric settlement patterns, resource utilization, site density, structure and location. What follows is a summary of the relevant ecological, geological and topographical factors that have influenced the nature of prehistoric habitation in the project area.

The Middlebury ST SPUR(2) – Environmental Impact Statement project area lies within the Champlain Valley biophysical zone, which extends to the north and east to the St. Lawrence River, and west to the lowlands of eastern New York State, wrapping around the Adirondacks up to the Great Lakes (Thompson and Sorenson 2000). Formed during the Ordovician period, the soils in the valley derived from limestones, shales and dolomites which are some of the oldest rocks in the northeast. Throughout geological time, the Champlain Valley has been periodically inundated with water, the two most recent episodes being Lake Vermont and the Champlain Sea, of the late Pleistocene and early Holocene epochs, respectively. The resulting sediment deposited by post-glacial lakes, seas and rivers have produced highly fertile soils, which formed the basis of the plant and animal communities that the prehistoric Native American occupants of the valley adapted to and utilized (Thompson and Sorenson 2000).

Specifically, two soil types are found within the preferred alignment area, and they are classified as the Vergennes and Limerick series (USDA SCS 1971). Vergennes series soil is characterized as clayey in texture, moderately well drained, difficult to till or dig, sticky and plastic when wet, hard when dry, and generally fertile. Formed on deep-water laid deposits, the soils once represented the deepest parts of Lake Vermont and the Champlain Sea (Thompson and Sorenson 2000). Common agricultural uses include pasturing, hay, corn and woodlot. Vergennes series soil is found entirely in Areas 2-5, and in the western, or elevated portion of Area 1. Limerick soils are found within the eastern, or lower, portion of Area 1, on the active Otter creek floodplain. This soil type is characterized as being deep, poorly drained and having a high water table. Limerick soils stay wet into the late spring, rendering them less suitable for agricultural cultivation. Limerick soils are generally used for hay and pasture, or when idle, as woodlots. These soils formed from sediment produced during floods and are common along the Otter Creek, Middlebury River, Leicester and New Haven rivers (USDA, SCS 1971).

The major hydrological feature in the general project area is Otter Creek, located within the western portion of the preferred alignment. Beginning on the north slope of Dorset Mountain, the Otter Creek flows north for 163 km (102 mi) and then northwest to Ferrisburg, where it empties into Lake Champlain. With a watershed of 702,870 acres (1,098 mi^2; LCBP 1999), the Otter Creek is the only north flowing major river in Vermont, and as such, it has served as an important historic and prehistoric travel corridor. Generally, the river flows slowly but is interrupted by several falls and cascades over bedrock sills along its course. The fertile floodplains of the Otter Creek provide prime agricultural land, as well as highly diverse plant and animal communities which were exploited both in the past and into the present day. Named Wonakake-took, or Otter River, by Algonquian people, the main stem of the river, its tributaries and expansive wetlands were highly attractive to native inhabitants, both on a seasonal and permanent basis. The Otter Creek valley is known to be one of the richest archaeological regions within the state. Portions of the river are prone to floods and as a result, archaeological sites have the potential to be deeply buried in stratified alluvial contexts. Relict channels are common within the valley, indicative of the river's potential to change course rapidly. Major tributaries of the Otter Creek include the Big Branch, Mill River, Neshobe River, Leicester River, Middlebury River, New Haven River, Lemon Fair River, and Dead Creek.

The elevation above mean sea level along the proposed preferred alignment of the ranges from 101-121 m (332-400 ft), with the Otter Creek floodplain (Area 1) lowest, and the area around Beaver Brook (Area 5), highest. The elevated ridge located within Area 2 sits at 116 m (382 ft) above mean sea level. Given the general elevation and soil types of the project area, the forest community sustained by the soils, climate and topography is classified as Valley Clayplain Forest (Thompson and Sorenson 2000). The canopy of a Valley Clayplain Forest community commonly consists of white oak, red oak, red maple, white pine, shagbark hickory and white ash (Lapin 1998). With oak trees, the mast produced was an important food component for prehistoric Native Americans. Animals commonly found within the Valley Clayplain Forest include gray squirrel, eastern chipmunk, raccoon, beer and white tailed deer. The close proximity of the project area to the Otter Creek and nearby expansive wetlands would have provided abundant fish, waterfowl and reptilian animals, as well as a diverse array of mammals such as moose, muskrat, beaver and otter, in addition to a variety of exploitable vegetation to prehistoric populations.

This cumulative environmental information suggests that people during the prehistoric past are likely to have established a range of types of encampments along the Otter Creek valley and its tributaries. The variety of subsistence resources available to Native Americans coupled with the ease of travel provided by the Otter Creek and its tributaries into varying ecosystems, along with the known archaeological record of the watershed, underlies the archaeological sensitivity within the proposed preferred alignment. It is likely that archaeological sites dating from all prehistoric time periods may be found within the proposed rail spur corridor.

PREHISTORIC CONTEXT

Vermont Prehistory

Although no temporally diagnostic artifacts were recovered from sites VT-AD-1493, 1494, 1495 and 1496, numerous sites are located within less than 0.5 km (0.31 mi) of the proposed project area that have been dated, such as sites VT-AD-1442 and VT-AD-1443, sites which date to the Early Woodland and Early Archaic respectively. These sites were identified as a result of archaeological study conducted for the Middlebury South Subdivision and Lodge at Otter Creek project (Fletcher and Crock 2008). To understand the sites identified within the APE of the proposed Middlebury Spur alignment, it is beneficial to conceptualize the types of activities that may have been carried out in the area during Vermont's prehistory, in order to better understand the past lifeways of Vermont's Native inhabitants, and to address a number of research topics pertinent to Vermont prehistory. The Vermont historic preservation plan contains an overview of Native American prehistory for the state and it is quoted and paraphrased here to provide a basis for understanding prehistoric occupation in the study area (VDHP 1991:10-13).

Vermont's earliest settlers began to move into Vermont following the end of the Pleistocene Epoch around 9000-8000 B.C., at the end of the last ice age. These earliest settlers are referred to by archaeologists as Paleoindians. Following the retreat of the glaciers and increase in mean temperatures in the area an arctic like tundra landscape gave way to a sparse forest of spruce, fir and birch. This environment likely supported mega fauna such as mastodons, woolly mammoth and large herds of caribou, all of which are believed to have been hunted by Paleoindians. In addition to these large animals, Paleoindians hunted a wide range of smaller game and collected wild plant foods. The Paleoindian tool kit featured the fluted point, a type of spear point unique to this period of prehistory. Along with fluted spear points, other temporally diagnostic artifacts such as spurred scrapers and gravers have been recovered from Paleoindian sites located in Colchester, Highgate, Williston and Ludlow, Vermont. At least thirty Paleoindian sites have been identified in Vermont, although the majority represents small clusters of artifacts or isolated fluted spear points. In addition to these terrestrial resources, people of this period also may have exploited the residual marine resources available in the remnants of the Champlain Sea, an inland arm of the ocean that formed after the glacier sheets retreated and the Atlantic Ocean flooded the St. Lawrence River valley. Living as semi-nomadic groups of hunters and gatherers, it is believed that Paleoindians traveled great distances while in pursuit of game and for procurement of raw materials. Extensive exchange networks may have also existed, as suggested by Vermont sites containing lithic materials from origins as far away as White Mountains of New Hampshire, northern Maine, central New York, Pennsylvania, and the Massachusetts coast.

By about 7000 B.C. a change in both environmental conditions and subsistence strategies had occurred, with populations utilizing a wide array of natural resources. At that time closed forest covered developed with hardwood trees appearing for the first time in the Champlain Valley, while the uplands remained dominated by conifers.

Developing lake, pond and wetland environments provided improved habitats for birds, animals and a wide variety of useful plants. In this period, called the Early Archaic, the human population gradually increased. Most of the sites discovered from this 1,500-year period between 7000 and 5500 B.C. have been identified on the basis of small, bifurcated base or side-notched spear points used for hunting. Bifurcate based points are rare in Vermont and those found are considered analogous to those recovered from sites to the south and west. A unique variation of this spear point type known as Swanton corner-notched was first identified at the John's Bridge site, from a terrace along the Missisquoi River in Swanton, Vermont. The John's Bridge site has been dated to ca. 6100 B.C. (Thomas and Robinson 1983). A second site, located on a small site above the Otter Creek in Wallingford, Vermont, also contained a Swanton corner-notched spear point (Doherty, Sloma and Thomas 1995). The locations of these two sites minimally suggest that the diverse resources associated within riverine flood plains were attractive to inhabitants of this time period.

Little is known of the subsequent Middle Archaic period, ca. 5500-4000 B.C. Diagnostic artifacts from this time period are poorly known or have not been recognizable (Haviland and Power 1994). A Middle Archaic component recently was identified in a deeply buried floodplain context along the Missisquoi River in Swanton, Vermont, however (Cowie, personal communication 2003). This site and isolated finds of Middle Archaic tools suggest that the lack of sites from this time period may be more an issue of archaeological sampling than a measure of population density. Despite the small number of known sites, it is clear that people continued to live in Vermont during this time period (e.g., Petersen et al. 1985:57-59; Thomas 1992).

At the beginning of the Late Archaic period, around 4000 B.C., the warm regional climate fostered human population growth. Not only could groups exploit the increased food resources in the rich valleys and bottom lands, but the upland regions, especially the lakes and ponds, also witnessed an increased diversification of animal and plant communities. Residential and other activity sites from this period have been found in all parts of Vermont, from lakeshore to mountain tops (e.g. Thomas 2000). Evidence suggests that people returned to many sites repeatedly in the course of their seasonal rounds. The extensive array of woodworking tools found in sites dating to the Late Archaic period, suggest that the dugout canoe was an important method of transportation. For portions of the Late Archaic period, like the earlier Paleoindian period, we have evidence of wide-ranging exchange networks. Although most of the stone used for tools was derived from local sources, Late Archaic and later Early Woodland period sites in Vermont have contained a walrus tooth from Arctic Canada, copper tools and beads from the upper Great Lakes, and shells from the Gulf of Mexico (e.g., Haviland and Power 1994).

The period that began about 1000 B.C., known as the Early Woodland period, is represented in Vermont at several burial sites (e.g. Haviland and Power 1994, Heckenberger et al. 1990; Loring 1985). Ritual mortuary practices and artifacts found at these sites suggest a close cultural affiliation with Adena cultures in the Midwest. Few Early Woodland habitation sites are known in Vermont. Two sites, Auclair and Ewing, located in the Winooski River watershed, and another site located on Shelburne Pond contain cultural deposits of this time period (e.g. Petersen et al. 1985:61, Table 5; Thomas and Doherty 1981: Table 1, 1985: Table C). The artifacts recovered from these sites suggest that several technological changes such as the introduction of pottery (Haviland and Power 1994:91-99) and perhaps the bow and arrow into Vermont occurred during this time period.

Long-term population growth in the region apparently began about 100 B.C. At that time, people shifted between increasing numbers of environmental habitats (e.g., from mountains to valleys) to exploit the full range of available resources, reflecting a more diversified subsistence strategy. The Winooski site, located in the lower Winooski River valley, is one of the best known sites from this period and contains a stratified sequence of Middle Woodland occupations that date to ca. 1-1000 A.D. (Petersen 1980).

By A.D. 1050, at the beginning of the Late Woodland period all major river valleys in Vermont contained extensive settlements. It was during this time that the seasonal cycle of hunting, fishing, and gathering of wild plant foods was supplemented by the planting and harvesting of crops. Corn, bean and squash cultivation quickly became an important component of the diversified subsistence strategy. To date, the earliest evidence for food cultivation occurs at the Skitchewaug site on the Connecticut River in Springfield Vermont. By A.D. 1100, corn, beans and squash were being cultivated and stored in pits beneath small houses located on the flood plain adjacent to the river (Heckenberger et al. 1992). At the Donahue site, located on the Winooski Intervale, corn horticulture was actively practiced by A.D. 1450, if not before (Bumstead 1980). Analysis of floral remains from the Bohannon site, located in East Alburg, Vermont, near the northern end of Lake Champlain, indicate that corn cultivation was practiced there between ca. A.D. 1300-1600 (Crock and Mandel 2000).

The arrival of Samuel de Champlain on Lake Champlain in 1609 marked the beginning of the end for a way of life that had persisted for nearly 11,000 years. Having continually adapted to changes in climate, forest and food resources, Native Americans soon found themselves competing for the same lands and resources as the European colonists. Warfare and dispersal and European diseases decimated entire communities of indigenous people.

Archaeological evidence of Contact period sites is scarce in Vermont, although several sites have produced radiocarbon dates and associated artifacts within the Champlain Lowlands. Further study of this time period is needed in Vermont to better assess the nature and timing of interaction between Vermont’s Native period and Europeans. Despite the events of the Contact period, Native American cultures continue to adapt and persist to the present.

Project Area Prehistory

A review of the Vermont Archaeological Inventory (VAI) was conducted as part of the ARA for the proposed project. Numerous archaeological sites are known within 3.2 km (2 mi) of the proposed preferred alignment (see Figure 3). Five prehistoric Native American sites are located within the preferred alignment corridor, or immediately outside of its limits. Site VT-AD-245 is located approximately 50 m (164 ft) north of the proposed centerline of the RS-1 alignment, 460 m (1,500) west of Halladay Road, and just south of Middle Road (see Figure 3). The site is characterized as a small lithic artifact scatter consisting of three debitage specimens and one Levanna type projectile point attributable to the Middle and Late Woodland periods, ca. A.D. 750-1600 (Thomas and Robinson 1980). Site VT-AD-465 was identified during the course of archaeological investigations related to the Champlain Pipeline (Robinson et al., 1992). The site VT-AD-465 was identified by the recovery 51 lithic artifacts during a surface inspection of a plowed field located alongside a small tributary of Beaver Brook in the eastern portion of the proposed alignment corridor (see Figure 3). This site can be minimally attributed to the Middle and Late Woodland periods based on the recovery of three Levanna type projectile points.

Three sites, VT-AD-1441, 1442 and 1443 were identified as a result of Phase I and II archaeological studies related to a residential and retirement development project located within and adjacent to the center portion of the proposed alignment corridor (Fletcher and Crock 2008) (see Figure 4). Site VT-AD-1441 is located on a small knoll above a small tributary and wetland of Otter Creek. A dense surface scatter of lithic artifacts, none of which are temporally diagnostic, were found on the crest and gentle south facing slope of the knoll. Site VT-AD-1442 was recovered from a slight ridge along the margins a broad wetland located between Areas 2 and 3 of the preferred alignment. A rare Swanton Corner-notched projectile point, attributable to the Early Archaic period, ca. 8000-6000 B.C., was recovered from the surface of a fallow field. Site VT-AD-1443 was identified by the recovery of a single Meadowood type projectile point recovered from the surface of a plowed field adjacent to the same vast wetland (see Figure 4). Meadowood type projectile points area dateable to the Early Woodland period, ca. 900-100 B.C.

In addition, twelve more precontact period Native American sites are known just beyond the limits of the proposed project's APE. These sites include VT-AD-243, 244, 246, 1361 and 1362 (e.g., Mandel and Crock 2006; see Figure 3). Many of these sites are located on the Otter Creek floodplain in a similar environment as sites VT-AD-1493 and 1496, indicating that still other sites may be present within Area 1 of the current proposed alignment corridor.

Historic Archaeological Site Potential

No historic period archaeological resources are located within the proposed preferred alignment. An overlay of the of the proposed project corridor of the 1871 Beers' map (Figure 5) and the historic 1905 USGS map (Figure 6) indicate that only two historic period farmsteads lie within the proposed corridor. South of the modern OMYA plant, the proposed RS-1 alignment cuts through what once was the L.P. Boardman farmstead. This historic period farmstead has been disturbed since its 19th Century occupation, and is currently the location of the Vermont National Agricultural Products facility, which has disturbed the ground through leveling, the construction of warehouse structures, and the processing of manure.

Along the proposed alignment, near the location of the proposed TR-1 Transload facility, a farmstead attributed to J.W. Morse will be bisected (Figure 7). Currently a wooden shack exists in the vicinity of the Morse farmstead, but this wooden shack is unlikely to be related to the historic Morse farmstead. In addition, construction elements of the shack, such as a concrete chimney suggest a more recent date of construction. Finally, aerial photographs of this area from 1962 indicate that the construction of what appears to be a private air strip oriented north-south, and other leveling and filling activities have disturbed this portion of the farmstead (see Figure 7).

As a result, significant historic archaeological deposits are not expected within the proposed project's APE.

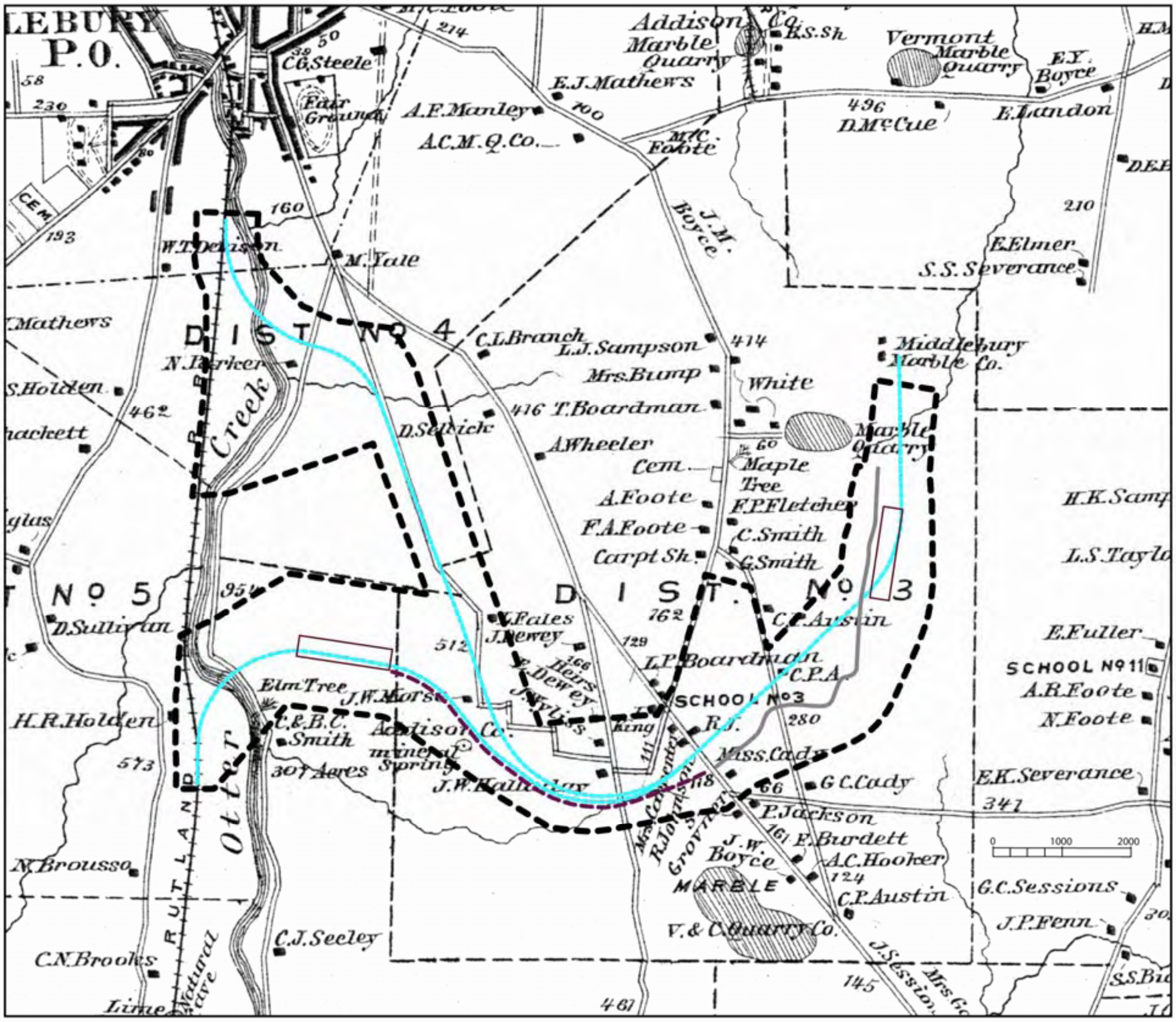

Figure 5. Historic 1871 map showing the location of the proposed Middlebury ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

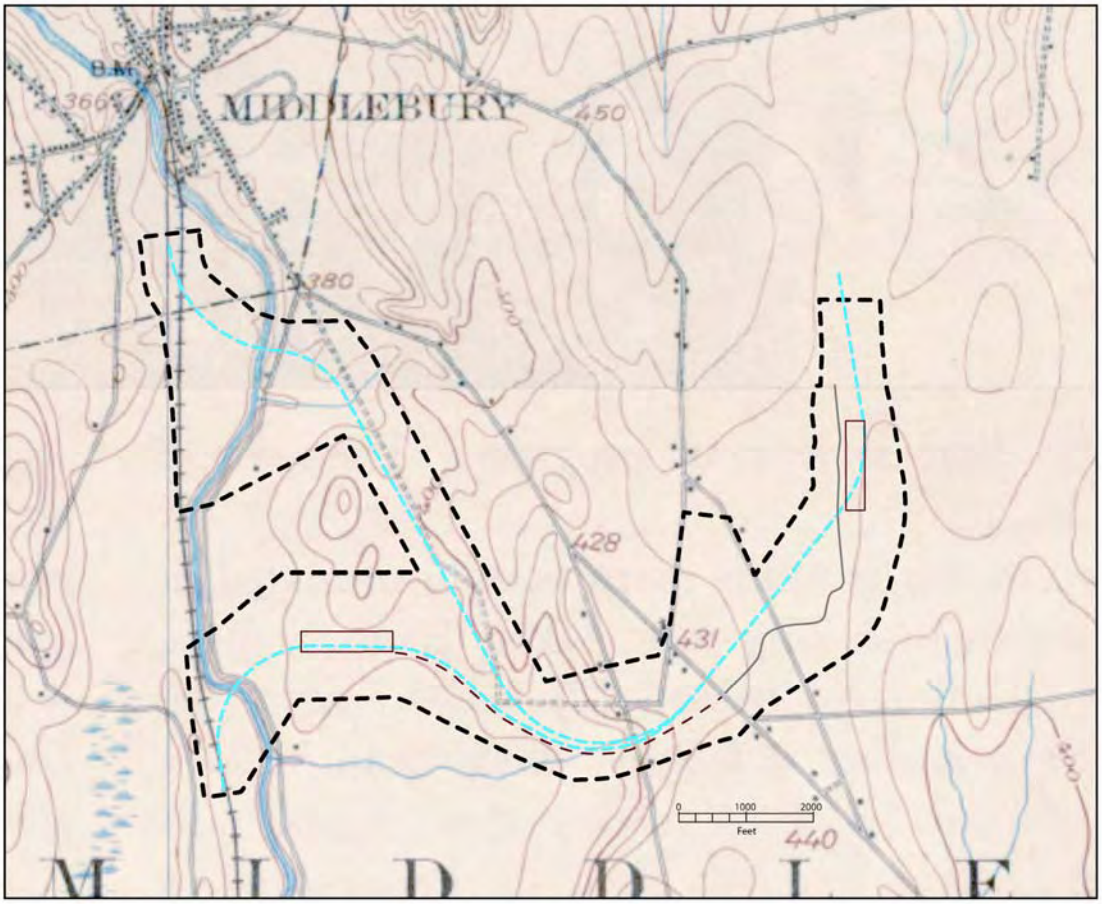

Figure 6. Historic 1905 map showing the location of the proposed Middlebury ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

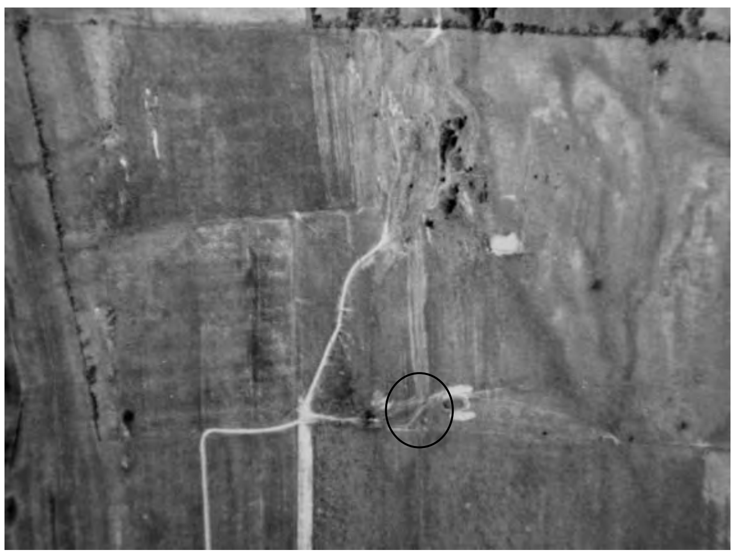

Figure 7. Historic 1962 aerial photographs showing the approximate location of Identified wooden shack and the probable airstrip located nearby on what was once the historic Morse Farmstead, within the APE of the proposed Middlebury ST SPUR(2) rail alignments, Middlebury, Addison County, Vermont.

Potential Prehistoric Site Types in the General Study Area

A general model of possible prehistoric site types identified for the project area was developed prior to the undertaking of the archaeological Phase I site identification survey. Based on prehistoric site types listed in the prehistoric context of Vermont's Historic Preservation Plan (VDHP 1991), it was expected that several of these types may be present within the study area. These included base camps, small residential camps and small extractive camps.

Small residential camps and small extractive camps may contain relatively low to moderate densities of artifacts that are concentrated in more spatially limited activity areas. Site size, related to a single episode of occupation, is probably less than 500 m^2 (5,380 ft^2), and often less than 100 m^2 (1,076 ft^2). Small camps are frequently as small as 50 m^2 (538 ft^2) (e.g. Thomas 1986). The majority of artifacts are likely to occur around shelters and hearths where the majority of activities took place. This spatial pattern is reflected at sites across the state. Small residential camps and small resource extractive camps were estimated to be typical of sites predicted to be encountered within the project's sensitive areas.

Small residential and small resource extractive camps were probably used by small groups of people pursuing a subsistence strategy based on a broad to narrow range of food and material resources (Binford 1980; 5-7, 12). These site types typically exist throughout the state, but their age, seasonality and content vary substantially, due to the fact that people used the food and other resources within a variety of environmental settings during the course of a single year and over many centuries. Developing a prehistoric cultural chronology for Vermont and developing and understanding past technological, settlement and subsistence strategies across space and time are four of the major research topics identified in the context of Vermont's historic preservation plan. Therefore, archaeological sites that contain information about one or more of these aspects of past Native American cultures may be significant.

Although artifact and feature content will vary depending on the types of activities undertaken at small residential and extractive camps, cultural features, artifacts and their spatial patterns within a site are integral elements in determining the types of activities undertaken and how a site functioned within a larger cultural system. Based on this information and the natural setting of the proposed project, it was expected that sites within the project's APE might contain one or more small hearths and possibly scatters of fire-cracked rock. In general, most hearths are probably smaller than 1 m^2 (11 ft^2). Hearths may contain carbonized bone and plant materials related to food preparation and wood charcoal that can be used to date the period of occupation. Quartzite, chert and quartz flakes produced during stone tool manufacture are likely to be the most common artifacts at most of these sites. Most flakes may be clustered in areas of 1-3 m^2 (11-32 ft^2). The tools themselves are far less common, but where present, provide important clue for understanding the types of activities that were undertaken.

Data from excavated sites throughout Vermont suggest that artifact density within portions of many prehistoric sites is likely to be low. During a Phase I survey, a single lithic flake recovered in good context is considered sufficient evidence to identify a prehistoric Native American site. Due to the low density and small size of sites, it is not surprising that tools and features such as hearths are rarely identified during the Phase I level of testing. However, given the archaeological sensitivity of the Otter Creek valley, the probability of encountering sites of any type is likely to be greater than in other areas of the state.

Bedrock quarries, quarry workshops, burial sites and find spots also may be associated with cultural activities during Vermont's prehistory (VDHP 1991). Lithic quarrying workshops are unlikely to be present within the project area, as suitable raw material outcrops are not known within the project area. Burial sites might be present, but are not likely to be encountered during the Phase I subsurface testing.

METHODOLOGY

Field Methods

The Phase I field methodology was based upon data collected for known prehistoric Native American sites in the general region and specific area and the site inspection of the proposed project's APE. All of the methodology followed Vermont's *Guidelines for Archaeological Studies* (Peebles 2002).

Phase I Field Methodology

The Phase I field methodology consisted of two strategies, subsurface test pits and the visual inspection of the surfaces of plowed fields. The use of either strategy was dependent upon the local topography, amount of observable disturbance, and in the case of the Rider Farmstead, the location of historic structural remains, of each of the eight identified sensitive areas. In areas where subsurface test pit sampling was conducted, test pits, 50 x 50 cm (20 x 20 in) in size were excavated along linear transects or clusters of five test pits. The test pits were spaced at 5 m (16 ft) intervals. When prehistoric Native American artifacts or cultural features were encountered, additional test pits spaced at 2.5 m (8 ft) intervals were excavated around the original positive test pits. Phase I subsurface testing was conducted in sensitive Areas 1-5. The locations of the test pits were recorded on project design plans using a handheld Global Positioning System (GPS) unit.

All test pit soil was excavated in arbitrary 10 cm (4 in) levels with respect to natural stratigraphic soil horizons. Based on the environmental data, prehistoric archaeological sites were anticipated in shallow, non-depositional settings. All test pits were excavated at least 10 cm (4 in) into the intact subsoil, and in those test pits containing prehistoric deposits, at least one negative arbitrary level containing artifacts was excavated. All soils were sifted through 0.64 cm (1/4 in) mesh screens. Stratigraphic soil profiles were recorded for each test pit according to texture and Munsell soil chart colors. When cultural features were encountered, detailed plan-view maps were drawn. Representative soil profiles are presented in Appendix 1.

Where the topography and current farm practices allowed, the surfaces of fallow plowed fields were visually inspected for prehistoric and historic era artifacts. These surface inspections were conducted in Area 2 and involved the UVM CAP crew systematically walking the fields. Crew members were placed on line and spaced approximately 2 m (6.6 ft) apart. When artifacts were identified their location was marked with a labeled pin flag. Control stations were then established and the artifacts were collected using a Brunton compass, Jacob staff and metric tape. In some cases, to ensure accuracy and correct plotting on project design plans, the GPS unit was also used to record the location of the artifacts. In addition, the GPS was also used to record the extent of surface inspected plowed fields.

Laboratory Methods

In the laboratory, all artifacts were cleaned and cataloged using various descriptive categories such as artifact type, raw material, condition, size and weight and the information was entered on standardized computer coding forms. The field and laboratory computer files were merged to form a master catalog. Bulk soil samples collected from prehistoric features underwent flotation to insure the recovery of small artifacts, charcoal for radiocarbon dating, and organic remains. All artifacts and project records will be curated at the University of Vermont's Consulting Archaeology Program.

All lithic artifacts recovered from the Middlebury Spur project area site were analyzed according to function, raw material type and stylistic attributes. All lithic tools were then measured, weighed and subjected to macroscopic and microscopic analysis to determine, if possible, patterns of usewear or damage along utilized edges and surfaces which might lead to inferences about their past function. Typically, microscopic analysis was conducted with magnification between 8 and 45 X with a binocular microscope. Lithic debitage analysis also was undertaken using macroscopic and a handheld 10 X magnification glass to better determine raw material type and if possible, for stage of reduction represented by each flake. In some cases, articulation of some lithic flakes and tools was achieved through this process. This in turn helped to reconstruct the lithic reduction and manufacturing processes, including breakage and discard, undertaken at the site. A comparative lithic raw material collection also was consulted to better determine source origin for the types of lithic material recovered from the sites.

PHASE I

Fieldwork Results

Area 1, Site VT-AD-1493

Area 1 is located along the western side of Otter Creek, east of the mainline of the Vermont Railroad (Figure 8). The area is presently used as a horse pasture, and given the visibility across the clear floodplain, several relict channels of the Otter Creek are easily identifiable. Both sites VT-AD-1493 and VT-AD-1494 are located on slight relict levees of the Otter Creek. A historically enhanced seasonal stream is present in the center of the field, and site VT-AD-1493 is located to the east of this stream and adjacent to the modern day channel of the Otter Creek (see Figure 8). Site VT-AD-1494 is located to the west of the seasonal stream, on a slightly elevated relict levee located near the toe-of-slope of a ridge containing the railroad bed (see Figure 8).

Site VT-AD-1493 is located between project design Stations 18+00 and 19+00 (see Figure 8). Two linear transects containing a total of 16 test pits were excavated across the western and eastern levees of a relict river channel. The test pits along each transect were spaced at 5 m (16 ft) intervals. Transect 10, located on the western levee, included nine test pits (see Figure 8). Four test pits, 1,2, 6 and 7, contained prehistoric Native American lithic artifacts, including a broken biface fragment, a processing tool and two specimens of lithic debitage. None of the tools are temporally diagnostic and therefore, site VT-AD-1493 can only be attributed to the general prehistoric time period, ca. 9500 B.C. –A.D. 1600.

Stratigraphic soil profiles recorded for each of the test pits excavated along Transect 10 include an uppermost, disturbed plowzone that ranges from 13-28 cm (5-11 in) in thickness. In several test pits, a second buried plowzone is present, extending to depths from 26-35 cm (10-14 in) below the ground surface. Beneath the plowzone(s), lightly weathered fine sand alluvial deposits are present to a depth of 1.0 m (3.3 ft). No buried former stable ground surfaces such as paleosols or anthrosols were identified. All of the artifacts, except one, a quartzite flake, were recovered from the uppermost or buried plowzones. The quartzite flake, recovered from Test Pit 7, was recovered from the upper cm (4 in) of the alluvial stratum beneath the uppermost plowzone.

Transect 11 was located on the eastern levee of the relict channel and it contained seven test pits spaced at 5 m (16 ft) intervals (see Figure 8). Test Pit 7 contained one quartzite debitage specimen which was recovered from an alluvial stratum 30-40 cm (12-16 in) beneath the ground surface. The stratigraphic soil profiles recorded for the test pits excavated along Transect 11 were similar to those recorded for test pits along Transect 10.

PHASE I

Fieldwork Results

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Area 1 is located along the western side of Otter Creek, east of the mainline of the Vermont Railroad (Figure 8). The area is presently used as a horse pasture, and given the visibility across the clear floodplain, several relict channels of the Otter Creek are easily identifiable. Both sites VT-AD-1493 and VT-AD-1494 are located on slight relict levees of the Otter Creek. A historically enhanced seasonal stream is present in the center of the field, and site VT-AD-1493 is located to the east of this stream and adjacent to the modern day channel of the Otter Creek (see Figure 8). Site VT-AD-1494 is located to the west of the seasonal stream, on a slightly elevated relict levee located near the toe-of-slope of a ridge containing the railroad bed (see Figure 8).

Site VT-AD-1493 is located between project design Stations 18+00 and 19+00 (see Figure 8). Two linear transects containing a total of 16 test pits were excavated across the western and eastern levees of a relict river channel. The test pits along each transect were spaced at 5 m (16 ft) intervals. Transect 10, located on the western levee, included nine test pits (see Figure 8). Four test pits, 1,2, 6 and 7, contained prehistoric Native American lithic artifacts, including a broken biface fragment, a processing tool and two specimens of lithic debitage. None of the tools are temporally diagnostic and therefore, site VT-AD-1493 can only be attributed to the general prehistoric time period, ca. 9500 B.C. –A.D. 1600.

Stratigraphic soil profiles recorded for each of the test pits excavated along Transect 10 include an uppermost, disturbed plowzone that ranges from 13-28 cm (5-11 in) in thickness. In several test pits, a second buried plowzone is present, extending to depths from 26-35 cm (10-14 in) below the ground surface. Beneath the plowzone(s), lightly weathered fine sand alluvial deposits are present to a depth of 1.0 m (3.3 ft). No buried former stable ground surfaces such as paleosols or anthrosols were identified. All of the artifacts, except one, a quartzite flake, were recovered from the uppermost or buried plowzones. The quartzite flake, recovered from Test Pit 7, was recovered from the upper cm (4 in) of the alluvial stratum beneath the uppermost plowzone.

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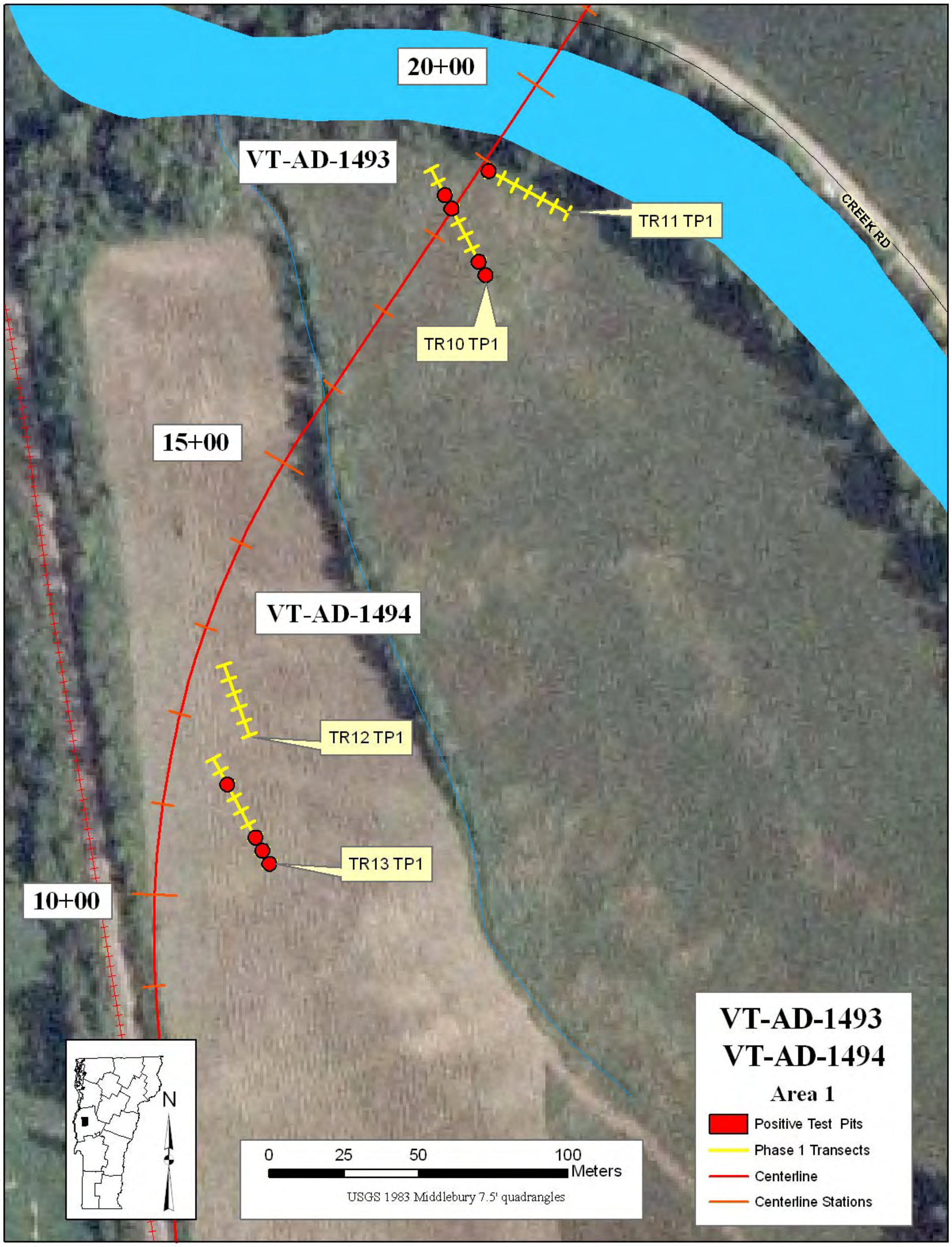

Figure 8. Map showing the location of the Phase I test pits and sites VT-AD-1493 And VT-AD-1494 within archaeologically sensitive Area 1 of the proposed Middlebury ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Lithic Tools

A small biface edge fragment (cat. #414; Figure 10) was recovered from the upper 7 cm (2.8 in) of the plowzone of Transect 10, Test Pit 1. The edge is thin and brittle and does not appear to be finished. Made of a grayish brown chert, this artifact suggests that to some degree, stone tools were manufactured at the site.

A processing tool, likely a scraping implement (cat. #413; see Figure 10) was recovered from the upper 10 cm (4 in) of the plowzone from Transect 10, Test Pit 2. This tool is small, measuring only 2.7 cm in length. The bit end, or utilized end, consists of a small, excavate edge with dorsal surface retouch flaking to produce a viable working edge. The edge is heavily rounded and polished, suggesting use on a soft substance such as hide or green wood. This tool may have been hafted.

Figure 9. View northeast of the UVM CAP archaeologists excavating test pits along Transect 10, west levee of relict Otter Creek Channel, Area 1 of the proposed Middlebury ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont. Otter Creek behind treeline in background.

Figure 10. Chert uniface scraper and biface edge portion recovered from Transect 10, Test Pit 1, and Transect 10, Test Pit 2, respectively, from site VT-AD-1493, Area 1 of the proposed Middlebury ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Area 1, Site VT-AD-1494

Site VT-AD-1494 is located in the western portion of Area 1 and just to the east of the Vermont Railway mainline. Two linear transects containing a total of 15 test pits spaced at 5 m (16 ft) intervals (see Figure 8). Transect 12 was located on the western levee of a relict Otter Creek channel, and it contained 6 test pits. No prehistoric Native American archaeological deposits were identified within the test pits excavated along Transect 12.

Transect 13 was located approximately 12 m (39 ft) to the west and southwest of Transect 12, and it contained 9 test pits (see Figure 8). Four test pits, 1-3 and 7 contained prehistoric artifacts (see Figure 8). Test Pits 1 and 2 produced one fragment of fire-affected rock from the uppermost plowzone stratum, from 10-20 cm (4-8 in) below the ground surface. A total of 20 lithic debitage specimens were recovered from the plowzone of Test Pit 3, from 10-20 cm (4-8 in) below the ground surface. One chert debitage specimen was recovered from the uppermost plowzone of Test Pit 7. All of the chert debitage appears to be derived from the Clarendon Springs formation, known to outcrop nearby along the southeastern shore of Lake Champlain. No evidence of cultural features, such as hearths, were identified at site VT-AD-1494 but the recovery of two fragments of fire-affected rock suggests that cultural feature(s) could be located in the vicinity. None of the artifacts recovered from site VT-AD-1494 are temporally diagnostic and therefore, the site can only be attributed to the general prehistoric period, ca. 9500 B.C. – A.D. 1600.

Stratigraphic soil profiles recorded for the test pits excavated at site VT-AD-1494 include an uppermost 20-23 cm (8-10 in) thick, silt loam plowzone underlain by weathered clay loam subsoil. Buried former stable ground surfaces such paleosols and anthrosols were not identified at site VT-AD-1494.

Figure 11. View southwest of UVM CAP archaeologists excavating test pits along Transect 13, Area 1, site VT-AD-1494 for the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Area 2, VT-AD-1495

Area 2 encompasses a wide ridge top overlooking the Otter Creek and its floodplain to the west and an expansive wetland to the east (see Figure 4). At the time of the Phase I survey, Area 2 was a fallow, unplowed cornfield. Given the modest visibility of the barren surface of the field, a surface inspection was conducted within the approximate limits of the proposed alignment corridor and transload facility, resulting in the visual inspection of approximately 1.2 hectares (3 acres) of the wide ridge top and intermediate terraces along its western and eastern flanks (Figure 12). Of note, the western portion of the proposed alignment scales an intermediate terrace and the highest terrace where a gap exists between two brush covered outcrops of bedrock (Figures 13 & 14).

Site VT-AD-1495 was identified by the recovery of 72 lithic artifacts from the exposed surface of the fallow field in the western portion of the proposed preferred alignment (see Figure 12). The majority of the artifacts were found in a dense concentration located to the east of the northern bedrock outcrop, in the location of the proposed transload facility. The artifact density tapers off to the south, ending approximately 20 m (66 ft) to the north of project design Station 31+00 (see Figure 12). Based on the horizontal distribution of the artifacts, site VT-AD-1495 encompasses approximately 600 m^2 (6,456 ft^2).

All of the artifacts were derived from Cheshire quartzite, and include three biface fragments, three modified flake tools, a large core and 65 specimens of debitage. None of the lithic artifacts are temporally diagnostic and as such, site VT-AD-1495 can only be attributed to the general prehistoric time period, ca. 9500 B.C. – A.D. 1600. Although most of the surface collected artifacts are located to the north of the proposed preferred alignment, additional artifacts may be recovered from a much broader area following the plowing of the fallow field.

To better define the extent of the site and to determine if it intersected the proposed preferred alignment, one linear transect, designated Transect 17, containing four test pits spaced at 5 m (16 ft) intervals, was excavated to the east of the two bedrock exposures and within the corridor of the alignment (see Figure 12). Transect 17 was located roughly 25 m (82 ft) to the east of the western terrace edge (Figure 15). No prehistoric Native American artifacts were recovered from the any of the four test pits excavated along Transect 17. Stratigraphic soil profiles recorded for these test pits included a 20 cm (8 in) thick uppermost, clay plowzone underlain by intact, weathered clay loam subsoil.

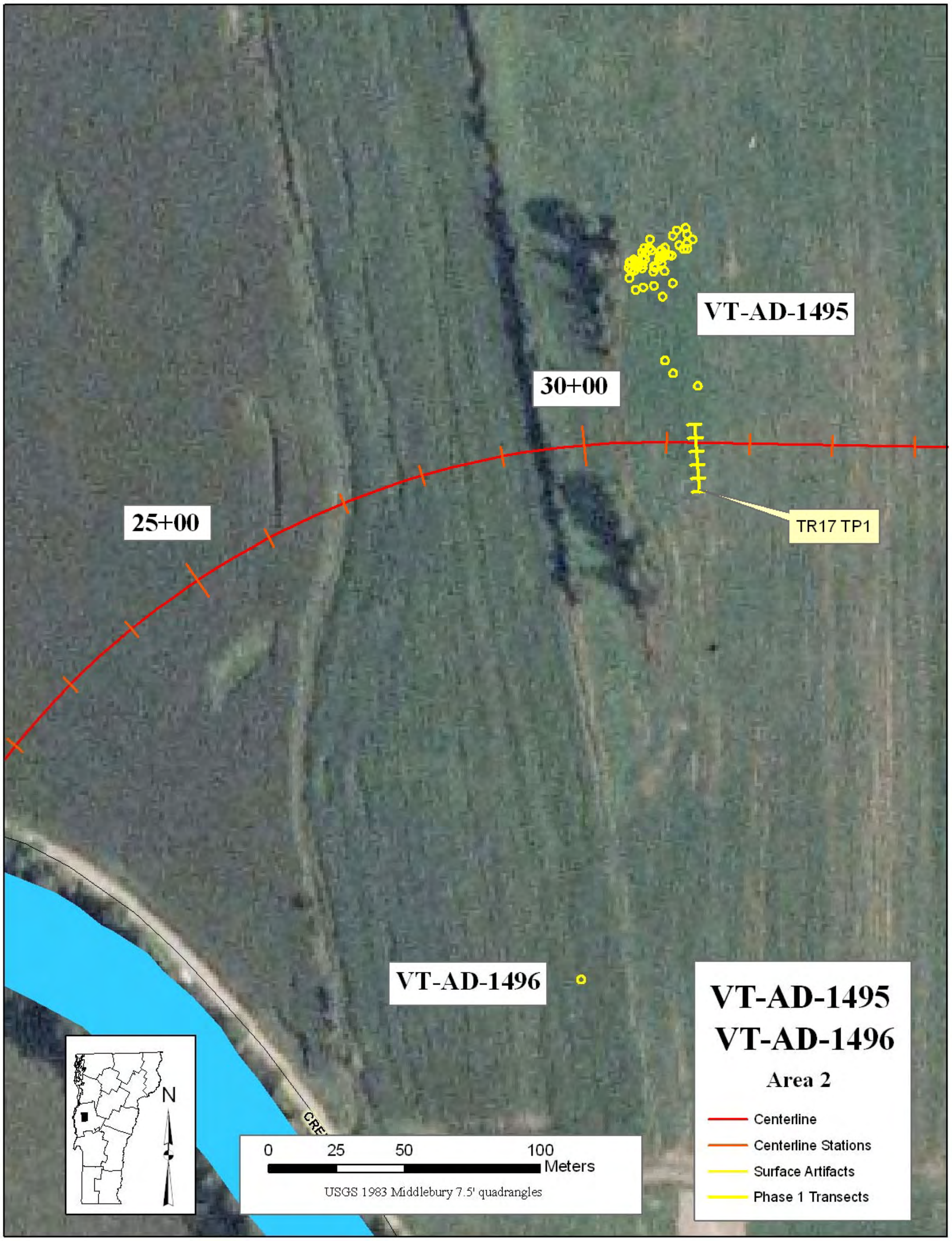

Figure 12. Map showing the location of the Phase I test pits and sites VT-AD-1495 and VT-AD-1496 within archaeologically sensitive Area 2 of the proposed Middlebury ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Figure 13. View west of UVM CAP archeologists conducting a surface inspection of
a fallow cornfield in Area 2 of the proposed Middlebury Rail ST SPUR(2) rail alignment,
Middlebury, Addison County, Vermont.

Figure 14. View west of surface collected artifact locations in fallow cornfield of
Area 2, site VT-AD-1495, of the proposed Middlebury Rail ST SPUR(2) rail alignment,
Middlebury, Addison County, Vermont.

Figure 15. View east of the UVM CAP archaeologists excavating test pits along Transect 17, Area 2, site VT-AD-1495 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury Addison County, Vermont.

Lithic Tools

Two early stage bifaces (cat. #505 and 512; Figure 16) were recovered from the dense lithic artifact concentration of site VT-AD-1495 (see Figure 12). The two biface fragments represent early stage reduction as both are tabular and blocky. Both were likely broken during manufacture, as suggested by the linear fracture facets across their bodies. The whole biface is also representative of early stage reduction as a prominent platform and incipient bulb-of-percussion are present along one lateral edge and the ventral surface. This biface is ovoid in shape but still too early in the production stage to suggest a possible finished tool type.

A large modified flake tool (cat. #515; Figure 17) was recovered from the dense concentration of surface collected artifacts. This tool is unusual in that it is very large, measuring 14 cm (5.8 in) in length, 7.1 cm (2.8 in) in width, and 3.9 cm (1.5 in) in thickness. For descriptive purposes, this tool is shaped like an axe head, with a thick “pole” end which gradually tapers to a thin, crescent shaped “bit” end. Unifacial flaking is visible along one lateral surface of the bit end. Given the grainy texture of quartzite, it is difficult to discern damage as a result of use along the bit end. What might be considered edge damage from use could also be platform preparation for the unifacial flaking of the one lateral surface. The pole end of this tool consists of a thick, linear fracture.

A second modified flake (cat. #522; Figure 18), also recovered from the dense concentration of surface artifacts, appears to have been used as a heavy-duty scraping/shaving implement. Made of a blocky, robust fragment of quartzite, the working edge of this tool has been prepared by the removal of series of dorsal surface flakes, creating a steep faceted edge. Damage from use consists of moderate step fractures and microflaking, and patches of moderate to heavy rounding along the modified edge. This tool was most likely handheld.

The third modified tool (cat. #539; see Figure 18) appears to be a broken drill. The bit end, or perforating end, is broken and missing. The bit end has been triangularly shaped by the removal of alternating flakes from three sides. This tool is large and was undoubtedly held by end, as the pole end of the tool is very thick. A concave edge along the bit end may also have been used as a knife as a series of small step fractures and microflakes are visible along the dorsal edge surface.

A large core (cat. #508), weighing 2.5 kg (5.5 lbs) was recovered from the dense concentration of surface collected artifacts (Figure 19). The core exhibits many large primary flake scars. One facet of the core contains cortex, suggesting that the core was originally derived from a cobble. The cobble may have originated from the Otter Creek and was subsequently transported to the site area.

Figure 16. Quartzite biface fragments recovered from Area 2, site VT-AD-1495 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Figure 17. Quartzite modified flake tool recovered from Area 2, site VT-AD-1495 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Figure 18. Quartzite modified flake tools recovered from Area 2, site VT-AD-1495 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont. From to left to right: modified flake tool, broken drill, modified flake tool.

Figure 19. Quartzite core recovered from Area 2, site VT-AD-1495 of the proposed Middelbury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Lithic Debitage

As previously stated, all of the lithic debitage recovered from site VT-AD-1495 was derived from Cheshire quartzite. An analysis of debitage size and physical attributes indicates that initial and secondary lithic reduction activities were conducted at the site. Of the 65 debitage specimens, 8 are less than 1 cm in size; 37 are from 1-3 cm in size; 13 are from 3-5 cm in size; and, 7 are larger than 5 cm. None show cortex such as that found on the large core. Hard hammer percussion, by either stone or antler billet, was likely used during the reduction processes.

Area 3

Area 3 is located between project design Stations 55+00 and 60+00 (see Figure 4). Based on the UVM CAP ARA, Area 3 included the entire large agricultural field located to the east and north of expansive wetlands (Figure 20). Due to insufficient project design maps during the site inspection, an area to the south of the proposed alignment was tested with subsurface test pits (see Figure 20). Three linear transects containing a total of 22 test pits were used to sample the slight ridge in the southern portion of the agricultural field (see Figure 20). Transects 7 and 8 were oriented parallel to slight terrace edge overlooking the wetlands to the west. Transect 9 was located to the east and perpendicular to Transects 7 and 8. All test pits were spaced at 5 m (16 ft) intervals. No prehistoric Native American sites were identified as a result of the subsurface testing conducted in Area 3.

Stratigraphic soil profiles recorded for the test pits excavated in Area 3 include a 20-25 cm (8-10 in) thick uppermost plowzone underlain by weathered intact subsoil. The soil encountered along Transects 7-9 was extremely difficult to excavate and screen, as it is classified as Vergennes clay.

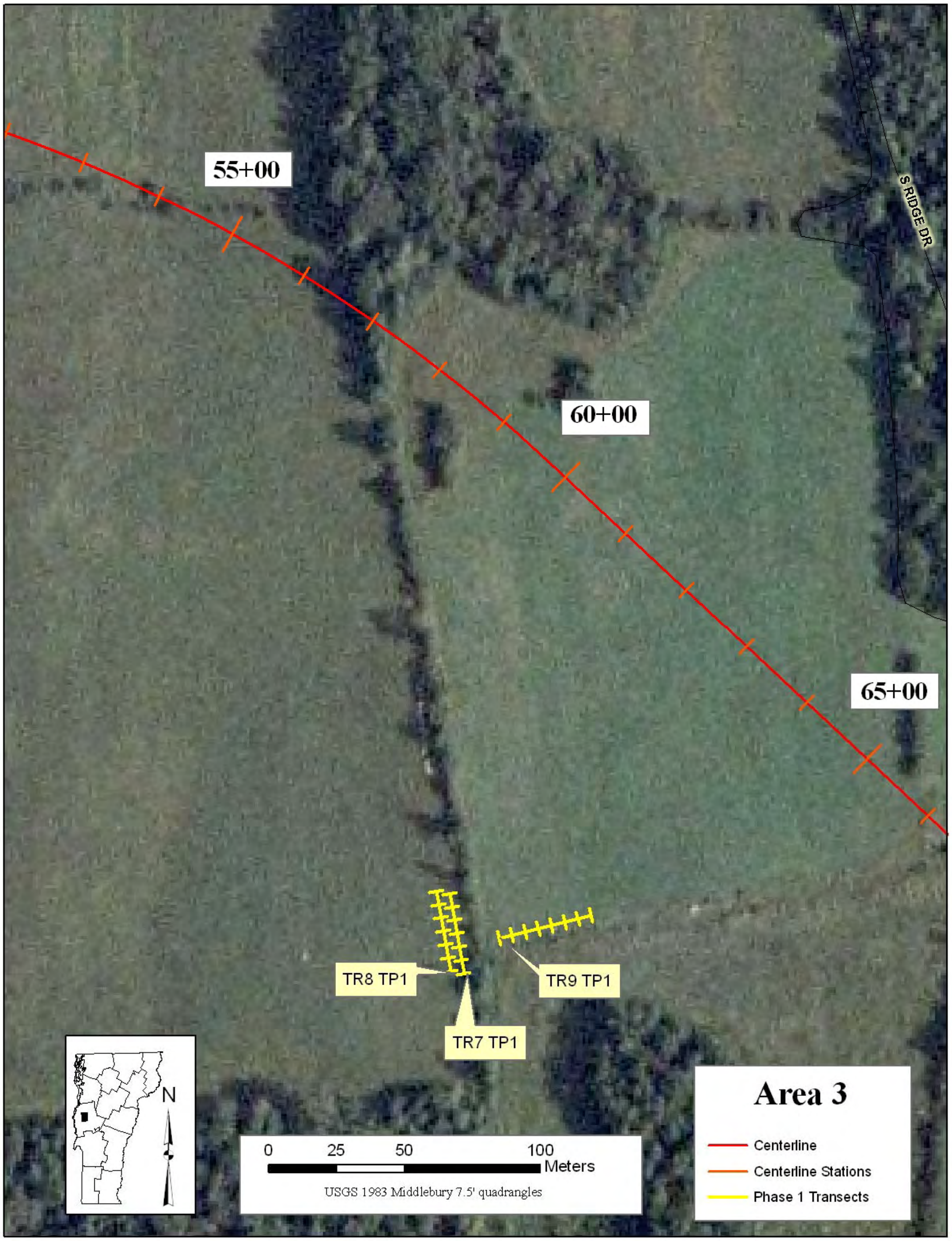

Figure 20. Map showing the location of the Phase I test pits within archaeologically sensitive Area 3 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Figure 21. View south of the UVM CAP archaeologists excavating test pits along Transect 9, Area 3, of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Area 4

Area 4 is located between project design Stations 89+00 to 96+00 (see Figure 4). Specifically, two spatially discrete ridges, one each located on the east and west sides of Halladay Road, were designated for subsurface testing during this initial Phase I site identification survey. Transects 1-3 were located on a generally level ridge located east of Halladay Road, and south of a small, unnamed tributary that ultimately flows into the Otter Creek (Figure 22). In addition to the transects, a cluster, containing four test pits, was excavated on a lower knoll overlooking the tributary, which is located just beyond a fence line to the north (see Figure23). Transects 1-3 were spaced 5 m (16 ft) apart. All of the test pits along the transects and within the cluster were spaced at 5 m (16 ft) intervals. No prehistoric Native American archaeological sites were identified in this portion of Area 4 as a result of the subsurface testing.

The subsurface testing on the ridge crest located on the west side of Halladay Road involved the excavation of 15 test pits located along three linear, parallel transects which were spaced 5 m (16 ft) apart (see Figure 22). All of the test pits were spaced at 5 m (16 ft) intervals. Transects were located to the north of a bedrock outcrop and overlooked the unnamed Otter Creek tributary and wetlands below and to the east and south. No prehistoric Native American sites were identified on the western ridge as a result of the subsurface testing.

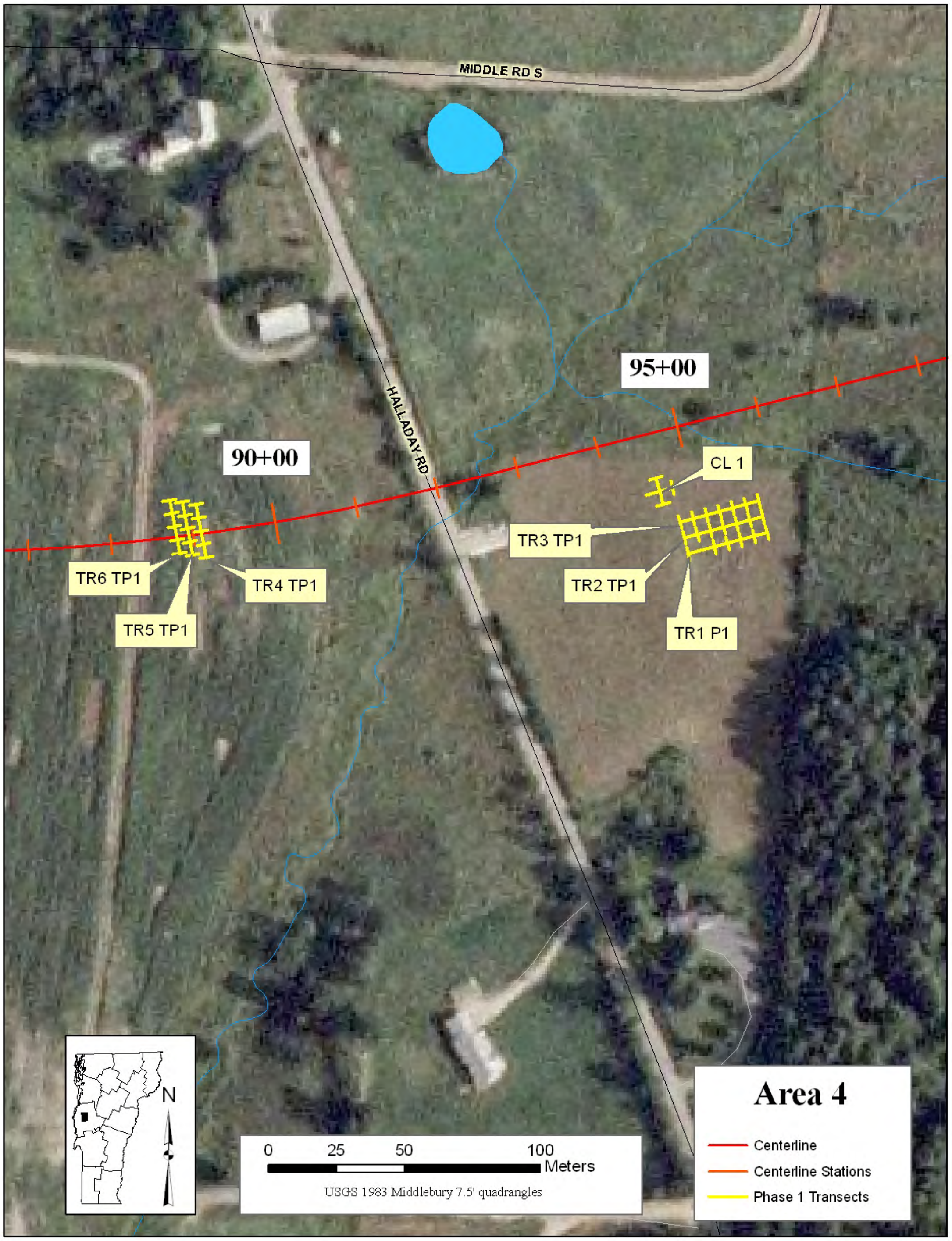

Figure 22. Map showing the location of the Phase I test pits within archaeologically Sensitive Area 4 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Stratigraphic soil profiles recorded for the test pits excavated in Area 4 include a 15-20 in (6-8 in) thick uppermost plowzone underlain by weathered subsoil. The soil encountered on both ridge tops was extremely difficult to excavate and screen, given that it is classified as Vergennes clay.

Figure 23. View west of the UVM CAP archaeologists excavating test pits along Transects 1-3 within archaeologically sensitive Area 4 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Area 5

Area 5 is located in the eastern part of the proposed preferred alignment, between project design Stations 155+00 to 160+00 (see Figure 4). In addition to the proposed alignment, a transfer station is also proposed in this area (see Figure 4). The proposed railway line and transfer station are situated on a series of gentle, east-west trending ridges located on the western side of a small, mechanically enhanced, tributary of Beaver Brook. The area is currently an active hayfield. Recent archaeological studies related to the VELCO Northwest Reliability Project power line corridor, located on the east side of the tributary, resulted in the identification of a small prehistoric Native American site designated VT-AD-1395 (see Figure 3; Robinson et al. 2008). This site was identified by the recovery of one quartzite lithic debitage specimen from the northeast corner of the hayfield, adjacent to the tributary. This area was heavily disturbed by drainage enhancement and quarrying activities.

Three linear transects, designated Transects 14-16, were used to sample the three small ridges (Figure 25). A total of 19 test pits, spaced at 5 m (16 ft) intervals, were excavated in Area 5. No prehistoric Native American sites were identified as a result of the subsurface testing along the three small ridges.

Stratigraphic soil profiles recorded for the test pits excavated along Transects 14-16 include an uppermost 15-25 cm (6-10 in) thick clayey plowzone, underlain by intact clay subsoil. Following the excavation of the test pits, consultation with the landowner revealed that this area, particularly the ridges, had been historically graded to improve the local agriculture.

Figure 24. View north of the UVM CAP archaeologists excavating test pits along Transect 15 within archaeologically sensitive Area 5 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

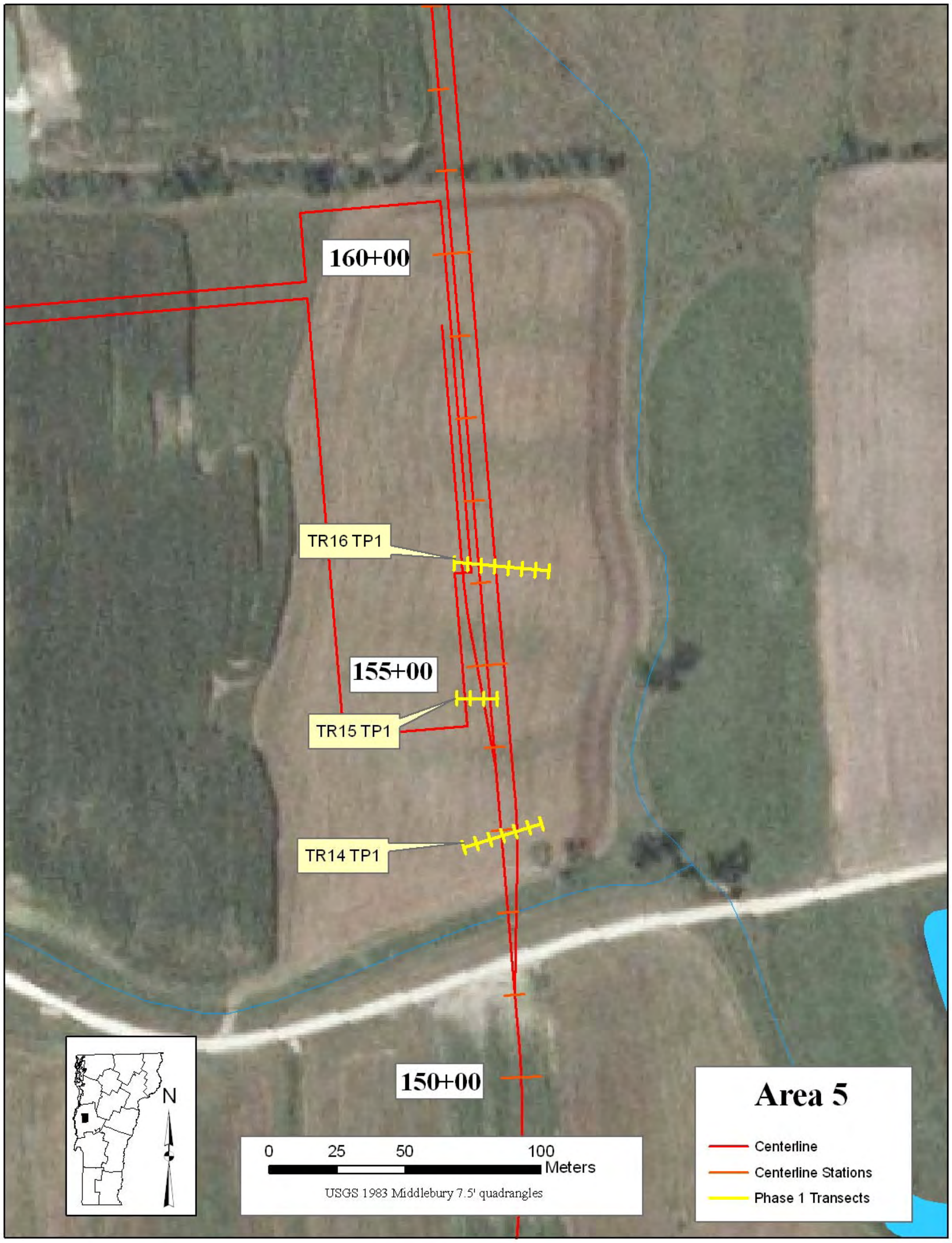

Figure 25. Map showing the location of Phase I test pits within archaeologically sensitive Area 5 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Non-Area Outside APE, Site VT-AD-1496

Site VT-AD-1496 was identified by the UVM CAP field crew while in route to Area 2 (see Figure 3). Two chert debitage specimens were recovered from the fallow, unplowed surface of a cornfield located on a gentle west facing slope of a ridge overlooking the Otter Creek floodplain. The site is located approximately 80 m (262 ft) to the south of site VT-AD-1495 and the proposed Middlebury Spur APE (see Figure 12). The artifacts were plotted and collected with the aide of a handheld Global Positioning system (GIS). Site VT-AD-1496 is located far from the proposed preferred alignment corridor, but it could fall within any proposed access road to the corridor given its close proximity to an existing farm access road.

Conclusions and Recommendations

The initial Phase I site identification survey along several topographic features within a subset of five archaeologically sensitive areas along the proposed preferred alignment resulted in the identification of three previously unknown prehistoric Native American archaeological sites, VT-AD-1493, 1494 and 1495. A fourth site, VT-AD-1496, was identified outside of the proposed alignment corridor while accessing the corridor. Four of the five subset areas, 1, 2, 4 and 5, received a high sensitivity score based on environmental criteria and proximity to known archaeological sites. One area, Area 3, was graded as moderate to low sensitivity, based on the same criteria.

Sites VT-AD-1493 and 1494 are located within Area 1, which occupies a portion of the broad Otter Creek floodplain and proposed project design Stations 10+00 to 19+00. Specifically, site VT-AD-1493 is located between design Stations 18+00 and 19+00, on the east and west sides of a relict channel of the Otter Creek. The placement of the two transects intersected the proposed railway alignment, and as such, the goal of identifying any sites within this portion of the alignment was achieved. It is highly likely that the site is much larger than presently defined. In addition, although no deeply buried archaeological deposits were identified at this time, it is also possible that they may exist in other untested portions of the alignment in this area. In order to determine the size, age(s), possible function(s), integrity and overall significance of site VT-AD-1493, a Phase II site evaluation is recommended prior to any proposed construction within this portion of the proposed alignment.

Site VT-AD-1494 is located in the western portion of Area 1, just to the south of proposed project design Stations 10+00 to 13+00. Two transects were placed along and parallel to a relict levee of a former channel of the Otter Creek. At the time of the Phase I testing, the proposed alignment was not visibly demarcated and hence, the placement of the transects fell just outside of the proposed centerline of the alignment. However, a portion of the known site, identified in Transect 13, Test Pit 7, may fall within the limits of construction disturbance. Given that the relict channel levee extends north from the known site area and crosses the alignment between Stations 12+00 to 13+00, it is likely that the site extends into this portion of the alignment. A Phase II site evaluation is recommended at site VT-AD-1494 to better determine its size, age(s), possible function(s), integrity and overall significance prior to any proposed construction between project design Stations 10+00 to 14+00.

In addition to the recommended Phase II site evaluations of sites VT-AD-1493 and 1494, further Phase I site identification testing is recommended in two other highly sensitive portions of the proposed alignment within Area 1 that were identified during a site inspection and/or during the course of the initial Phase I survey (Figure 26). These areas include the relict levees present between project design Stations 14+00 to 15+00 (west side of enhanced stream), and between Stations 16+00 to 17+00 (east side of enhanced stream) (see Figure 26). It may prove that the entire floodplain contains archaeological deposits and that one large site, possibly representing multiple occupations, is present on this portion of the Otter Creek floodplain.

Site VT-AD-1495 is located within the western portion of Area 2, adjacent to a terrace edge overlooking the Otter Creek and its floodplain to the west. The site is situated on a generally level agricultural field just to the east of two bedrock outcrops. The proposed alignment passes through the gap between the outcrops. The site was identified during a visual inspection of a fallow field. A dense concentration of lithic artifacts was encountered approximately 50 m (162 ft) to the north of the centerline, with several artifacts found as close as 15 m (49 ft) away to the north. A transload facility is proposed in this area, extending from the southern limits of the dense concentration of artifacts up to the centerline. Limited subsurface testing was conducted across the proposed alignment centerline at approximately station 31+25, and no archaeological deposits were identified in these test pits. Given the unplowed nature of the fallow field and modest surface visibility, a more accurate determination of the site's size could not be ascertained. Therefore, a Phase II site evaluation of site VT-AD-1495 is recommended prior to any proposed ground disturbance between proposed project design Stations 30+00 to 32+00, and up to and including the proposed location of the transloading facility and core area of site VT-AD-1495.

In addition to the recommended Phase II evaluation at site VT-AD-1495, supplemental Phase I testing is recommended along the length of the proposed alignment, between Stations 32+00 to 37+00, that cross the level ridge top and descends down the eastern terrace slope adjacent to expansive wetlands (Figure 27). The Phase I testing in this area should include a combination of surface reconnaissance of the plowed alignment and subsurface testing around any identified surface artifacts, and along the eastern terrace slope.

The last site identified during the initial Phase I survey, VT-AD-1496, was found while accessing Area 2. Two lithic debitage specimens were collected from a gentle west facing slope in a fallow field. This site is located approximately 200-250 m (656-813 ft) to the south of site VT-AD-1495, 110 m (361 ft) to the east of Creek Road, and 50 m (164 ft) to the northeast of an existing farm field road. At present, this site is far from any proposed impact associated with the proposed alignment. If, however, the farm access road is to be used as an access into the alignment corridor, consideration of additional

Phase I testing should be given to the site, dependent upon its proximity to any proposed access road.

Subsequent to the Phase I testing within Area 3, the project design plans were altered, thereby shifting the proposed alignment to the northwest to exit the northwestern portion of the agricultural field instead of the southwestern portion of field (see Figure 20). The shift in the alignment was likely done to avoid the expansive wetlands located between Areas 2 and 3.

The Phase I testing in Area 3, located in the southwestern corner of the agricultural field, did not result in the identification of any prehistoric Native American archaeological sites. The new alignment, moved to the northwest, does appear to be sensitive, given its topographic location adjacent to the wetlands on a gentle slope, and its proximity to similar sites (VT-AD-1442 and VT-AD-1443) identified on similar landforms located 240 m (787 ft) and 600 m (1,968 ft) to the west (Fletcher and Crock 2008). For these reasons, a Phase I site identification survey is recommended within Area 3 from revised proposed design Stations 59+00 to 63+00 (Figure 28).

The Phase I testing within two portions of Area 4 did not result in the identification of any prehistoric Native American sites. The testing was focused along the level tops of two ridges located on the east and west sides of Halladay Road. Due to time constraints, other sensitive portions of Area 4 were not sampled, and these included the lower terraces between proposed project design Stations 85+00 to 87+00, and the series of terraces and ridge tops located adjacent to an unnamed stream between Stations 94+00 to 98+00 (Figure 29). A Phase I site identification survey is recommended in these areas to determine the presence/absence of any prehistoric era site.

The phase I testing within Area 5 did not result in the identification of any prehistoric Native American sites within this portion of the proposed alignment. Contact with the current landowner indicated that large portions of the area had been substantially altered and disturbed to enhance modern agriculture and thus, the integrity of any archaeological site within this area would be severely compromised. In addition, almost the entire alignment between project design Stations 123+00 to 160+00 has also been disturbed in the past, thereby negating the integrity of any possible sites within this portion of the proposed alignment (see Figure 3). This section of the alignment begins at Lower Foote Street and ends at the OMYA quarry. No further archaeological study is recommended in this portion of the proposed preferred alignment.

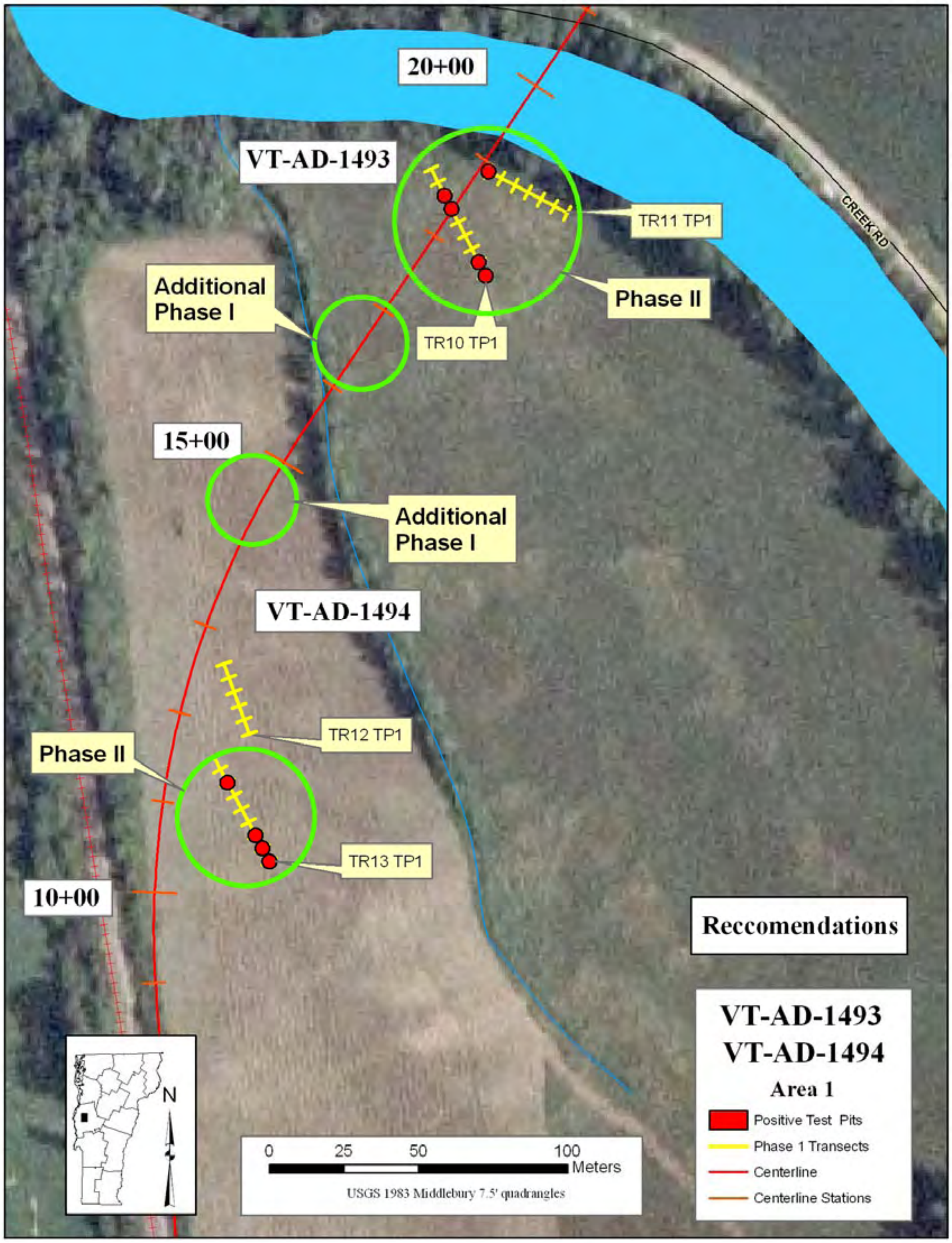

Figure 26. Map showing areas of recommended Phase II of sites VT-AD-1493 and 1494, and additional Phase I studies in archaeologically sensitive Area 1 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

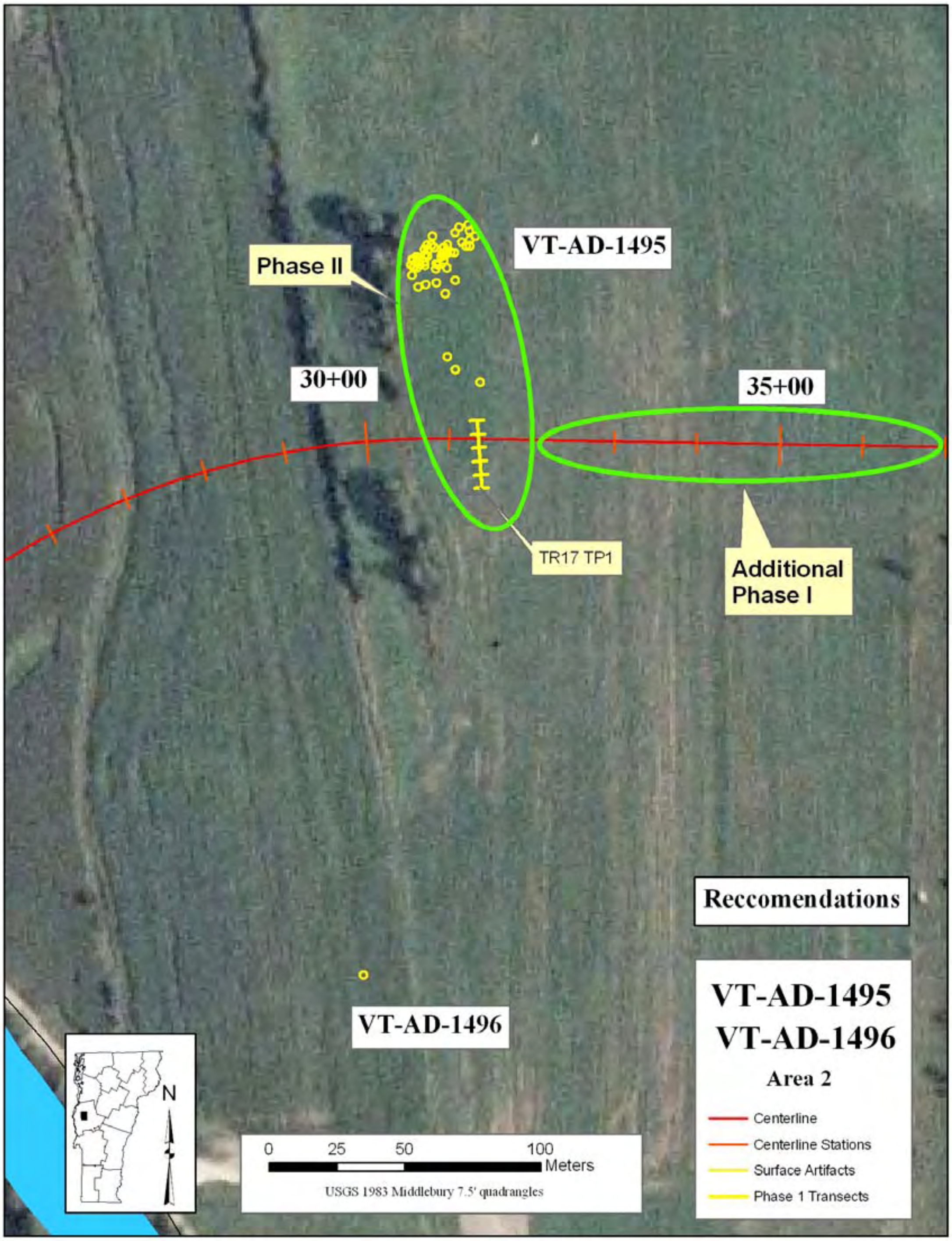

Figure 27. Map showing areas of recommended Phase II of sites VT-AD-1495, and additional Phase I studies in archaeologically sensitive Area 2 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

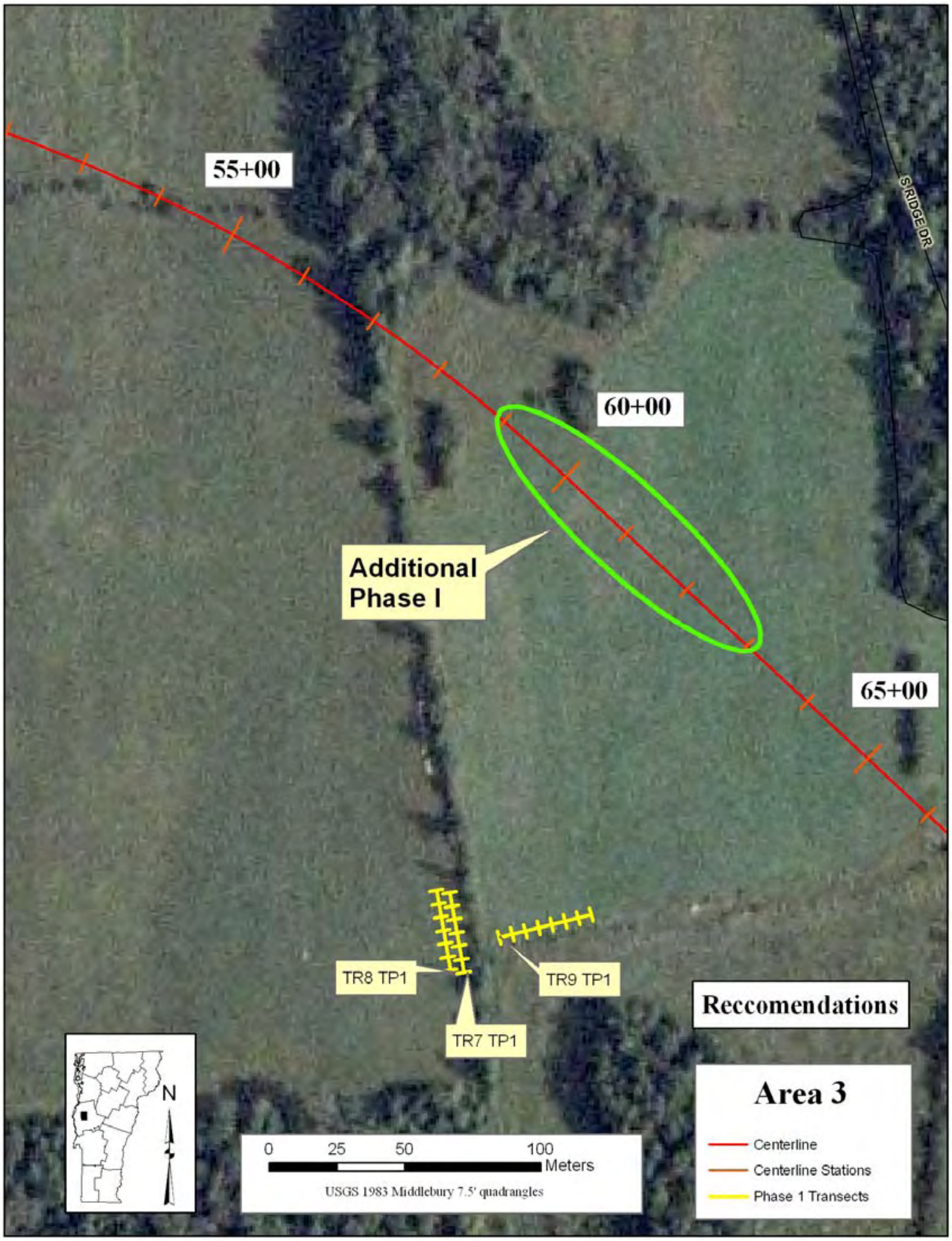

Figure 28. Map showing areas of recommended for additional Phase I studies in archaeologically sensitive Area 3 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

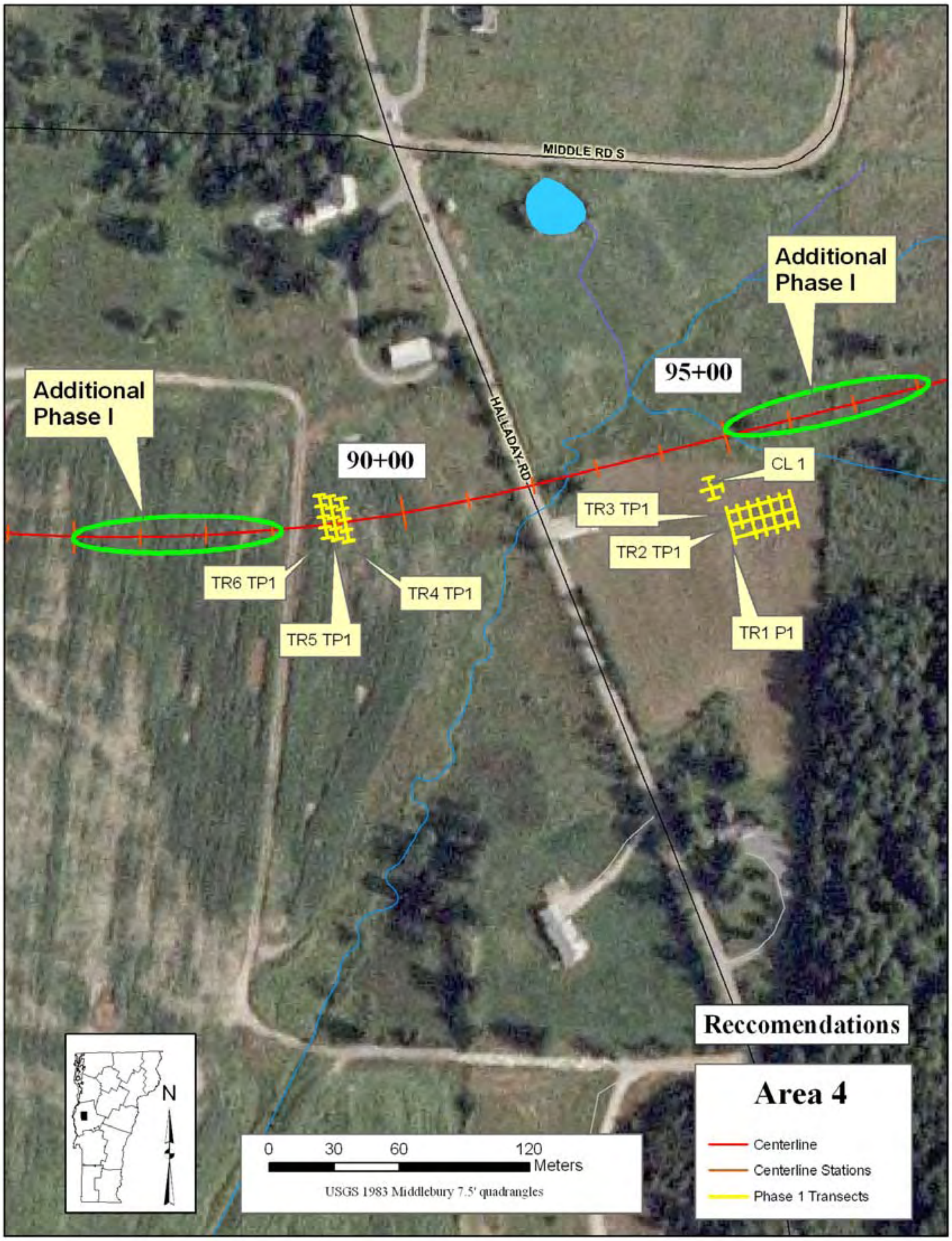

Figure 29. Map showing areas of recommended for additional Phase I studies in archaeologically sensitive Area 4 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Second Subset of Archaeologically Sensitive Areas

The initial Phase I site identification survey included a sampling of archaeologically sensitive landforms within five archaeologically sensitive areas as defined by the Vermont Division for Historic Preservation's GIS based predictive model, a review of the VAI, and an inspection of the preferred alignment. The Phase I testing did not test all archaeologically sensitive areas within the first subset however, and will require additional Phase I testing at some point in the future. Nonetheless, the Phase I survey identified four previously unknown prehistoric Native American archaeological sites. Based on the results of this initial survey, a second subset of four additional archaeologically sensitive areas have been identified and require Phase I testing prior to any proposed construction within the preferred alignment. Furthermore, as previously stated, other sensitive portions of the original subset of five areas will require Phase I or Phase II testing. The second subset of archaeologically sensitive areas is designated as Areas 6-9, and they are described below.

Area 6

Area 6 includes the eastern floodplain of the Otter Creek, opposite that of Area 1 where prehistoric Native American sites VT-AD-1493 and 1494 are located, and includes project design Stations 21+00 to 27+00 (Figure 30). The preferred alignment descends down the western slope of Area 2 and extends approximately 150 m (492 ft) from the toe-of-slope to the eastern levee of the current Otter Creel channel. At present, Area 6 is actively cultivated in corn. At least one relict channel of Otter Creek is visible within the floodplain. Given that Area 6 occupies a floodplain, there is a potential for deeply buried, stratified archaeological deposits, and as such, a Phase I survey in this portion of the alignment should include a testing strategy capable of identifying any such sites.

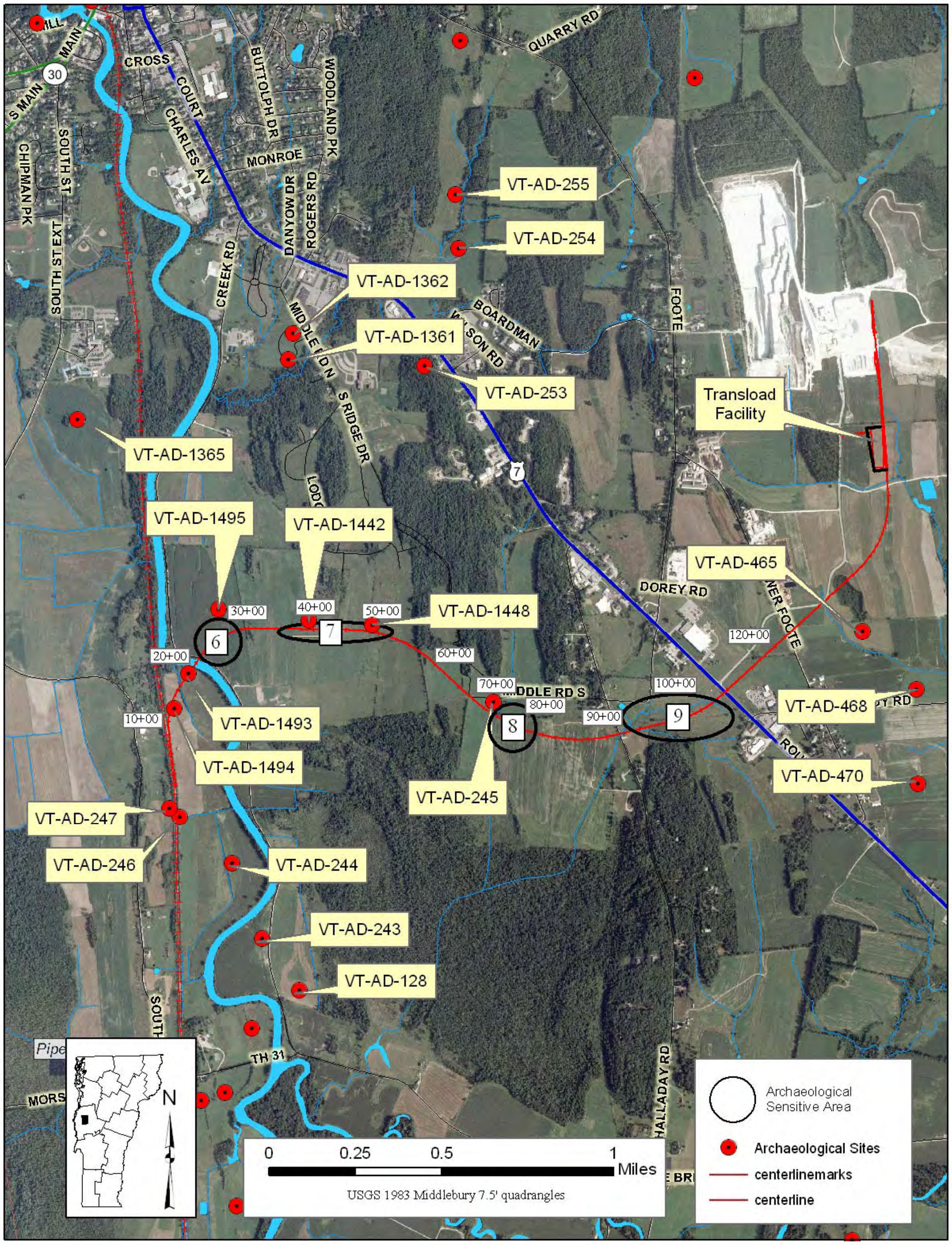

Figure 30. Map showing the location of subset of archaeologically sensitive Areas 6-9 of the proposed Middlebury Rail ST SPUR(2) rail alignment, Middlebury, Addison County, Vermont.

Area 7

Area 7 is located along the northern margins of a vast wetland located between Area 2 and Area 3, and includes project design Stations 37+00 to 57+00 (see Figure 30). Presently, this area is an active cornfield field between design Stations 37+00 and 39+00, and a hayfield and brush line between Stations 39+00 to 57+00. Several slight rises, approximately 1-2 m (3.3-6.6 ft) in elevation, are present along the margins of the wetland. One such rise, near Station 49+50, contains prehistoric Native American site VT-AD-1443, which was identified during the course of archaeological studies related to a residential development project (see Figure 30; Fletcher and Crock 2008). The small rise was plowed and a broken Meadowood type projectile point was recovered during a surface inspection. Subsequent test pit sampling around this artifact find-spot did not result in the identification of additional artifacts. Meadowood type projectile points are attributable to the Early Woodland period, ca. 900-100 B.C.

A second prehistoric Native American site, designated VT-AD-1442, was also identified during the course of archaeological studies related to the development project (see Figure 26; Fletcher and Crock 2008). A surface inspection of the plowed cornfield resulted in the recovery of a Swanton Corner-notched type projectile point diagnostic of the Early Archaic period, ca. 7000-5500 B.C., and several specimens of lithic debitage. Subsequent test pit sampling around the cluster of artifacts did not result in the recovery of additional archaeological deposits. The site occupies a 5 m (16 ft) high ridge located approximately30-80 m (98-262 ft) to the north of project design Station 39+00 (see Figure 26).

The identification of these two sites underscores the archaeological sensitivity of this section of the proposed alignment. A phase I site identification survey, including plowing and test pit sampling between Stations 37+00 to 57+00, is recommended prior to any proposed construction along the margin of the wetland.

Area 8

Area 8 is located in an active hayfield and cornfield on the east and west sides of a small Otter Creek tributary, between project design Stations 72+00 to 75+00 (see Figure 30). One prehistoric Native American site, VT-AD-245, is known along this small tributary. The site was identified during archaeological studies related to the proposed Middlebury Bypass project (Thomas and Robinson 1980). The site was identified by the surface recovery a Levanna type projectile point and three debitage specimens from a 10 square meter area in a fallow, unplowed hayfield. No subsurface test pit sampling was conducted at this site. Levanna type projectile points are attributed to the Middle and Late Woodland periods of Vermont prehistory, ca. A.D. 750-1600. The site is located approximately 50 m (164 ft) to the north of the proposed alignment centerline. Given that the size of the site is not full established, and the sensitivity of the stream banks, a Phase I site identification survey is recommended in this portion of the alignment prior to any proposed construction.

Area 9

Area 9 is located to the east of Area 4, and west of Vermont Route 7, between project design Stations 118+00 to 123+00 (see Figure 30). This area includes several small tributary streams and associated wetlands and small terraces. Portions of this area are presently in active hayfield. Phase I subsurface test pit sampling is recommended in this portion of the proposed preferred alignment prior to any construction.

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APPENDIX I: SOIL PROFILES

Key

Ap	Plowzone, disturbed layer
B	Horizon which has been physically and chemically weathered.
C	Subsoil horizon; parent material from which soil developed.
l	Loam
s	Sand
si	Silt
dk	Dark
lt	Light
v	Very
f	Fine
brn	Brown
grysh	Grayish
ol	Olive
yllw	Yellowish

APPENDIX II: STAFF ASSIGNMENTS

Principal Investigator	John G. Crock, Ph.D.
Research Supervisor	Geoffrey A. Mandel
Field Crew Members	Cullen Black Andrew Fletcher Robert Ingraham Kevin Lambert Alix Martin Charles Paquin Jeremy Ripin Anitra Sapula Mary Stilley-Wesley
Laboratory Staff	Alix Martin
Photographer	Geoffrey A. Mandel
Lithic Analysis	Geoffrey A. Mandel
Cartography	Charles Knight, Ph.D.
Report Production	Jessica Desany, M.A.
Editor	Charles Knight, Ph.D.

PUBLIC INFORMATION SUMMARY

The University of Vermont Consulting Archaeology Program (UVM CAP) conducted a Phase I site identification study from September 19 to October 10, 2007 for the proposed Middlebury ST SPUR(2) – Environmental Impact Statement project located in Addison County, Vermont, as part of the Section 106 National Historic Preservation Act (NHPA) as amended, permitting review process (Figure 1). Previously, the UVMCAP had identified numerous areas that are sensitive for precontact Native American sites that will be disturbed by the proposed project alignment. The preferred project alignment, designated RS-1/TR-1, begins at the OMYA rock quarry located in Middlebury, Vermont, east of Vermont Route 7. The alignment continues west, crossing Lower Foote Street approximately 300 m (984 ft) north of Cady Road, and continues southwest crossing Vermont Route 7 and Halladay Road. The alignment then turns northwest, crossing meadows, wetlands and agricultural fields before turning west, across Middle Road, the Otter Creek, and two more large fields before connecting with the existing railway mainline.

To assist with the identification of prehistoric archaeological Native American sites, the Vermont Division for Historic Preservation's (VDHP) Geographic Information System (GIS) data base was employed to help better predict the presence/absence of sites along the preferred alignment corridor. Approximately twenty agricultural fields and/or terraces, together forming ten archaeologically sensitive areas were delineated based on the criteria of the VDHP predictive model. To test the predictive model, a subset of five archaeologically sensitive areas was chosen for Phase I sampling following a physical site inspection of these areas. In total, three areas, designated Areas 1, 2 and 4, were determined to be highly sensitive for containing precontact era sites, and two, Areas 3 and 5 scored low to moderate for potential archaeological sites. Areas 6-10 are a second subset that were not investigated during this Phase I study.

As a result of the Phase I study, three previously unknown prehistoric Native American sites were identified. Two sites, designated VT-AD-1493 and 1494 were identified in Area 1 and site VT-AD-1495, was identified in Area 2. A fourth site, VT-AD-1496, was identified while accessing Area 2 in an area that will not be disturbed by the proposed project. The artifact inventory of all four sites consists of stone tools and the debris that results from making them. None of the artifacts could be dated, therefore the sites date to general prehistoric time period, ca. 9500 B.C. to 1600 A.D. The identification of these four sites underscores the effectiveness of the predictive model and site inspection as a means to identifying potential topographic areas containing sites, and as such, the remaining untested sensitive landforms within archaeologically Sensitive Area 1-5, in addition to sensitive Areas 6-10 will require Phase I examination before any proposed ground disturbance occurs within the project's APE. In addition, Phase II evaluations of sites VT-AD-1493, 1494 and 1495 are recommended prior to any proposed disturbance. Presently, no further archaeological work is recommended at site VT-AD-1496, given that is located outside of the proposed project's Area of Potential Effects (APE).

PROCESS MEMORANDUM OF AGREEMENT

AMONG THE FEDERAL HIGHWAY ADMINISTRATION (FHWA), AND THE VERMONT AGENCY OF TRANSPORTATION (VTRANS) IN ACCORDANCE WITH SECTION 4(G)(2) OF THE VERMONT STATEWIDE SECTION 106 PROGRAMMATIC AGREEMENT

REGARDING: Middlebury ST SPUR(2)
Middlebury Railroad Spur Project, Middlebury, Addison County, Vermont

WHEREAS, it is proposed that a railroad spur will be constructed in Middlebury to provide a new freight rail link with the main line of the Vermont Railway at a point approximately 2000 feet north of the mouth of the Middlebury River, to implement Middlebury ST SPUR(2): Middlebury Railroad Spur Project, Middlebury, Addison County, Vermont; and

WHEREAS, the project is an FHWA undertaking, and;

WHEREAS, the VTrans Archeology Officer has established the Middlebury ST SPUR(2) project Area of Potential Effect, as defined at 36 CFR 800.16(d), to comprise an approximately one thousand foot wide corridor beginning at the Omya quarry where it would head south and then southwest toward US 7, roughly following the current Omya access road. The alignment would cross Lower Foote Street about 25 feet below the existing elevation, then cross under US 7, passing under a new US 7 vehicular bridge over the rail spur. The alignment would then head west toward the mainline, traversing mostly farmland. It would cross Halladay Road via grade separated crossing toward the western terminus, then head south, bridging over Creek Road and Otter Creek, and connecting with the mainline heading south, a total length of 3.17 miles, and;

WHEREAS, the VTrans Archaeology Officer has established and the FHWA concurs that Middlebury ST SPUR(2) has extensive archaeological requirements to comply with Section 106 of the National Historic Preservation Act prior to construction of the project, and;

WHEREAS, the VTrans Archaeology and Historic Preservation Officers have determined and the FHWA concurs that the project's extensive archaeological requirements are consistent with the requirements of Section 4(G)(2) of the VT Statewide Section 106 PA allowing the development of a Process MOA; and

NOW, THEREFORE, the FHWA and the VTrans agree that, upon the FHWA's decision to proceed with Middlebury ST SPUR(2) that the VTrans Archaeology Officer acting on behalf of the VTrans shall ensure the following stipulations are implemented in order to take into account the effects of Middlebury ST SPUR(2) on historic properties.

Archaeological Stipulations

An archaeological modeling of the Area of Potential Effect and limited archaeological testing has been completed to confirm that there are numerous archaeological resources present. However, this only confirms the usefulness of the modeling and has initially identified some archaeological resources in the APE. Clearly defined archaeological studies (Phases I, II & III) in the VTrans Manual of Standards and Guidelines will have to be implemented for project review.

The FHWA in cooperation with the VTrans Archaeology Officer has determined that the Standard Mitigation Measures as defined in the VTrans Manual of Standards and Guidelines in Section 4G(1) - No. 15, Data Recovery of Archaeological Information, is appropriate to mitigate any adverse effects. Preservation in-place of archaeological resources, as a mitigation tool for adverse effects to archaeological resources, is not expected to be used in this project.

Standard Archaeological Stipulations
(From VTrans Statewide Manual of Standards and Guidelines)

The VTrans Archaeology Officer will ensure archaeological studies are conducted in a manner consistent with the Secretary of the Interior's Standards. The completed survey will be sufficient to determine the nature and extent of resources, evaluate their National Register significance, and determine appropriate treatment measures.

The VTrans Archaeology Officer, acting on behalf of VTrans, shall ensure the following stipulations are implemented:

A: Archaeological Resources:

1. All archaeological studies will be completed in accordance with the Secretary of the Interior's Standards and guidelines for Archaeology (48 FR 44734-37), Vermont State Historic Preservation Officer's (SHPO) Guidelines for Archaeological Studies July 2002.
2. All archaeological studies must be completed prior to the initiation of any ground disturbing activities or any other construction activity related to the project.

B: Discovery:

1. The project will stop immediately if previously unidentified archaeological sites, including human remains and/or cultural items, are discovered during project construction.
2. Burials are considered archaeological sites under state & federal laws.
3. The Construction Company or Resident Engineer will immediately notify the VTrans Archaeology Officer who will notify the SHPO.
4. No further construction will proceed in the site area until it has been reviewed and documented according to 36 CFR 800.11.
5. The VTrans Archaeology Officer will conduct a field inspection of the site to determine its potential National Register eligibility and the project's potential effects.
6. The VTrans Archaeology Officer may hire an Archaeological Consultant if additional information is necessary to determine site boundaries and NR eligibility.
7. Site significance and treatment options should be discussed with the appropriate interested public parties and documented.
8. If site avoidance is not possible, then data recovery of the site must be completed in accordance with Standard Mitigation Measure No. 15 of the VTrans Statewide Section 106 Programmatic and its implementing Manual of Standards and Guidelines.

C: Treatment of Human Remains:

1. If human remains and/or associated cultural items are discovered during construction, that portion of the project will stop immediately. The remains will be respectfully covered and the project resident engineer will immediately contact the VAOT Archaeology Officer who will notify the SHPO.
2. The VTrans Archaeology Officer will also contact the Town Sheriff, Town Clerk, Chief Medical Examiner, and State Police as well as Native Americans, when appropriate, and shall follow the requirements of state law.
3. If the human remains are identified as Native American, then a treatment and reburial plan will be developed in full consultation with the appropriate Native American group(s) as identified above.
4. Human remains and cultural items should not be disturbed or removed from their original location if at all possible. [refer to Advisory Council for Historic Preservation Policy Statements: Native American Concerns (1993)]
5. All determinations will be made or approved by the VTrans Archaeology Officer.
6. If human remains are identified, a written treatment plan will be developed in consultation with the VTrans Archaeology Officer, SHPO and with public parties such as Native Americans, local government and others as appropriate.
7. Recovery when necessary should be done carefully, respectfully and completely in accordance with the proper archaeological methods (as outlined in 36 CFR 800 and the Guidelines for Archaeological Studies, July 2002) [also refer to Advisory Council

for Historic Preservation Policy Statements: Native American Concerns (1988, 1993)].
Refer to Programmatic Agreement Manual of Standards and Guidelines; Section 4 (J) for additional guidance.

Above-Ground Historic Resource Stipulations

Above-ground historic resources in the project APE have been identified and the effects of the undertaking on them have been evaluated. Adverse effects are limited to a single instance comprising changes to the viewshed of the Hathaway property (M25) caused by an embankment associated with the grade separation over Halladay Road.

The VTrans Historic Preservation Officer, acting on behalf of the VTrans shall ensure the following stipulations are implemented:

1. That the overall effects of the project on historic properties shall be considered consistent with the VT Statewide Sections 106 Programmatic Agreements and its implementing Manual of Standards and Guidelines, and that all Section 106 documentation shall be prepared and distributed in accordance with this agreement.

Execution of this Process MOA by the FHWA and the VTRANS and implementation of its terms evidence that the FHWA has taken into account the effects of Middlebury ST SPUR(2) on historic and archaeological properties.

FEDERAL HIGHWAY ADMINISTRATION
Ernest Blais Date: 8/26/08
FHWA Division Administrator

VT AGENCY OF TRANSPORTATION
By: Duncan C Wilkie Date: 08-12-08
VTRANS ARCHAEOLOGY OFFICER

By: [signature] Date: 8.12.08
VTRANS HISTORIC PRESERVATION OFFICER

November 29, 2005

Scott Newman
Vermont Agency of Transportation
Technical Services Division
National Life Building
Montpelier, Vermont 05602-0501

Re: Middlebury Spur Project
Reasonable Range of Alternatives
Historic Resource Identification

Dear Mr. Newman,

This Historic Resource Identification Report will assist the Vermont Agency of Transportation (VTrans) and the Federal Highway Administration (FHWA) with compliance under Section 106 of the National Historic Preservation Act. Project review has been conducted according to the standards ser forth in 36 CFR. regulations established by the Advisory Council on Historic Preservation to implement Section 106. The purpose of the report is to identify historic buildings, structures, districts, landscapes and settings that may be affected by this project. A final clearance letter for Section 106 will be drafted by VTrans upon completion of an archaeological investigation.

INTRODUCTION

The purpose of this letter report is to identify historic resources on or eligible for listing on the National Resister of Historic Places within the project's Area of Potential Effect (APE), "the geographic area within which the project may cause changes to the character of or the use of the historic properties" [36CFR 800.2(c)]. The determination of National Register eligibility follows the guidelines established in *National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation*, published by the National Park Service.

The report will assist the towns of Pittsford, Brandon, Leicester, Salisbury and Middlebury, the FHWA and VTrans with compliance with Section 106 of the National Historic Preservation Act of 1966 and its amendments, Section 4(f) of the Department of Transportation Act of 1966, and 22 V.S.A. Chapter 14, The Vermont Historic Preservation Act of 1975.

The Historic Resource Identification Report will be prepared in two parts. The initial report identifies sites that are listed on, or appear to be eligible to the National Register, located in the APE of four alternatives, and provides a brief justification of that eligibility for non-listed properties.

Note: this report was prepared prior to the elimination of RS-3 from the reasonable range of alternatives. Therefore, potential impacts to the RS-3 study area are included.

The second report will provide an opinion of the potential impacts on historic resources for the alternatives that will be studied as part of the Draft Environmental Impact Statement, and will include recommendations for possible mitigation for any potential adverse effect. The report has been prepared for McFarland-Johnson, Inc., Concord, New Hampshire. Archaeological survey will be conducted by the UVM Consulting Archaeology Program.

National Register (NR) and Vermont State Register (SR) files were reviewed to identify listed sites located in the project area. Site visits were made in August and September, 2005, at which times photographs were taken. Additional properties that appear to be over 50 years old but are not listed on the Vermont State Register were identified and evaluated for eligibility to the National Register.

PROJECT DESCRIPTION

Omya, Inc. operates a marble quarry in the Town of Middlebury, just south of Middlebury Village. The marble is currently transported in trucks from the quarry to a processing facility 22 miles away in Florence, a village in the Town of Pittsford, Vermont. The trucks travel from the quarry, south on US Route 7, to the intersection with Kendall Hill Road in Pittsford. The marble is then transported west on Kendall Hill Road, West Creek Road, through the Village of Florence, and on Fire Hill Road, to the private Omya road. The processed marble leaves the Florence plant by rail and trucks.

In 1998, the Vermont Agency of Transportation undertook a study of alternative means of transporting materials from the Omya quarry in Middlebury to the processing plant and rail distribution point in Florence Village. In 2002, the study was expanded to include a study of a rail-based freight transportation system south of Middlebury Village.

The current phase of the on-going study has identified a reasonable range of alternatives to be carried forward for additional review and evaluation. These include the No-Build Alternative, Rail Spur Alternative 1 (RS-1), Rail Spur Alternative 3 (RS-3), and Truck to Rail Alternative 1 (TR-1). These four alternatives are the subject of this historic resource identification report.

No-Build Alternative: The truck transport of marble will continue on US Route 7 and town roads in Pittsford, and includes the construction of a northbound acceleration lane on US Route 7 immediately north of Kendall Hill Road.

Rail Spur Alternative 1 (RS-1) and Rail Spur Alternative 3 (RS-3): RS-1 and RS-3 each provide a rail connection from the Omya quarry in Middlebury west to the mainline rail that runs north to south through Middlebury. There are other potential users of the rail spur alternatives. Therefore a rail transload facility would likely be constructed near the quarry to allow other users to load and unload materials to and from rail cars.

Truck to Rail Alternative 1 (TR-1):
The truck to rail alternative, TR-1, provides a truck connection from the quarry to a transload facility located near the western end of the new road. A short new rail segment will connect the transload facility to the mainline rail. Other potential uses will be able to use the new truck road, transload facility and rail connector.

RAIL SPUR ALTERNATIVE 1 (RS-1)
RS-1 begins at the Omya quarry where it heads south and then southwest towards US Route 7, roughly following the current Omya access road. The alignment crosses Lower Foote Street about 15 feet below the existing elevation of the road, and may therefore cut-off Lower Foote Street. The rail spur will then pass under US Route 7, passing under a new vehicular bridge over the track. The new spur will then head generally west towards the mainline. Three options will be studied for the intersection of the rail line and Halladay Road: At-Grade with Halladay Road, Grade Separated over Halladay Road, or Halladay Road Relocation. If Halladay Road is cut-off, a cul-de-sac will be constructed to terminate Halladay Road on the north side of the rail spur. On the south side of the rail spur, a new road will be constructed that will connect Halladay Road with Route 7. West of Halladay Road, the spur line will be constructed on an earthen berm of currently undetermined height, in order to provide the grade and elevation required by rail. Near its western terminus, the rail spur will head south, bridging over Creek Road and Otter Creek on a trestle, to connect with the mainline heading south. RS-1 is approximately 3.17 miles long.

RAIL SPUR ALTERNATIVE 3 (RS-3)
RS-3 is identical to RS-1 from the quarry to Halladay Road. West of Halladay Road, the spur heads northwest towards Middle Road. The alignment will parallel the west side of Middle Road past the Middlebury Union Middle School, and then head west through the VTrans maintenance facility. Towards its western terminus, RS-3 will cross Creek Road at grade, bridge over Otter Creek, and connect with the mainline heading north, for a length of approximately 3.84 miles.

TRUCK TO RAIL ALTERNATIVE 1 (TR-1)
TR-1 is a new east to west roadway located in Middlebury between US Route 7 and the mainline rail. It will begin on US Route 7, opposite the existing intersection with the Omya quarry access road. From Route 7, TR-1 will roughly follow the RS-1 alignment, but will generally follow the existing grades. The transload facility for TR-1 will likely be located in a field east of Otter Creek, as there are no adequate sites for the facility closer to the mainline. A short rail spur will be constructed from the transload facility to the mainline heading south. The spur will bridge over Creek Road and Otter Creek on a trestle. The total length of the alignment is approximately 3.10 miles, including 1.18 miles of new road and 0.72 miles of new rail spur.

DESCRIPTION OF THE RESOURCES

Criteria for Evaluation
A property is evaluated for significance and eligibility to the National Register of Historic Places based one or more of the following Criteria:

- Criterion A: Event, association with events or broad patterns of history,
- Criterion B: Person, association with the lives of significant people,
- Criterion C: Design/Construction, architectural distinction, and
- Criterion D: Information Potential, ability to yield information important in history or prehistory.

Additionally, to be eligible to the National Register, a property must exhibit a high degree of historic integrity, or the ability to convey its significance. The aspects of historic integrity include location, design, setting, materials, workmanship, feeling and association. Unless otherwise noted, the sites discussed in this report that appear eligible to the NR appear eligible under Criterion C: Design/Construction.

Vernacular Architecture

Vernacular architecture is defined as having few of the architectural elements or ornamental details that characterize a particular architectural style (The Historic Architecture of Addison County, Vermont Division for Historic Preservation, 1992). Vernacular buildings were commonly constructed in Vermont throughout the 19^{th} and 20^{th} centuries and are an important contribution to the architectural history and social development of the state. A Vernacular building is considered to be historic if its historic form, massing, materials and context are for the most part intact, and legible.

Historic Farmstead

The historic property type Farmstead is described in "Multiple Properties Documentation Form: Agricultural Resources in Vermont". Historically, a farmstead in Vermont usually included a farmhouse, a main barn, a series of outbuildings, a well or springhouse, barn and farm yards, orchard, vegetable garden, farm dump, paths and roads, natural source(s) of water, and outlying meadows, pastures and woodlots bounded by fencing and hedgerows. Generally farmsteads are sited close to the road. Occasionally, a farmstead is representative of a specific period of significance. More typically, a farmstead has evolved, and includes buildings constructed over a period of time, for a variety of purposes. Frequently, buildings constructed for a specific use become obsolete, as farming practices change. Buildings no longer in use are not always maintained and are therefore threatened.

In order to meet the registration requirements for eligibility to the National Register as a Farmstead, the property must include all or some of the following: a farmhouse, a main barn, outbuildings, and a surrounding parcel of land historically associated with the farm. The farm must be over 50 years old and must exhibit sufficient historic integrity so that the evolution of the farmstead is clearly recognizable and understood.

Middlebury Spur Project
NO-BUILD ALTERNATIVE

The historic resource survey for the No-Build Alternative was conducted from the entrance to the Omya processing plant in Florence to the Omya quarry access road in Middlebury, along both sides of the following roads:

- Florence: Fire Hill Road, West Creek Road, Kendall Hill Road
- Towns of Pittsford, Brandon, Leicester, and Salisbury: US Route 7
- Town of Middlebury:
  US Route 7 from Cady Cross Road to the intersection of Middle Road South and Foote Street
  Foote Street from US Route 7 to intersection of Foote Street and Lower Foote Street
  Lower Foote Street from Foote Street to Cady Cross Road
  Cady Cross Road from Lower Foote Street to US Route 7

The resources are listed generally south to north, starting at the Omya plant, and ending near the Omya quarry.

Florence Village, Town of Pittsford

Site F1.
The c.1840 Classic Cottage with historic wing is located on the north side of Fire Hill Road, near the entrance to the Omya plant, and is listed on the State Register (SR Pittsford #6). The house retains its original form, massing and fenestration pattern, as well as slate roof, historic chimneys and added historic Queen Anne period porch. The house and the associated small gable-front barn retain integrity of location, design, setting, and materials and appear eligible to the NR with local significance. Photos 1 – 3.

Site F2.
The c. 1910 St. Theresa's Catholic Church (Pittsford SR #7) is located on the north side of Fire Hill Road near the Omya entrance. The Neo-Gothic Revival style building retains integrity of location, design, setting, materials, workmanship, and association and appears to be eligible to the National Register with local significance. Photo 4.

Site F3.
The c.1920 Vernacular/Colonial Revival style house is located on the west side of West Creek Road, and is the second building south of the railroad trestle. The house and its associated garage are listed on the SR (Pittsford SR #16). The house appears nearly unaltered and retains its historic form and massing, slate roof, brick chimney, clapboard and wood shingle siding, 1/1 wooden windows and Colonial Revival style front porch. The hip-roofed garage retains a slate roof and is a well-preserved example of the building type. The buildings also retain integrity of location, setting, and workmanship and appear eligible to the NR with local significance. Photos 5 – 6.

Site F4.
The house on the west side of West Creek Road, immediately south of the railroad trestle, is listed on the SR (Pittsford SR #15). The c.1900 Vernacular/Greek Revival style building retains historic form and massing, as well as slate roof, brick chimney, clapboard siding, and Colonial Revival style porch, but the access onto the porch is awkward and does not appear to be historic. Several of the posts that support the porch deck have been replaced and the

integrity of the front wall below the porch is questionable. Sufficient questions about the original appearance of the building make it appear ineligible to the NR. Further research would be warranted if demolition were proposed. Photo 7.

Site F5.
The railroad trestle over West Creek Road appears to be associated with the Rutland-Florence Marble Company (Site F6). The Rutland-Florence Marble Company site appears eligible to the NR. The associated trestle therefore appears eligible to the NR under Criterion A:Event. The trestle retains integrity of location, design, materials, setting, workmanship, feeling and association. Photo 8.

Site F6.
The site of the early 20th century Rutland-Florence Marble Company is located on the east side of West Creek Road, north of the railroad trestle (Site F5), and is listed on the State Register (Pittsford SR #14). Although most of the structures that made up the marble company are deteriorated or no longer standing, the property appears to be eligible to the National Register under Criterion A: Event, with statewide significance. Photo 9.

Site F7.
The 1½ story, gable-front building is the second house south of the millpond on the west side of West Creek Road. It is similar to the contributing buildings in the Florence SR Historic District but is not listed on the State Register. The c.1890 house retains its Queen Anne style gable screen, clapboard siding and Queen Anne style porch roof with exposed rafter tails, but the existing porch posts, porch deck and front door are not historic. In addition, the original form and massing of the house have been altered by the construction of two non-historic gable-roofed wings. Therefore the house does not appear to be individually eligible to the NR. Photo 10.

Site F 8.
The 1½ story building is the first house south of the millpond on the west side of West Creek Road, and is also very similar to the houses in the Florence SR Historic District. The house retains its historic slate roof, gable screen and Queen Anne period porch, but has been altered by the construction of a contemporary wing and an exterior brick chimney. The house is not listed on the State Register and does not appear to be individually eligible to the NR.
Photo 11.

Site F9.
The large gable-roofed barn on the east side of West Creek Road, north of the mill pond, appears to be over 50 years old and retains its historic form, slate roof and roof monitors, but the introduction of contemporary, residential scale windows and entry porch make the building, which is not listed on the SR, ineligible to the National Register. Photo 12.

Site F10.
The c.1890 eaves-front house is #A5 in the Florence SR Historic District. Despite the installation of synthetic siding, the building retains its historic form, massing, slate roof, ridge chimney, wooden sash windows, Queen Anne style porch and marble foundation. The house retains integrity of location, design, setting, materials, and association and therefore appears to be eligible to the NR with local significance. Photo 13.

Site F11.
The house is a contributing structure in the Florence SR Historic District (#A4) and retains its historic form and massing, as well as the Queen Anne period porch and most materials. Although some of the sash windows have been replaced, the window openings do not appear to have been altered. The house also retains integrity of location, setting and association and therefore appears to be eligible to the NR with local significance. Photo 14.

Site F12.
The house is located on the west side of West Creek Road and is a contributing building in the Florence Historic District (#A6). The house retains its historic form, massing and materials, and is a very good example of its type. The house also retains integrity of location, setting, and association and appears to be eligible to the NR with local significance.
Photo 15.

Site F13.
The house is included in the Florence SR Historic District (#A3) and retains its slate roof, ridge chimney and gable screen but does not appear individually eligible to the NR due to loss of its front porch, addition of a contemporary wing, and installation of vinyl siding.
Photo 16.

Site F14.
The house is #A7 in the Florence SR Historic District. Historic sash windows and the gable screen have been retained but the house has lost architectural integrity because the Queen Anne porch has been removed and because the bottoms of the walls have been covered with incompatible brick. Therefore the building does not appear to be eligible to the NR.
Photo 17.

Site F 15.
The gable-front, c.1890 house is located on the east side of West Creek Road and is included in the Florence SR Historic District (#A2). The building retains is historic form and ridge chimney but has been significantly altered by the loss of its historic porch and the installation of non-historic window openings. Therefore the building does not appear eligible to the NR.
Photo 18.

Site F16.
The house is #A8 in the Florence SR Historic District. Although the slate roof, front door and historic wood sash have been replaced, the house retains its form and massing, gable screen, clapboard siding, marble foundation, and importantly its Queen Anne style porch. Therefore the house appears eligible to the NR for local significance. The house also retains integrity of location, setting and association. Photos 19 – 20.

Site F17.
The small, c.1890 eaves-front house is located on the east side of West Creek Road and is a contributing structure in the Florence SR Historic District (#A1). Despite the installation of vinyl siding and asphalt shingle roof, the building retains its form, brick ridge chimney, Queen Anne style porch and marble foundation. The house also retains integrity of location, setting, and association and appears to be eligible to the NR with local significance.
Photo 21.

Site F18.
The c. 1890 gable-front house on the east side of West Creek Road, immediately north of the boundary of the Florence Village SR Historic District, is listed on the State Register (Pittsford

SR #12). Although the house retains its historic form and massing, slate roof and front porch roof with exposed rafter tails, the remaining components of the Queen Anne porch have been replaced with non-historic materials. In addition, the house is sheathed with vinyl, and the historic front door and many historic sash have been replaced. Therefore the house and its associated garage do not appear to be eligible to the NR. Photos 22 – 23.

Site F19.
The house on the west side of West Creek Road, immediately north of the boundary of the Florence Village SR Historic District, listed on the SR (Pittsford SR # 8). The house is a c.1890, Vernacular building with a Queen Anne style porch, and although the historic form and massing are evident, sufficient alterations have been made so that it does not appear to be eligible to the NR. These alterations include reduction in the size of the window openings in the main block and wing, replacement of the front door, and inappropriate repairs to the porch posts and steps. Photos 24 – 25.

Site F20.
The 1-story house is located on the south side of Kendall Hill Road, approximately 3/10 of a mile east of West Creek Road. The hip-roofed house with its brick chimney and the associated hip-roofed garage with small, hipped ventilator were probably constructed in the first decades of the 20th century in the Colonial Revival period of architectural design. The house is not listed on the State Register and does not appear to be eligible to the NR due to loss of most historic materials and the introduction of contemporary window openings and windows. Photo 26.

Site F21.
The form and massing of the small, 1½ story, Vernacular eaves-front house on the south side of Kendall Hill Road suggest that it was constructed in the second half of the 19th century. The existing sash appear to be wooden 1/1s but the building is sheathed with vinyl and lacks any character-defining architectural details. Therefore the house does not appear to be eligible to the NR. The associated gable-roofed barn, tile silos and milk house on the north side of the road also appear to date from the last decades of the 19th century but have lost some structural integrity and do not appear individually eligible to the National Register. The house, barn and milk house are not listed on the SR and do not meet the registration requirements to be eligible to the NR as a Farmstead. Photos 27 – 28.

Site F22.
The 2½ story Vernacular house on the north side of Kendall Hill Road, just west of the Hammond Covered Bridge, is not listed on the SR. The house retains a Colonial Revival style porch, brick ridge chimney and molded window caps, but the construction of an exterior concrete block chimney on the primary elevation and the introduction of synthetic siding and replacement windows make the house appear to be individually ineligible to the NR.
Photo 29.

Site F23.
The 1842 Hammond Covered Bridge is individually listed on the National Register of Historic Places. Photo 30.

Pittsford Town

Site P1.
The house and collection of historic agricultural buildings on the west side of Route 7 are not listed on the State Register. The 4 x 2 bay Classic Cottage appears to have been constructed in the first half of the 19th century and retains an historic panel door and a dentilated frieze on its façade. Historic sash have been replaced but the window openings do not appear to have been modified. The foundation under the clapboarded house is made of marble. Agricultural buildings include an eaves-side bank barn with a metal roof and a wooden silo, and a slate-covered, gable-roofed barn that date from the 19th century. A small, shed-roofed building on an early 20th century poured concrete foundation is probably a milk house. When viewed with the surrounding farmyard and fields, the property appears to meet the registration requirements to be eligible to the NR as a Farmstead. The farm retains integrity of location, design, setting, materials, workmanship and feeling. Photos 31 – 33.

Site P2.
The c.1802 Federal style house with later Queen Anne style porch is listed on the SR (Pittsford SR #82), although the site was omitted from the State Register map of Pittsford in the <u>Historic Architecture of Rutland County)</u>. The property includes a 19th century gable front barn with ell addition, located east of the house, and a c.1920 Ground Level Stable barn and milk house on the west side of Route 7. The farm is an operating dairy. The grouping of buildings and the associated fields appears to meet the registration requirement that make the complex eligible to the NR as a Farmstead that has evolved over a very long period of time. The farm retains integrity of location, design, setting, materials, workmanship and feeling. Photos 34 – 35.

Site P3.
The 1½ story, eaves-front house, located on the east side of Route 7, is not listed on the SR. The form of the main block, the location of door and window openings tight up under the eaves, and the 6/6 sash window in the north gable end suggest that the house was constructed in the early decades of the 19th century. The architectural integrity of the building has been compromised by the use synthetic siding, installation of an incompatible bay window on the primary elevation, and construction of a large exterior chimney and the large 20th century garage addition. Therefore the building does not appear individually eligible to the NR. Photo 36.

Site P4.
The 1816 Federal style house and its associated c.1920 Ground Level Stable barn are listed on the SR (Pittsford SR #20). The stone house retains a beautiful original fanlight and Federal style half-length sidelights, as well as a later historic slate roof. The barn, with its attached milk house, is also a good example of the type. The property retains integrity of location, design, materials, and workmanship and appears to be eligible to the National Register with statewide significance. The property does not appear to meet the registration requirements for a Farmstead because of the lack of outbuildings and, perhaps due to the elevation and very close proximity of Route 7, the lack of a sense of the agricultural history of a working farm. Photos 37 – 38.

Site P5.
The c.1845 Greek Revival style house and the associated collection of historic agricultural buildings, including a main c. 1930 Ground Level Stable barn, are listed on the SR (Pittsford SR #21) and appear to be eligible to the NR as an evolved Farmstead. The well-preserved

farm is an active dairy that retains integrity of location, design, setting, materials, workmanship and feeling, and is a very good example of the property type. Photos 39 – 42.

Site P6.
The 1½ story house is located on the east side of Route 7. The centered Gothic wall dormer suggests that the building may date from the first half of the 19th century. The house retains its historic form, some wooden 6/6 windows, and brick chimney, but the construction of the incompatible enclosed porch across the façade and the relocation of the primary entry, in conjunction with the installation of synthetic siding, make the house, which is not listed on the SR, appear to be individually ineligible to the NR.

The associated gable-roofed barn appears to be a three-bay wide English Barn, to which a fourth, historic southern bay was added. The barn is not listed on the SR but the original 3-bay section may date from the first decades of the 19th century. The original barn probably sat on grade. Later in the century, the barn may have been raised up and placed on a basement level, with an earthen ramp access to the main level, allowing the building to function as an Early Bank Barn. The fourth bay may have been added at the same time. The barn appears nearly unaltered since its reorientation to an Early Bank Barn and therefore appears to be eligible to the NR for local significance, as a good example of the type. The barn retains integrity of location, design, setting, materials and workmanship. The property does not meet the registration requirements for a Farmstead. Photos 43 – 45.

Site P7.
The form of the slate-covered main block of the small 1½ story house on the east side of Route 7 indicates that the building is well over 50 years old. The house is now sheathed with synthetic material and all the sash have been replaced. Window openings also appear to have been altered. The building is not listed on the SR and lacks sufficient architectural detailing, and so does not appear to be individually eligible to the NR. Photo 46.

Site P8.
The c.1845 Greek Revival style house is listed on the SR (Pittsford SR #23). The house is now covered with vinyl siding and its wood sash have been replaced. Regardless, the house retains its historic form and massing and many other historic architectural features including slate roof, brick chimneys, Greek Revival door surround and later Queen Anne period wing porch. The design of the door in the added opening in the south end of the wing suggests that the opening was made in the first half of the 20th century. Although the added exterior concrete block chimney against the front wall of the wing is unfortunate, the main block of the house is generally intact. The house also retains integrity of location, setting, workmanship and feeling and therefore appears to be individually eligible to the NR with local significance. Photo 47.

Site P9.
The monument on the west side of Route 7 commemorates Fort Vengeance. Fort Vengeance was constructed by the Republic of Vermont and occupied from 1780 until 1782 to guard the western frontier from the French, British and Native Americans. The monument was erected by the citizens of Pittsford in 1873. The monument and the site of the fort have been previously determined eligible to the NR. The National Register nomination for the site is in process. Photo 48.

Site P10.
The house is listed on the State Register (Pittsford SR #22). Although the architectural integrity of the building has been compromised by the removal of the historic sash and the installation of vinyl over siding and trim, the form and massing of the mid-19th century Greek Revival style house with Gothic wall dormer are intact. And importantly, the Queen Anne period front porch is also well preserved. The house retains integrity of location, design and setting and therefore appears to be marginally eligible to the NR with local significance. Photo 49.

Brandon Town

Site B1.
The 2-story, c.1820 Federal style house (Brandon SR #95) has been altered by the installation of asbestos shingle siding, which has apparently covered any typical historic door surround. The original sash windows have also been replaced with wooden 1/1 sash, probably an historic change. Regardless, the form and massing, brick chimney, slate roof and fenestration pattern on the main block and wing are intact. The associated agricultural buildings include a main barn, a smaller barn and several historic sheds. The sheathing pattern and the roof line on the main barn suggests that the building may have been originally constructed as an on-grade English barn, perhaps contemporaneously with the house, and later placed on a foundation as an Early Bank to which a northern, shingled addition was made. The property is apparently no longer in agricultural use but the open farmyard connecting and surrounding the buildings conveys a sense its historic agricultural use. Therefore the property appears to meet the registration requirements to be eligible to the NR as a 19th century Farmstead. The farm retains integrity of location, design, setting, materials, and workmanship.
Photos 50 – 51.

Site B2.
The building, located on the west side of Route 7, appears to be over 50 years but is not listed on the SR. The building does not appear to be eligible to the NR because it lacks architectural style and distinction. Photo 52.

Site B3.
The building, located on the west side of Route 7, appears to be over 50 years old but is not listed on the SR. The building does not appear to be eligible to the NR because of loss of materials and architectural integrity. Photo 53.

Site B4.
The building, located on the east side of Route 7 may be over 50 years old but is not listed on the SR. The house does not appear to be eligible to the NR due to lack of historic materials and incompatible additions. Photo 54.

Site B5.
The building, located on the east side of Route 7, appears to be over 50 years old but is not listed on the SR. The house does not appear to be eligible to the NR because it generally lacks architectural distinction and because the fenestration pattern on the front elevation appears to have been altered. Photo 55.

Site B6.
The c.1820 house and associated barns are listed on the SR (Brandon SR# 94) and were determined to be individually eligible to the NR in 1998, as part of the environmental review of the project to build a turning lane into the Otter Valley High School. Photo 56.

Site B7.
The c.1860 Greek Revival style, side-hall plan house with attached utilitarian wing and added historic Queen Anne period porch is a very good example of the type. Aside from the construction of the non-historic access ramp, the house is intact. It retains historic chimneys, slate roof, clapboards, and wooden 6/6 sash, as well as the porch. The property also includes the hip-roofed structure just south of the house that may be some sort of farm stand building, a small gable-front barn with transom, and several cottages or cabins. The property is listed on the SR (Brandon SR #93), retains integrity of location, design, setting, materials, workmanship and feeling, and appears eligible to the NR with statewide significance. Photos 57 – 58.

Site B8.
The form, massing and wood paneled front door of this house, located on the east side of Route 7 south of Brandon Village, suggest that it is well over 50 years old, but the building is not listed on the SR. The architectural integrity of the building has been compromised by the alteration of the historic fenestration pattern and the installation of non-historic materials including roof shingles, synthetic siding and window sash. Therefore the building does not appear to be eligible to the NR. Photo 59.

Site B9.
The c.1900 Vernacular/Colonial Revival style house on the west side of Route 7 is not listed on the SR. The building retains its historic form and massing, fenestration patterns, some 2/2 sash, clapboard siding and brick chimney, as well as an intact Colonial Revival style porch. The roof is currently covered with asphalt shingles. Although the building appears to be poorly maintained, it is nearly unaltered and therefore appears to be eligible to the NR with local significance. The building retains integrity of location, design, setting, materials, and workmanship. Photos 60 – 61.

Site B10.
The agricultural complex on the east side of Route 7 is listed on the SR (Brandon SR #92). The active farm includes a c.1860 farmhouse, two primary gable-roofed barns, several sheds and associated fields that are still in agricultural use. The farm stand on the east side of Route 7 is associated with the complex. The property retains integrity of location, design, setting, materials, workmanship and feeling, and appears to meet the registration requirements that make it eligible to the NR as a Farmstead. Photos 62 – 63.

Site B11.
The Classic Cottage on the east side of Route 7 may have been constructed in the mid 19th century, but does not appear to be eligible to the NR due to alterations. These include installation of new sash windows, a new front door, the construction of a non-historic window bay on the front elevation, and an exterior chimney against the east gable end. The house is not listed on the SR. Photo 64.

Site B12.
The mid 19th century house with polychromatic slate roof was constructed c.1870 and is listed on the SR (Brandon SR #54). Despite a small rear addition, the historic form and massing are

very legible. The house also retains historic chimneys, porches, clapboards, and trim, as well as the significant slate roof. The property retains integrity of location, setting, materials, workmanship and feeling. Therefore the building appears to be eligible to the NR with statewide significance. Photo 65.

Site B13.

The original portion of the Maple Grove Restaurant building appears to be a four-bay wide Classic Cottage with Gothic wall dormer but various large additions that have been made to the original house appear to make it ineligible to the NR under Criterion C. The associated barn to the north of the restaurant is clearly over 50 years old but does not appear individually eligible to the NR.

The semicircle of tourist cabins associated with the restaurant are a good, intact example of small cabins built in response to the increase of automobile travel in the first half of the 20th century. The cabins are outside the Area of Potential Effect but appear to be eligible to the NR with statewide significance. The tourist cabins retain integrity of location, design, setting, materials, workmanship, feeling and association. The main restaurant building, barn and tourist cabins are not listed on the SR. Photos 66 – 67.

Site B 14.

The 5 x 2 bay, 2½ story eaves-front house on the west side of Route 7 probably dates from the last quarter of the 19th century but is not listed on the SR. The slate-covered gable roof lacks cornice returns and is therefore Vernacular in feeling. The building also exhibits Italianate period details, including an irregular fenestration pattern on the façade and a lovely arched entry porch. Curiously the peaked lintels above the windows on the front elevation are less ornate than the arched Italianate lintels over the attic window in the gable ends.   The 3/1 wooden sash are typical of early 20th century Colonial Revival period windows and may have replaced an earlier sash pattern. Despite the addition of the non-historic exterior stairs and second level entry on the south gable end, which are reversible, the unusual house appears eligible to the NR with local significance. The agricultural building immediately north of the house appears to be two, small gable-roofed sheds or shops that have been connected, but are otherwise nearly unaltered. The northern most machine shed has exposed rafter tails, suggesting that it was constructed c.1920. The middle barn has been significantly altered and has lost architectural integrity. The smaller barn/shop and the machine shed appear to be eligible to the NR in association with the house. The property retains integrity of location, design, setting, materials, and workmanship, but does meet the registration requirements as a Farmstead because historically associated fields are not evident.
Photos 68 – 69.

Site B15.

The 1½ story, L-plan house just south of the Brandon Historic District is not listed on the SR. The c.1900 Vernacular/Queen Anne style building retains historic form and massing, a rebuilt brick ridge chimney, slate roofs, Queen Anne style porches, marble foundation, and marble porch steps and stringers. The window shutters do not appear to be historic. Although the house is sided with vinyl and the window sash have been replaced, the house appears eligible to the NR for its local significance, as it retains integrity of location, design and workmanship. The associated barn retains its slate roof, although a contemporary overhead garage door now fills the opening in the gable end. Photos 70 – 71.

Site B16.

The Brandon Village Historic District is listed on the National Register of Historic Places.

Photos 72 – 74.

Photo 72. Showing US Route 7 and High Street, the southern end of the historic district.

Photo 73. Showing US Route 7 and the northwestern most building in the historic district.

Photo 74. Showing US Route 7 and the northeastern most building in the historic district.

Site B17.
The building that now houses the Seasoned Books Store is not listed on the SR. The building is over 50 years old and retains some historic features such as clapboards and some sections of slate roof, but does not appear eligible to the NR due to the construction of a fairly large incompatible addition that now functions as the building's primary entrance. Photo 75.

Site B18.
The form and massing of the main block of the 1½ story Vernacular style house on the east side of Route 7 suggest that the structure is over 50 years old. The integrity of the building has been compromised by the construction of two non-historic enclosed porches and by the loss of many historic materials. The building lacks any additional historic characteristics or features and therefore appears ineligible to the NR. The house is not listed on the SR. Photo 76.

Site B19.
The gable-front southern block of the house on the west side of Route 7 may have been constructed in the last decades of the 19th century. The gambrel-roofed northern block was probably built in the early 20th century. Although the evolution of the house is fairly evident, several non-historic additions, including the enclosed entry on the primary elevation, as well as synthetic siding and replacement windows and doors, make the house appear ineligible to the NR. The building is not listed on the SR. Photo 77.

Site B20.
The 1½ story house on the west side of Route 7 is not listed on the SR but its L-plan and cornice returns suggest that it may have been constructed in the mid 19th century. The building also retains a few wooden 2/2 sash that date from the last decades of that century, but it does not appear individually eligible to the NR due to the introduction of non-historic window openings, loss of most historic materials, and lack of significant architectural detailing. Photo 78.

Site B21.
The evolution of the 1½ story house on the east side of Route 7 is not clear. It appears most likely that the house was constructed c.1850 as a Classic Cottage, with its primary entry in the south eave elevation. The door and window openings on the west gable end of the house are awkward and are not typical of the fenestration pattern expected on a Greek Revival side hall plan building. The ground floor openings are not evenly spaced across the wall plane. The door is located tight against the building corner. The fenestration pattern on the second level of the front gable is also oddly unbalanced and does not appear to be historic. The glazed and paneled exterior door and intact Queen Anne style porch on the south elevation were probably added in the last decades of the 19th century. Although the house has been well maintained and the existing Queen Anne elements are good, intact examples of the style, the apparent alterations to the west gable end are not representative of one or more periods of

architectural design and do not appear to be historic. Therefore the house does not appear individually eligible to the NR under Criterion C. Photos 79 – 80.

Site B22.
The stonewall and iron gate associated with the Pine Hill Cemetery appear to be over 50 years old. The wall and gate are character-defining landscape features along the east side Route 7, a short distance north of the Brandon Historic District. The Pine Hill Cemetery can be considered eligible to the NR under Criterion A, as it reflects the broad pattern of the historic and culture of Brandon. Photo 81.

Site B23.
The building that houses The Gallery of American Folk Art on the west side of Route 7 is over 50 years old but is not listed on the SR. Its architectural integrity has been compromised by the introduction of various incompatible features including non-historic additions, dormers, entries, and materials. Therefore the building does not appear eligible to the NR. Photo 82.

Site B24.
The house on the east side of Route 7 is over 50 years old but has lost architectural integrity due to non-compatible additions and loss of historic materials and is therefore does not appear to be eligible to the NR. Photo 83.

Site B25.
The c.1900 Vernacular house on the east side of Route 7 is not listed on the SR. The main block retains its form and massing, slate roof, brick chimney, clapboards and fenestration pattern on the west gable end. The full-width Colonial Revival style porch on the south elevation was probably added soon after the house was constructed and includes a flared half-wall with battered posts. The existing in fill above the porch wall is not historic. The form, slate roof and historic chimney on the attached wing suggest that it was part of the original construction. The massing of the wing has been altered by the addition of an incompatible bay window and a non-historic enclosed entry on its primary façade. The wing is also covered with vinyl and the historic fenestration pattern on its east gable end has been changed. Therefore the house does not appear to be eligible to the NR. Photos 84 – 85.

Site B26.
The 1½ story, Greek Revival style, side-hall plan house with rear wing and attached barn on the west side of Route 7 is not listed on the SR. The primary block retains its historic form and massing as well as an intact front elevation with historic sash, Greek Revival style entry and historic door. It can be assumed that originally the south wall of the wing was set back behind the plane of the south wall of the main block. It appears that the wing was widen so that its south wall is now forward of the south wall of the main block. The full-width dormer on the south roof slope of the wing may have been constructed when the wing was widened. The 2/2 wooden sash windows in the south elevation of the wing suggest that the change was made in the late decades of the 19th century, making the reconfiguration of the wing an historic change. The small, 1/1 sash windows in the upper level of the wing are the same height as the two knee wall windows in the south elevation of the main block. The knee wall windows in the north elevation of the main block are horizontally oriented 2 x 4 light fixed windows, suggesting that the windows in the south elevation were changed in conjunction with the upper level windows in the wing. The building is sheathed with clapboards and retains historic brick chimneys, but the porch on the south elevation of the main block is deteriorated. The deck has apparently been replaced with concrete and the porch posts are

not historic. Non-historic roofs have been constructed along the wing and in the interior corner of the wing and barn. A non-historic entry door, garage bay and garage door have been installed in the front gable of the attached barn. The north elevation of the house has been compromised by the construction of an exterior concrete block chimney, as well as the addition of contemporary windows and a door in the north wall of the wing. Despite the lack of sensitivity, the reconfiguration of the wing and alterations to the knee wall windows appear to be over 50 years old and are therefore historic changes. Regardless, the architectural integrity of the building has been seriously compromised by the cumulative effect of the non-historic alterations, so that it does not appear eligible to the NR. Photos 86 – 88.

Site B27.
The Cape Cod style, c.1790 Federal style house on the east side of Route 7 is listed on the SR (Brandon SR #12). The main block of the house does retain its historic form, massing and clapboard siding, but significant changes have been made to the historic door and window openings. Some of the window openings on the front and north elevations have been reduced in size to accommodate stock replacement sash. The front door is not historic and the sidelights and transom have been removed. The gable-front wing addition to the north gable of the main block retains historic clapboards, but all other historic features have been removed, so that the approximate date of its construction is unclear. Historic materials of the wing's front porch have been replaced. The wing's side porch and exterior brick chimney are not historic. Although the main block is quite old, the alterations to the fenestration pattern and primary entry, combined with the alterations to the addition, make the house appear ineligible to the NR.

The associated gambrel-roofed barn with attached shed-roofed milk house is not mentioned in the SR but was probably constructed c.1920-30 and is a good example of its type. The west eave elevation is built parallel to an earthen bank to allow access to the loft level through the covered high drive ramp. Although the barn is no longer in agricultural use, it is generally intact and therefore appears to be eligible to the NR with local significance. The barn retains integrity of location, design, setting, materials, and workmanship. The property does not appear to meet the registration requirement to the eligible to the NR as a Farmstead due to the extent of alterations to the farmhouse. Photos 89 – 91.

Site B28.
The 1½ story Vernacular house on the west side of Route 7 is not listed on the SR but was probably built in the last quarter of the 19th or early in the 20th century. The house does exhibit two features identifiable as Colonial Revival in design, the hipped roof porch with battered columns and the 3/1 sash windows. These elements may be part of the original construction, or may have been added soon after the house was built. Regardless, the integrity of the historic form and massing has been compromised by the fairly large non-historic rear addition. The house is now roofed and sided with non-historic material and some of the historic sash have been replaced. Therefore the house does not appear to be eligible to the NR. Photo 92.

Site B29.
The 1½ story gable-front house on the west side of Route 7 appears to have been constructed in the second half of the 19th century but the building does not appear eligible to the NR due to the construction of the non-historic enclosed entry on the façade and the introduction of non-historic materials. The associated gambrel-roofed barn appears to be less than 50 years old. Photo 93.

Site B30.
The small 1½ story gable-front house and associated barns on the west side of Route 7 are not listed on the SR. Although the Vernacular house retains its historic footprint and most materials, including wooden sash and clapboard siding, the existing front porch is not historic. Engaged, turned posts have been retained at the corners of the front wall, and indicate that the existing porch replaced an earlier Queen Anne style porch. Therefore the Vernacular house does not appear eligible to the NR.

The northern most of the associated barns appears to be a three-bay-wide English style barn but the roof pitch and width of the roof overhang suggest that it may have been constructed in the second half of the 19th century, and may therefore be contemporaneous with the house. Inspection of the barn's frame may help to reveal approximate date of construction. The southern barn has stable windows along its north eave elevation, suggesting that animals were stabled on the ground level. Much of the exterior sheathing on the south barn is not historic. As the evolution of the barns is not clear, neither appears to be individually eligible to the NR. If demolition were proposed additional research about the property would be required. The complex may be in limited agricultural use. The collection of buildings does not qualify as a Farmstead because none of the buildings exhibit sufficient architectural merit or integrity. Photos 94 – 95.

Leicester Town

Site L1.
The form of the 1½ story gable-front main block of the house on the east side of Route 7 suggests that is was probably constructed in the last decades of the 19th century. The flared porch half-wall is typical of the Colonial Revival style but the infill above the wall is not historic. Historic roofing, wall sheathing, and sash windows have been replaced. The massive exterior chimney and the two flanking non-historic windows on the south elevation are architecturally incompatible. The house is not listed on the SR and does not appear to be eligible to the NR. Photo 96.

Site L2.
The 1 ½ story gable-front house and associated outbuildings on the west side of Route 7 are not listed on the SR. The massing, low-pitched roof form, and cornice returns on the gable-front main block suggest that the original section of the house may date from the Federal period (pre-1835), although primary entries generally occur in eave elevations in Federal period architecture. The ell addition to the north elevation of the main block is also clearly over 50 years old. Access into the ell revealed a hewn frame, split lathe and wide, up and down sawn roofing boards, indicating that the ell also dates from the first half of the 19th century. The wall dormer may be original to the ell, but if so, the feature was probably remodeled c.1900 as its truncated form is typical of Colonial Revival architecture. Most of the wooden 1/1 sash also probably date from the turn of the century. The front porch may have also been added about that time, because the flared half-wall is a typical Colonial Revival element. The porch columns are square posts. The associated millhouse and small gambrel-roofed outbuilding also appear to date from c.1900. The early, unusual house retains integrity of location, design, setting, materials, workmanship and feeling and appears eligible to the NR for its local significance. The c.1900 outbuildings appear to be NR eligible as part of the complex. Photos 97 – 99.

Site L3.
The property on the west side of Route 7 is listed on the SR as a farm (Leicester SR # 21). The c.1850 Vernacular/Greek Revival house retains its historic form and massing, as well as slate roof. Some sash have been replaced and the window openings reduced in size. The front door is not historic and the sidelights are covered with plywood, but the Greek Revival door surround has been retained. The property includes a barn and a granary that date from the 19th century, as well as an early 20th century shed. Although the alterations to the window openings could render the house individually ineligible to the NR, when viewed in conjunction with the intact agricultural buildings, the property appears to marginally meet the registration requirements to be eligible to the NR as a Farmstead. The house is very close to the road. The building's main blocks are intact. The property appears to be in only limited agricultural use, and does not include a Ground Level Stable barn, indicating that the farm may not have made the transition to large scale dairy farming that occurred across Vermont in the late 19th and early 20th centuries. The land immediately around the buildings has been retained so that the sense of farming activity is evident. The farmstead retains integrity of location, setting, design and materials. Photos 100 – 103.

Site L4.
The form and massing of the 1½ story house on the east side of Route 7, just south of Leicester Four Corners, suggest that it may have been constructed c.1850, but the building is now covered in synthetic siding and its door and sash windows have been replaced with modern features. The attached garage wing is not historic. The building is not listed on the SR and does not appear eligible to the NR. Photo 104.

Site L5.
The form of the main block of the house on the west side of Route 7, just south of Leicester Four Corners, suggests that the building was constructed between 1835 and 1860, and although the house retains some historic sash windows, its architectural integrity has been compromised by the construction of several incompatible additions. Therefore the house does not appear eligible to the NR. Photo 105.

Site L6.
The c. 1830 tavern is individually listed on the National Register, as well as on the Vermont State Register (Leicester SR #26). Photo 106.

Site L7.
The c.1858 Leicester School and Town Hall is individually listed on the National Register, as well as on the State Register (Leicester SR # 24). Photo 107.

Site L8.
The 1826 Leicester Meetinghouse is individually listed on the National Register, and on the Vermont State Register (Leicester SR # 25). Photo 108.

Site L9.
The house on the west side of Route 7 in Leicester Four Corners is listed on the SR (Leicester SR #27). The building retains the form and massing of a house constructed c.1845 but all of its historic materials have been replaced. Therefore the house does not appear individually eligible to the NR. Photo 109.

Site L10.
The 1 ½ story house on the east side of Route 7, just opposite Site L9, appears to be over 50 years old, but lacks architectural distinction and has been compromised by non-historic additions and the introduction of non-historic materials. The house is not listed on the State Register and does not appear eligible to the NR. Photo 110.

Site L11.
The small, 1½ story, gable-front house on the west side of Route 7 exhibits several features that suggest it was constructed c.1890. These include the triangular brackets at the gable peak and at the bottom of the raking eaves, and the Colonial Revival style porch with exposed rafter tails and flared half-wall. The main block retains its brick chimney but is now covered with vinyl. Most importantly, the very large, non-historic addition to the south elevation has seriously altered the building's historic form and massing. Therefore the house, which is not listed on the SR, does not appear eligible to the National Register. Photo 111.

Site L12.
The c.1920 Ground Level Stable Barn on the east side of Route 7, just north of Leicester Four Corners is listed on the SR (Leicester SR #28). The barn retains its historic form, massing and materials, as well as typical metal roof ventilators, several silos and attached milk house. The barn also retains integrity of location, setting, workmanship and feeling and appears to be individually eligible to the NR for local significance. The associated farmhouse is not listed on the SR and does not appear eligible to the NR due to alterations including the non-historic bay windows and the enclosed porch along the front elevation. The extent of alterations to the house also excludes the property from eligibility to the NR as a Farmstead.
Photos 112 – 114.

Site L13.
The c.1900, 1½ story Vernacular house on the west side of Route 7 retains historic 3/1 and 2/2 wood sash, suggesting that it was constructed in the last decades of the 19th century. Otherwise, the building appears to lack significant architectural detailing, and is deteriorated and apparently abandoned. The house is not listed on the SR and does not appear to be eligible to the NR. Photo 115.

Site L14.
The c.1850 house with centered gable-roofed wall dormer on the east side of Route 7 is not listed on the SR. Although the historic form of the house is still legible, the building does not appear eligible to the NR due to the severe alteration of the fenestration pattern on the primary elevation, and because of loss of most historic materials. Photo 116.

Site L15.
The southern portion of the building on the east side of Route 7 retains a hip-shaped roof, wide-overhanging eaves supported on decorative brackets, and 2/2 wooden sash, suggesting that it was constructed late in the 19th century. The building is not listed on the SR and does not appear eligible to the NR because of the large, incompatible, not-historic addition to the north elevation. The historic use of the original section is unknown. Photo 117.

Salisbury Town

Site S1.
The c. 1840 Greek Revival style, side-hall plan house and related barn are listed on the SR (Salisbury SR # 59). Although the fenestration pattern on the historic wing has been altered, the main block of the house appears generally unaltered. Except for the presence of 20th

century roofing shingles, most historic materials are also intact. The mid-19th century barn with attached millhouse is also generally unaltered. The property does not appear to meet the registration requirements of a Farmstead because of loss of historic context, but the buildings appear to be eligible to the NR with local significance. The property retains integrity of location, design, materials, and workmanship. Photos 118 – 119.

Site S2.
The c.1857 Classic Cottage with centered Gothic wall dormer on the east side of Route 7 is listed on the SR (Salisbury SR # 55). The SR listing describes an Italianate style front porch, which had been removed when the house was photographed for this report. The building is apparently being rehabilitated, as other exterior carpentry was also evident. The existing structure retains integrity of location, design, setting, materials and feeling, and if the current work restores the house to its historic appearance, it appears to be eligible to the NR as a good example of its type. Photo 120.

Site S3.
The c.1845 house is located on Holman Road, west of Route 7 and is listed on the SR (Salisbury SR #21). Although the small dormers on the main roof and the even smaller ventilator on the roof of the wing are not historic, the house is otherwise a very good example of Greek Revival style residential design. The building retains historic form and massing, 6/6 sash windows, Greek Revival trim, clapboards and front door and door surround, as well as integrity of location, design, setting, workmanship and feeling. The house appears eligible to the NR for local significance. Photo 121.

Site S4.
The form and the stone foundation of the Classic Cottage just north of Holman Road, on the west side of Route 7, indicate that the building is over 50 years old but it is not listed on the SR. It does not appear eligible to the NR due to loss of historic materials and due to the alteration to the windows and door on the front elevation. Photo 122.

Site S5.
The c.1830 house on the east side of Route 7, just north of Vermont Route 53, is listed on the SR (Salisbury SR #28). The house is a very well preserved example of a transitional house as it exhibits architectural details from both the Federal and Greek Revival periods of design. The building also retains most of its historic materials including entry door and surround, clapboards, wood trim and historic wooden sash. The associated carriage barn is also listed on the SR. The property retains integrity of location, design, setting, materials, workmanship and feeling and appears eligible to the NR with statewide significance. Photo 123.

Site S6.
The c.1845 Greek Revival style Classic Cottage on the east side of Route 7 is not listed on the SR. The house is a wonderful example of an evolved building that includes a wing that may be part of the original construction, and an attached, board and batten sided barn. The details of the bay window on the front elevation of the main block and the porch across the wing are typical of the Colonial Revival period. The house also retains historic clapboards and trim, 2/2 wooden sash windows, and historic chimneys, as well as integrity of location, setting, workmanship and feeling. The building therefore appears to be eligible to the NR with statewide significance. Photos 124 – 125.

Site S7.
The c.1810 house on the east side of Route 7 is listed on the SR (Salisbury SR #27). The well-preserved Federal style building retains its form and massing, and lovely Federal entry

door with typical half-length sidelights. The barn described in the SR is apparently no longer standing. The early house retains integrity of location, design, setting, materials, workmanship and feeling and appears eligible to the NR with statewide significance.
Photo 126.

Site S8.
The complex of buildings on the east side of Route 7 is listed on the SR (Salisbury SR #26). The SR states that the c.1840 Greek Revival Classic Cottage was designed and built by James Lamb, who is known to have built other high-style houses in the area. The house and associated agricultural buildings retain integrity of location, design, setting, materials, workmanship, feeling, and association, and therefore appear eligible to the NR with statewide significance. Photo 127.

Site S9.
The c.1900 Vernacular house on the west side of Route 7, opposite Plains Road, is not listed on the SR. The house retains its historic form and massing, clapboards, trim, chimneys and 2/2 wooden sash windows. The building is architecturally unadorned except for the hip-roofed Colonial Revival style porch with flared half-wall that stretches across the gable front of the main block. The integrity of the historic porch has been compromised by a non-historic porch addition that extends north beyond the north wall of the house. A non-historic door opening, filled with an architecturally inappropriate door, has been made in the east wall of the ell. The integrity of the associated barn has been impacted by the addition of a contemporary garage door, a modern entry door in a new opening, and by a band of four plate glass windows in the front wall. Therefore the Vernacular house and associated barn do not appear eligible to the NR due to alterations. Photos 128 – 131.

Site S10.
The form of the southern main block of the building that houses a flea market on the east side of Route 7 suggests that the original portion is over 50 years old but the structure is not listed on the SR. The building does not appear eligible to the NR due to alterations to the historic fenestration pattern, installation of the incompatible bay windows on the primary elevation, loss of historic materials and construction of the large incompatible addition. Photo 132.

Site S11.
The farm complex on the east side of Route 7 is listed on the SR (Salisbury SR #24). The house is a c.1835 Vernacular/Greek Revival style building that retains historic form and massing, Greek Revival front door and door surround, cornice trim and some 2/2 wooden sash, as well as an added, Italianate style porch on the south elevation. The house is now sided with synthetic material. Only two of the three historic barns listed in the SR are still standing. The property, which appears eligible to the NR with local significance, retains integrity of location, design, setting, materials, workmanship and feeling. Although the area around the house and barns remains open, the agricultural context of the property has been altered so that it does not appear to meet the registration requirements for eligibility as a Farmstead. Photos 133 - 134.

Site S12.
The 2½ story, gable front house on the east side of Route 7 is not listed on the SR. The gable front main block and the ell that projects from its south elevation are roofed with slate, suggesting the original massing of the house. The paired window openings and the peaked attic window on the west gable of the main block are Italianate in style and suggest that the house was constructed c. 1885. Although the building retains most historic materials,

original sash have been replaced. Most importantly, the non-historic enclosed porch built across the ell completely obliterates any historic entry door in the ell. No other historic entries are visible. Therefore the house does not appear eligible to the NR. Photo 135.

Site S13.
The c.1900 Vernacular style, gable-front house on the east side of Route 7 is not listed on the SR. The house retains its historic form and massing and some materials, including two historic chimneys and slate roof on the ell. The house does not appear to be eligible to the NR because a significant portion of its original elements have been altered, including installation of vinyl on the primary elevation, replacement sash, replacement of the original front door with an architecturally incompatible, recycled door, and inappropriate repairs to the south porch. Photos 136 – 137.

Site S14.
The c.1845 Classic Cottage on the east side of Route 7 is listed on the SR (Salisbury SR # 23), and although the historic form and massing are intact, the building does not appear individually eligible to the NR because of the cumulative effect of loss of historic materials, including the main chimney, clapboard siding and wood trim, sash windows and front door. The windows on the ground level of the main block are also strangely large, and may have been enlarged. The fenestration pattern across the wing has also been greatly altered. Photo 138.

Site S15.
The c.1855 Classic Cottage and associated carriage barn on the west side of Route 7 (Salisbury SR #22) retain historic form and massing, and although the historic sash have been replaced and vinyl has been installed over the clapboards, the fenestration pattern is intact. The house and carriage barn retain integrity of location, design, setting, materials, and workmanship, and appear eligible to the NR with local significance. Photos 139 – 140.

Site S16.
The gable roof form and the stone foundation of the 1½ story house on the east side of Route7 indicate that the building is over 50 years old but it is not listed on the SR. The house has lost architectural integrity because the historic fenestration pattern and primary entry have been altered and most historic materials have been replaced. Therefore the house does not appear eligible to the NR.

The associated gambrel-roofed barn is not listed on the SR but is a very good, well-preserved example of a c.1940 Ground Level Stable barn. The barn retains integrity of location, design, setting, materials, workmanship and feeling and appears individually eligible to the NR. Photos 141 – 142.

Middlebury Town – US Route 7 from Salisbury to Cady Cross Road

Site M1.
The c.1885 Queen Anne period house and barn retain historic form, massing and materials and are wonderful examples of the style. The buildings are listed on the SR (Middlebury SR #65) and retain integrity of location, design, setting, materials and workmanship. The property appears to be eligible to the NR as a Farmstead because it includes an historic shed/garage with a slate roof as well as surrounding open fields. The elevation and width of Route 7 has impacted the integrity of the farmstead's setting and feeling. Photos 143 – 144.

Site M2.
The early Federal style house is listed on the SR (Middlebury SR #66). The SR states that the house was constructed c.1800 and remodeled c.1825. The 1992 State Register photo of the house shows windows in the first, second, fourth and fifth bays. Since then, the windows in the second and fourth bays were enlarged as doors, but otherwise the building retains its historic form and massing, slate roof, brick chimneys, Colonial Revival period porch, and some historic 2/2 sash. The house is now covered with vinyl, but because of its age and legibility it appears eligible to the NR with local significance. The building retains integrity of location and design. At least one of the three associated camp buildings referenced in the State Register is still standing. Photos 145 – 146.

Site M3.
The unusual stucco-covered, Federal period (c.1810) house is located on Three Mile Bridge Road, west of Route 7, and is listed on the SR (Middlebury SR #67). Although a contemporary exterior brick chimney has been constructed against the south gable, the house retains its historic form, massing, fenestration pattern, and 2/2 sash windows. The house also retains integrity of location, setting, and workmanship, and therefore appears eligible to the NR with local significance. Photos 147 – 148.

Site M4.
With exception of its early 20th asbestos century siding, the Italianate style house on the west side of Route 7 appears nearly unaltered from is c. 1880 construction date. The house retains its historic form, massing, slate roofs, bracketed eaves, probably original 2/2 sash, stone foundation and hip-roofed Italianate style porch. The SR (Middlebury SR #68) entry for the house includes a related stable, granary and barn. The house is sited close to the road. The buildings are surrounded by open space, and connected by a dirt road. Although the property does not appear to be in agricultural use, its context is sufficiently intact, and it is therefore appears to be eligible to the NR as a 19th century Farmstead. The complex retains integrity of location, design, setting, materials, and workmanship. Photos 149 – 151.

Site M5.
The c.1935 Colonial Revival period gambrel-roofed house on the west side of Route 7, opposite VT Route 125, is not listed on the SR. The house does not appear eligible to the NR because the front elevation has been severely altered. Originally the full-width front dormer was not a wall dormer, but sat on the roof slope approximately 12” above the front eave. At some time, the bottom of the roof, below the face of the dormer, was cut off so that the front roof slope is shorter than the rear slope. In addition, the building is covered with vinyl and the sash have been replaced. Photo 152.

Site M6.
The late 19th century (c.1880) house on the east side of Route 7 is listed on the SR (Middlebury SR # 69). Although the sash windows have been replaced and the house is now sided with vinyl, the form and massing of the 3-bay wide main block and wing, as well as the historic front door and transom, are intact. The house retains integrity of location, design, setting and feeling and appears eligible to the NR with local significance. Photo 153.

Site M7.
The early Federal period (c.1815) house on the west side of Route 7 is listed on the SR (Middlebury SR # 70). Although it is now sided with vinyl and most historic window sash have been replaced, the form and massing are quite legible and the historic fenestration pattern is intact. Importantly, the front door and simple fanlight are still in place. The house

retains integrity of location, design, setting, and feeling and appears eligible to the NR with local significance. Photo 154.

Site M8.
The c. 1890 house on the east side of Route 7 is listed on the SR (Middlebury SR #71). The building retains its historic form and massing, as well as clapboards, molded window caps, wooden 1/1 sash windows and an intact Queen Anne style porch. The house is a well-preserved example of the style, retains integrity of location, design, setting, materials, and workmanship, and appears eligible to the NR for its local significance. Photos 155 – 156.

Site M9.
The small, c.1935 gable-roofed Colonial Revival style house on the east side of Route 7 is listed on the SR (Middlebury SR #72). The house appears nearly unaltered and retains clapboard siding, Colonial Revival front and side porches, front door, and single and paired 6/1 sash windows. The house retains integrity of location, design, setting, materials, workmanship and feeling and therefore appears eligible to the NR for its statewide significance. Photo 157.

Site M10.
The Colonial Revival house on the east side of Route 7 is listed on the SR (Middlebury SR #73) but does not appear eligible to the NR due to alterations. Although the porch may be historic, the porch infill and door are not historic and the fenestration pattern across the front dormer, which may be historic, has been altered. In addition, the historic form and massing of the c. 1935 house has been compromised by the construction of the large garage addition to the south gable end. Photos 158 – 159.

Site M11.
The small, single-story, Colonial Revival style house on the east side of Route 7 is listed on the SR (Middlebury SR #74). The c.1940 house retains its historic form, massing, 6/1 sash windows, bay windows with transoms, and Colonial Revival porch. Although the building is now sided with vinyl, it is a good example of its type and therefore appears eligible to the NR with statewide significance. The building also retains integrity of location, setting, workmanship and feeling. Photo 160.

Middlebury Town – US Route 7 north of Cady Cross Road, including Cady Cross Road, Foote Street and Lower Foote Street.

Site M12.
The c. 1930, cross-gable plan, Colonial Revival style house on the west side of Route 7 is not listed on the SR. Although the historic portion of the building retains its form, massing and some materials, the architecturally incompatible rear addition is significantly larger than the original house. Therefore the building does not appear eligible to the NR. Photo 161.

Site M13.
The small 3 x 1 bay, eaves-front house on the west side of Route 7 and its associated early 20^{th} century garage are over 50 years old but are not listed on the SR. The house lacks architectural distinction and does not appear eligible to the NR. The associated garage is a typical example of its type but is not individually NR eligible. Photos 162 – 163.

Site M14.
The gable-roofed field building on the west side of Route 7, opposite the Omya road, does not appear eligible to the NR. Photo 164.

Site M15.
The c.1850 Classic Cottage on the west side of Route 7 is listed on the SR (Middlebury SR #84). The house retains its mid-19th century massing, clapboards, brick chimney, historic wood sash, and granite foundation. The shed dormer with 3/1 sash, the front porch and the rear shed extension probably date from the Colonial Revival period in the early 20th century. The associated c.1930 gambrel-roofed Ground Level Stable barn is not listed on the SR but is a very good example of its type, and with increasing age, is now considered to be historic. The barn is also significant because it includes a c.1950 gable- roofed addition and three concrete stave silos. The house and barn appear to be eligible to NR with statewide significance, as they retain significance of location, design, setting, materials and workmanship. The property does not meet the registration requirements of a Farmstead because its historic context has been lost. Photos 165 – 168.

Site M16.
The large, 2-story house on the west side of Route 7 is listed on the SR (Middlebury SR #85). The early building (c.1830) is a Vernacular/Federal style structure that retains historic form and massing, as well as slate roof, brick chimneys, clapboards, wood trim and granite foundation. The house is also highlighted by an intact Queen Anne period porch on the south gable end. The historic sash windows have been replaced and the fenestration pattern on the east elevation has been seriously compromised by the apparent removal of the front door from the middle bay and the installation of an incompatible, projecting bay window. Clapboard in fill can be seen below the added bay window. Although the unfortunate alteration of the east elevation is significant, the house is otherwise generally intact, and due to its age, appears marginally eligible to the NR with local significance. The building retains integrity of location, setting, and workmanship. The associated gable-roofed carriage barn is also listed on the SR but has lost integrity due to the introduction of the very large garage door opening on the primary elevation. Photos 169 – 171.

Site M17.
The c.1860/c.1920 house on the west side of Route 7, immediately north of South Middle Road, is listed on the SR (Middlebury SR # 86) but does not appear to be individually eligible to the NR due to the construction of the large enclosed entry on the primary elevation, several additions and loss of historic materials. Photo 172.

Site M18.
The former school, on the east side of Route 7 immediately north of Foote Street, was constructed c.1850 and is listed on the SR (Middlebury SR # 83). The large banks of windows are probably historic openings added in the early 20th century but the existing sash in the openings are not historic. The interior of the school has been altered by the removal of historic finishes. Regardless, the historic form and massing are intact so that the clapboarded building is clearly recognizable as a school. The building appears eligible to the NR under Criterion A: Event, because of its role in the history and development of Middlebury. The building retains integrity of location, design, workmanship, feeling and association.
Photos 173 – 174.

Site M19.
The small, c.1800 house on the east side of Foote Street, immediately south of the intersection of Foote Street and Lower Foote Street, listed on the SR (Middlebury SR #77). The house is composed of a 1½ story, 3 x 2 bay, eaves-front (west), main block with a shorter gable-roofed ell projecting from its rear elevation. A Colonial Revival period porch has been constructed in the rear interior corner between the main block and the ell. The house is sheathed with vinyl but retains its historic form and massing, as well as historic 2/2 sash, front door with deep reveal and unusual, early fanlight. The brick chimney is historic but may not be original, although the owner reports that there is no chimney mass from an earlier, larger chimney in the basement. The property includes an early gable-front (north) barn with 12-light and 6/6 sash windows and a peaked lintel over the gable entry, and a mid 19th century gable-front (east) carriage barn/garage. The early barn remains in agricultural use as part of the dairy operated by Vermont Agricultural Products. The early house and barns appear eligible to the NR with local significance as they retain integrity of location, materials, setting, workmanship, feeling and association. The property does not meet the registration requirements of a Farmstead because the land historically associated with the buildings is no longer apparent. Photos 175 – 180.

Site M20.
The c.1800 Cape Cod style house is located on the east side of Lower Foote Street, south of the intersection of Lower Foote and Foote streets. The building is a 1½ story, 5 x 3 bay, eaves-front (west) main block with a single story ell projecting from its rear (east) elevation. The house is not listed on the SR but its form and massing suggest that it may have been constructed in the late 18th or early 19th century. The owner reports that it may be older than the c.1800 house on the opposite side of Lower Foote Street (Site M19). In addition to its form and massing, the house retains clapboard siding, some historic wooden sash, a stone foundation, and for the most part, its historic fenestration patterns. The front dormer is probably not original but may have been constructed in conjunction with the Colonial Revival style hip-roofed front porch. The porch posts and deck are not historic but the shape of the roof suggests that the porch was constructed c.1900. The brick exterior chimney and the front door are not historic. Although its materials have been altered, the building is probably quite old and retains integrity of location, design, setting, most materials, workmanship and feeling, and therefore appears eligible to the NR with local significance. Photos 181 – 182.

Site M 21.
The farm complex on the east side of Lower Foote Street is listed on the SR (Middlebury SR # 76), although the State Register map shows the property further north on Lower Foote Street than its actual location. The property includes a c.1850, 1 ½ story Greek Revival style house composed of a 5-bay wide main block and a shorter rear ell. The west-facing main block features an intact Queen Anne style front porch and slate roof, although it is sided with vinyl and has replacement sash. The rear ell retains historic materials including clapboard siding, wood sash and slate roof. The historic form and massing of the house is for the most part intact.

The historic granary, corn crib, bull barn/seed processing barn, and forge are located just south and east of the house, and are nearly unaltered from their 19th century appearance. The bull barn was reportedly moved to its currant location early in the 20th century. The c.1910 barn and c.1920 shop included in the 1992 SR listing are no longer standing. Two mid-20th century barns, a 1956 Ground Level Stable Barn and a c.1960 gambrel-roofed milking parlor with attached, gable-roofed calf barn ell, are located just south of the 19th century buildings. Several non-contributing agricultural buildings now associated with the farm's compost production business, have been constructed south of the stable and milking parlor, so that the evolution of the complex is clearly recognizable and understood.

Although the Ground Level Stable, which is nearly 50 years old, no longer houses cows, the typical metal stanchions are still in place. A portion of the stable now serves as offices for the compost production business. The property remains in agricultural use, although the dairy operation is now housed in the non-historic free-stall barns north of the farmhouse. The historic agricultural buildings are now used for storage associated with the farm's compost production business, or are unused. The complex of buildings includes connecting paths and dirt roads. The associated fields are under cultivation. The complex retains integrity of location, design, setting, materials, workmanship, feeling and association and appears to meet the registration requirements that make it eligible to the NR as a Farmstead.
Photos 183 – 191.

Site M22.
The c.1880, 1½ story Vernacular house on the east side of Lower Foote Street is composed of a gable-front (west) main block with a 1½ story ell projecting from its south elevation and is listed on the SR (Middlebury SR # 75). The simple house is distinguished by a Queen Anne style bay window on the front gable elevation. The historic form and massing are generally intact, but most historic materials have been replaced and a skylight and enclosed exterior stair have been added to the ell. The associated c. 1930 gambrel-roofed Ground Level Stable barn and concrete stave silos are not included in the SR but now are considered to be historic. The 20th century barn probably replaced an earlier barn. The property also includes a small, early 20th century shop or utilitarian building and a very large, non-historic machine shed. Although the property does not appear to be an active dairy, the surrounding fields are in agricultural use and the open land around the buildings conveys a sense of its farming history. Therefore the property appears to meet the registration requirements that make it eligible to the NR as Farmstead that has evolved over time. The property retains integrity of location, design, setting, materials, and workmanship. Photos 192 – 194.

No Build Alternative Summary

<u>Sites listed on or that appear to be eligible for the National Register of Historic Places</u>

Florence Village

F1 House and associated barn, c.1840
F2 Church, c.1910
F3 House, c.1920
F5 Railroad Trestle, c.1910
F6 Rutland-Florence Marble Company site, c1910
F10 House, c.1890
F11 House, c.1890
F12 House, c.1890
F16 House, c.1890
F17 House, c.1890
F32 Hammond Covered Bridge, 1842

Pittsford Town

P1 Farmstead, c.1840

P2 Farmstead, house, c.1802
P4 House, 1816 and Barn, c.1920
P5 Farmstead, c.1845/c.1930
P6 Early Bank Barn, c.1830
P8 House, c.1845
P9 Fort Vengeance Monument, 1873
P10 House, c.1840

Brandon Town

B1 Farmstead, house.c.1820
B6 House and barn, c.1820
B7 House and outbuildings, c.1860
B9 House, c.1900
B10 Farmstead, c.1860
B12 House, c.1870
B13 Tourist cabins, c.1940
B14 House, c.1880, barn and shed
B15 House, c.1900
B16 Brandon Village National Register Historic District
B22 Pine Hill Cemetery, stonewall and iron gate
B27 Ground Level Stable Barn, c.1920-30

Leicester Town

L2 House, 1820 and outbuildings
L3 Farmstead, c 1850
L6 Tavern, c.1830
L7 Leicester School and Town Hall, c.1858
L8 Leicester Meetinghouse, 1826
L12 Ground Level Stable Barn, c.1920

Salisbury

S1 House, c.1840 and barn
S2 House, c.1857
S3 House, c.1845
S5 House, c.1830, and barn
S6 House, c.1840
S7 House, c1810
S8 House, c.1840
S11 House, c. 1835 and barns
S15 House, c.1855 and carriage barn
S16 Ground Level Stable Barn, c.1930

Middlebury

M1 Farmstead, c.1885
M2 House, c.1800/1825
M3 House, c.1810
M4 Farmstead, c.1880

M6 House, c.1880
M7 House, c.1815
M8 House, c.1890
M9 House, c.1935
M11 House, c.1940
M15 House, c.1850 and Ground Level Stable Barn, c.1920/1950
M16 House, c.1830
M18 School, c.1850
M19 House, c.1800, Barn, c.1840, Carriage Barn, c.1860
M20 House, c.1800
M21 Farmstead, c.1850
M22 Farmstead, House, c.1880, Ground Level Stable Barn, c.1930

Middlebury Spur Project
RAIL SPUR ALTERNATIVE 1(RS-1) and
TRUCK TO RAIL ALTERNATIVE l (TR-1)

The historic resource survey for the RS-1/TR-1 alternatives was conducted along both sides of the following roads.

- South Street Extension from the height of land west of Otter Creek to approximately 0.5 mile south of the proposed mainline/rail spur junction.
- Creek Road from US Route 7 south to approximately 0.5 mile south of the proposed SR-1/TR-1 spur crossing.
- Halladay Road, approximately 0.3 mile north and south of the intersection with South Middle Road.
- US Route 7 from Cady Cross Road to the intersection of South Middle Road and Foote Street.
- Foote Street from US Route 7 to intersection of Foote Street and Lower Foote Street.
- Lower Foote Street from Foote Street to Cady Cross Road.
- Cady Cross Road from Lower Foote Street to US Route 7.

Site M23.
The farm on South Street Extension is listed on the SR (Middlebury SR #100). The c.1860 house and collection of agricultural buildings that date from the second half of the 19th century and early 20th are very well preserved, having changed very little from their period of significance. The buildings are connected by barnyards delineated by fences, and surrounded by pastures and fields. The farm remains in agricultural use and appears to be eligible to the NR as a Farmstead. The property retains integrity of location, design, setting, materials, workmanship and feeling. Photos 195 – 200.

Site M24.
The farm identified as Creek Road Farm, on the east side of Creek Road, south of the proposed RS-1/TR-1 alignment, is not listed on the SR. The complex includes a main house, a single story, hip-roofed secondary dwelling, a main barn, and two machine sheds. The eaves-front house was probably built in the second half of the 19th century, but has lost architectural integrity due to the construction of non-historic additions on at the front and rear elevations, as well as a non-historic enclosed porch across the width of the front elevation. The house is covered with vinyl, most historic sash have been replaced, and a non-historic exterior chimney has been built against the west gable end. Similarly, any historic materials on the smaller house have also been replaced. Novelty siding on the smaller machine shed suggests that it was constructed early in the 20th century. The main barn is a very large c.1930-40 gambrel roofed Ground Level Stable with a gable roofed wing projecting from the west third of its south eave elevation. Each slope of the barn's roof is defined by five small, shed-roofed dormers. There is a tile silo against the north elevation and a concrete stave silo on the south elevation. The barn is now sheathed with sheet metal that is probably not original. The roof is also covered with metal. The sag in the ridge of the wing suggests that it may be older than the Ground Level Stable, but non-historic, residential scale doors and windows have been added to the front and south elevation. The wing is also sheathed with replacement clapboards and rests on a poured concrete foundation or a concrete slab. Although the Ground Level barn is legible and prominent in the landscape, the loss of original siding and the non-historic changes to the wing have diminished the barn's architectural integrity. Because the barn is not particularly old and is not a rare type, these

changes make it appear individually ineligible to the NR. The property remains in agricultural use and the surrounding fields are open, but the farm does not meet the registration requirements to be eligible to the NR as a Farmstead because the form, massing and materials of the farmhouse have been significantly altered. Photos 201 – 206.

Site M25.
The large, c.1800 house in the southwest quadrant of Halladay Road and South Middle Road is listed in the State Register (Middlebury SR #89). When the property was surveyed for the SR in 1992, it was recorded as a farm complex that included a number of historic agricultural buildings. Presently, only the house, a c.1925 shed with exposed rafter tails, and an outhouse are still standing. The five bay wide Federal style house features a Gothic Revival front porch as well as slate roof, brick chimneys, clapboard siding and historic sash windows and front door. The form and massing of the main block remain intact. The house retains integrity of location, design, setting, materials, workmanship and feeling, and appears to be eligible to the NR with statewide significance. The associated buildings appear NR eligible as part of the complex. Photos 207 – 210.

Site M26.
The house is located on the west side of Halladay Road and is the sixth property north of the intersection with South Middle Road. The original section of the house appears to be a c.1850 Greek Revival style Classic Cottage. The house is not listed on the SR and does not appear eligible to the NR due to the construction of several large, incompatible additions, and loss of historic materials. Photo 211.

Site M27.
The Vernacular house on the east side of Haliday Road, approximately three-tenths of a mile south of South Middle Road, was probably constructed in the last decade of the 19th century or early in the 20th century. The house is not listed on the SR and does not appear eligible to the NR due to loss of historic materials and construction of several non-historic additions and an enclosed porch. Photos 212 – 213.

Site M28.
The c.1885 Italianate style house and associated agricultural buildings on Creek Road, north of the proposed RS-3 alignment, are listed in the State Register as a farm (Middlebury SR # 102). When it was listed on the State Register in 1992, the property included the house, a c.1910 shed, c.1930 garage, c.1890 granary, c.1925 chicken coup and c.1930 milk house. Currently it appears that the garage and milk house are no longer standing. The farmhouse is a 2½ story gable-front main block with a 1½ story ell projecting from its south elevation. The historic form and massing appear unaltered. The house retains its brick chimneys, clapboard siding, wooden trim, including scroll sawn brackets at the corners, Italianate style ell porch, historic doors, and stone foundation. The three remaining agricultural buildings also appear to be nearly unaltered. The large, single-story gable-roofed barn was probably constructed in the 1960s or 70s and therefore is not yet considered to be historic. Its presence on the farm does help to describe the evolution of the farm. Although the property lacks an historic main barn, the collection of historic buildings is legible so that the evolution of the farm can be understood. The property appears to be in agricultural use and the surrounding fields are under cultivation. The farm retains integrity of location, design, materials, and workmanship, and appears to meet the registration requirements that make it eligible to the NR as a Farmstead. Photos 214 – 217

The following sites, described above in the No-Build Alternative section, are also located within the APE of SR-1/TR-1:

Site M12.
Site M13.
Site M14.
Site M15.
Site M16.
Site M17.
Site M18.
Site M19.
Site M20.
Site M21.
Site M22.

RS-1 / TR-1 Summary

Sites listed on or that appear to be eligible to the National Register of Historic Places

M15	House, c.1850 and Ground Level Stable Barn, c.1920/1950
M16	House, c.1830
M18	School, c.1850
M19	House, c.1800, Barn, c.1840, Carriage Barn, c.1860
M20	House, c.1800
M21	Farmstead, c.1850
M22	Farmstead, House, c.1880, Ground Level Stable Barn, c. 1930
M23	Farmstead, c.1860
M25	House, c.1800, and outbuildings
M28	Farmstead, c. 1880

Middlebury Spur Project
RAIL SPUR ALTERNATIVE 3 (RS-3)

The historic resource survey for the RS-3 Alternative was conducted along both sides of the following roads:

- Creek Road from US Route 7 south to approximately 0.5 mile south of the proposed RS-3 alignment.
- Middle Road from US Route 7 to the dead end of North Middle Road.
- Halladay Road, approximately 0.3 mile north and south of the intersection with South Middle Road.
- US Route 7 from Cady Cross Road to the intersection of South Middle Road and Foote Street.
- Foote Street from US Route 7 to intersection of Foote Street and Lower Foote Street.
- Lower Foote Street from Foote Street to Cady Cross Road.
- Cady Cross Road from Lower Foote Street to US Route 7.

Site M29.
The c.1900 house is located on the east side of Creek Road, approximately 0.2 mile north of the entrance to the VTrans District Garage. The Foursquare, Colonial Revival style building retains its slate roof, historic siding, typical 3/1 windows, historic front door and Colonial Revival style porch. Aside from the non-historic side door at the added handicapped ramp, which is reversible, the building appears nearly unaltered. It retains integrity of location, design, materials, and workmanship, although its context has been impacted by the construction of various adjacent non-historic structures. The house is listed on the State Register (Middlebury SR# 107) and appears to the eligible to the NR with local significance. Photo 218.

The following sites, described above in the No-Build Alternative section, are also located within the APE of RS-3.

Site M12.
Site M13.
Site M14.
Site M15.
Site M16.
Site M17.
Site M18.
Site M19.
Site M20.
Site M21.
Site M22.

The following sites, described above in the RS-1/TR-1 Alternative section, are also located within the APE of RS-3:

Site M 23
Site M 25
Site M 26

Site M 27
Site M 28

RS-3 Summary

<u>Sites listed on or that appear to be eligible to the National Register of Historic Places</u>

M15	House, c.1850 and Ground Level Stable Barn, c.1920/1950
M16	House, c.1830
M18	School, c.1850
M19	House, c.1800, Barn, c.1840, Carriage Barn, c.1860
M20	House, c.1800
M21	Farmstead, c.1850
M22	Farmstead, House, c.1880, Ground Level Stable Barn, c.1930
M23	Farmstead, c.1860
M25	House, c.1800
M28	Farmstead, c.1880
M29	House, c.1900

POTENTIAL EFFECT

A separate report that provides additional information about the alternatives, and discusses potential impacts of the alternatives on historic resources, will be prepared. The report will include recommendations for mitigation as needed, and will be submitted to VTrans for concurrence.

Please let me know if you need additional information concerning the historic properties identified in this report. If the Vermont Agency of Transportation concurs with this determination, please sign on the line provided below.

Thank you.

Sincerely,

Mary Jo Llewellyn
Historic Preservation Consultant

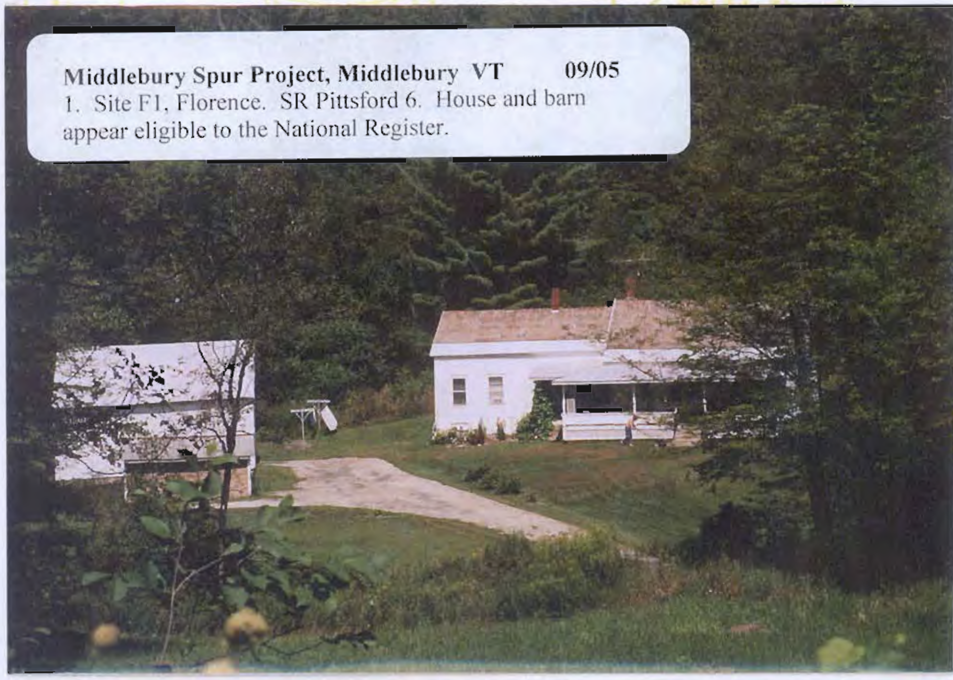
CONCUR:

____ __________
Scott Newman, VAOT Historic Preservation Coordinator Date

cc: Jed Merrow, McFarland-Johnson, Inc.

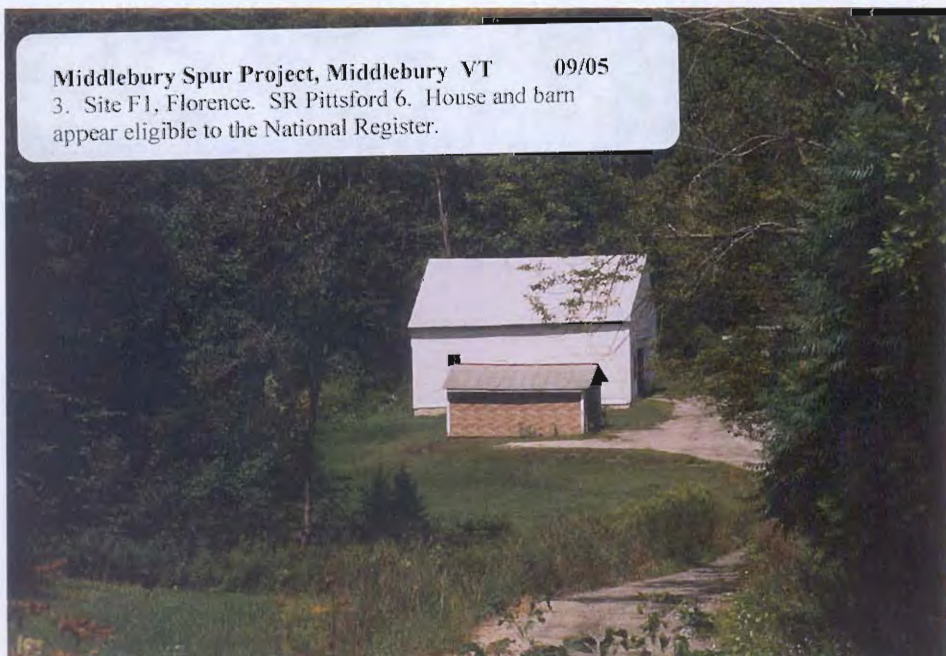
attachments

Photographs 1 - 218

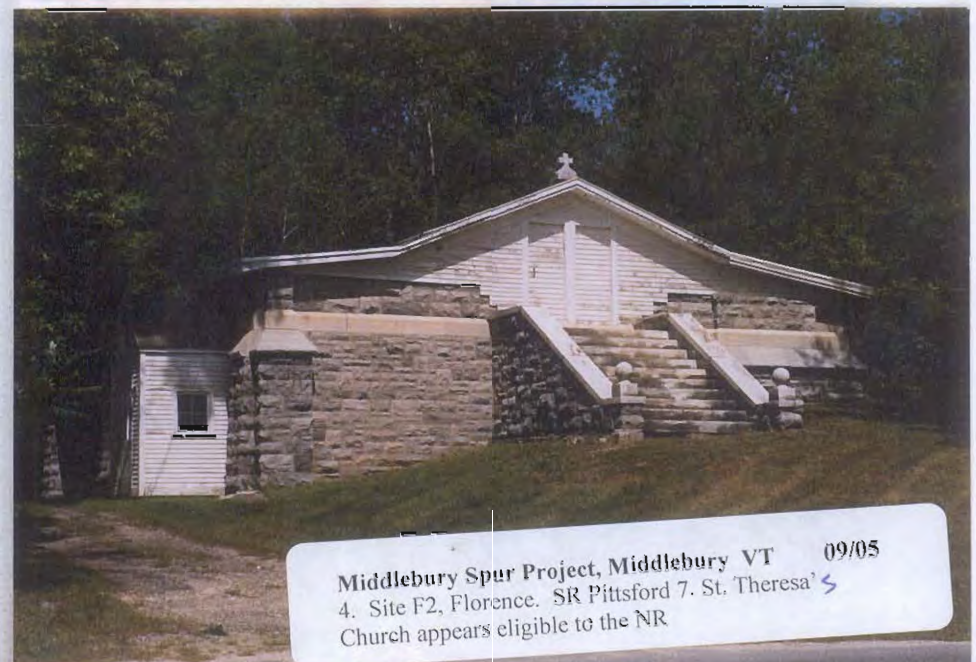


Middlebury Spur Project, Middlebury VT **09/05**
1. Site F1, Florence. SR Pittsford 6. House and barn appear eligible to the National Register.

Middlebury Spur Project, Middlebury VT **09/05**
2. Site F1, Florence. SR Pittsford 6. House and barn appear eligible to the National Register.

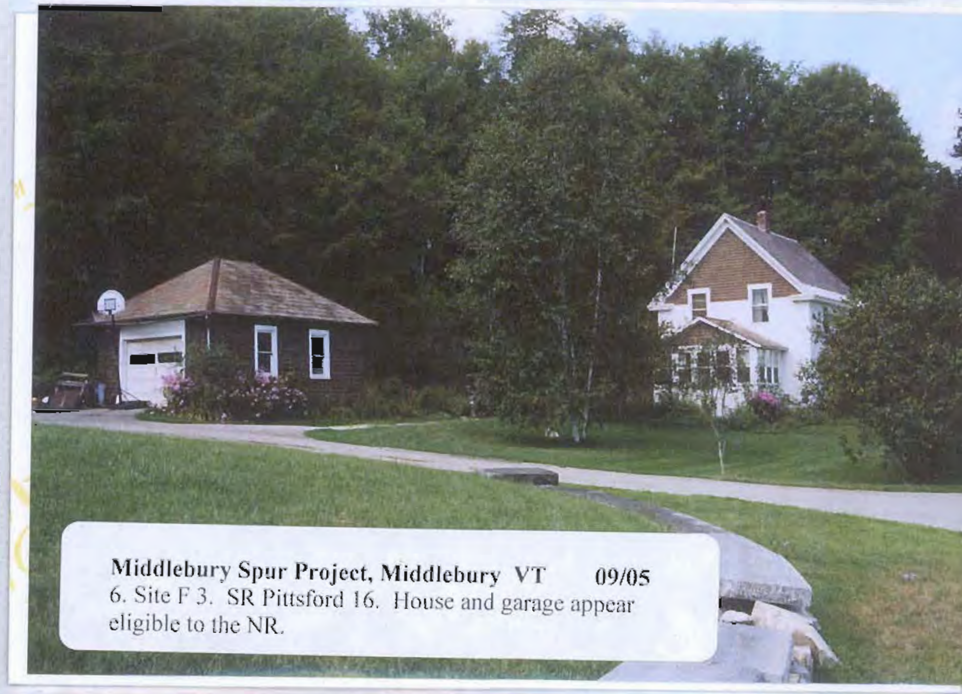


Middlebury Spur Project, Middlebury VT **09/05**
3. Site F1, Florence. SR Pittsford 6. House and barn appear eligible to the National Register.



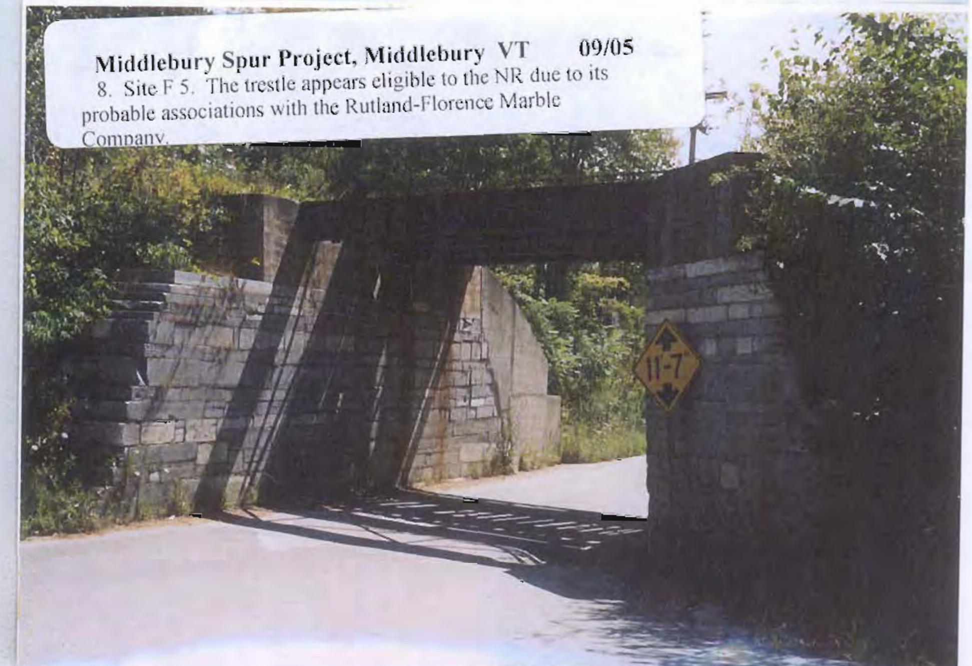
Middlebury Spur Project, Middlebury VT **09/05**
4. Site F2, Florence. SR Pittsford 7. St. Theresa's Church appears eligible to the NR

Middlebury Spur Project, Middlebury VT **09/05**
5. Site F 3. SR Pittsford 16. House and garage appear eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
6. Site F 3. SR Pittsford 16. House and garage appear eligible to the NR.

Middlebury Spur Project, Middlebury VT **09/05**
7. Site F 4. SR Pittsford 15. House does not appear eligible to the NR due to alterations of the porch.

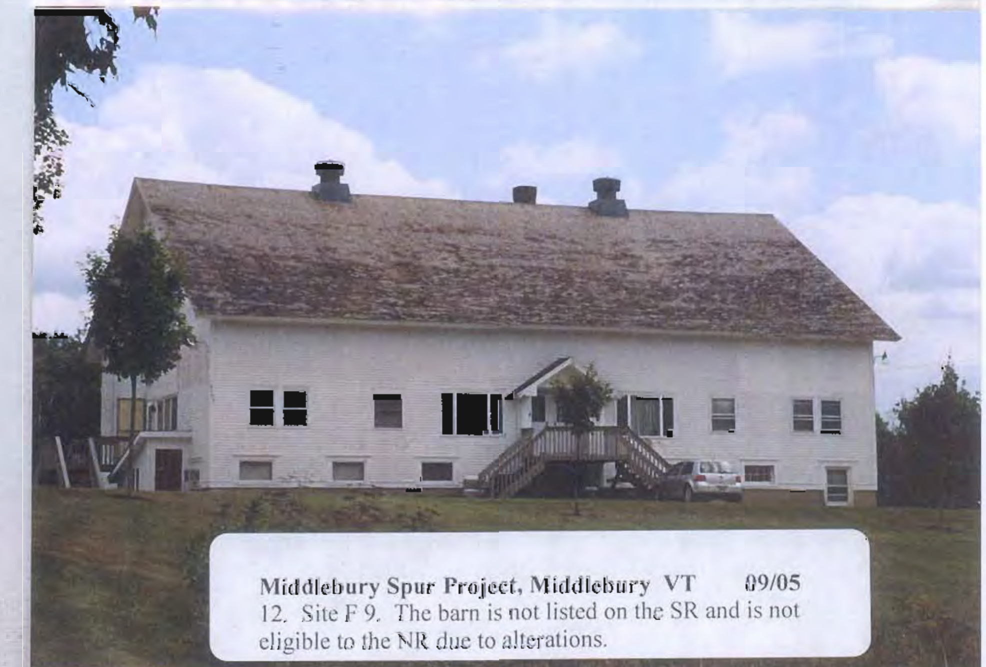


Middlebury Spur Project, Middlebury VT **09/05**
8. Site F 5. The trestle appears eligible to the NR due to its probable associations with the Rutland-Florence Marble Company.

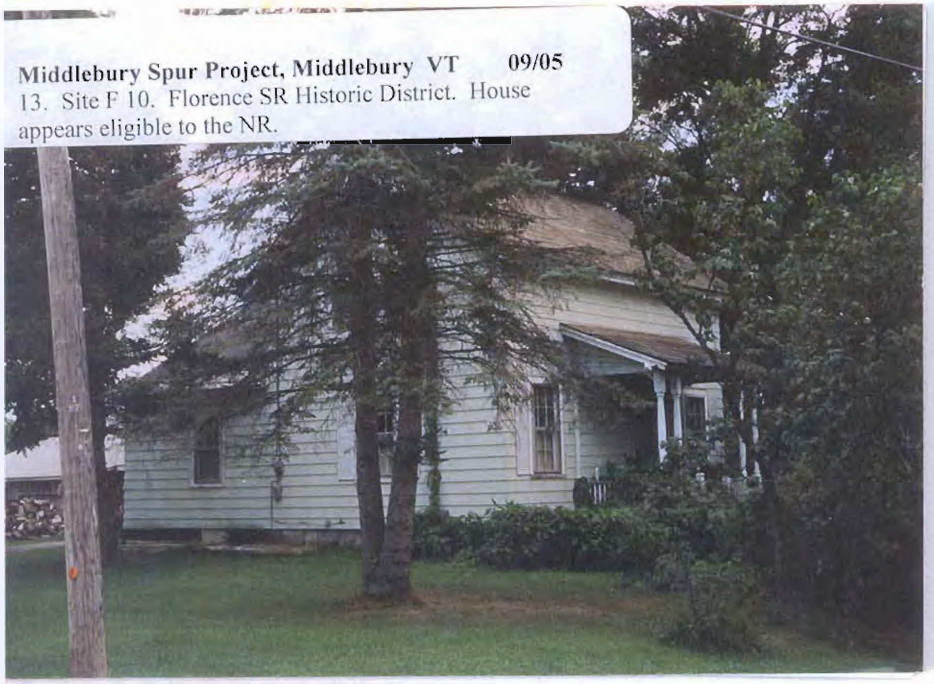
Middlebury Spur Project, Middlebury VT 09/05
9. Site F 6. Rutland-Florence Marble Company, SR Pittsford 14, is eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
10. Site F 7. The house is not eligible to the NR due at additions and alterations.

Middlebury Spur Project, Middlebury VT 09/05
11. Site F 8. The house doe not appear NR eligible due to alterations.



Middlebury Spur Project, Middlebury VT 09/05
12. Site F 9. The barn is not listed on the SR and is not eligible to the NR due to alterations.



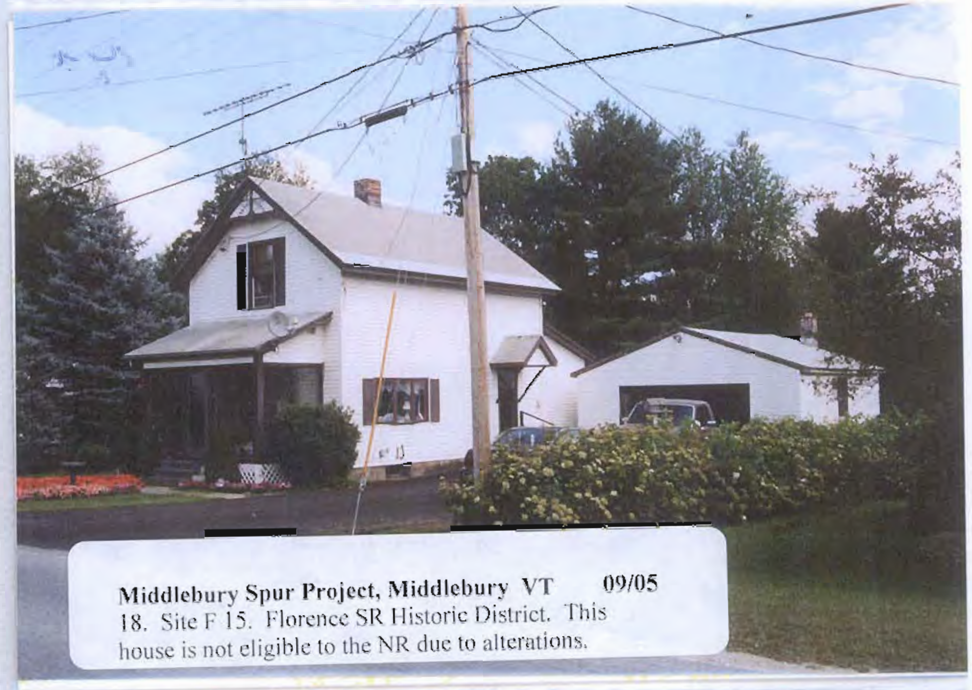
Middlebury Spur Project, Middlebury VT **09/05**
13. Site F 10. Florence SR Historic District. House appears eligible to the NR.

Middlebury Spur Project, Middlebury VT **09/05**
14. Site F 11. Florence SR Historic District. House appears eligible to the NR.

Middlebury Spur Project, Middlebury VT **09/05**
15. Site F 12. Florence SR Historic District. The house appears eligible to the NR.

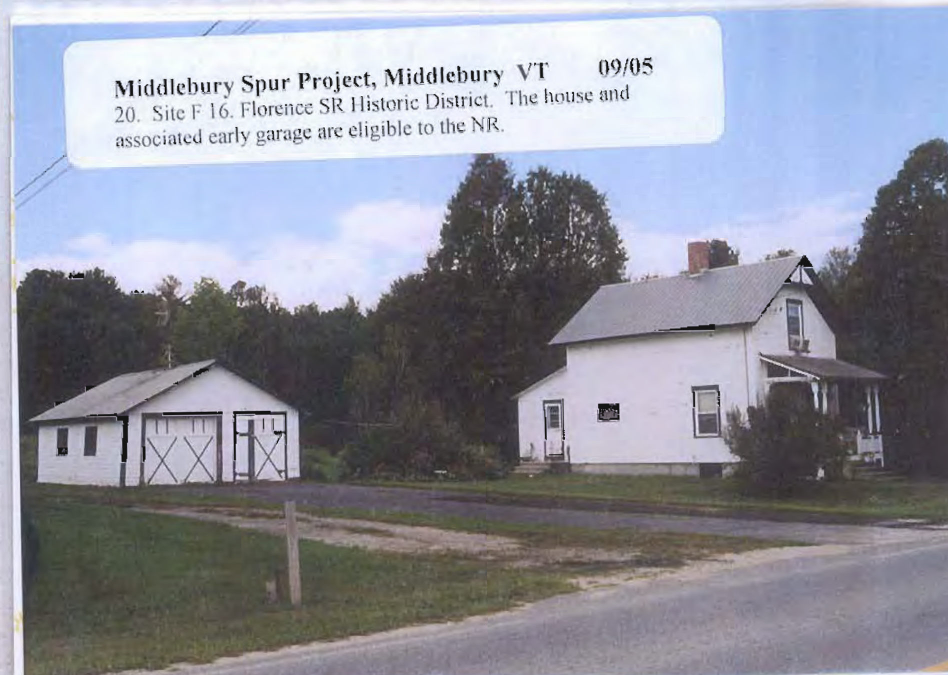
Middlebury Spur Project, Middlebury VT **09/05**
16. Site F 13. Florence SR Historic District. This house is not eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT **09/05**
17. Site F 14. Florence SR Historic District. This house is not eligible to the NR due to alterations.

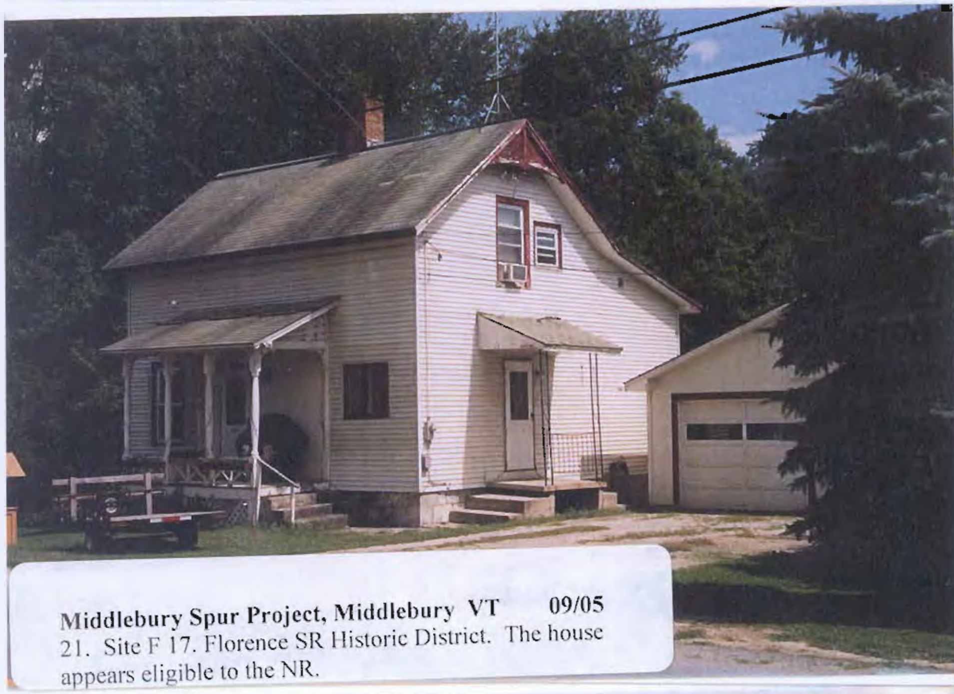


Middlebury Spur Project, Middlebury VT **09/05**
18. Site F 15. Florence SR Historic District. This house is not eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT **09/05**
19. Site F 16. Florence SR Historic District. The house is eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
20. Site F 16. Florence SR Historic District. The house and associated early garage are eligible to the NR.



Middlebury Spur Project, Middlebury VT 09/05
21. Site F 17. Florence SR Historic District. The house appears eligible to the NR.

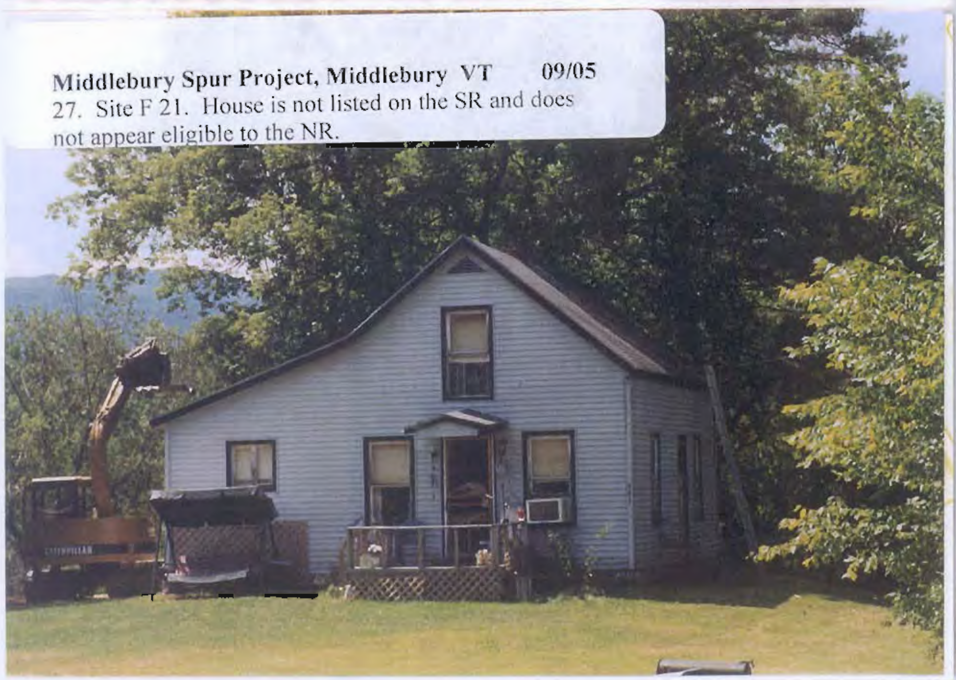
Middlebury Spur Project, Middlebury VT 09/05
22. Site F 18. SR Pittsford 12. The house does not appear eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT 09/05
23. Site F 18. Pittsford SR 12, associated garage does not appear individually eligible to the NR.

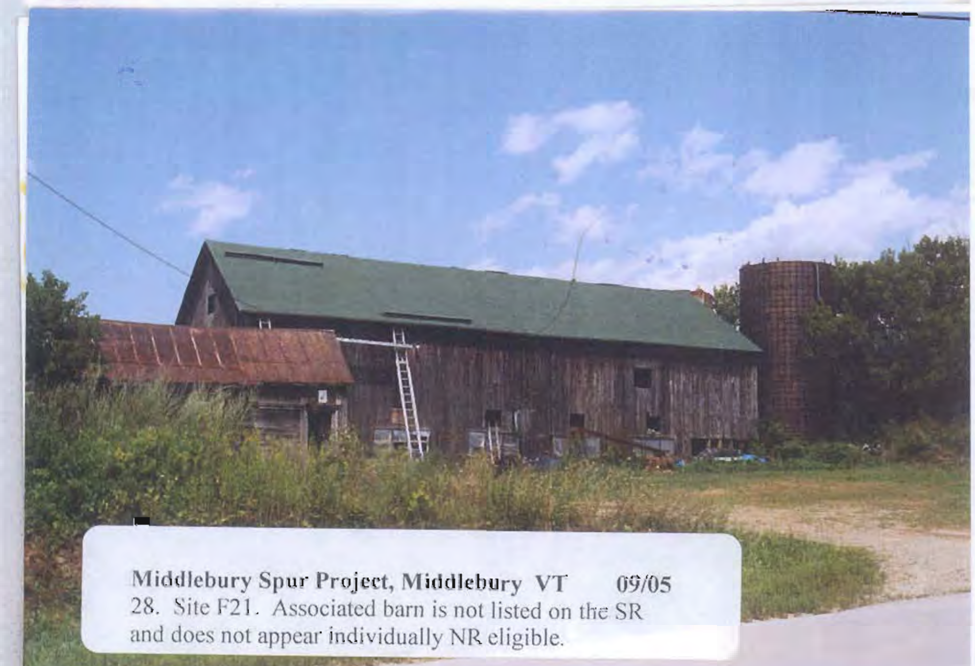
Middlebury Spur Project, Middlebury VT 09/05
24. Site F19. Pittsford SR 8. This house does not appear eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT **09/05**
25. Site F 19. Pittsford SR 8. The house does not appear eligible to the NR due to alterations.

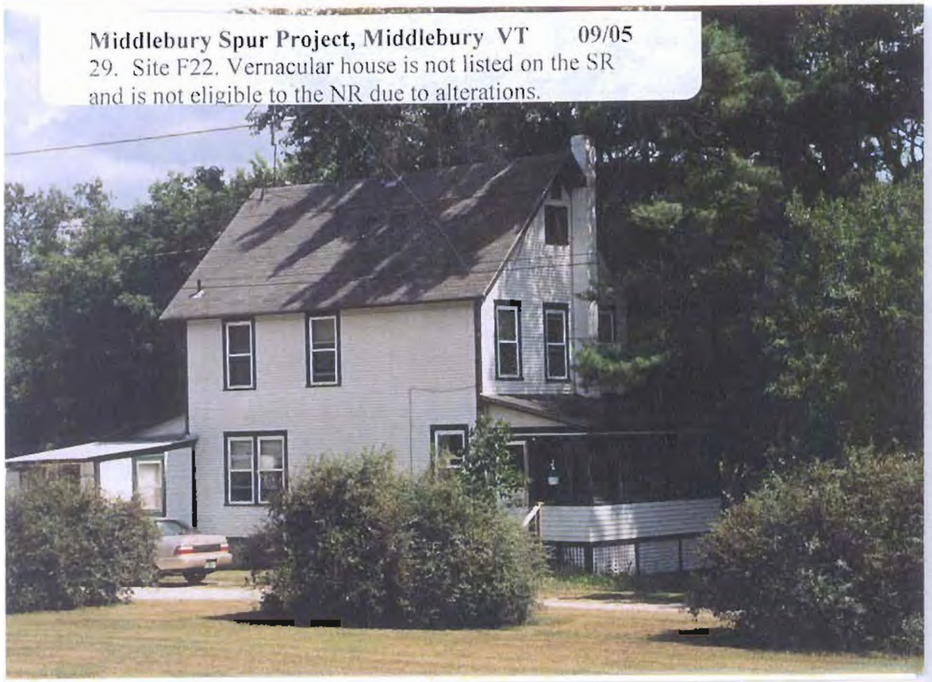
Middlebury Spur Project, Middlebury VT **09/05**
26. Site F 20. House is not listed on the SR and does not appear eligible to the NR.

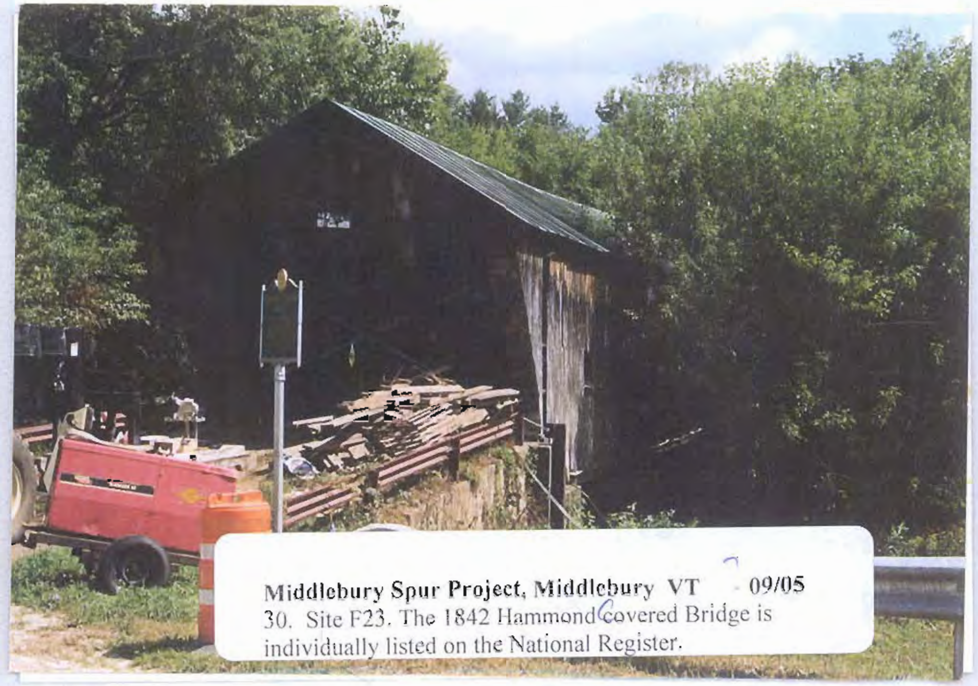


Middlebury Spur Project, Middlebury VT **09/05**
27. Site F 21. House is not listed on the SR and does not appear eligible to the NR.

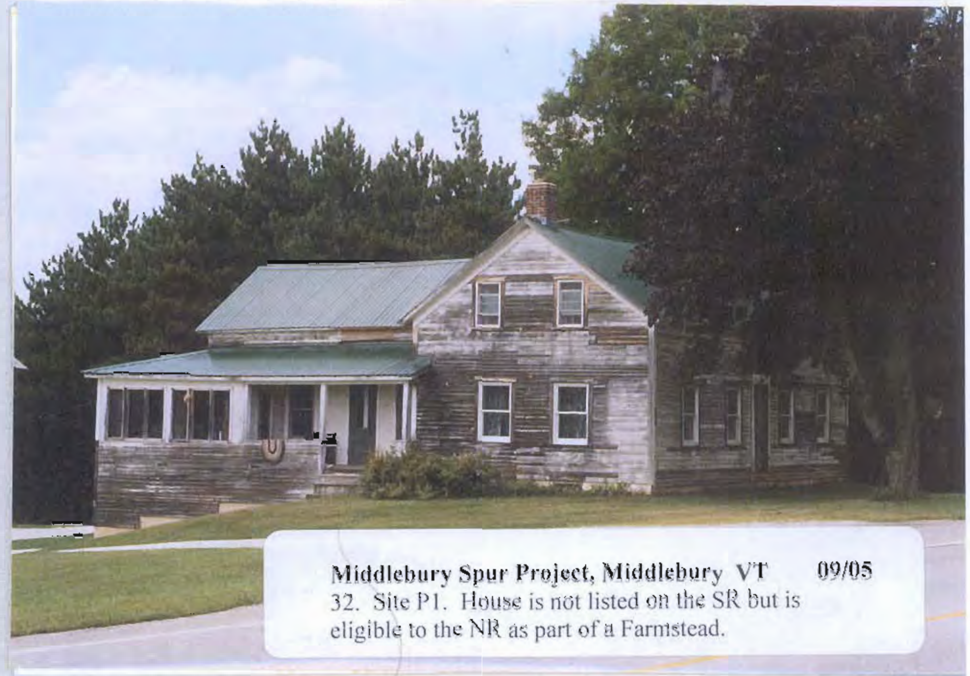


Middlebury Spur Project, Middlebury VT **09/05**
28. Site F21. Associated barn is not listed on the SR and does not appear individually NR eligible.

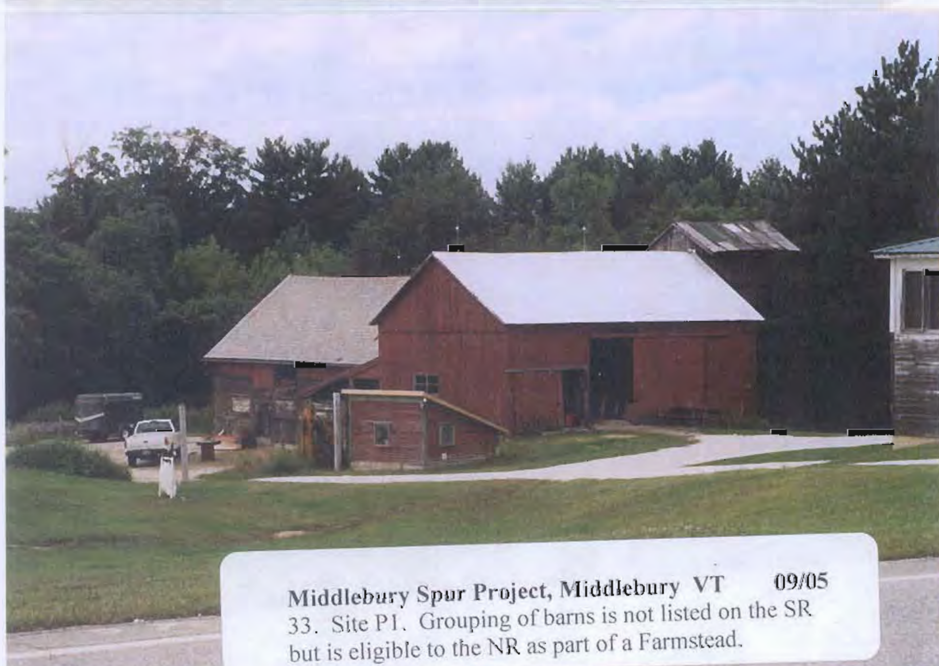

Middlebury Spur Project, Middlebury VT 09/05
29. Site F22. Vernacular house is not listed on the SR and is not eligible to the NR due to alterations.


Middlebury Spur Project, Middlebury VT 09/05
30. Site F23. The 1842 Hammond covered Bridge is individually listed on the National Register.

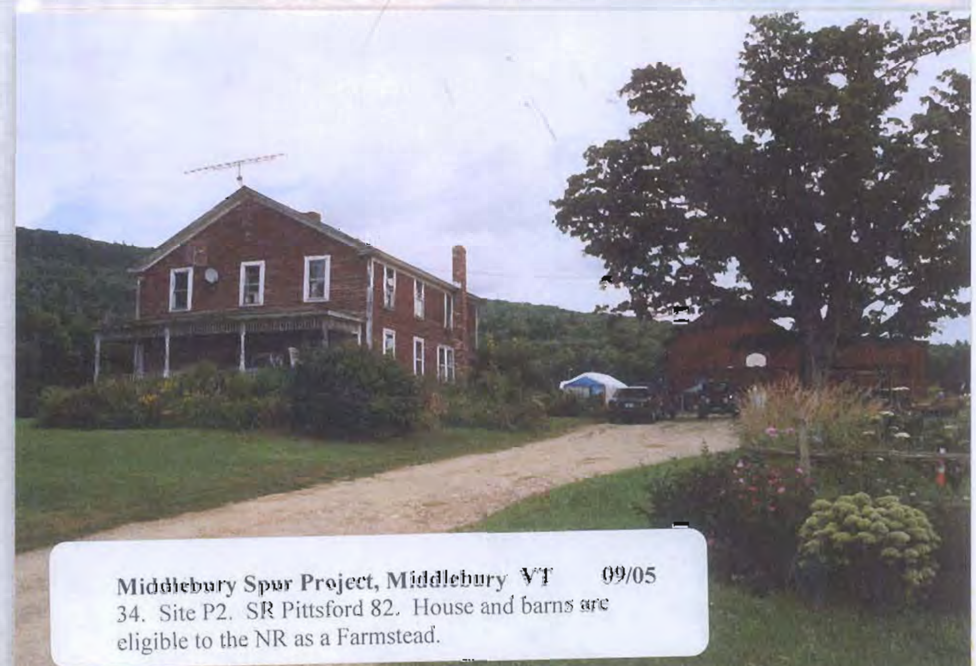
Middlebury Spur Project, Middlebury VT 09/05
31. Site P1. The complex is not listed on the SR but appears eligible to the NR as a Farmstead.



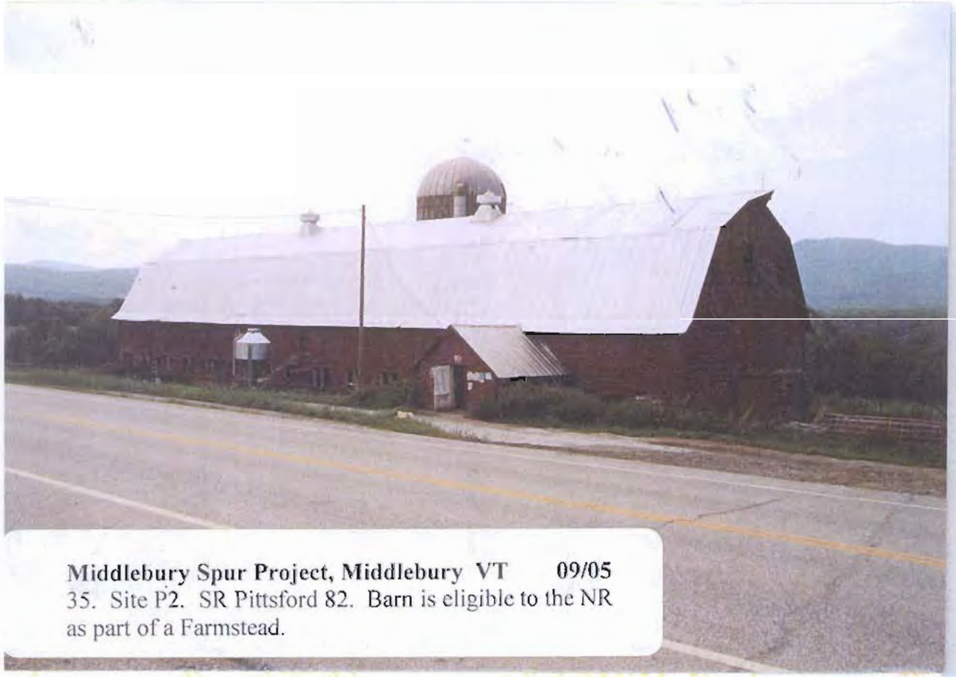
Middlebury Spur Project, Middlebury VT 09/05
32. Site P1. House is not listed on the SR but is eligible to the NR as part of a Farmstead.



Middlebury Spur Project, Middlebury VT 09/05
33. Site P1. Grouping of barns is not listed on the SR but is eligible to the NR as part of a Farmstead.

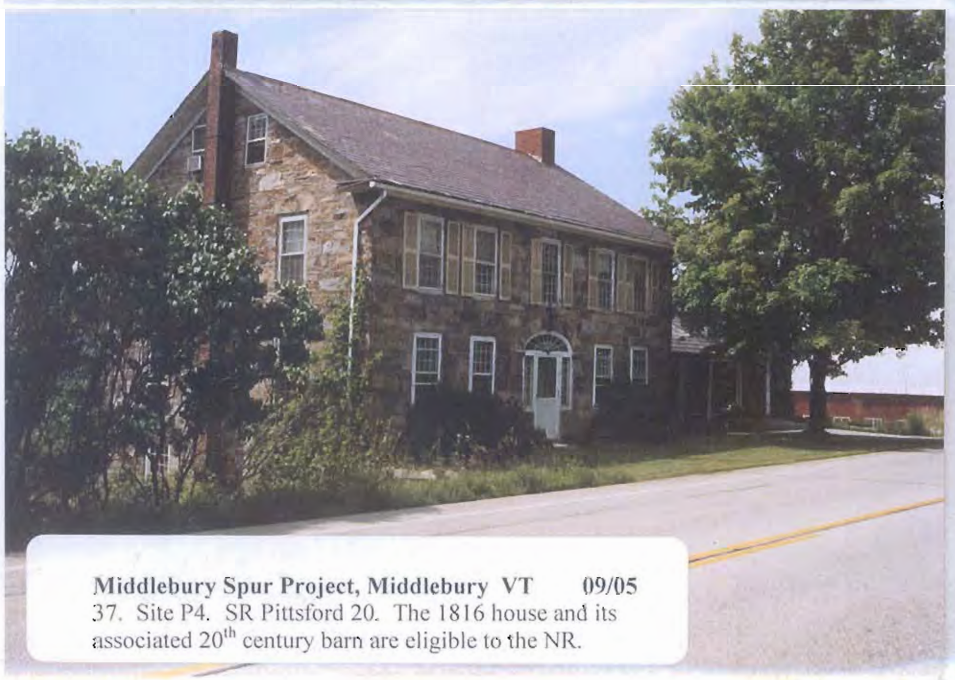


Middlebury Spur Project, Middlebury VT 09/05
34. Site P2. SR Pittsford 82. House and barns are eligible to the NR as a Farmstead.

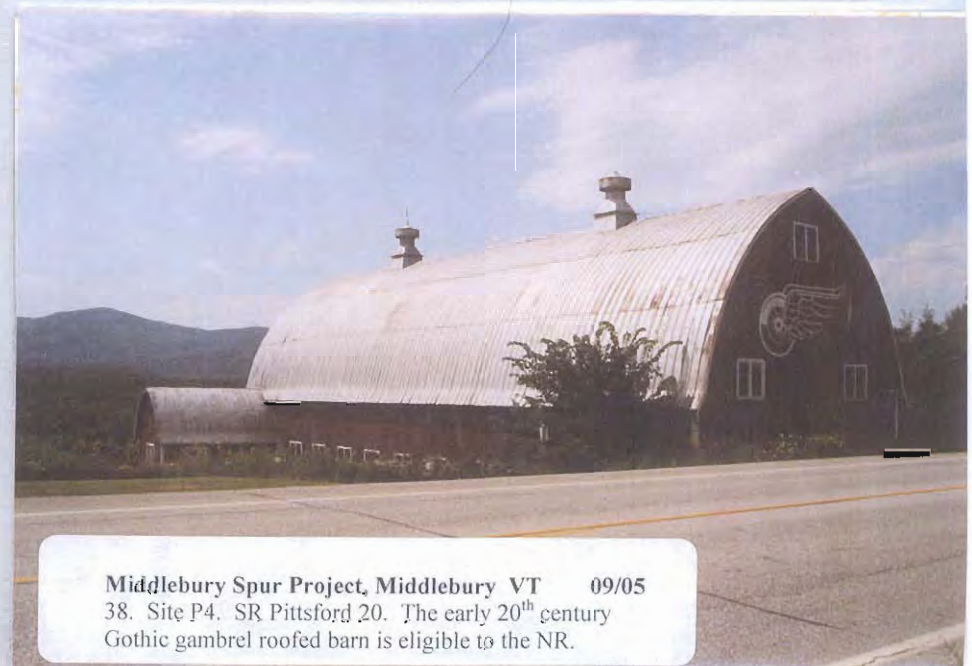


Middlebury Spur Project, Middlebury VT 09/05
35. Site P2. SR Pittsford 82. Barn is eligible to the NR as part of a Farmstead.

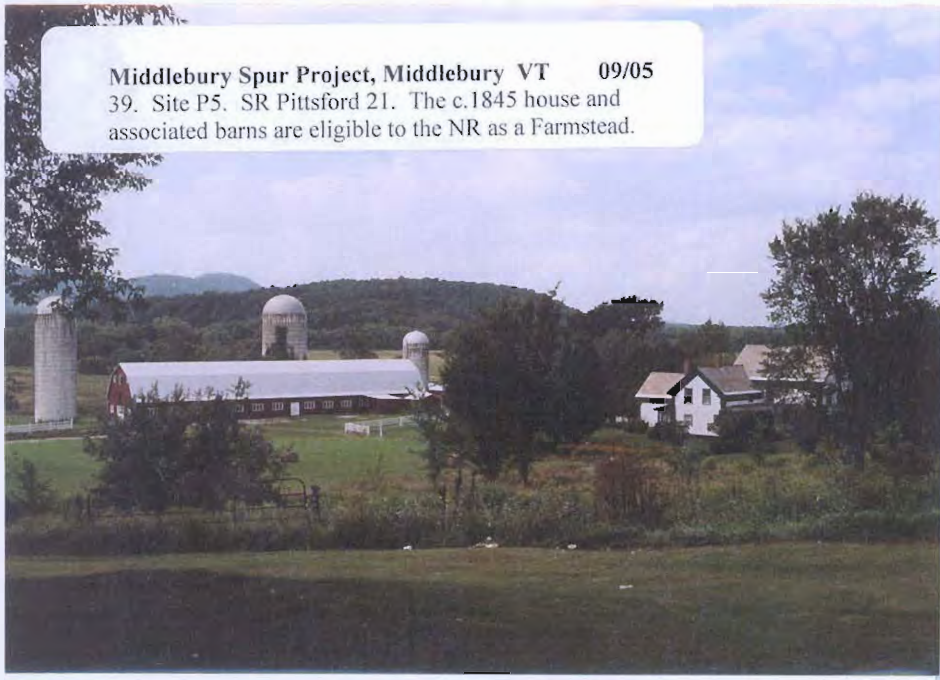
Middlebury Spur Project, Middlebury V 09/05
36. Site P3. House is not listed on the SR and is not eligible to the NR due to alterations.



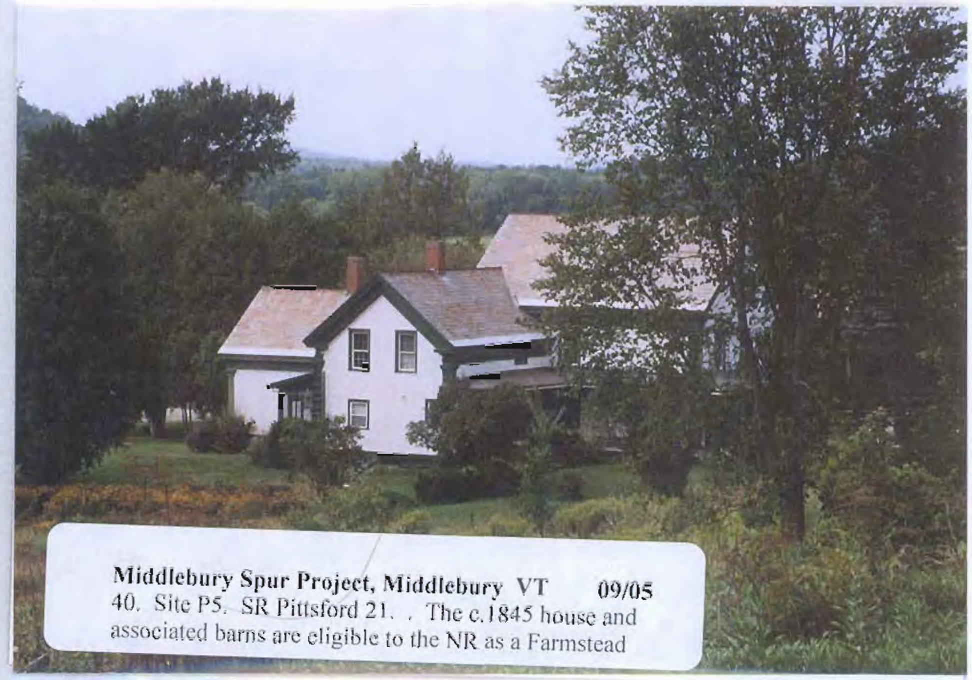
Middlebury Spur Project, Middlebury VT 09/05
37. Site P4. SR Pittsford 20. The 1816 house and its associated 20th century barn are eligible to the NR.



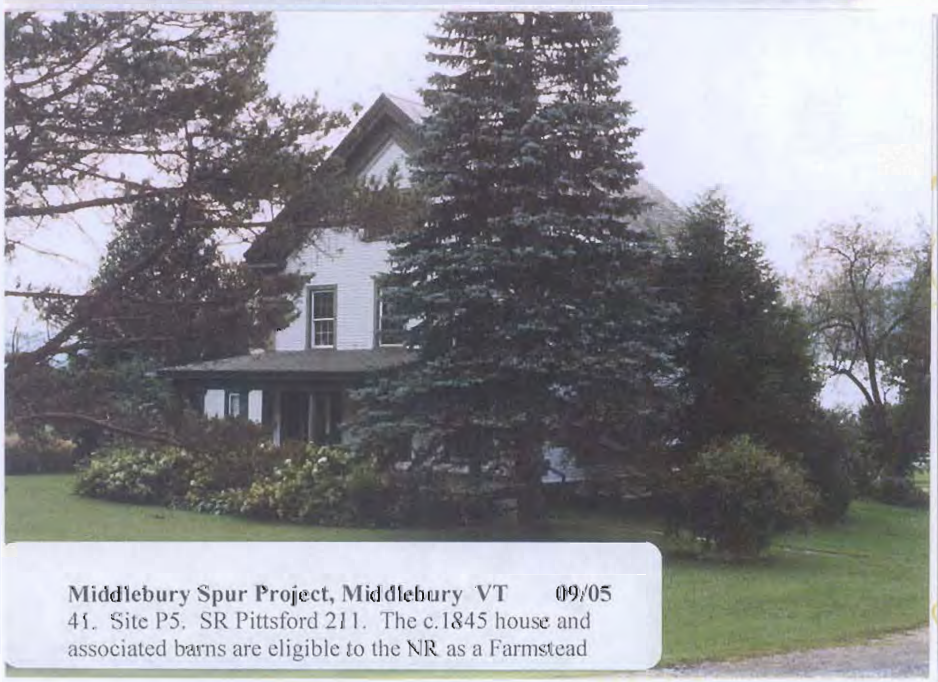
Middlebury Spur Project, Middlebury VT 09/05
38. Site P4. SR Pittsford 20. The early 20th century Gothic gambrel roofed barn is eligible to the NR.



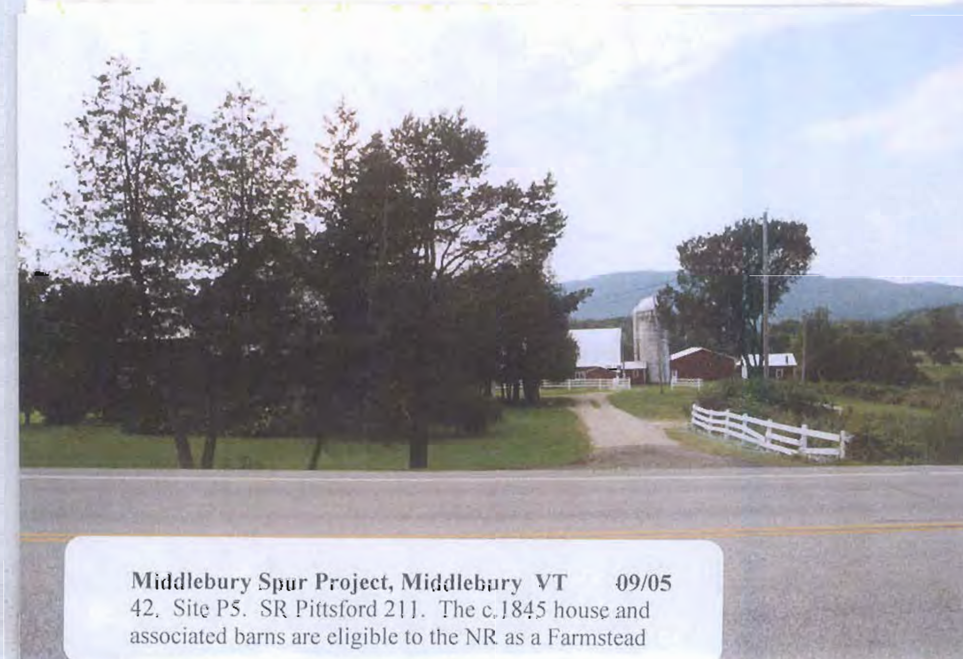
Middlebury Spur Project, Middlebury VT 09/05
39. Site P5. SR Pittsford 21. The c.1845 house and associated barns are eligible to the NR as a Farmstead.



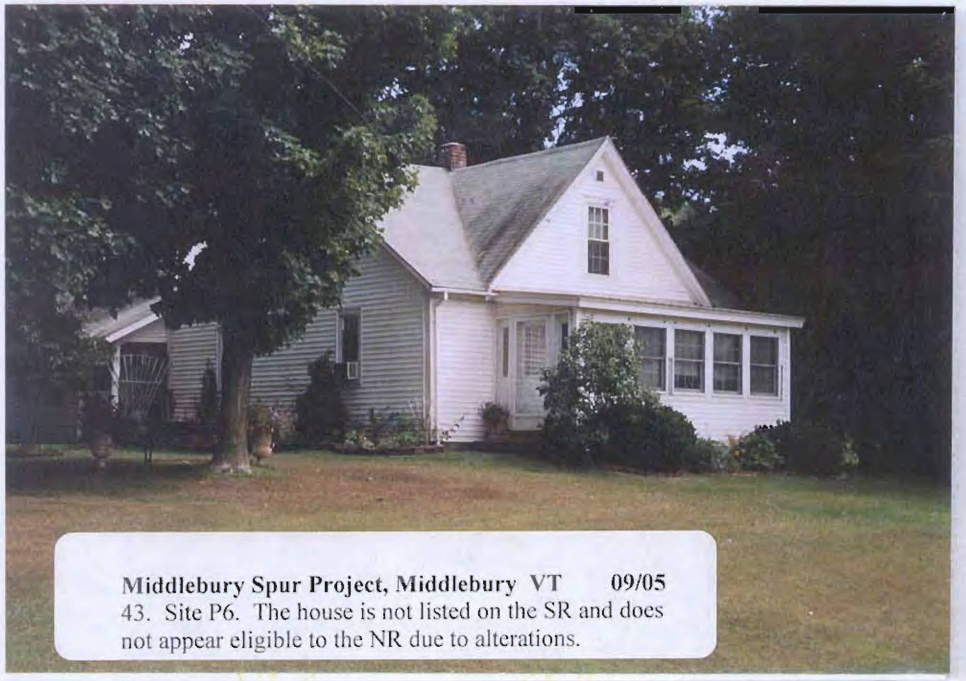
Middlebury Spur Project, Middlebury VT 09/05
40. Site P5. SR Pittsford 21. . The c.1845 house and associated barns are eligible to the NR as a Farmstead



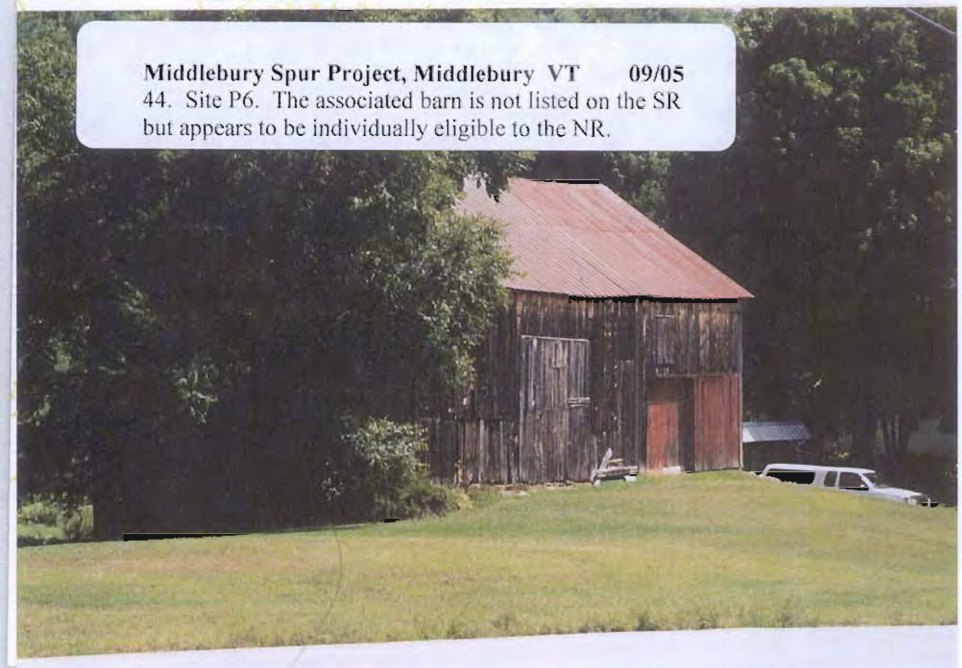
Middlebury Spur Project, Middlebury VT 09/05
41. Site P5. SR Pittsford 211. The c.1845 house and associated barns are eligible to the NR as a Farmstead



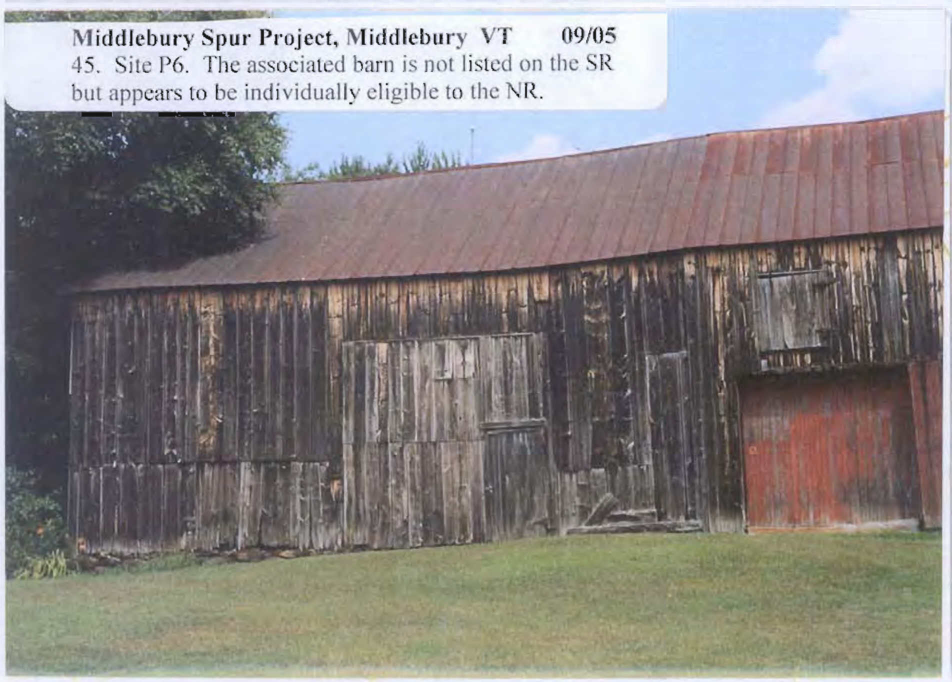
Middlebury Spur Project, Middlebury VT 09/05
42. Site P5. SR Pittsford 211. The c.1845 house and associated barns are eligible to the NR as a Farmstead



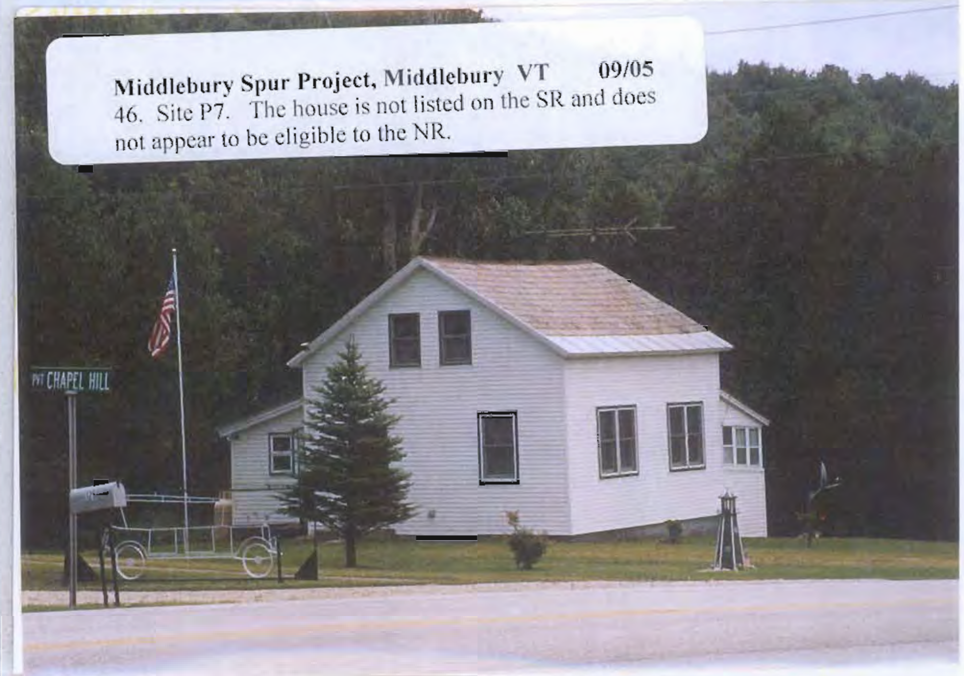
Middlebury Spur Project, Middlebury VT **09/05**
43. Site P6. The house is not listed on the SR and does not appear eligible to the NR due to alterations.



Middlebury Spur Project, Middlebury VT **09/05**
44. Site P6. The associated barn is not listed on the SR but appears to be individually eligible to the NR.

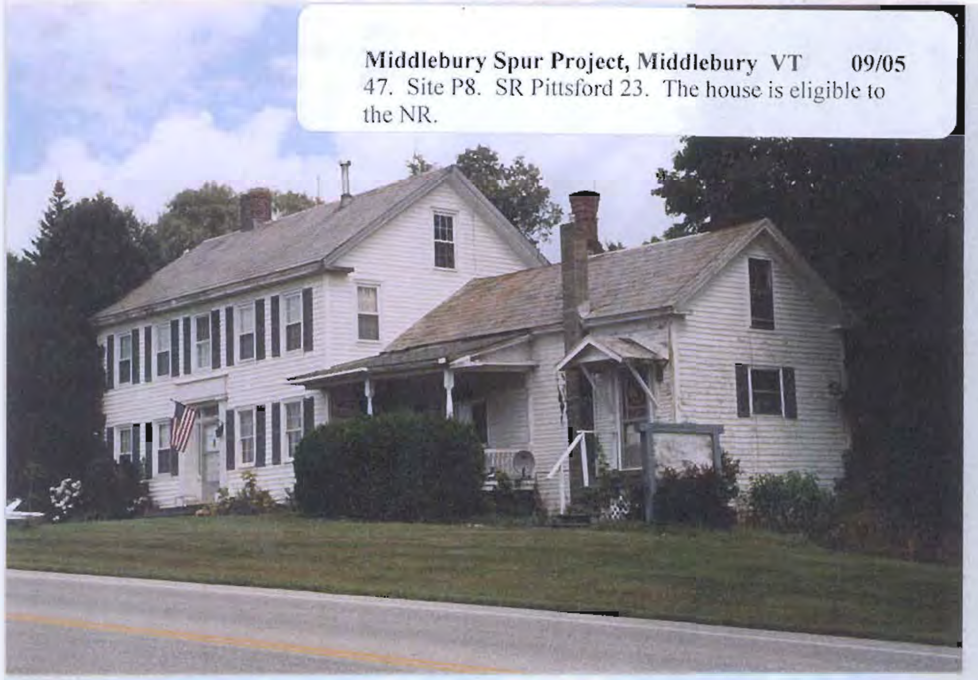


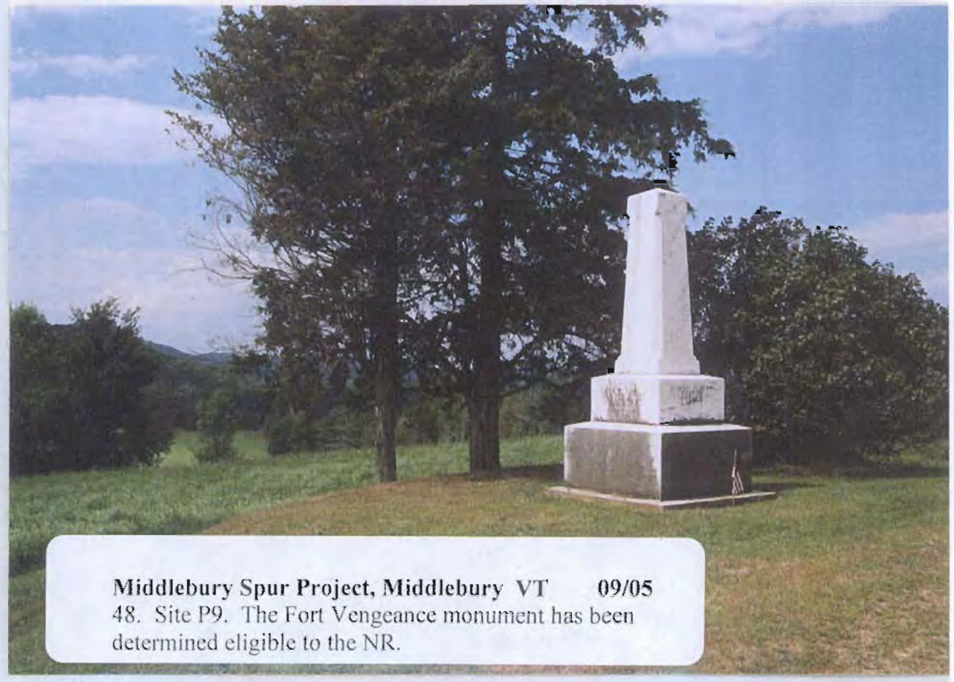
Middlebury Spur Project, Middlebury VT **09/05**
45. Site P6. The associated barn is not listed on the SR but appears to be individually eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
46. Site P7. The house is not listed on the SR and does not appear to be eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
47. Site P8. SR Pittsford 23. The house is eligible to the NR.

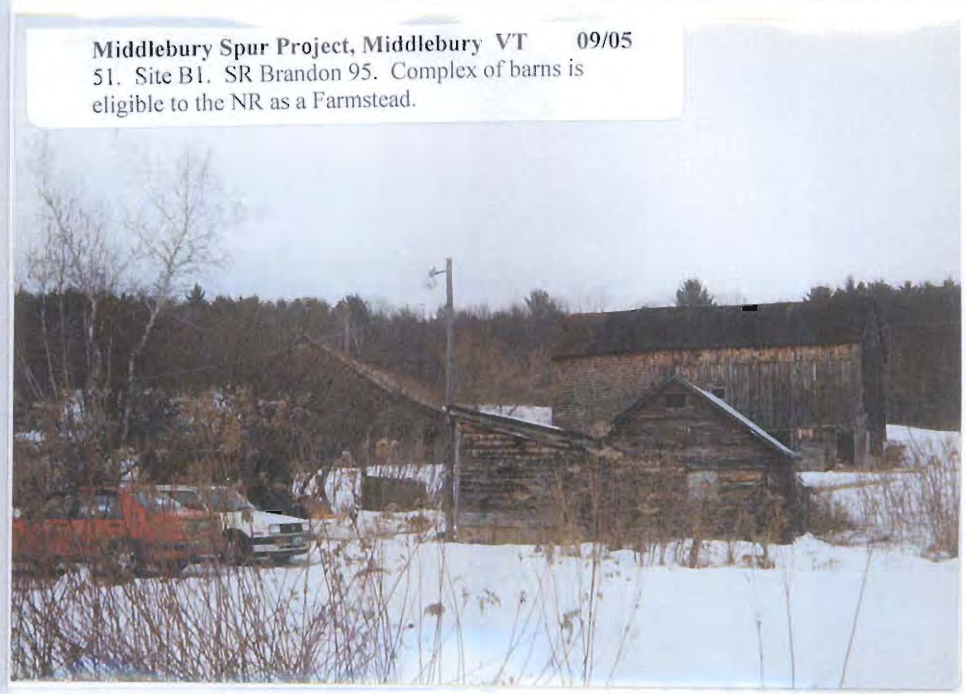




Middlebury Spur Project, Middlebury VT 09/05
48. Site P9. The Fort Vengeance monument has been determined eligible to the NR.

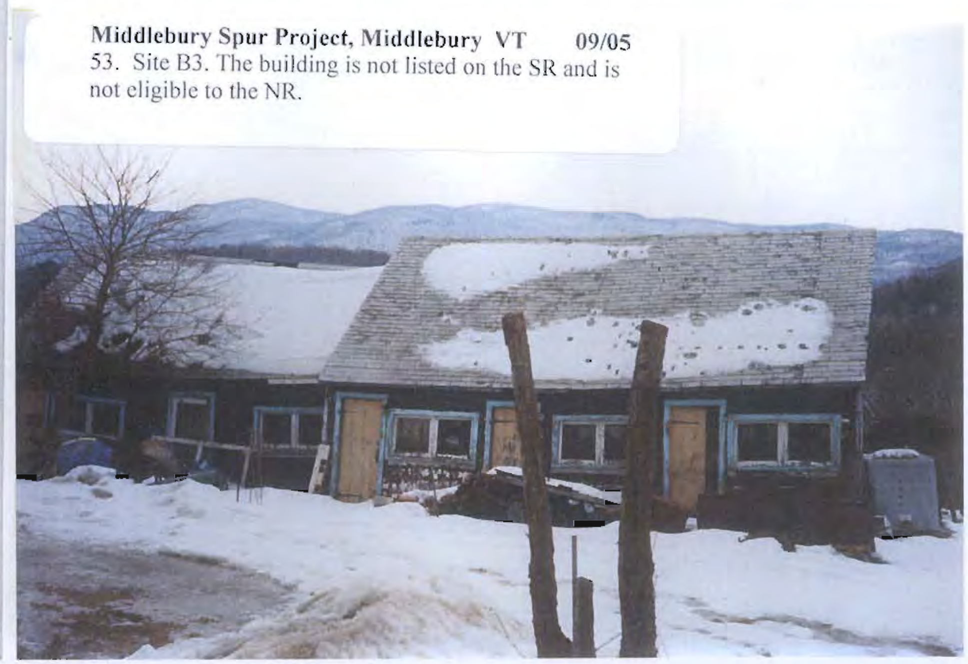
Middlebury Spur Project, Middlebury VT 09/05
49. Site P10. SR Pittsford 22. The house is marginally eligible to the NR due to its in tact Queen Anne porch

Middlebury Spur Project, Middlebury VT **09/05**
50. Site B1. SR Brandon 95. The house and associated barns appear eligible to the NR as a Farmstead.

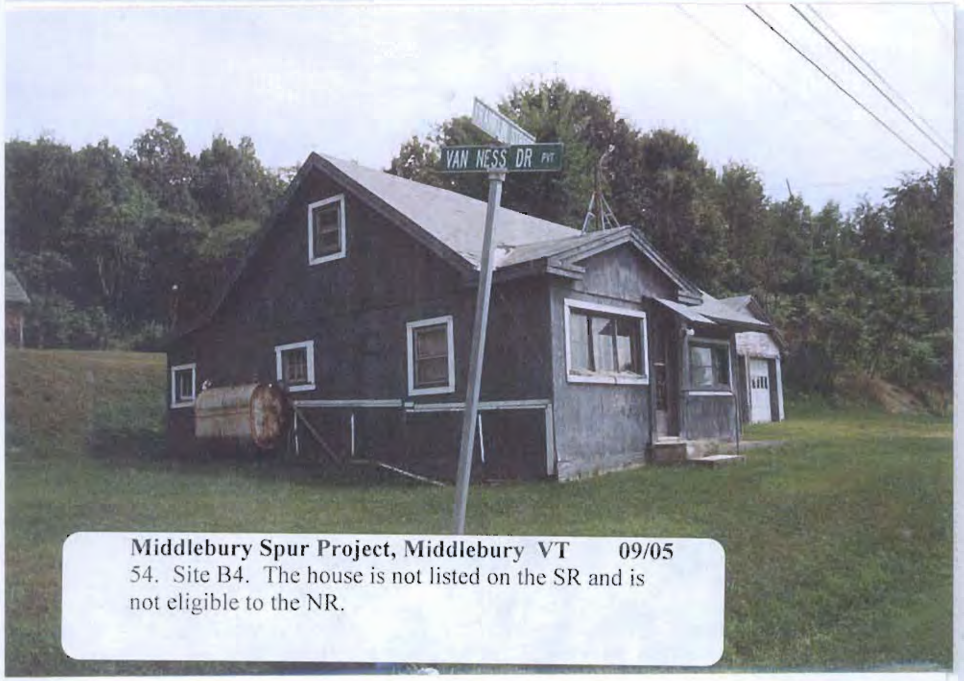


Middlebury Spur Project, Middlebury VT **09/05**
51. Site B1. SR Brandon 95. Complex of barns is eligible to the NR as a Farmstead.

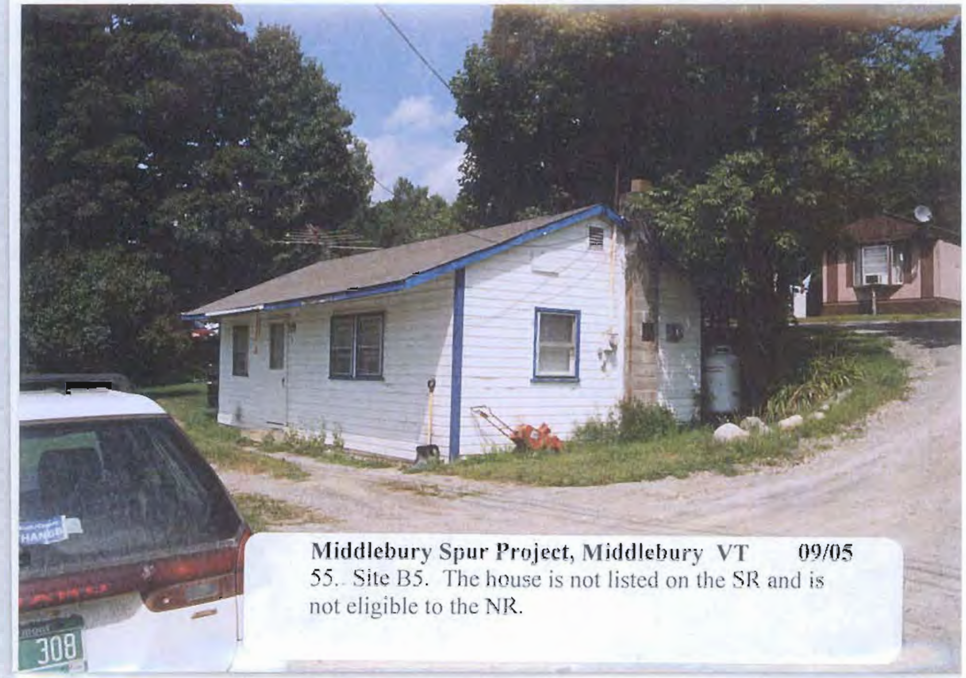
Middlebury Spur Project, Middlebury VT **09/05**
52. Site B2. The house is not listed on the SR and is not eligible to the NR.



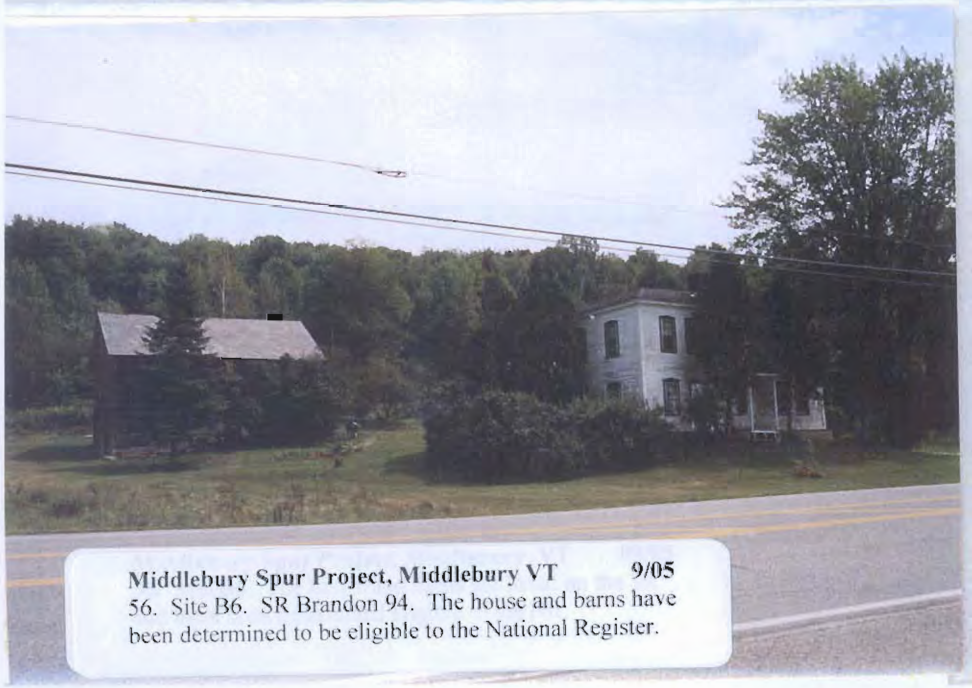
Middlebury Spur Project, Middlebury VT **09/05**
53. Site B3. The building is not listed on the SR and is not eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
54. Site B4. The house is not listed on the SR and is not eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
55.. Site B5. The house is not listed on the SR and is not eligible to the NR.



Middlebury Spur Project, Middlebury VT **9/05**
56. Site B6. SR Brandon 94. The house and barns have been determined to be eligible to the National Register.

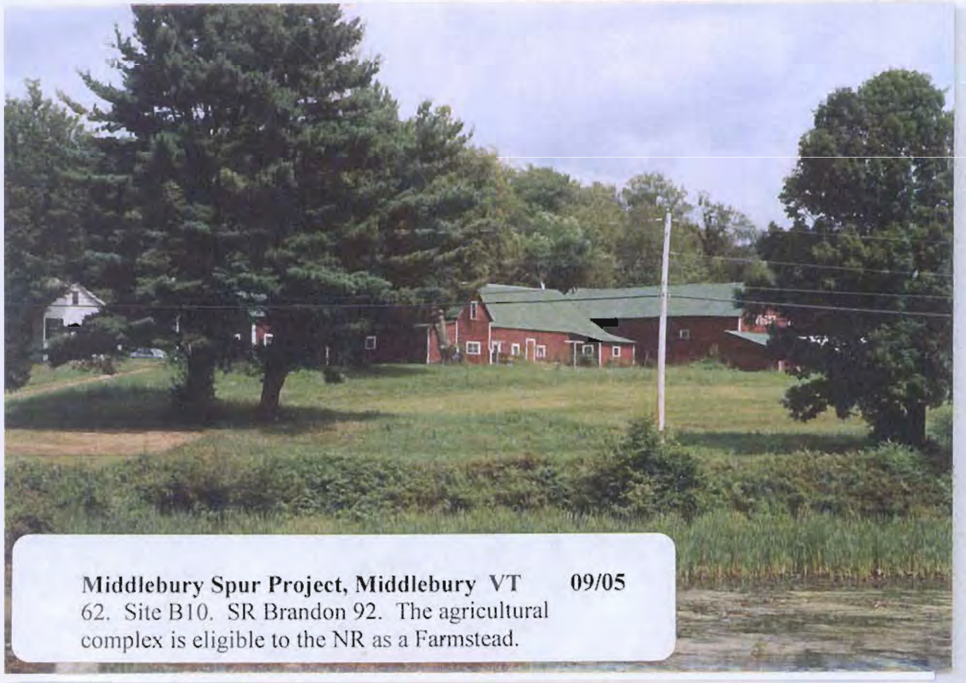
Middlebury Spur Project, Middlebury VT **09/05**
57. Site B7. SR Brandon 93. The house is eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
58. Site B7. SR Brandon 93. The associated outbuildings are NR eligible as part of a complex.

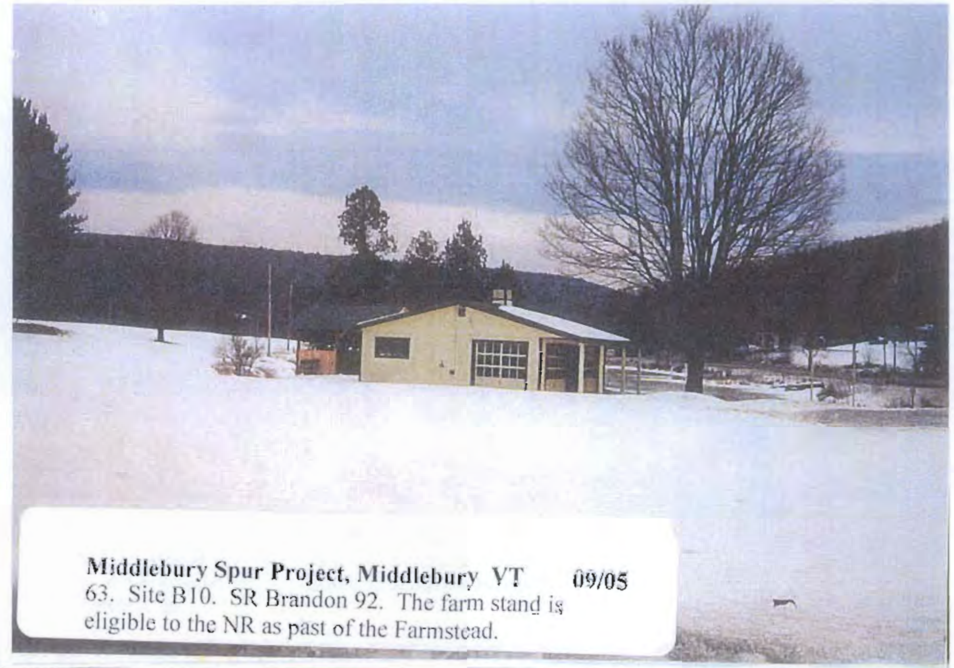
Middlebury Spur Project, Middlebury VT 09/05
59. Site B8. The house is not listed on the SR and is not eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
60. Site B9. The nearly in tact vernacular house is not listed on the SR but is NR eligible.

Middlebury Spur Project, Middlebury VT 09/05
61. Site B9. The nearly in tact vernacular house is not listed on the SR but us eligible to the NR.



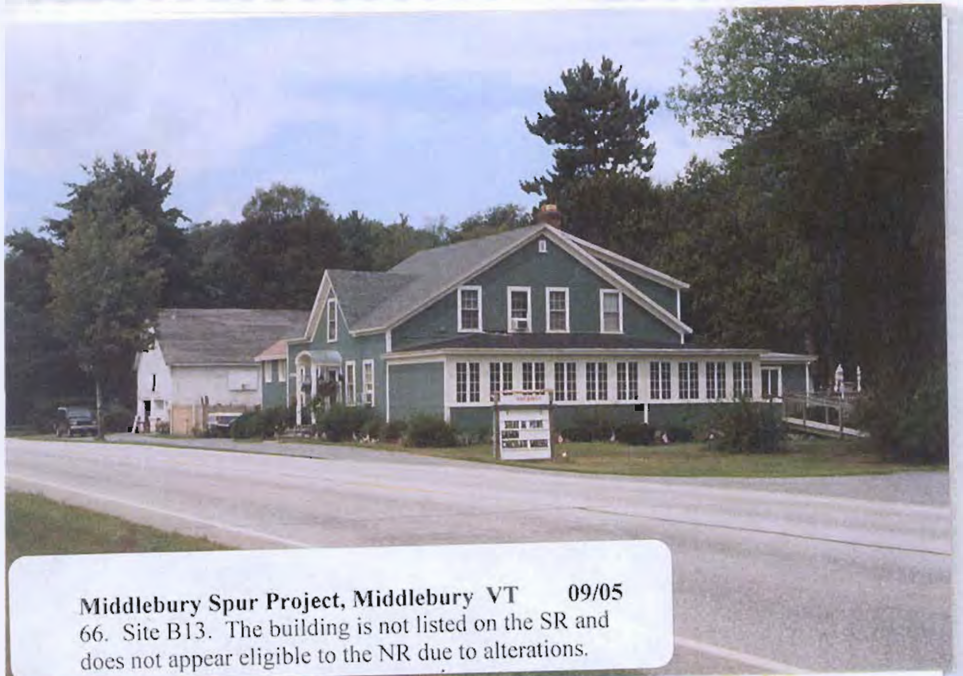
Middlebury Spur Project, Middlebury VT **09/05**
62. Site B10. SR Brandon 92. The agricultural complex is eligible to the NR as a Farmstead.



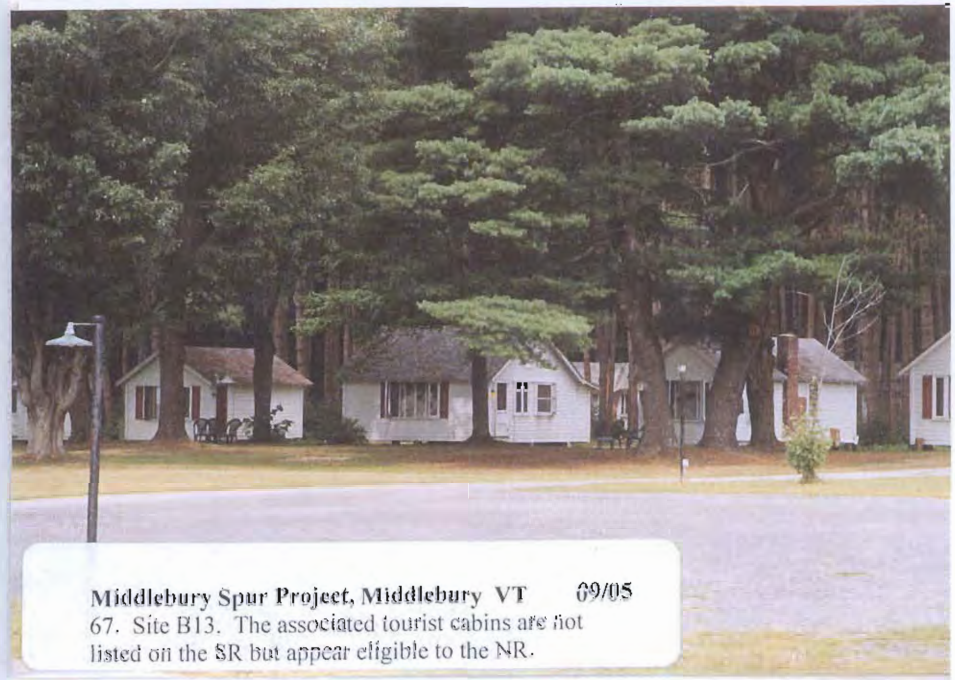
Middlebury Spur Project, Middlebury VT **09/05**
63. Site B10. SR Brandon 92. The farm stand is eligible to the NR as past of the Farmstead.

Middlebury Spur Project, Middlebury VT **09/05**
64. Site B11. The house is not listed on the SR and is not eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT **09/05**
65. Site B12. SR Brandon 54. The house is eligible to the NR.

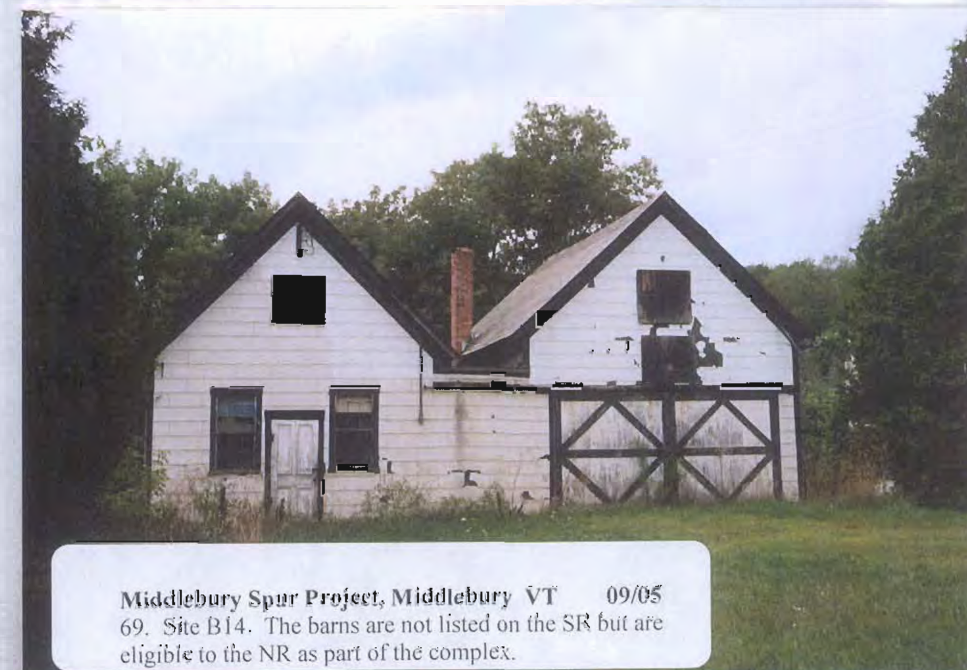


Middlebury Spur Project, Middlebury VT **09/05**
66. Site B13. The building is not listed on the SR and does not appear eligible to the NR due to alterations.

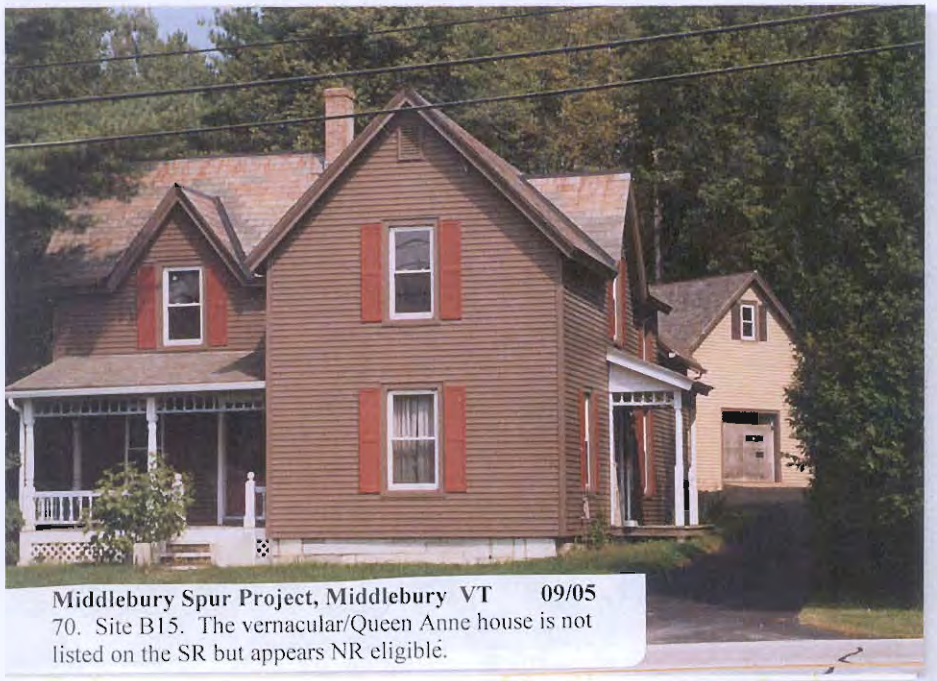


Middlebury Spur Project, Middlebury VT **09/05**
67. Site B13. The associated tourist cabins are not listed on the SR but appear eligible to the NR.

Middlebury Spur Project, Middlebury VT **09/05**
68. Site B14. The house and associated barns are not listed on the SR but appear eligible to the NR.

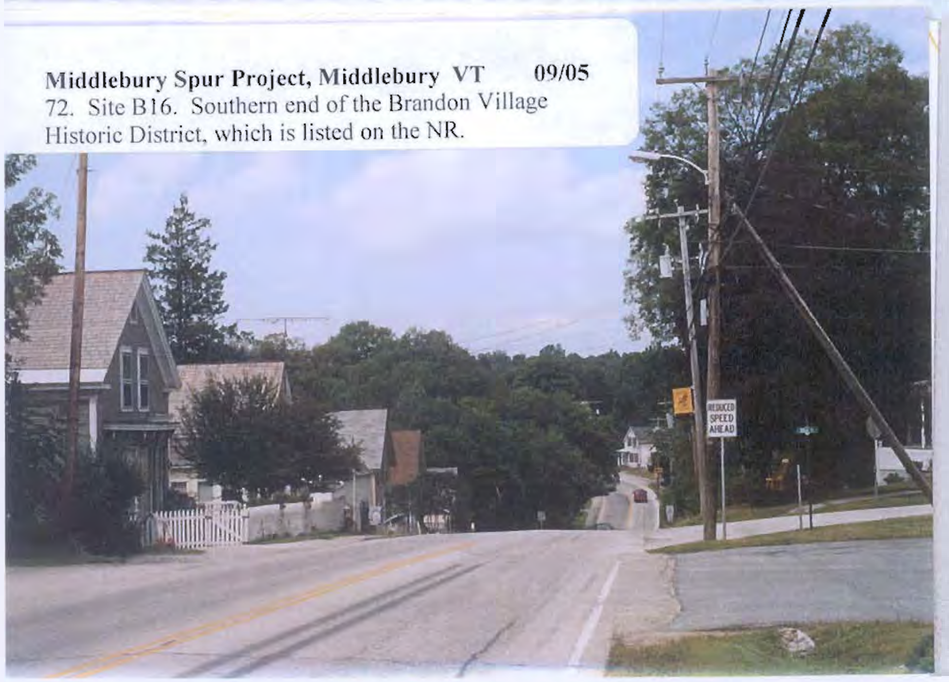


Middlebury Spur Project, Middlebury VT **09/05**
69. Site B14. The barns are not listed on the SR but are eligible to the NR as part of the complex.

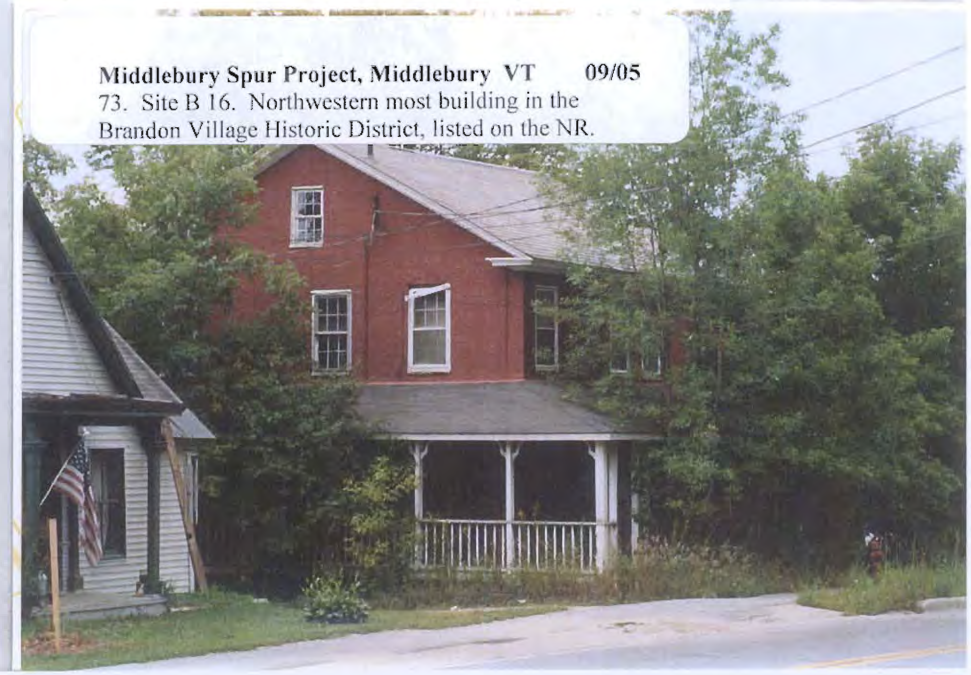


Middlebury Spur Project, Middlebury VT 09/05
70. Site B15. The vernacular/Queen Anne house is not listed on the SR but appears NR eligible.

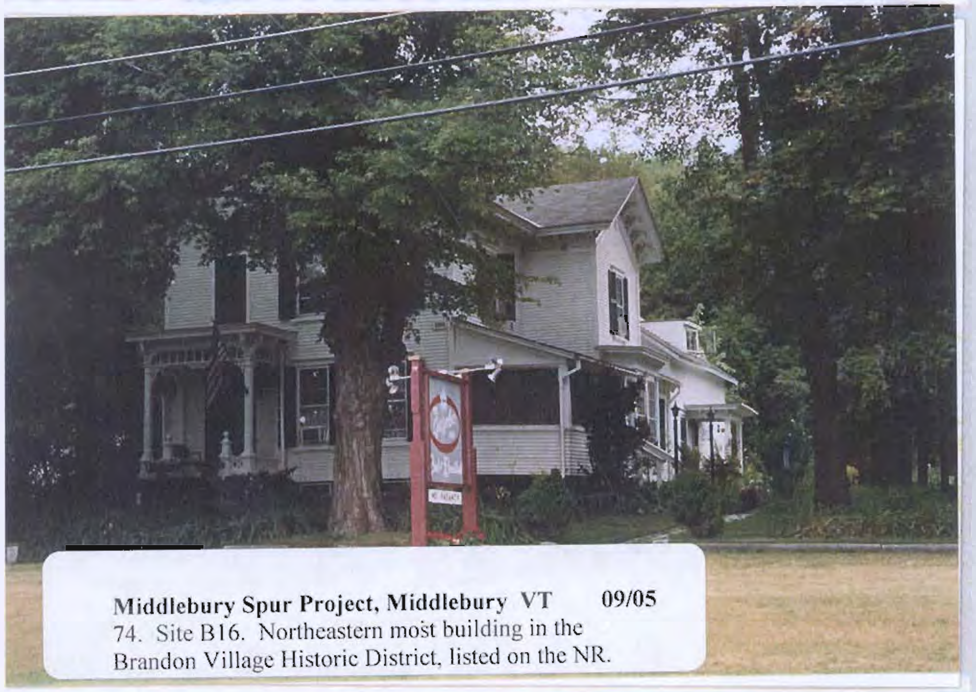
Middlebury Spur Project, Middlebury VT 09/05
71. Site B15. The vernacular/Queen Anne house is not listed on the SR but appears eligible to the NR.



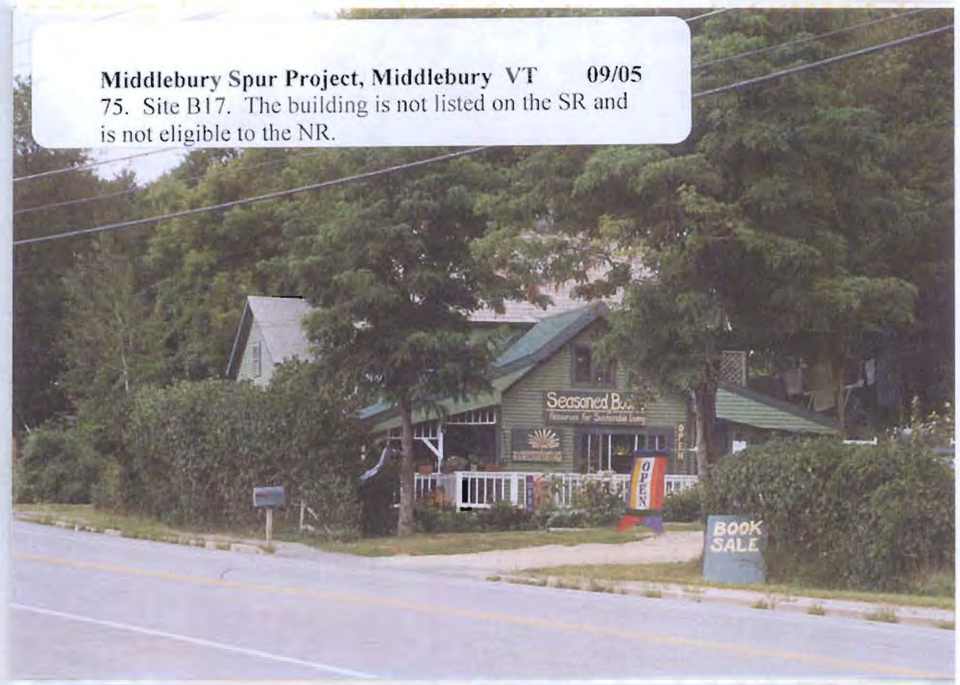
Middlebury Spur Project, Middlebury VT 09/05
72. Site B16. Southern end of the Brandon Village Historic District, which is listed on the NR.



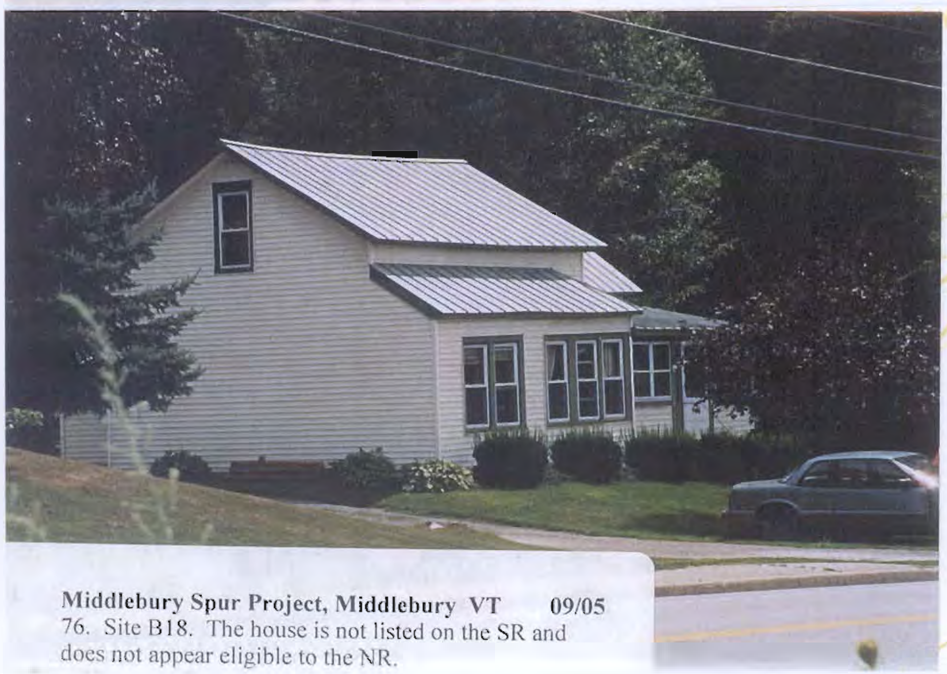
Middlebury Spur Project, Middlebury VT 09/05
73. Site B 16. Northwestern most building in the Brandon Village Historic District, listed on the NR.



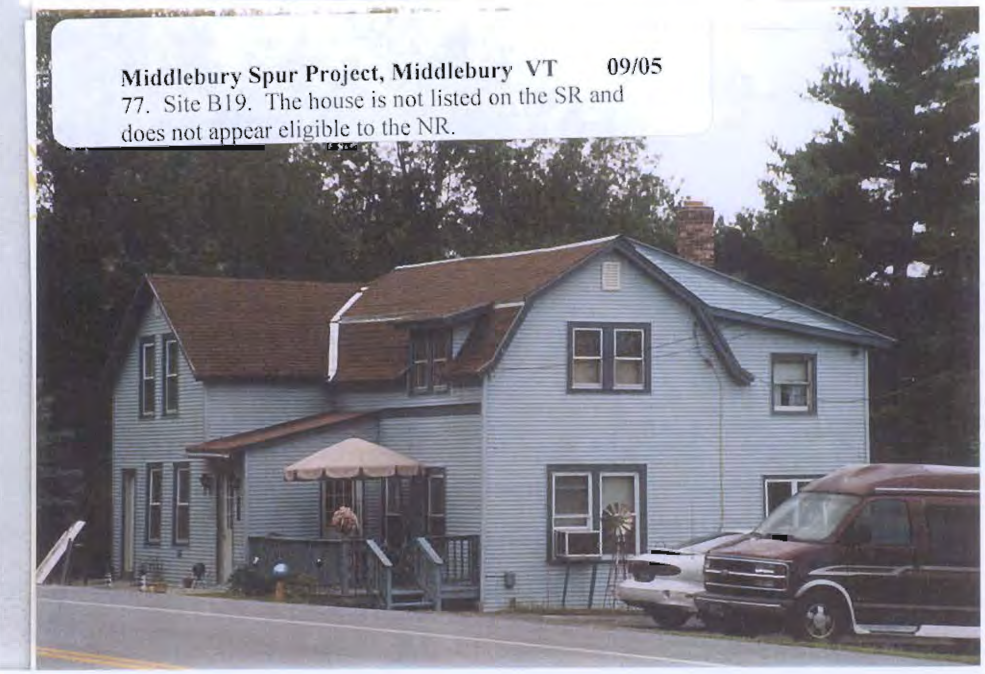
Middlebury Spur Project, Middlebury VT **09/05**
74. Site B16. Northeastern most building in the Brandon Village Historic District, listed on the NR.



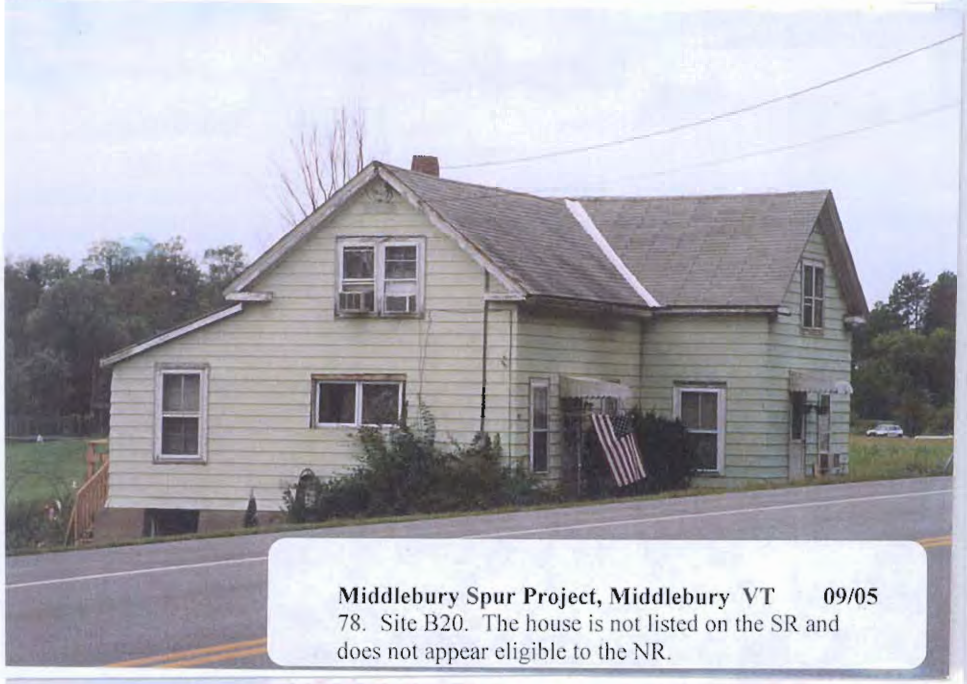
Middlebury Spur Project, Middlebury VT **09/05**
75. Site B17. The building is not listed on the SR and is not eligible to the NR.



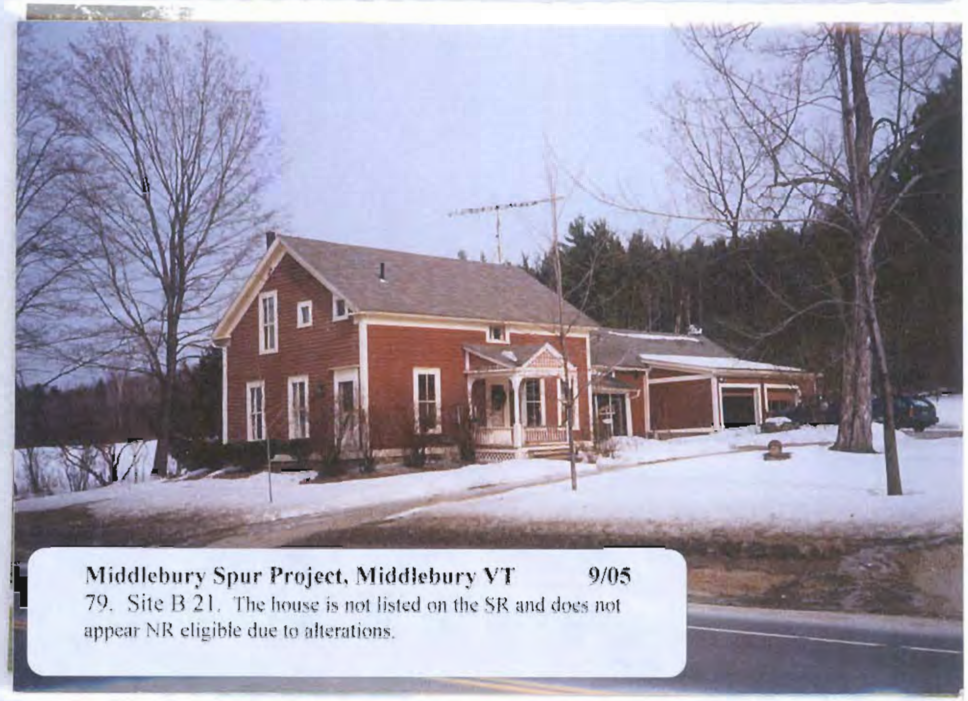
Middlebury Spur Project, Middlebury VT **09/05**
76. Site B18. The house is not listed on the SR and does not appear eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
77. Site B19. The house is not listed on the SR and does not appear eligible to the NR.



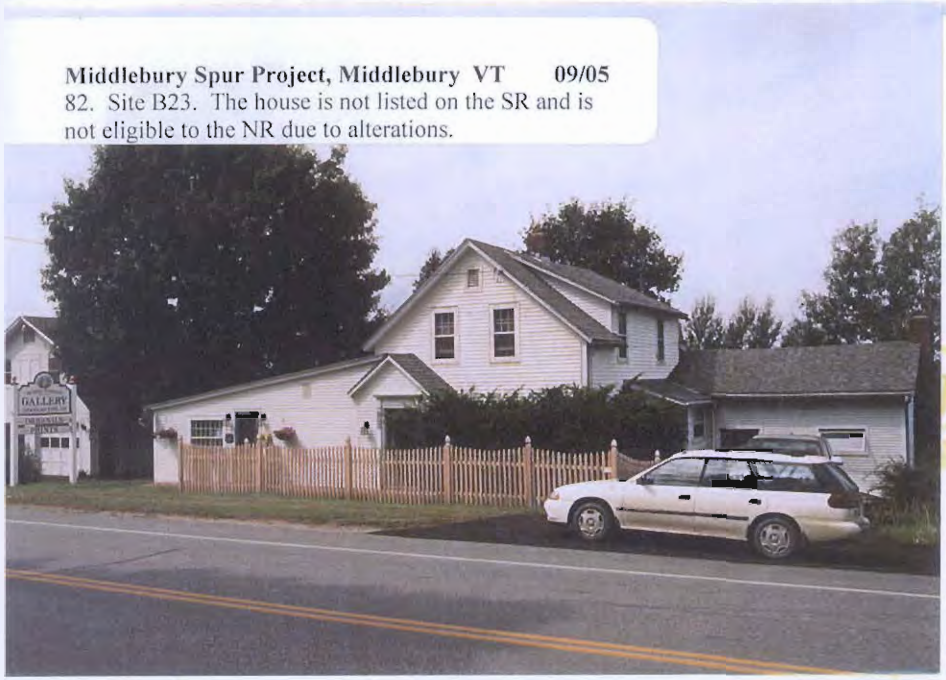
Middlebury Spur Project, Middlebury VT 09/05
78. Site B20. The house is not listed on the SR and does not appear eligible to the NR.



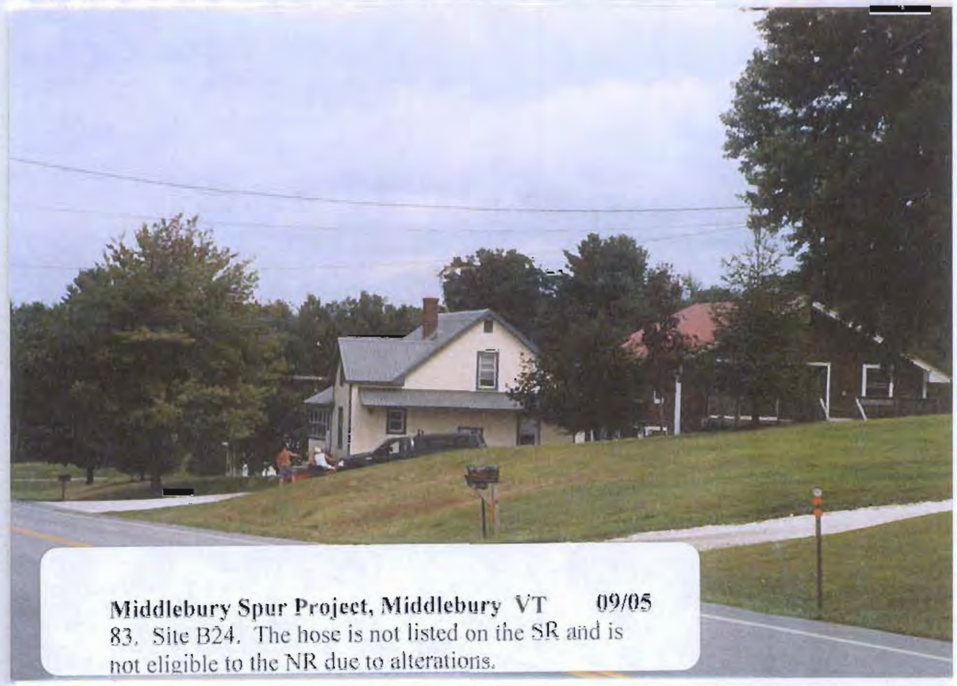
Middlebury Spur Project, Middlebury VT 9/05
79. Site B 21. The house is not listed on the SR and does not appear NR eligible due to alterations.

Middlebury Spur Project, Middlebury VT 09/05
80. Site B21. The house is not listed on the SR and does not appear NR eligible due to alterations.

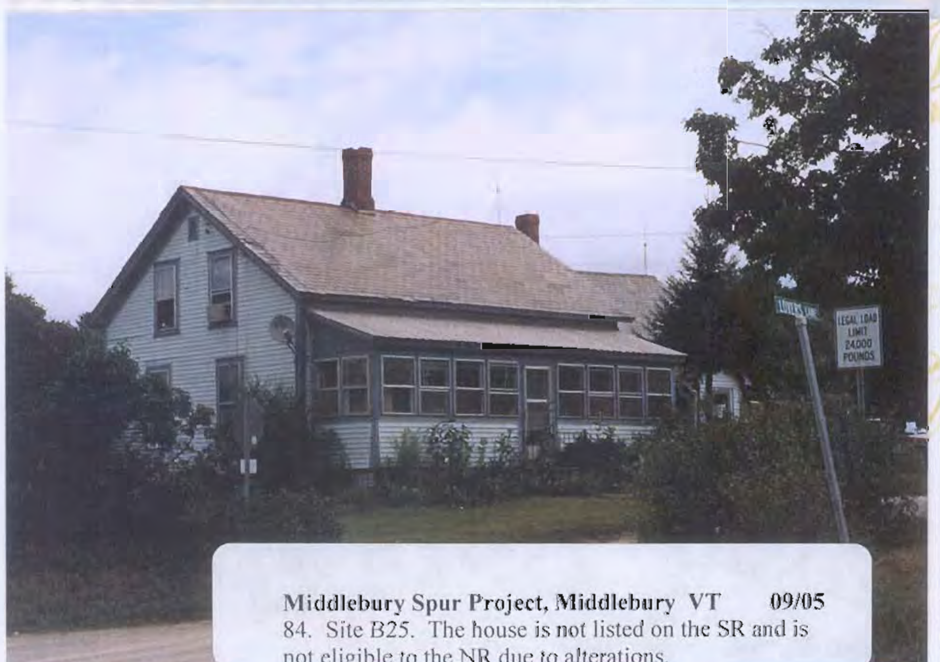
Middlebury Spur Project, Middlebury VT 09/05
81. Site B22. The field stone wall and iron fence are not listed on the SR but appear eligible to the NR.



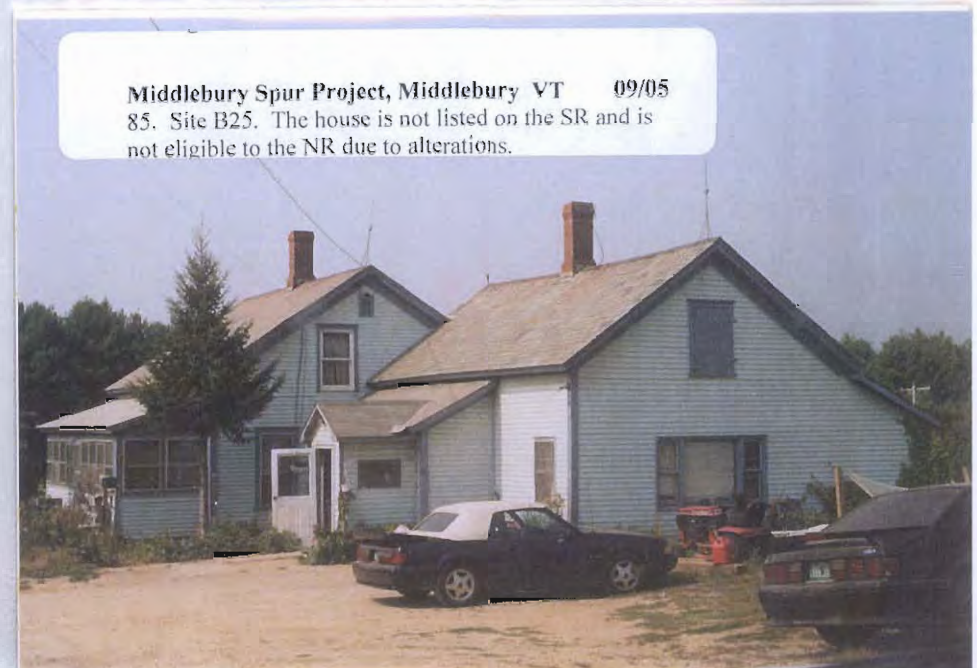
Middlebury Spur Project, Middlebury VT 09/05
82. Site B23. The house is not listed on the SR and is not eligible to the NR due to alterations.



Middlebury Spur Project, Middlebury VT 09/05
83. Site B24. The hose is not listed on the SR and is not eligible to the NR due to alterations.



Middlebury Spur Project, Middlebury VT 09/05
84. Site B25. The house is not listed on the SR and is not eligible to the NR due to alterations.

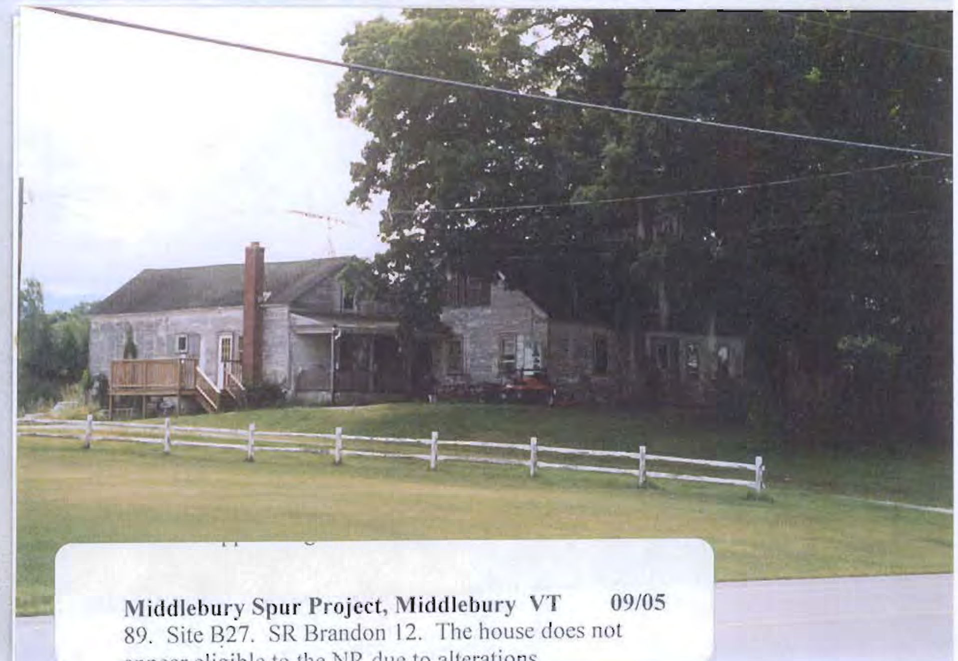


Middlebury Spur Project, Middlebury VT 09/05
85. Site B25. The house is not listed on the SR and is not eligible to the NR due to alterations.

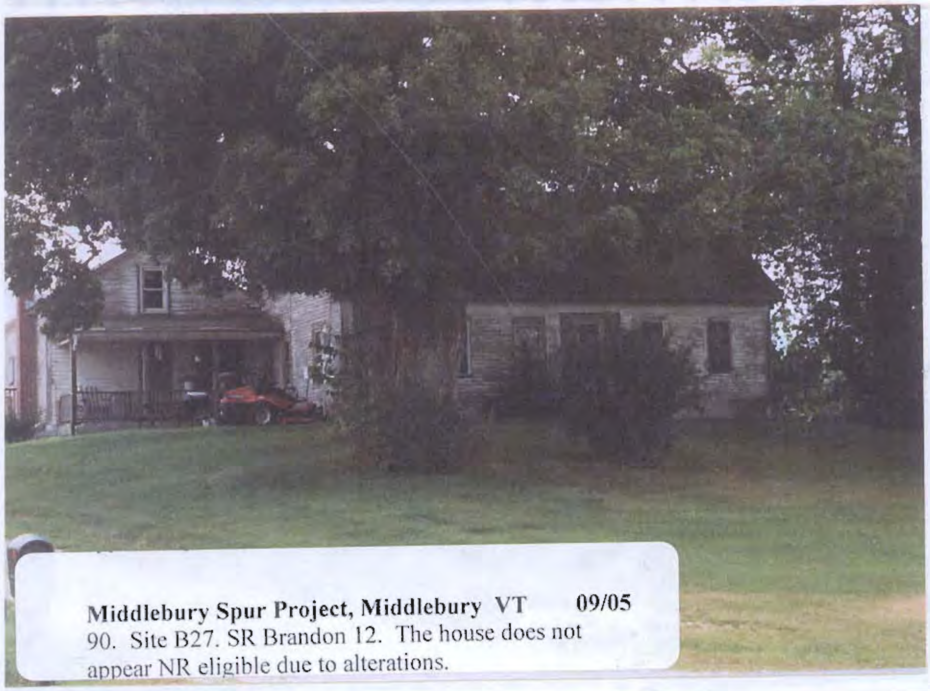
Middlebury Spur Project, Middlebury VT **09/05**
86. Site B26. The house and attached barn are not listed on the SR and do not appear NR eligible..

Middlebury Spur Project, Middlebury VT **09/05**
87. Site B26. The house is not listed on the SR and does not appear eligible to the NR due to alterations.

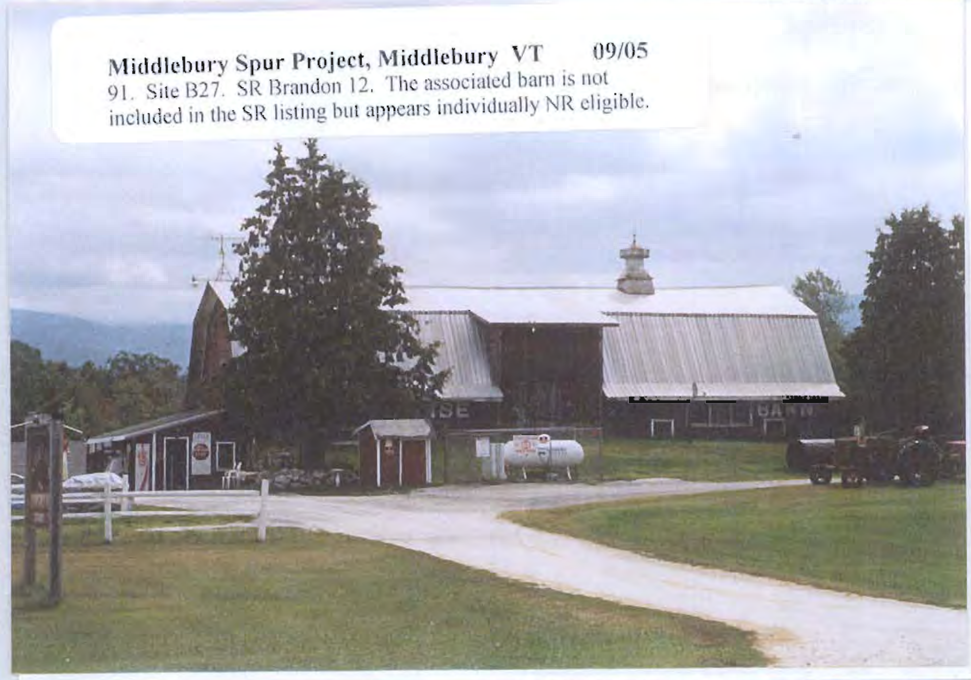
Middlebury Spur Project, Middlebury VT **09/05**
88. Site B26. The house and attached barn do not appear eligible to the NR due to alterations.



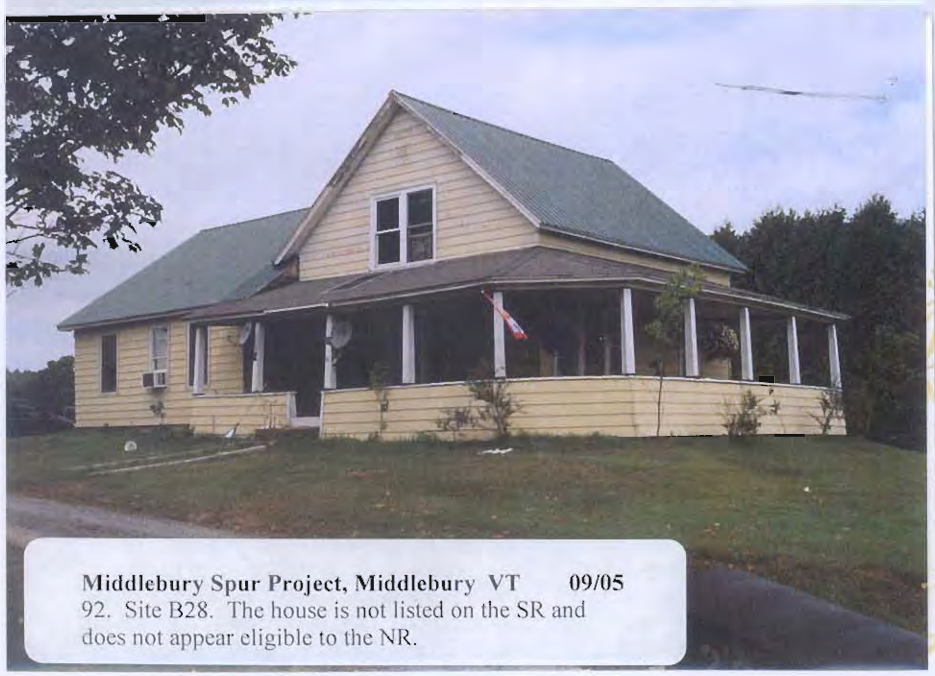
Middlebury Spur Project, Middlebury VT **09/05**
89. Site B27. SR Brandon 12. The house does not appear eligible to the NR due to alterations.



Middlebury Spur Project, Middlebury VT **09/05**
90. Site B27. SR Brandon 12. The house does not appear NR eligible due to alterations.

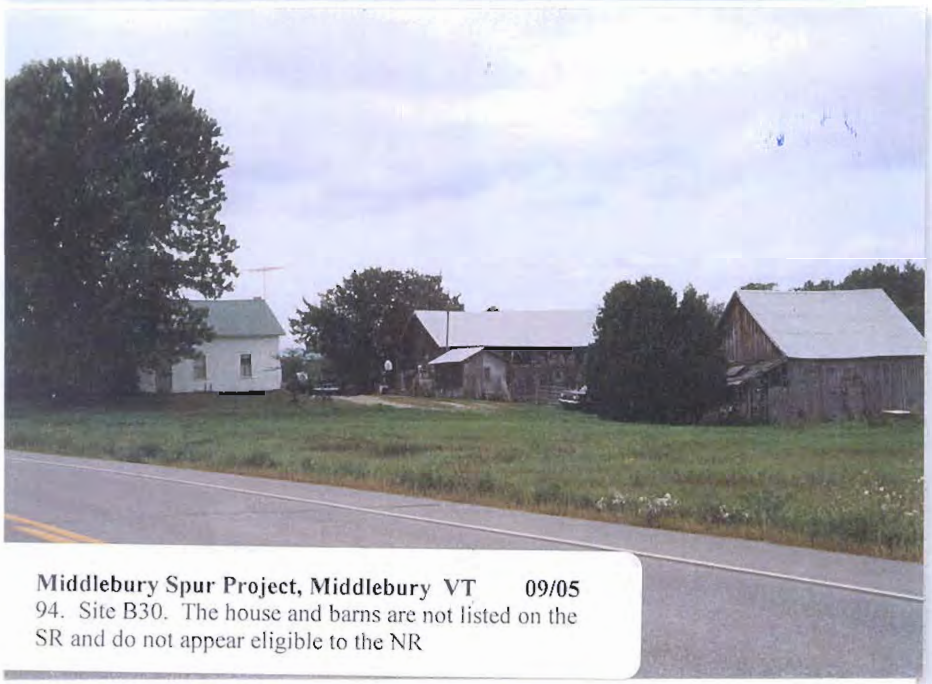


Middlebury Spur Project, Middlebury VT **09/05**
91. Site B27. SR Brandon 12. The associated barn is not included in the SR listing but appears individually NR eligible.



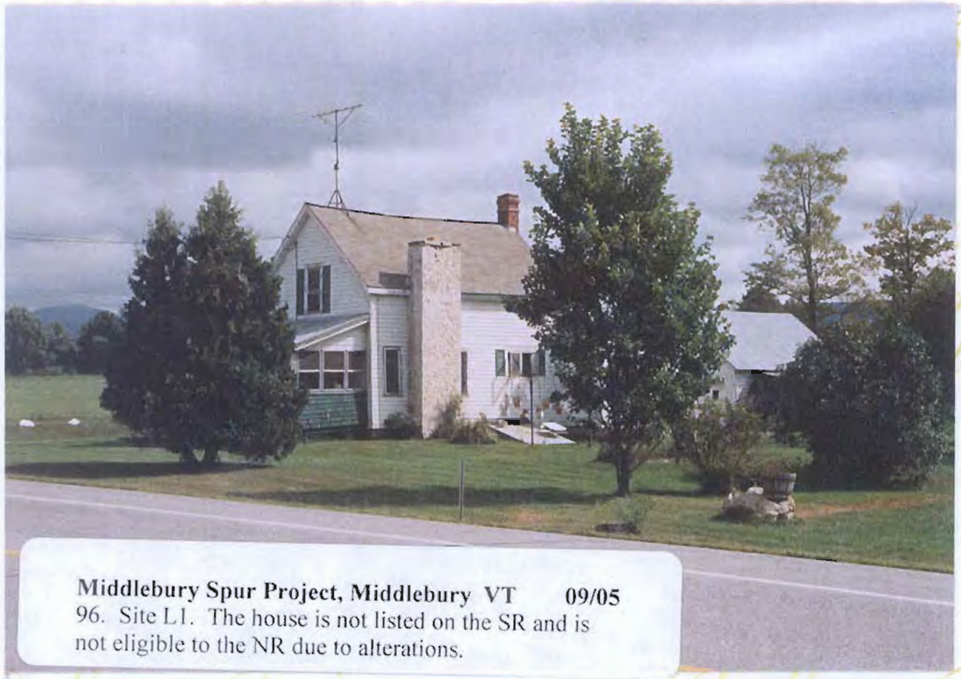
Middlebury Spur Project, Middlebury VT **09/05**
92. Site B28. The house is not listed on the SR and does not appear eligible to the NR.

Middlebury Spur Project, Middlebury VT **09/05**
93. Site B29. The house is not listed on the SR and does not appear to be eligible to the NR.



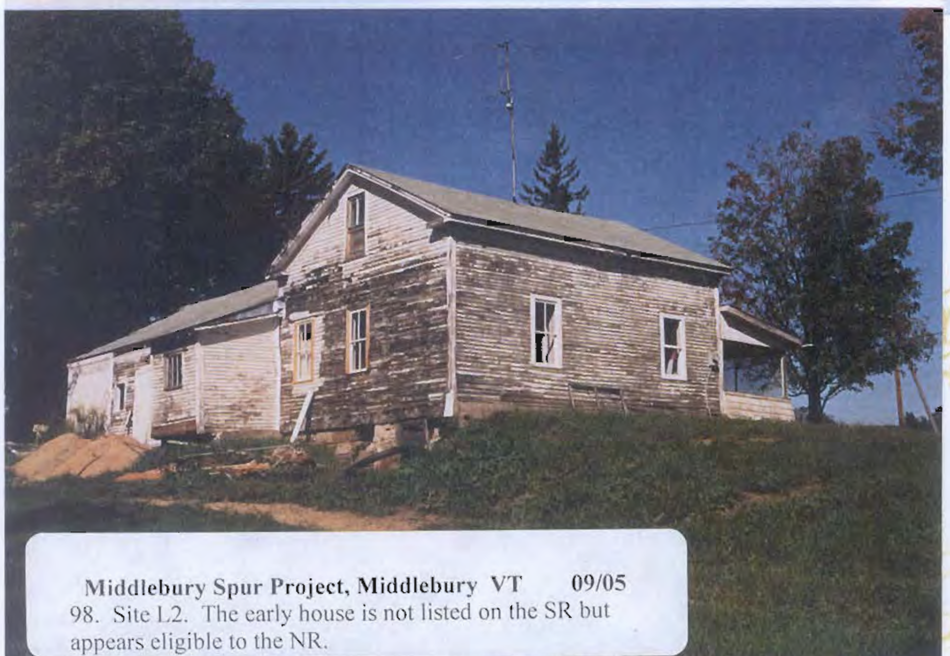
Middlebury Spur Project, Middlebury VT **09/05**
94. Site B30. The house and barns are not listed on the SR and do not appear eligible to the NR

Middlebury Spur Project, Middlebury VT **09/05**
95. Site B30. The house is not listed on the SR and is not eligible to the NR due to alterations.

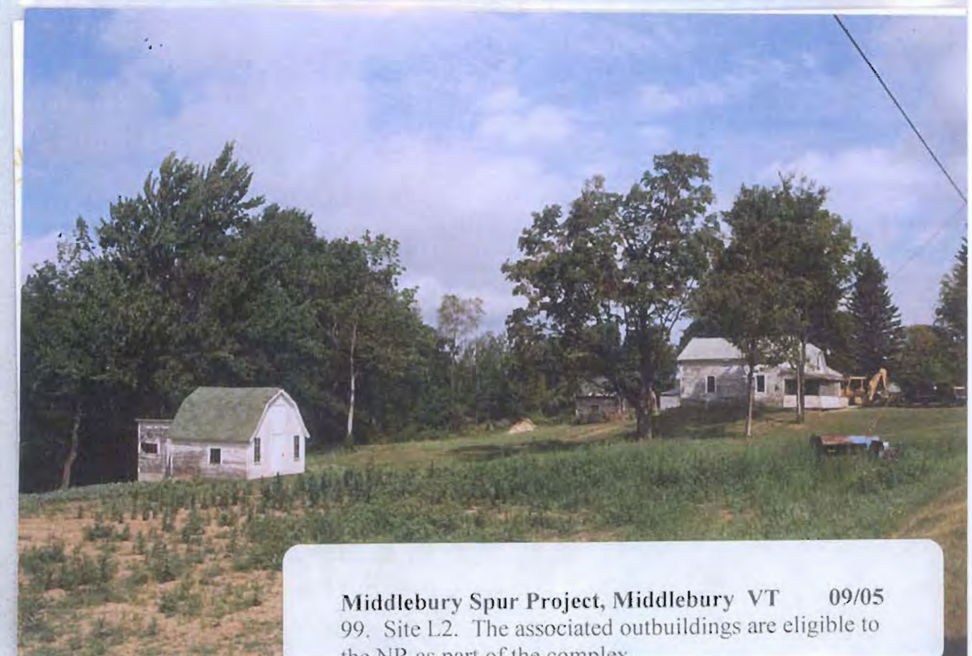


Middlebury Spur Project, Middlebury VT 09/05
96. Site L1. The house is not listed on the SR and is not eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT 09/05
97. Site L2. The early house is not listed on the SR but appears eligible to the NR.

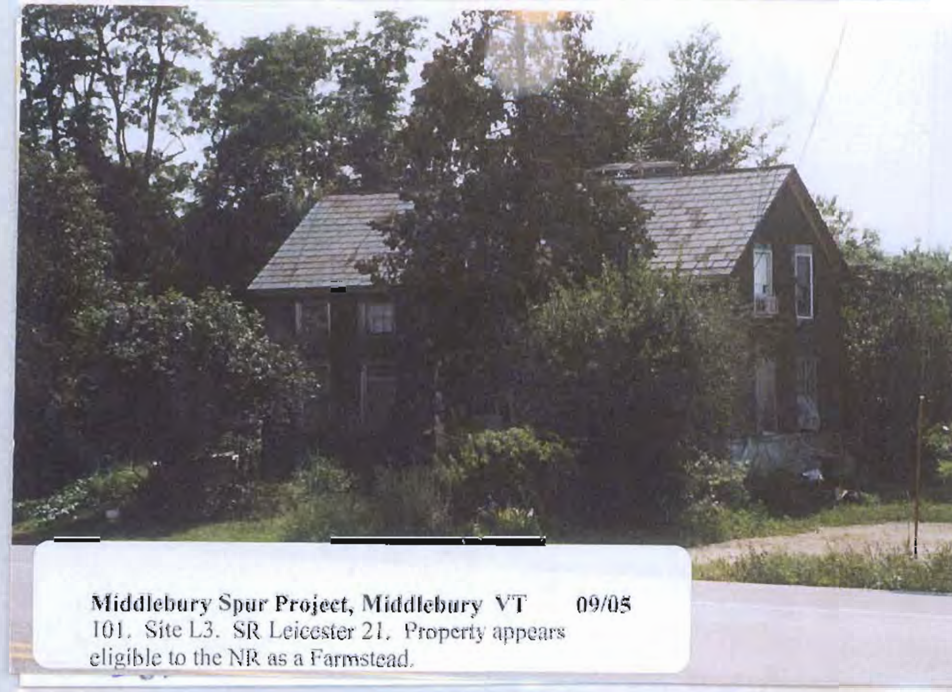


Middlebury Spur Project, Middlebury VT 09/05
98. Site L2. The early house is not listed on the SR but appears eligible to the NR.



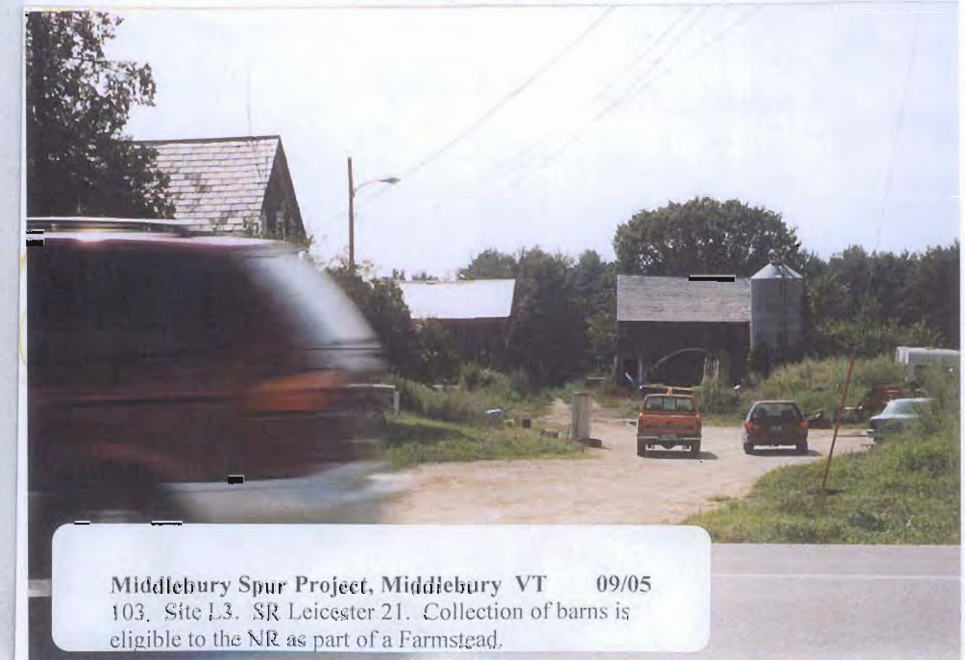
Middlebury Spur Project, Middlebury VT 09/05
99. Site L2. The associated outbuildings are eligible to the NR as part of the complex.

Middlebury Spur Project, Middlebury VT 09/05
100. Site L3. SR Leicester 21. Although in deteriorating condition, the property appears eligible to the NR as a Farmstead

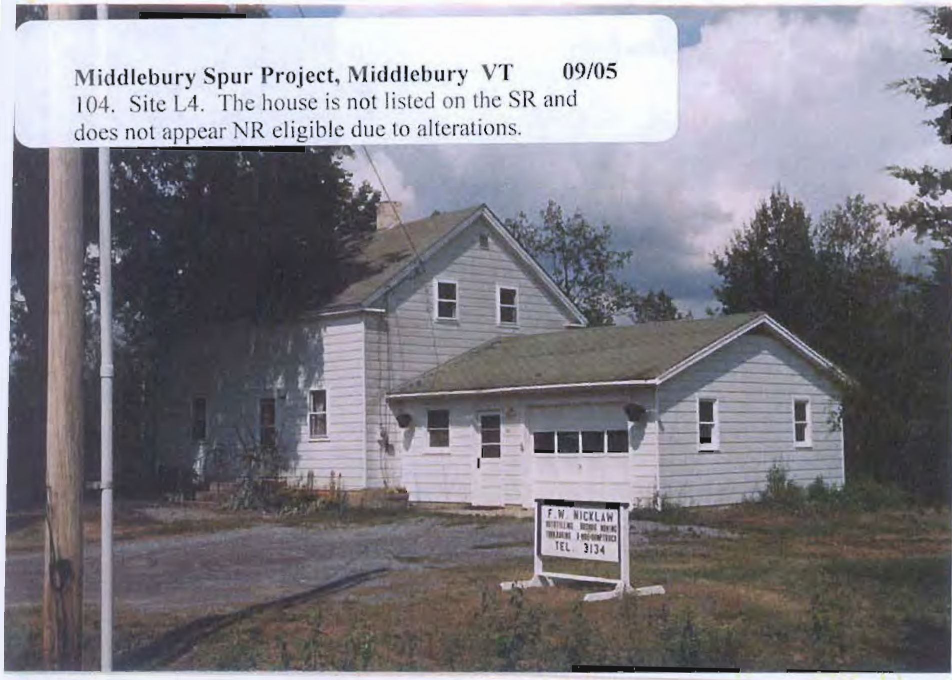


Middlebury Spur Project, Middlebury VT 09/05
101. Site L3. SR Leicester 21. Property appears eligible to the NR as a Farmstead.

Middlebury Spur Project, Middlebury VT 09/05
102. Site L3. SR Leicester 21. Property appears eligible to the NR as a Farmstead.



Middlebury Spur Project, Middlebury VT 09/05
103. Site L3. SR Leicester 21. Collection of barns is eligible to the NR as part of a Farmstead.

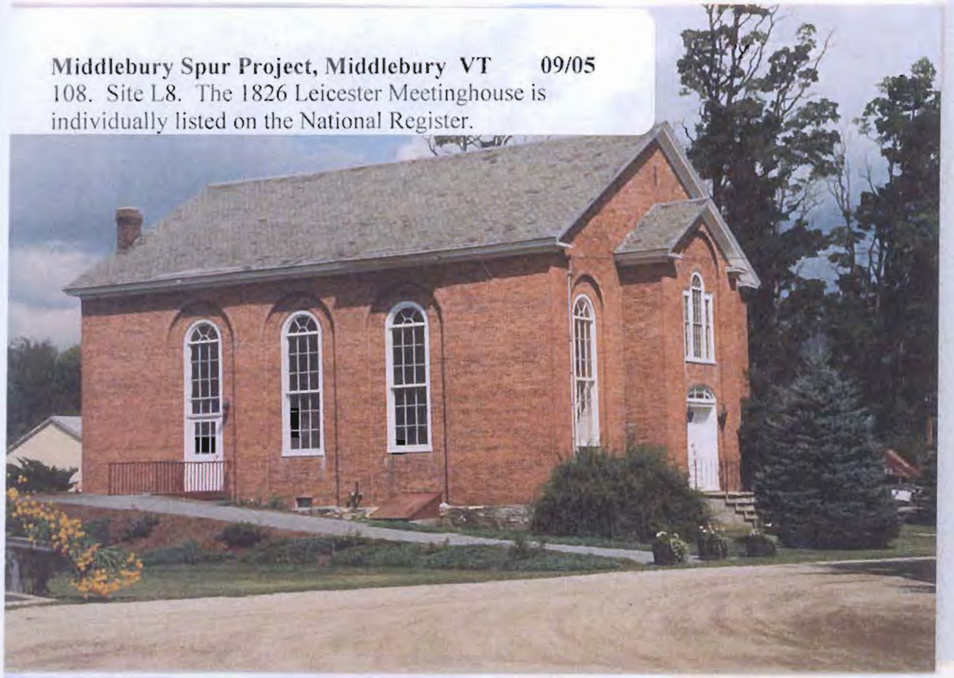


Middlebury Spur Project, Middlebury VT 09/05
104. Site L4. The house is not listed on the SR and does not appear NR eligible due to alterations.

Middlebury Spur Project, Middlebury VT 09/05
105. Site L5. The house is not listed on the SR and does not appear NR eligible due to alterations.

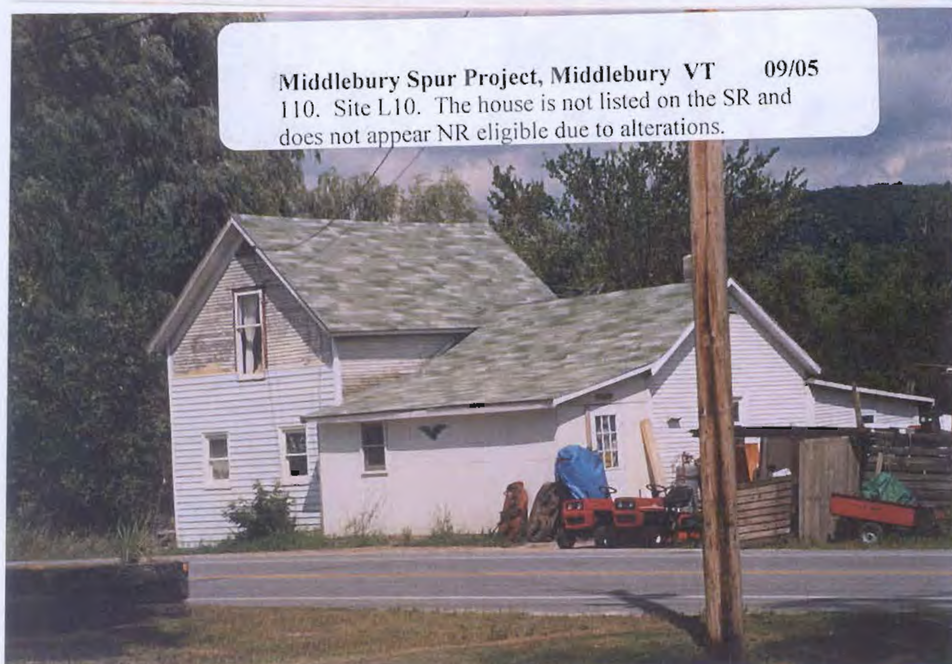
Middlebury Spur Project, Middlebury VT 09/05
106. Site L6. The c.1830 tavern is individually listed on the National Register.

Middlebury Spur Project, Middlebury VT 09/05
107. Site L7. The c.1858 school and town hall is individually listed on the National Register.

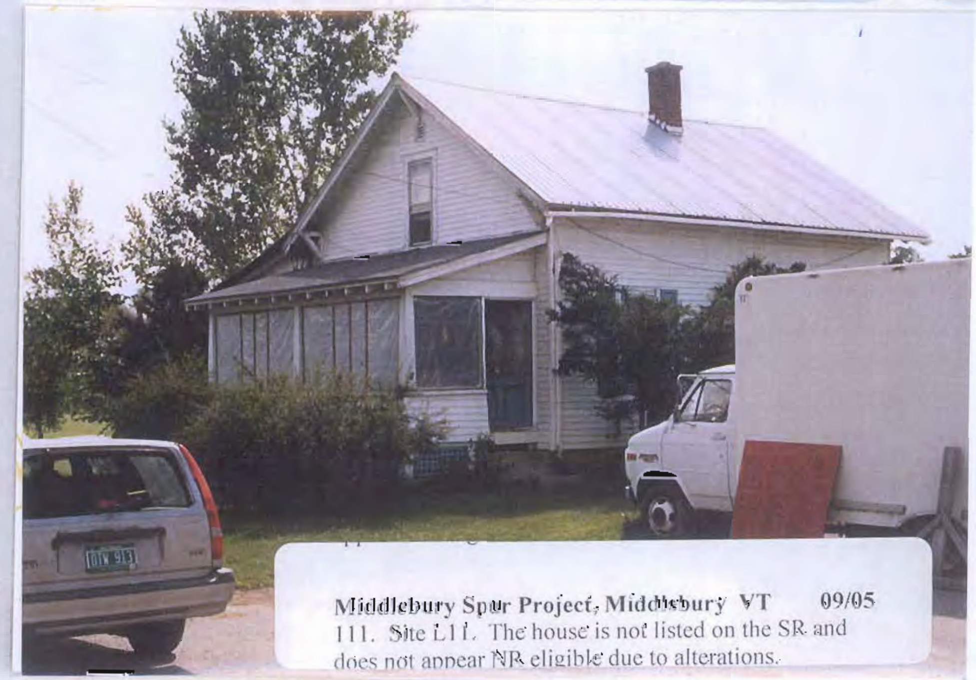


Middlebury Spur Project, Middlebury VT 09/05
108. Site L8. The 1826 Leicester Meetinghouse is individually listed on the National Register.

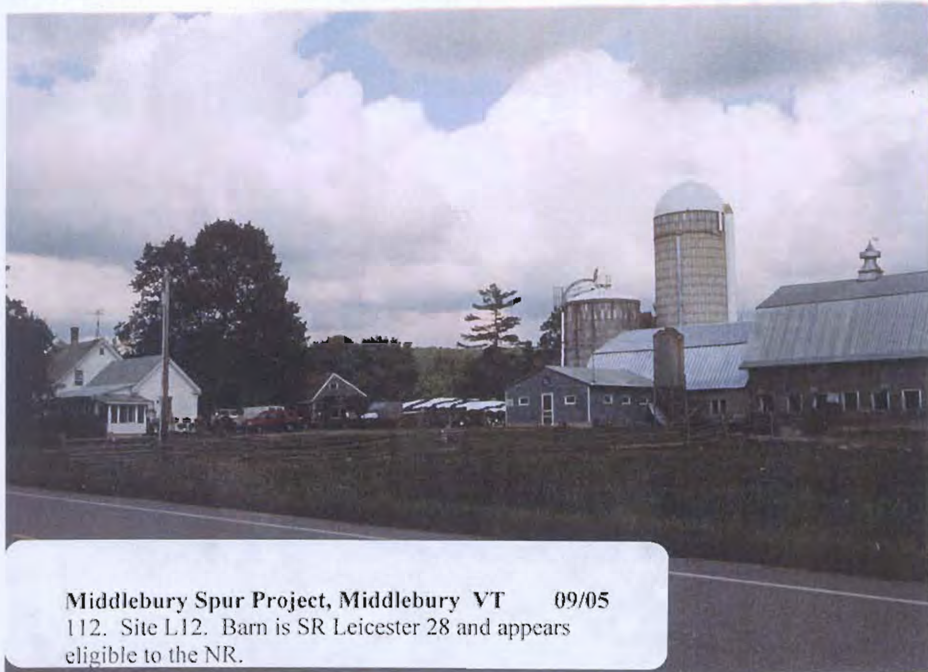
Middlebury Spur Project, Middlebury VT 09/05
109. Site L9.. SR Leicester 27. The house does not appear NR eligible due to alterations.



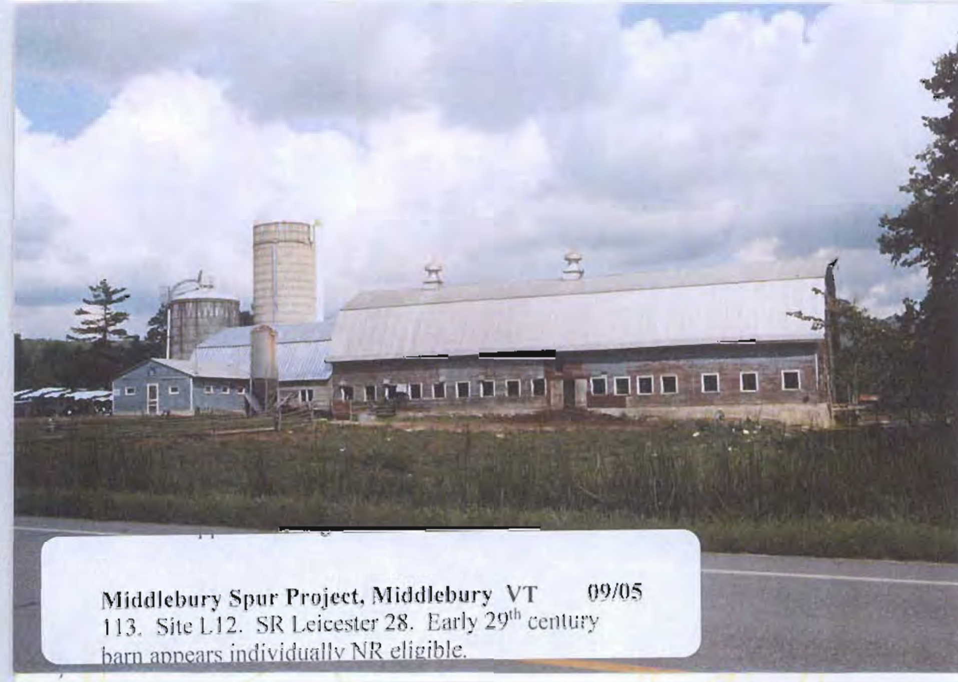
Middlebury Spur Project, Middlebury VT 09/05
110. Site L10. The house is not listed on the SR and does not appear NR eligible due to alterations.



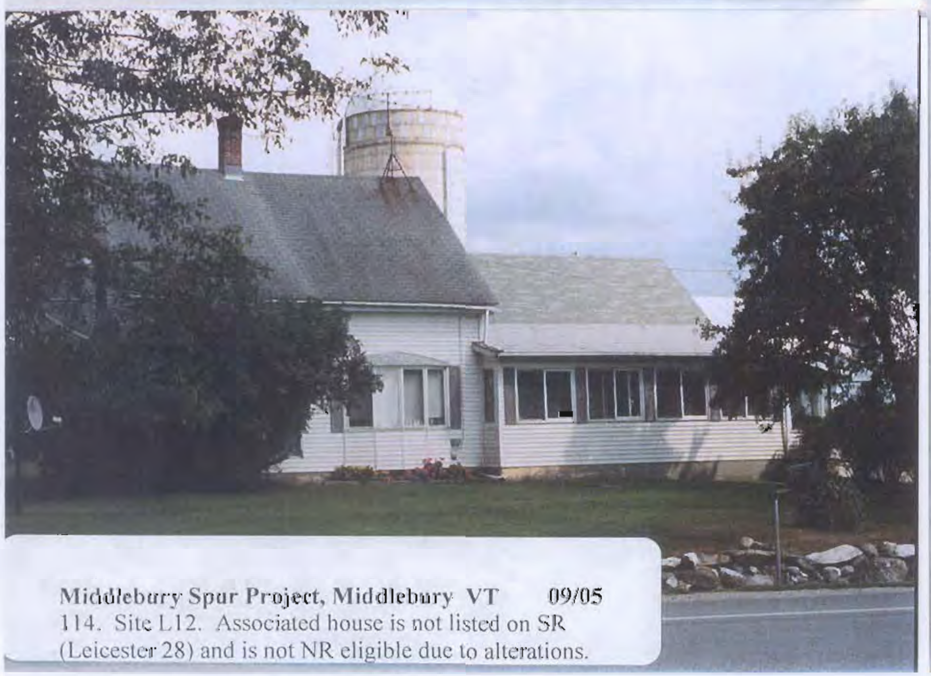
Middlebury Spur Project, Middlebury VT 09/05
111. Site L11. The house is not listed on the SR and does not appear NR eligible due to alterations.



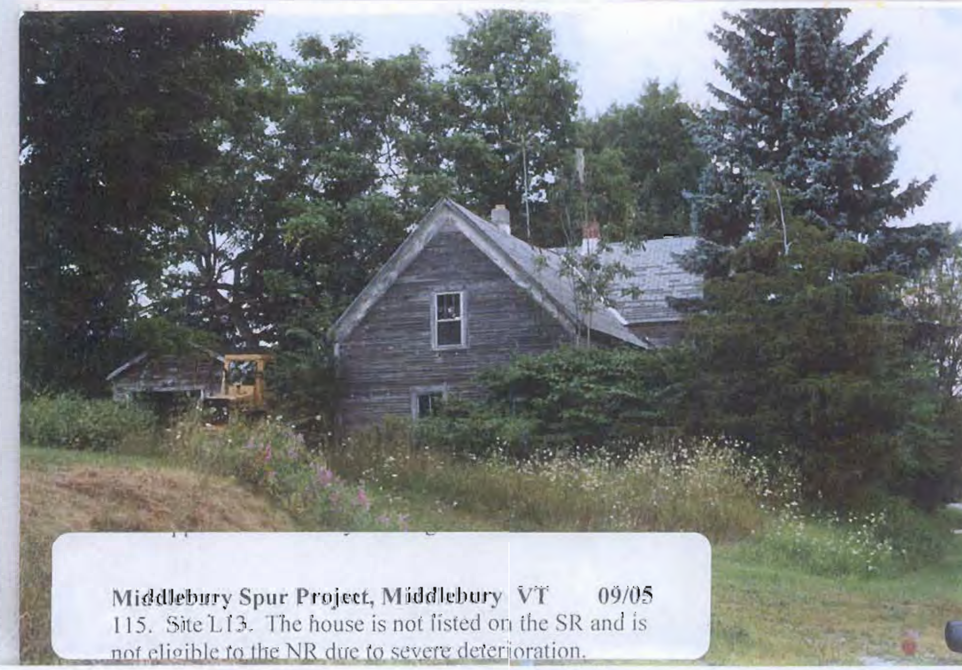
Middlebury Spur Project, Middlebury VT 09/05
112. Site L12. Barn is SR Leicester 28 and appears eligible to the NR.



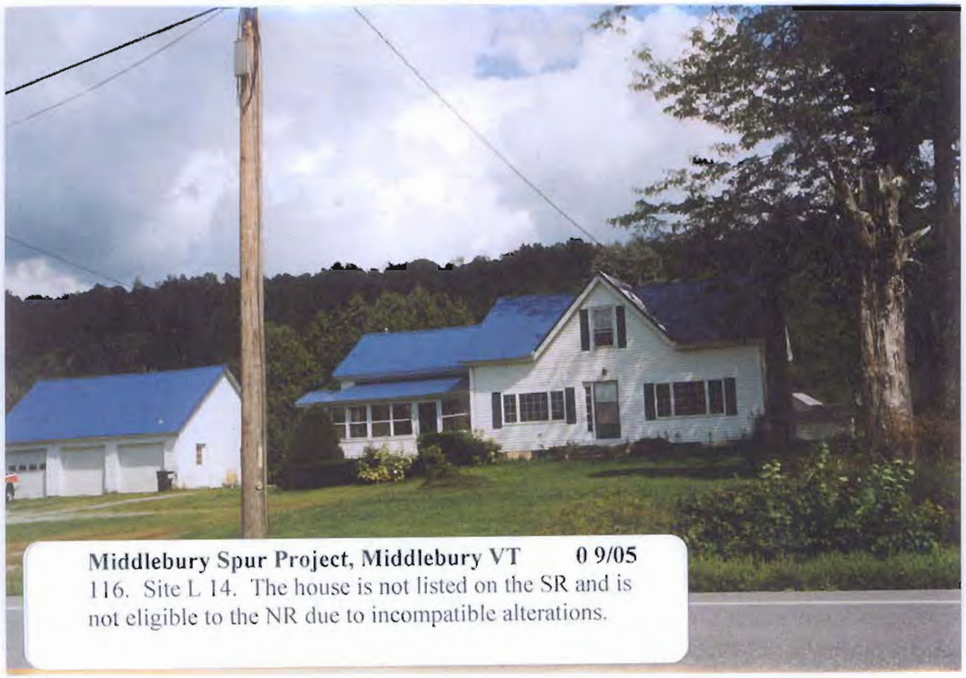
Middlebury Spur Project, Middlebury VT 09/05
113. Site L12. SR Leicester 28. Early 29th century barn appears individually NR eligible.



Middlebury Spur Project, Middlebury VT 09/05
114. Site L12. Associated house is not listed on SR (Leicester 28) and is not NR eligible due to alterations.

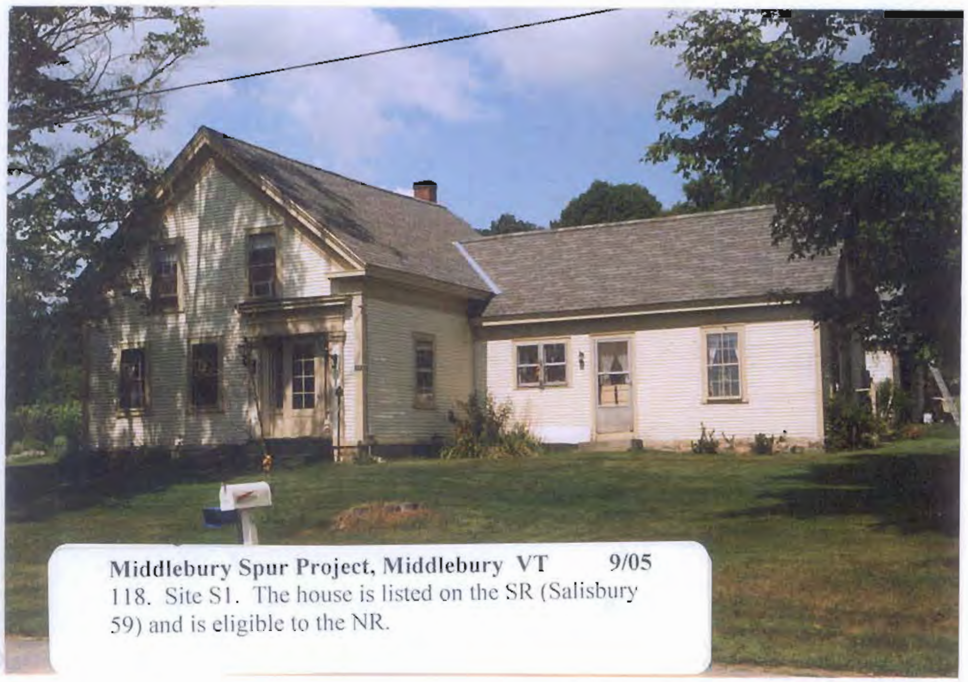


Middlebury Spur Project, Middlebury VT 09/05
115. Site L13. The house is not listed on the SR and is not eligible to the NR due to severe deterioration.

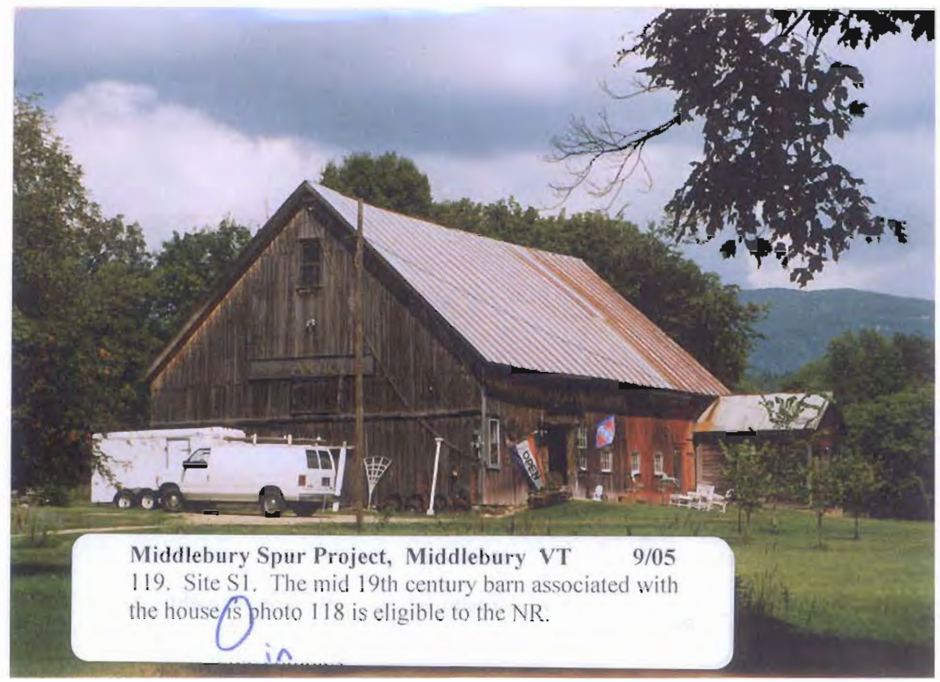


Middlebury Spur Project, Middlebury VT 0 9/05
116. Site L 14. The house is not listed on the SR and is not eligible to the NR due to incompatible alterations.

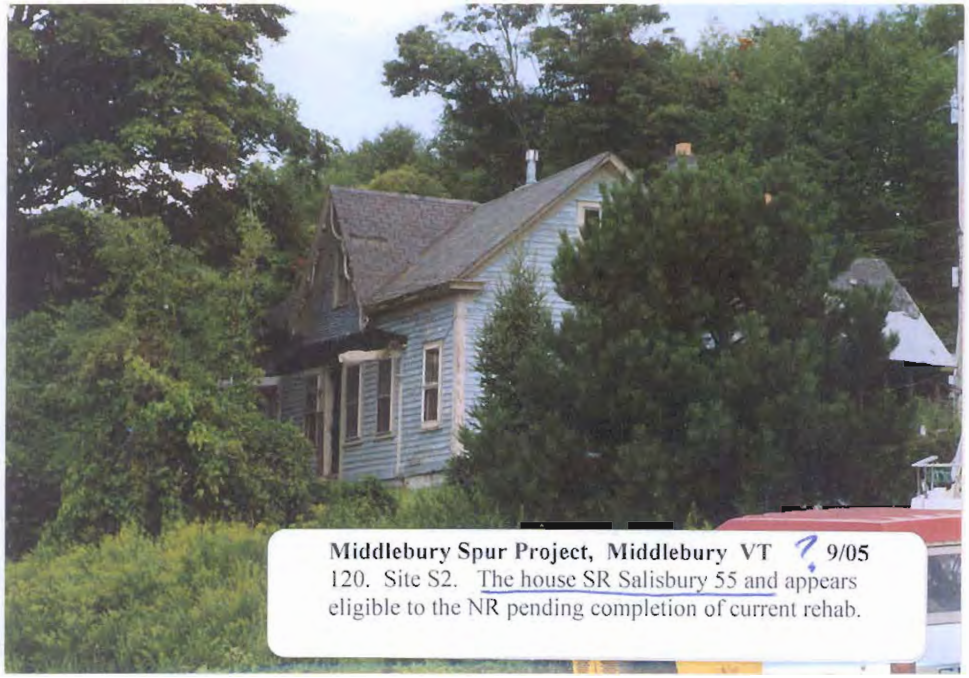
Middlebury Spur Project, Middlebury VT 9/05
117. Site L15. The building is not listed on the SR and is not eligible to the NR due to the large incompatible addition.



Middlebury Spur Project, Middlebury VT 9/05
118. Site S1. The house is listed on the SR (Salisbury 59) and is eligible to the NR.



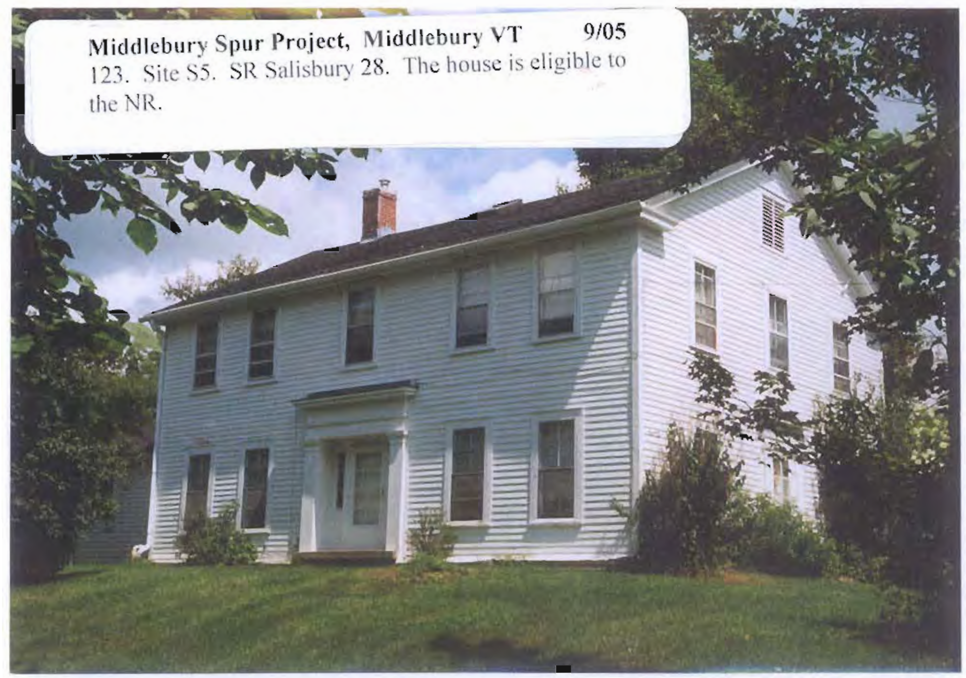
Middlebury Spur Project, Middlebury VT 9/05
119. Site S1. The mid 19th century barn associated with the house is photo 118 is eligible to the NR.
in



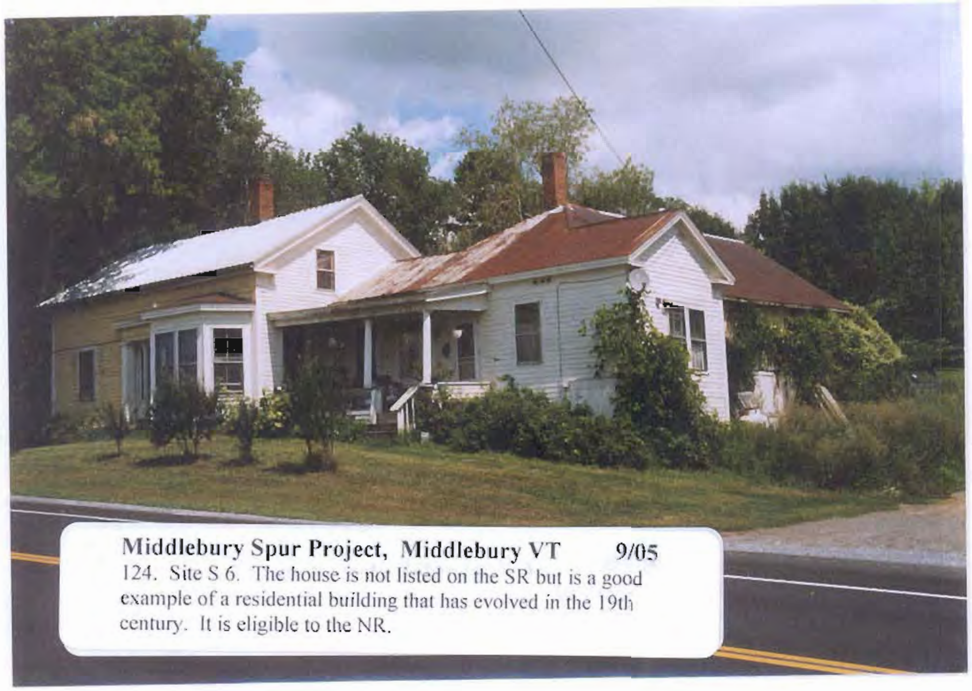
Middlebury Spur Project, Middlebury VT ? 9/05
120. Site S2. The house SR Salisbury 55 and appears eligible to the NR pending completion of current rehab.

Middlebury Spur Project, Middlebury VT 9/05
121. Site S3. SR Salisbury 21. The house is eligible to NR and is a good example of its type.

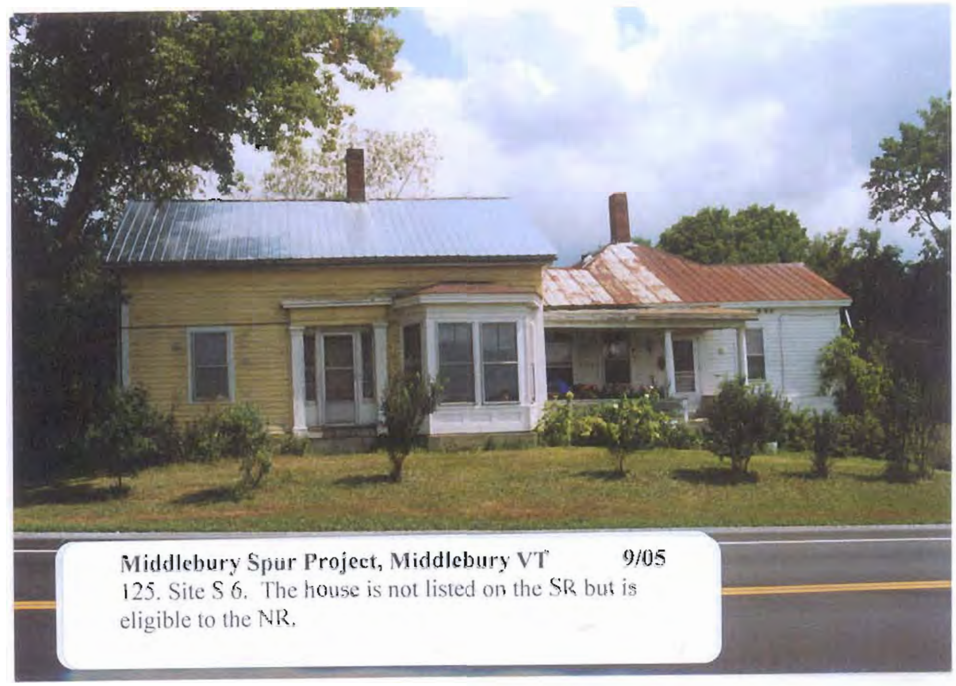
Middlebury Spur Project, Middlebury VT 9/05
122 Site S4. The house is not listed on the SR and is not eligible to the NR due to alterations.



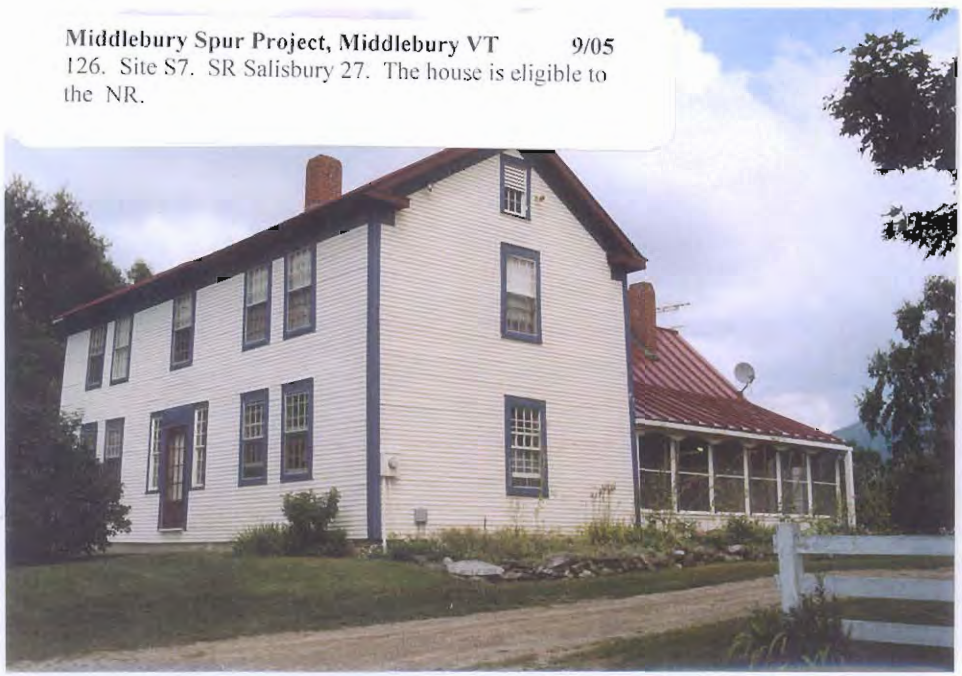
Middlebury Spur Project, Middlebury VT 9/05
123. Site S5. SR Salisbury 28. The house is eligible to the NR.



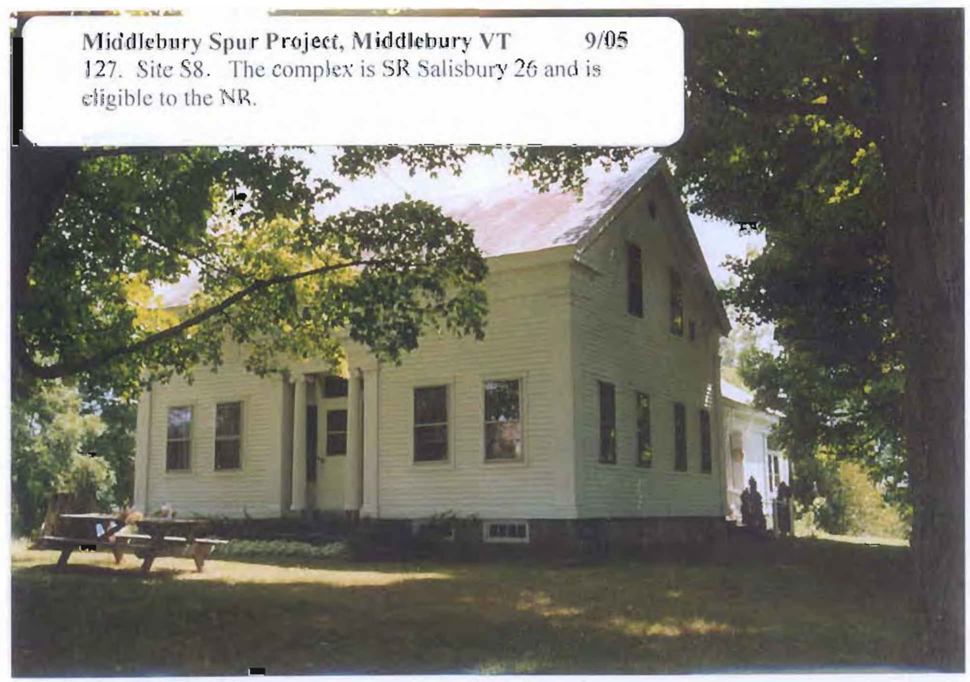
Middlebury Spur Project, Middlebury VT **9/05**
124. Site S 6. The house is not listed on the SR but is a good example of a residential building that has evolved in the 19th century. It is eligible to the NR.



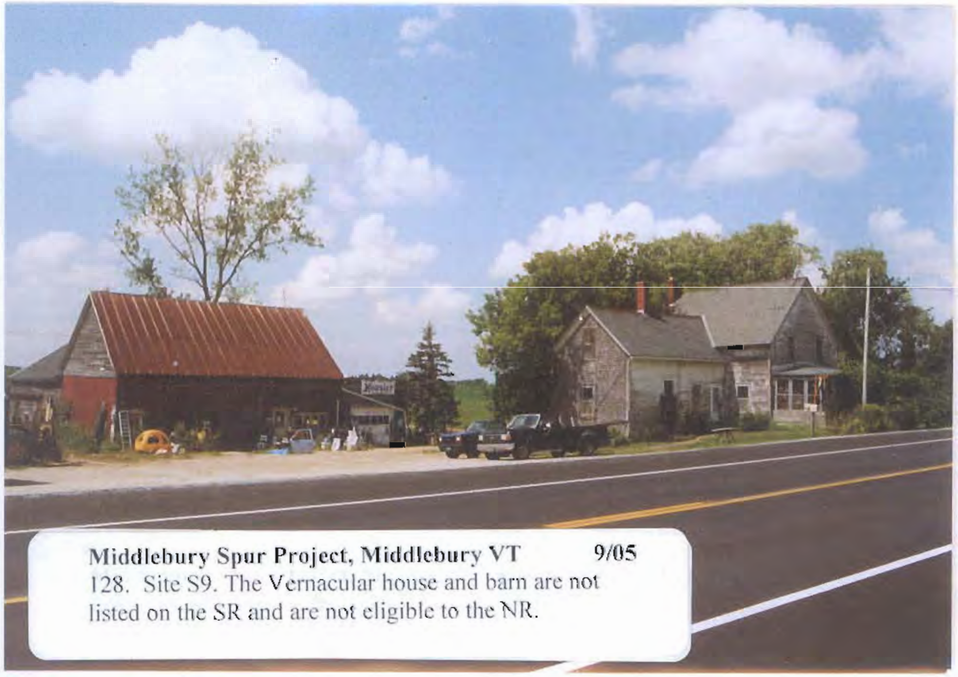
Middlebury Spur Project, Middlebury VT **9/05**
125. Site S 6. The house is not listed on the SR but is eligible to the NR.



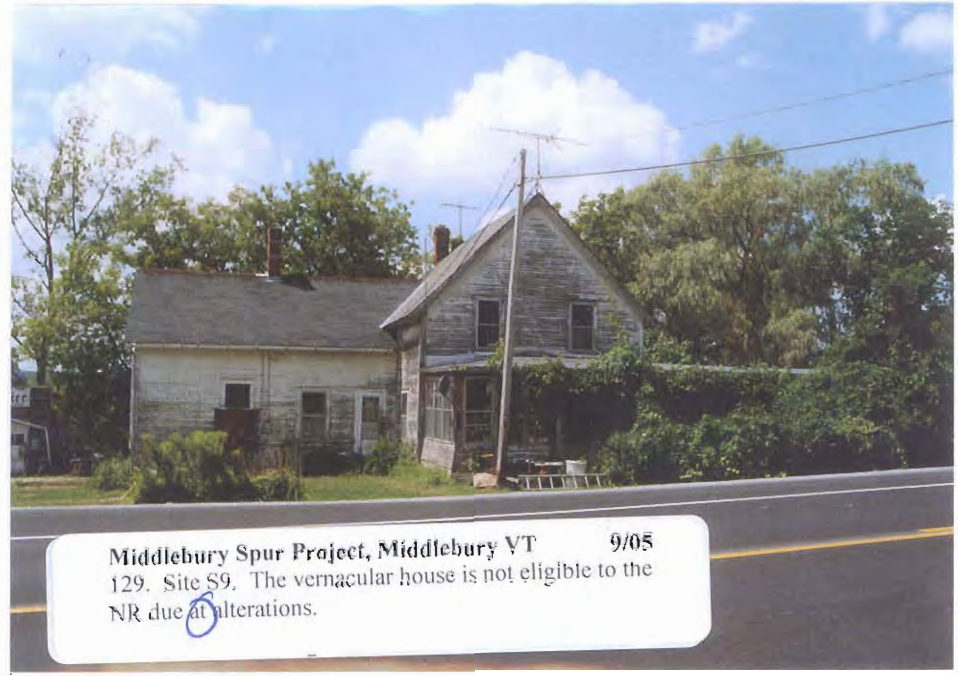
Middlebury Spur Project, Middlebury VT **9/05**
126. Site S7. SR Salisbury 27. The house is eligible to the NR.



Middlebury Spur Project, Middlebury VT **9/05**
127. Site S8. The complex is SR Salisbury 26 and is eligible to the NR.

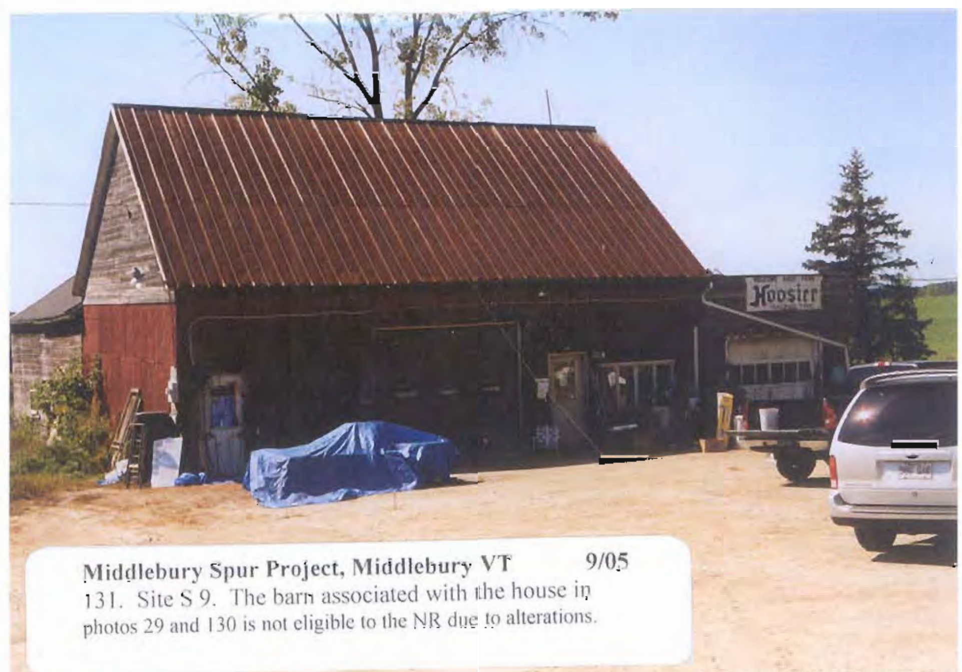


Middlebury Spur Project, Middlebury VT 9/05
128. Site S9. The Vernacular house and barn are not listed on the SR and are not eligible to the NR.

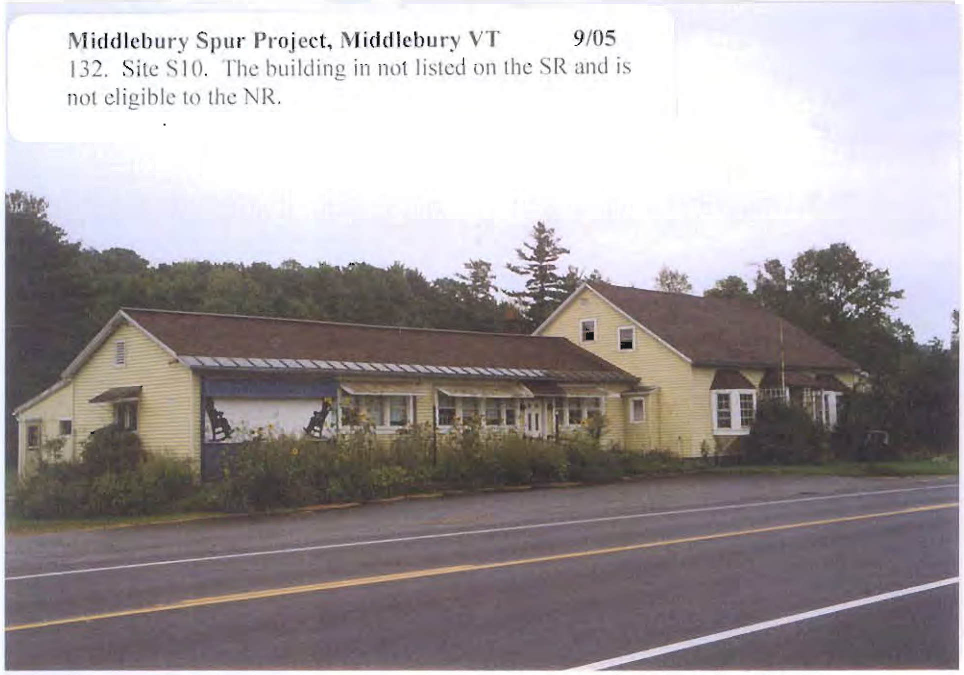


Middlebury Spur Project, Middlebury VT 9/05
129. Site S9. The vernacular house is not eligible to the NR due at alterations.

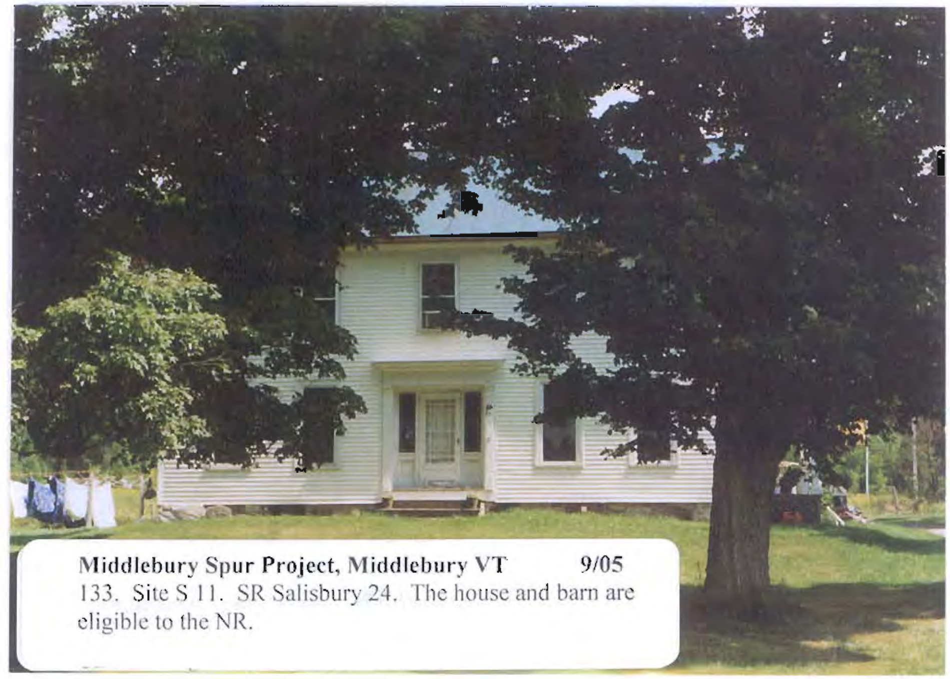
Middlebury Spur Project, Middlebury VT 9/05
130. Site S9. The vernacular house is not listed on the SR and is not eligible to the NR due to alterations.



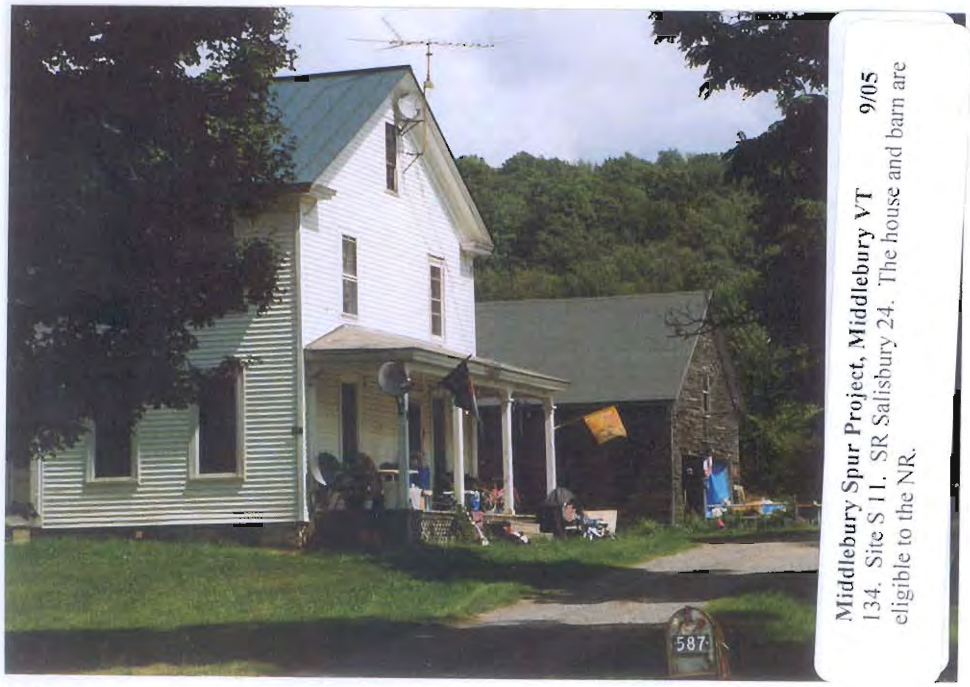
Middlebury Spur Project, Middlebury VT 9/05
131. Site S 9. The barn associated with the house in photos 29 and 130 is not eligible to the NR due to alterations.



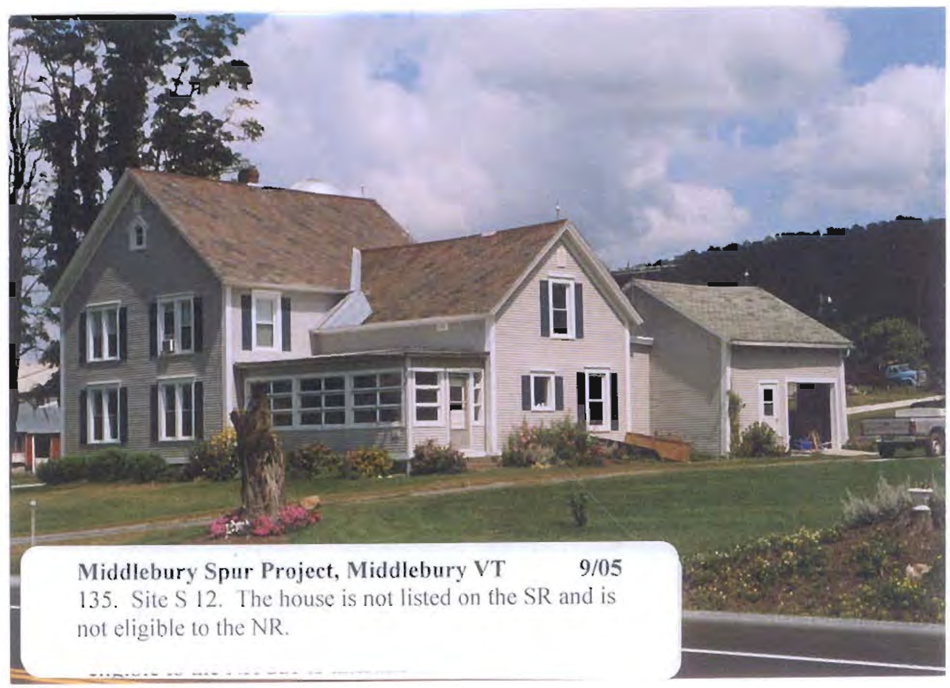
Middlebury Spur Project, Middlebury VT **9/05**
132. Site S10. The building in not listed on the SR and is not eligible to the NR.



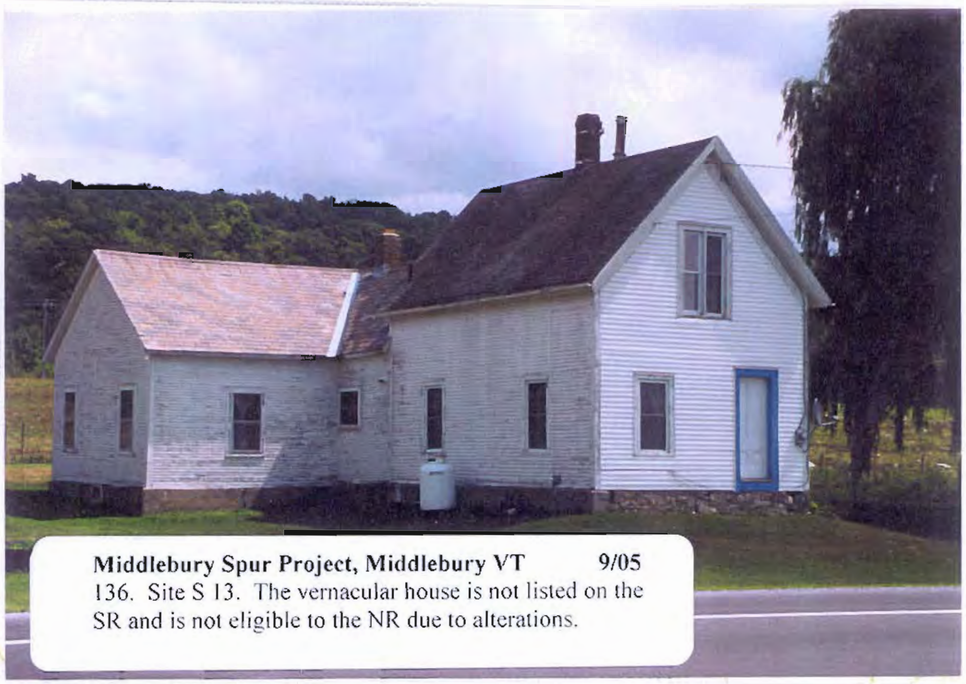
Middlebury Spur Project, Middlebury VT **9/05**
133. Site S 11. SR Salisbury 24. The house and barn are eligible to the NR.

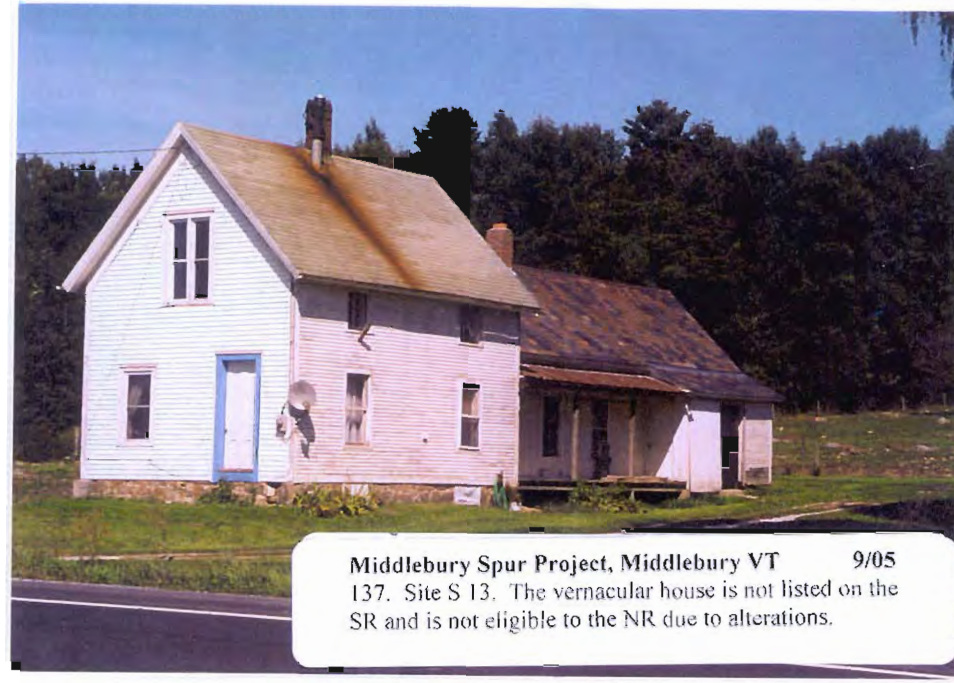


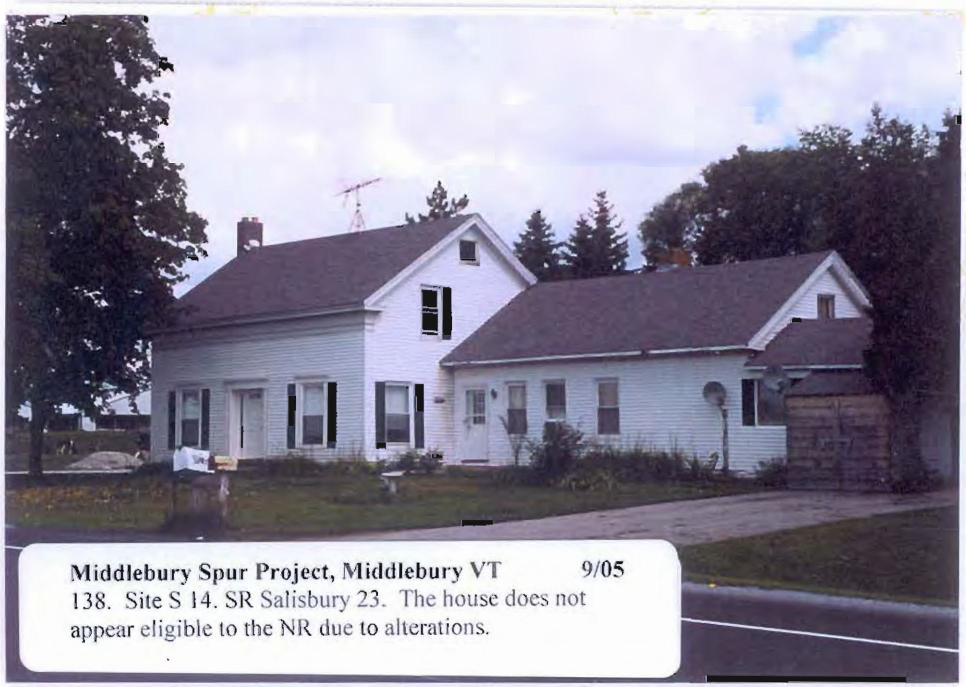
Middlebury Spur Project, Middlebury VT **9/05**
134. Site S 11. SR Salisbury 24. The house and barn are eligible to the NR.

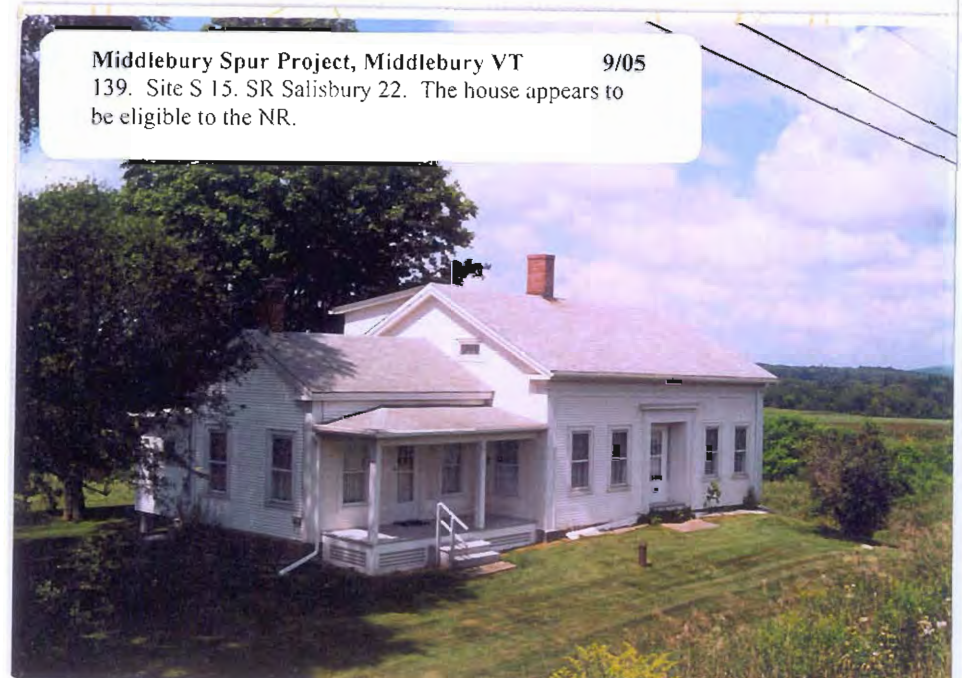


Middlebury Spur Project, Middlebury VT **9/05**
135. Site S 12. The house is not listed on the SR and is not eligible to the NR.

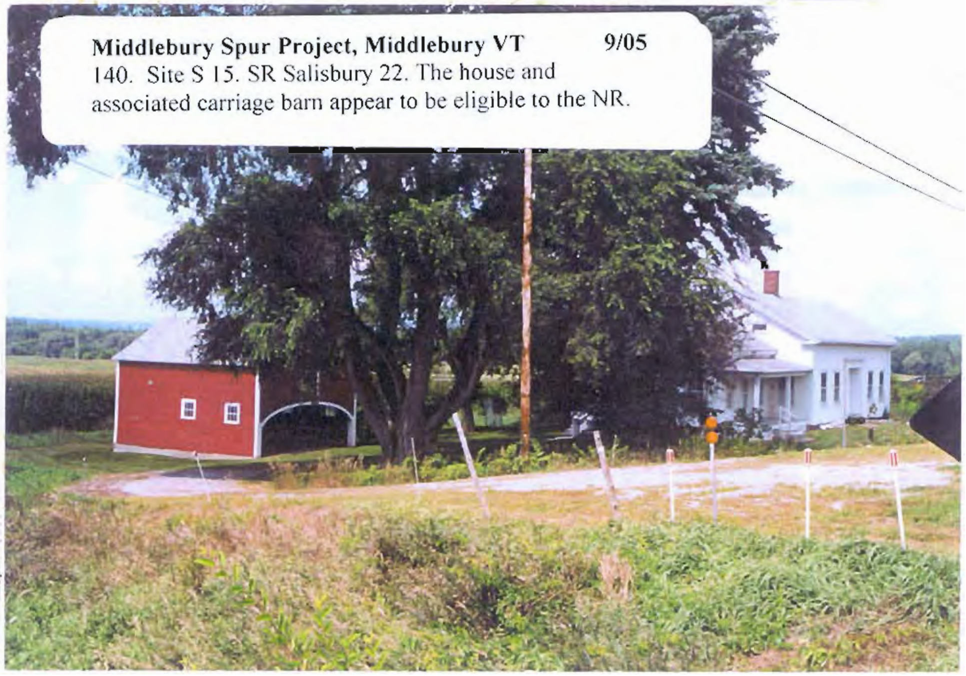

Middlebury Spur Project, Middlebury VT 9/05
136. Site S 13. The vernacular house is not listed on the SR and is not eligible to the NR due to alterations.


Middlebury Spur Project, Middlebury VT 9/05
137. Site S 13. The vernacular house is not listed on the SR and is not eligible to the NR due to alterations.


Middlebury Spur Project, Middlebury VT 9/05
138. Site S 14. SR Salisbury 23. The house does not appear eligible to the NR due to alterations.

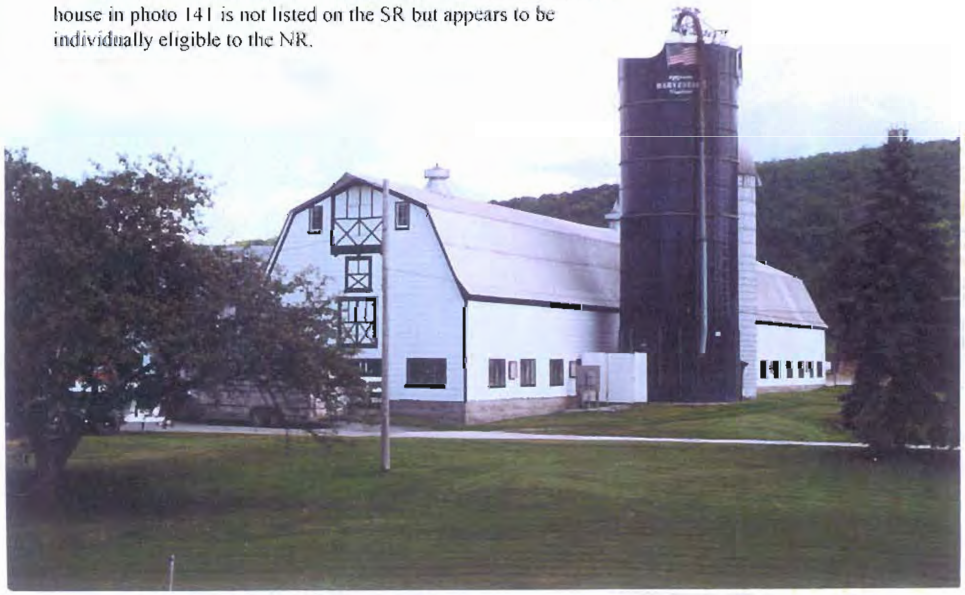

Middlebury Spur Project, Middlebury VT 9/05
139. Site S 15. SR Salisbury 22. The house appears to be eligible to the NR.

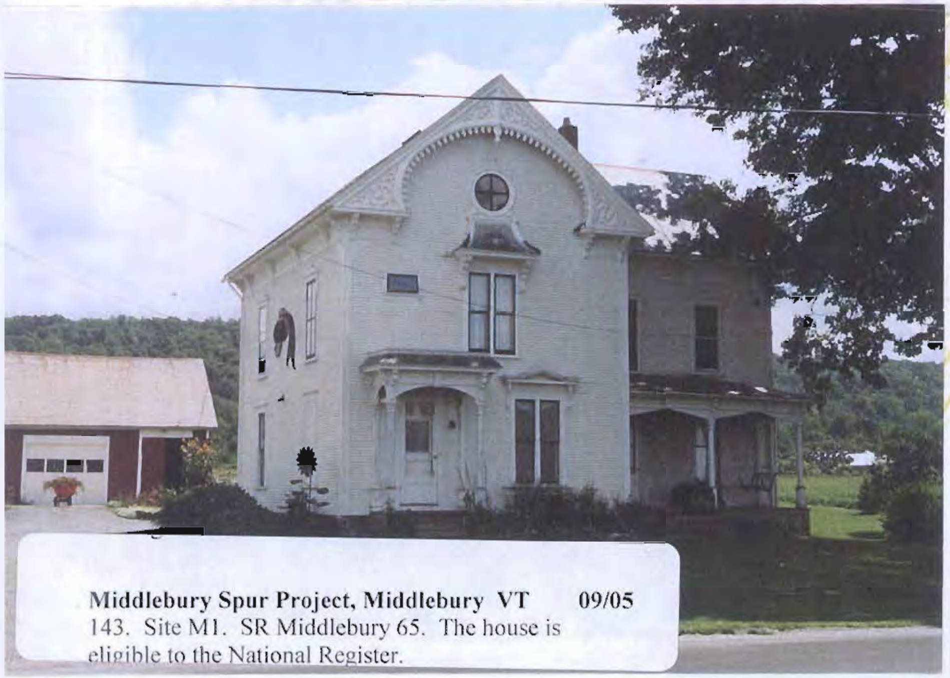
Middlebury Spur Project, Middlebury VT 9/05
140. Site S 15. SR Salisbury 22. The house and associated carriage barn appear to be eligible to the NR.



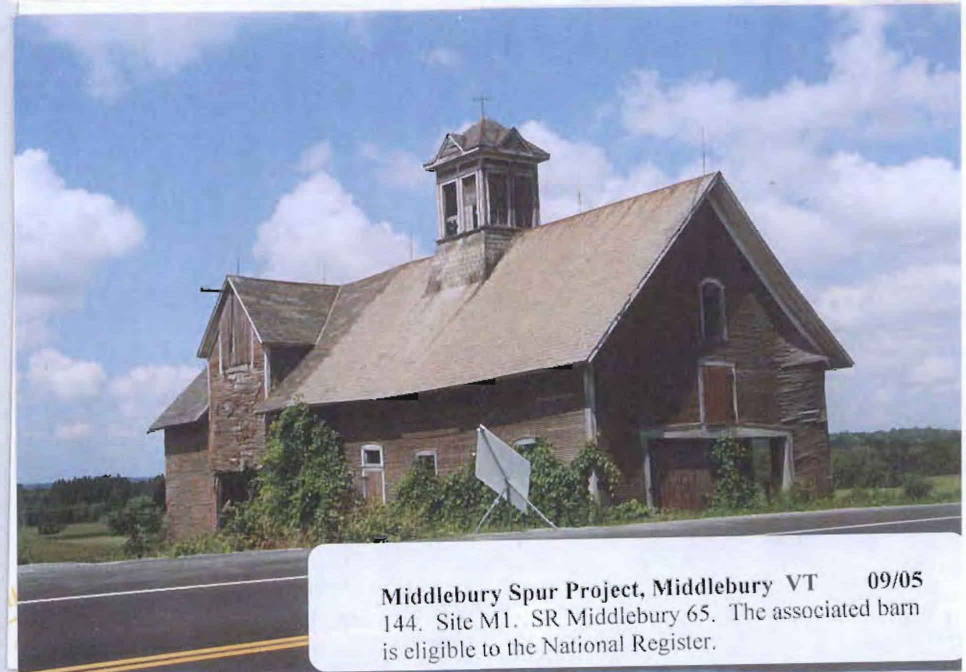
Middlebury Spur Project, Middlebury VT 9/05
141. Site S 16. The house is not listed on the SR and is not eligible to the NR due to numerous alterations

Middlebury Spur Project, Middlebury VT 9/05
142. Site S16. The Ground Level Stable Barn associated with the house in photo 141 is not listed on the SR but appears to be individually eligible to the NR.

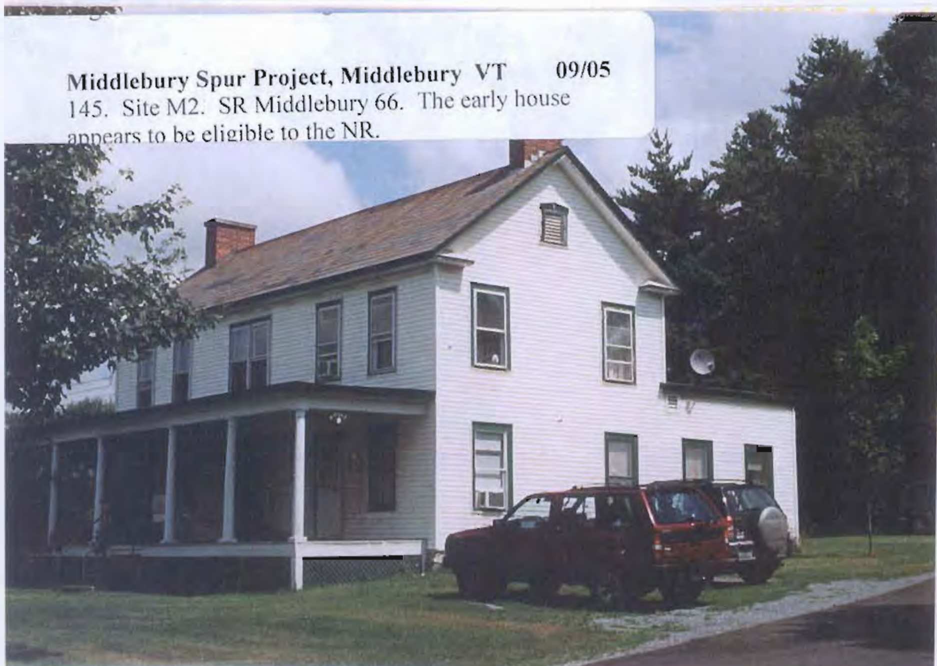




Middlebury Spur Project, Middlebury VT **09/05**
143. Site M1. SR Middlebury 65. The house is eligible to the National Register.



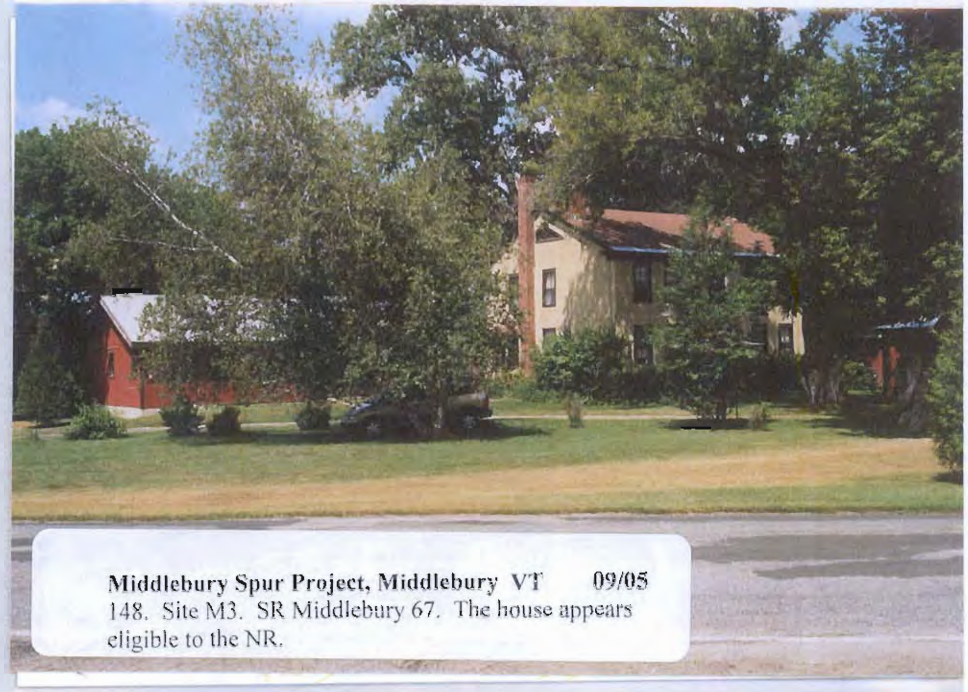
Middlebury Spur Project, Middlebury VT **09/05**
144. Site M1. SR Middlebury 65. The associated barn is eligible to the National Register.



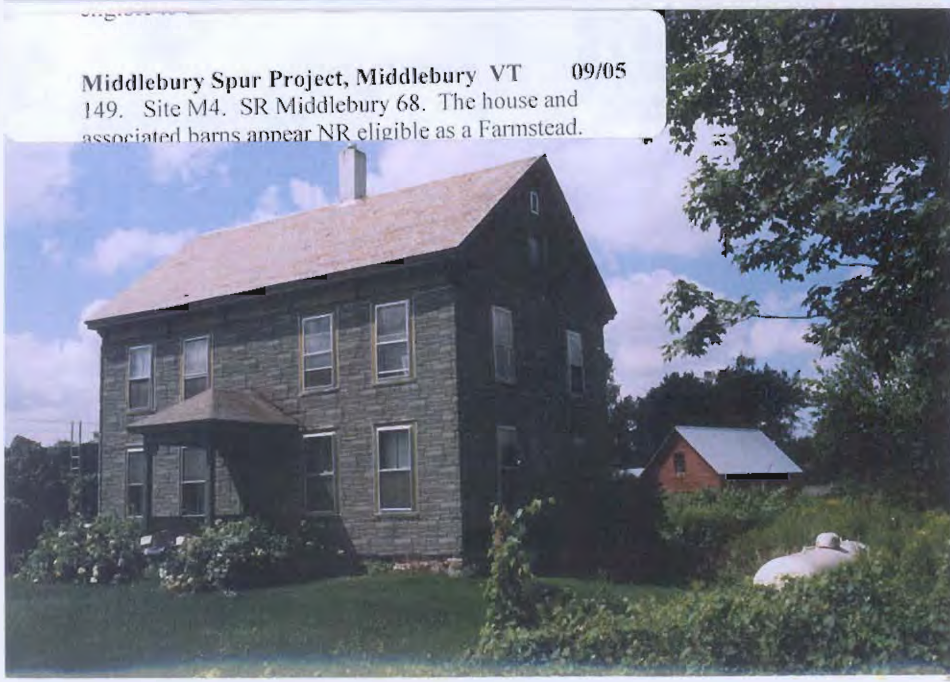
Middlebury Spur Project, Middlebury VT **09/05**
145. Site M2. SR Middlebury 66. The early house appears to be eligible to the NR.

Middlebury Spur Project, Middlebury VT **09/05**
146. Site M2. SR Middlebury 66. The early house appears to be eligible to the NR

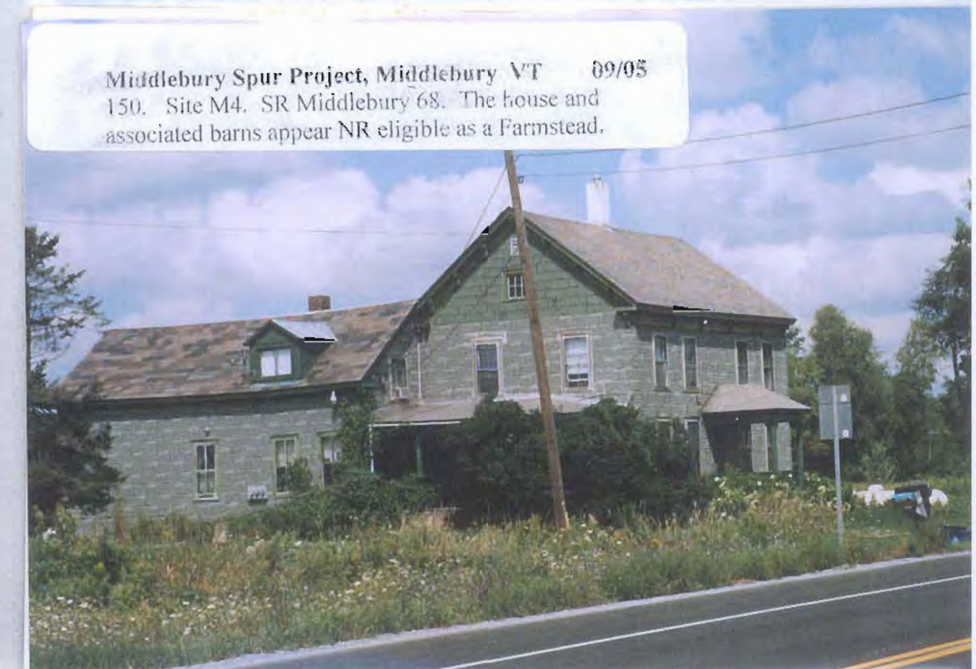
Middlebury Spur Project, Middlebury VT **09/05**
147. Site M3. SR Middlebury 67. The house appears eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
148. Site M3. SR Middlebury 67. The house appears eligible to the NR.

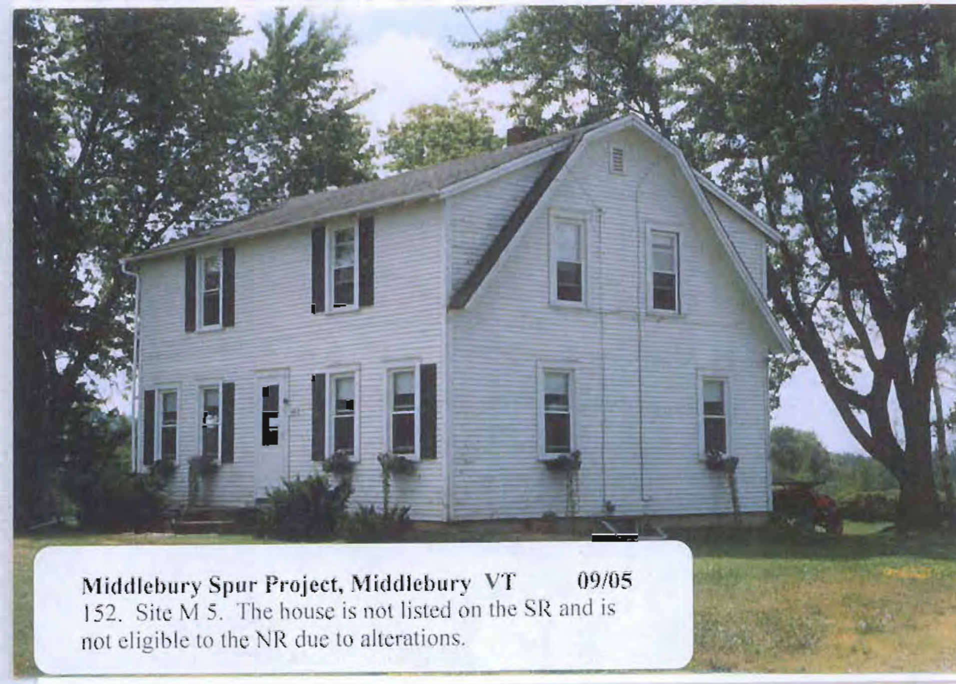


Middlebury Spur Project, Middlebury VT **09/05**
149. Site M4. SR Middlebury 68. The house and associated barns appear NR eligible as a Farmstead.

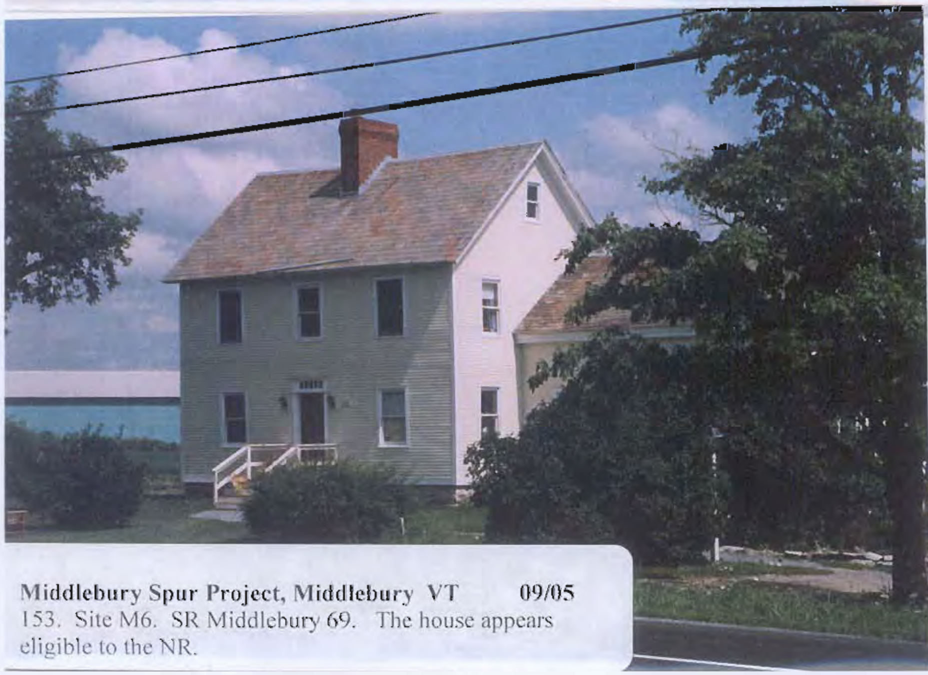


Middlebury Spur Project, Middlebury VT **09/05**
150. Site M4. SR Middlebury 68. The house and associated barns appear NR eligible as a Farmstead.

Middlebury Spur Project, Middlebury VT 09/05
151. Site M4. SR Middlebury 68. Associated barns are eligible to the NR as part of a Farmstead.

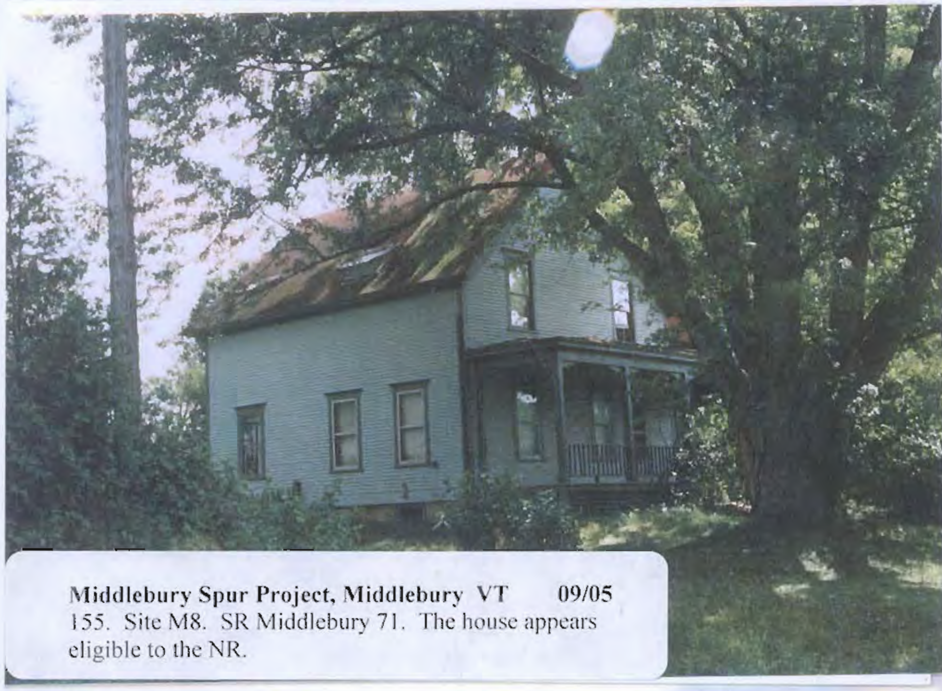


Middlebury Spur Project, Middlebury VT 09/05
152. Site M 5. The house is not listed on the SR and is not eligible to the NR due to alterations.



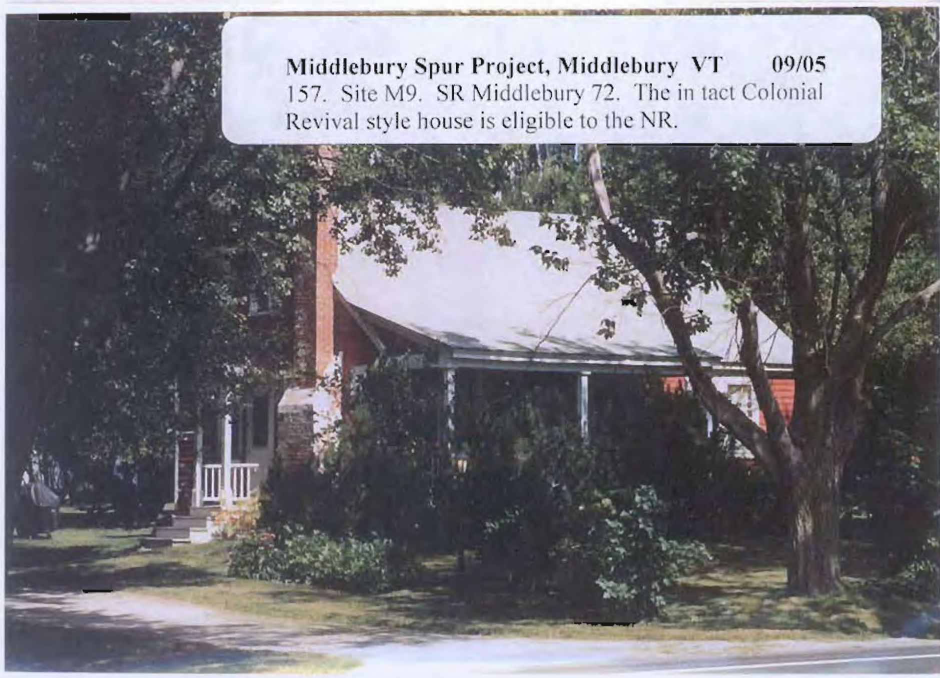
Middlebury Spur Project, Middlebury VT 09/05
153. Site M6. SR Middlebury 69. The house appears eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
154. Site M7. SR Middlebury 70. The early house appears eligible to the NR.



Middlebury Spur Project, Middlebury VT 09/05
155. Site M8. SR Middlebury 71. The house appears eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
156. Site M8. SR Middlebury 71. The house appears eligible to the NR.



Middlebury Spur Project, Middlebury VT 09/05
157. Site M9. SR Middlebury 72. The in tact Colonial Revival style house is eligible to the NR.

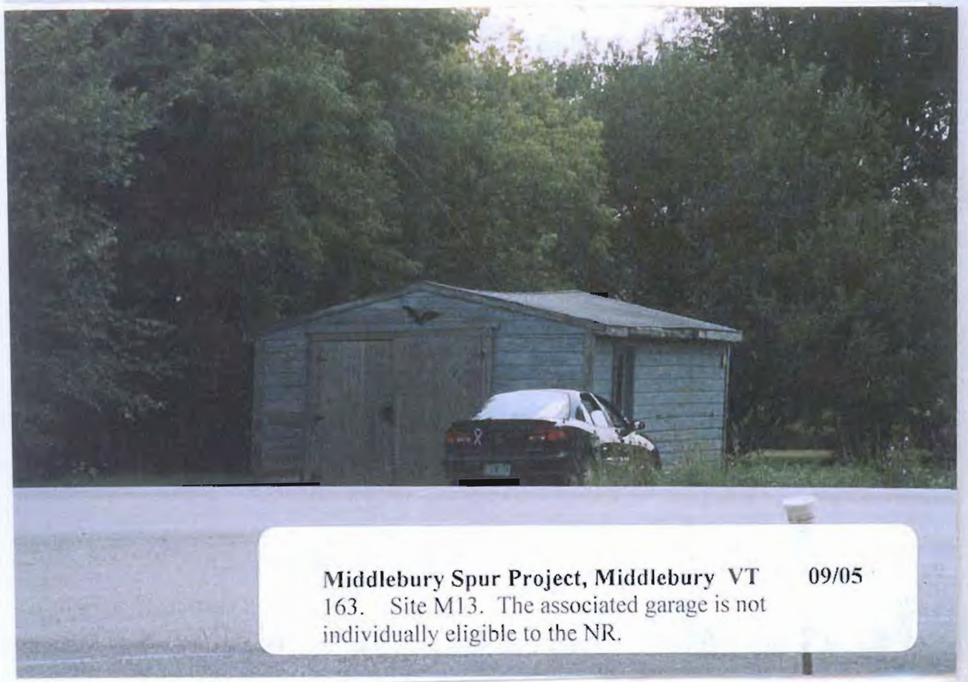
Middlebury Spur Project, Middlebury VT 09/05
158. Site M10. SR Middlebury 73. The Colonial Revival house is ineligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT 09/05
159. Site M10. SR Middlebury 73. The house in not eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT 09/05
160. Site M11. SR Middlebury 74. The in tact Colonial Revival style house is eligible to the NR.

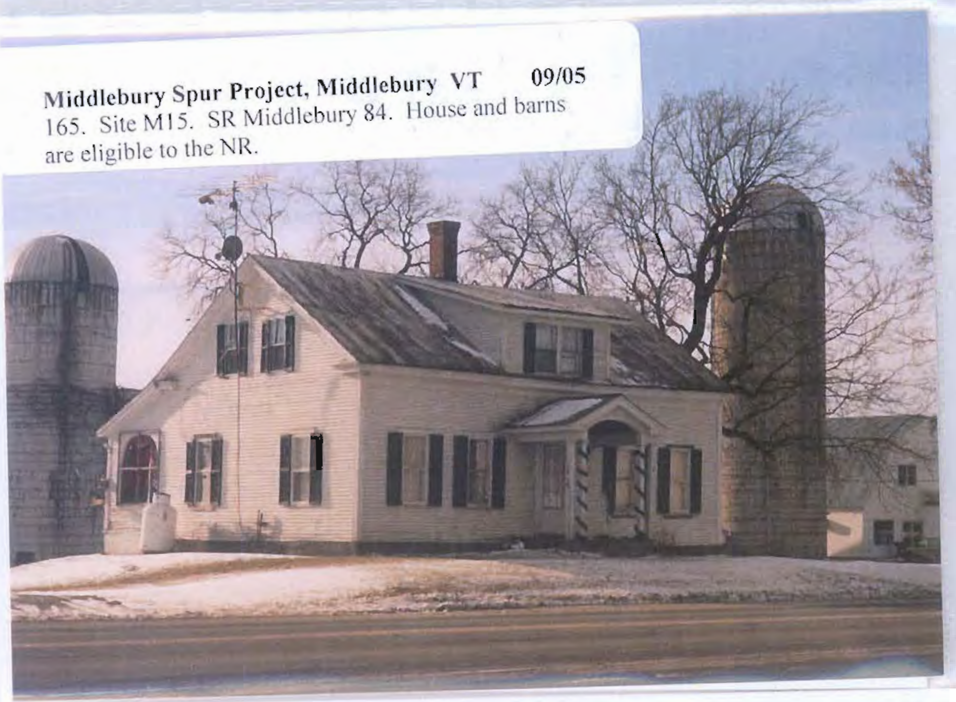
Middlebury Spur Project, Middlebury VT 09/05
161. Site M12. The house is not listed on the SR and is not NR eligible due to the large addition.

Middlebury Spur Project, Middlebury VT 09/05
.162. Site M13. The house is not listed on the SR and is not eligible to the NR.

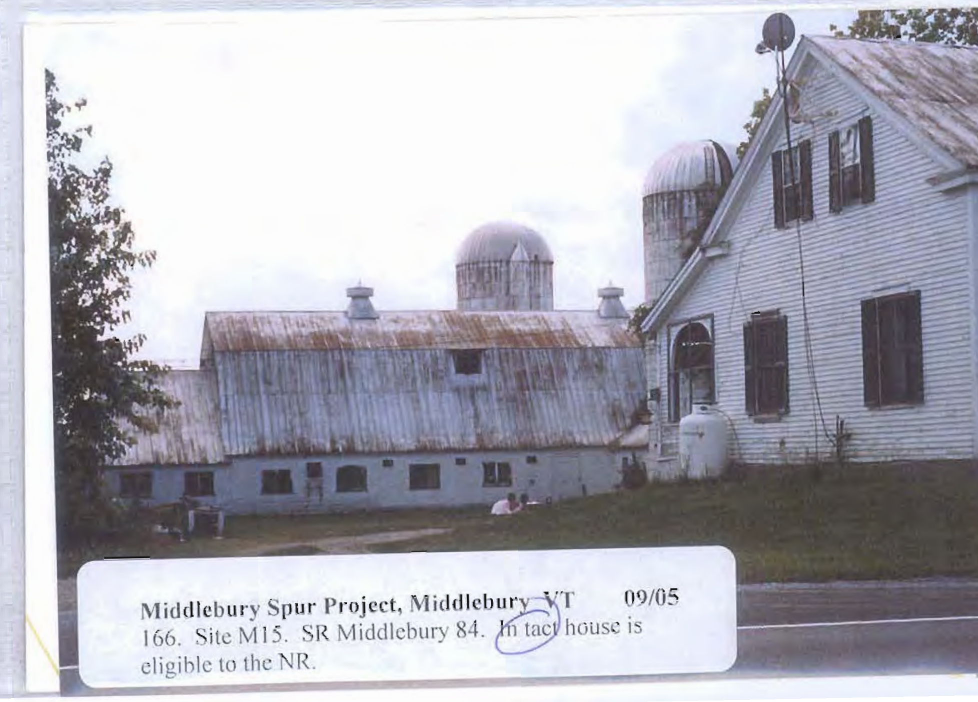


Middlebury Spur Project, Middlebury VT **09/05**
163. Site M13. The associated garage is not individually eligible to the NR.

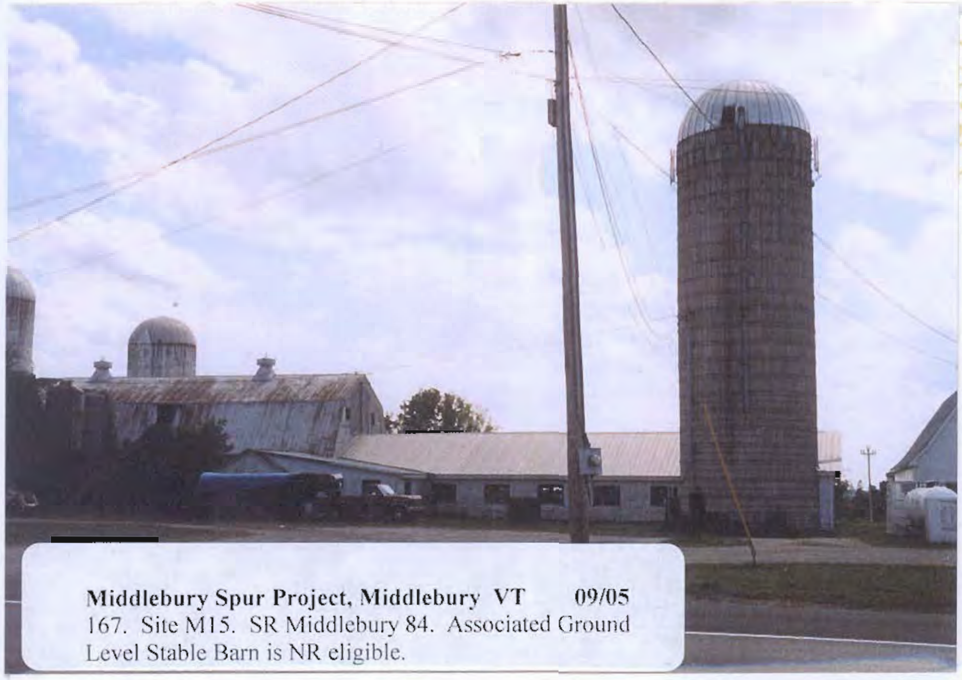
Middlebury Spur Project, Middlebury VT **09/05**
164. Site M14. The field building is not listed on the SR and is not eligible to the NR.



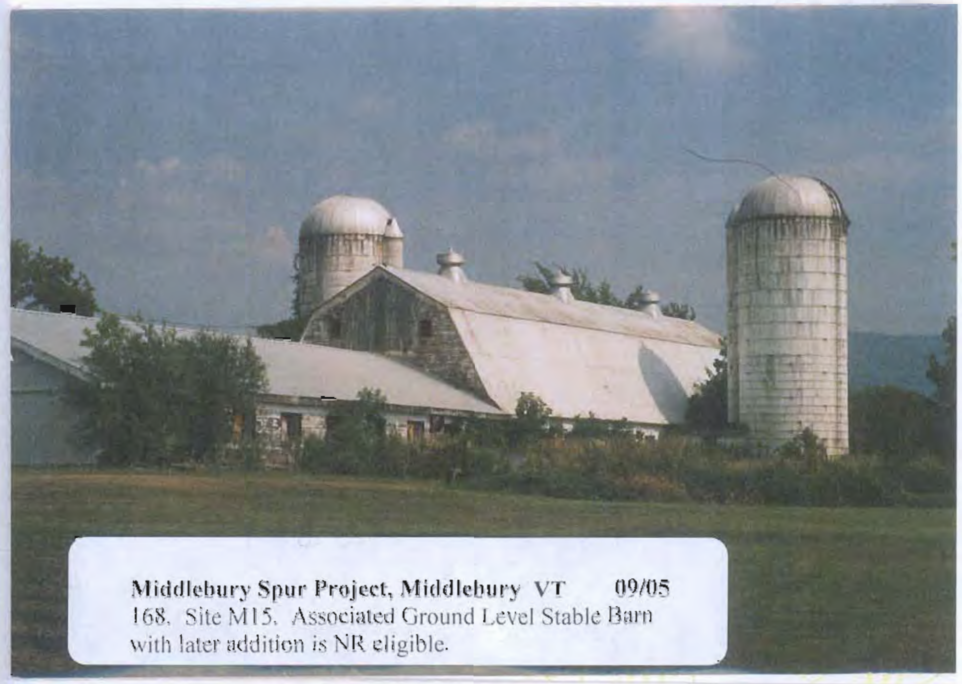
Middlebury Spur Project, Middlebury VT **09/05**
165. Site M15. SR Middlebury 84. House and barns are eligible to the NR.



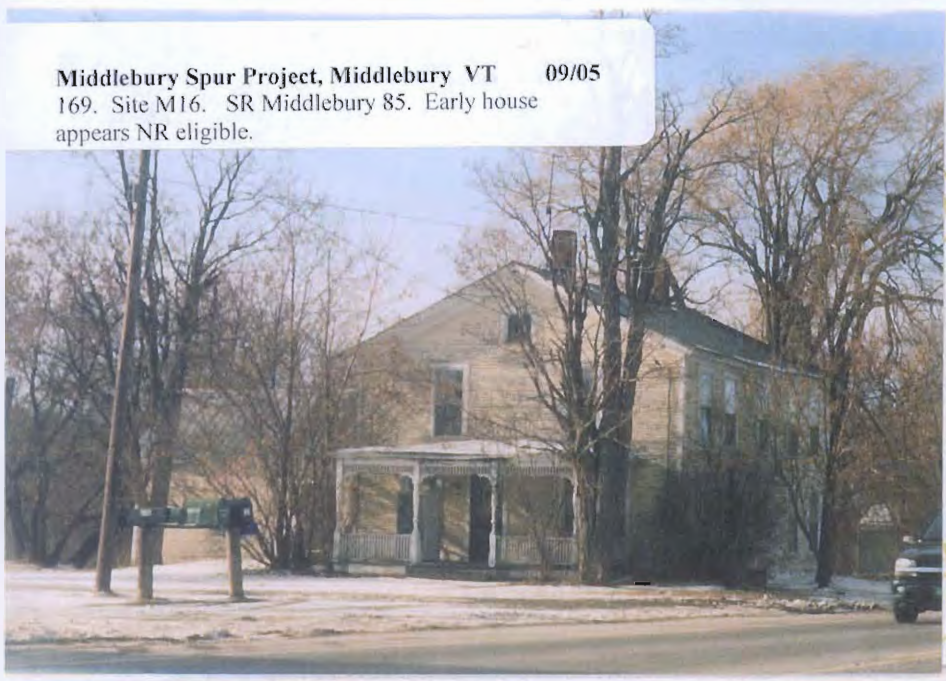
Middlebury Spur Project, Middlebury VT **09/05**
166. Site M15. SR Middlebury 84. In tact house is eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
167. Site M15. SR Middlebury 84. Associated Ground Level Stable Barn is NR eligible.

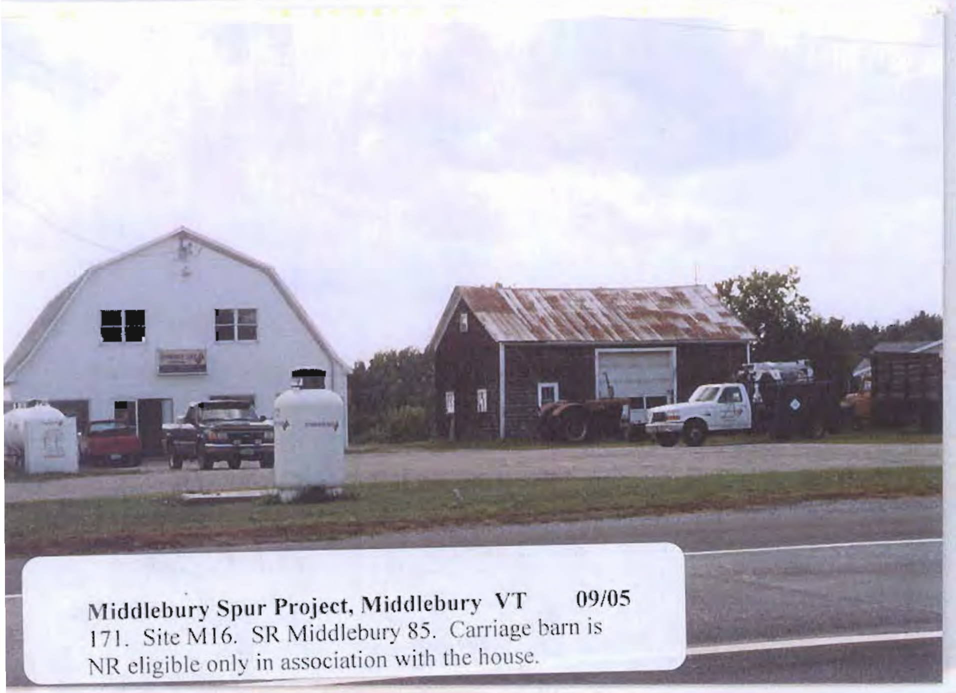


Middlebury Spur Project, Middlebury VT **09/05**
168. Site M15. Associated Ground Level Stable Barn with later addition is NR eligible.

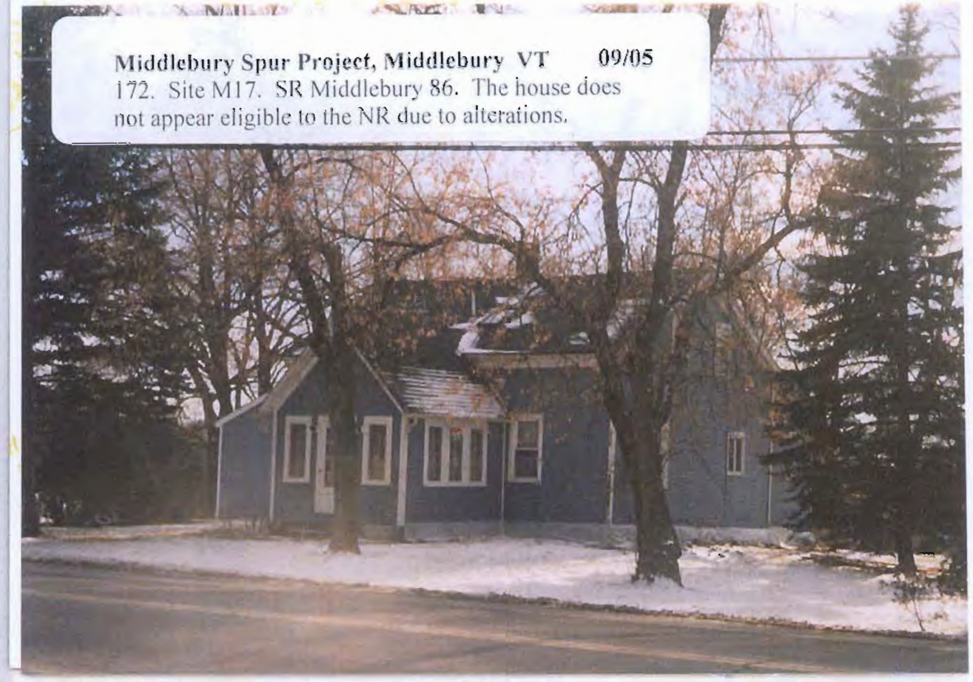


Middlebury Spur Project, Middlebury VT **09/05**
169. Site M16. SR Middlebury 85. Early house appears NR eligible.

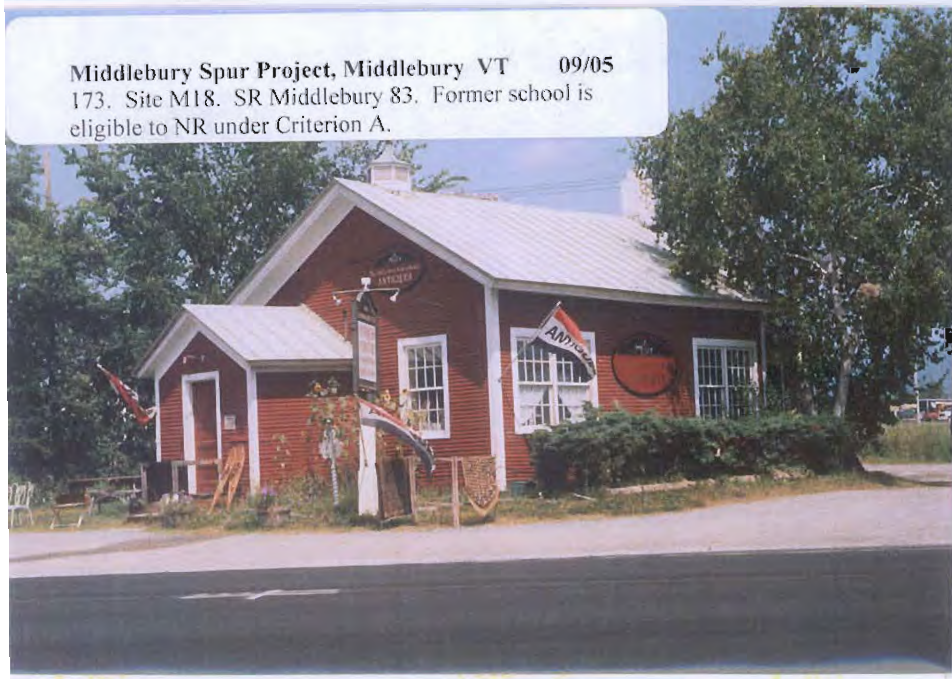
Middlebury Spur Project, Middlebury VT **09/05**
170. Site M16. SR Middlebury 85. Early house despite some alterations appears to be NR eligible.



Middlebury Spur Project, Middlebury VT 09/05
171. Site M16. SR Middlebury 85. Carriage barn is NR eligible only in association with the house.



Middlebury Spur Project, Middlebury VT 09/05
172. Site M17. SR Middlebury 86. The house does not appear eligible to the NR due to alterations.

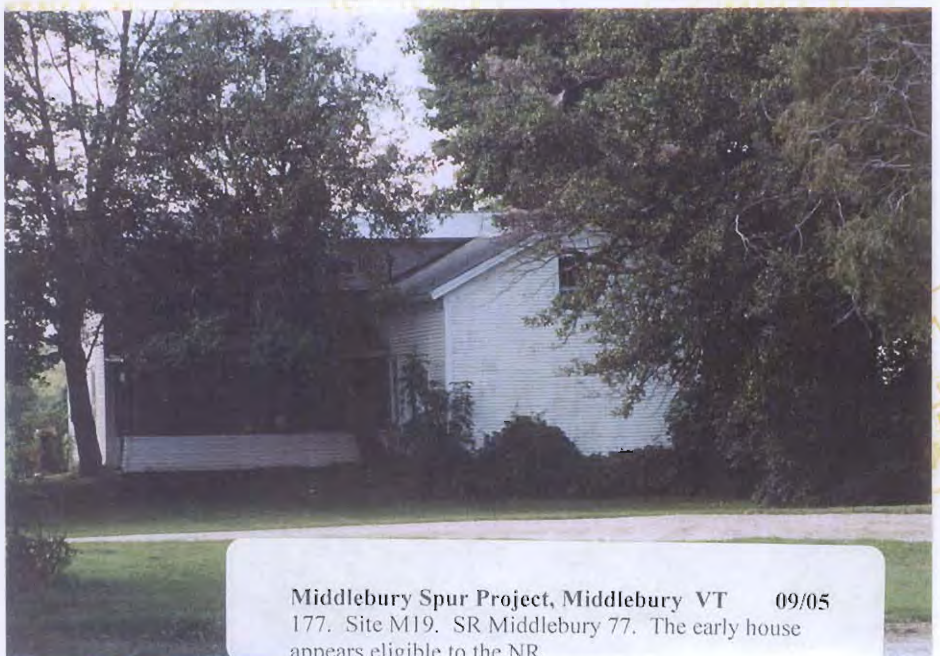


Middlebury Spur Project, Middlebury VT 09/05
173. Site M18. SR Middlebury 83. Former school is eligible to NR under Criterion A.

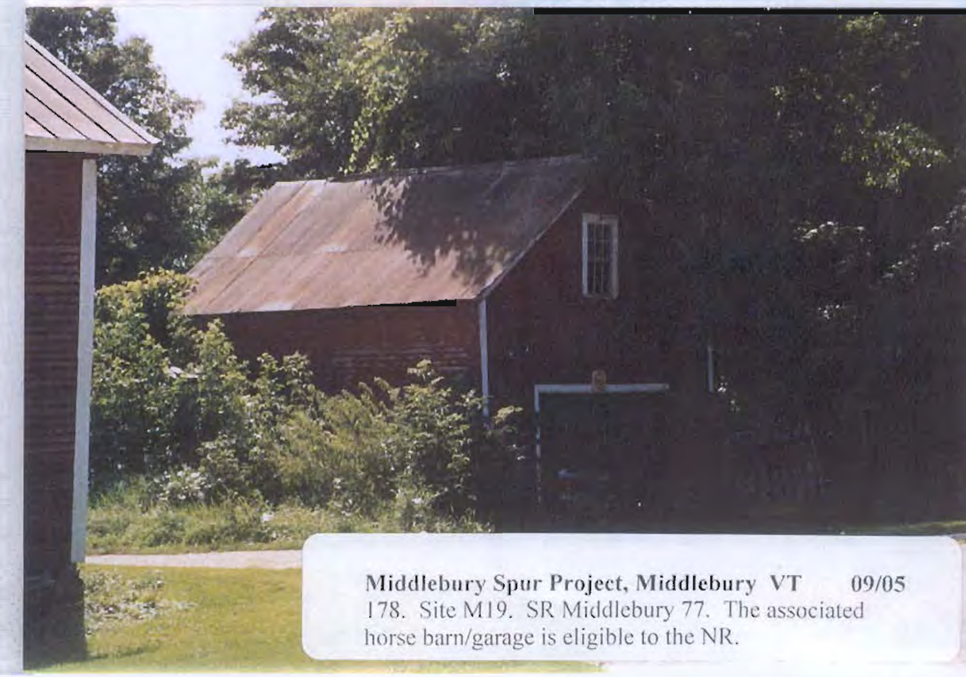
Middlebury Spur Project, Middlebury VT 09/05
174. Site M18. SR Middlebury 83. Former school is eligible to NR under Criterion A

Middlebury Spur Project, Middlebury VT **09/05**
175. Site M19. SR Middlebury 77. The early house appears eligible to the NR.

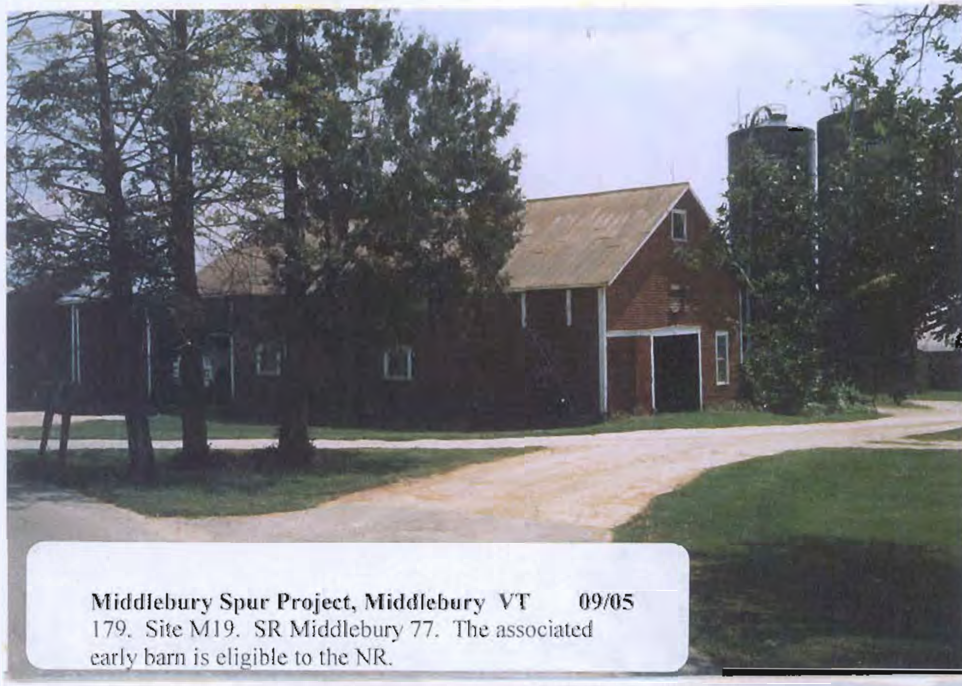
Middlebury Spur Project, Middlebury VT **09/05**
176. Site M19. SR Middlebury 77. The early house appears eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
177. Site M19. SR Middlebury 77. The early house appears eligible to the NR.



Middlebury Spur Project, Middlebury VT **09/05**
178. Site M19. SR Middlebury 77. The associated horse barn/garage is eligible to the NR.

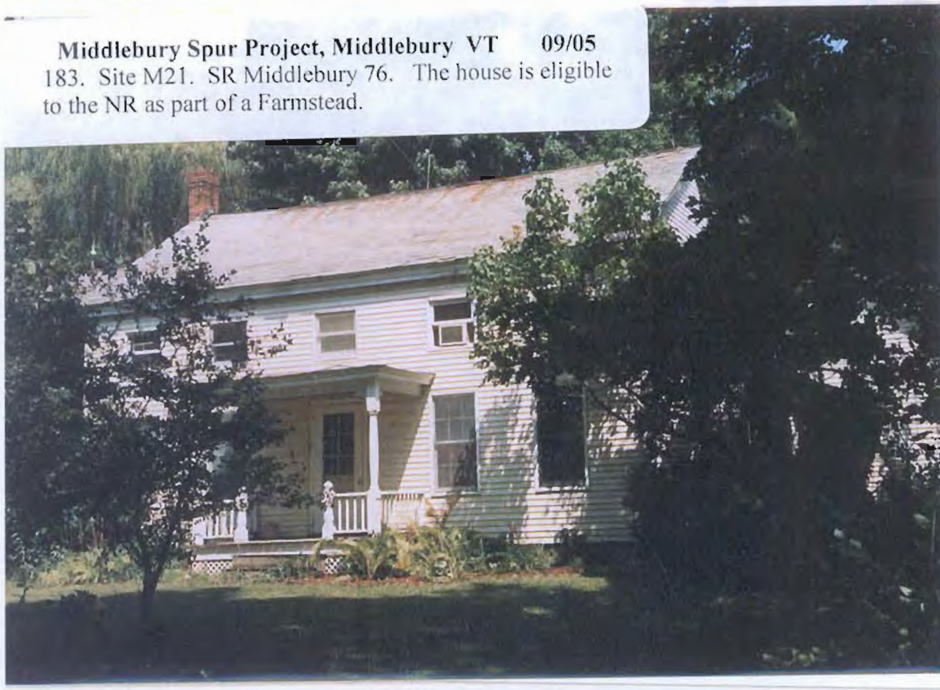


Middlebury Spur Project, Middlebury VT 09/05
179. Site M19. SR Middlebury 77. The associated early barn is eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
180. Site M19. SR Middlebury 77. The associated early barn is eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
181. Site M20. The early house is not listed on the SR but appears to be eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
182. Site M20. The early house is not listed on the SR but appears to be eligible to the NR.

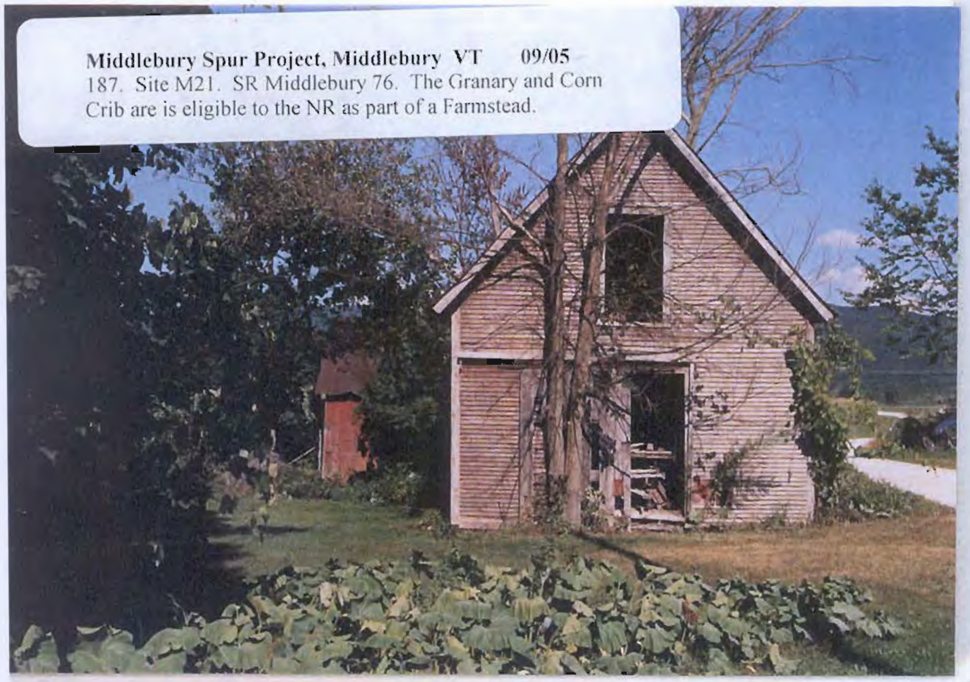


Middlebury Spur Project, Middlebury VT 09/05
183. Site M21. SR Middlebury 76. The house is eligible to the NR as part of a Farmstead.

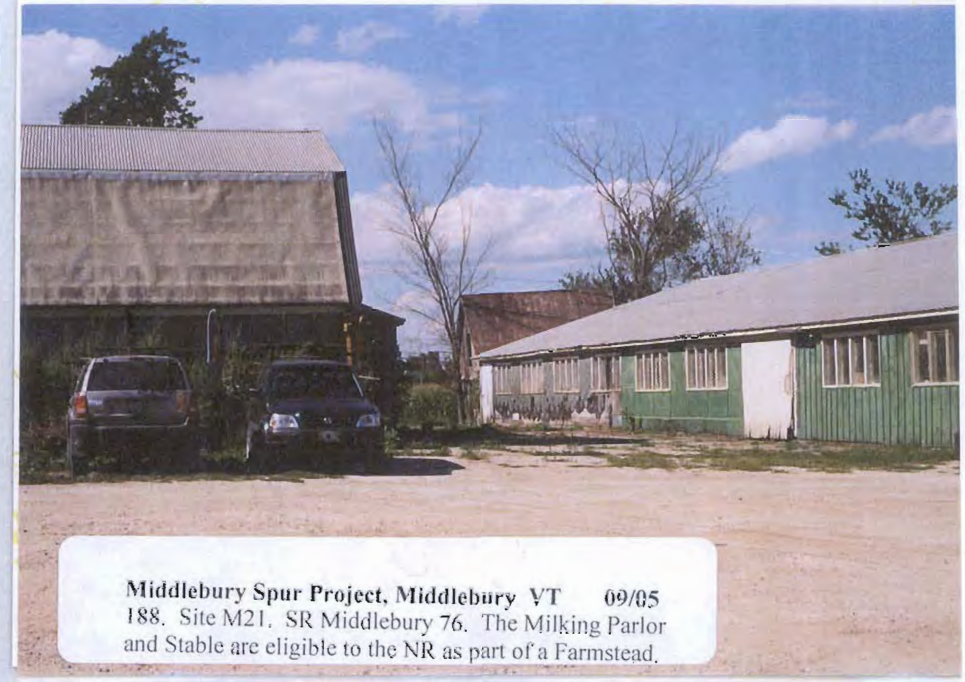
Middlebury Spur Project, Middlebury VT 09/05
184. Site M21. SR Middlebury 76. The house is eligible to the NR as part of a Farmstead

Middlebury Spur Project, Middlebury VT 09/05
185. Site M21. SR Middlebury 76. The house is eligible to the NR as part of a Farmstead.

Middlebury Spur Project, Middlebury VT 09/05
186. Site M21. SR Middlebury 76. The Bull Barn is eligible to the NR as part of a Farmstead.



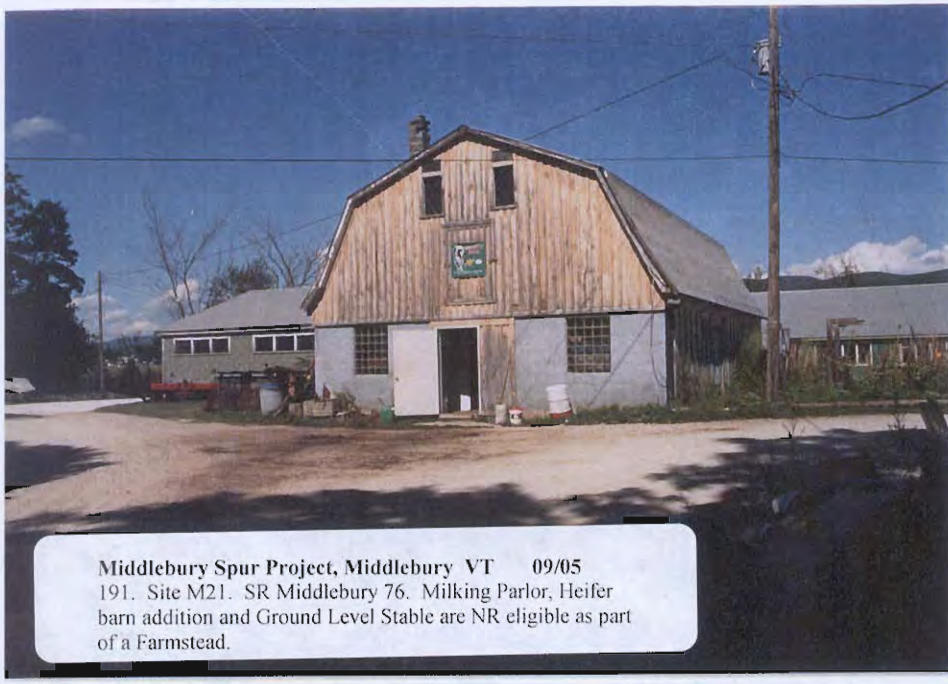
Middlebury Spur Project, Middlebury VT 09/05
187. Site M21. SR Middlebury 76. The Granary and Corn Crib are is eligible to the NR as part of a Farmstead.



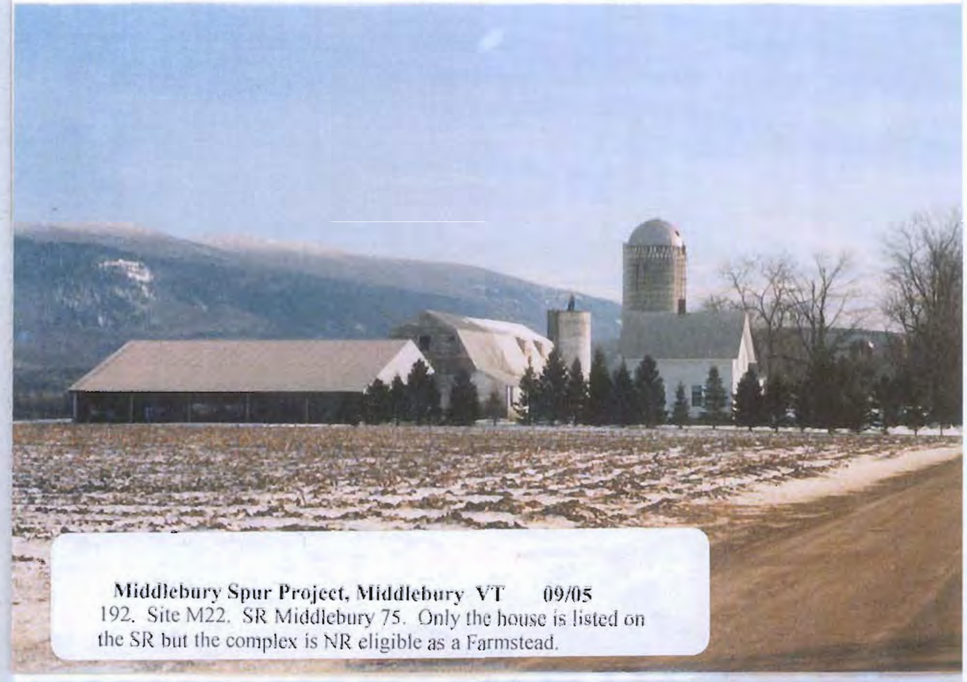
Middlebury Spur Project, Middlebury VT 09/05
188. Site M21. SR Middlebury 76. The Milking Parlor and Stable are eligible to the NR as part of a Farmstead.

Middlebury Spur Project, Middlebury VT 09/05
189. Site M21. SR Middlebury 76. The house is eligible to the NR as part of a Farmstead.

Middlebury Spur Project, Middlebury VT 09/05
190. Site M21. SR Middlebury 76. Ground Level Stable, Milking Parlor and Heifer Barn are NR eligible as part of a Farmstead.



Middlebury Spur Project, Middlebury VT 09/05
191. Site M21. SR Middlebury 76. Milking Parlor, Heifer barn addition and Ground Level Stable are NR eligible as part of a Farmstead.

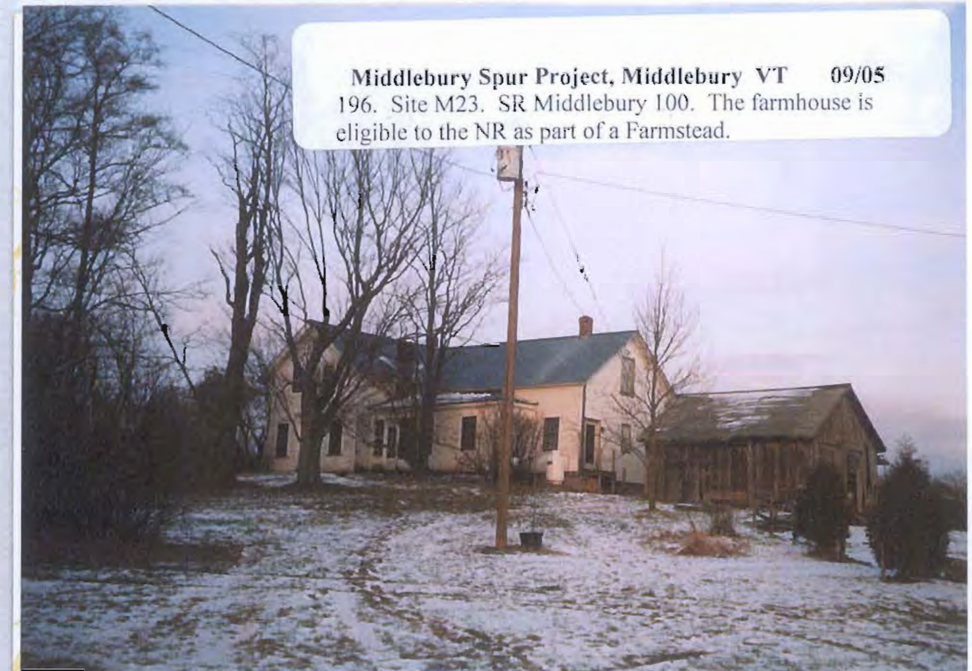


Middlebury Spur Project, Middlebury VT 09/05
192. Site M22. SR Middlebury 75. Only the house is listed on the SR but the complex is NR eligible as a Farmstead.

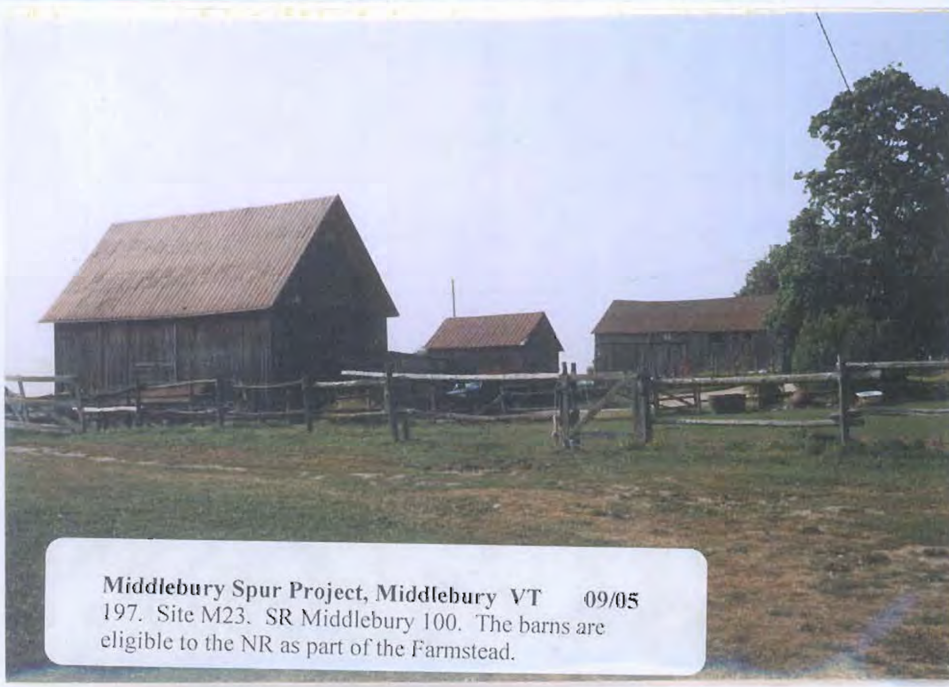
Middlebury Spur Project, Middlebury VT 09/05
193. Site M23. SR Middlebury 75. House appears marginally eligible to the NR as part of a Farmstead.

Middlebury Spur Project, Middlebury VT 09/05
194. Site M22. SR Middlebury 75. Barn is NR eligible a past of a Farmstead.

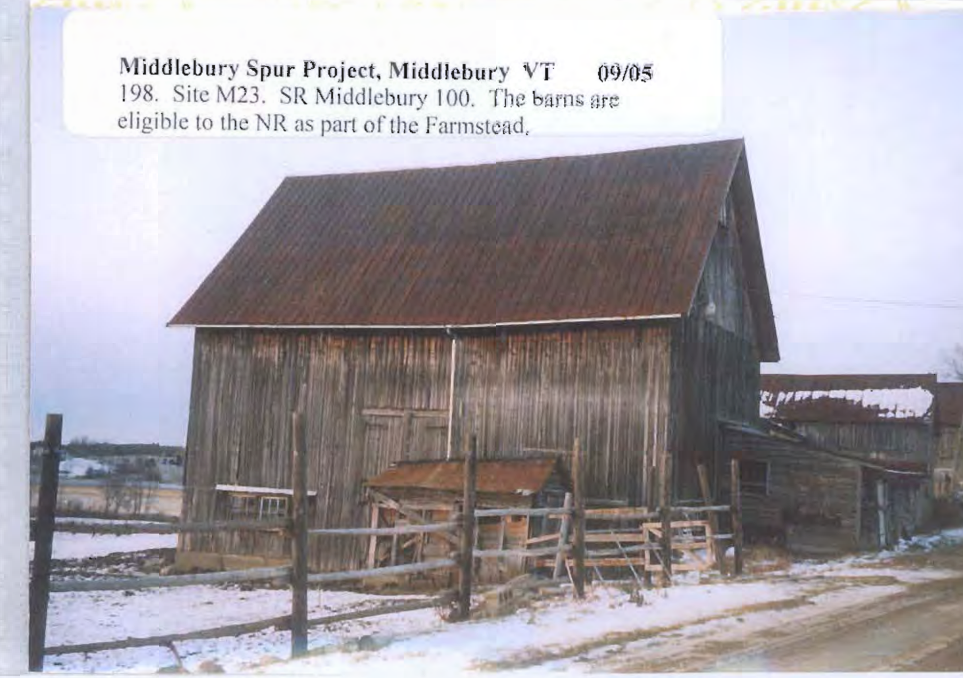
Middlebury Spur Project, Middlebury VT 09/05
195. Site M23. SR Middlebury 100. The farm complex is eligible to the NR as a Farmstead.



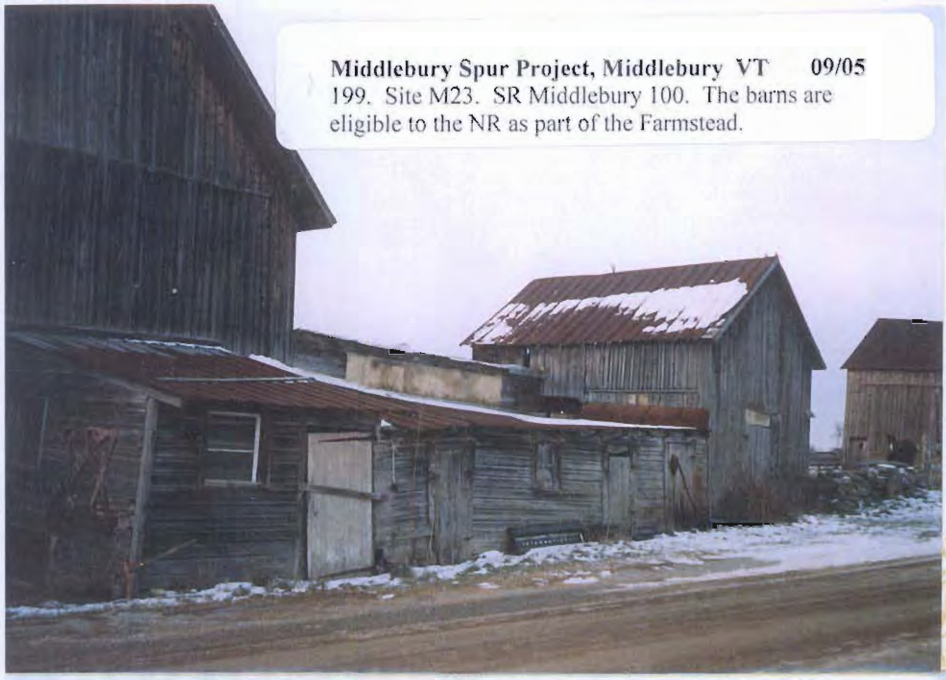
Middlebury Spur Project, Middlebury VT 09/05
196. Site M23. SR Middlebury 100. The farmhouse is eligible to the NR as part of a Farmstead.



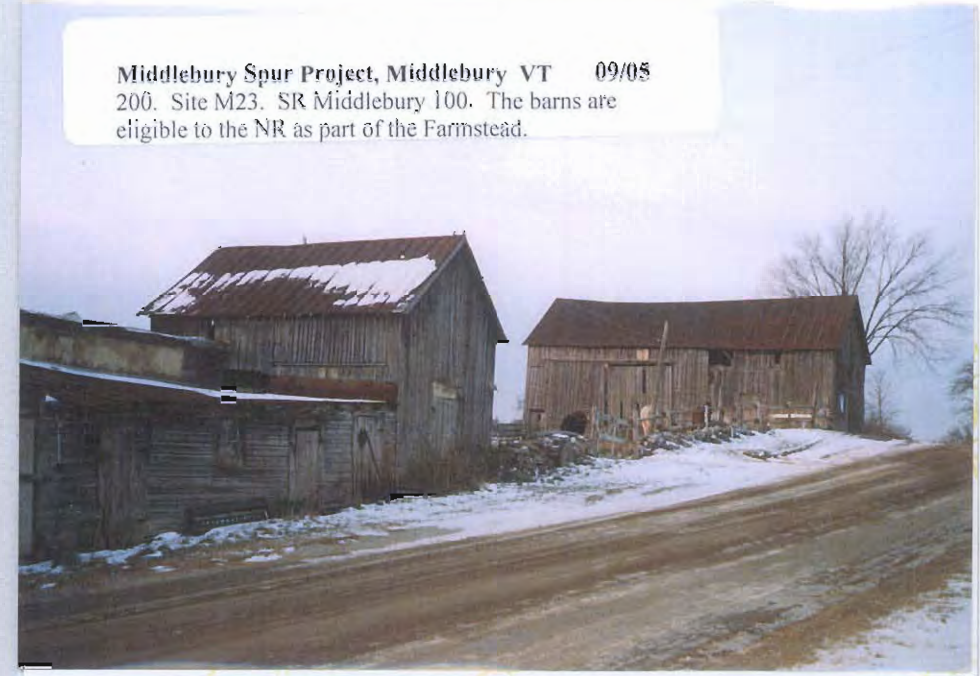
Middlebury Spur Project, Middlebury VT 09/05
197. Site M23. SR Middlebury 100. The barns are eligible to the NR as part of the Farmstead.



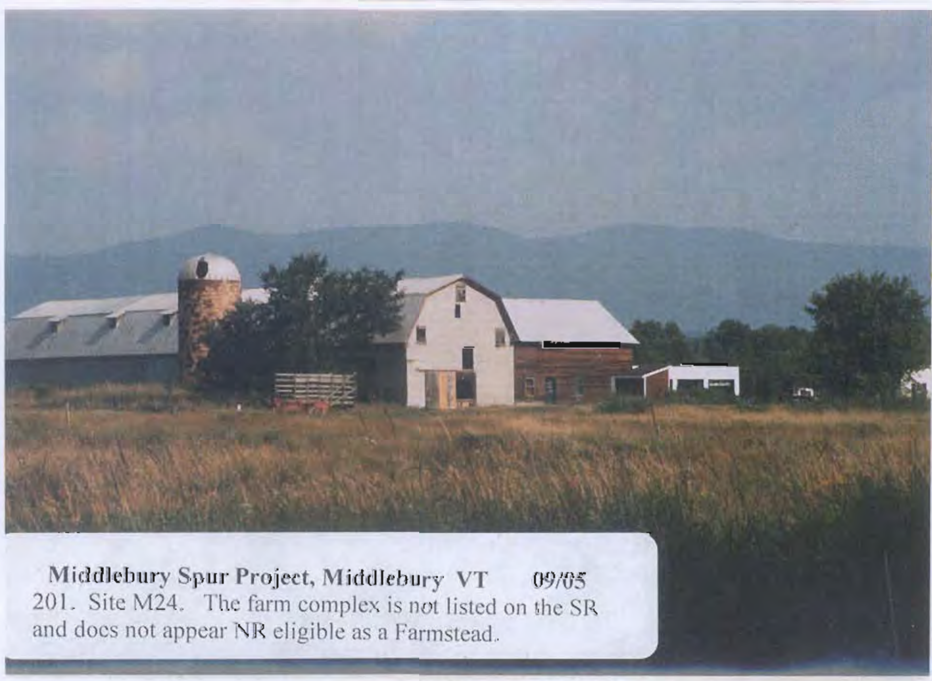
Middlebury Spur Project, Middlebury VT 09/05
198. Site M23. SR Middlebury 100. The barns are eligible to the NR as part of the Farmstead.



Middlebury Spur Project, Middlebury VT 09/05
199. Site M23. SR Middlebury 100. The barns are eligible to the NR as part of the Farmstead.

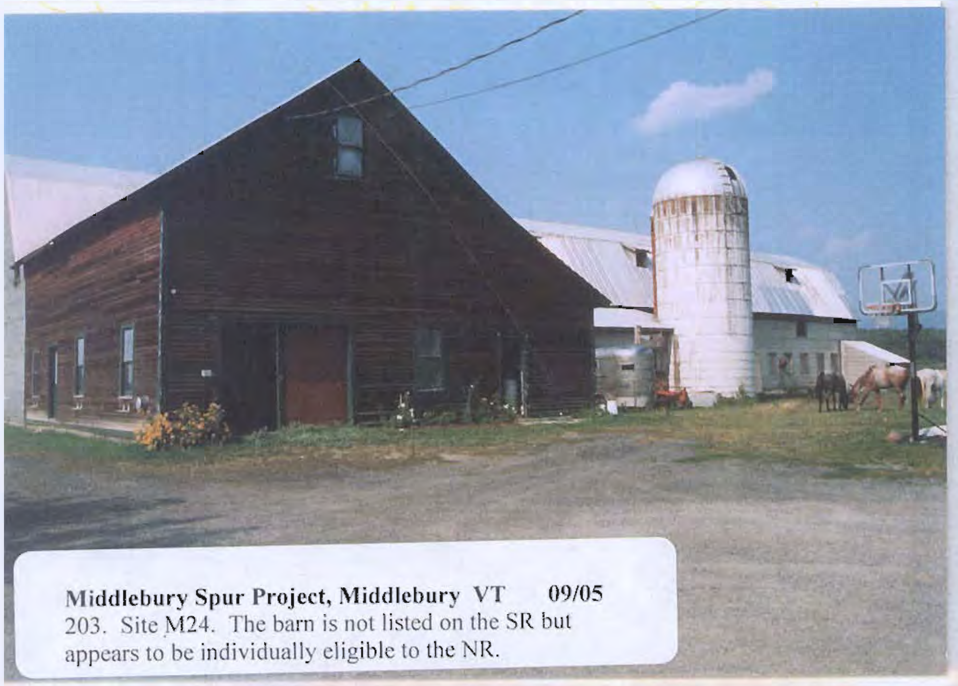


Middlebury Spur Project, Middlebury VT 09/05
200. Site M23. SR Middlebury 100. The barns are eligible to the NR as part of the Farmstead.



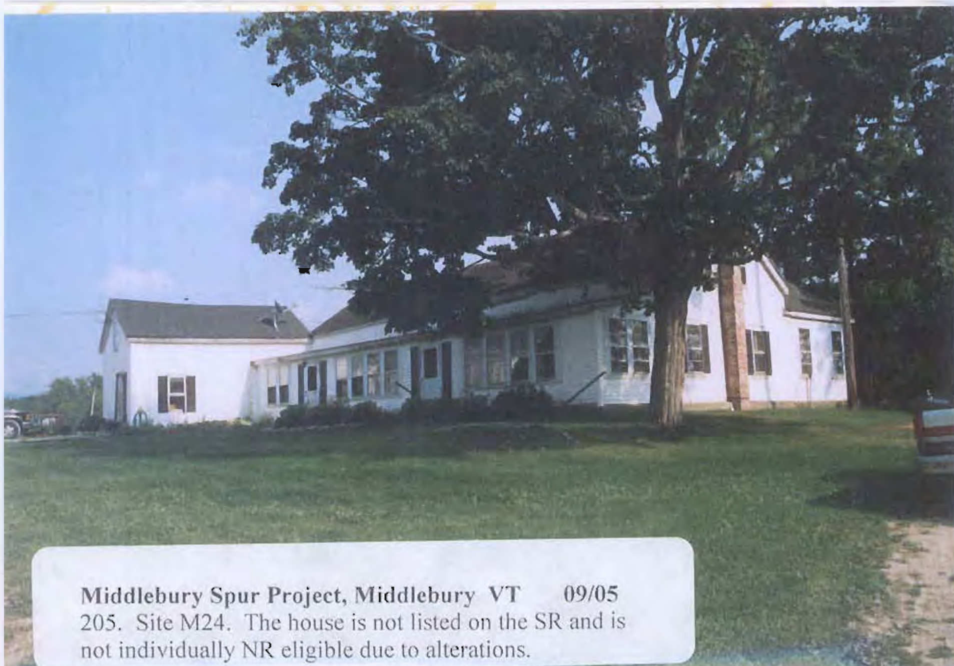
Middlebury Spur Project, Middlebury VT 09/05
201. Site M24. The farm complex is not listed on the SR and does not appear NR eligible as a Farmstead.

Middlebury Spur Project, Middlebury VT 09/05
202. Site M24. The farmhouse is not listed on the SR and is not individually NR eligible due to alterations.

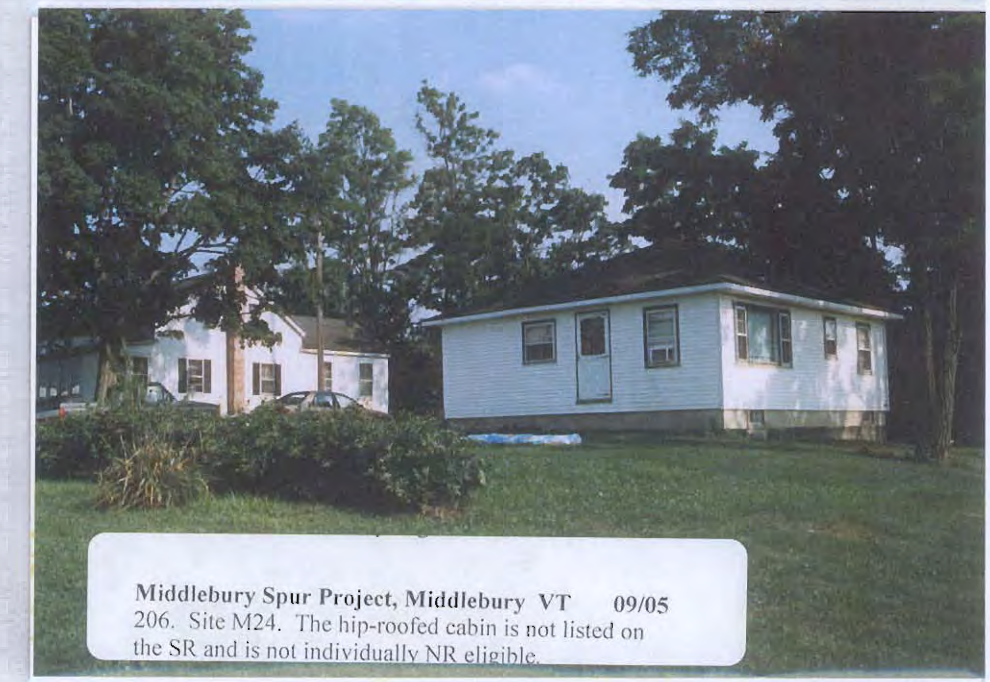


Middlebury Spur Project, Middlebury VT 09/05
203. Site M24. The barn is not listed on the SR but appears to be individually eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
204. Site M24. The machine shed is not listed on the SR and is not individually eligible to the NR.

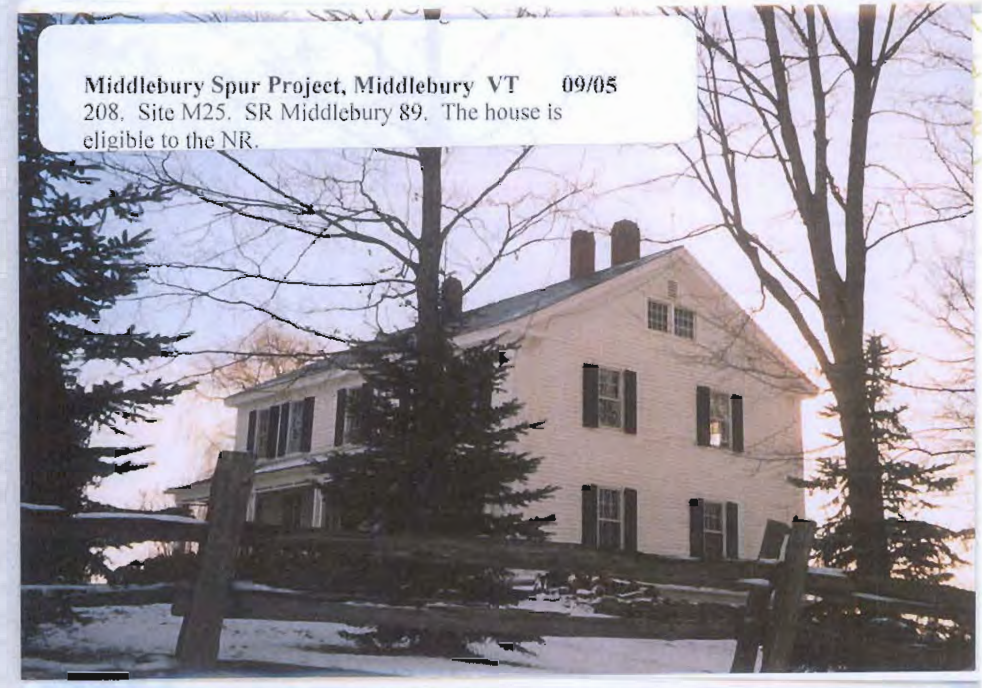


Middlebury Spur Project, Middlebury VT 09/05
205. Site M24. The house is not listed on the SR and is not individually NR eligible due to alterations.



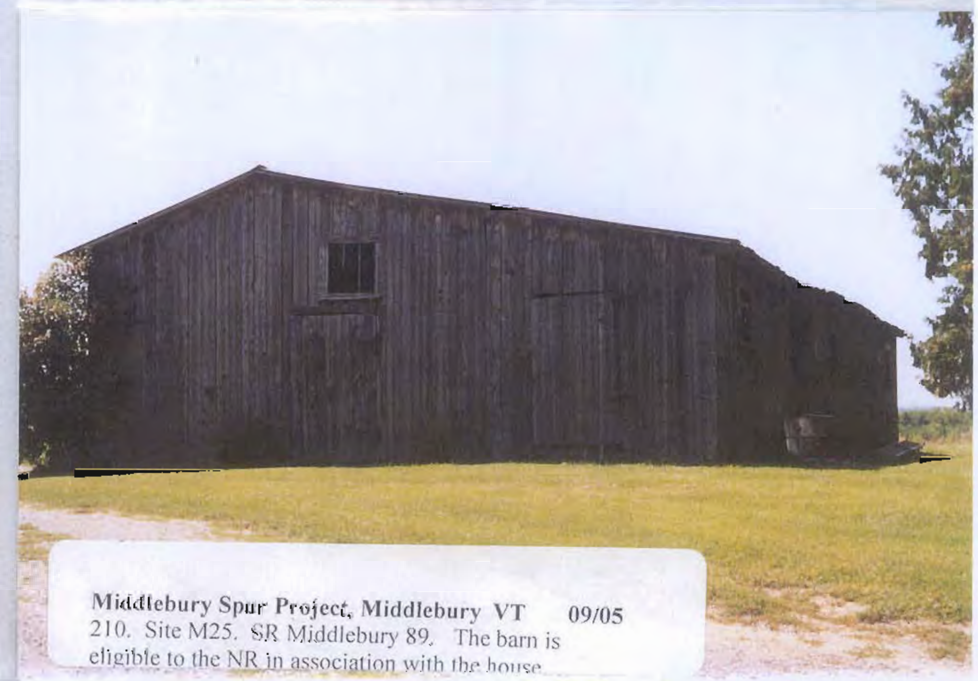
Middlebury Spur Project, Middlebury VT 09/05
206. Site M24. The hip-roofed cabin is not listed on the SR and is not individually NR eligible.

Middlebury Spur Project, Middlebury VT 09/05
207. Site M25. SR Middlebury 89. The house is eligible to the NR.



Middlebury Spur Project, Middlebury VT 09/05
208. Site M25. SR Middlebury 89. The house is eligible to the NR.

Middlebury Spur Project, Middlebury VT 09/05
209. Site M25. SR Middlebury 89. The barn is eligible to the NR in association with the house.

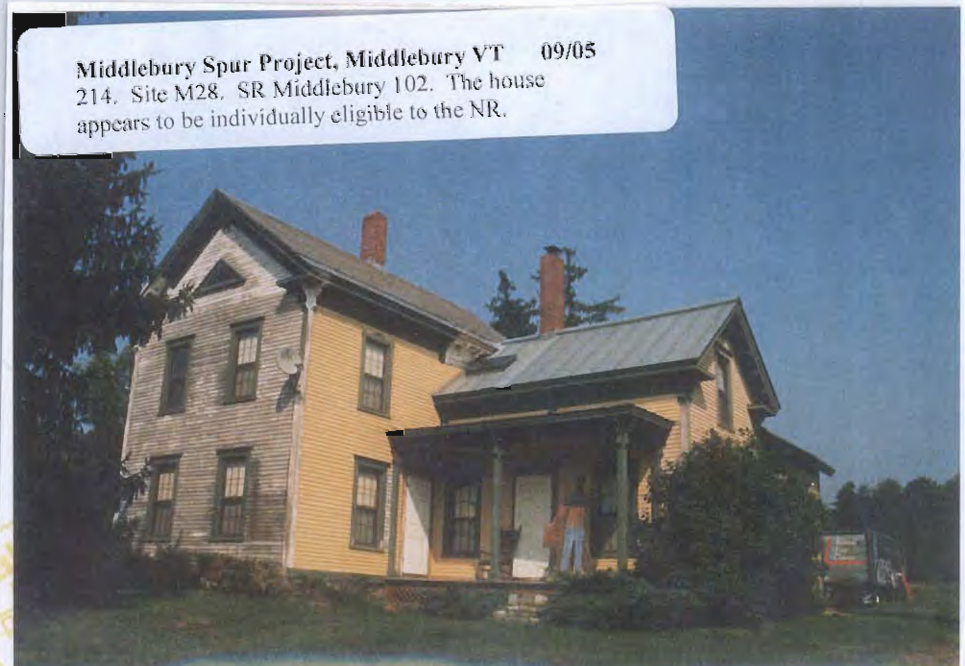


Middlebury Spur Project, Middlebury VT 09/05
210. Site M25. SR Middlebury 89. The barn is eligible to the NR in association with the house.

Middlebury Spur Project, Middlebury VT 09/05
211. Site M26. The house is not listed on the SR and is not eligible to the NR due to alterations.

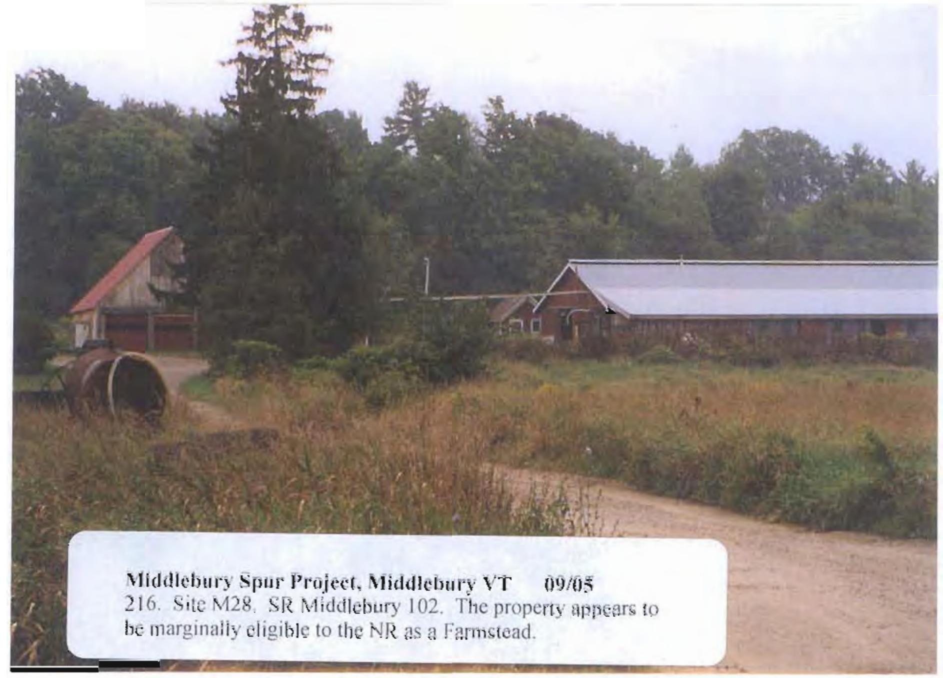
Middlebury Spur Project, Middlebury VT 09/05
212. Site M27. The house is not listed on the SR and is not eligible to the NR due to alterations.

Middlebury Spur Project, Middlebury VT 09/05
213. Site M27. The house is not listed on the SR and is not eligible to the NR due to alterations.

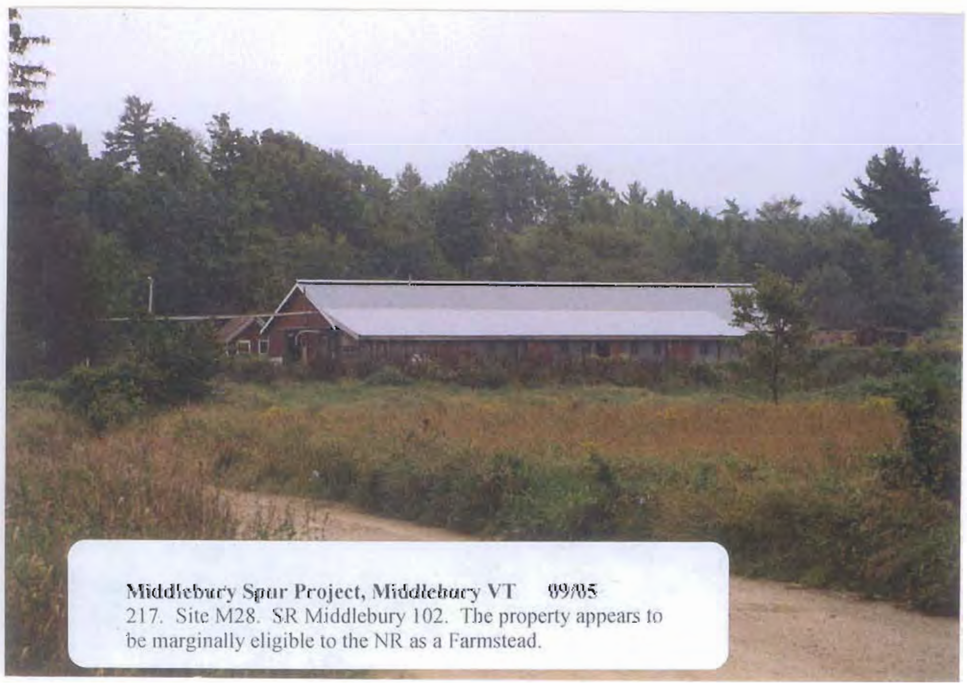


Middlebury Spur Project, Middlebury VT 09/05
214. Site M28. SR Middlebury 102. The house appears to be individually eligible to the NR.

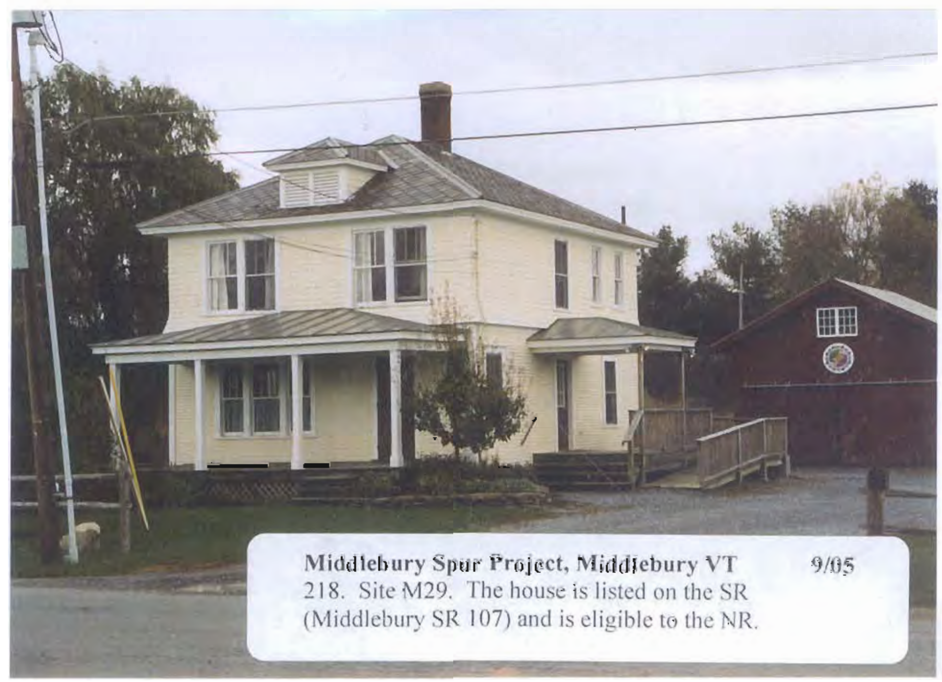
Middlebury Spur Project, Middlebury VT 09/05
215. Site M28. SR Middlebury 102. The house appears to be individually eligible to the NR.



Middlebury Spur Project, Middlebury VT 09/05
216. Site M28. SR Middlebury 102. The property appears to be marginally eligible to the NR as a Farmstead.



Middlebury Spur Project, Middlebury VT 09/05
217. Site M28. SR Middlebury 102. The property appears to be marginally eligible to the NR as a Farmstead.



Middlebury Spur Project, Middlebury VT 9/05
218. Site M29. The house is listed on the SR (Middlebury SR 107) and is eligible to the NR.

January 25, 2006

Scott Newman
Vermont Agency of Transportation
Technical Services Division
National Life Building
Montpelier, Vermont 05602-0501

Re: Middlebury Spur Project
Reasonable Range of Alternatives
Historic Resource Identification
Opinion of Potential Impacts

Dear Mr. Newman,

This Historic Resource Identification Report will assist the Vermont Agency of Transportation (VTrans) and the Federal Highway Administration (FHWA) with compliance under Section 106 of the National Historic Preservation Act. Project review has been conducted according to the standards set forth in 36 C.F.R., regulations established by the Advisory Council on Historic Preservation to implement Section 106. A Historic Resources Identification Report for the project was prepared on November 29, 2005.

This report offers an opinion of potential impacts on historic resources identified in the project's Area of Potential Effect (APE). The Area of Potential Effect is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" [36CFR Part 800.16(d)]. A final clearance letter for Section 106 will be drafted by VTrans upon completion of an archaeological investigation.

The report will assist the towns of Pittsford, Brandon, Leicester, Salisbury and Middlebury, the FHWA and VTrans with compliance with Section 106 of the National Preservation Act of 1966 and its amendments, Section 4(f) of the Department of Transportation Act of 1966, and 22 V.S.A. Chapter 14, the Vermont Historic Preservation Act of 1975.

The report has been prepared for McFarland-Johnson, Inc, Concord, New Hampshire. The archaeological survey will be conducted by the UVM Consulting Archaeology Program.

NO-BUILD ALTERNATIVE

The truck transport of marble will continue on town roads in Pittsford and along US7. The construction of a northbound acceleration lane on US 7 immediately north of Kendall Hill Road in Pittsford was included in the LEDPA document but is no longer part of the Middlebury Spur Project. It may be reconsidered later in the design phase.

As part of the scoping phase of the EIS for the project, the study area for the project was expanded. The historic resource survey for the No-Build Alternative was conducted from the entrance to the Omya, Inc. processing plant in Florence to the Omya quarry in Middlebury along both sides of the following roads:

- Florence: Fire Hill Road, West Creek Road from approximately ¼ mile south of the railroad trestle to Kendall Hill Road, Kendall Hill Road to US 7
- Towns of Pittsford, Brandon, Leicester and Salisbury: US 7
- Town of Middlebury:
    - US 7 to the intersection of South Middle Road and Foote Street,
    - Foote Street from US 7 to the intersection of Foote Street and Lower Foote Street,
    - Lower Foote Street from Foote Street to Cady Road,
    - Cady Road from Lower Foote Street to US 7

The surveyed structures are discussed in the Historic Resource Identification Report for the project, dated November 11, 2005.

Sixty-two buildings and structures that are listed on or that appear to be individually eligible for listing on the National Register of Historic Places (NR) were identified in the No-Build Alternative's APE. Most of the buildings and structures are located along the No-Build corridor, immediately adjacent to and are accessed from US 7 and local roads in Florence.

The No-Build Alternative passes through Brandon Village, which is listed on the National Register as an historic district. One hundred and two of the 245 contributing structures in the historic district are located along US 7/Main Street.

The No-Build Alternative must be considered as having No Effect because no work is planned. There will be no alteration to the characteristics of the historic properties that make them eligible for listing on the National Register. The existing conditions will not change.

The Middlebury Spur Project was initiated in part because of concerns about the impact of the heavy truck traffic in the US 7 corridor and in the village centers through which it passes. The Omya trucks are a significant part of the truck traffic, passing by any spot along the route at least every five minutes during the hours of operation. Along rural stretches of the highway, trucks traveling at the posted speed limits pass very close to a number of 19th century buildings. The impacts of high-speed truck traffic on the rural portions of US 7 have not been studied but it is clear that dust and exhaust have some effect on these structures. The heavy truck traffic also affects the quality of the natural and human rural environment.

Brandon Village, the largest of the villages along the section of US 7 used by the Omya trucks, is made up of a dense concentration of 19th and 20th century historic buildings, many of which are constructed of brick. Residents and town officials have long expressed concern about any impacts that may be caused by the frequent truck traffic that winds through the community. These concerns include noise, vibration, dust and acids. Heavy traffic may also impact the economy of the village as it could discourage tourism. The impacts of heavy traffic on the quality of the human environment, both social and physical, may be more difficult to assess.

The US 7 traffic also passes through Leicester Four Corners, a small rural community that grew up around two major north/south and east/west roads. Three buildings that are individually listed on the National Register of Historic Places are located around the four corners. The buildings are representative of religious, civic and social activities that were the mainstay of 19th century life in Vermont. The setting and feeling of Leicester Four Corners is certainly impacted by the heavy volume of traffic on US 7. It is unknown if the physical health of the buildings is being affected. The truck traffic also affects the small hamlet of Florence. The trucks appear to be larger than the tiny houses in the village that were built as worker housing associated with the turn-of-the-century Rutland-Florence Marble Company. Although the trucks move slowly, the frequency and scale of the truck traffic seems contradictory to the setting and feeling of the village.

The impacts of noise and vibration to the No-Build Alternative, the RS-1 Alternative, and the TR-1 Alternative are reported elsewhere in this document.

RAIL SPUR RS-1 ALTERNATIVE

The RS-1 Alternative would provide a rail connection from the mainline rail on the west side of Otter Creek to the Omya Quarry in Middlebury, east of US 7. A transload facility would be constructed near the quarry to allow other users of the rail spur to load and unload materials.

The historic resource survey for the RS-1 Alternative was conducted along both sides of the following roads:

- South Street Extension from the height of land west of Otter Creek to approximately 0.5 mile south of the proposed mainline/rail spur junction.
- Creek Road from US 7 south to approximately 0.5 mile south of the proposed RS-1/TR-1 spur crossing.
- Halladay Road, approximately 0.3 mile north and south of the intersection with South Middle Road.
- US 7 from Cady Road to the intersection of South Middle Road and Foote Street.
- Foote Street from US 7 to the intersection of Foote Street and Lower Foote Street.
- Lower Foote Street from Foote Street to Cady Road.
- Cady Road from Lower Foote Street to US 7.

The RS-1 Alternative rail spur would be constructed with a 1% maximum grade as it climbs from the mainline to the Omya quarry 3.17 miles away. Therefore, substantial excavation and placement of fill would be required to provide the required grade along the length of the alignment. . The spur would be carried over Otter Creek, the flood plain and Creek Road on an elevated trestle to ensure the flow of the creek. The spur would also pass under US 7. Alternative RS-1 would begin at the existing rail line on the west side of Otter Creek. The spur would branch off the mainline on an elevated trestle that would head northeasterly over Otter Creek and Creek Road, and then easterly to its termination in a field currently under cultivation. The trestle would be approximately 2400’ long and would be supported on concrete piers that would occur every 30’ to 40’. The piers would carry a 4’ to 5’ deep concrete superstructure on which the track would be laid. The elevation of the trestle would vary along its length. The bottom of the superstructure would be 14’ above the level of the road when it crosses Creek Road. The trestle would be elevated 2’ to 3’ above grade at its eastern end. The trestle portion of the RS-1 Alternative is the same as the trestle portion of the TR-1 Alternative.

The rail spur would be carried on an earthen embankment from the eastern end of the trestle to just east of Halladay Road. The embankment would vary in height, width and grade along its length, with a 2:1 slope. The height of the embankment has been generally established from its western end to approximately station 58+50. The spur would be constructed with a 0% grade along this section. The embankment would be as high as 20’and as wide as 40’ at its base (Figures A and B).

Three options are being studied for the crossing of Halladay Road. The height of the embankment from station 58+50 to station 109+75 (US 7 underpass) is different for each option because each option would require a specific elevation at the crossing. The first option is the construction of a railroad bridge over Halladay Road (Grade Separated Over Halladay Road) (Figure B-1). The bottom of the bridge would be 18’ above the road. In order to gain the required elevation above the road at a maximum grade of 1%, the rail spur would begin to climb at station 58+50. The elevation of the land west of the Halladay Road is significantly lower than the road. Therefore in order to cross the road on a bridge, the embankment would be nearly 40’ high and 80’ wide at its base approximately 1000’ west of the road. Immediately west of the road, the embankment would be 20’ high. Immediately east of the railroad bridge, the embankment would be 25’ tall, but would diminish in height rather quickly, because the land to the east is higher in elevation. Approximately 500’ east of Halladay Road, the spur would briefly be at-grade before it enters a cut. The spur would remain in the cut until east of Lower Foote Street.

The second option for Halladay Road is an at-grade crossing (Figure B-2) (At-Grade with Halladay Road). For this option, the spur would continue east on a 0% grade past station 58+50 to approximately station 74+30, where it would begin to climb with a 1.33% grade. At this grade, it would be necessary to raise the level of Halladay Road approximately 5’ so that the road and spur would be at the same elevation. The embankment west of the at-grade crossing would be 15’ to 18’ tall at its tallest. The spur would cut through a small knob between stations 87+00 and 90+00 and re-emerge on an 8’ high embankment immediately west of the crossing. The embankment would be 15’ tall immediately east of the road. The at-grade option would enter the cut approximately 300’ east of Halladay Road.

Option three, the relocation of Halladay Road (Halladay Road Relocation), would eliminate the intersection of the road and the rail spur (Figure B-3). Halladay Road would be cut off on the north side of the alignment opposite the barn associated with Site M25. The road would be cut off approximately 35’ south of the spur. A new road would be constructed to connect Halladay Road on the south side of the rail spur with US 7. The new road would generally be parallel to the spur and would intersect US 7 south of the new highway bridge over the rail spur. The centerline of the new road would be 10’ from the top of the rail spur cut. This option was added to the project after the Historic Resource Identification Report was prepared, but the proposed road does not change the Area of Potential Effect or the number of historic resources that may be affected by the project.

With the Halladay Road crossing eliminated the elevated spur would be able to continue on a level grade to station 71+00 where it would begin to climb at the optimum 1% grade towards the cut under US 7. One thousand feet west of the road location, the embankment would be over 20’ tall and 40’ wide at its base. Like the at-grade option, the spur would cut through the small knob west of Halladay Road and re-emerge on a 12’ to 18’ high embankment that would will carry it over the former location of the road before entering the main cut near station 96+00.

East of Halladay Road the spur would enter into a cut that would continue to station 143+50 east of Lower Foote Street, passing under US 7 at a depth of 28’. The cut would be 25’ deep at Lower Foote Street. Like the embankment that would elevate the spur, the cut would vary in width and depth, depending on topography and soil composition. The sides of the spur cut would typically have a 2:1 slope. The cut would widen as it deepens.

Two options are being studied for the treatment of the cut at Lower Foote Street. The first option would cut off Lower Foote Street (Figure C-1). The road would be cut off immediately south of the Omya access road north of the alignment. The road would be cut off approximately 20’ south of the cut.

The second option is the construction of a bridge on Lower Foote Street. Due to the required depth of the cut at this location, the elevation of Lower Foote Street would be raised several feet. The road grade would be changed, beginning approximately 45' north of the alignment, for a distance of about 100'.

Six hundred feet east of Lower Foote Street, the alignment of the spur would require that a section of the existing Omya access road to be relocated. The loop in the road would be straightened. The realigned section of access road would be north of its current location, and therefore closer to Site M21.

The spur would emerge from the cut at approximately station 144+00 and continue on grade to station 146+50. From that point the spur would be elevated on an approximately 8' to 10' embankment till it ends in the quarry.

A new transload facility would be built immediately adjacent to the north side of the spur between stations 154+00 and 161+00 on land owned by the adjoining property owner, Foster Brothers, Inc. The 60' x 18' transload area would be accessed from a short road off the Omya access road and would facilitate the use of the spur by other users. The facility would include turnout tracks, storage of up to five rail cars, and an office for rail workers and a facility to store and maintain locomotives. The transload facility would probably not be visible from Lower Foote Street but may be illuminated at night. The amount of noise and similar indirect impacts generated by the transload facility are unknown and are being studied as part of the EIS for the project. The ore from the Omya quarry would be loaded onto the trains in the quarry at the end of the spur

Currently, one to two roundtrip trains per day would be anticipated for the RS-1 Alternative. The access road east of Lower Foote Street would be retained. The access road west of Lower Foote Street would be eliminated. The amount of traffic on Lower Foote Street may increase, as other users of the rail spur would travel over it, and the access road, to arrive at the transload facility.

Historic Resources

South Street Extension

1. Site M23. No Adverse Effect

The farm complex on South Street Extension is listed on the Vermont State Register (Middlebury SR#100) and appears eligible for listing on the National Register as a Farmstead. The buildings that comprise the complex appear to date from the second half of the 19^{th} and early 20^{th} centuries so it is likely that the existing mainline rail pre-dated the farm in its current configuration.

The property is located on the west side of Otter Creek, immediately west of the mainline rail. Pastureland that is associated with the property lies between the building complex and the mainline track. The west bank of Otter Creek is elevated above the stream and the open farmland along the east bank, so that the east and southeast views from the property beyond the mainline are expansive. The proposed spur would branch away from the mainline towards the northeast approximately 600' south of the farm. The trestle and much of the embankment would be visible from the property. The RS-1 Alternative would not alter the physical characteristics of the individual buildings or of the complex that make it eligible for listing on the NR, but may affect the Farmstead's integrity of setting and feeling. The construction of the elevated concrete railroad trestle and tall earthen embankment would alter the physical environment of the historic property because the modern materials, calculated shape of the alignment, and artificial embankment would appear out of context with the agricultural lands they would pass through. Similarly the historic feeling, or the property's ability to express the sense of its period of significance, would also be altered. The mainline has probably always been part of the environment of the farm. The trestle would move away from the property as it drops down to meet the embankment. The property is elevated above the spur so that the view of the alignment would flatten as it proceeds east through the fields towards Halladay Road. Therefore, it appears the RS-1 Alternative would have No Adverse Effect on the historic farm.

Creek Road

2. M28. No Adverse Effect
The farm complex is located on Creek Road, approximately 0.7 miles north of the RS-1 alignment. The farm is sited low on the land, just above the floodplain. The trestle and a portion of the embankment would be visible from the property. The spur would not alter the physical characteristics of the farm but may affect the integrity of the property's setting and feeling because it would introduce modern materials and artificial shapes into its agricultural environment. Site visits suggest that the perceived scale and massing of the spur from the farm would be diminished by the property's siting, its distance from the alignment, and the undulations of the fields between the two. Therefore is appears the RS-1 Alternative would have No Adverse Effect on the farm.

Halladay Road

3. M25. Potential Adverse Effect
The c.1800 Federal style house, c.1925 shed-roofed barn and outhouse are listed on the State Register (Middlebury SR#89) and appear to be eligible for listing on the National Register. The early house features a Gothic Revival style front porch as well as most historic materials including slate roof and sash windows. The house sits at an elevation of approximately 410', 500' north of the rail alignment. The front elevation faces Halladay Road and South Middle Road with views to the east across scrubby fields to US 7. The land to the south of the property drops away into a small gully and open fields. The gully broadens to the southwest with additional views of fields and forested areas. The fields on the east side of Creek Road and the gable peak of a barn on South Street Extension (M23) can be seen to the west behind the house. Due to its siting, much of the rail spur would be visible from the house, from the fields east of Otter Creek to US 7. The barn is located only 250' north of the spur alignment, at an elevation of 405'. Just south of the barn, Halladay Road follows the contour of the land and drop down into the gully. The elevation of Halladay Road at its low point in the gully is approximately 380', or 30' below the elevation of the house. The embankment would intersect Halladay Road at its low point. The size of the embankment in the vicinity of Halladay Road would vary with each of the three crossing options.

Each of the three options for crossing Halladay Road has the potential to impact site M25. The house is sited so that it would look out over and down on a significant portion of the elevated alignment, so the potential impact of the RS-1 Alternative on the resource, regardless of which option is selected for the Halladay Road crossing, is significant. The potential impacts of the alternative and the crossing options are increased by the fact that the house is only 500' away from the alignment.

The Grade Separated over Halladay Road option has the greatest potential to impact the property because the option requires the tallest and widest embankment. The grade separated option would be carried on an embankment that would begin to climb 3,300' west of the crossing. One thousand feet west of Halladay Road the embankment would be nearly 40' tall and 80' wide at its base. The embankment would be 25' tall at Halladay Road, or 5' below the elevation of the historic house. At an elevation of 400' to 405', the option would alter and/or eliminate views from the house, and would also impact views of the property from US 7, Halladay Road, South Middle Road and adjoining properties.

The At-Grade with Halladay Road option would result in the lowest embankment. The existing grade of Halladay Road would need to be elevated approximately 5' so that the road and the spur would be at the same elevation. The embankment west of the at-grade crossing would be 15' to 18' tall at its tallest. The embankment would be 8' tall on the west side of the crossing and 13' tall on the east side.

The Halladay Road Relocation option would eliminate the crossing from the design and would therefore allow the rail spur to be constructed on a shallower grade. The required embankment would be approximately 5' taller than the at-grade embankment along its length.

The At-Grade with Halladay Road and the Halladay Road Relocation options would be at elevations of 390' and 395' respectively at the intersection, and although lower than the Grade Separated over Halladay Road option, would also impact the views from and views of the house and barn. The proposed alignment for the relocated section of Halladay Road lies within the APE of the spur project and appears to have no adverse effect on historic properties.

The RS-1 Alternative would not directly alter the physical characteristics of the buildings that appear to make them eligible for listing on the National Register. The RS-1 Alternative could indirectly alter the historic characteristics of the resources that appear to make them eligible for listing on the NR because the introduction of the embankment could diminish the integrity of the property's setting, or its physical environment, and the integrity of its feeling, or its ability to convey its historic character. .

Railroads carried on constructed earthen embankments and rail underpasses are part of Vermont's historic landscape. The setting and feeling of the landscape associated with M25, through which the RS-1 Alternative would pass, has been altered repeatedly over time but to date the natural landscape and the manmade features within it remain human in scale. No one feature dominates the landscape. Unlike photo simulations that are static or fixed in place, human experience of a landscape is active. Similarly, the RS-1 embankment would not be a structure isolated in a specific location but would have a perceivably unending presence in the landscape in which it would be constructed. The embankment would be in the view shed from M25 from US 7 in the southeast, through the fields to the south and southwest, and to the west nearly to Otter Creek. The RS-1 alignment as it passes south of M25 would also be visible from US 7, Halladay Road, and South Middle Road.

The At-Grade with Halladay Road and the Relocation of Halladay Road options would impact the integrity of the historic property's setting and feeling because each would introduce a landscape feature that would pass through the views from and of the property. The RS-1 embankment would be constructed as a 2:1 slope along its length, resulting in a monolithic, repetitive form. Photo simulations and site visits suggest that the size of the embankments required for the At-Grade with Halladay Road and the Relocation of Halladay Road options would alter but would not eliminate the middle distance views to the south and southwest from the house. The repetitive form of the shorter embankments would not dominate the visual experience of the resource or of its environment because of their limited heights. Therefore is appears that the At-Grade with Halladay Road option and the Relocation of Halladay Road option would have no adverse effect on the resource because they would not significantly diminish the property's integrity of setting and feeling.

Photo simulations and site visits indicate that the size of the embankment required by the Grade Separated over Halladay Road option would eliminate the existing middle distance view from M25 to the south and southwest. Those views would instead be filled by a manmade feature that would be much greater in scale than other features in the landscape. Similarly, the large embankment would also impact views of the resource. The huge scale and monolithic, repetitive form of the embankment would physically dominate the environment through which it would pass, thus diminishing the historic integrity of the setting of M25. The embankment would also be visually incompatible with the existing natural and manmade environment of the property, and would diminish the integrity of the feeling or historic character of the property. Therefore the Grade Separated over Halladay Road option appears to have an Adverse Effect on Site M25.

US 7

The rail spur would be contained in a cut in the vicinity of US 7. The spur would enter the cut just east of Halladay Road, pass under US 7 and Lower Foote Street and emerge from the cut as it approaches the quarry. The cut must be 28' deep under US 7 to allow for adequate clearance. A new highway bridge with 10' shoulders will be constructed to carry US 7 over the cut. The cut will be approximately 60' wide from station 100+00 east of Halladay Road to station 134+00 east of Lower Foote Street, a distance of 3400' feet. Therefore, in the vicinity of US 7, the greatest visual impact of the RS-1 alternative would be the deep, artificial cut in the landscape, rather than the rail spur in the bottom of the cut. Vantage point and elevation would determine if the track could be seen.

4. M15. No Adverse Effect

The c.1850 house on the west side of US 7 is approximately 800' north of the existing Omya access road and the proposed spur when it would pass under the highway. The house is listed on the State Register (Middlebury SR#84) and appears to be eligible for listing on the National Register. The c.1930/1950 Ground Level Stable barn was not included in the SR listing but is now over 50 years old and is also considered NR eligible as a very good example of the type. The property is the first north of the alignment but the historic context of the house and barn has been impacted by development along US 7, widening of the road and increased traffic. The land immediately south and west of the buildings, the path of the proposed rail spur, remains as open fields. The RS-1 alignment would not alter the physical characteristics of the buildings. Construction of the spur would eliminate the frequent stopping, turning, and accelerating of the marble trucks at the Omya access road just south of the property. The embankment west of Halladay Road and all the Halladay Road crossing options will be visible from the property but at a distance. Site visits suggest that the rail spur in the bottom of the cut would be visible from the property, but the alignment is located far enough away from the buildings that it would not significantly further diminish the integrity of the setting. Therefore, it appears the RS-1 Alternative would have No Adverse Effect on the property.

5. M16. No Adverse Effect

The c.1830 house and associated carriage barn on the west side of US 7 are listed on the State Register (Middlebury SR# 85) and although the front elevation of the house has been altered, the property appears marginally eligible to the National Register. The buildings are located approximately 1000' north of the spur alignment. The house is located very close to the edge of the highway. The alternative would not alter the physical characteristics of the buildings. The integrity of the early house's historic setting and feeling has long been diminished by the development along US 7, widening of the road and increased traffic. Although there is open land to the rear and southwest of the house and barn, any view of the embankment at the Halladay Road crossing would probably be impeded by the slight rise in the land west of South Middle

Road. Site visits suggest that views of the spur at the bottom of the cut from the property would be limited. Therefore it appears the RS-1 Alternative would have No Adverse Effect on the property.

6. M18. No Adverse Effect
The former District # 3 school is located on US 7 approximately 1400’ north of the proposed spur alignment and the new highway bridge. The rail spur would enter the cut east of Halladay Road and re-emerge above ground east of Lower Foote Street.   Portions of the cut would be visible from the school but it is unlikely that the rail spur in the bottom of the cut would be visible. It is also unlikely that the above-grade spur in the vicinity of Halladay Road would be visible from the school building. The RS-1 Alternative would not alter the physical characteristics of the school building. The integrity of the 19th century rural district school’s physical environment has been diminished by development and increased traffic along US 7. The construction of the spur would not diminish the integrity of the building’s location, design, workmanship, feeling and association and therefore, it appears there would be No Adverse Effect.

Foote and Lower Foote Street
Lower Foote Street is generally a north/south-oriented road that branches off from US 7 south of Middlebury, intersects with Cady Road and travels north to Foote Street. Four of the seven properties on Lower Foote Street between Cady Road and Foote Street appear eligible for listing on the NR. The land along this section of the street is open and much of it remains in agricultural use. Some of the earliest settlement in Middlebury occurred around the intersection of Foote Street and Lower Foote Street. The house that Daniel Foote built in 1784 is located on Foote Street, just outside the project’s APE. Although non-historic buildings have been constructed in and around the vicinity of the intersection, its historic evolution remains legible. Lower Foote Street may have received its name because it led to the Foote property on Foote Street. Lower Foote Street is shown on both the 1871 Beers’ Atlas of Addison County and the 1857 Walling Map. It is referenced repeatedly in various deeds throughout the 19th century. Several of those deeds refer to a parcel of land “next to and on the east side of the highway leading from the home place of F.A. Foote to the home place of G.C. Cady” (Middlebury Land Records, Vol.3, Page 31,1890).

The cut for the spur would be 25’deep at Lower Foote Street. Two options are proposed for vehicular traffic at the crossing. One option is to cut off Lower Foote Street just south of   the existing quarry access road and 30’ south of the alignment.   The second option is to construct a bridge to carry the road over the cut. Due to the depth of the cut, the bridge would be constructed so that it would elevate the level of the road several feet. As elsewhere along the length of the cut, vantage point and elevation would determine if the track at the bottom of the cut would be visible.

Omya trucks do not use Lower Foote Street, traveling instead from the quarry to US 7 on the access road. Construction of the rail spur would eliminate the Omya trucks from the vicinity of Lower Foote Street, but other users of the spur would use Lower Foote Street to access the quarry road and the transload facility. The amount of additional truck traffic on Lower Foote Street is unknown, but it is assumed that it would be no more than a few per day, significantly less than the current Omya truck traffic on the access road.

7. M19. No Adverse Effect
The c.1800 house, early gable-front barn and mid-19th century carriage barn are located on the east side of Foote Street, immediately south of the Lower Foote Street Y-intersection. The property is located approximately 2600’ north of the cut under Lower Foote Street and is

therefore at the outside edge of the Area of Potential Effect. The RS-1 Alternative would not alter the physical characteristics that make the complex appear eligible for listing on the National Register. Additionally, the property's integrity of location, design and workmanship would not be altered. Although the integrity of the property's setting, or its physical environment, may be diminished by the introduction of a deep, wide, artificial landscape feature, the buildings are located a sufficient distance from the alignment so that it appears the RS-1 Alternative would have No Adverse Effect. A significant increase in traffic on Lower Foote Street would have the potential to further diminish the integrity of the property's historic setting.

8. M20. No Adverse Effect
The c.1800 Cape Cod style house on the east side of Lower Foote Street just south of Foote Street is reportedly older than the house (M19) across the road. It is not listed on the State Register but despite a few non-historic alterations appears to be eligible for listing on the NR. It is located approximately 2500' north of the RS-1 alignment, at the outside edge of the APE. The RS-1 Alternative would not alter the physical characteristics of the building. The impact of the cut would not significantly diminish its historic integrity due to the distance between the house and the alignment, although a significant increase in truck traffic on Lower Foote Street may impact the property. Therefore, it appears the RS-1 Alternative would have No Adverse Effect.

9. M21. No Adverse Effect
The farm complex on the east side of Lower Foote Street is listed on the State Register (Middlebury SR#76) and appears to be eligible for listing on the NR as a Farmstead. The property includes a mid-19th century farmhouse, granary, corncrib, small late 19th century utilitarian barn, and a Ground Level Stable barn built in 1956. The Milking Parlor barn with calf stable wing that was constructed c.1960 will soon be 50 years old and contributes to the story of the farm's evolution. The layout of the farm complex is also significant. The oldest buildings are located at the northern end of the complex. Each generation of new buildings was added further south along Lower Foote Street, so that the evolution of the Farmstead is very clear.

The newest buildings include several modern structures that are associated with the current owner's, Foster Brothers, Inc., compost production business. The commercial composting operation is agricultural in nature and is a very good re-use for an historic farm, although the size and number of the large piles of material being composted, and the large machinery needed to move the compost have impacted the setting and feeling of the property to some degree. The acreage of the property has increased substantially since its period of significance (1866 – 1939).

Deed research has been conducted to determine the historic boundaries of the Farmstead that is now part of the larger Foster Brothers property. In 1866 Eli E. Elmer sold three parcels of land totaling 150 acres to Charles P. Austin. The Estate of Charles P. Austin sold "said farm containing 150 acres, lying next to and on the east side of the highway" to Gardener C. Cady in 1890. The farm changed ownership four more times, but remained intact until 1939, when it was incorporated into a larger property. The 150-acre parcel is generally an east/west-oriented rectangle bounded on the west by Lower Foote Street and a short section of Foote Street, and extending east at least 2800'. The RS-1 Alternative would pass through the rear (east) quarter of the historic farmstead from approximately station 142+50 to station 162+00. This portion of the RS-1 alignment includes an embankment as high as 10' and the transload facility.

East of Lower Foote Street the existing Omya access road passes through the Foster Bothers property on land presumably leased to Omya. The access road is currently a private road, as only Omya or its contractors use it. The access road intersects with Lower Foote Street approximately 700' south of the historic buildings. The road heads generally east for approximately 800' before turning left and traveling north for 2000’ to the quarry. The northern-oriented section of the access road bisects the land historically associated with the Farmstead. Existing farm roads allow Foster Brothers’ agricultural equipment to cross the access road to reach fields under cultivation east and south of the road.

A portion of the RS-1 Alternative would be constructed on land owned by Foster Brothers, including land historically associated with the Farmstead. The spur would pass under Lower Foote Street approximately 900’ south of the historic buildings, traveling east for approximately 2000’, at which point it would turn north for a distance of 3800’, to its terminus in the quarry.

The spur would pass under Lower Foote Street in a 25’ deep cut, gradually coming up to grade at station 144+00. The spur will remain at grade for approximately 300’as it begins its turn to the north. From station 147+00 to its terminus in the quarry, the rail spur would be elevated on an embankment of up to 10’ tall.

The transload facility would be constructed on the west side of the spur, between stations 155+00 and 160+00, on land historically associated with the Farmstead. The facility would include turnout tracks, storage of up to five rail cars, and an office for rail workers and a facility to store and maintain locomotives. The transload facility would probably not be visible from Lower Foote Street but may be illuminated at night. The amount of noise and other indirect impacts generated by the transload facility are unknown and are being studied as part of the EIS for the project

The RS-1 rail spur and transload facility would be used by the public. Therefore, the land associated with the alignment and the transload area would have to be obtained by the State of Vermont. A farm crossing for Foster Brothers may be retained along the at-grade section of the rail spur. It is also possible that the cut and embankment would create a barrier that would require Foster Brothers to travel around the spur and the quarry to access their property east and south of the alignment. Foster Brothers may consider using the rail spur. Use of the spur would allow the company to expand its market geographically because it would be more cost effective for it to ship further away.

The RS-1 Alternative would not alter the physical characteristics of the historic buildings but it would physically alter the land historically associated with the Farmstead. Land that is historically associated with a Farmstead is considered to be a contributing element of the resource. The proposed cut and embankment would amount to physical damage to the land. Physical damage to any characteristic of a historic property that qualifies the property for listing on the National Register in a manner that diminishes the property’s historic integrity may be considered an adverse effect.

The RS-1 Alternative would alter the integrity of the farm’s setting and feeling because, despite the introduction of non-historic buildings and structures, the area surrounding the complex of historic buildings remains generally in agricultural use. The contemporary agricultural buildings at the south end of the complex are larger in scale but their recognizable function is in keeping with the intended function of the historic buildings. The Farmstead’s setting, or physical environment has evolved over time but the historic character of the building complex has been retained. Similarly, the property retains sufficient physical features, including the land, that taken together, convey the property’s historic character.

The construction of a deep, wide cut and a 10’ tall, 2000’ long earthen embankment across the open land would appear as a unnatural, incompatible landscape feature so their introduction would diminish the integrity of the property’s setting and feeling.

The integrity of the historic land has previously been diminished to some degree by the construction of the existing quarry road. Although the quarry road does not physically alter the land, it does bisect the historic parcel. The RS-1 Alternative would occur in the rear quarter of the parcel a significant distance from the group of historic buildings. The land west of the alignment, between the spur and the buildings, is slightly higher in elevation, and so would probably block the view of the spur and transload from Lower Foote Street and the farm building. Therefore, because of the cumulative affect of the existing quarry road that bisects the historic parcel, the location of the RS-1 Alternative at a significant distance from the historic buildings, and the fact that the portion of the alternative that occurs on the land associated with the Farmstead would not be visible from the farm buildings, it appears the RS-1 Alternative would have No Adverse Effect.

10. M22. No Adverse Effect
The State Register listing for the property (Middlebury SR# 75) does not include the Ground Level Stable barn but it has also gained sufficient age to be considered historic.
The farm is located on the east side of Lower Foote Street approximately 1200’ south of the proposed alternative. The flat field between the farm and the access road is under cultivation. The current use of the access road impacts the setting of the farm to some extent, due to the frequency and nature of the truck traffic. The alternative would not alter the physical characteristics of the property. Although the deep cut would be an unnatural feature in the landscape, site visits suggest that the distance between the cut and the building complex would be sufficiently far so that the integrity of the property’s setting would not be significantly diminished. The amount of truck traffic on the access road adjacent to the property would be reduced because the Omya trucks would be eliminated. Other users would access the new transload facility via Lower Foote Street and the Omya road, thus increasing the amount of traffic on Lower Foote Street. Cumulatively, it appears the TR-1 Alternative would have No Adverse Effect.

RS-1 Summary

Grade Separated over Halladay Road option

RS-1 Alternative may have an adverse effect on one historic property, site M 25; the house, associated barn and outhouse on Halladay Road. The Grade Separation over Halladay Road option appears to have an adverse effect on the historic resource because the size, scale and form of the embankment required for the option would dominate the landscape and would therefore significantly diminish the integrity of the property’s setting and feeling. The At-Grade over Halladay Road and the Halladay Road Relocation options are somewhat lower in elevation, so that the integrity of the property’s setting and feeling would be diminished to a much lesser degree. Therefore the At-Grade with Halladay Road and the Relocation of Halladay Road options appear to have no adverse effect on site M25.

RS-1 Mitigation

<u>Screening</u>
Some sort of screening is typically recommended as mitigation for the introduction of visual elements that are out of character with historic resources. The Grade Separated over Halladay Road option appears to have an adverse effect on site M25 in part because it would eliminate a significant portion of the view from the property. Screening could reduce the severity of the view of the embankment from the historic house but is not recommended as mitigation because it would only further isolate the property from its environment. The owners may support the concept of screening.

<u>Plantings</u>
The Grade Separated over Halladay Road option appears to have an adverse effect on site M25 in part because the size, scale and monolithic form of the embankment would introduce a incompatible element into the property's environment. Limited, irregular plantings of wild flowers and native shrubs that occur naturally in open fields on the embankment slopes, in the vicinity of Halladay Road, may help to mitigate the adverse effect because they would add texture, relief and color to the otherwise repetitive surface of the slopes.

<u>Local Input</u>
It may be difficult to mitigate or to reduce the severity of the adverse effect on site M25 caused by the Grade Separated over Halladay Road option due to the huge size and scale of the continuous embankment. The local historical society and/or preservation organization may be able to offer suggestions for activities that could compensate for the adverse effect.

TRUCK TO RAIL TR-1 ALTERNATIVE

The TR-1 Alternative includes the construction of a short new rail spur from the mainline rail on the west side of Otter Creek to a field on the east side of the creek. A transload facility would be constructed at the east end of the rail spur. A new truck road would connect the transload facility and the quarry. Other potential users would be able to use the short rail spur, transload facility and new truck road. The truck road would probably be paved.

The alignment of the TR-1 Alternative generally follows the alignment of the RS-1 Alternative. The Area of Potential Effect for the two build alternatives is the same.

Alternative TR-1 would begin at the existing rail line on the west side of Otter Creek. The spur would branch off the mainline on an elevated trestle that heads northeasterly over Otter Creek and Creek Road, and then easterly to its termination in a field currently under cultivation. The trestle portion of the TR-1 Alternative is the same as the trestle portion of the RS-1 Alternative. The structure would be approximately 2400' long and would be supported on concrete piers that would occur every 30' to 40'. The piers would carry a 4' to 5' deep concrete superstructure on which the track would be laid. The elevation of the trestle would vary along its length. When it crosses Creek Road, the bottom of the superstructure would be 14' above the level of the road. The trestle would be elevated 2' to 3' above grade at its eastern end.

A generally rectangular, 450' x 2,700' transload facility would be constructed at the east end of the trestle. The area would be re-graded, filled and leveled as needed so that the finish grade would be approximately 5' above the existing grade. The track from the spur would extend into the transload area approximately 2600' and would include several rail turnouts. The tracks would be elevated on an embankment to maintain the required rail grade. The top of the embankment would be approximately 10’ above the level of the transload facility. The perimeter of the facility would be encircled by the truck road. The truck road would exit the transload facility at its southeast corner and head southeasterly towards Halladay Road, generally following the alignment of the RS-1 Alternative. The truck road would be generally constructed on-grade to Halladay Road.

Significant activity is anticipated at the TR-1 transload facility. Currently the Omya trucks make 85 round trips per day on US 7 from the quarry to the Florence processing plant. It can be assumed that at least that many truck trips would be made daily to the transload facility. The large trucks would dump the marble into piles and return to the quarry. Loaders would load the marble from the piles into rail cars. It is also assumed that two 20-car trains per day would carry marble to the processing plant. Containers belonging to other users of the spur could also be stored at the transload. The containers might not be moved onto a train and out of the transload as quickly as the Omya marble.

The transload facility would include facilities for workers. Omya personnel would work at the facility all day. Rail personnel would work most of the day. The transload facility would also include a storage building for maintenance of the engines.

The transload facility would probably include lighting and would probably be enclosed with chain link fence. The facility would be noisy and dusty, but the extent of noise and dust are unknown and are being studied as part of the EIS for the project.

Two options are being studied for the Halladay Road crossing. The first option is the construction of a bridge that would carry the truck road over Halladay Road (Grade Separated over Halladay Road). The bridge would be 20’ above the level of Halladay Road, so the truck road would be constructed on an earthen embankment from station 848+00 to approximately station 857+00, or approximately 900’. The embankment would be just over 25’ high at station 850+50 and almost 19’ high at the road. East of the bridge, the truck road would continue to climb on a low angle to grade and soon enter a cut at station 857+50. Construction of the bridge over Halladay road would require all others users to access the truck road at the Lower Foote Street intersection.

The second option is an at-grade intersection at Halladay Road (At-Grade with Halladay Road). East of intersection the truck road would enter the cut that would take it under US 7 to connect with the existing quarry access road. The At-Grade with Halladay Road option would permit other users to access the truck road from Halladay Road as well as from Lower Foote Street.

The cut east of Halladay Road would take the truck road under US 7 opposite the existing Omya quarry access road. A highway bridge would be constructed to carry US 7 over the 20’ deep cut. The truck road would continue in the cut, following the alignment of the access road, until it comes to grade at 875+00, approximately 100’ east of US 7. The trucks would then continue on the access road, crossing Lower Foote Street at grade, eventually entering the quarry. The cut for the truck road would typically have a 4:1 slope. The slope would be closer to 2:1 where the cut is deeper than 10’.

The amount of traffic on Lower Foote Street would increase to some degree because other users would access the truck road from Lower Foote Street. If a bridge is constructed over Halladay Road, all other users would access the truck road from Lower Foote Street. An at-grade intersection at Halladay Road would provide a second access to the truck road, and possibly removing some of the other users from Lower Foote Street. It is anticipated that no more than several other users per day would use the TR-1 Alternative. Currently, traffic on Lower Foote Street is not required to stop at the Omya road intersection. Trucks using the access road are required to stop before crossing Lower Foote Street. This traffic pattern is not anticipated to change.

Historic Resources

South Street Extension

1. Site M23. No Adverse Effect

The farm complex on South Street Extension is listed on the Vermont State Register (Middlebury SR#100) and appears to be eligible for listing on the National Register as a Farmstead. The buildings that comprise the complex appear to date from the second half of the 19th and early 20th centuries so it is likely that the existing mainline rail pre-dated the farm in its current configuration.

The property is located on the west side of Otter Creek, immediately west of the mainline rail. Pastureland that is associated with the property lies between the buildings and the mainline track. The west bank of Otter Creek is elevated above the stream and the open farmland along the east bank, so that the east and southeast views from the property beyond the mainline are expansive. The TR-1 spur would branch away from the mainline towards the northeast approximately 600' south of the farm. The trestle and much of the transload facility would be visible from the property. The TR-1 Alternative would not alter the physical characteristics of the individual buildings or of the complex that make it eligible for listing on the NR, but may affect the Farmstead's integrity of setting and feeling. The construction of the transload facility would alter the physical environment of the historic property because the large rail yard would appear out of context with the agricultural lands surrounding it. Similarly the historic feeling or the property's ability to express the sense of its period of significance would also be altered. The mainline has probably always been part of the environment of the farm. The trestle would move away from the property as it drops down to the transload area. The property is elevated above the transload so that the view of the facility would be flattened. The two-lane truck road would diminish in size and visual impact as it moves east through the fields. The amount and nature of any anticipated noise, dust and other indirect impacts generated by the transload facility are unknown, but because the facility is some distance from and below the Farmstead, it appears the TR-1 Alternative would have No Adverse Effect on the historic farm.

Creek Road

2. M28. No Adverse Effect

The farm complex is located on Creek Road, approximately 0.7 of a mile north of the TR-1 alignment. The farm is sited low on the land, just above the flood plain. The trestle would be visible from the property. The transload facility and elevated rail line may be visible. The amount and nature of any anticipated noise, dust and other indirect impacts that would be generated by the transload facility are unknown. The TR-1 Alternative would not alter the physical characteristics of the farm but may affect the integrity of the property's setting and feeling because it could introduce significant noise into its environment. Site visits suggest that the perceived scale and massing of the alternative when viewed from the farm would be diminished by the property's low elevation, its distance from the alignment, and the undulations of the fields between the two. Therefore, it appears the TR-1 Alternative would have No Adverse Effect on the farm.

Halladay Road

3. M25. No Adverse Effect

The c.1800 Federal style house and associated c.1925 shed-roofed barn and outhouse are listed on the State Register (Middlebury SR#89) and appear to be eligible for listing on the National Register. The early house features a Gothic Revival style front porch as well as most historic materials including slate roof and sash windows. The house sits at an elevation of approximately 410', 500' north of the truck road alignment. The front elevation faces Halladay Road and South Middle Road with views to the east across scrubby fields to US 7. The land to the south of the property drops away into a small gully and open fields. The gully broadens to the southwest with views of fields and forested areas. The fields on the east side of Creek Road and the gable peak of a barn on South Street Extension (M23) can be seen to the west behind the house. Due to the siting of the house, much of the truck road would be visible from the fields east of Otter Creek until it passes under US 7.The truck road would be built generally at-grade west of Halladay Road. It is possible that the transload facility could be visible from the property. The cut east of Halladay Road would be visible. The at-grade crossing of Halladay Road would not alter the physical characteristics of the property that make it eligible for listing on the National Register. The frequency and speed of the truck traffic on the road could impact the integrity of the property's setting and feeling but would not disqualify it for the NR. Therefore, it appears the TR-1 At-Grade with Halladay Road option would have No Adverse Effect.

The truck bridge over Halladay Road would have a much greater impact on the historic house because the bridge would be elevated on an embankment to carry it over Halladay Road. The embankment would vary in height between 19' and 25'. The elevation of the bridge deck would be 400', or 10' below the level of the house. The elevated bridge would not alter the physical characteristics of the buildings, but it would impact the integrity of the property's setting and feeling. From its higher vantage point the house would look out over and down on the bridge, but this view would be limited to the crossing. Unlike the RS-1 Alternative's continuous embankment, the TR-1 truck bridge and embankment would be approximately 900' long. A structure of this scale is much more compatible with and understandable in this landscape. The frequency and speed of the truck traffic on the road could impact the integrity of the property's setting and feeling but would not disqualify it for listing on the NR. Therefore, it appears the Grade Separated over Halladay Road option would have No Adverse Effect. Noise and vibration studies will be prepared for the options at the Halladay Road crossing and could provide additional information about impacts of the truck bridge on the historic house.

US 7

The truck road would be contained in a cut in the vicinity of US 7. The road would enter the cut just east of Halladay Road and pass under US 7 opposite the existing Omya access road. The new road would emerge from the cut, continue along the existing quarry road, cross Lower Foote Street and enter the quarry. The cut would be 20' deep as it passes under US 7 to allow for adequate clearance. A new highway bridge with 10' shoulders would be constructed to carry US 7 over the cut. The cut would be approximately 40' wide from station 860+00 east of Halladay Road to station 870+00 just east of US 7, or approximately 1000' long. Therefore, in the vicinity of US 7, the greatest visual impact of the TR-1 Alternative would be the deep, artificial cut in the landscape. Vantage point and elevation would determine if the truck road in the bottom of the cut could be seen.

4. M15. No Adverse Effect

The c.1850 house on the west side of US 7 is approximately 800' north of the existing Omya access road and the proposed truck road when it would pass under the highway. The house is listed on the State Register (Middlebury SR#84) and appears to be eligible for listing on the National Register. The c.1930/1950 Ground Level Stable barn was not included in the SR listing but is now over 50 years old and is also considered NR eligible as a very good example of the type. The historic context of the house and barn has been impacted by development along US 7, increased traffic and widening of the road but the land immediately south and west of the buildings, the path of the proposed truck road, remains as open fields. The TR-1 alignment would not alter the physical characteristics of the buildings. Construction of the truck road would eliminate the frequent stopping, turning and accelerating of the ore trucks at the Omya access road just south of the property, but much of that noise would be relocated to the new road adjacent to the buildings. The truck road over Halladay Road option could be visible from the property. The 40' wide, 20' deep cut that would take the truck road under US 7 would be visible from the property. Site visits suggest that the road in the bottom of the cut would also be visible. The impact of the project on the character of the setting, or physical environment of the house and barn would be reduced because the truck road would be below grade when it is adjacent to the property, and because the historic context along US 7 has been previously impacted. Therefore, it appears the TR-1 Alternative would have No Adverse Effect.

5. M16. No Adverse Effect
The c.1830 house and associated carriage barn on the west side of US 7 are listed on the State Register (Middlebury SR# 85) and although the front elevation of the house has been altered, the property appears to be marginally eligible for listing on the National Register. The buildings are located approximately 1000' north of the TR-1 alignment. The house is located very close to the edge of the highway. The alternative would not alter the physical characteristics of the buildings. The integrity of the early house's historic setting and feeling have long been diminished by the development along US 7, increased traffic and widening of the road. Although there is open land to the west and southwest of the house and barn, any view of the Halladay Road crossing may be impeded by the slight rise in the land west of South Middle Road. Site visits suggest that views from the property of the truck road in the bottom of the cut would be limited. Therefore, it appears the TR-1 Alternative would have No Adverse Effect on the property.

6. M18. No Adverse Effect
The former District # 3 school is located on US 7 approximately 1400' north of the proposed spur alignment and the new highway bridge. The truck road would enter the cut east of Halladay Road and will re-emerge above ground 600' east of US 7. Portions of the cut would be visible from the school but it is unlikely that the road in the bottom of the cut would be visible. It is also unlikely that the above-grade truck road in the vicinity of Halladay Road would be visible from the school building. The TR-1 Alternative would not alter the physical characteristics of the school building. The integrity of the 19th century rural district school building's physical environment has been diminished development and increased traffic along US 7. The construction of the new road and cut would not diminish the integrity of the building's location, design, workmanship, feeling and association. Therefore, it appears the TR-1 Alternative would have No Adverse Effect.

Foote Street and Lower Foote Street
Construction associated with the TR-1 Alternative would stop approximately 600' west of Lower Foote Street. From that point the alternative would continue along the existing Omya access road, crossing Lower Foote Street at-grade. Currently, traffic on Lower Foote Street is not required to stop at the intersection of the Omya access road. Trucks using the access road are required to stop before crossing Lower Foote Street. This traffic pattern is not anticipated to change.

It is anticipated that traffic on Lower Foote Street would increase to some degree. Construction of the road cut and the highway bridge over US 7 would eliminate vehicular access into and out of the quarry from the highway. Therefore, all traffic entering and exiting the quarry for purposes other than use of the TR-1 Alterative would use Lower Foote Street.

If a truck bridge is constructed over Halladay Road, all other users of the TR-1 Alternative would access the truck road from Lower Foote Street. An at-grade intersection at Halladay Road would provide a second access to the truck road, thus removing some of the other users from Lower Foote Street. It is anticipated that no more than several other users' trucks per day would use the TR-1 Alternative.

Any significant increase in traffic on Lower Foote Street may impact historic resources.

7. M19. No Adverse Effect
The c.1800 house, early gable-front barn, and mid-19th century carriage barn are located on the east side of Foote Street, immediately south of the Lower Foote Street Y-intersection. The property is located approximately 2600' north of the existing intersection of the Omya access road and Lower Foote Street and is therefore at the outside edge of the Area of Potential Effect. The TR-1 Alternative would not alter the physical characteristics that make the complex appear to be eligible for listing on the National Register. Additionally, the property's integrity of location, design and workmanship would not be altered. The integrity of the property's setting, or its physical environment, would not be significantly diminished because the construction associated with the alternative ends west of Lower Foote Street. Therefore, it appears the TR-1 Alternative would have No Adverse Effect. Any significant increase of traffic on Lower Foote Street may impact the property's historic setting.

8. M20. No Adverse Effect
The c.1800 Cape Cod style house on the east side of Lower Foote Street just south of Foote Street is reportedly older than the house (M19) across the road. It is not listed on the State Register but despite a few non-historic alterations appears to be eligible for listing on the NR. The building is located approximately 2500' north of the TR-1 alignment, at the outside edge of the APE. The TR-1 Alternative would not alter the physical characteristics of the building. Additionally, the property's integrity of location, design and workmanship would not be altered. The integrity of the property's setting would not be significantly diminished because the construction associated with the alternative ends west of Lower Foote Street. Therefore, it appears the TR-1 Alternative would have No Adverse Effect. Any significant increase of traffic on Lower Foote Street may impact the property's historic setting.

9. M21. No Adverse Effect
The farm complex on the east side of Lower Foote Street is listed on the State Register (Middlebury SR#76) and appears to be eligible for listing on the NR as a Farmstead. The property includes a mid-19th century farmhouse, granary, corncrib, small late 19th century utilitarian barn, and a Ground Level Stable barn built in 1956. The Milking Parlor barn with calf stable wing that was constructed c.1960 will soon be 50 years old and contributes to the story of the farm's evolution. The layout of the farm complex is also significant. The oldest buildings are located at the northern end of the complex. Each generation of new buildings was added further south along Lower Foote Street, so that the evolution of the Farmstead is very clear.

The newest buildings include several modern structures that are associated with the current owner's, Foster Brothers, Inc., compost production business. The commercial composting operation is agricultural in nature and is a very good re-use for an historic farm, although the size and number of the large piles of material being composted, and the large machinery needed to move the compost have impacted the setting and feeling of the property to some degree. The acreage of the property has increased substantially since its period of significance (1866 – 1939).

Deed research has been conducted to determine the historic boundaries of the Farmstead that is now part of the larger Foster Brothers property. In 1866 Eli E. Elmer sold three parcels of land totaling 150 acres to Charles P. Austin. The Estate of Charles P. Austin sold “said farm containing 150 acres, lying next to and on the east side of the highway” to Gardener C. Cady in 1890. The farm changed ownership four more times, but remained intact until 1939, when it was incorporated into a larger property. The 150-acre parcel is generally an east/west-oriented rectangle bounded on the west by Lower Foote Street and a short section of Foote Street, and extending east at least 2800’.

East of Lower Foote Street the existing Omya access road passes through the Foster Brothers property, on land presumably leased to Omya. The access road intersects with Lower Foote Street approximately 700’ south of the historic buildings. The road heads generally east for approximately 800’ before turning left and traveling north 2000’ to the quarry. The northern-oriented section of the access road bisects the land historically associated with the Farmstead. Existing farm roads allow Foster Brothers agricultural equipment to cross the access road to reach fields under cultivation east and south of the road.

The access road is currently a private road, as only Omya or its contractors use it.
The TR-1 Alternative would be used by the public so the land associated with the alignment would be obtained by the State of Vermont. Foster Brothers’ equipment would be able to pass over the TR-1 truck road to reach fields under cultivation east and south of the road.

The constructed portion of the TR-1 Alternative would stop 600’ east of US 7 and would not alter the physical characteristics that make the Farmstead appear eligible for listing on the National Register. The access road and heavy truck traffic amount to an existing condition. It can be assumed that the volume of truck traffic on the access road would increase. Other users would access the truck road from Lower Foote Street, thus increasing the traffic on that road as well. The volume and nature of the existing and potential truck traffic would impact the historic setting and feeling of the Farmstead, but would not significantly diminish the property’s eligibility for listing on the National Register. Therefore, it appears the TR-1 Alternative would have No Adverse Effect.

10. M22. No Adverse Effect
The State Register listing for the property (Middlebury SR# 75) does not include the Ground Level Stable barn but it has also gained sufficient age to be considered historic.
The farm is located on the east side of Lower Foote Street approximately 1200’ south of the proposed alternative. The flat field between the farm and the access road is under cultivation. The alternative would not alter the physical characteristics of the property. The current use of the access road impacts the setting of the farm to some extent, due to the frequency and nature of the truck traffic. The potential increase in the amount of traffic on the access road and on Lower Foote Street could further diminish the integrity of the property’s setting. Site visits suggest that the distance between the access road and the complex of buildings is sufficient enough so that the integrity of the property’s setting would not be significantly impacted if the volume of traffic does not increase significantly. Therefore, it appears the RS-1 Alternative would have No Adverse Effect.

TR-1 Summary

The Truck to Rail Alternative would have fewer impacts to historic resources that the RS-1 Alternative because the truck road would be constructed generally at-grade or contained within the cut that would take it under US 7 and Lower Foote Street with one exception. The exception is the impact of the truck bridge over Halladay Road on site M25. Bridge abutments and embankments are common features in historic landscapes. The materials and design of bridges, abutments and approaches have evolved but the basic form remains the same. Although the size and scale of the embankment required to carry the truck road over Halladay Road would be large, it would not alter the characteristics that make the property appears eligible for listing on the National Register. Impacts of noise and vibrations may impact the property.

The TR-1 Alternative would eliminate the Omya truck traffic on US 7 and local roads in Pittsford by relocating the traffic to a new road. The amount of truck traffic will not be reduced. The size of the associated transload facility and the extent of truck and other activity expected at the facility on a daily basis would not impact historic resources. Environmental quality concerns are discussed elsewhere in this document.

Simulated views of the project are included in the EIS document. An over-lay of the historic property boundary of Site M21 as it relates to the alignment of the RS-1 and TR-1 alternatives is attached.

Please let me know if you need other materials. Thank you.

Sincerely,

Mary Jo Llewellyn
Historic Preservation Consultant

cc: Jed Merrow
McFarland-Johnson, Inc.

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 6/19/08	4. Sheet 1 of 2
1. Name of Project **Middlebury Rail Spur**	5. Federal Agency Involved **Federal Highway Administration**	
2. Type of Project **New Rail Line Construction**	6. County and State **Addison, VT**	
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form **Keith Hartline**
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐		4. Acres Irrigated / Average Farm Size
5. Major Crop(s) **corn silage, grass/legume hay**	6. Farmable Land in Government Jurisdiction Acres: **324,401** %	7. Amount of Farmland As Defined in FPPA Acres: **207,836** %
8. Name Of Land Evaluation System Used **County Land Evaluation**	9. Name of Local Site Assessment System **Non Available**	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*		Alternative Corridor For Segment ______			
		Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		32	32	35	
B. Total Acres To Be Converted Indirectly, Or To Receive Services		3	3	6	
C. Total Acres In Corridor		35	35	41	0
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland		1	1	1	
B. Total Acres Statewide And Local Important Farmland		27	27	30	
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0.01	0.01	0.01	
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		24	24	24	
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*		63.03	63.11	63.33	
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area in Nonurban Use	15	15	15	15	
2. Perimeter in Nonurban Use	10	10	10	10	
3. Percent Of Corridor Being Farmed	20	20	20	20	
4. Protection Provided By State And Local Government	20	20	20	20	
5. Size of Present Farm Unit Compared To Average	10	7	7	7	
6. Creation Of Nonfarmable Farmland	25	9	11	15	
7. Availablility Of Farm Support Services	5	5	5	5	
8. On-Farm Investments	20	1	1	1	
9. Effects Of Conversion On Farm Support Services	25	0	0	0	
10. Compatibility With Existing Agricultural Use	10	1	1	1	
TOTAL CORRIDOR ASSESSMENT POINTS	160	88	90	94	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	63.03	63.11	63.33	
Total Corridor Assessment (From Part VI above or a local site assessment)	160	88	90	94	0
TOTAL POINTS *(Total of above 2 lines)*	260	151.03	153.10	157.33	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request 3/16/07 — 4. Sheet 1 of 2
1. Name of Project Middlebury Rail Spur	5. Federal Agency Involved Federal Highway Administration
2. Type of Project New Rail Line Construction	6. County and State Addison, VT
PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS 3/19/07 — 2. Person Completing Form Keith Hartline
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☑ NO ☐	4. Acres Irrigated 4400 — Average Farm Size 236
5. Major Crop(s) corn silage, grass/legume hay — 6. Farmable Land in Government Jurisdiction Acres: 324,401 %	7. Amount of Farmland As Defined in FPPA Acres: 207,836 %
8. Name Of Land Evaluation System Used County land Evaluation — 9. Name of Local Site Assessment System None Available	10. Date Land Evaluation Returned by NRCS 4/17/07

PART III *(To be completed by Federal Agency)*	Maximum Points	Alternative Corridor For Segment TR-1 Corridor A	Corridor B	Corridor C	Corridor D
A. Total Acres To Be Converted Directly		39	40		
B. Total Acres To Be Converted Indirectly, Or To Receive Services		4	3		
C. Total Acres In Corridor		43	43	0	0
PART IV *(To be completed by NRCS) Land Evaluation Information*					
A. Total Acres Prime And Unique Farmland		1	1		
B. Total Acres Statewide And Local Important Farmland		33	34		
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted		0.01	0.01		
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value		24	24		
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*					
PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points	60.58	60.57		
1. Area in Nonurban Use	15	15	15		
2. Perimeter in Nonurban Use	10	10	10		
3. Percent Of Corridor Being Farmed	20	20	20		
4. Protection Provided By State And Local Government	20	20	20		
5. Size of Present Farm Unit Compared To Average	10	7	7		
6. Creation Of Nonfarmable Farmland	25	7	4		
7. Availablility Of Farm Support Services	5	5	5		
8. On-Farm Investments	20	1	1		
9. Effects Of Conversion On Farm Support Services	25	0	0		
10. Compatibility With Existing Agricultural Use	10	1	1		
TOTAL CORRIDOR ASSESSMENT POINTS	160	86	83	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	60.58	60.57		
Total Corridor Assessment (From Part VI above or a local site assessment)	160	86	83	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	146.58	143.57	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: | DATE

NOTE: Complete a form for each segment with more than one Alternate Corridor

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
P.O. Box 568
Montpelier, Vermont 05601

IN REPLY REFER TO:

April 19, 2007

Mr. Neale Lunderville, Secretary
Vermont Agency of Transportation
National Life Building, Drawer 33
Montpelier, Vermont 05633-5001

Attention: Ms. Susan Scribner

Dear Mr. Lunderville:

Subject: Middlebury Spur Draft Environmental Impact Statement
State Project No. ST SPUR(2)
Section 4(f) Determination

The purpose of this letter is to document FHWA's determination concerning the applicability of Section 4(f) to the Build Alternatives being studied as part of the subject Draft Environmental Impact Statement (DEIS).

There are two situations along the proposed alignment that raise some potential for a use under Section 4(f), both of these are associated with the Hathaway property, also referred to in the document as historic resource M25. There is no dispute that the above-ground improvements on the property are eligible for listing on the National Register of Historic Places (NR), and as such are also considered resources under Section 4(f).

The first situation occurs on the portion of the Hathaway property on the east side of Halladay Road. The proposed project would require the acquisition of land from the Hathaway property. However, this acquisition does not amount to a Section 4(f) use under 23 CFR 771.135(p)(1)(i) because we have determined that the land that would be permanently incorporated into the transportation facility is not part of the property that is NR eligible. Specifically, we have determined through consultation between FHWA, the VTrans Historic Preservation Officer, and the consultant's historic preservation specialist that the property is NR eligible as an historic farmhouse but does not retain the integrity to be considered an historic farmstead. As a result the NR eligibility is limited to the above-ground features, and in general does not include the surrounding land. To the extent that some land would need to be included in the eligibility determination to provide continuity between the house and various outbuildings, such land would be on the west side of Halladay Road since all the buildings are located there. No land from the Hathaway property west of Halladay Road is proposed to be incorporated into the project.

The second potential Section 4(f) use concerns whether the visual impacts associated with Build Alternative RS-1, Grade Separation over Halladay Road Option would constitute a constructive use under 23 CFR 771.135(p)(1)(iii) and 23 CFR 771.135(p)(2). While the alignment does not require the acquisition of land from this parcel west of Halladay Road as discussed above, the placement of a new rail spur within 500 feet of the historic farmhouse would alter the views from the farmhouse. Specifically, the Halladay Road Grade Separated Suboption has had a preliminarily Section 106 determination of Adverse Effect because of the embankment associated with the grade separation.

FHWA has determined that although the grade separation would adversely effect this historic resource, the impact does not rise to the level of a constructive use under Section 4(f). The adverse effect would be caused by the project's impact to the views ***from*** the historic farmhouse. However, the embankment is not close enough to the farmhouse to either effect the views that the general public has ***of*** the farmhouse or substantially detract from its setting as in the example under 23 CFR 771.135(p)(4)(ii). Accordingly, we have concluded that the embankment would not substantially diminish the property's activities, features, or attributes.

In summary, we have determined that there are no Section 4(f) uses associated with Build Alternatives RS-1 or TR-1 and no Draft Section 4(f) Evaluation is required as part of the DEIS. If you have any questions, please contact the undersigned at (802)828-4573.

Sincerely yours,

Kenneth R. Sikora, Jr.
Environmental Program Manager

Responses to Comments on the Draft Environmental Impact Statement

This appendix provides responses to substantive comments on the Draft Environmental Impact Statement. All letters and emails received from government agencies, elected officials, private organizations, and private citizens in response to the DEIS are reproduced here. The transcript of the public hearing held on June 7, 2007 is also reproduced here. For the purpose of comment responses, each comment letter has been assigned an identifier, listed below. Comment letters are displayed on the left hand pages and comment responses on the right hand pages. Where letters are more than one page long, they continue on the next even numbered (left hand) page.

Public hearing participants are identified by name in the transcript, and by "PHT" in the comment responses. The Public Hearing Transcript is reproduced here beginning on page 38 of the transcript, when the public comment period began. The Public Hearing Transcript in its entirety is available upon request. Each substantive comment within a letter or from the public hearing transcript is identified with a number, which may be found in the comment text.

Commenter	**Identifier**
Vermont Land Trust	VLT
Omya, Inc.	OMYA
Vermonters for a Clean Environment	VCE
Frances Hutner	FH
David J Saward	DJS
Rutland Economic Development Corporation	REDC
The Eddy Farm School for Horse and Rider	EFSHR
Chris Robbins	CR
U.S. Department of the Interior, Office of Environmental Policy and Compliance	OEPC
Surface Transportation Board	STB
Foster Brothers Farm and Vermont Natural Ag Products	FB & VNAP
Town of Brandon	BRANDON
Addison County Regional Planning Commission, Natural Resources Committee	NRC
Addison County Regional Planning Commission, Transportation Advisory Committee	TAC
Mary and Fred Lower	M&FL
National Oceanic and Atmospheric Administration National Geodetic Survey	NOAA
Rutland Economic Development Corporation	REDC
Holly Tippett and Gregory O'Brien	HT & GO
Bob Champlin	BC
Eric and Holly Hathaway	E & HH
Herbert J and Susan Taylor	H & ST
Linda Healey and Jim Schamber	LH & JS
Pinewood Gardens	PG
Philip Keyes	PK

Rutland Region Chamber of Commerce	RRCC
U.S. Environmental Protection Agency	EPA
Advisory Council on Historic Preservation	ACHP
Public Hearing Transcript	PHT

Vermont Land Trust

CONSERVING LAND FOR THE FUTURE OF VERMONT

RECEIVED
JUL 12 2007
McFARLAND-JOHNSON, INC.
CONCORD, NH

June 29, 2007

PDD - LTF
JUL 02 2007
Approved

8 Bailey Avenue
Montpelier, VT 05602
(802) 223-5234
(802) 223-4223 fax
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REGIONAL OFFICES

Central Vermont
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Champlain Valley
P.O. Box 850
Richmond, VT 05477
(802) 434-3079

Northeast Kingdom
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(802) 748-6089

Southeast Vermont
and Mountain Valley
54 Linden Street
Brattleboro, VT 05301
(802) 251-6008

Southwest Vermont
and Mettowee Valley
10 Furnace Grove Road
Bennington, VT 05201
(802) 442-4915

Mr. Kenneth R. Sikora, Jr.
Environmental Program Manager
Federal Highway Administration
Post Office Box 568
Montpelier, Vermont 05601

Ms. Susan E. Scribner
Project Manager
Vermont Agency of Transportation
Drawer 33
Montpelier, Vermont 05633

Re: Middlebury Spur Draft Environmental Impact Statement

Dear Ms. Scribner and Mr. Sikora:

Please accept the following comments with respect to the Middlebury Spur Draft Environmental Impact Statement (DEIS):

1. We have preliminarily reviewed the DEIS with respect to the proposed spur's potential impact on natural resource and other public values associated with five parcels conserved through perpetual conservation easements. Because we have only recently received the corridor maps associated with the DEIC we have yet to precisely document the location of the proposed spur in relation to parcels conserved by the Vermont Land Trust (VLT) and partner conservation organizations. However, we preliminarily believe the proposed spur would cross one farm parcel that is encumbered by a conservation easement co-held by the Vermont Agency of Agriculture, Food and Markets, the Vermont Housing and Conservation Board, and VLT. The spur would impact four other parcels encumbered by conservation easements held by the Middlebury Area Land Trust (and perhaps co-held by others). VLT-1

2. We are in the process of assembling digital maps of conserved properties so they can be correlated with the spur corridor described in the DEIS. We will then conduct site visits to the conserved properties in question and consult with our conservation partners. We ask that the DEIS comment period be extended not less than thirty (30) days to allow us to accomplish these tasks. VLT-2

Responses to DEIS Comments

Vermont Land Trust

VLT-1 The draft EIS acknowledged that the project will require the acquisition of property of privately held lands encumbered by conservation easements. Privately owned lands with conservation easements were shown on figures 4.3-1 and 4.3.2. Conservation easements are recognized interests in land and will be further considered during the project's right-of-way acquisition stage. Typically, conservation easements include language addressing how the proceeds of eminent domain damage awards must be allocated between the fee owner and the holder of the conservation easement. Moreover, they usually require the holder of the conservation easement to apply its share of the proceeds of an eminent domain award toward protection of similar resources. In the case of the properties that are proposed to be affected by the rail spur, the provisions in the easements vary. Easement language is summarized in Table I-1, shown on page I-7.

VLT-2 The comment period for the DEIS was 47 days and was consistent with federal regulations.

Table I-1 Conservation Easements Affected by Alignments

Owner	Easement Holder	Parcel No	Alignment's Effect on Parcel	Easement Provisions Relevant to Eminent Domain Acquisition
EDDY FARM SCHOOL FOR HORSE & RIDER CORP	Vermont Land Trust, Vermont Department of Agriculture, Food and Markets, Vermont Housing and Conservation Board	7026.000	East side of mainline railroad tracks; rail trestle would cross the northwest portion of the lot under either alternative.	Grantee is entitled to proceeds from eminent domain sale which pertain to the Grantee's rights and interests. Proceeds to be allocated between Grantee and Grantor provided that the allocation of proceeds to Grantees shall be 46.5% of the full fair market value of the Protected Property exclusive of the value of improvements. Grantee shall use proceeds to preserve undeveloped and open space land of the state through non-regulatory means.
HATHAWAY, ERIC	Middlebury Area Land Trust	8211.000	West side of Halladay Road. TR-1 would impact the southeast corner of this lot. RS-1 would impact a larger portion of the lot.	Grantee is entitled to proceeds from eminent domain sale which pertain to the Grantee's rights and interests. Proceeds to be allocated between grantee and Grantor based on a ratio based upon the relative value of the development rights and conservation restrictions, and on the value of the fee interest. Grantee shall use proceeds to preserve undeveloped and open land of the Town through non-regulatory means.
BERTHIAUME, RICHARD E	Middlebury Area Land Trust	8211.200	West of Halladay Road, with a portion along Halladay Road reserved for development. Both alignments would cut across the northern portion of lot.	No provisions related to eminent domain acquisition.
SAWARD, DAVID J F	Middlebury Area Land Trust	8212.000	Triangular lot east of Halladay Road. RS-1 At-Grade and Over Halladay Options would impact the northwest corner of this lot. RS-1 Halladay Road Relocation and TR-1 would impact larger portions of the lot.	Grantee is entitled to proceeds from eminent domain sale which pertain to the Grantee's rights and interests. Proceeds to be allocated between grantee and Grantor based on a ratio based upon the relative value of the development rights and conservation restrictions, and on the value of the fee interest. Grantee shall use proceeds to preserve undeveloped and open land of the Town through non-regulatory means.
NOP, GERRIT	Middlebury Area Land Trust	7003.400	L shaped lot abutting and east of Otter Creek. Trestle would essentially bisect the lot under either alternative.	Grantee is entitled to proceeds from eminent domain sale which pertain to the Grantee's rights and interests. Proceeds to be allocated between grantee and Grantor based on a ratio based upon the relative value of the development rights and conservation restrictions, and on the value of the fee interest. Grantee shall use proceeds to preserve undeveloped and open land of the Town through non-regulatory means

3. While our site visits will allow us to identify and analyze the potential impacts of the spur, preliminarily we believe the spur could have material negative impacts on productive agricultural soils and associated farming operations, recreational resources, and public scenic views. VLT-3

4. There have been direct and indirect public investments in the five conservation easements described above. At this early juncture we are unsure whether the DEIS adequately addresses the spur's impact on those public investments. VLT-4

Please feel free to contact me if you have any questions about these comments.

Sincerely,

Gil Livingston
President

cc: Christopher Bray, MALT
William Coster, VHCB
Sylvia Jensen, VAAFM
Danielle M. Rougeau, Eddy Farm School for Horse and Rider Corporation

VLT-3 The DEIS acknowledged that the project will have agricultural impacts. These impacts, including impacts to important farmland soils and farming operations, are addressed in Section 4.9 of this document. Impacts to public lands and recreational resources are discussed in Section 4.3.6. Impacts to visual resources are discussed in Section 4.4.

VLT-4 See response to VLT-1.

June 29, 2007

OMYA, Inc.
61 Main Street
Proctor, Vermont 05765
802 459 3311
fax 802 459 2125

Ms. Susan E. Scribner
Project Manager
Vermont Agency of Transportation
Drawer 33
Montpelier, Vermont 05633

Re: MIDDLEBURY SPUR DRAFT ENVIRONMENTAL IMPACT STATEMENT

Dear Ms. Scribner:

Thank you for the opportunity to submit comments on the Middlebury Spur Draft Environmental Impact Statement ("Draft EIS"). Omya Inc. commends the effort of the Agency, its staff, and the consultants involved in conducting a complete and thorough analysis of the Spur project, available alternative options, and the environmental impacts of those alternatives.

As you are aware, Omya and Vermont Railway have worked long and closely together to explore and enhance the use of rail for freight shipments. Indeed, the two entities together first evaluated a rail spur over twenty years ago, but it proved not to be feasible at that time. Omya is committed to using rail wherever possible to transport its raw materials and finished product, and is the largest shipper of freight by rail in Vermont. Over the past three years, while the analysis of the spur has been ongoing, Omya has removed more than 3300 trucks from the public highways by converting outbound shipments to rail from truck transportation. Omya supports extending that concept to converting shipments of its ore feedstock from truck to rail as well and prefers the all rail option to the other alternatives evaluated. OMYA-1

While Omya supports the conclusions of the Draft EIS, it believes that certain conclusions contained in the document are in error as same relate to the environmental benefits to be obtained by converting to rail from truck transportation. Further, the Draft EIS is in error when it states (at section 4.2.2) that Omya "employs fewer than 20 people in its Florence plant". The employment at the plant actually numbers almost ten times that number. OMYA-2 OMYA-3

Again, thank you for the Agency's efforts in preparing the Draft EIS and for inviting comments.

Sincerely,

Erik G. Bohn
Director, Logistics

PDD - LTF
JUL 02 2007
Approved____

OMYA

Omya, Inc.

OMYA-1 Without more specificity, it is not possible to respond appropriately to this comment.

OMYA-2 Without additional information it is impossible to respond to this comment.

OMYA-3 So noted. The correction has been made in the FEIS.

Scribner, Sue

From: Annette Smith [vce@vce.org]
Sent: Friday, May 18, 2007 9:47 AM
To: Scribner, Sue
Subject: Middlebury Spur DEIS

Sue,

In reading through the Middlebury Spur DEIS, there is a factual error. On 4-17, it says that "The Middlebury quarry provides 90 percent of the raw material processed in Florence, with the balance coming from a quarry in South Wallingford."

Omya operates (or their sub-contractors operate) three quarries that serve the Florence plant, not two. The Middlebury Quarry is permitted for 115 trucks per day, the South Wallingford quarry is grandfathered under Act 250 but Omya has said in public that 6 to 8 trucks per day come from that site. In addition, Omya operates (or subcontracts the operation of) the Hogback Quarry just north of their plant in Florence and it is permitted for 40 truck trips per day. If the current trucking from Middlebury is 80 to 85 trucks per day, then the Middlebury quarry does not account for "90 percent of the raw material processed in Florence." It would be more like 60 or 65%. VCE-1

These numbers are then used to calculate the possible increases in material coming from Middlebury to Florence via rail, and are used to show how much the plant's production would increase as well as how much material from Middlebury would increase. By not including the material from the Hogback Quarry, all the other numbers are wrong.

Thanks for passing this along to the consultants.

Annette

Annette Smith
Executive Director
Vermonters for a Clean Environment, Inc.
789 Baker Brook Rd.
Danby, VT 05739
(802) 446-2094
http://www.vce.org/
vce@vce.org

Vermonters for a Clean Environment

VCE-1 In 2007, Omya averaged approximately 105 truck round trips/day from its Middlebury quarry and 24 truck trips/day from its Hogback Mountain quarry and 5 truck trips/day from its South Wallingford quarry. Permits limit Omya's shipments from its Middlebury Quarry to 115 truck trips/day and from its Hogback Mountain quarry to 40 truck trips per day. The EIS has been updated to reflect these figures. Currently 78% of all truck trips come from Middlebury; at permitted maximums, 77% of the truck trips would be from Middlebury. The percentage of truck trips originating from Middlebury makes no difference in the conclusions of the study.

Vermonters
for a
Clean Environment
789 Baker Brook Road
Danby, Vermont 05739

June 29, 2007

Kenneth Sikora
Environmental Program Manager
Federal Highway Administration
PO Box 568
Montpelier, VT 05601

Susan Scribner
Project Manager, VTrans
National Life Building, Drawer 33
Montpelier, VT 05633

Dear Mr. Sikora and Ms. Scribner,

Attached please find the comments from Vermonters for a Clean Environment regarding the Draft EIS for the proposed Middlebury Spur project.

These comments have been sent by email with a hard copy to each of you following in USPS mail.

Should you have any questions about our comments, please feel free to contact Matt Levin, VCE's Outreach and Development Director at 229-4281 or mattldc@msn.com.

Sincerely,

Annette Smith

Annette Smith
Executive Director

PDD - LTF

JUL 0 2 2007

Approved ________

Corrected Omya Truck Numbers

On a technical note, we notice that the Draft EIS (DEIS) contains an important error in the information about how much material goes to Omya's plant in Florence. The 40 trucks a day that drive from the Hogback Quarry to the Florence plant are not mentioned. This is not a small oversight, and would seem to throw off all the other calculations about how much Omya could expand its operations in Florence once the rail spur is built and in use. The numbers must be corrected for the Final EIS (FEIS), and a new estimate of Omya's expanded capacity based on what is actually happening now must be calculated. These new figures will have an impact on much or all of the analysis and the conclusions in the final report.

VCE-2

Scope

At several points in the Draft EIS, starting in the Executive Summary, the DEIS defines this project as running from Middlebury to Pittsford. This contention was repeated by comments in the project presentation made at the June 7 public hearing. This definition of the project clearly is erroneous, as the project only runs from the Omya East Middlebury quarry to the main rail line in Middlebury. Not only does this description highlight the obvious biases behind the project's very conception, it is factually incorrect. We suggest it be corrected in the FEIS and in all future project written materials.

VCE-3

Impacts of Omya's Operations – Beyond Route 7

The DEIS clearly indicates that one of the main goals of this proposed rail spur is to enable Omya to increase its output at its plant in Florence by getting more raw material to process. Unfortunately for the neighbors of Omya's plant in Florence, that means more water, chemical and oil usage, more air pollution and more water pollution, more dust and more noise.

VCE-4

Given the independent scientific study that is currently taking place at Omya's site in Florence regarding its impacts on human health and the environment, the lack of permits for waste disposal, and the currently unresolved issues Omya's neighbors have with the impacts Omya's operations are having on their quality of life, we have asked Omya to not expand its operations in Florence until all those issues are resolved. Further, we suggest that the FEIS must address these secondary impacts of the spur in order to recognize fully the implications for other communities that arise from the expansion of Omya's production.

Assumption about Omya's Long-term Operations

There are a variety of permitting and legal processes outstanding regarding the operation of the Florence facility and their waste management that could have serious impacts on Omya's operations in the coming years. For these and other reasons, we believe it is very hard to say for sure what Omya's operations will look like in 2010.

VCE-5

We understand that the DEIS is not meant to be a full economic analysis of the rail spur project, and that some of these questions we are raising are connected with financial as opposed to environmental issues. However the DEIS is based on and built around significant economic assumptions about Omya's operations. Until these issues are resolved, we suggest that some of

VCE-2 See response to VCE-1.

VCE-3 The project area was described in detail in Section 1.1, "Description of Project Area". Section 3, Affected Environment, identified an area approximately 1,000-2,000 feet wide from the quarry to the mainline as the "alternatives corridor". This is the area along which resources have the potential to be directly affected by the proposed alignments. The broader context of the project, including the quarry, the alternatives corridor, the roadways comprising the existing freight transportation route used by Omya, and existing rail line, and the resource context within which these project elements lie, was referred to as the "project area". The project area extends to Pittsford to include the truck route of trucks transporting marble from the Omya quarry to the Florence plant and the mainline railroad. The extent of the project is acknowledged in a later paragraph of this letter (VCE -19), which states "the Middlebury Spur project looks specifically at the problem of traffic from the quarry to Florence". The project area concept was further supported in the Purpose and Need Statement, Section 1.3 of the EIS. The project scoping considered alternatives within a larger area, and the project area encompasses this area.

VCE-4 Section 4.17 addresses potential indirect and cumulative effects of the project, in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1500 -1508), including effects at the Florence processing facility. Existing permits for current operations are not within the purview of the EIS.

VCE-5 Projections of traffic levels, rail usage, demographic conditions, and operations at Omya and other future conditions were developed by economists, professionals from the highway and railroad industry, and on growth projections provided by Omya. The most likely reasonably foreseeable conditions, rather than the range of possible conditions, were used in the EIS.

the underlying assumptions of the DEIS need to be re-examined, that these issues be clearly outlined in this study, and that an appropriate amount of uncertainty be factored into the analysis.

The No-Omya Scenario

Omya, Vermont Railway, and the state of Vermont are pursuing the rail spur based on the assumption that Omya will continue operating in Vermont well into the future. However, the marketplace for Omya's product is continually changing, and the company makes production and delivery changes based on economics that are not under their control. For instance, not long ago Omya announced they were cutting back their production at their Canadian facility. Omya has also disposed of its holdings in Illinois. Times change, businesses change. Markets move. VCE-6

We believe it is appropriate to recognize the possibility that at some point in the future, Omya may choose to cease operations in Vermont or cut them back. The basic premise of the DEIS is that Omya will continue to operate, and expand, their Vermont operations for the next 20 years. But what if that does not happen, or the reverse happens? In order to accurately portray the impact of the project on the community and the landscape, the use and utility of the project, and the basic underlying economics and finances of the project – all of which are discussed in the DEIS – this possibility must be addressed in the FEIS.

Assumptions about Omya Truck Traffic in 2010

The DEIS states, implies, or suggests in numerous places that, once the spur is built, Omya will remove all of their truck traffic from Route 7. This occurs in Section 2.3.1.1, Table 4.1-1, and Section 4.1.2.1.2 among other places. The clear implication from Table 4.1-1 is that the day the spur opens in 2010, Omya's haul truck traffic on Route 7 will decrease to 0. VCE-7

This is a promise we have heard for years, and never seen any evidence to support that it will in fact occur. We ask that you please provide VCE and the public with whatever evidence VTrans and others have been provided by Omya to support this assumption, and make it available as part of the FEIS.

Preemption of State Regulations

One of the most distressing aspects of the DEIS is its complete disregard for, or ignorance of, the preemption which railroads enjoy over any state or local regulations.

On over a dozen occasions, the DEIS refers to state permitting and regulatory processes in such as way as to infer that they will provide some level of protection for neighbors, communities, and the environment, and a level of accountability for the project itself. However, as VTrans staff are no doubt aware recent US Supreme Court rulings have made it clear that railroad projects are in fact exempt from most state regulations. In fact, it was Vermont's very own Act 250 that was the key regulation under review in the most recent case on the issue. VCE-8

By repeatedly referring to Act 250 and other "required" state permits, the DEIS is promising a level of protection, scrutiny, and oversight that will in fact not occur. The implied protections

VCE-6 Economic conditions are always subject to change. The EIS presents reasonably foreseeable future conditions which are based upon the best available information attainable through consultation with Omya and economic and transportation professionals.

VCE-7 FHWA and VTrans share this concern. Omya has indicated that the intention is to use the rail spur. See the comment letter from Omya reproduced in this Appendix, in particular the second paragraph, which reads "Omya is committed to using rail whenever possible to transport its raw material and finished product". However, a firm commitment to using the rail and to removing truck traffic from Route 7 is critical to meeting the purpose and need of the project. Before the project moves forward, FHWA will explore ways to secure Omya's commitment to using rail. However, Omya's actual use of the proposed rail spur necessarily is dependent on future economic conditions so it is not appropriate to require an ironclad guarantee from Omya as to use of the proposed rail spur.

VCE-8 Because railroads are instrumentalities of interstate commerce, they are exempt from some (but not all) types of state and local regulation, either because of implied pre-emption under the Commerce Clause of the United States Constitution (sometimes referred to as the "dormant Commerce Clause") or because of pre-emption arising under various statutes where Congress has indicated an intent to occupy a particular regulatory field, to the exclusion of state or local regulation. Several years ago, in *Green Mountain R.R. Corp. v. State of Vermont*, 404 F.3d 638 (2nd Cir.), *cert. denied,* 546 U.S. 977 (2005), the federal court of appeals held that a 1995 federal statute pre-empted application of the pre-construction permit requirement of Vermont's Act 250 (10 V.S.A. Chapter 151) to a railroad's proposed construction of a transloading facility adjacent to its tracks. However, the federal court acknowledged that state and local governments may exercise traditional police powers over the development of railroad property, at least to the extent that regulations protect public health and safety, are settled and defined, can be obeyed with reasonable certainty, entail no extended or open-ended delays, and can be approved (or rejected) without the exercise of discretion on subjective questions. Railroads also remain subject to various federal permitting requirements.

are made in reference to agricultural lands, wetlands, waterways, groundwater, floodplains, and on and on.

While there is some question as to how a state-funded project can, in effect, be exempt from the state's own laws, we do not to understand why the DEIS fails to address or even mention this critical legal issue. We hope that more information about this will be forthcoming before the FEIS is drafted, and once that occurs that appropriate changes will be made to the language, presumptions, and analysis in the FEIS.

Further, we hope that the FEIS will provide an outline of what regulatory reviews will be involved as the project moves forward, and what the public process will be for those reviews and in general. VCE-9

<u>Public Process</u>
VCE and members of the community have been under the impression that there would be a strong public outreach component of the planning for this project, beyond the meetings related to the EIS process. To date, we are not aware that any such comprehensive public outreach has taken place. In order to get accurate and complete feedback on the EIS process in particular, it would have been necessary to do a better job up front of engaging the public whose interests are affected. Negotiating easements and/or gaining access to land for surveys in no way constitutes good or thorough public outreach. Nor are meetings directly related to the EIS process the same as meetings that discuss the full scope of the project in a comprehensive way. It is also the case that meetings with corporate "partners" listed in the DEIS, such as Omya, do not constitute part of a public engagement process. In VCE's opinion, the value of the EIS process and the analysis that will result from it is weaker and less valuable because of a lack of community involvement regarding the project as a whole. VCE-10 VCE-11 VCE-12

<u>Mitigation</u>
In discussions in the DEIS about wetlands and habitat, there are numerous references to impacts being mitigated by "replacing" destroyed resources. In recent years VCE has seen numerous examples of these mitigation efforts, and can report that they are uniformly unsuccessful in replicating the lost resources. You can "mitigate" a deeryard, but there is no way to tell the deer they have to move and where to go. It is the same with frogs and snakes, birds and furbearing mammals. This is not simply about moving water or trees – once habitat is gone, there is no way to make up for that loss to the populations impacted. We would suggest that the record of limited successes of these efforts be noted, and that the value of "replacement" properties be downplayed in the FEIS. VCE-13

<u>No Build Presumptions</u>
At several points in the DEIS there are presumptions made about the "No Build" alternative that downplay any other possible efforts that might be undertaken to address the issues of freight mobility in the region. For instance, in section 2.3.2.5 the DEIS states, "'No Build' means that no improvements are made to address the needs outlined for this project." In the same paragraph VCE-14

VCE-9 The EIS identifies permits and approvals that could be required, but because there are uncertainties about the applicability of some permit programs, it is beyond the scope of the EIS to state with certainty which will be required or what their processes for regulatory review would be. The burden of the EIS is to "list all federal permits, licenses, and other entitlements which must be obtained in implementing the proposal. If it is uncertain whether a federal permit, license, or other entitlement is necessary, the draft environmental impact statement shall so indicate."(40 CFR §1502.25) Details on the public processes of each possible regulatory review program are beyond the scope of the EIS.

VCE-10 VTrans' intent was that all public outreach related to the project would be part of the NEPA process. VTrans never intended to hold meetings unrelated to the EIS process. Public participation included four public meetings and the DEIS public hearing. The number of meetings held exceeded NEPA requirements for this project. All public meetings were noticed in local papers, posted at town halls, and members of the public who had signed up at previous meetings were mailed or emailed notices. Press releases were issued before each public meeting, and public meetings were broadcast by the local cable network, Middlebury Community Television. Plans and other materials were displayed and handed out at meetings, and comments and questions taken or addressed on all aspects of the project. VTrans was assisted in part by an Advisory Committee made up of local and state governmental interests, representatives from Vermont Natural Ag Products Inc., Conservation Law Foundation, the Rutland Economic Development Authority, and the Rutland Redevelopment Authority. Public Participation is further described in Section 7.3, and the Advisory Committee is described in Section 7.2. Minutes of the Advisory Committee meetings are included in Appendix B. Summaries of the Public Meetings are included in Appendix C.

VCE-11 No easements have been negotiated nor have surveys been conducted. Land owners have been contacted for archaeological surveys. These contacts and associated field work were carried out to obtain information needed to assess impacts. Activities such as these were not intended as public outreach.

VCE-12 It is appropriate and warranted for VTrans to meet with parties that will be directly affected by the project.

VCE-13 The EIS, in accordance with CEQ, FHWA, and Army Corps of Engineers regulations or guidance, discusses potential mitigation measures for each alternative. Under the Clean Water Act, the Corps requires compensatory mitigation to replace aquatic resource functions unavoidably lost or adversely affected by authorized activities. The EIS addresses proposed mitigation for unavoidable impacts in accordance with state and federal regulations. Mitigation for wetlands is provided on a greater than 1:1 basis to account for the uncertainty of success of the process. VTrans believes, based on feedback from the resource agencies, that mitigation has been successful on past projects.

VCE-14 Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (40 CFR 1502.14) require that in preparing an Environmental Impact Statement, the authors must:

" …(b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits… (d) Include the alternative of no action…"

CEQ regulations (40 CFR 1502.16, 40 CFR 1508.7, and 40 CFR 1508.8) require that reasonably foreseeable indirect and cumulative effects should be included in the assessment of impacts resulting from the proposed action. The regulations provide no further guidance on the assumptions that should be used when examining the no action (or no-build) alternative. While the rail spur may not be built, other improvements may be proposed and built, and assumptions about the timing of such improvements would be speculative. The "No-Build" assumed that there might be independently planned highway freight transportation improvements. Projects that were known to be part of the Statewide Transportation Plan or Municipal Transportation Plans, for example, were included. The "No-Build" alternative is precisely that, a comparison of what the scenario would be if the proposed action did not occur, not an analysis of other events that may subsequently occur.

in 2.3.2.5, there are disclaimers about other improvements that might be "planned independently", but the whole analysis is based on making choices with this all-or-nothing contrast, which is neither realistic nor accurate, and therefore has produced what is in our opinion a flawed result in the DEIS.

It seems inevitable that there will be some economic growth in the region in the next 20 years, and that this will mean more trucks on the road. But it is not necessarily true that the Spur project is the only possible method of increasing freight mobility and capacity in the region. Thus the statement in 4.1.1.1.1 that, "The No Build Alternative would not provide any new means for moving freight in and out of the Middlebury region," predictably but inappropriately suggests that "No Build" means "build nothing at all, ever". This is not the case – just because we don't build a new railroad does not mean we have decided to build nothing at all. And the conclusions that follow from this faulty presumption undercut the validity of the entire DEIS analysis. VCE-15

Similar assumptions are made in 3.1.1.4, Traffic Growth, where it is assumed that no improvements would be made to Route 7 in a 20+ year span. This is clearly an unreasonable, overly broad assumption. Wouldn't the growth referred to in other sections of the DEIS in related and unrelated industries and population mean that some improvements would be made regardless? VCE-16

All of these extremely conservative presumptions seem overly broad and exclusionary. Should the community in the future see needs that can be met in other (or additional) ways than by building the Spur, they would certainly seek state and federal funding to support them. This possibility, or more accurately this likelihood, should be factored into the FEIS in a realistic way. The "all-or-nothing" tone set by the DEIS is inappropriate and unrealistic, and should be changed for the FEIS. VCE-17

There are one or two points where the DEIS is contradictory on this subject. Note the description of "No Build" in 2.6.1, where it states that no improvements are to be made but there is a reference to "improvements which have been planned independently". VCE-18

In previous fillings, VCE has expressed our support for the "No Build" alternative, a position we still hold. This does not mean that nothing should be done to address the issues in Middlebury, Brandon, and throughout the Route 7 corridor. But the Middlebury Spur project looks specifically at the problem of traffic from the quarry to Florence, not overall traffic and, more importantly, through traffic, on Route 7. Omya is the largest single individual freight hauler on Route 7, but as the DEIS itself states, Omya's trucks make up far less than half of the total truck traffic. How will the Spur project help the region if, for example, Omya stops all operations? How will it contribute to cutting down on the majority of the freight traffic? If Omya stopped operation, would RS-1 still be the preferred alternative? If not, why not? We hope the FEIS addresses these questions. VCE-19

VCE agrees that the focus must be on making Route 7 safer and freight handling more efficient – in the long run, with all factors and impacts in mind. Option RS-1 is not the best choice, when all factors are taken into account. VCE-20

VCE-15 The No-Build alternative, as described in the EIS, includes projects that are reasonably foreseeable, such as those included in the Statewide Transportation Plan and the Municipal Transportation Plan. See response to VCE-14, above.

VCE-16 The Statewide Transportation Plan and Municipal Transportation Plans do not include plans for improvements that would increase capacity on Route 7 between Middlebury and Brandon. Section 3.1.1.4 explicitly includes the Pittsford-Brandon Upgrades Project in traffic projections for 2030. Traffic projections did not speculate that any improvements beyond those already planned would occur.

VCE-17 As stated above, the EIS is based on the best available information, and does not speculate about improvements that have not been proposed.

VCE-18 Section 2.6.1 is not contradictory. The No Build does not include improvements necessary to meet the purpose and need of the project. Rather, independently planned transportation improvements that are part of the STP or the MTP are typically included in growth projections as part of No-Build alternatives in NEPA documents, as was done in the EIS.

VCE-19 See the above responses to VCE-3, which addresses the determination of the project area, and VCE-14, which addresses the No Build Alternative. The geographic extent of the project area was defined in Chapter 1. The assumption that Omya will continue freight shipments from the quarry is reasonably foreseeable based on conversations with Omya and other economic indicators. EIS's are not required to analyze every possible future scenario.

VCE-20 So noted.

Omya Growth and Act 250

One of the most distressing aspects of the DEIS is the presumption stated repeatedly that Omya will grow despite any regulatory or other limitations that might exist. As is stated in 4.1.1.1.1, "it is reasonable to assume that in the future, Omya will develop a means to accommodate further growth in shipment volumes, by securing a new Act 250 permit, using larger trucks, extending hours of operation, etc." This is a shocking statement, one that seems totally disconnected with reality. The DEIS fails to substantiate this presumption by demonstrating how exactly any of these scenarios would occur. VCE-21

This is a far from "reasonable" assumption, and undermines the whole analysis for the "No Build" Alternative and in fact the whole DEIS. The DEIS takes this assumption and infers increased impacts on Route 7, Brandon, the environment, etc., creating significant bias in favor of construction. Desire does not equal reality – Omya wanting something does not make it so. We strongly encourage this presumption be removed from the FEIS, and the impact analyses be refigured without this inherent bias.

The Basis for Growth Predictions

At the same time as the DEIS makes presumptions about Omya's growth, this very presumption is called into question in other portions of the DEIS. Note the passage in 2.13.2 that states, "Neither Omya nor other shippers are willing to forecast expected future shipment volumes, and future market conditions are difficult to anticipate." How then are the economic assumptions that underlie the DEIS constructed? Similarly, in Section 4.2.1.2, the DEIS states that, "RS-1 could result in more efficient and economical operations, avoiding the costs of truck transportation." We note the text reads "could", not "will". VCE-22

And later in the section, on page 4-20, the report suggests that there was an extremely tepid response from local firms to the possibility of taking advantage of any new rail capacity. The DEIS refers to, "the possibility that the transload facility would be useful for receiving raw materials or shipping finished products at some unspecified point in the future." Not much to go on. VCE-23

Further, there are contradictions on this issue in the report. In Section 4.7.2, the DEIS states that, "The rail spur is not expected to increase the rate at which stone is removed from the quarry." This presumption is repeated in section 4.16.1.2. This is perhaps because the DEIS presumes that Omya's business will expand regardless of whether or not the spur is built – in itself, a faulty presumption. VCE-24

With this much doubt, and so little proof, we recommend the growth assumptions be removed from the FEIS. Alternatively, the FEIS should at a minimum contain an assessment the impacts of a lack of growth or reduction in production by Omya on the spur's functioning and finances. VCE-25

Omya's Raw Material Supply

Section 3.7.1, Bedrock Geology, states that, "Historically, mining of the marble, limestone, and slate deposits in western Vermont have played important roles in the economy of this region.

VCE-21 It is reasonably foreseeable that there may be changes in regulatory constraints or technological advances that would allow the amount of material that is shipped to increase.

VCE-22 The EIS states in Section 2.6.2.2, Rail Spur Operations, "Neither Omya nor other shippers are willing to forecast expected future shipment volumes, and future market conditions are difficult to anticipate." (There is no Section 2.13.2 in the EIS.) The text goes on to read that "For purposes of the EIS studies, it has been assumed that Omya will increase its shipments by approximately 20 percent by 2030, and other shippers will ship up to ten rail cars per week." These estimates are based upon past growth patterns and input from Omya, and are reasonable estimates.

VCE-23 The project has proceeded under the assumption that it may be used by shippers other than Omya. Local businesses have shown interest, but have not been willing to commit to using the rail spur. For the purpose of impact assessments, it was assumed that there would be an additional 5 rail cars/week in 2010 and an additional 10 cars/week in 2030.

VCE-24 As stated above, it is reasonable to assume that there may be changes in regulatory processes or technological advances that would allow the amount of material that is shipped to increase. For the purposes of the EIS, it was assumed that the amount of material shipped from the quarry would be the same whether the rail spur is built or not.

VCE-25 The growth projections are based upon the best information available for future conditions. The scenario of Omya's ceasing growth or reducing production was not considered because the best available information indicates this is unlikely to happen. NEPA requires that the EIS present reasonably foreseeable, not speculative, scenarios.

Although many of the deposits have been depleted, the Omya quarry in Middlebury is one of several operational marble, limestone, and slate quarries in the state." We have no idea what the basis is for the statement about depletion, as the East Middlebury quarry has years of raw material remaining and there are plenty of mineral deposits in Vermont that have not been depleted. We suggest this statement be clarified or deleted. VCE-26

Main Line Rail Impacts

Section 4.1.1.2.4 seems to downplay the impact that increased rail traffic on the main line would have on the community. While the projected level of traffic may be "well within the capacity" of the mainline, it certainly represents a significant change from current usage. VCE-27

What is the current level of usage, and what are the impacts from that amount of rail traffic? Would there be an increase in noise, pollution, train/car conflict, or other issues that need to be addressed? Will the increases change the way the community currently interacts with this transportation resource given the current level of usage?

The conclusion that "no mitigation measures are needed" seems to ignore these issues. We would hope that more analysis of these impacts, and suggestions for mitigation, are included in the FEIS.

Visial Impacts

The comments in the DEIS that trestles and rail lines will visually mimic farm structures and field layouts seem humorous at best and insulting at worst. We strongly recommend dropping these references from the FEIS. The wisdom, viability, and visual impact of a 2000' long, 23' high viaduct is questionable enough without this judgmental, subjective, "artistic" analysis. VCE-28

Further, the graphical representations of the Spur fail to accurately show the project's proximity to houses in the neighborhood or the true scale of the 23-foot high trestle piers. We recommend that new efforts be made to more accurately show, and realistically assess, the visual impacts on the surrounding neighborhood in FEIS materials.

In addition, we would suggest that the characterization of the visual resource of Halladay Road, as described on page 14 of the Executive Summary and elsewhere, is undervalued. Rather than "relatively high", our on-site inspection leads us to believe the area has an "extremely high" degree of scenic quality.

Noise

Section 4.5.3.1 states that, "All of these project (noise) along the mainline corridor are due to the increased use of warning horns at the grade crossings. Noise impacts are not predicted to occur along the rail spur portion of RS-1." VCE's experience with rail operations around the state, and specifically with rail operations related to Omya's use of the main rail line around the Florence facility, indicates this statement to be false. Residents of Florence have reported noise impacts associated with squeaky wheels and wheels against rail, along with other noises related to car VCE-29

VCE-26 Data provided by the United States Geological Survey on the online "Mineral Resource Data System" (http://tin.er.usgs.gov/mrds/) states that there were historically 50 operational marble and limestone quarries in Vermont. Of these, nine are listed as current producers. There were historically 55 slate quarries in the state, of which 35 are now closed. Supplemental information has been added to the FEIS.

VCE-27 Section 4.1.1.2.4 summarizes effects of the proposed project on the rail transportation system, which included the corridor from Middlebury to Florence. The statement quoted in this comment is specific to the impacts on the rail infrastructure, including the conclusion that "no mitigation measures are needed". Potential impacts to automobile safety are addressed in Section 4.1.2. Potential impacts from noise are addressed in Section 4.5.3.3, impacts to water quality in 4.9.2.2.1, and impacts to air quality are addressed in Section 4.4. The need for mitigation for each of these impacts is addressed within each section.

VCE-28 Section 4.3.1 describes the methods by which visual impacts were assessed. A professional in the field of assessing visual impacts was retained for this purpose. Figures 4.3.1 – 4.3.40 provide photo simulations that are accurate and to scale of RS-1 and TR-1 for selected locations along the alignment, to demonstrate the visual effect of the proposed project on surrounding neighborhoods. Figures 2.6-1 and 2.6-11 provide aerial views of RS-1 and TR-1, and clearly depict the locations of nearby houses and other buildings.

Section 3.3 describes the criteria that were used to evaluate the scenic quality of the landscape, including the visual resource of Halladay Road. Evaluation of such a resource is by nature subjective, but the evaluation process uses standard methods for assessing visual resources.

VCE-29 Section 4.5.3.1 describes the methods that were used to calculate project-generated noise along the project rail corridor, including noise from locomotives, rail cars, and warning horns. Table 4.5-5 shows the predicted noise from locomotives, rail cars, horns, and signal crossings. The statement quoted in the comment that "all of the project impacts are due to the increased use of warning horns" refers to impacts as defined by Federal Transit Administration (FTA) standards. Increased noise exposure does not necessarily constitute an "impact" as defined therein.

movements. This statement seems inaccurate at best, and should be re-evaluated using real-world data collection for the FEIS.

Herbicide Usage, Impacts

Conspicuously missing from the environmental analysis is any mention of the impact of herbicides on wetlands, agricultural lands, and other natural resources. Railroads in Vermont routinely, if not annually, apply chemical herbicides along rail lines to limit growth and ensure track safety. This process is well documented, and permits are awarded for it on an annual basis that could be used to judge what the usage would be for the spur project. While the need for chemical applications is debatable, they are the norm, and should be anticipated in any analysis of impacts of a rail line. In order to capture the full impact of the proposed spur, we strongly suggest the inclusion of such an impact analysis in the FEIS. VCE-30

Town Plan Coordination

We note that Section 3.2.3, Existing Land Use Development, refers to the 2005 Middlebury Town Plan. Our understanding is that that Plan was amended this year. The FEIS should refer to and reference the more recent Plan. VCE-31

VCE-30 The Federal Railroad Administration (FRA) requires railroads to control vegetation on or immediately adjacent to the railroad roadbed. Control of vegetation relies on mechanical methods (i.e., tree and brush cutting), as well as herbicides. It is not anticipated that herbicides will be used to control vegetation in the elevated trestle sections of the rail spur. In Vermont, use of herbicides by utilities and railroads for right-of-way vegetation control is regulated by the Agency of Agriculture, Food and Markets, under 6 V.S.A. Chapter 87 (Control of Pesticides) and the Agency's "Vermont Regulations for the Control of Pesticides." These regulations require use of licensed applicators, as well as annual permits. The application of herbicides in accordance with all applicable regulations is not expected to result in an adverse impact. Supplemental information has been added to the FEIS.

VCE-31 The Draft EIS was published in April, 2007, which was before the 2007 Town Plan was approved by the Middlebury Select Board (June 19, 2007). The Final EIS cites the 2007 Town Plan.

VTrans Working to Get You There
Vermont Agency of Transportation

MIDDLEBURY SPUR
DRAFT ENVIRONMENTAL IMPACT STATEMENT

COMMENT/QUESTION FORM

Name	Frances Cornwall Hutner
Address	PO Box 48 1070 Dragon Brook Road
City/Town	East Middlebury
State	VT
ZIP	05740
E-Mail Address	[redacted]
Phone Number	[redacted]
Message/Comment	Please see 2 pages attached ~ Frances C Hutner

Forms may be returned to:
Ms. Susan Scribner, Project Manager
Vermont Agency of Transportation
National Life Building, Drawer 33
Montpelier VT 05633
Telephone: 802-828-3615
Fax: 802-828-5712
Email: sue.scribner@state.vt.us

COMMENTS: MIDDLEBURY SPUR IMPACT STATEMENT

The VTrans preferred RS-1 Middlebury rail spur project destroys the farm that my family owned for almost all of the 20th century. Some of the best farmland in Åddison County, indeed in the state or Vermont, would be permanently sacrificed for a few decades of increased profit for a private firm, Omya. FH-1

The traffic benefits seen for Brandon can be achieved at less cost by other means. And the proposed traffic transfer station at the Omya site would increase truck traffic on the highways serving towns neighboring the transfer site, including Brandon. FH-2

The RS-1 proposed spur makes a mockery of the land trust promise of perpetual stewardship to protect the two farms most affected by the spur from development; our former farm—then known as Deermeadow Farm–and the former Doris Eddy farm. The owners of these farms judged the public interest in preserving this open land in Vermont to be more important than their own pecuniary interests. FH-3

Furthermore, the cost of carrying out the proposed RS-1 plan is exorbitant. The proposal requires major expenditures for going under Route 7, bisecting a fallow meadow and a working pasture and then somehow crossing Halladay Road. This is a busy road and a sewer pumping station in an old brook bed complicates the crossing site. FH-4

The consultant at the recent public hearing on the spur spent considerable time describing a solution to the Halladay Road problem. The consultants suggest dead ending Halladay Road in both directions at the crossing site. They would then build a road out to Route 7 for traffic coming up from the south. This would add another crossing to the pasture already bisected by the rail spur. Halladay Road traffic north of the dead end that wished to go south would have to go north to Route 7 and then come back to Halladay Road on the new pasture road. It is a solution worthy of John Cleese, the proprietor of Fawlty Towers. FH-5

Having crossed Halladay Road, the proposed rail spur runs into a hill. Inside the hill there is a large water aquifer. This aquifer supplied all the needs of our farm—two families:, a herd of Holstein milking cows, draft, driving and saddle horses, a flock of sheep; and, in the later years, 1,000 laying hens that took the place of the milking cows. Even in the driest years we never ran out of water. FH-6

Beyond the hill aquifer the spur would go across more pasture and then cross fertile meadow land. Most of these meadows are wetlands, flooded by Otter Creek, the source of their loam and fertility. The proposed plan projects a trestle extending a half mile or more over the wetlands to the Creek. Then there would be a bridge across the Creek and a junction site on the Eddy farm with the main rail line. FH-7

Frances Cornwall Hutner

FH-1 Agricultural impacts, including impacts to important farmland soils and impacts to active agricultural operations, were addressed in Section 4.8 of the DEIS. .

FH-2 Alleviating traffic in Brandon is part of the project purpose, as described in the Purpose and Need Statement (Section 1.3 of the EIS). A total of 20 alternatives were screened, including four highway bypass alternatives in Brandon. All of the alternatives assumed that planned improvements to US Route 7 would occur. The screening process, and rationale for the elimination of some of the alternatives, was detailed in Chapter 2 of the DEIS. Impacts to traffic from RS-1 were discussed in Section 4.16.1.4.

FH-3 The draft EIS acknowledged that the project will require the acquisition of property of privately held lands encumbered by conservation easements. Conservation easements are recognized interests in land and will be further identified during the project's right-of-way acquisition stage. The easement held by the Middlebury Area Land Trust on Lot 8211.000 (the Hathaway lot, formerly Deermeadow Farm) provides that, in the case of acquisition of the property though eminent domain, proceeds would be allocated between the grantee and grantor based on a ratio based upon the relative value of the development rights and conservation restrictions, and on the value of the fee interest. The Middlebury Area Land Trust would then, in accordance with the easement, use the proceeds to preserve undeveloped and open land in the Town through non-regulatory means. In the case of the easement held on the Eddy Farm, proceeds to the grantees of the easement would be 46.5% of the full market value of the property exclusive of improvements. The grantee would use the proceeds to preserve undeveloped and open land in the state through non-regulatory means.

FH-4 So noted. The DEIS contained information in Section 2.7 on cost which included these components. As discussed in the text, the sewer pumping station will be accommodated during the final design process, and will be moved if necessary.

FH-5 The Halladay Road Relocation Option is no longer being considered, and is not part of the preferred alternative in the FEIS.

FH-6 Section 4.9.1.1 describes anticipated impacts to aquifers in the study area. As described in the DEIS, no impacts to groundwater resources are anticipated, because of the low transmissivity of the clay soils. If it appears during final design that aquifers would be disturbed during construction, monitoring would occur. If private wells were to be affected by construction of the rail spur, VTrans policy is to provide corrective action.

FH-7 Impacts to wetlands and farmlands are discussed in sections 4.10 and 4.8. The length of wetland to be crossed by the trestle is less than a half mile.

Finally, in discussing "Floodplain and Floodway Mitigation" the "Middlebury Spur Draft Environmental Impact Statement" concludes "Other mitigation could include constructing flood storage areas, widening floodplain channel, constructing levees, or other measures." But how can anyone approve the current suggested plan that does not include a firm analysis of what "other measures" will be part of the approved plan? For example, do we really want to approve levees for Otter Creek? FH-8

There are better ways to achieve the objectives of increasing rail traffic on Vermont Railways and reducing Omya truck traffic through Brandon. The simplest one would be to provide a transfer site to the main line railroad at Leicester Junction. This would use existing, adequate roads a few miles from Omya's present road connection to Route 7. The traffic would not go through any village streets. There are also junction sites at New Haven Junction and Vergennes which would provide truck to rail transfers. FH-9

FH-8 Section 4.10.3.3 of the FEIS has been updated to reflect the results of the hydraulic study conducted for the area. Major mitigation measures such as levees, floodwalls, or floodproofing are not warranted because the rise in floodwaters is negligible (0.1 inches). There will be continued coordination with resource agencies during final design, and measures such as minor modifications to the trestle design may be considered. Because the rise in floodwaters is negligible (0.1 inches) no floodplain mitigation is proposed.

FH-9 Section 2.2.2.2 describes the truck-to-rail alternatives that were screened early in the EIS process. TR-5 and TR-6 were potential alternatives that would have provided for material to be transferred in Leicester. Additional truck transfer sites beyond the seven described here were not considered viable alternatives. Transport of material through downtown Middlebury to access junction points north of Middlebury was not considered practical, but the screening process did examine a highway bypass option that would have allowed trucks to head north.

Section 2.3.1.2.3 describes the results of the screening process and describes why the Leicester truck-to-rail alternatives were not carried forward.

Ms. Susan Scribner
VTrans Project Manager
National Life Building
Drawer 33
Montpelier
Vt 05633

David J Saward
721 Halladay Road
Middlebury
Vt, 05753
[redacted]

June 28, 2007

Dear Susan,
Please accept this letter as my formal objection to the proposed Rail spur in Middlebury Vermont. As one of the major property owners in this construction I have significant concerns about the alteration to my immediate environment and the long term affect the project will have upon pollution, noise and general aesthetics to what is a beautiful Vermont vista.

I have been living here on Halladay Road for 10 years and have enjoyed the beauty and relative peace that the property affords to both me, my family and my neighbors. The proposed rail spur, however 'cosmetically pleasing' it may be to you, OMYA and others, will have a significant impact upon the neighborhood. Noise and air pollution are just two major concerns that come to mind, not to mention the disruption to the local habitat and the wetlands area. DJS-1

I have felt, and still do, that my interests are completely secondary to whole proceedings. This was amplified at the last meeting when I was informed that now, my back field may be used for redirecting Halladay Road. Needless to say, this was a shock, as this was the first I heard of such a proposal. I want to go on record as saying that I am totally opposed to Halladay Road being routed through my property. I think Halladay Road should be a 'Dead End' on both sides of the track. DJS-2

When I bought this property I was informed that the land opposite was in a Land Trust and could 'never be built on'. As I say to my children, "*Never say never*" as there is always an exception to every rule. Now it seems as though if "Big Brother wants, Big Brother gets"!!! DJS-3

Another area of interest, is that in every building project in Vermont one hears the magic words 'ACT 250'. As I have listened to the experts discus this project, Act 250 seems to be irrelevant, which I find interesting and somewhat baffling. DJS-4

I appreciate you allowing me to voice my concerns and objections. Please keep me informed of immediate developments. My email is [redacted] and I look forward to hearing back from you,

Sincerely

David J Saward

David J. Saward

DJS-1 Section 4.4 addressed effects on air quality from the proposed rail spur, and section 4.5 addressed effects on noise from the proposed rail spur. Section 4.3 addressed affects to visual resources of the proposed alternatives. Section 4.6 addressed impacts to wildlife habitat of the proposed alternatives, and section 4.10 addressed impacts to wetlands of the proposed alternatives.

DJS-2 The Halladay Road Relocation Option is not the preferred alternative, nor is creating a dead end or a cul de sac.

DJS-3 The DEIS acknowledged that the project will require the acquisition of privately held property encumbered by conservation easements. Privately owned lands with conservation easements are shown on figures 4.3-1 and 4.3.2. Conservation easements are recognized interests in land and will be further identified during the project's right-of-way acquisition stage. The easement held by the Middlebury Area Land Trust on Lot 8212.000 (the David Saward lot) provides that, in the case of acquisition of the property though eminent domain, proceeds would be allocated between the grantee and grantor based on a ratio based upon the relative value of the development rights and conservation restrictions, and on the value of the fee interest. The Middlebury Area Land Trust would then, in accordance with the easement, use the proceeds to preserve undeveloped and open land of the Town through non-regulatory means.

DJS-4 Vermont's Act 250 does not apply to "every building project in Vermont." In a town with local zoning and subdivision control such as Middlebury, Act 250 generally applies only to major projects involving more than 10 acres of land (see 10 V.S.A. § 6001(3)). Act 250 itself contains an exemption for many types of railroad projects (see 10 V.S.A. § 6001(3)(C)(iv). As explained in Response VCE-8, above, certain types of state and local regulation do not apply to railroads because of federal pre-emption. The applicability of Act 250 to the project has not yet been determined.

Scribner, Sue

From: Saward, Dave [redacted]
Sent: Wednesday, June 27, 2007 5:22 PM
To: AOT - Midd-Spur-Deis
Subject: Register my name and objection to the proposed Rail spur in Middlebury

To Whom it May Concern,

I would like officially register my name and objection to the proposed rail spur in Middlebury. My name is David J Saward and I live at 721 Halladay Road, Middlebury Vermont, 05753. My property will be directly affected by both the rail line and the change in location of Halladay Road itself.

I have attended many of the meetings over the years and the whole process has been interesting to say the least. It seems to me that a great deal of money has been wasted to come up with this final proposal. I believe this to be a bad idea. I am in complete sympathy with the residents of Brandon, yet this new propsal is about to completely change the fabric of my property for good and for most other property owners in the vicinity of the propsed rail line.

The proposed route of the line will travel through pristine Vermont countryside and will alter the vistas and the habitat along the route. It is going to pass through some major wetlands and, from the projected pictures, be carried on a very unsightly tressel through fields and across the beautiful Otter Creek.

DJS-5

When I purchased my property I was told that the land opposite was in a 'Land Trust' and can NEVER be built on, but it seems that is now not the case. Needless to say I am less than excited about this project and I would appreciate being kept in the information loop as things progress.

DJS-6

I appreciate your consideration of this letter,

Sincerely

David J Saward
721 Halladay Road
Middlebury
Vt
05753

DJS-5 Visual impacts from the proposed rail trestle were addressed in Section 4.4.3.5. Wetland impacts were discussed in Section 4.11, and Wildlife Habitat impacts were discussed in Section 4.7.

DJS-6 See response to DJS-3.

Rutland
Economic
Development
Corporation
redc

June 26, 2007

Ms. Susan Scribner
Project Manager
Vermont Agency of Transportation
National Life Building, Drawer 33
Montpelier, VT 05633

Dear Ms. Scribner:

I am writing on behalf of the Rutland Economic Development Corporation (REDC) in support of the Middlebury Spur, per the Draft Environmental Impact Statement (DEIS).

REDC-1

As part of the Western Corridor Project, the Middlebury Spur is important to job growth in Rutland County and in the state of Vermont. It also is the first piece of the four components of the Western Corridor Project, all of which are critical infrastructure investments for the future of our state.

In its current state, the rail system in Vermont is limited in its contribution to Vermont's economy. In fact, in 2007, rail was identified by the joint Public Policy Committee of REDC and the Rutland Region Chamber of Commerce as a vital resource for businesses and individuals. The committee stated that Vermont's rail system needs improvement in order to meet national standards and to eliminate limits on its utilization. The completion of the Western Corridor Project will help meet these needs and a few examples of how it will help follow.

REDC-2

- It will reduce truck traffic on the roads, aiding in congestion and safety issues.
- It will increase existing Vermont businesses' access to raw materials and open new market opportunities to them so that they can continue to provide jobs for Vermonters.
- It will aid the travel of residents and tourists using the passenger rail system, again reducing road congestion and also increasing traffic to Vermont businesses.

We encourage the FHWA and the VAOT to support the Middlebury Spur Project as the cornerstone to the implementation and completion of the Western Corridor Project in its entirety.

Sincerely,

JoAnn Hollis Graffam

JoAnn Hollis Graffam
Executive Director

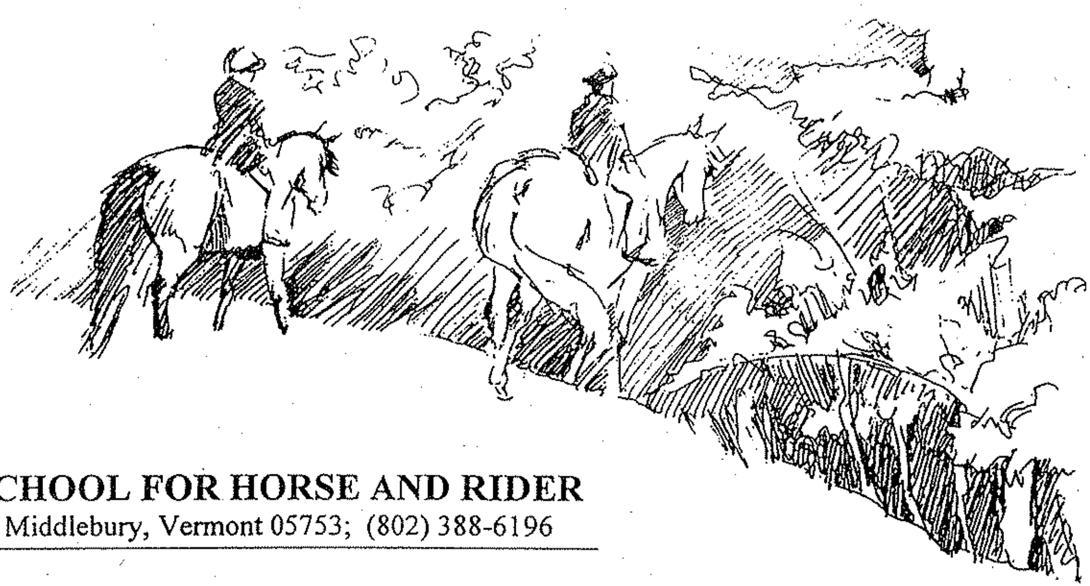
Cc: Peter Giancola, President

112 Quality Lane • Rutland, Vermont 05701 • 802-773-9147 Fax 802-773-8009 • rutlandeconomy.com

<u>Rutland Economic Development Corporation</u>

REDC-1 So noted.

REDC-2 So noted.



THE EDDY FARM SCHOOL FOR HORSE AND RIDER

1815 South Street Extension; Middlebury, Vermont 05753; (802) 388-6196

June 27, 2007

Ms. Susan E. Scribner, Project Manager
Vermont Agency of Transportation
Drawer 33
Montpelier, Vermont 05633

Dear Ms. Scribner, FHWA and VTrans,

Thank you for your presentation of the DEIS at the Middlebury Spur Hearing on Thursday June 7, 2007, in Middlebury. As a non-profit organization substantially and directly affected by the proposed RS-1 and TR-1 project options, EFSHR is formally registering its comments.

The Eddy Farm School for Horse and Rider (EFSHR) is a non-profit, 501(c)3 educational organization whose mission is to teach traditional horsemanship skills and promote amateur athletic competition for everyone in our community, regardless of age or physical ability. Riding instructor and life-long Middlebury resident, Doris Eddy, established the Eddy Farm School in the 1940's, and taught hundreds of students not only fine horsemanship, but invaluable life skills. Since Ms. Eddy's death in 1998, the Farm has continued to offer equestrian education and protect and steward the land. EFSHR sold its development rights to the Vermont Land Trust in 2001 with the intent that the land remain agrarian in perpetuity. The Farm's historic structures are listed in the Vermont Historic Register.

EFSHR-1

First, and emphatically, EFSHR is opposed to the OMYA rail spur, not only because of the repercussions to our beautiful pasture and surroundings and how that bears detrimentally on the organization itself, but also because, ultimately, the proposed rail spur will not resolve the problem it intends to address – namely, the truck traffic through Brandon.

EFSHR-2

Eddy Farm School for Horse and Rider

EFSHR-1 So noted. Impacts to agricultural resources were discussed in Section 4.8 of the DEIS. Visual impacts were discussed in Section 4.3 of the DEIS. Proposed mitigation for agricultural impacts includes measures to minimize impacts to the Eddy Farm, such as a change in the RS-1 alignment. The alignment, as depicted in the FEIS, features a tighter curve where it approaches the mainline, and therefore cuts off a smaller portion of the field near Otter Creek (see Figure 2.6.2).

EFSHR-2 Truck traffic in Brandon is part of the need identified in the Purpose and Need Statement in the EIS. While it is true that the amount of truck traffic passing through Brandon will increase even if the rail spur is built, the amount of truck traffic if the spur were not built would be even greater.

While Omya and VTR would benefit from the proposed rail spur, VTrans expects that the residents and businesses of Brandon Village and the roadways along Omya's truck route would also benefit. Other freight shippers may also benefit by improved access to rail transportation.

Given the statistics presented at the Hearing, OMYA truck traffic accounts for a small percentage of the total number of trucks passing through Brandon. Removing OMYA truck traffic, therefore, still leaves the town of Brandon suffering an above average percent of truck traffic. As a Brandon resident at the Hearing pointed out, the normal increase of traffic over the next 23 years (using the 2030 projections presented at the Hearing) will naturally put Brandon squarely back in the dilemma it now faces in a relatively short time. Unless a far larger percentage of trucking operations make use of the rail spur, the only entities that stand to benefit from the rail spur project are OMYA and Vermont Railways. We also understand that the current projected lifespan of the OMYA Foote Street quarry is 40-50 years – that timeline being based on the amount of material currently being removed. With the rail spur moving material three times faster, the projected lifespan of the quarry is even shorter, 17 years plus or minus, meaning that the tremendous costs of permitting and construction, and the detrimental affects on landowners' property values and the landscape itself, is a sizeable cost to incur for the short-lived benefit of two large corporations.

EFSHR-2

EFSHR-3

It is also ironic that after two years of public meetings, OMYA has made no clear, public statement that it will suspend all truck traffic and use the proposed rail spur exclusively. It is understandable that OMYA needs the option to move its product by truck should the rail spur be unavailable, but even accepting that proviso, OMYA needs to clearly state commitment to rail transport and its suspension of truck transport.

EFSHR-4

Please understand that EFSHR is not in any way opposed to OMYA having a more efficient and economical method to move its product. It is, however, strongly opposed to suffering consequences that are irreversible, perpetual, and of no benefit to its community, operation, mission, and landscape. It is also unclear that either rail spur project benefits the town of Middlebury. It would be counterproductive if additional companies using the Transload Facility (TR-1) create an increase in truck traffic in the town of Middlebury. Regardless, it is very clear that either plan would not benefit any of the landowners who would be affected.

EFSHR-5

Should the rail spur be built, there would be substantial repercussions to EFSHR itself

The proposed rail spur would intersect with the existing rail 250 feet directly east of our central facility of operation. The indoor ring is strategically located within our physical plant to accommodate the needs of the farm manager, instructors, clients, and school. The indoor ring and surrounding area is used year-round for riding lessons and horse schooling sessions, and the majority of the students and horses are inexperienced. The complication of additional train traffic coupled with the proximity and noise level of engines accelerating and breaking to and from the OMYA quarry, on and off the rail spur, would be problematic for the schooling taking place at Eddy Farm. It is no small issue that the quiet, peaceful nature of the Eddy Farm would be drastically compromised, along with the safety measures established for an activity that is understood to be challenging and risky. Not only daily instruction, but schooling events, clinics, and other equestrian

EFSHR-6

EFSHR-3 The rate of marble extraction is projected to be the same whether the rail spur is built or not, and operations at the quarry are expected to continue for a minimum of 50 years into the future.

EFSHR-4 FHWA and VTrans share this concern. Omya has indicated that the intention is to use the rail spur. See the comment letter from Omya reproduced on page I-8 in this Appendix, in particular the second paragraph, which reads "Omya is committed to using rail whenever possible to transport its raw material and finished product". However, a firm commitment to using the rail and to removing truck traffic from Route 7 is critical to meeting the purpose and need of the project. Before the project moves forward, FHWA will explore ways to secure Omya's commitment to using rail. However, Omya's actual use of the proposed rail spur necessarily is dependent on future economic conditions so it is not appropriate to require an ironclad guarantee from Omya as to use of the proposed rail spur.

EFSHR-5 The Town of Middlebury conditionally supports the rail spur, as stated in the 2007 Middlebury Town Plan. Traffic impacts are addressed in Section 4.1.2.1. Landowners would be compensated for right of way impacts through the eminent domain process.

EFSHR-6 No part of the rail spur will be closer to the riding arena at the Eddy Farm than the existing mainline. The switch from the spur onto the mainline will not generate any more noise than the existing track, and the engine will be well south of the Eddy Farm when the train starts to accelerate. Noise impacts from the proposed rail spur are discussed in Section 4.5. Noise impacts (as defined by Federal Transit Administration [FTA], the Federal Highway Administration, and VTrans' criteria) on the rail corridor are all due to grade crossings. Incidental noise from the rail spur may be more frequent but not more severe than existing rail traffic on the main line, therefore the safety of the indoor rings and the peaceful atmosphere of the Eddy Farm would not be compromised.

related activities (all of which serve EFSHR's non-profit mission and are essential financially) take place in and around the indoor ring. To compromise the safety of the indoor ring and the peaceful atmosphere of the farm as a whole presents devastating complications for our business.

Every part of the Eddy Farm is utilized for its mission, activities, and sustainability, and the most important factor for its sustainability is the land and its varied uses. Our Creek Pasture, bordered by the existing rail on the west and the Otter Creek on the east, is approximately 40 acres in size and produces the majority of the hay that feeds our animals. Once hay is harvested, the pasture is used for recreational riding, lessons, competitions and winter turnout. The hay and forage provides total sustenance for most of the horses through the winter as well as supplemental farm income through hay sales.

The OMYA rail spur trestle for both the RS-1 and TR-1 projects would cut a sizeable section of land off the north end of the Creek Pasture, and construction would likely usurp additional land. Losing a substantial amount of our main feed source would not only result in smaller hay yields and reduced income from hay sales, but also annual, perpetual costs incurred to purchase supplemental feed. Financially and economically, that would create a daunting hardship for the Farm, losing feed, a riding and teaching resource, animal turnout, and the ability to be self-sustaining. There would also be the real complication of moving large numbers of horses to and from the Creek Pasture for grazing and pasture rotation: our primary access to and from the Creek Pasture (and this relates directly to the location of the indoor ring) is the crossing that would be lost if the rail spur were built. There are other crossings available, but these crossing are much further away and present a logistical challenge, particularly in the winter. It is just one of many daily activities that would become extremely complicated.

EFSHR-7

EFSHR-8

There is also concern for how plant and weed growth will be managed around the proposed trestle structure. The use of herbicides or other poisons to maintain brush and undergrowth presents a clear health hazard to the people and animals that would use the remaining land and nearby water sources. Depending on railroad procedure, what originally begins as a partial loss of pasture and resource due to structure could be become a more far-ranging loss due to the complications associated with rail maintenance and vegetation control.

EFSHR-9

The lack of an archeological survey in the DEIS is a concern. During the process of the Vermont Land Trust's purchase of the Eddy Farm's development rights, there was mention of archeological findings on the Farm property. Since this part of the DEIS was not completed prior to the public Hearing and public comment, any findings in an archeological survey will simply be noted in the final publication and will not be open for public hearing or public comment.

EFSHR-10

Building a rail spur for OMYA would force the Farm to drastically rethink and reorganize its current working plan. Daily logistics as well as special events would

EFSHR-7 Agricultural impacts are discussed in Section 4.8 of the EIS. The appraisal process used during right of way acquisition values land at its highest and best use, and landowners are compensated for land value during the eminent domain process. VTrans will assess hay production and the effect of the rail trestle during their appraisal/acquisition process.

EFSHR-8 If farm crossings important to the functioning of the Eddy Farm are eliminated because of the rail spur, they would be replaced after consultation with the Eddy Farm management. Consideration will be given to replacing crossings during final design.

EFSHR-9 The Federal Railroad Administration (FRA) requires railroads to control vegetation on or immediately adjacent to the railroad roadbed. Control of vegetation relies on mechanical methods (i.e., tree and brush cutting), as well as herbicides. In Vermont, use of herbicides by utilities and railroads for right-of-way vegetation control (including the use of herbicides near watercourses) is regulated by the Agency of Agriculture, Food and Markets, under 6 V.S.A. Chapter 87 (Control of Pesticides) and the Agency's "Vermont Regulations for the Control of Pesticides." These regulations require use of licensed applicators, as well as annual permits. The application of herbicides in accordance with all applicable regulations is not expected to result in an adverse impact. In any case, vegetation management along the mainline would not change as a result of the project, and it is not anticipated that herbicides will be used to control vegetation in the elevated trestle sections of the rail spur. Supplemental information has been added to the FEIS.

EFSHR-10 Subsequent to the DEIS, a sample of five areas of varying sensitivity were sampled by digging several series of test pits along transects. As a result of this test, three archaeological sites were discovered (VT-AD-1493, VT-AD-1494, and VT-AD-1495), two of which were within the Eddy Farm property. As a result of this study, more specific information on alternatives' impacts and appropriate mitigation have been included in this FEIS (see Section 4.11.1). As such, this information is being circulated for public review and comment.

Archaeological study will proceed with additional Phase I field testing in other sensitive portions of the rail corridor, as well as Phase II evaluation at the three identified sites at the Eddy Farm once VTrans obtains legal access to properties. Phase II study involves more detailed site excavation and study. Based on the results of the Phase II study, impacts will be known, and if necessary, mitigation could be provided through Phase III data recovery, or the study may be concluded with documentation, public education and outreach.

Section 106 of the National Historic Preservation Act of 1966 provides a process for determining effects on historical resources caused by federally funded actions, and for avoiding, minimizing and mitigating for such effects. A Memorandum of Agreement has been signed by the Federal Highway Administration and the Vermont Division for Historic

Preservation to ensure that the project is in compliance with all applicable laws and requirements.

As a clarification, a comment period will follow the publication of the FEIS and comments will be considered in the Record of Decision.

become far more complicated, and those essential activities are small considerations compared to the loss of land, the associated resources, and the atmosphere that characterizes life at the Eddy Farm and in the town of Middlebury. Middlebury and its community should not be expected to, nor can it, solve Brandon's transportation problems. Neither the RS-1 or TR-1 rail spur projects would help Brandon or serve Middlebury in the long run. To consider either project as a worthwhile solution is folly given the statistics and information provided by the DEIS. Only OMYA and VT Railways stands to gain and it comes at a high cost to Middlebury. EFSHR-11

Sincerely,

Danielle Rougeau
President, Board of Directors
EFSHR

ESFHR 11 So noted. The stated need for the project includes the relief of truck traffic in Brandon and Middlebury, which the project will achieve.

Scribner, Sue

From: Chris Robbins [redacted]
Sent: Friday, June 29, 2007 12:03 AM
To: Scribner, Sue
Subject: FHWA-VT-EIS-07-01-D

Dear Ms. Scribner:

Having looked at the EIS for the Middlebury rail spur, it appears that the option with the least impact on the environment and the transportation system would be RS-1 with a bridge over Lower Foote St. and with no relocation of Halladay Rd.

The report is very complete, but there are some errors/omissions. On page 4-97, the report states that "E. coli is associated with farming operations or failed septic systems, and is not associated with increases in impervious surface." I have to differ with that statement. Coliform bacteria is very highly correlated with impervious surface and land development. In fact, the amount of impervious surface usually explains more of the variability in coliform contamination than any other factor in a watershed. (Try doing a web search for "coliform" and "impervious.") CR-1

On page 4-147, in the section on indirect effects, you say that deepening the quarry would have no additional impacts except on bedrock. I would like to know whether groundwater is pumped out of the quarry, and whether deepening the quarry would lower the water table in the surrounding area. CR-2

On page 4-148, in the discussion of additional processing at the Florence plant, the impacts listed are limited to erosion and runoff, noise, and lighting. At the scoping hearing, many participants claimed that the Florence facility is not in compliance with its existing permits, and that it should not be allowed to expand until it is in compliance. The plant has air quality and NPDES permits, and there has been controversy over arsenic pollution of groundwater from an unpermitted tailings landfill. Is the facility in compliance? How many violations has it had recently? None of these issues are mentioned, even though they were obviously of concern to the people who made the effort to come to the scoping hearing. CR-3

I also do not see the issue of conservation easements addressed in the EIS. According to the Middlebury town plan, "In exchange for the rail corridor through Middlebury Area Land Trust existing recorded conservation easements, new conservation easements for the area around US Rt 7 must be established. Additional mitigation to the land owners and MALT must be examined and addressed." CR-4

These issues, as well as a firm commitment on wetland mitigation, should be dealt with before the project goes forward. CR-5

Thank you for the opportunity to comment.

Sincerely,

Chris Robbins
8 Gorham Ln.
Middlebury, VT

Chris Robbins

CR-1 It is true that in many locations, increases in impervious surface caused by urbanization are linked to higher levels of E. coli. In this case, the site is not urban. The statement in the EIS that "E. coli is associated with farming operations or failed septic systems, and is not associated with increases in impervious surface" is specific to the documented information available for Otter Creek. Otter Creek is an impaired water body, and the list of impaired water bodies published by the Vermont Agency of Natural Resources (the "303(d) list of waters") identifies that the source of elevated E. coli in Otter Creek is "failed septic systems and agricultural operations". This is clarified in the FEIS.

CR-2 The EIS states: "Further excavation downward in the quarry would not affect resources (beyond the effects of current operations)." This statement is in the context of indirect impacts. The rate of marble extraction is projected to be the same for both the No-Build and the selected alternative. Therefore, the construction of the rail spur would not cause any additional impacts to resources at the quarry. Groundwater is, in fact, currently pumped out of the quarry, but the effect on the water table has not been studied because it is not an impact of this project.

CR-3 The NEPA process is independent of state and local permitting processes. The text cited in the comment refers to indirect impacts that would occur because of the project, and not to all impacts that may be associated with the Florence processing facility. Omya's existing Act 250 permit identifies and regulates the ongoing effects to the environment that occur in Florence, and these impacts are beyond the scope of the EIS. Compliance with zoning and state law will continue to fall under the purview of local and state authorities.

CR-4 The DEIS acknowledged that the project will require the acquisition of property of privately held lands encumbered by conservation easements and also addressed consistency with relevant town plans, (see Section 4.3.4). The EIS proposes mitigation by providing just compensation required by the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, or other federal regulations. Additional mitigation to comply with the town plan is not being proposed as part of this project. While the town may desire to provide further mitigation, such compensation would be a town initiative. Conservation easements are recognized interests in land and will be identified during the project's right-of-way acquisition stage. Typically, conservation easements include language addressing how the proceeds of eminent domain damage awards must be allocated between the fee owner and the holder of the conservation easement. Moreover, they usually require the holder of the conservation easement to apply its share of the proceeds of an eminent domain award toward protection of similar resources. Details of the provisions found in the easements on parcels to be affected by the rail spur are found in the response to VLT-1.

CR-5 Section 4.10.4.1 of the FEIS describes more detailed wetland mitigation measures proposed for the project, than that provided in the DEIS.

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
408 Atlantic Avenue – Room 142
Boston, Massachusetts 02210-3334

TAKE PRIDE IN AMERICA

June 28, 2007

9043.1
ER 07/401

Mr. Kenneth Sikora, Jr.
Environmental Programs Manager
Federal Highway Administration
PO Box 568
Montpelier, VT 05601

Dear Mr. Sikora:

The Department of the Interior (Department) has reviewed, and has the following comments on, the Draft Environmental Impact Statement (DEIS) for the proposed Middlebury Rail Spur Project, Town of Middlebury, Addison County, Vermont.

Fish and Wildlife

The U.S. Fish and Wildlife Service (FWS) has been involved in the planning for this project for several years. The concerns of the FWS have been adequately addressed. When the preferred alternative is selected, further coordination with FWS is expected concerning mitigation of impacts. OEPC-1

Nationwide Rivers Inventory

Both Chapter/Sections 3.3.1 (page 3-20) and 4.3.4 (page 4-43) recognize Otter Creek to be a valuable natural and recreational resource subject to impact by either alternative RS-1 or TR-1. In fact, this segment of Otter Creek, for 25 miles south of Middlebury to Florence in Addison and Rutland Counties of Vermont, is a featured segment of the Nationwide Rivers Inventory (NRI), so determined by its botanic (swamp forest), hydrologic (free-flowing water), and historic (seven covered bridges) resource values significant particularly to the State of Vermont as well as the New England Region. Unfortunately, such designated status of Otter Creek, since 1982, has not been mentioned in the evaluation and analysis of impacts in this Draft Environmental Impact Statement. The NRI administered by the National Park Service is associated with the Wild and Scenic River System. OEPC-2

Conclusion

The Department has a continuing interest in this project. For further coordination on fish and wildlife resources, please contact Bill Neidermyer of the U.S. Fish and Wildlife Service, New England Field Office, 70 Commercial Street, Suite 300, Concord, NH 03301-5087, telephone (603) 223-2541. For additional information on the probable impact of this project on the NRI

U.S. Department of the Interior Office of Environmental Policy and Compliance

OEPC-1 So noted. Additional coordination with USFW will occur as the project proceeds.

OEPC-2 The corrected text is in Section 3.9.2.1 of the FEIS.

segment and consultation on ways to avoid or minimize the project's harm to the natural and recreational values of Otter Creek, please contact Mr. Jamie Fosburgh, National Park Service, Rivers, Trails and Conservation Assistance, 15 State Street, Boston 02109, telephone (617) 223-5191.

Thank you for the opportunity to review the DIES for the Middlebury Spur Rail Project. Please contact me at (617) 223-8565 if I can be of further assistance.

Sincerely,

Andrew L. Raddant
Regional Environmental Officer

Scribner, Sue

From: Danielle.Gosselin@stb.dot.gov
Sent: Thursday, June 28, 2007 12:51 PM
To: Sikora, Kenneth; Scribner, Sue
Subject: RE: Middlebury Spur

Dear Rob and Sue,
It was very nice meeting you both on June 7th. I appreciated being able to do the site visit and attend the public meeting. I am writing to let you know that our office does not have any comments on the Draft EIS at this time. We would, however, like to reserve some space in the Final EIS in order to describe a little bit about our agency and what we do. STB-1

In addition, I still haven't received a letter formally inviting us to participate as a cooperating agency in the project. Since we are already listed as a cooperating agency in the Draft EIS, our office requires that we receive and respond to a formal invitation. I would be happy to send a draft of the letter for your signature if that is easier. Please let me know.

Thanks,
Danielle

Danielle Gosselin
Attorney-Adviser
Section of Environmental Analysis
Surface Transportation Board
Tel: (202) 245-0300

STB-1 A description of the Surface Transportation Board has added.

Scribner, Sue

From: moodoovt [moodoovt@sover.net]
Sent: Thursday, June 28, 2007 4:03 PM
To: AOT - Midd-Spur-Deis
Subject: Comments
Importance: High

ATTN: Mr. Kenneth R Sikora, Jr. and Ms. Susan Scribner

The following comments are being submitted by Foster Brothers Farm and Vermont Natural Ag Products pertaining to the draft EIS pertaining to the Middlebury Spur project. As background, both entities are and will be significantly impacted by the proposed project with land being taken, efficient business activities disrupted or reduced, agreements changed or broken, drainage and its effects on both operations, etc.

We appreciate the effort that has gone into keeping the public informed as the studies have progressed.

We are concerned that some of the information presented in the study is not entirely accurate. Our concern is that, as has been so in other studies, the inaccuracy or choice of words become fact in future studies or decisions. A case in point, the category of "Streams" on Page 3-64 of Volume I, these are man made ditches to improve drainage not streams as inferred. There are significant operational impacts on our businesses depending on what definitions are used by which organizations with respect management and setbacks, etc.

Similarly, on 3-67, "Wetlands 2" these ditches were to a large extent excavated on dry land.

FB& VNAP-1

"Wetland 3", 3-68, has had hemlock timber harvested on numerous occasions and that species was not mentioned.

FB& VNAP-2

"Wetland 5", 3-69, and the area north of the access road is a man made drainage and retention system designed by NRCS with a filter strip for management of leachate from the composting site.

FB& VNAP-3

On 3-84 last paragraph the dairy is operated by Foster Brothers Farm not VNAP.

On 3-85, Site M-20, the building moved to the location and a dormer added.

On 3-86, Site M-22, the building was moved to the location from Foster Motors.

On 4-89, last paragraph, ...and west well beyond...should be 'east well beyond'.

On the top of 4-91 general comment these lots will be mostly consumed by the rail spur.

Figure 5.4 on the handout incorrectly identifies the land as VNAP not Foster Brothers Farm.

These are some of the errata found in a cursory review of the extensive document.

FB& VNAP-4

This leads to the question as to who provides funding to interested parties to identify and correct the errors and mistakes found in the documents as this study was an imposition on those effected. This is a burden that should not be born by the imposed upon. Therefore we reserve the right to recover any damages or imposition on our operations as a result of this study and any subsequent use of the data by interested parties such as the State of Vermont or its proxy or the Federal Government or its proxy.

FB& VNAP-5

We also wonder why the Trans-load Facility was chosen to be located on the farm land rather than on the lands of Omya.

FB& VNAP-6

Referencing ES-13, as well as other sections (2-33 and 2-34) of the document, the closing of Lower Foote Street would have serious negative repercussions to our dairy operation. Farm equipment having to get onto and off from Route 7 to access to Cady Road is a hazardous and impractical solution. Also, Lower Foote Street over the

FB& VNAP-7

Foster Brothers and Vermont Natural Ag Products

FB&VNAP-1 Figures 3.9-3 and 3.9-4 show all the jurisdictional wetlands in the study as determined by a field delineation and subsequent field review with representatives of the Vermont Agency of Natural Resources and the Army Corps of Engineers. Input from Foster Brothers farm representatives was taken into consideration in the determinations of wetland jurisdiction.

FB&VNAP-2 So noted. Corrections have been made to the FEIS.

FB&VNAP-3 See response to FB & VNAP-1

FB&VNAP-4 So noted. Corrections have been made to the FEIS.

FB&VNAP-5 No provisions exist for providing monetary compensation for correction of errors found in the DEIS.

FB&VNAP-6 The location for the proposed transload facility for RS-1 has been reconsidered and is now shown in the FEIS on Omya property (see Figure 2.6-1).

FB&VNAP-7 Impacts to active agricultural operations are discussed in Section 4.9.2. (See also 4.2.2.1.2) The closing of Lower Foote Street is not proposed as part of the preferred alternative in the FEIS.

years has become part of the de facto easterly bypass around Middlebury. A number of Bicyclist use Lower Foote Street as well. Closing the road is a not an option for us. FB& VNAP-7

Also, access to the quarry east of Lower Foote Street is a private road with Foster Brothers retaining ownership and Omya holding a right-of-way with the reverse west of Lower Foote Street. FB& VNAP-8

We are VERY concerned about how adequate compensation will be determined. After reviewing the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, there appears to be no provision for dealing with the business impacts and the long term consequences of those impacts which would include increased transportation costs, inefficiencies, drainage issues, soil water table impacts, increased traffic, ownership issues, permitting issues, isolation of the livestock from a large component of the forage production base etc. All of these impact the long term viability of our businesses and must be addressed. FB& VNAP-9

For further information please contact Robert Foster 802.388.1137. Foster Brothers Farm and VNAP, 297 Lower Foote Street, Middlebury, Vermont 05753

FB&VNAP-8 So noted. The DEIS referenced the quarry access road as a private road in Section 1.1 of the EIS.

FB& VNAP 9 Compensation will be determined during final design as part of the right of way acquisition process in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Uniform Act) and implementing regulations (49 CFR part 24). The Uniform Act provides compensation for land acquisition and assistance for persons and businesses displaced by government actions, including farming operations.

TOWN OF BRANDON VERMONT CHARTERED 1761

TOWN OF BRANDON

49 CENTER STREET • BRANDON, VERMONT 05733-1193
TOWN OFFICE FAX (802) 247-5481 • POLICE FAX (802) 247-0221

General Information 802-247-3635
Town Clerk / Treasurer 802-247-5721
Police - Business Office 802-247-0222
Town Manager 802-247-0225
Accounting 802-247-0223
Recreation Dept. 802-247-0228

June 25, 2007

Ms. Susan Scribner, Project Manager
Vermont Agency of Transportation
National Life Building, Drawer 33
Montpelier, VT 05633

Dear Ms. Scribner:

Regarding the "Middlebury Spur, Draft Environmental Impact Statement," the Town of Brandon hereby forwards its comments (attached). These comments were discussed at a duly warned meeting of the Brandon Selectboard on June 25, 2007.

We look forward to the possibility of removing some of the detrimental traffic from highly congested U.S. Route 7 in our downtown. This will somewhat benefit our economic development, but only to the extent that trucks hauling from Omya's quarry are removed. Brandon will continue to suffer the economic effects and unsafe conditions from the remaining traffic on an obsolete section of arterial highway which fails to meet federal standards. BRANDON-1

We believe consideration must be given to our citizens and neighbors who could be placed at a serious economic disadvantage when their jobs are displaced by the project. It is both reasonable and responsible to require the project to accommodate and mitigate their displacement. This point was not addressed by the Draft Environmental Impact Statement, and it is a serious oversight. BRANDON-2

Thank you for your consideration of these comments. If you require further information, you may contact the Selectboard through Brandon's Town Manager, Mr. Keith Arlund.

Sincerely,

G. William Hatch, Chair

Property Listers 802-247-0226
Zoning / Rental / Health 802-247-0227
Public Works Supt. 802-247-0224
Transfer Station 802-247-8372
Highway Garage 802-247-3600
Sewer Dept. 802-247-6730

Town of Brandon

BRANDON-1 Section 3.1 provides information about existing traffic conditions in the study area, including Brandon Village. The purpose of the project, as identified in the purpose and need statement in Section 1.3, is to provide for the safe and efficient transportation of freight to and from Middlebury, Vermont. The need for the project is based in part on the adverse effects of truck traffic in Brandon Village and on local roads. Alleviating all of the adverse effects of traffic on Brandon Village is beyond the purpose and need of the project. Independently planned improvements to traffic in the town of Brandon will still occur under the build alternatives.

The Purpose and Need of the Middlebury Rail Spur, as identified in Section 1.3 of the EIS, is to provide for the safe and efficient transportation of freight to and from Middlebury, Vermont. Traffic concerns in Brandon are a contributing part of the need. However, the Brandon highway bypasses were screened out early in the process, as described in Section 2.3.2.5, because they only partially met the project need, and because the time and cost for construction made them impractical.

BRANDON-2 Employment impacts are discussed in Section 4.3.2 of the EIS. While the EIS recognizes the impacts to individuals that are likely to occur as a result of the project, the net loss of 62 jobs does not necessarily warrant mitigation in a regional economy that supports 13,000 jobs. Services related to job outplacement, retraining, and relocation are available through other agencies.

TOWN OF BRANDON, VERMONT
COMMENTS PERTAINING TO DRAFT ENVIRONMENTAL IMPACT STATEMENT - MIDDLEBURY RAIL SPUR

1. The preferred alternative, RS-1, appears to meet the Purpose and Need of the specific project, with some collateral benefit for the Town of Brandon. Certainly, removing 230 truck trips per day ("heavies") from Route 7 through downtown would enhance the aesthetics and improve the economic viability along the Route 7 corridor through Brandon. However, the specific project does not do anything beyond that to meet the Purpose and Need for Brandon, and at least 2 Bypass Alternatives would be of more benefit to the Town. A bypass would remove almost all of the projected truck traffic, as well as significant amounts of other traffic from Brandon's downtown, and would be of far greater benefit to the Town. Since the initial study of the Rail Spur was initiated, the growth in truck traffic - other than that generated from Omya's transportation needs - has grown by more than the apparent relief offered by RS-1. We note from Table 3.1-4 ("Projected 2030 Average Annual Daily Traffic {AADT} Along US 7") the following: BRANDON-3

	Total AADT	Trucks
2004	11,500	1,265
2030	15,930	1,750.

Thus, while the Town of Brandon is generally supportive of the findings in the DEIS, we are still confronted with the specter of increasingly intense traffic in an already highly congested corridor.

2. The Town of Brandon is concerned with the apparent economic impact from jobs lost due to RS-1. We noted in Table 4.2-1 ("Year 2030 Employment Impact, RS-1") that a net of 41 Direct and 21 Indirect employees would be displaced, primarily due to the lost truck-driving, maintenance, etc. jobs that would not be required. Actually, the impact would not come in 2030, but immediately upon the Rail Spur becoming operational (2010-2013?). About 30 of those individuals live in Brandon; supporting their families, paying taxes, etc. from well-paid jobs. Economic development is about more than the investment attracted to the Town of Brandon by reducing traffic congestion. Brandon's economy also depends upon good, stable employment opportunities for its citizens. The Town of Brandon strongly encourages the Final EIS to take into consideration funding as a part of the ultimate project, some combination of: job outplacement, retraining, relocation, and/or direct compensation; to those who will lose their jobs as a result. This form of mitigation is no less important than other forms, such as wetlands, agricultural soils, and/or compensating property owners for compromised viewscapes. BRANDON-4

BRANDON-3 See response to BRANDON-1, above

BRANDON-4 See response to BRANDON-2, above.

Addison County Regional Planning Commission

79 Court Street Middlebury, VT 05753 www.acrpc.org Phone: 802.388.3141 Fax: 802.388.0038

June 19, 2007

Mr. Kenneth Sikora, Jr.
Environmental Program Manager
Federal Highway Administration
P.O. Box 568
Montpelier, Vermont 05601

Ms. Susan Scribner
Project manager
Vermont Agency of Transportation
Drawer 33
Montpelier, Vermont 05633

Re: Request to Extend the Comment period on the Middlebury Rail Spur EIS.

Dear Mr. Sikora and Ms. Scribner :

This letter constitutes the request of the Addison County Regional Planning Commission on behalf of its Natural Resources Committee for additional time to review and evaluate the EIS issued by the Federal Highway Administration and the Vermont Agency of Transportation on the Middlebury Rail Spur. The Natural Resource Committee is a committee of volunteers generally meeting once per month. The EIS is over 1,000 pages long and involves an important and substantial piece of infrastructure proposed within the Addison Region. The Natural Resources Committee wants to evaluate the project for its impacts on natural resources and hereby requests an additional 60 days from the original filing deadline (August 29th) to allow it to thoroughly review and thoughtfully comment on the EIS.

Thank you for your consideration of this matter. Please respond as soon as possible so the committee may act accordingly. In the meantime, if you have any questions or concerns, please call me at the number noted on the letterhead.

Sincerely,

Adam G. Lougee, Director
Addison County Regional Planning Commission

NRC-1

Cc: Andrea Ochs, Chair, Natural Resource Committee
Fred Dunnington

Addison Bridport Bristol Cornwall Ferrisburgh Goshen Leicester
Lincoln Middlebury Monkton New Haven Orwell Panton Ripton
Salisbury Shoreham Starksboro Vergennes Waltham Weybridge Whiting

Addison County
REGIONAL PLANNING COMMISSION

Natural Resources Committee of the Addison County Regional Planning Commission

NRC-1 The comment period for the DEIS was 47 days and was consistent with federal regulations.

Addison County Regional Planning Commission

79 Court Street Middlebury, VT 05753 www.acrpc.org Phone: 802.388.3141 Fax: 802.388.0038

June 26, 2007

Mr. Kenneth Sikora, Jr.
Environmental Program Manager
Federal Highway Administration
P.O. Box 568
Montpelier, Vermont 05601

Ms. Susan Scribner
Project manager
Vermont Agency of Transportation
Drawer 33
Montpelier, Vermont 05633

Re: Comments regarding the Middlebury Rail Spur EIS.

Dear Mr. Sikora and Ms. Scribner:

This letter constitutes the comments of the Transportation Advisory Committee ("TAC") of the Addison County Regional Planning Commission concerning the draft EIS issued by the Federal Highway Administration and the Vermont Agency of Transportation on the Middlebury Rail Spur. The TAC of the Addison County Regional Planning Commission was formed under the federal highway processes designed to ensure that local officials have the opportunity to comment on state and federal transportation projects within their regions. Accordingly, the TAC consistently reviews and comments on state and federal projects within the Addison region. At its meeting of June 19, 2007 the TAC discussed and reviewed the draft EIS for the Middlebury Rail Spur. The Chair of the TAC, Jeff Nelson noted the current version of the Transportation Section of the Regional Plan addresses the Middlebury Rail Spur as follows:

> The use of rail sidings for freight transfer should be encouraged. New rail spurs should be investigated for the shipment of extracted materials, such as quarry material and sand and gravel. In particular, rail alternatives should be vigorously explored for OMYA Corporation which currently uses US Route 7 for the shipment of material.

Addison County Regional Plan, Section 6, Transportation, p.6.1-43 (Originally adopted September 13, 1995, Readopted November 9, 2005). After discussion concerning the transportation elements of the proposed project, informed by members present at the June 7, 2007 public hearing in Middlebury, the TAC resolved that the draft EIS follows the recommendation of the Regional Plan noted above and adequately addressed the alternatives available. Accordingly, the TAC expressed its support for the preferred design alternative selected by the draft EIS.

TAC-1

The Transportation Advisory Committee of the Addison County Regional Planning Commission

TAC-1 So noted.

Scribner, Sue

From: Fred Lower [redacted]
Sent: Wednesday, June 27, 2007 10:32 PM
To: AOT - Midd-Spur-Deis
Subject: Omya rail spur comment

I live in the area that would be affected, but having just come from a meeting about preserving and enhancing all that is good about Middlebury, I see this draft proposal for a rail spur as a blight upon the whole community. We want our wetlands protected, our residential areas to remain livable, and industrial development to remain in the areas the town has already designated (the Exchange Street area). We are being "railroaded" by a rich company. I think the Draft Environment Impact Statement was skewed from the beginning by choosing criteria that asked how can we accommodate Omya? I attended several of the meetings and the presenters seemed transparent and calculating in their mission to put Omya's needs above Vermont citizens.

M&FL-1

Mary and Fred Lower

Mary & Fred Lower

M&FL-1 So noted. The location of the proposed rail spur is in the area designated for it in the Middlebury Town Plan.

Scribner, Sue

From: Brett Howe [Brett.Howe@noaa.gov]
Sent: Wednesday, June 13, 2007 2:35 PM
To: AOT - Midd-Spur-Deis
Subject: Comments on Middlebury Spur DEIS

June 13, 2007

Mr. Kenneth R. Sikora, Jr.
Environmental Program Manager
Federal Highway Administration
P.O. Box 568
Montpelier, Vermont 05601

Dear Mr. Sikora:

Attached are comments on the Middlebury Spur Proj, Improvements to the Freight Transportation System in the Town of Middlebury in Addison Co to the Town of Pittsford in Rutland Co, VT (20070181). We hope our comments will assist you. Thank you for giving us the opportunity to review this document.

Sincerely,

Brett Howe
Program Analyst
NOAA National Geodetic Survey
SSMC3 8622, NOAA,
N/NGS 1315 East West Highway
Silver Spring, Maryland 20910

MEMORANDUM FOR: Rodney F. Weiher
NOAA NEPA Coordinator

FROM: David Zilkoski
Director, National Geodetic Survey

SUBJECT: **DEIS Regarding Middlebury Spur Proj, Improvements to the Freight Transportation System in the Town of Middlebury in Addison Co to the Town of Pittsford in Rutland Co, VT (20070181)**

The subject statement has been reviewed within the areas of the National Ocean Service (NOS) responsibility and expertise and in terms of the impact of the proposed actions on NOS activities and projects.

All available geodetic control information about horizontal and vertical geodetic control monuments in the subject area is contained on the National Geodetic Survey's home page at the following Internet World Wide Web address: http://www.ngs.noaa.gov After entering the this home page, please access the topic "Products and Services" and then access the menu item "Data Sheet." This menu item will allow you to directly access geodetic control monument information from the National Geodetic Survey data base for the subject area project. This information should be reviewed for identifying the location and designation of any geodetic control monuments that may be affected by the proposed project.

If there are any planned activities which will disturb or destroy these monuments, NOS requires not less than 90 days' notification in advance of such activities in order to plan for their relocation. NOS recommends that funding for this project includes the cost of any relocation(s) required. NOAA-1

For further information about geodetic control monuments, please contact:

Brett Howe
SSMC3 8622, NOAA, N/NGS
1315 East West Highway
Silver Spring, Maryland 20910

Voice: (301) 713-3197 ext. 115
Fax: (301) 713-4175
Email: Brett.Howe@noaa.gov

National Oceanic and Atmospheric Administration

NOAA-1 Final engineering plans will locate geodetic survey monuments as well as any existing utilities. Available information has been researched, and there are no geodetic monuments that will be affected by the proposed alignments. NOAA monuments will be relocated as necessary in the event that any monument will be affected by construction work.

From: [redacted]
Sent: Wednesday, June 27, 2007 11:42 AM
To: AOT - Midd-Spur-Deis
Subject: Public Comment

My husband and I object to the Middlebury Rail Spur project for the following reasons which you identified in your DEIS:

- Increase air pollution over both the short and long term due to lack of emissions improvement in the railroad sector
- Increase noise pollution due to the travel of additional trains as well as required signals at two road crossings
- Decrease employment in the county and the Florence mining area as OMYA truckers lose their jobs
- Increase flooding in farm, wood lands and sensitive wetlands along the Otter Creek and Middlebury River convergence further increasing water pollution in an environmentally vulnerable area home to tens of thousands of fish, otters, grassland birds, beavers and amphibians (one of whom has already been identified as a Special Concern species) and ultimately increase pollution through runoff to Lake Champlain.

HT & GO-1

Even VTtrans identifies maintaining the status quo as the least of all the damaging options.

Additionally the project would degrade the rural scenery as the train will run on a trestle bridge over floodplain currently held in trust, appearing almost like a Disneyland monorail, and running within one hundred feet of a home currently part of Vermont's historic registry. While there hasn't been a formal archeological or architectural study conducted yet, the rich history of the Otter Creek river basin will require extensive study and has not been started. AOT and UVM archeologists indicated on a recent visit that they expect to find significant Native American artifacts all along the Otter Creek banks.

HT & GO-2

The rail spur was originally considered because of complaints from Brandon businesses and residents about the number of OMYA trucks hauling marble from the Middlebury quarry through Brandon en route to their Florence facility for processing. As a resident of a small town and frequent patron of Brandon businesses, I am very sympathetic to their frustration and the impact on their businesses and community. However, despite requests from the public for a written commitment from OMYA to remove trucks once an alternative is built, nothing has materialized. In fact, it has become apparent that OMYA will not provide that commitment

HT & GO-3

According to the Chittenden County Regional Planning Organization, the only real beneficiary economically is OMYA. A quote from their website: "and the Middlebury Rail Spur *(intended to cater to long-term demand of extraction from a calcium carbonate quarry, whilst reducing truck traffic on US 7 in Brandon)"*
Finally, if the project is approved, it will include a transfer station east of Route 7 and south of Middlebury. This transfer station will be the northernmost transfer station for all rail freight on the western side of Vermont. Rail freight would then be offloaded and trucked through the town of Middlebury north to Chittenden County and beyond. So the impact will essentially be felt around the Middlebury green as tractor trailers use Route 7 as their primary corridor to deliver their freight north.

HT & GO-4

Sincerely,

Holly Tippett
Gregory O'Brien
Middlebury

Holly Tippett and Greg O'Brien

HT&GO-1 Impacts to air quality are discussed in Section 4.4 of the EIS. Impacts to noise are discussed in Section 4.6. Impacts to employment are discussed in Section 4.3.2. Impacts to floodplains and floodways are discussed in Section 4.10.3, impacts to water quality are discussed in Section 4.9.2.2, impacts to wetlands are discussed in Section 4.10, and impacts to wildlife are discussed in Section 4.6.

HT&GO-2 Visual impacts are discussed in Section 4.3 of the EIS. Floodplain impacts are discussed in Section 4.9, and impacts to historic resources are discussed in Section 4.11.2. Impacts to archaeological resources are discussed in Section 4.11.1.

The proposed rail spur does not come within 100 feet of any historic homes. It would be 421 feet from the Hathaway house and 188 feet from the Hathaway barn. Additional information on impacts to the Hathaway property may be found in Section 4.11.2.2 of the FEIS.

Subsequent to the DEIS, a sample of five areas of varying sensitivity were sampled by digging several series of test pits along transects. As a result of this test, three archaeological sites were discovered (VT-AD-1493, VT-AD-1494, and VT-AD-1495). As a result of this study, more specific information on alternatives' impacts and appropriate mitigation have been included in this FEIS (see Section 4.11.1). As such, this information is being circulated for public review and comment.

Archaeological study will proceed with additional Phase I field testing in other sensitive portions of the rail corridor, as well as Phase II evaluation at the three identified sites at the Eddy Farm once VTrans obtains legal access to properties. Phase II study involves more detailed site excavation and study. Based on the results of the Phase II study, impacts will be known, and if necessary, mitigation could be provided through Phase III data recovery, or the study may be concluded with documentation, public education and outreach.

Section 106 of the National Historic Preservation Act of 1966 provides a process for determining effects on historical resources caused by federally funded actions, and for avoiding, minimizing and mitigating for such effects. A Memorandum of Agreement signed by the Federal Highway Administration and the Vermont Division for Historical Preservation to ensure that the project is in compliance with all applicable laws and requirements.

As a clarification, a comment period will follow the publication of the FEIS and comments will be considered in the Record of Decision.

HT&GO-3 FHWA and VTrans share this concern. Omya has indicated that the intention is to use the rail spur. See the comment letter from Omya reproduced on page I-8 in this Appendix, in particular the second paragraph, which reads "Omya is committed to using rail whenever possible to transport its raw material and finished product". However, a firm commitment to using the rail and to removing truck traffic from Route 7 is critical to meeting the purpose and need of the project. Before the project moves forward, FHWA will explore ways to secure Omya's commitment to using rail. However, Omya's actual use of the proposed rail spur necessarily is dependent on future economic conditions so it is not appropriate to require an ironclad guarantee from Omya as to use of the proposed rail spur.

HT&GO-4 There will be potential economic benefit to downtown Brandon and perhaps other areas as reduced truck traffic improves the atmosphere in shopping areas (see Section 4.2.2). The effects of other freight shippers using the rail spur are addressed in Section 4.1.1.2.2, under Traffic Impacts.

The proposed freight transfer station will not be the "northernmost transfer station for all freight rail on the western side of Vermont." There are transload facilities in several places north of the proposed facility, including the existing facility on Exchange Street in Middlebury, multiple facilities in Burlington, as well as facilities in St. Albans and Swanton.

Scribner, Sue

From: Bob Champlin [redacted]
Sent: Tuesday, June 19, 2007 4:55 PM
To: Scribner, Sue
Cc: fdunnington@town.middlebury.vt.us
Subject: RS-1 Halladay Road Rail Spur

Dear Sue:

I live just south of the proposed RS-1 rail crossing and feel that the best alternative would be a railway bridge over Halladay Road. This would allow Halladay Road traffic the same direct route that is present. On the option that would have a new extension of Halladay Road parallel to the railroad tracks residents of Halladay Road would have approximately 4/10 of a mile added to a round trip to Middlebury. This doesn't seem like much but over the course of a year it would add up to about 600 miles based on 5 trips a day over 300 days annually (this is about what we do based on two cars). There would be an additional cost of car operation based on 38 cents per mile of $228.00 yearly. Also a roundtrip to town would be about 10 minutes longer. (calculation: 4/10 miles per round trip x 5 trips per day x 300 days = 600 miles per year which would cost 38 cent per mile to operate car x 300 miles = $228. per year). BC-1

Also consider the school bus travels on Halladay Road and would have to detour to Route 7 and back to Halladay Road which would add about 5/10 of a mile one way. School bus travel time would be 5-10 minutes extra one way as the school bus would have to deal with entry to route 7 two times vs one time. This entry is very dangerous and a second entry that could be avoided should be eliminated.

Bob Champlin

Please note new email address:
[redacted]

Bob Champlin

BC-1 So noted. The Halladay Road Relocation Option is not included as part of the preferred alternative in the FEIS.

Scribner, Sue

From: Bob Champlin [redacted]
Sent: Tuesday, June 19, 2007 6:35 PM
To: Scribner, Sue
Cc: fdunnington@town.middlebury.vt.us
Subject: Middlebury, Vt rail spur comments - No build option.

Traffic in Brandon, Vermont on Route 7 is estimated to increase by 35% by 2027. With this increased truck traffic (not considering the OMYA trucks) Brandon at some point in the future will have the same truck traffic as it has now. Brandon will have truck traffic with or without the spur. BC-2

There is absolutely no guaranty that OMYA will use the spur and might revert to trucking or a combination of rail and trucking, OMYA has refused to consider this issue. BC-3

OMYA could close or curtail operation at the Middlebury Quarry if the product could be obtained elsewhere at a lower price. With a growing world economy this is possible. In the event the quarry was closed OMYA would not contribute on a tonnage basis and the cost would not be recovered. BC-4

There would be an adverse visual affect along with vibration and pollution with RS-1 that would not be present with the no build option. Pollution for railroads is not controlled as it is with trucks and there would actually be more pollution with rail operation. Property values would drop near the spur. BC-5

In conclusion it is a misuse of funds to spend a huge sum (30 million upwards) for a project that has so many undesirable components. The funds should be put to far better use to serve the public good.

Bob Champlin

BC-2 Section 4.1.2.1 details the impacts to the traffic system that will occur following construction of the proposed rail spur. Traffic will increase whether or not the rail spur is constructed. For NEPA purposes, quantification of impacts is based on comparisons of build alternatives with the No Build Alternative, not with existing conditions.

BC-3 FHWA and VTrans share this concern. While Omya has indicated that the intention is to use the rail spur, a commitment to using the rail and to removing truck traffic from Route 7 is critical to meeting the purpose and need of the project. Before the project moves forward, FHWA will explore ways to secure Omya's commitment to using rail. However, Omya's actual use of the proposed rail spur necessarily is dependent on future economic conditions so it is not appropriate to require an ironclad guarantee from Omya as to use of the proposed rail spur.

BC-4 Economic conditions are always subject to change. The EIS presents a reasonably foreseeable future scenario based upon the best available information attained through consultation with Omya and economic and transportation professionals.

BC-5 Visual, air quality, vibration, water quality, and hazmat impacts are addressed in Sections 4.3, 4.4, 4.5, 4.9, and 4.12, respectively. Impacts to properties are described in Section 4.2.3.

June 22, 2007

To: Sue Scribner, VTrans

We are the property owners of 484 Halladay Road, Middlebury. Our property, in particular, is one of the potentially affected pieces of land if the Middlebury Rail Spur moves forward. We would like to state that we are completely against the idea of a rail spur being placed in our quiet, scenic, and beautiful neighborhood.

We are understanding of the need for alternative transportation, and the problem that exists in Brandon. However, we have not seen any agreements from OMYA to eliminate their truck traffic. It is also very concerning, according the reports from Vtrans own EIS, with the increase in pollution(from trains) in the long term reports. The proposed route would affect many acres of wetlands, not to mention impose major negative alterations to our existing views. We are also not understanding how this project is being considered even though it is intended for 1 company. E&HH-1 E&HH-2

Our home is listed with the VT Historical Society and qualifies for the National Registry. E&HH-3

A significant amount of property in which the proposed rail spur is intended, is also currently protected by Middlebury Area Land Trust, this includes our acreage and home.

I have heard considerations of an "at grade crossing" with route 7, I realize that this is cheaper than a " below E&HH-4

Eric and Holly Hathaway

E & HH-1 Air quality impacts are described in Section 4.4. Wetland impacts are described in Section 4.10. Visual impacts are described in Section 4.3. (See also response to BC-3.)

E & HH-2 While Omya benefits from the proposed rail spur, VTrans expects that the residents and businesses of Brandon Village and the roadways along Omya's truck route would also benefit. Other freight shippers may also benefit by improved access to rail transportation.

E & HH-3 Impacts to historic resources, including the Hathaway house on Halladay Road, are described in Section 4.11.2. Privately owned lands with conservation easements are shown on figures 4.2-1 and 4.2-2. Conservation easements are recognized interests in land and will be identified during the project's right-of-way acquisition stage. The easement held by the Middlebury Area Land Trust on Lot 8211.000 (the Hathaway lot) provides that, in the case of acquisition of the property though eminent domain, proceeds would be allocated between the grantee and grantor based on a ratio based upon the relative value of the development rights and conservation restrictions, and on the value of the fee interest. The Middlebury Area Land Trust would then, in accordance with the easement, use the proceeds to preserve undeveloped and open land of the Town through non-regulatory means.

E & HH-4 All of the proposed RS-1 options feature a crossing under Route 7. An At-Grade crossing for Route 7 has never been considered.

grade crossing", but I feel this would hinder the traffic flow on route 7. This would also affect the entire layout of the potential rail spur, including ALL the open views from our property and our neighbors views as well.

This project is inconceivable and would completely ruin our historical piece of property. We intend to take all the necessary steps to preserve our land and our rights. We ask that you visit our home , in person, and neighborhood to view the land that you intend to destroy.

Sincerely,
Holly Hathaway
Eric Hathaway

Eric & Holly Hathaway
484 Halladay Rd
Middlebury, VT 05753
802-388-7507

PDD - LTF

JUN 25 2007

Approved________

June 22, 2007

Dear Ms. Scribner,

The proposed railroad spur is planned to pass under Rte 7 south, run through privately owned land and to cross Halladay Rd. While this is not a lengthy road a lot of good people have homes here, and the road is scenic enough to attract local people as well as tourists. The proposed freight rail will change this quiet neighborhood to that of an industrial zone.

H & ST-1

One proposal to move freight cars across Halladay Rd is to build a bridge to span the road. An attractive covered bridge might be interesting but the suggested drawings do not show that. Another idea is to make a grade level crossing with gates, flashing lights, and horns. A third idea is to block the crossing to be dead ended. This would divide our neighborhood. People whose homes are located north of the rail crossing would exit a short distance onto Rt. 7. Those below the blocked area would have to travel down and around to Rt 7. To solve this problem it has been suggested that a new road be built through

H & ST-2

Herb and Sue Taylor

H & ST-1 The land use zone around Halladay Road is Agricultural/Rural Residential, and not an industrial zone, and the zoning will not change as a result of the project. Noise impacts of the proposed rail crossing are addressed in Section 4.5, visual impacts are addressed in Section 4.3, and traffic impacts are addressed in Section 4.1. The rail spur is depicted in the Middlebury Town Plan in the same location as the FEIS.

H & ST-2 The Halladay Road Relocation option was not included as part of the preferred alternative in the FEIS. The type of bridge will be determined during final design.

the woods and fields to a new exit further south on Rt 7. This is a disruptive, unacceptable, and costly idea.

Immediately after crossing Halladay Rd. trains would run through parcels of private property, land belonging to the Middlebury Area Land Trust, and the Vermont Land Trust. Needed land would be taken for the benefit of the railroad.

H & ST-3

Farmlands, woods, wet areas and flood plains are all involved. Such places are important for people of all ages to enjoy the beauty of natural settings, to sustain a wide variety of healthy wildlife to clean and protect water levels, to boost air purity, and for study and research. The running of freight trains would compromise these areas.

The Middlebury rail spur is a bargain for Omya. Omya will pay a

H & ST-4

share for the rail construction on the basis of estimated cost, which is most likely low by a substantial dollar amount. Their payments, if amortized

H & ST-3 Impacts to private property are discussed in Section 4.2.3. Privately owned lands with conservation easements are shown on figures 4.2-1 and 4.2.2. The Middlebury Land Trust holds easements on four parcels that will be affected by the rail spur, but does not own any of the land. Conservation easements are recognized interests in land and will be identified during the project's right-of-way acquisition stage. Typically, conservation easements include language addressing how the proceeds of eminent domain damage awards must be allocated between the fee owner and the holder of the conservation easement. Moreover, they usually require the holder of the conservation easement to apply its share of the proceeds of an eminent domain award toward protection of similar resources. Impacts to farmlands, wetlands, floodplains, wildlife, surface water, and air quality are discussed in Sections 4.8, 4.10, 4.9.3, 4.6, 4.9.2, and 4.4 respectively.

H & ST-4 The costs of the proposed project alternatives are detailed in Section 2.7. The project would be most likely funded through a combination of federal, state, and private sources. Agreements regarding cost-sharing have not been finalized. In addition, the legislature will ultimately have to approve the expenditure of state and federal funds.

12 FRANKLIN STREET B&B

FDD - ITT
JUN 25 2...
Approved

12 Franklin Street Bed and Breakfast
Brandon, VT 05733

Susan Scribner
Project Manager
Vermont Agency of Transportation
Montpelier, VT 05633

Dear Ms. Scriber,

LH & JS-1

As small business owners along Route 7 in Brandon, we strongly endorse the idea of the Omya rail spur proposal. We believe this proposal is the best available to reduce the terrible truck noise problems that we endure each day. The rail spur would be a boon to, not only our small bed and breakfast, but the other small businesses along the route. We hope this project will proceed as rapidly as possible.

Sincerely,

Linda Healy Jim Schamber

Linda Healy/Jim Schamber
12 Franklin Street B&B
Brandon, VT 05733

<u>Linda Healy & Jim Schamber</u>

LH & JS-1 So noted.

PINEWOOD GARDENS, INC.
2473 Franklin St., (US Rte 7)
P.O. Box 398
Brandon, VT 05733-0398
Ph 802 247 3388 Fax 802 247 3328

pgctr@sover.net

June 6, 2007

Susan Scribner, VTrans Project Manager
Vermont Agency of Transportation
Program Development Division
National Life Building – Drawer 33
Montpelier, VT 05633

Re: Rutland Herald Article "Omya mulls rail alternative…."

Dear Susan Scribner:

PG-1

Seems to us, twenty years of discussion concerning the proposed rail spur is enough. Now is the time to go ahead with the project. Mulling time should be over.

The railroad spur is, without doubt, the only common sense alternative for transporting marble from Middlebury to Florence.

Sincerely,

Tom & Beverley Sabatini

Tom & Bev Sabatini
Pinewood Gardens, Route 7, Brandon, VT

PDD - LTF
JUN 11 2007
Approved____

Pinewood Gardens

PG-1 So noted.

Ms. Susan Scribner, Project Manager
Vermont Agency of Transportation
Montpelier, VT 05633
June 22, 2007

Dear Ms. Scribner,

Thank you for your presentation in Middlebury Thursday, June 7, on the Draft Environmental Impact Statement of the Middlebury Spur Project.

As a resident of Brandon, and someone who lives mere blocks away from both Route 7 and Vermont Railway, I have been following this project with keen interest. Any effort to remove trucks from from Route 7 travelling through Brandon would be great, but for me, the DEIS, in fact, raises more questions than answers regarding the project.

PK-1

I found the photos demonstrating what the project would look like very interesting, but I was surprised that there were no computer projections of what the transload facilities would look like. Due to the large footprint of the transload facility and associated roadway needed for the TR-1, I agree that RS-1 would be the preferred alternative; but what would that transload facility look like?

What rail equipment would be used to haul quarried material to Florence? Would these rail cars be covered? Since the current arrangement calls for trucks with canvas covers, I would be concerned if extra dust was generated by material carried via rail in open hopper or gondola cars. It has been suggested that welded rail would help reduce noise levels. PK-2

PK-3

What's to become of the 30-odd truck-driving residents of our towns that work for OMYA hauling this material? Would their jobs be modified, or eliminated, and has this economic impact been studied? With respect for these folks, they drive carefully and slowly through Brandon and are very respectful of pedestrians crossing the streets, and of cars trying to turn onto Route 7 via side streets. Has the economic impact of these trucks and the impact of traffic in Brandon been studied?

Having identified areas of archaeological interest, I look forward to seeing the results of sampling studies to see how the project may impact these important historical resources. Likewise, having identified an area of Indiana Bat habitation, could the impact of the rail line on this endangered species be further studied to assess it's impact? Would the new rail spur encourage further economic development south of Middlebury that would put further pressure on the natural resources identified in the DEIS? PK-4

PK-5

Would, in fact, construction of the spur encourage OMYA to increase use of the quarry to an extent that the resource would be used up sooner, and the *raison d'etre* for the Spur would be a moot point to the industry for which the spur was originally intended?

Like other commentators, I suspect local truck traffic would increase from shippers seeking to use the rail spur to ship or receive their goods. Would the Spur offset those road vehicles, before the projected increase in truck traffic equal the levels now travelling the corridor? Whether the Spur's construction and use would reduce effects of traffic in Brandon over the long term is a question that is also tied to the pending reconstruction of Route 7, and by the policies of OMYA, as influenced by corporate and economic factors beyond our control. PK-6

PK-7

While some of these questions fall into the category of speculation about the future, in light of a fragile area economy, the idea of a rail spur seems, on paper, a great idea. As a separate piece of the local transportation puzzle, it seems good idea for us in Brandon, but perhaps less so for those living south of Middlebury directly in the path and operation of the Spur, or for those neighbors on the receiving end in Florence, where OMYA facilities will require modification for off-loading, and safe stockpiling of material. Without reconstructing Route 7, access to the Spur would depend on the current overburdened transportation network; a network that's expected to funnel more traffic to the Spur and still handle the projected future increases in general traffic at the same time.

I'm afraid the Spur's long term success will be limited without considering it as part of an overall transportation improvement plan that includes upgrades to Route 7 and alternate routes - a whole package - that area businesses, residents from Rutland to Middlebury, can all agree upon with this and future governors as well as VTrans officials - can promote and support through the many years that will be required for it's completion. PK-8

Sincerely,

Philip Keyes

Philip Keyes
15 Carver Street
Brandon, VT 05733

Phil Keyes

PK-1 The TR-1 transload facility was simulated in Figure 4.3.40. The RS-1 transload facility would not be visible from US 7 or Lower Foote Street, so no simulation was provided. The transload facility would be similar in appearance to the TR-1 transload, but much smaller (2.2 acres, compared to 27.9 acres for TR-1).

PK-2 It is anticipated that the rail cars would be rotary dump gondola cars with covered tops.

The EIS determined that noise impacts do not warrant mitigation. There are advantages and disadvantages to using welded rail; its use will be evaluated during final design.

PK-3 Employment impacts are discussed in Section 4.2.2 of the EIS. While the EIS recognizes the impacts to individuals that will occur as a result of the project, the net loss of 62 jobs does not necessarily warrant mitigation in a regional economy that supports 13,000 jobs. Services related to job outplacement, retraining, and relocation are available through other agencies. Regarding traffic in Brandon, the build alternatives would reduce truck traffic on U.S. Route 7 compared to the No-Build scenario, as described in Section 4.1.2.

PK-4 Impacts to threatened and endangered species is addressed in Section 4.6.3 of the EIS. Cumulative effects on resources are addressed in Section 4.16 of the EIS.

Subsequent to the DEIS, a sample of five areas of varying sensitivity were sampled by digging several series of test pits along transects. As a result of this test, three archaeological sites were discovered (VT-AD-1493, VT-AD-1494, and VT-AD-1495). As a result of this study, more specific information on alternatives' impacts and appropriate mitigation have been included in this FEIS (see Section 4.11.1). As such, this information is being circulated for public review and comment.

Archaeological study will proceed with additional Phase I field testing in other sensitive portions of the rail corridor, as well as Phase II evaluation at the three identified sites at the Eddy Farm once VTrans obtains legal access to properties. Phase II study involves more detailed site excavation and study. Based on the results of the Phase II study, impacts will be known, and if necessary, mitigation could be provided through Phase III data recovery, or the study may be concluded with documentation, public education and outreach.

Section 106 of the National Historic Preservation Act of 1966 provides a process for determining effects on historical resources caused by federally funded actions, and for avoiding, minimizing and mitigating for such effects. A Memorandum of Agreement signed by the Federal Highway Administration and the Vermont Division for Historical

Preservation to ensure that the project is in compliance with all applicable laws and requirements.

As a clarification, a comment period will follow the publication of the FEIS and comments will be considered in the Record of Decision.

PK-5 The rate of marble extraction is projected to be the same whether the rail spur is built or not, and operations at the quarry are expected to continue for a minimum of 50 years into the future.

PK-6 Potential effects of other freight shippers are discussed in Section 4.1, Traffic and Transportation, and Section 4.16.1.4. Impacts to the roadway system are discussed in Section 4.1.2.

PK-7 Potential indirect effects from modifications to the Florence processing facility are discussed in Section 4.16.1.3. There will be indirect economic benefit to downtown Brandon and perhaps other areas as reduced truck traffic improves the atmosphere in shopping areas. The effects of other freight shippers using the rail spur are addressed in Section 4.1.1.2.2, under Traffic Impacts.

PK-8 The scope of this project is limited to the purpose and need described in Chapter 1 of the EIS.

Rutland Region Chamber of Commerce

Serving the Rutland Region for over 100 years~

CROSSROADS OF VERMONT

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June 21, 2007

Mr. Kenneth R. Sikora, Jr.
Environmental Program Manager
Federal Highway Administration
P.O. Box 568
Montpelier, Vermont 05601

RE: Middlebury Spur Project

Dear Mr. Sikora:

I am writing on behalf of the Rutland Region Chamber of Commerce to comment on the Draft Environmental Impact Statement (DEIS) for the Middlebury Spur Project.

As noted in the DEIS Project Overview and History the Middlebury Spur project follows a series of freight transportation studies spanning over 20 years. The DEIS studied numerous alternatives including rail spur alternatives.

The DEIS selected Rail Spur Alternative 1 (RS-1). The Rutland Region Chamber of Commerce supports this conclusion. Among the many other considerations is the "No Build Alternative". As pointed out in the document the No Build Alternative does not satisfy the project purpose and need. Specifically, it would not remove trucks from US 7, local roads, or Brandon Village, would not improve transportation efficiency, and would not allow Omya and other shippers to take advantage of access to the railroad. RRCC-1

Conversely, the document points out that RS-1 would address the purpose and need of providing efficient transportation of freight to and from Middlebury by

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Rutland Region Chamber of Commerce

RRCC-1 So noted.

providing an alternative to US 7. Removing trucks from US 7 would reduce congestion and maintain an acceptable level of service for a longer period of time. It is further noted that the build alternatives would positively affect Brandon's economic environment.

We understand that the construction of the rail spur will require compliance with a variety of federal, state, and local laws, and the acquisition of various federal, state and local permits. Given the already 20 year history and associated in depth study we strongly urge the FHA and VAOT to support the DEIS conclusion and move the project forward forthwith.

Sincerely,

Thomas L. Donahue
Executive Vice President / CEO

CC Ms. Susan E. Scribner
Project Manager
Vermont Agency of Transportation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

June 28, 2007

OFFICE OF THE
REGIONAL ADMINISTRATOR

Kenneth Sikora, Jr.
Environmental Programs Manager
Federal Highway Administration
PO Box 568
Montpelier, VT 05601

Re: Draft Environmental Impact Statement Middlebury Spur Project, Addison County, Vermont (CEQ #20070181)

Dear Mr. Sikora:

The Environmental Protection Agency-New England Region (EPA) has reviewed the Federal Highway Adminstration's (FHWA) Draft Environmental Impact Statement (DEIS) for the construction of the Middlebury Rail Spur project in Middlebury, Vermont. We submit the following comments on the DEIS in accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

The DEIS describes the work necessary to provide for the safe and efficient transportation of freight to and from Middlebury, Vermont. Specifically, as proposed the project is intended to improve the ability of the local transportation network to move material from a marble quarry in Middlebury, Vermont through better access to the rail system. The project is also intended to result in the removal of trucks from the roadway system.

The attachment to this letter highlights several concerns that we recommend that you consider as you develop the Final Environmental Impact Statement (FEIS) for the proposed project. We appreciate the opportunity to comment on the DEIS. Based on our review, we have rated the DEIS "EC-2—Environmental Concerns-Insufficient Information" in accordance with EPA's national rating system, a description of which is attached to this letter. Please contact Timothy Timmermann (617-918-1025) of EPA's Office of Environmental Review with any comments or questions about this letter.

Sincerely,

Robert W. Varney
Regional Administrator

Attachment

Internet Address (URL) • http://www.epa.gov/region1
Recycled/Recyclable • Printed with Vegetable Oil Based Inks on Recycled Paper (Minimum 30% Postconsumer)

Summary of Rating Definitions and Follow-up Action

Environmental Impact of the Action

LO--Lack of Objections
The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns
The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO--Environmental Objections
The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU--Environmentally Unsatisfactory
The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the CEQ.

Adequacy of the Impact Statement

Category 1--Adequate
EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2--Insufficient Information
The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3--Inadequate
EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

Additional Detailed Comments
Middlebury Spur
Draft Environmental Impact Statement
Middlebury, Vermont

Air Quality

1. The DEIS does not include the actual regional emission analyses or the air quality technical support documentation for the analysis described in Section 4.4 "Air Quality." Therefore, EPA is unable to independently evaluate the air quality analysis, modeling, methodology and associated assumptions. EPA-1

2. The results of the air quality analysis for the no-build alternative, Rail Spur Alternative 1 (RS-1) and Truck to Rail Alternative (TR-1) do not support the elimination of any alternative based solely on air quality impacts. However, given public health concerns about diesel exhaust from heavy duty diesel trucks and train locomotives, EPA recommends that measures be implemented to reduce fine particle emissions emitted from diesel engines. EPA-2

Emissions from older diesel engines can be controlled with retrofit pollution control equipment such as diesel oxidation catalysts or particulate filters that can be installed on the exhaust of the diesel engine. Retrofits have been successfully applied to many diesel engines across the country and oxidation catalyst technology has been successfully applied to construction equipment used on several projects in the Northeast, including the Central Artery/Third Harbor Tunnel project in Boston and the Q Bridge Reconstruction project near New Haven, CT. Based on this success, some New England States (e.g., MA and CT) are now requiring construction equipment to be retrofitted with retrofit control devices or use clean fuels. Retrofit technologies may include EPA verified emission control technologies and fuels and CARB-verified emission control technologies. A listing of these technologies can be accessed at http://www.epa.gov/otaq/retrofit/verif-list.htm.

3. Table 3.4-1 National and Vermont Ambient Air Quality Standards (Chapter 3, page 26) should be updated to reflect recent revisions to the National Ambient Air Quality Standards (NAAQSs). Effective December 18, 2006, the PM_{10} annual standard of 50 $\mu g/m^3$ was revoked and the $PM_{2.5}$ 24-hour standard of 65 $\mu g/m^3$ was revised to 35 $\mu g/m^3$. The National Ambient Air Quality Standards can be found on EPA's web site at URL address: http://www.epa.gov/air/criteria.html. EPA-3

Wetlands

1. Chapter 3, Page 76, Disturbed Wetlands/Invasive Species--The EIS should also include mention of reed canary grass, *Phalaris arundinacea,* another invasive species. EPA-4

2. Chapter 4.10.4, Page 419, Potential Wetland Mitigation Measures--We recommend removing the discussion of storm water treatment measures from the first paragraphs. While these measures will be important for minimizing overall environmental impacts of the project and are required to comply with state storm water laws, they would not be part of a wetland mitigation plan. EPA-5

3. The discussion of mitigation in the EIS should include methods to control and remediate the spread of invasive species. Many of the sites being considered have large stands of reed canary grass. The EIS should discuss options for eradicating invasive species found at these sites. EPA-6

Environmental Protection Agency

EPA-1 The Air Quality Analysis was provided to the EPA in July, 2008.

EPA-2 The DEIS analysis showed that, based on Clean Air Act standards, none of the alternatives would result in an air quality impact, so there is no need to mitigate or for environmental commitments to abate emissions. The air quality analysis was based on standard emission factors for the expected engines. Vermont Railway has expressed an interest to upgrade their fleet to lower their emissions. However, such an upgrade would not be enforced through the NEPA process.

EPA-3 The EIS has been revised to reflect the updated standards.

EPA-4 The EIS has been edited to include a discussion of reed canary grass.

EPA-5 ACOE regulations and guidelines for the Clean Water Act provide that wetland mitigation be based on replacement of lost wetland functions. The Vermont Wetland Rules also define wetland compensation as a means to replace lost wetland functions. Stormwater treatment or water quality improvement may, in part, replace lost wetland functions, especially where those are the primary functions provided by the wetland to be affected. Stormwater treatment practices may also minimize impacts to wetlands, and as requested by EPA and the ACOE, these are now addressed as minimization measures in the EIS.

EPA-6 Mitigation for wetland impacts is addressed in Section 4.10.4. The mitigation package proposed here was developed in conjunction with the resource and regulatory agencies. Appropriate and desirable features will be included in the mitigation plan as feasible.

4. The wetland mitigation sites have potential for compensating for unavoidable losses of wetland function and value. Both sites under consideration in the EIS appear to have existing wetlands that could be managed (enhanced) to promote greater vegetative diversity. Enhancement can be part of an overall mitigation plan, but EPA also recommends that the applicant investigate additional restoration opportunities and that there be assurance that an upland buffer can be secured for the mitigation parcel. The Cornwall Otter Creek Site due to its surrounding land uses (primarily protected lands by the Nature Conservancy and the State of Vermont) is promising as a mitigation site that can mitigate for the loss of habitat value. EPA-7

EPA-7 So noted.

Preserving America's Heritage

May 11, 2007

Mr. Kenneth R. Sikora
Environment & Right-of-Way Program Manager
Vermont Division
Federal Highway Administration
87 State Street
PO Box 568, Room 216
Montpelier, VT 05601

RE: *Middlebury Spur Project*
Addison and Rutland Counties, Vermont

Dear Mr. Sikora:

On May 8, 2007, the Advisory Council on Historic Preservation (ACHP) received a copy of the Draft Environmental Impact Statement for the referenced undertaking. Our comments pursuant to the National Environmental Policy Act of 1969 (NEPA) were requested. We have no comments pursuant to NEPA at this time.

While the documentation provided indicates that the proposed undertaking may adversely affect historic properties, we have no record of receiving notification of adverse effects from FHWA regarding this undertaking as is required under our regulations, "Protection of Historic Properties" (36 CFR Part 800). Please continue to consult with the New York State Historic Preservation Office (SHPO) and other consulting parties to complete the requirements of the Section 106 process. If, or when, FHWA makes an adverse effect finding in this case, you should provide the required notification and documentation to ACHP in accordance with 36 CFR § 800.6 and § 800.11(e).

If you have any questions or would like to discuss this issue, please contact me by telephone at (202) 606-8520 or by e-mail at kharris@achp.gov.

Sincerely,

ACHP-1

Katry Harris

Katry Harris
Historic Preservation Specialist
Office of Federal Agency Programs

ADVISORY COUNCIL ON HISTORIC PRESERVATION
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Phone: 202-606-8503 • Fax: 202-606-8647 • achp@achp.gov • www.achp.gov

Advisory Council on Historic Preservation

ACHP-1 36 CFR 800, "Protection of Historic Properties", (a)(2) provides for use of alternative procedures, including programmatic agreements for the purpose of implementing Section 106 of the National Historic Preservation Act. In Vermont, alternative procedures have been implemented through execution of the "Programmatic Agreement Among the Federal Highway Administration, the Vermont Agency of Transportation, the Advisory Council On Historic Preservation, and the Vermont State Historic Preservation Officer" of August 5, 2000. Under these alternative procedures, advance notification of adverse effect to the Advisory Council on Historic Preservation is not required.

MS. SCRIBNER: I would just like to make a few clarifying comments.

MR. MERROW: Sure.

MS. SCRIBNER: The first was to do with the archeological studies that need to be conducted, and I would just like to make it clear that those will be done between this point and when the Final Environmental Impact Statement is published. That's not something that will be done way in the future. It is something that will be done almost immediately, so we will have more concrete findings in that area.

As well, I just want to clarify we will be responding to comments, however, the response will be done via the Final Environmental Statement. There won't be individual responses to the comments you folks made. You will be able to find the responses in the document. I just wanted to clarify those two points.

MR. MERROW: Thank you. And with that, I'll open it up to any comments folks may have.

MR. RACINE: Yeah. Thank you, Mr. Moderator. My name is Bud Racine from Brandon. I'm the Economic Development Coordinator for the town. My comment is I agree with your overview of the

PHT-1

impact of the truck traffic on the Town of Brandon. Although the truckers, the Omya truckers that go through Brandon are very courteous and law-abiding folks, it is pass-through traffic, and it has no direct impact, economic value to the Town of Brandon other than the road congestion in the village.

PHT-1

One thing that I would add to that is that your first slide that showed the truck, the Omya truck in the town of -- in the village, which was obstructing the view of my office, also it is obstructing the view of the bridge right there in front of the town office, and VTrans has identified that bridge has needing significant repair in the short term. So, reducing the truck traffic on Route 7 in that area would probably elongate the need for that bridge to be repaired. So, I welcome the opportunity to speak and support your project. Thank you.

PHT-2

MR. MERROW: Did you get the name, Maureen?

THE STENOGRAPHER: I would just like him to spell his last name, please.

MR. MERROW: Could you spell your last name, please?

MR. RACINE: R-A-C-I-N-E.

MR. MERROW: Thank you.

Public Hearing Transcript ***(Individual commenters identified in transcript)***

PHT-1 So noted.

PHT-2 Planned improvements along Route 7, including the bridge over the Neshobe River, will occur independently of the proposed rail spur. Aside from improving safety and efficiency of Route 7, the rail spur project won't eliminate the need for Route 7 infrastructure improvements.

MS. CORNWALL HUNTER: My name is Francis Cornwall Hunter, and I grew up in what I guess you call the Hathaway House, which my family owned for 90 years, and I would like to say that it is historic house. I'm sorry. I don't have much of a voice. I have had radiation that injured one of my vocal cords. I would like to say that I think that the floodplain that you're talking about is a lot bigger than what you have there. There were years when we could take a boat out and paddle it over the fences on our farm, not every year obviously, but that did happen. The land there is very fertile and very rich, and it's a shame to put a railroad over it.

PHT-3

And I have one question to ask you, one alternative that you haven't considered is Omya can find its powder somewhere else. There's a lot of marble in Vermont, and it seems to me we're going to great lengths and great expense to accommodate Omya. I know the quarry they have is a very good quarry, but in the end, just like at least for the time being, we're not supposed to drill for oil in the Alaskan Wildlife Refuge, not to drill for oil along the coast of the Gulf of Mexico and outside Los Angeles and so forth, but you haven't considered

PHT-4

PHT-3 Floodplains as shown on Figures 3.9-5 and 3.9-6 are based on the most current maps, the 1985 FEMA flood insurance maps. The floodplain as shown is the 100 year floodplain, which is defined as "the flood which has a one percent chance of being equaled or exceeded in any given year (also known as a 100-year flood). It is possible that more extensive floods can happen in any given year. Impacts to floodplains are discussed in Section 4.9.3.1. A hydraulic study conducted for the EIS concluded that the rail trestles would raise the floodplain by 0.1 inches.

Proposed impacts to farmland are discussed in Section 4.8.

PHT-4 Omya's operational decisions are based in part on the availability of natural resources. Omya considers the Middlebury marble quarry to be a source of particularly high quality marble, and projects that it will continue to extract marble there for the foreseeable future. CEQ guidance on NEPA states that agencies are not responsible for studying alternatives that are beyond their control. An alternative that would require that Omya close its operations in Middlebury is outside of the range of reasonable alternatives.

that possibility apparently at all.

MR. PERRIN: Hi. Mark Perrin. I noticed in the RS-1 plans that the rail spur currently as it's outlined in the drawings goes right through some water retention ponds from a development that's known as Middle Road Ventures. I would assume -- well, I'm making the assumption that that rail spur would have to be moved south and does that -- how does that affect all the studies that you've done so far, especially since the wetlands and some of the impacts are further south of where the rail spur is?

PHT-5

MR. MERROW: I would just say that a number of factors went into that alignment, and we will -- we are aware of the Middle Road Ventures' subdivision, and we're also aware of your property interests. So, we'll continue to look at that as the project moves forward.

MR. SHONNARD: My name is Wally Shonnard. I live in Ferrisburg, Vermont where Otter Creek enters Lake Champlain. My concerns are, number one, the number of -- I'll put it this way. I would like to see a comparison of the economics of one truck and its impacts by the highway department on what damage one truck has been doing to the roads and then multiply that by the number of vehicles per day to

PHT-6

PHT-5 The RS-1 alignment in the FEIS has been shifted slightly south of the alignment shown in the DEIS in the area referenced here, near the Middle Road Ventures Development. The wetland impacts, discussed in Section 4.10 of the FEIS, have not increased as a result of this shift.

PHT-6 Quantitative comparisons of truck vs. car impacts to roadways are beyond the scope of this EIS, but it is safe to assume that trucks take a larger toll on roadways and bridges.

get a report on the economic impact.

The second concern would be how this will affect the carbon cycle down the road in the virtue, versus the rail, versus the trucking and so forth. I'm not either for or against it. I'm just asking for more information I think.

PHT-7

And the third thing I would like to see in there somewhere is what the estimated impacts would be on Otter Creek entering Lake Champlain at Fort Cassin (phonetic) at Kellogg Bay where we live. I would like to see some estimate of that impact.

PHT-8

Thank you very much for the opportunity to present, and your work and so forth on these various alternatives, it's very encouraging. Thank you.

MR. MERROW: Thank you.

THE STENOGRAPHER: Sir, could you spell your last name?

MR. SHONNARD: Yes, the last name is S-H-O-N-N-A-R-D. First name is Wally.

THE STENOGRAPHER: Thank you.

ATTORNEY JIM SWIFT: Good evening. I'm Jim Swift. I represent some of the folks involved here and just one sort of common discretion, I've heard a lot of trying to avoid overpasses, underpasses, and grade crossings both from aesthetic purposes and

PHT-9

PHT-7 No detailed fuel analysis or carbon cycle analysis was conducted for the EIS. However, information on emissions, which are related to fuel consumption, is provided in Section 4.4 of the EIS.

PHT-8 Proposed impacts to surface waters, including Otter Creek, are discussed in Section 4.9.2. Effects to Otter Creek at Kellogg Bay are anticipated to be negligible.

PHT-9 According to the most recent VTrans accident data, the US Route 7 / Halladay Road intersection is not a "high accident location". Intersection improvements at that location are beyond the scope of this project.

also from safety concerns.

PHT-9

Halladay Road, for instance, in particular, the current junction with Route 7 is notorious for having some rather severe accidents and other things; and if anything could be done to perhaps eliminate that, it would be helpful, and it's also the idea of the aesthetics that could work better that way.

You know, I think a lot of folks prefer that this never happened at all as you can probably understand, and I do appreciate you taking the time to come here and talk to them, and I'm sure that they'll have lots of comments to make probably in writing to help ameliorate as much as possible any impact if this project does, in fact, go forward. Thank you.

MS. TIPPETT: Hi. I'm Holly Tippett. It's T-I-P-P-E-T-T. I just had a couple of questions. Has Omya made a written commitment to reducing or eliminating the road traffic in Brandon as a result of this investment? And also what other

PHT-10

businesses -- there has been some speculation that other businesses would take advantage of this rail spur opportunity. I would like to hear a little bit about who they are, what their commitment is, what

PHT-11

PHT-10 FHWA and VTrans share this concern. Omya has indicated that the intention is to use the rail spur. See the comment letter from Omya reproduced in this Appendix, in particular the second paragraph, which reads "Omya is committed to using rail whenever possible to transport its raw material and finished product". However, a firm commitment to using the rail and to removing truck traffic from Route 7 is critical to meeting the purpose and need of the project. Before the project moves forward, FHWA will explore ways to secure Omya's commitment to using rail. However, Omya's actual use of the proposed rail spur necessarily is dependent on future economic conditions so it is not appropriate to require an ironclad guarantee from Omya as to use of the proposed rail spur.

PHT-11 Potential effects from other freight shippers are addressed in Section 4.16.1.4. Effects on employment are discussed in Section 4.2.2, and air quality impacts are discussed in Section 4.4. Potential impacts to water quality are discussed in Section 4.9.2.2.

kind of impact it would have on jobs in the area, and what kind of pollution impact that would have as well? Thank you.

PHT-11

MR. LEVIN: Good evening. My name is Matt Levin. I am an Outreach and Development Director for Vermonters for a Clean Environment. I have a number of comments to go over this evening and will be submitting some written comments as well, some of them echo the comments of Ms. Tippett as it turns out.

On a technical note, we notice that there seems to be an error in the information about how much material goes to the Omya quarry per day in Florence. About 40 trucks a day from the Hogback quarry to the Florence plant are not mentioned. This would seem to throw off all the other calculations about how much Omya could expand its operations in Florence once the rail spur is built and in use. We would like to see those numbers corrected and the new estimate of Omya's expanded capacity based on what is actually happening now.

PHT-12

In any case, this document clearly indicates that one of the purposes of this rail spur is to enable Omya to increase its output at its plant in Florence by getting more raw material to process.

PHT-13

PHT-12 In 2007, Omya averaged approximately 105 truck round trips/day from its Middlebury quarry and 24 truck trips/day from its Hogback Mountain quarry and 5 truck trips/day from its South Wallingford quarry. Permits limit Omya's shipments from its Middlebury quarry to 115 truck trips/day and from its Hogback Mountain quarry to 40 truck trips per day. The FEIS has been updated to reflect these figures. These shipment numbers do not alter conclusions made about the Florence plant and its capacity.

PHT-13 It is projected that quarry extraction and processing rates would be the same whether or not the project is built. Section 4.16.1.3 addresses potential indirect and cumulative effects of the project to the Florence processing facility, in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR §§ 1500 -1508).

Unfortunately for the neighbors at the Omya plant in Florence, that means more water, chemical and oil usage, more air pollution and more water pollution, more dust and more noise.

PHT-13

Given the independent scientific study that is currently taking place at the Omya site in Florence regarding its impact on human health and the environment, the lack of permits for waste disposal, and the currently unresolved issues Omya's neighbors have with Omya's operations that they're having on their quality of life, we ask for Omya to not expand its operations in Florence until all those issues are resolved.

PHT-14

Further, there are a variety of permitting and legal processes outstanding regarding the operation of the Florence facility and their waste management that could have serious impacts on Omya operations in the coming years. In short, for these and other reasons, we believe it is very hard to say for sure what Omya's operations will look like in 2010.

PHT-15

We understand that the Draft EIS is not meant to be an economic analysis of the rail spur project and that some of these questions we are raising are technically financial as opposed to

PHT-16

PHT-14 See response to PHT-12. Completion of the NEPA process does not constitute all permitting that must occur for Omya's operations in Florence to expand or be altered. Omya is and will continue to be subject to all relevant local, state, and federal regulations.

PHT-15 The EIS is based upon the best available information and reasonably foreseeable effects attainable through consultation with Omya and evaluation of existing regulatory processes.

PHT-16 Economic conditions are always subject to change. The EIS presents a reasonably foreseeable future scenario based upon the best available information attained through consultation with Omya and economic and transportation professionals.

environmental issues. However, the draft EIS is based on and built around significant economic assumptions about Omya's operation. Until these issues are resolved, we suggest that some of the underlying assumptions of this Draft EIS need to be reexamined; that these issues be clearly outlined in this study, and that the appropriate amount of uncertainty be factored into the analysis.

PHT-16

Second, we have some questions about the assumptions of Omya truck traffic in 2010. The Draft EIS states, implies or suggests in numerous places that, once the spur is built, Omya will remove all their truck traffic from Route 7. This occurs in Section 2.3.1.1 in Table 4.1-1 and 4.1.2.1.2 among other places. The clear implication from Table 4.1-1 is that the day the spur opens in 2010, Omya truck traffic on Route 7 will decrease to zero. This is a promise we have heard for years and have never seen any evidence to support that it will in fact occur. We ask that you please provide VCE and the public with whatever evidence VTrans has been provided by Omya to support this assumption and make it available as part of the Final EIS.

PHT-17

Finally, one of the most distressing aspects of the Draft EIS is its complete disregard for or

PHT-18

PHT-17 See response to PHT-10.

PHT-18 See response to VCE-8.

State-funded project can, in effect, be exempt from the State's own laws, we do not understand why the Draft EIS fails to address or even mention this critical legal issue. We hope more information about this will be forthcoming before the Final EIS is drafted; and once that occurs, that appropriate changes would be made to the language, presumptions, and analysis in the Final EIS.

PHT-18

We have other comments on other issues which we will be submitting in writing, and we look forward to more conversations about this project. Thank you.

MR. MERROW: Thank you.

MR. CHAMPLIN: I'm Bob Champlin, C-H-A-M-P-L-I-N. You say, you indicated that there would be an estimated 35 percent increase in traffic on Route 7 through Brandon by the year 2027, assuming that 12 percent of this is truck traffic, what would the breakeven point be as far as Brandon seeing just as much traffic as they see now even if the bypass or TR-1 was built? Do you have any answer on that, or is it like five years or eight years?

PHT-19

MR. MERROW: I don't have it right now, no. No.

PHT-19 Section 4.1.2.1 details the impacts to the traffic system that will occur following construction of the proposed rail spur. Traffic will increase whether or not the rail spur is constructed. For NEPA purposes, quantification of impacts is based on comparisons of build alternatives with the No Build Alternative, not with existing conditions.

MR. CHAMPLIN: Okay. I just was interested if this is enough of a long-term solution or whether Brandon is going to be right back to where they were in a fairly short period of time.

MR. MERROW: Any other comments?

MR. PATTIS: I'm Louis Pattis from Brandon. We run the Brandon Inn, and we have had a long history with Omya over the years in trying to contain the permitting through trucks and being involved in Act 250. As we say, numbers never lie so does not reality. We are sitting down there for 20 years now and we have the impact of the truck traffic, and over the years we had numerous occasions where we lost big time business because of the Omya trucks, specifically because they start early in the day, they run at times at full capacity, and it was very detrimental to our business.

PHT-20

I appreciate all your detailed study. We have been following it, have been too many meetings, and every time it seems to be more detailed and more information and more answers and less questions, and I would also thank the people in Middlebury who consider their neighbor, Brandon, which takes the full impact of this traffic. If there is a way that

PHT-20 So noted.

we can go about and take some of the traffic off Route 7, that would be a great thing. Thank you.

PHT-20

MS. BUDDAH: Hello. I'm Lisa Buddah (phonetic) of Middlebury. I just wanted to comment on a couple of things and a couple other people have commented on it, but I felt it was helpful to express it.

On one of the slides where it says that TR-1 would remove traffic from roads, if this was actually a rail spur that's accessible for other trucking companies or, you know, companies who want to use it, it could actually increase traffic on the local roads, so I'm not sure how you could make that sort of absolute statement in this presentation.

PHT-21

I also think that without any kind of incentives or assurances that Omya would actually reduce their truck trips down to Florence, you can't make a statement that the rail would remove 230 truck trips a day, and I think you were projecting that out. I think that was -- I didn't get it, but maybe by 2030, but without any kind of absolute assurance, I mean I see where the rail would go, I see how it might be built, I see how it might impact some things, but it just seems it's really up in the air in terms of traffic.

PHT-22

PHT-21 Traffic impacts from TR-1 are addressed in Section 4.1.2.1.

PHT-22 See response to PHT-10.

And when you said the no build solution does not meet the purpose and the need of the project, the purpose and need of the project is to provide safe and efficient transportation for freight to Middlebury, from Middlebury to Florence, to and from Middlebury, I guess. I think the roads are currently doing that, and I don't think this is meeting the needs of a lot of other truck trips that are going on the roads.

PHT-23

So, it seems interesting to say to not build it, we don't meet that need already, and I think that unless you can assure us you're actually taking trucks off the road, that you can't say the no build doesn't meet what we already have.

MR. PERRIN: Mark Perrin. Curious as to the RS-1, the land that would be affected that's currently under the Middlebury Area Land Trust and how that will be impacted?

PHT-24

MR. MERROW: Any other comments? If there are no other comments, we'll end the hearing. We do hope that if you have substantive comments, you provide them to us either written or e-mail. We have comment forms at the back, the handouts include several places where you can provide comments.

Thank you very much for coming this evening.

PHT-23 The EIS looked at future conditions as well as present conditions. The No-Build alternative does not meet the Purpose and Need for the project as described in Chapter 1 of the FEIS.

PHT-24 Conservation easements are recognized interests in land and will be further identified during the project's right-of-way acquisition stage. The easement held by the Middlebury Area Land Trust on Lot 7003.000 (the Gerrit Nop lot) provides that, in the case of acquisition of the property though eminent domain, proceeds would be allocated between the grantee and grantor based on a ratio based upon the relative value of the development rights and conservation restrictions, and on the value of the fee interest. The Middlebury Area Land Trust would then, in accordance with the easement, use the proceeds to preserve undeveloped and open land of the Town through non-regulatory means.

We'll stick around for a little bit if you have some issues that you would like to discuss with us or some of the consultants who are here. Thank you very much.

(Whereupon, the hearing was concluded at 8:31 p.m.)

C E R T I F I C A T E

I, Maureen A. Booth, Registered Merit Reporter, Court Reporter and Notary Public, hereby certify that the foregoing pages, numbered 2 through 52, inclusive, are a true record of the Proceedings - Draft Environmental Impact Statement - Middlebury Spur Project - Public Hearing, taken before me on the 7th day of June, 2007, at the Middlebury Municipal Building, Middlebury, Vermont.

Dated this 21st day of June, 2007.

____

Maureen A. Booth, RMR

FINAL ENVIRONMENTAL IMPACT STATEMENT

Volume II: Figures

MIDDLEBURY SPUR

October 2008

U.S. Department of Transportation
Federal Highway Administration

VTrans Working to Get You There

MIDDLEBURY SPUR PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

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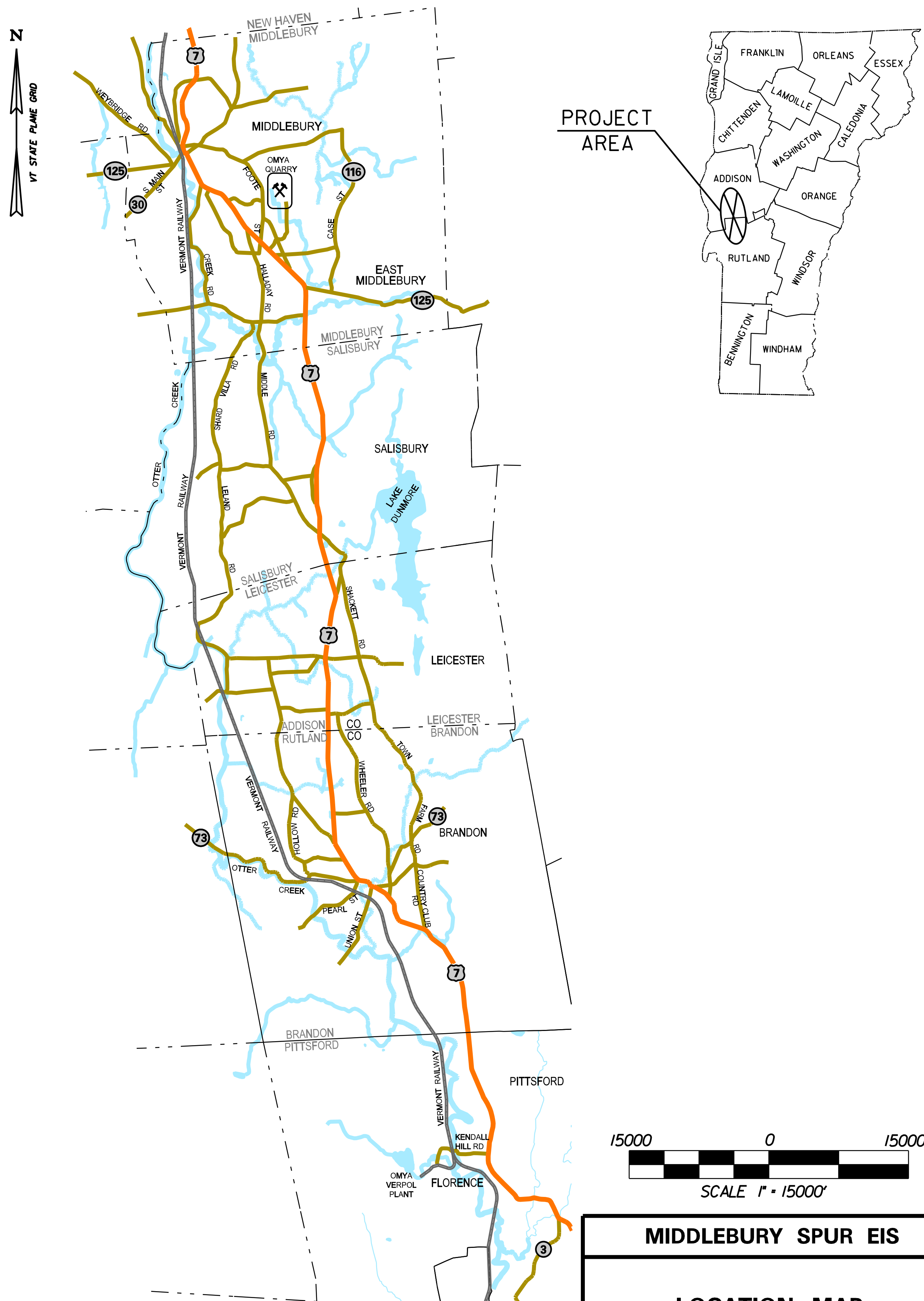

DATA SOURCES:
ROADWAY NETWORK (2003), SURFACE WATERS (2004), AND TOWN BOUNDARIES (2005), FROM VCGI.

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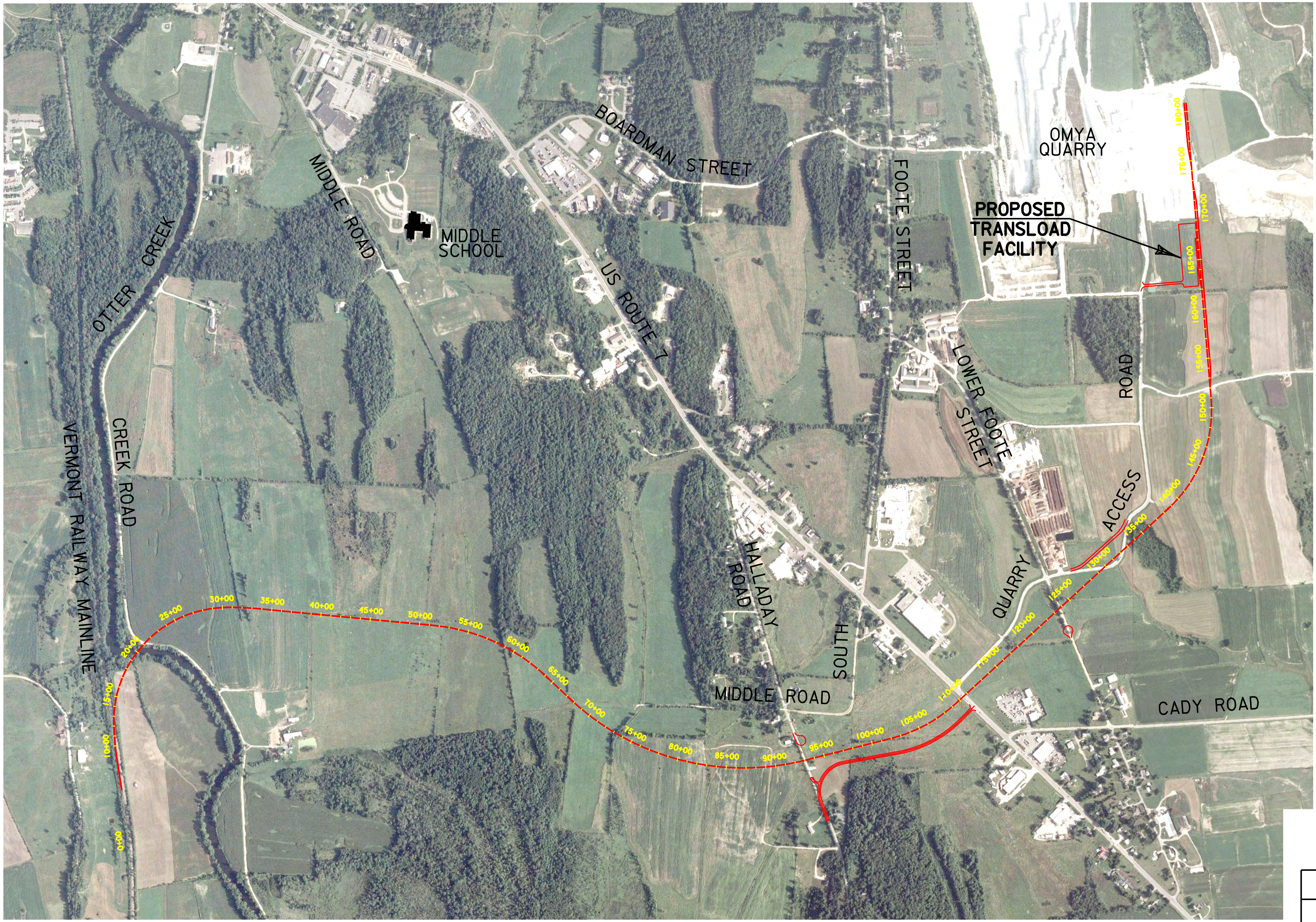
VERMONT AGENCY OF TRANSPORTATION

MIDDLEBURY SPUR EIS

LOCATION MAP

SEPTEMBER 2008 FIGURE NO. 1.1-1



MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1

SEPTEMBER 2008 FIGURE NO. 2.6-1

DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA, VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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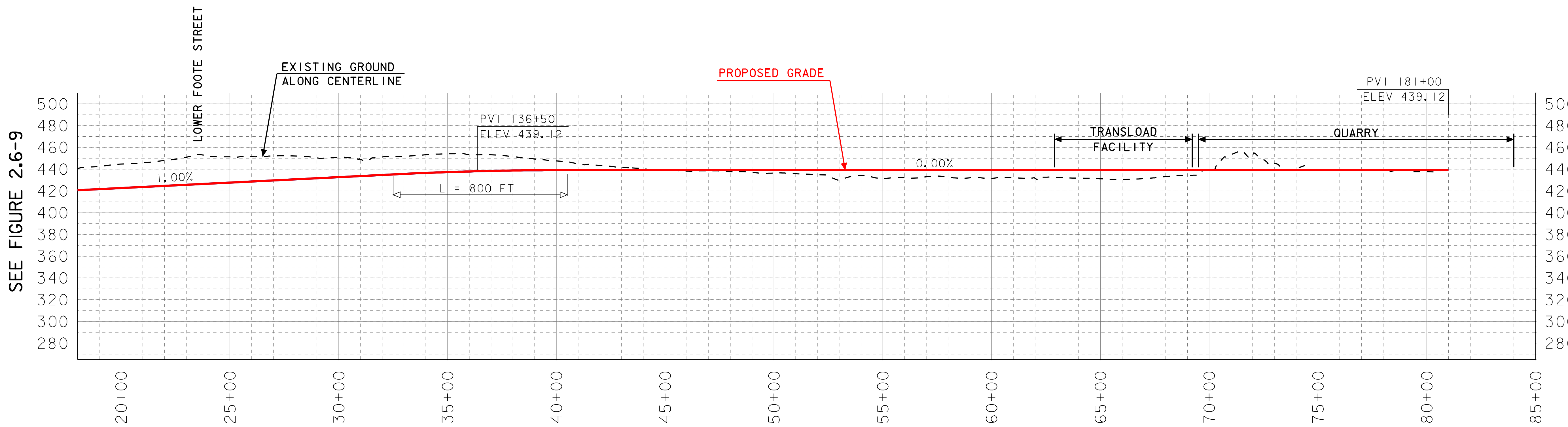

RAIL SPUR PROFILE

HORIZONTAL SCALE 1" = 500'
VERTICAL SCALE 1" = 100'

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
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MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1 (EAST) PROFILES

SEPTEMBER 2008 FIGURE NO. 2.6-10

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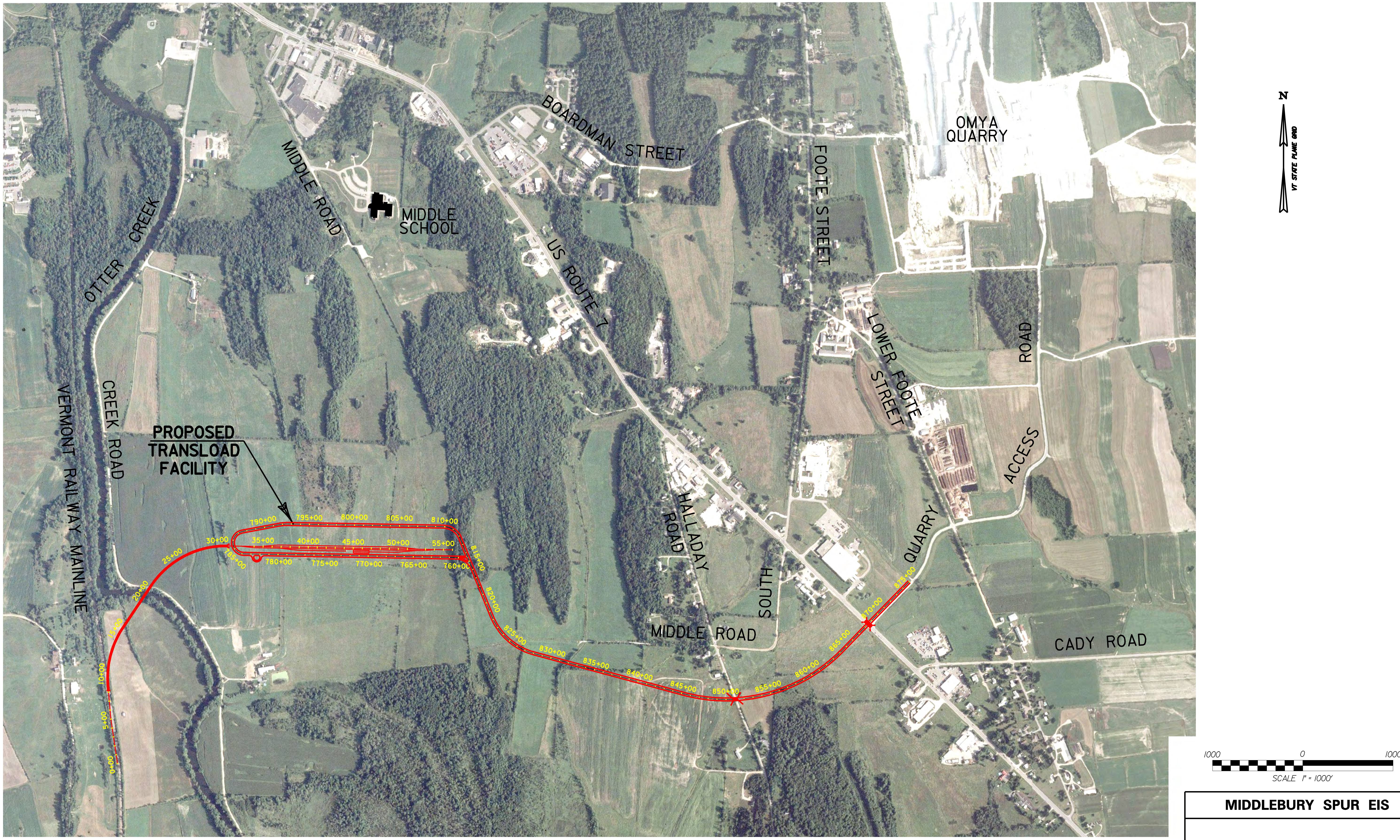

MIDDLEBURY SPUR EIS

ALTERNATIVE TR-1

SEPTEMBER 2008 FIGURE NO. 2.6-11

DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA, VCGI, INC.

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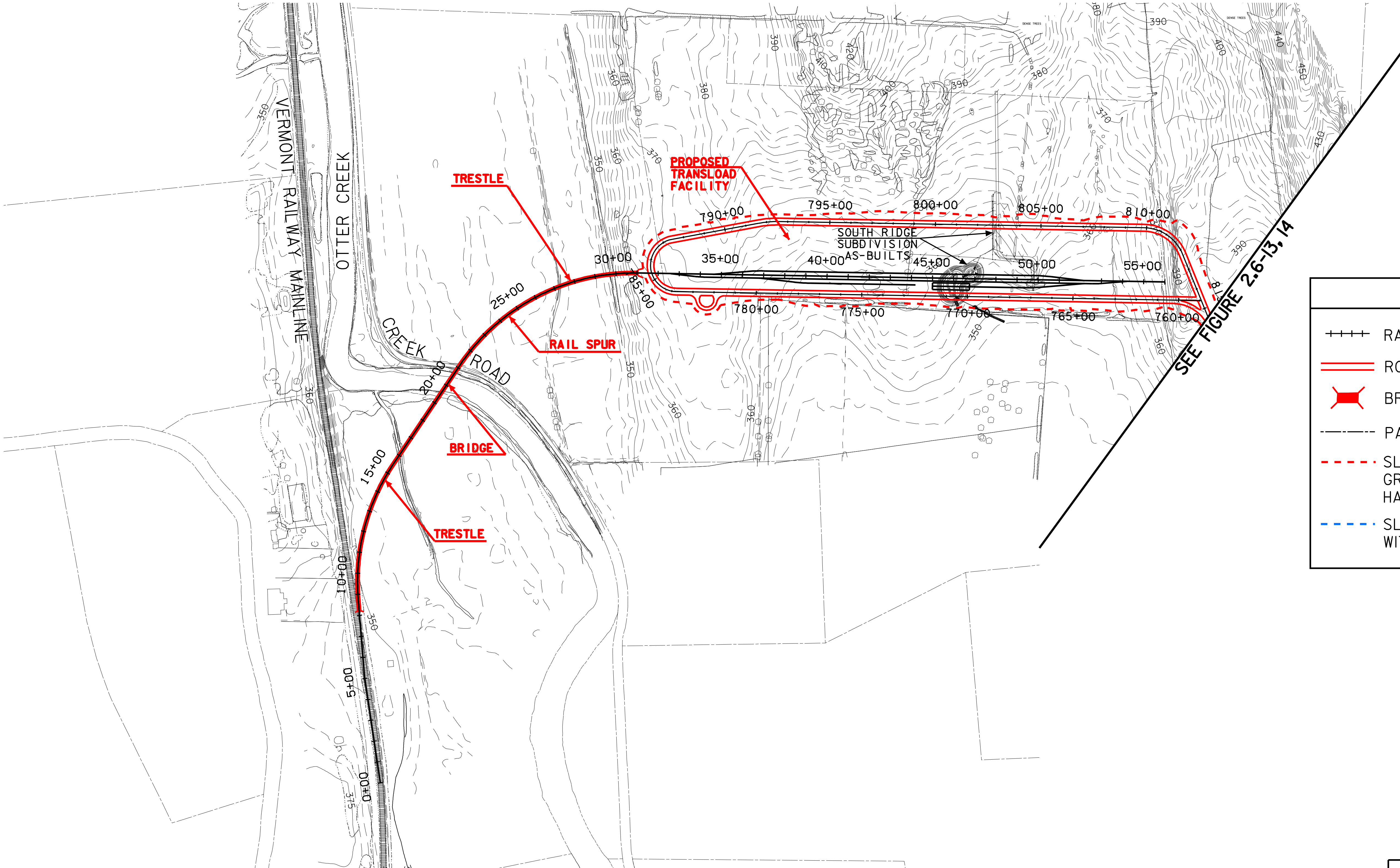

LEGEND

- RAIL CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - TR-1 & TR-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD

DATA SOURCES: CONTOUR MAPPING BASED ON PHOTOGRAMMETRY PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN ON APRIL 24, 2004. "AS-BUILT" MAPPING PROVIDED BY CIVIL ENGINEERING ASSOCIATES, MARCH 2008.

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MIDDLEBURY SPUR EIS

ALTERNATIVE TR-1 (WEST)

SEPTEMBER 2008 FIGURE NO. 2.6-12

03-OCT-2008
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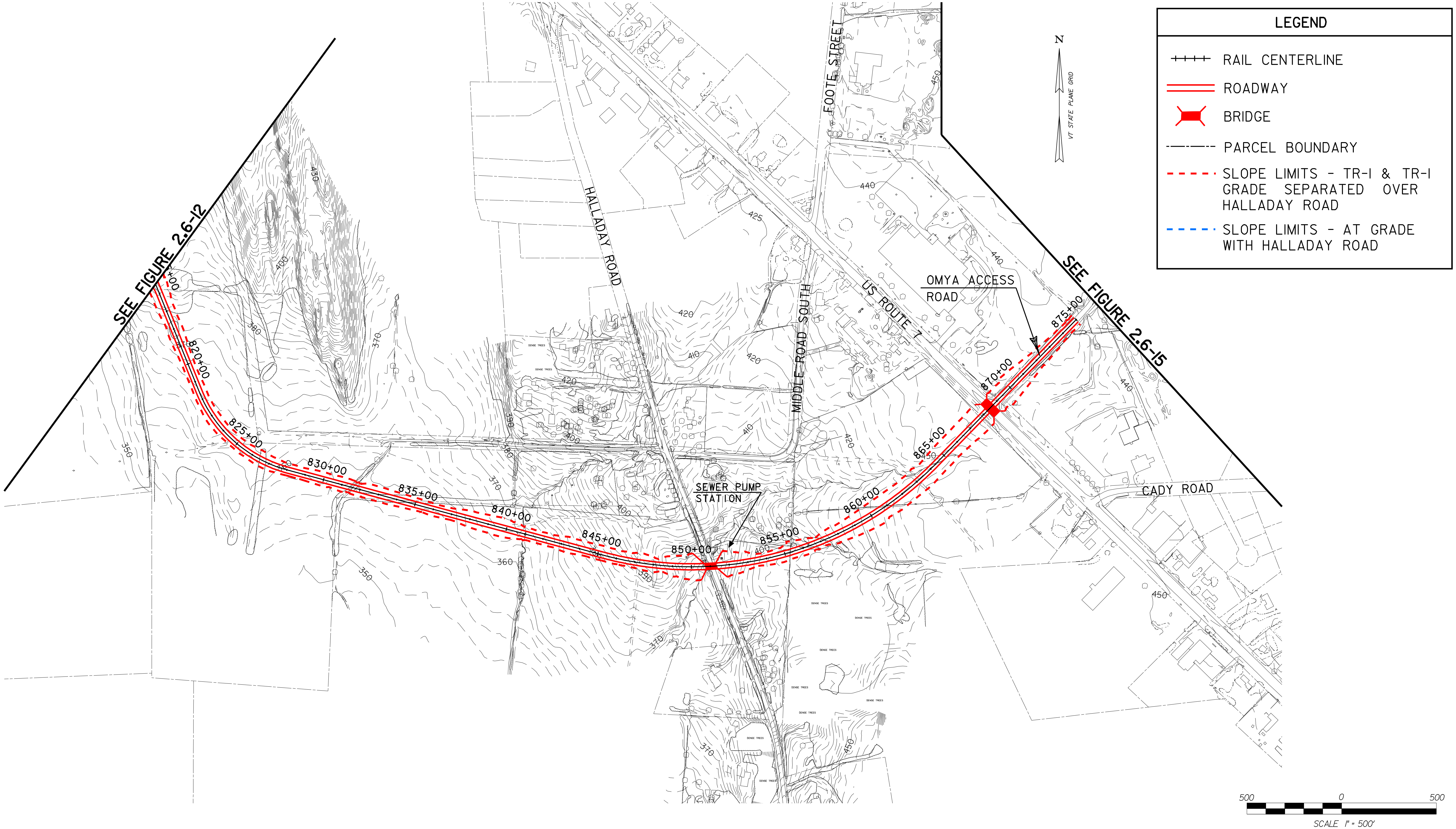

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ON APRIL 24, 2004.

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MIDDLEBURY SPUR EIS

ALTERNATIVE TR-1 (CENTRAL) GRADE SEPARATED OVER HALLADAY ROAD

SEPTEMBER 2008 FIGURE NO. 2.6-13

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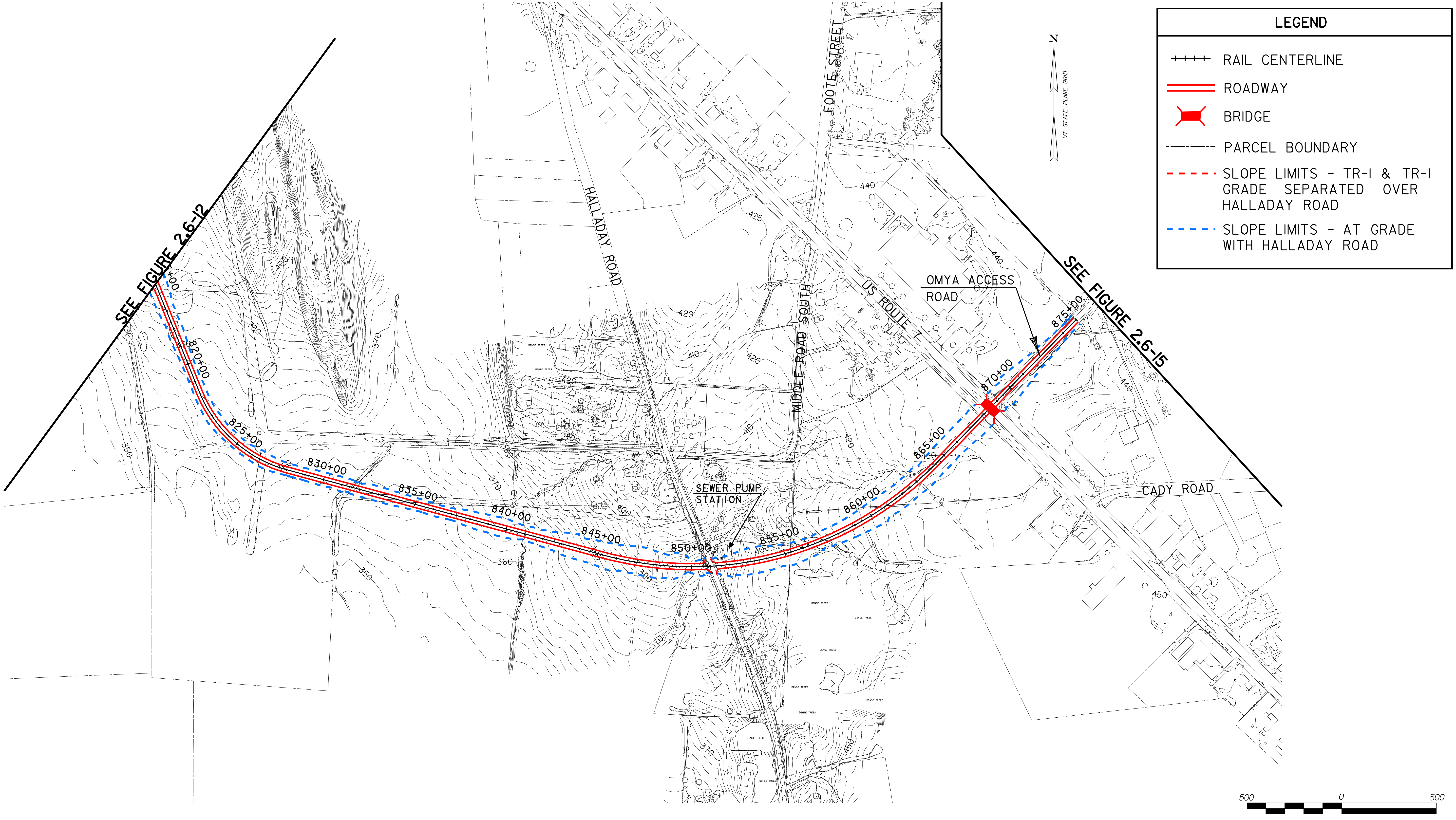

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ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
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MIDDLEBURY SPUR EIS

**ALTERNATIVE TR–1 (CENTRAL)
AT–GRADE WITH
HALLADAY ROAD**

SEPTEMBER 2008 FIGURE NO. 2.6-14

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MIDDLEBURY SPUR EIS

ALTERNATIVE TR-1 (EAST)

SEPTEMBER 2008 FIGURE NO. 2.6-15

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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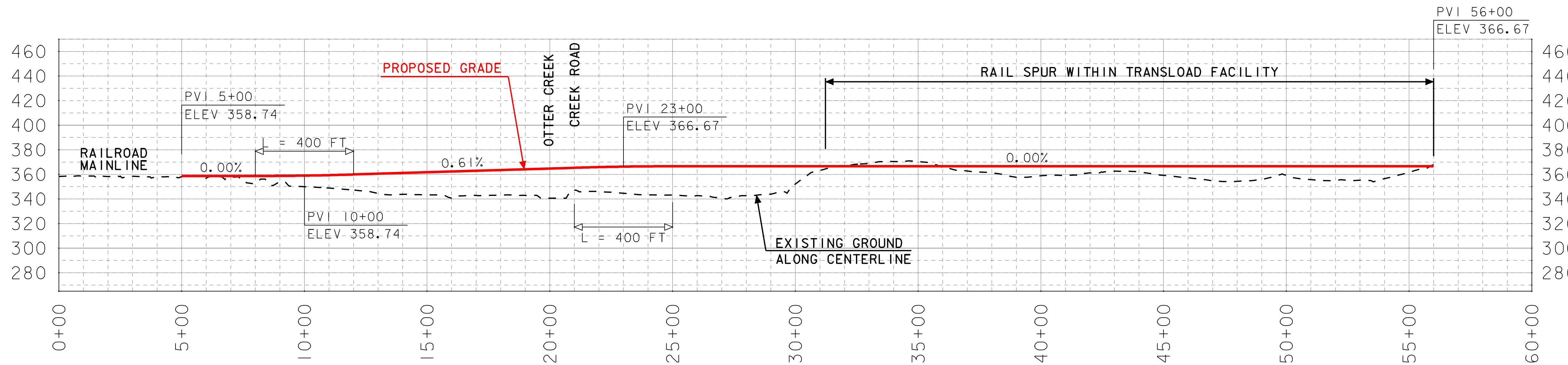
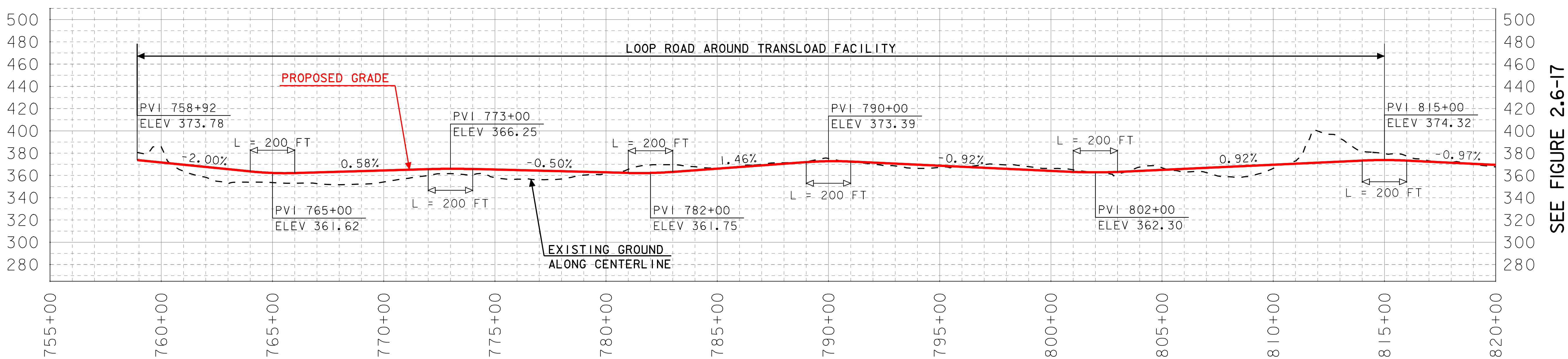
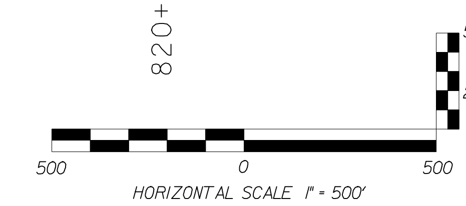


TR-1 RAIL SPUR PROFILE



TRUCK ROADWAY PROFILE



DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

ALTERNATIVE TR-1 (WEST) PROFILES

SEPTEMBER 2008 FIGURE NO. 2.6-16

03-OCT-2008
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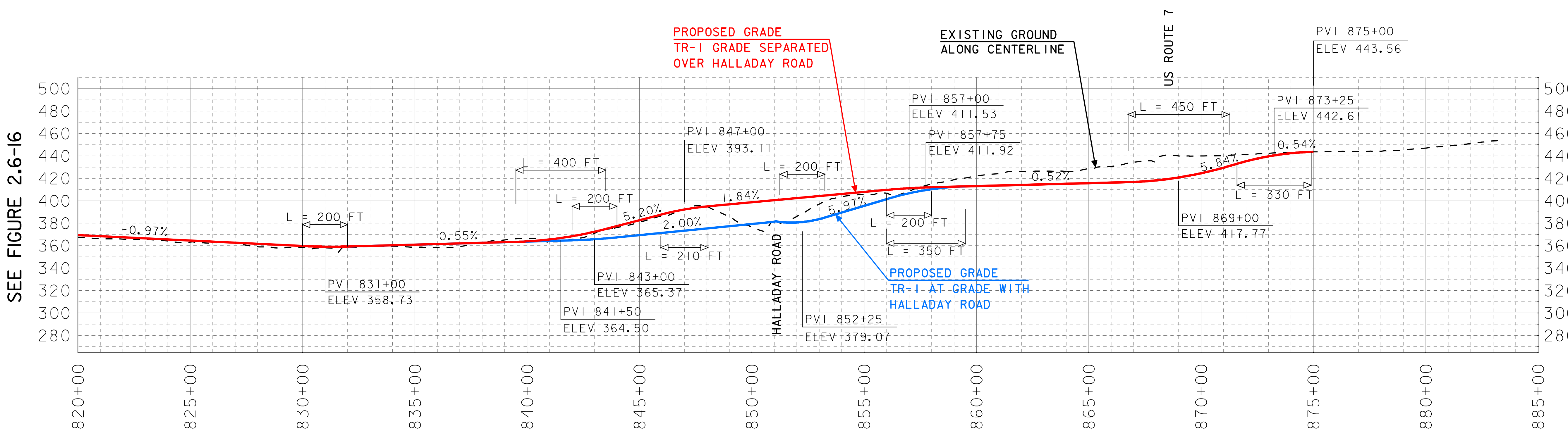

TRUCK ROADWAY PROFILE

HORIZONTAL SCALE 1" = 500'
VERTICAL SCALE 1" = 100'

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

ALTERNATIVE TR-1 (CENTRAL) PROFILES

SEPTEMBER 2008 FIGURE NO. 2.6-17

03-OCT-2008
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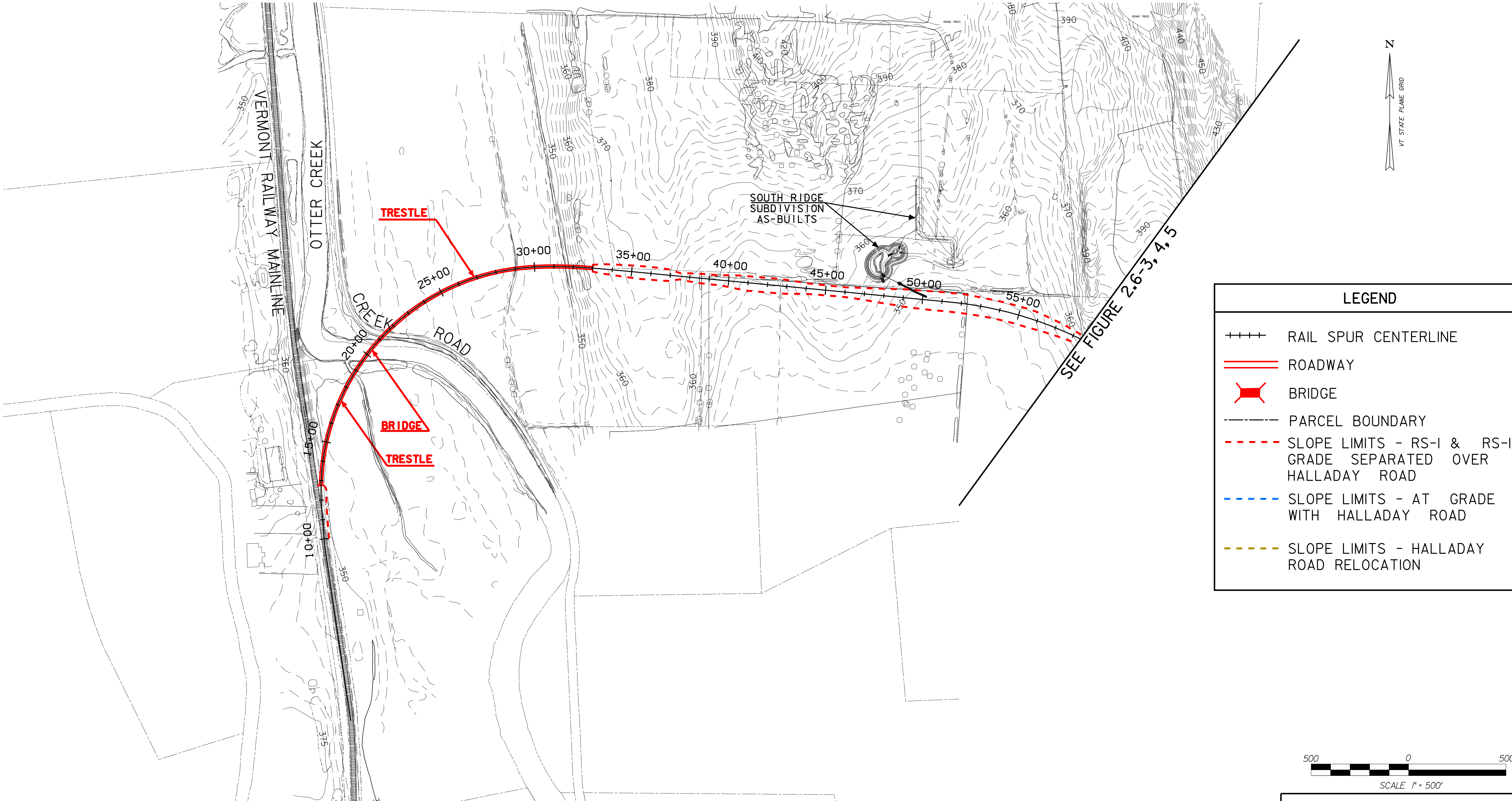


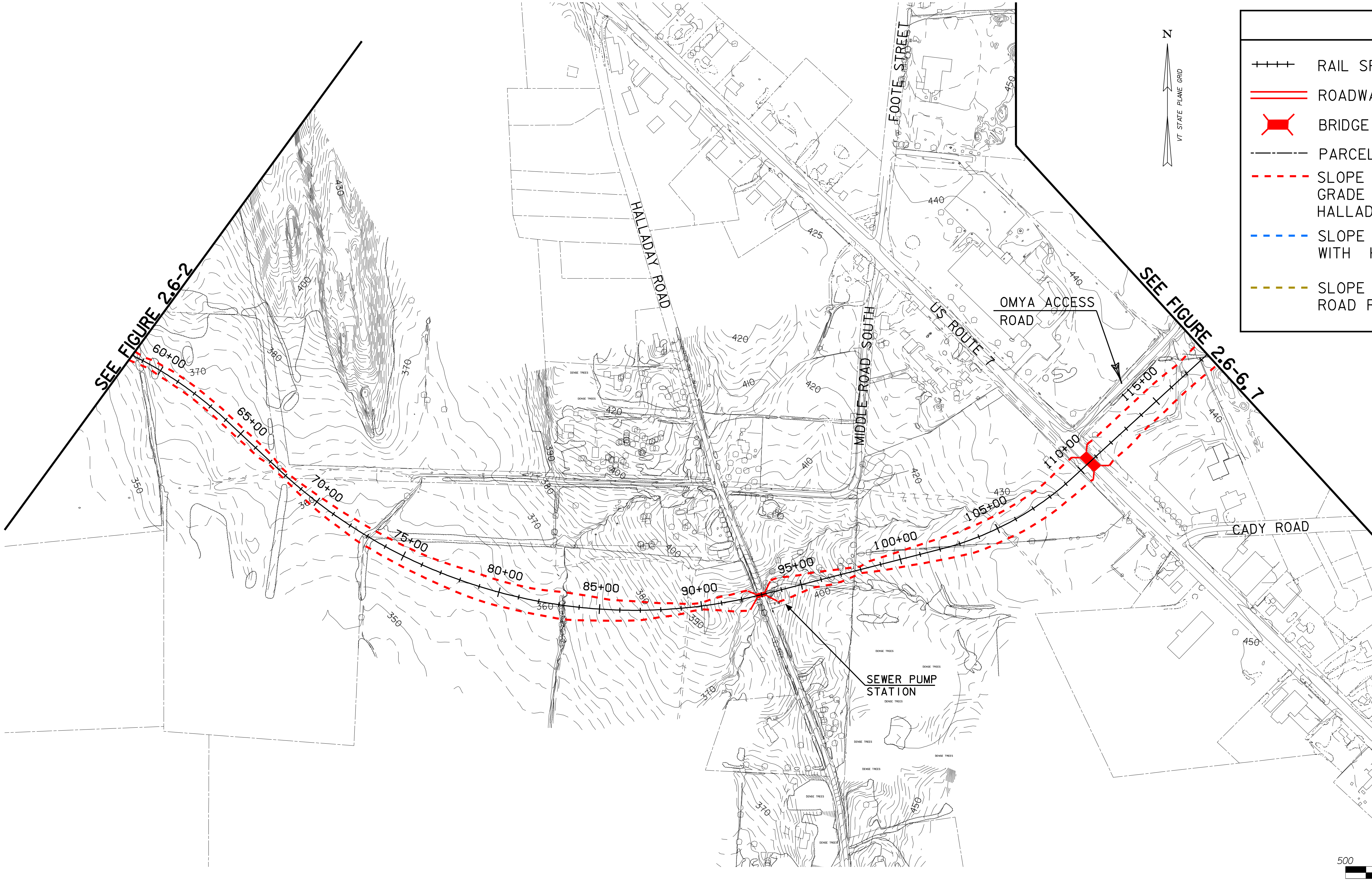
DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1 (WEST)

SEPTEMBER 2008 FIGURE NO. 2.6-2



LEGEND

- RAIL SPUR CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - RS-I & RS-I GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS - HALLADAY ROAD RELOCATION

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

ALTERNATIVE RS–1 (CENTRAL) GRADE SEPARATED OVER HALLADAY ROAD

SEPTEMBER 2008 FIGURE NO. 2.6-3

03-OCT-2008
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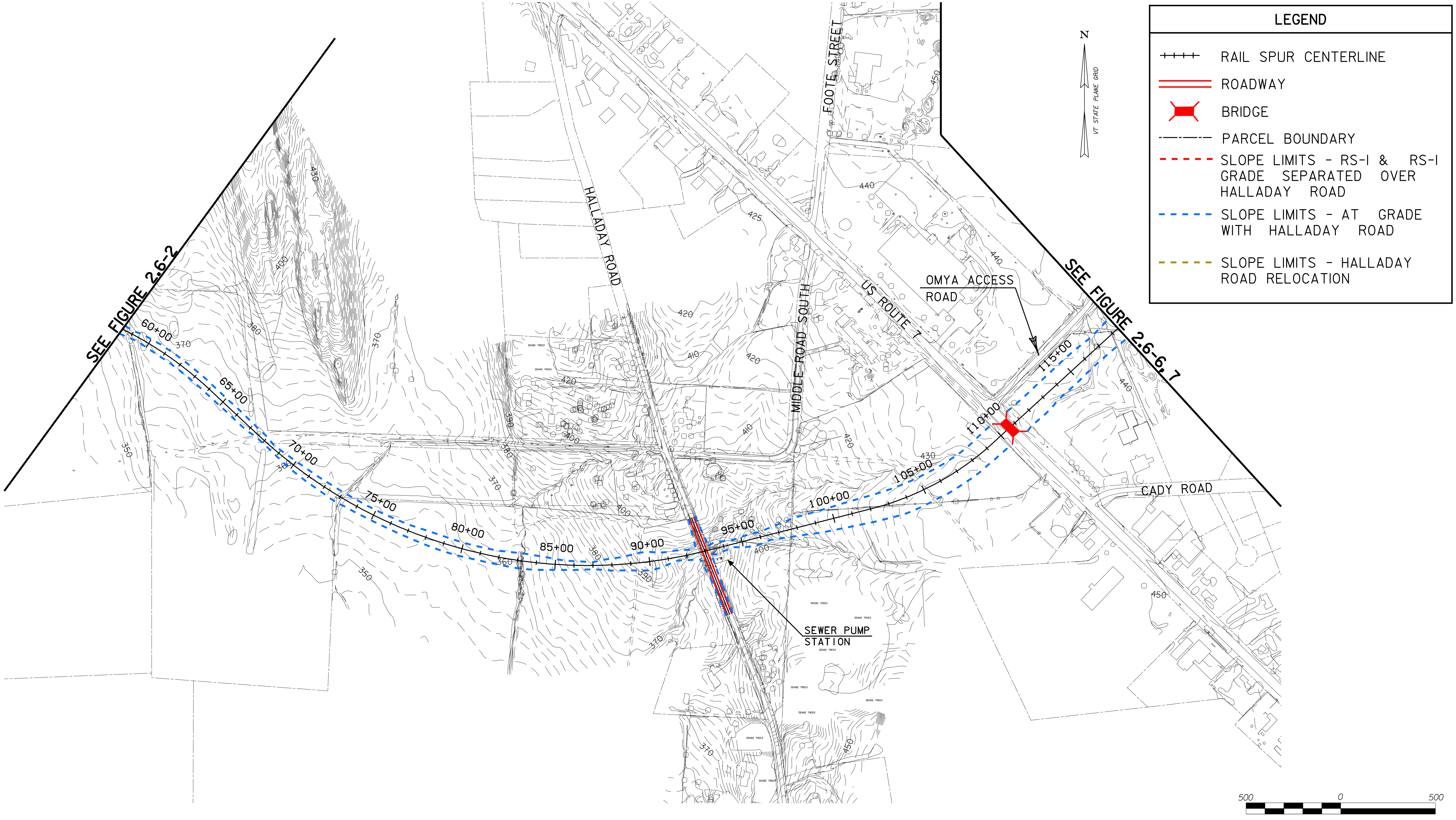

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1 (CENTRAL) AT-GRADE WITH HALLADAY ROAD

SEPTEMBER 2008 FIGURE NO. 2.6-4

03-OCT-2008
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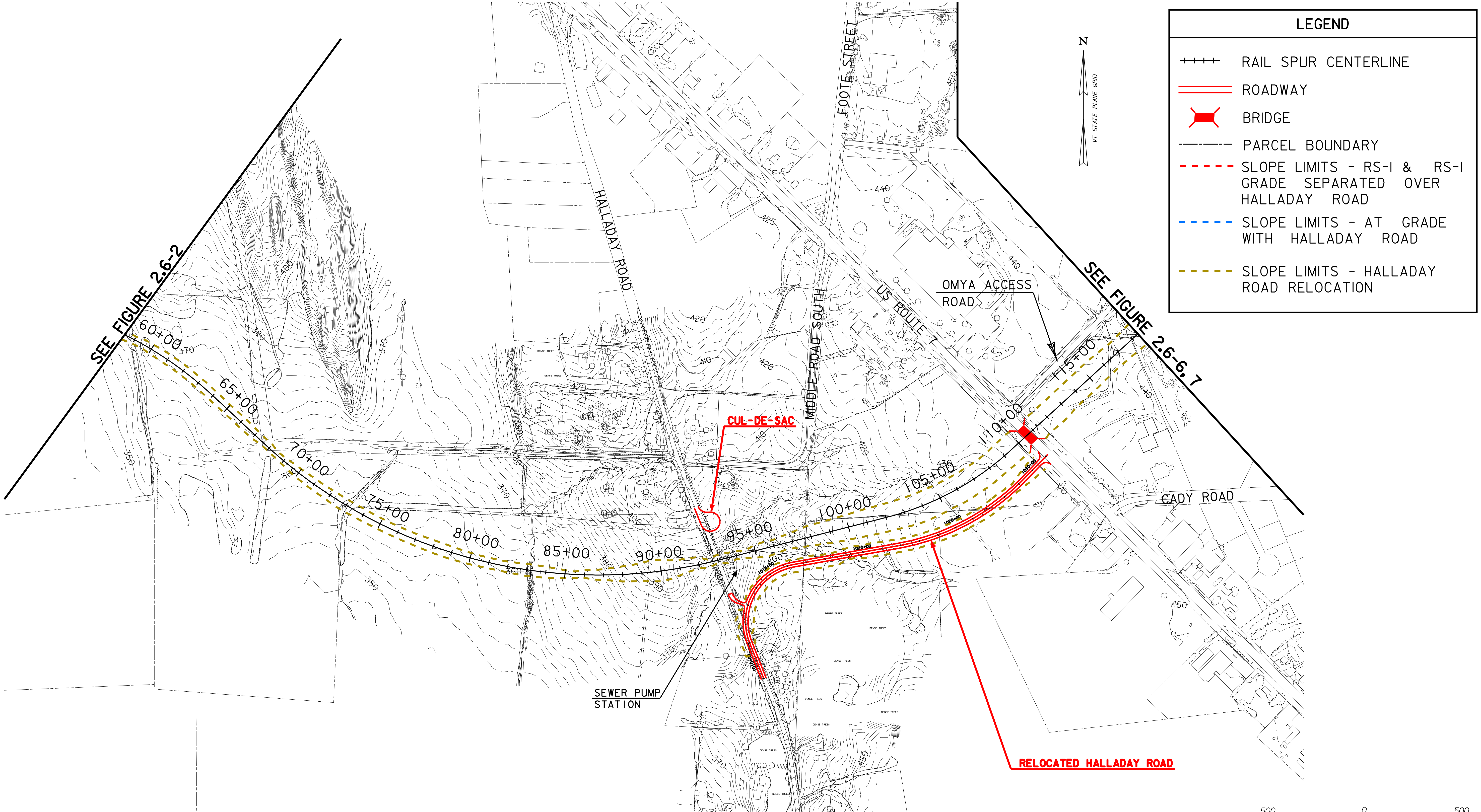

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1 (CENTRAL) HALLADAY ROAD RELOCATION

SEPTEMBER 2008 FIGURE NO. 2.6-5

03-OCT-2008
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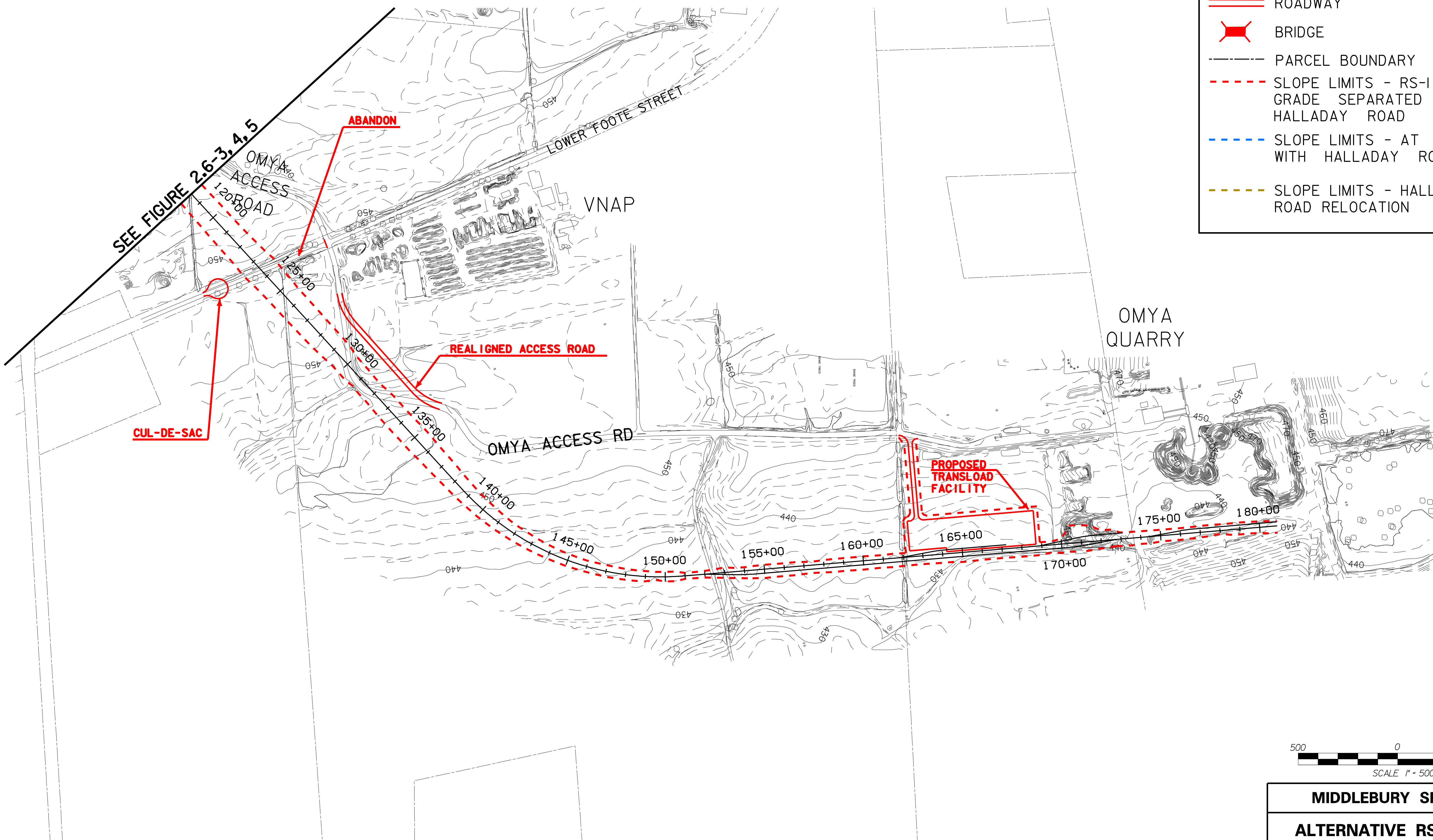

VT STATE PLANE GRID N

LEGEND

- RAIL SPUR CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - RS-I & RS-I GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS - HALLADAY ROAD RELOCATION

500 0 500
SCALE 1" = 500'

MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1 (EAST) CUT OFF LOWER FOOTE STREET

SEPTEMBER 2008 FIGURE NO. 2.6-6

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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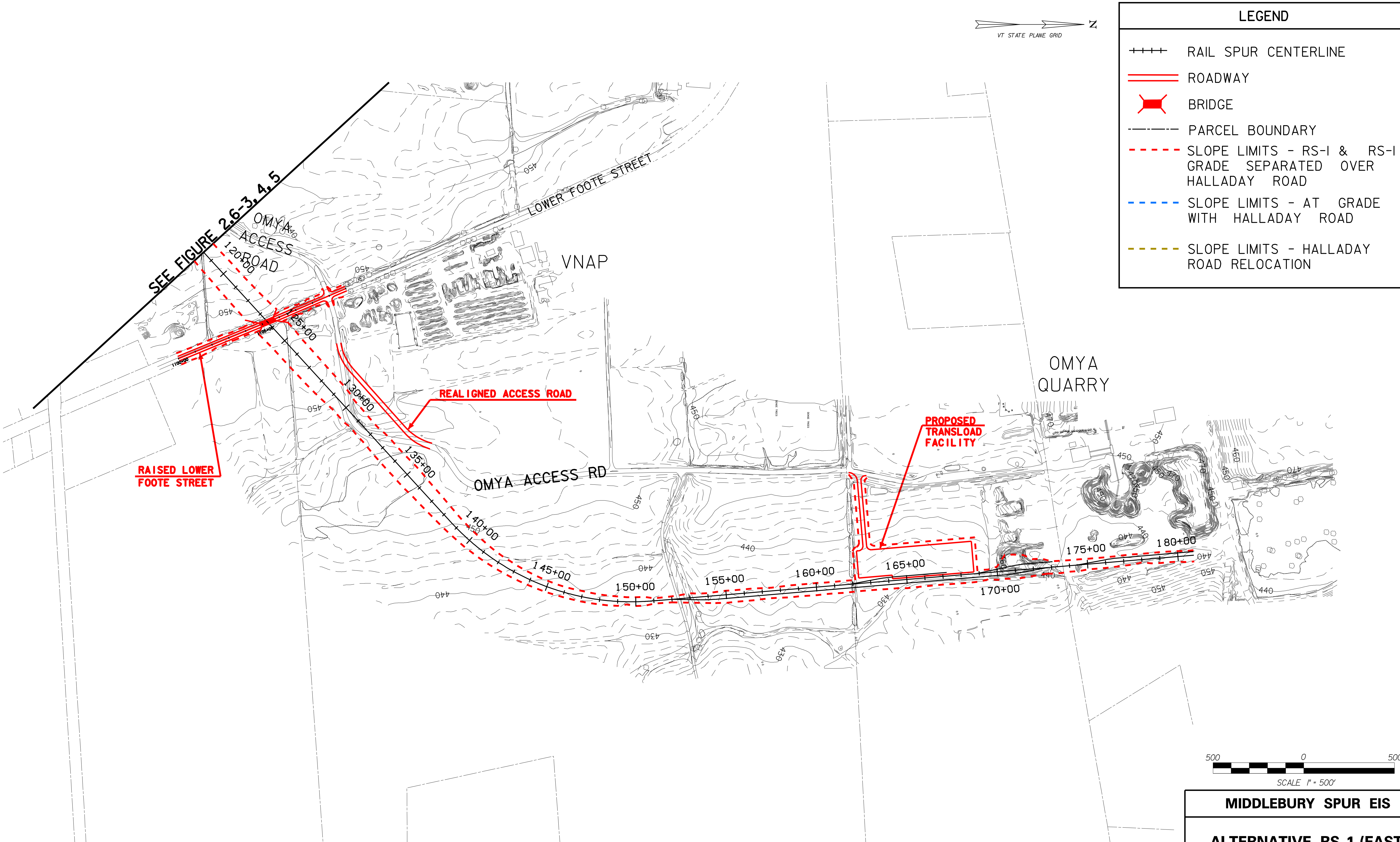

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

ALTERNATIVE RS–1 (EAST)
LOWER FOOTE STREET BRIDGE

SEPTEMBER 2008 FIGURE NO. 2.6-7

03-OCT-2008
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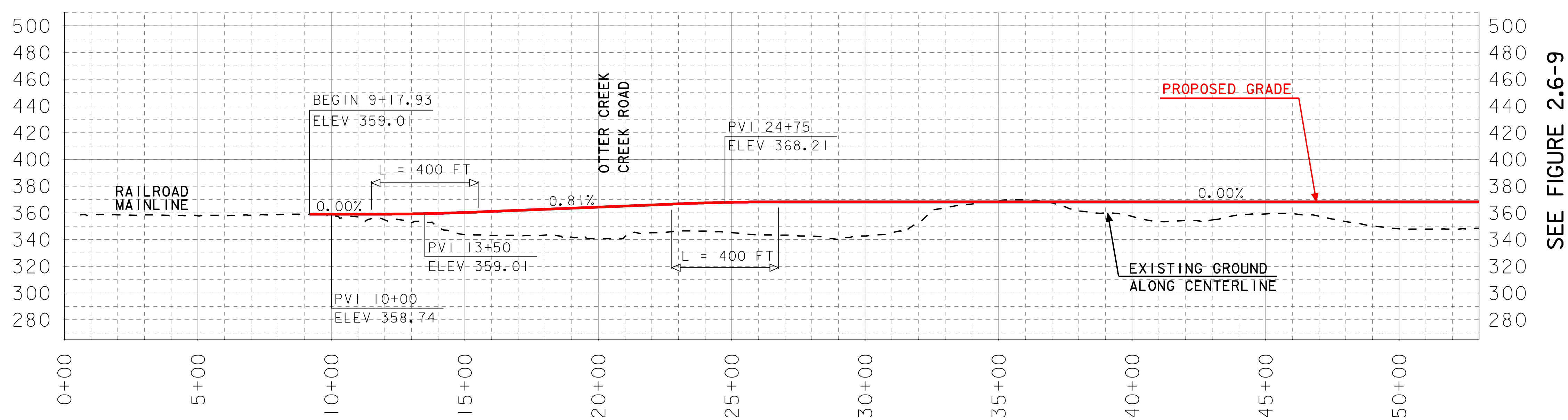

RAIL SPUR PROFILE

HORIZONTAL SCALE 1" = 500'
VERTICAL SCALE 1" = 100'

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1 (WEST)
PROFILES

SEPTEMBER 2008 FIGURE NO. 2.6-8

03-OCT-2008
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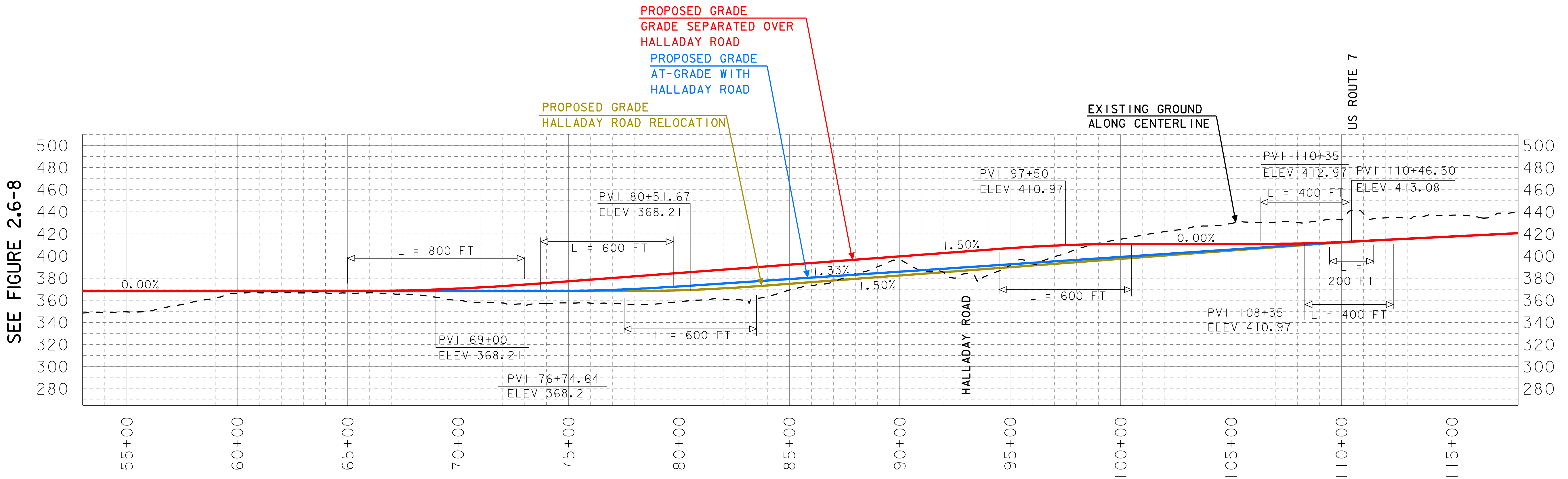

RAIL SPUR PROFILE

500 0 500
HORIZONTAL SCALE 1" = 500'
VERTICAL SCALE 1" = 100'
50
20

DATA SOURCES:
CONTOUR MAPPING BASED ON PHOTOGRAMMETRY
PRODUCED FROM AERIAL PHOTOGRAPHY FLOWN
ON APRIL 24, 2004.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

ALTERNATIVE RS-1 (CENTRAL)
PROFILES

SEPTEMBER 2008 FIGURE NO. 2.6-9

03-OCT-2008
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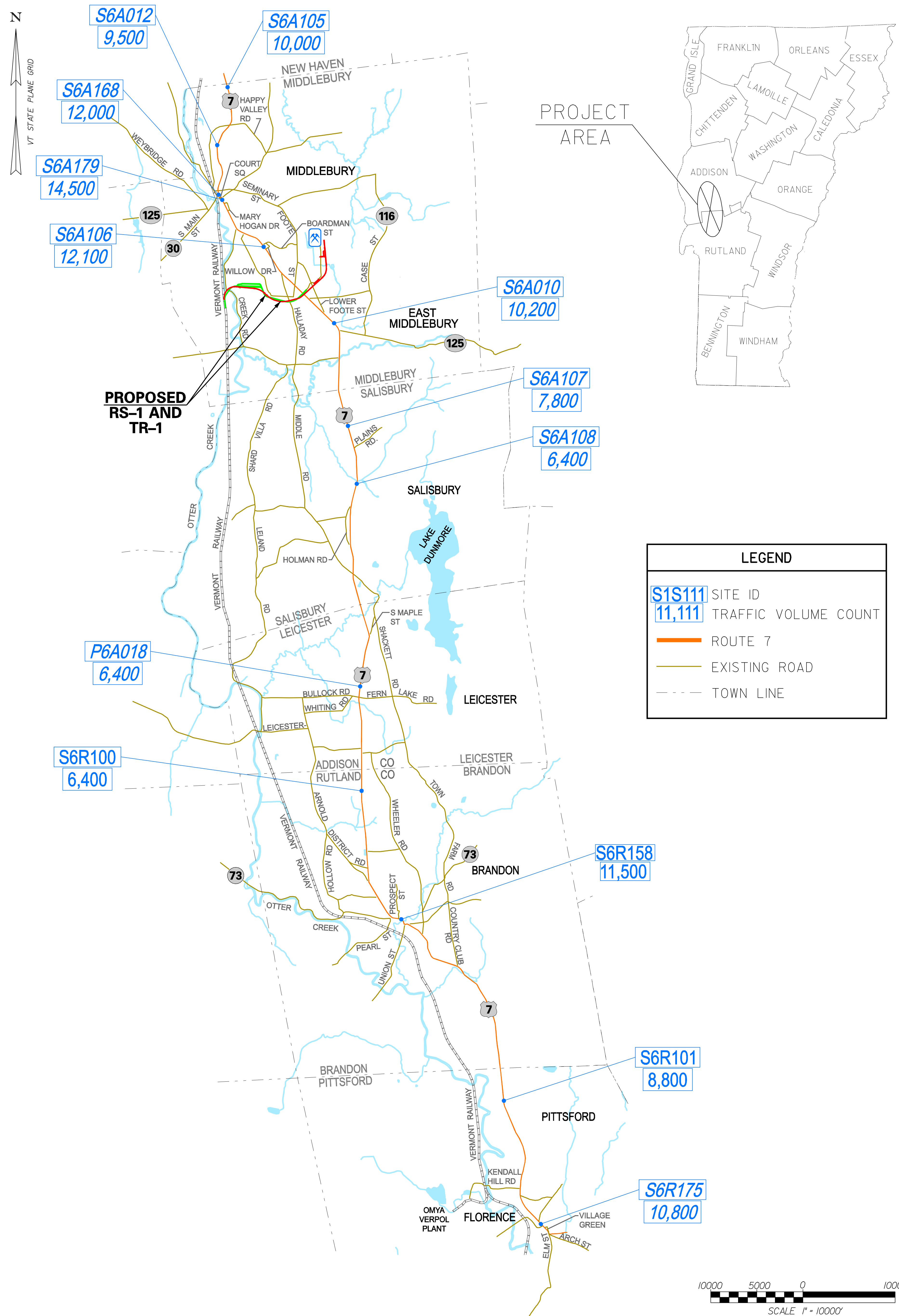

DATA SOURCES:
TRAFFIC COUNTS BASED ON VTRANS 2004
ANNUAL AVERAGE DAILY COUNT DATA
FROM AUTOMATIC TRAFFIC RECORDER
STATIONS.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

ROADWAYS IN PROJECT AREA

SEPTEMBER 2008 FIGURE NO. 3.1-1

03-OCT-2008
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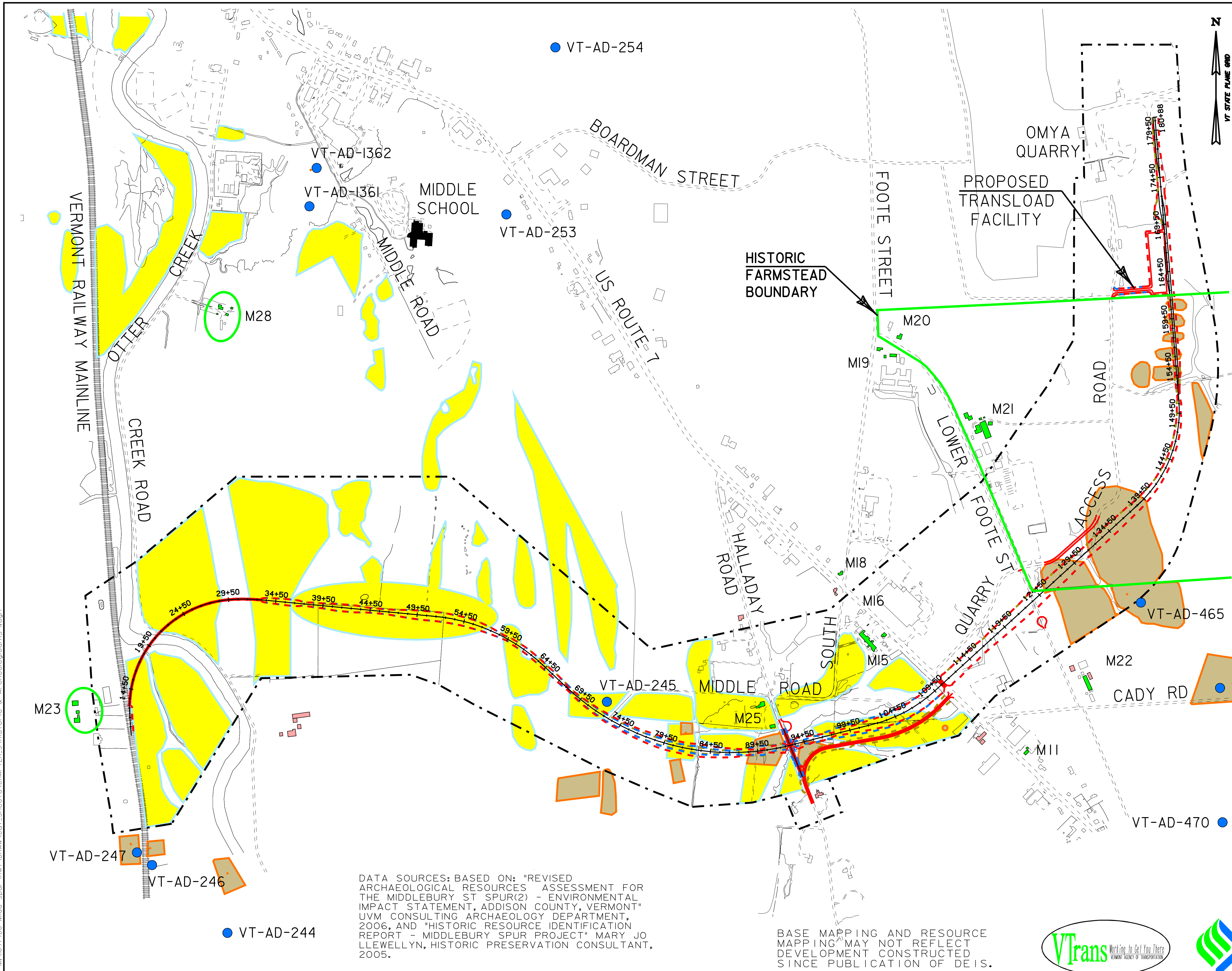

LEGEND

- RAIL SPUR CENTERLINE
- ROADWAY
- SLOPE LIMITS - RS-1 & RS-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS - HALLADAY ROAD RELOCATION
- STUDY AREA LIMITS
- LISTED IN OR IS ELIGIBLE FOR NATIONAL REGISTER OF HISTORIC PLACES
- ELIGIBLE FOR NATIONAL REGISTER AS HISTORIC FARMSTEAD, HISTORIC BOUNDARIES UNDETERMINED
- BUILDING OVER 50 YEARS OLD BUT INELIGIBLE FOR NATIONAL REGISTER DUE TO ALTERATIONS
- ARCHAEOLOGICALLY SENSITIVE AREAS - PHASE I OR II TESTING MAY BE NEEDED
- ARCHAEOLOGICALLY PREVIOUSLY TESTED AREAS - NO FURTHER TESTING RECOMMENDED
- ARCHAEOLOGICAL SITES

DATA SOURCES: BASED ON: "REVISED ARCHAEOLOGICAL RESOURCES ASSESSMENT FOR THE MIDDLEBURY ST SPUR(2) - ENVIRONMENTAL IMPACT STATEMENT, ADDISON COUNTY, VERMONT" UVM CONSULTING ARCHAEOLOGY DEPARTMENT, 2006, AND "HISTORIC RESOURCE IDENTIFICATION REPORT - MIDDLEBURY SPUR PROJECT" MARY JO LLEWELLYN, HISTORIC PRESERVATION CONSULTANT, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

HISTORIC AND ARCHAEOLOGICAL RESOURCES RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.11-1

03-OCT-2008
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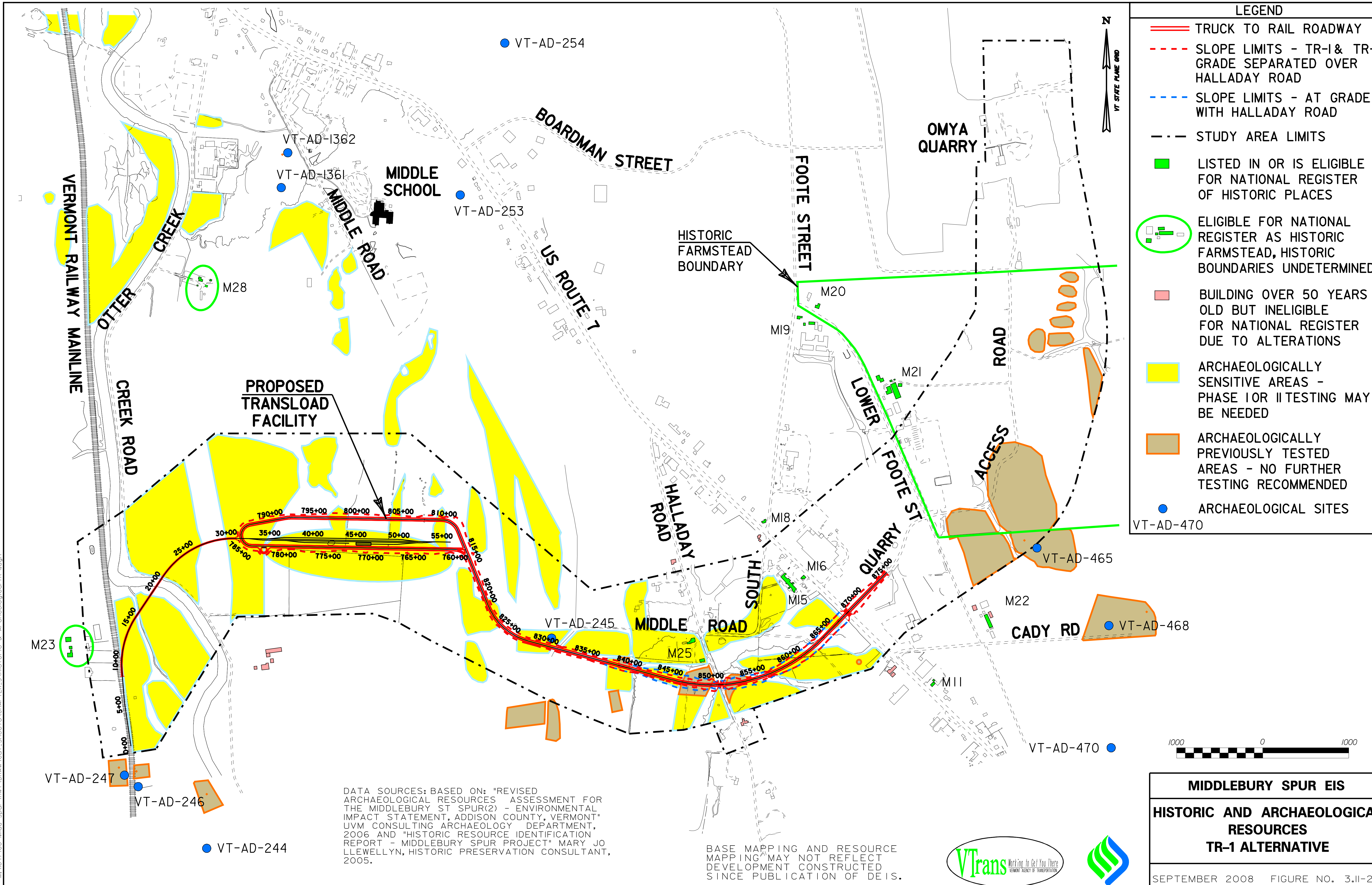
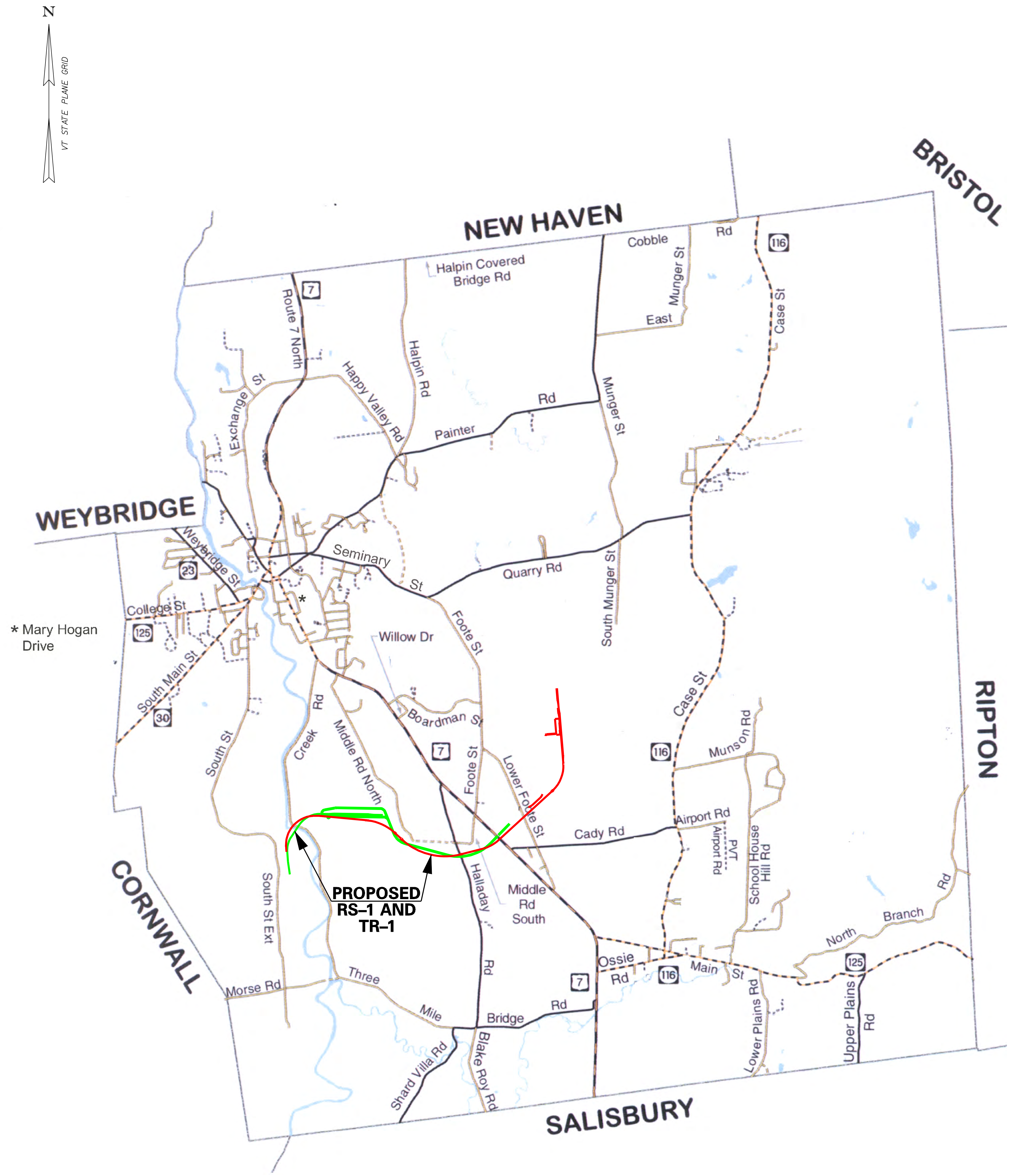


MIDDLEBURY SPUR EIS

HISTORIC AND ARCHAEOLOGICAL RESOURCES TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.II-2



TOWN OF MIDDLEBURY

DATA SOURCES:
"TOWN OF MIDDLEBURY ROAD NAMES"
ADDISON COUNTY REGIONAL PLANNING
COMMISSION, 2004

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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4000 2000 0 4000
SCALE 1" = 4000'

MIDDLEBURY SPUR EIS

ROADWAYS IN VICINITY OF ALTERNATIVES CORRIDOR

SEPTEMBER 2008 FIGURE NO. 3.1-2

03-OCT-2008
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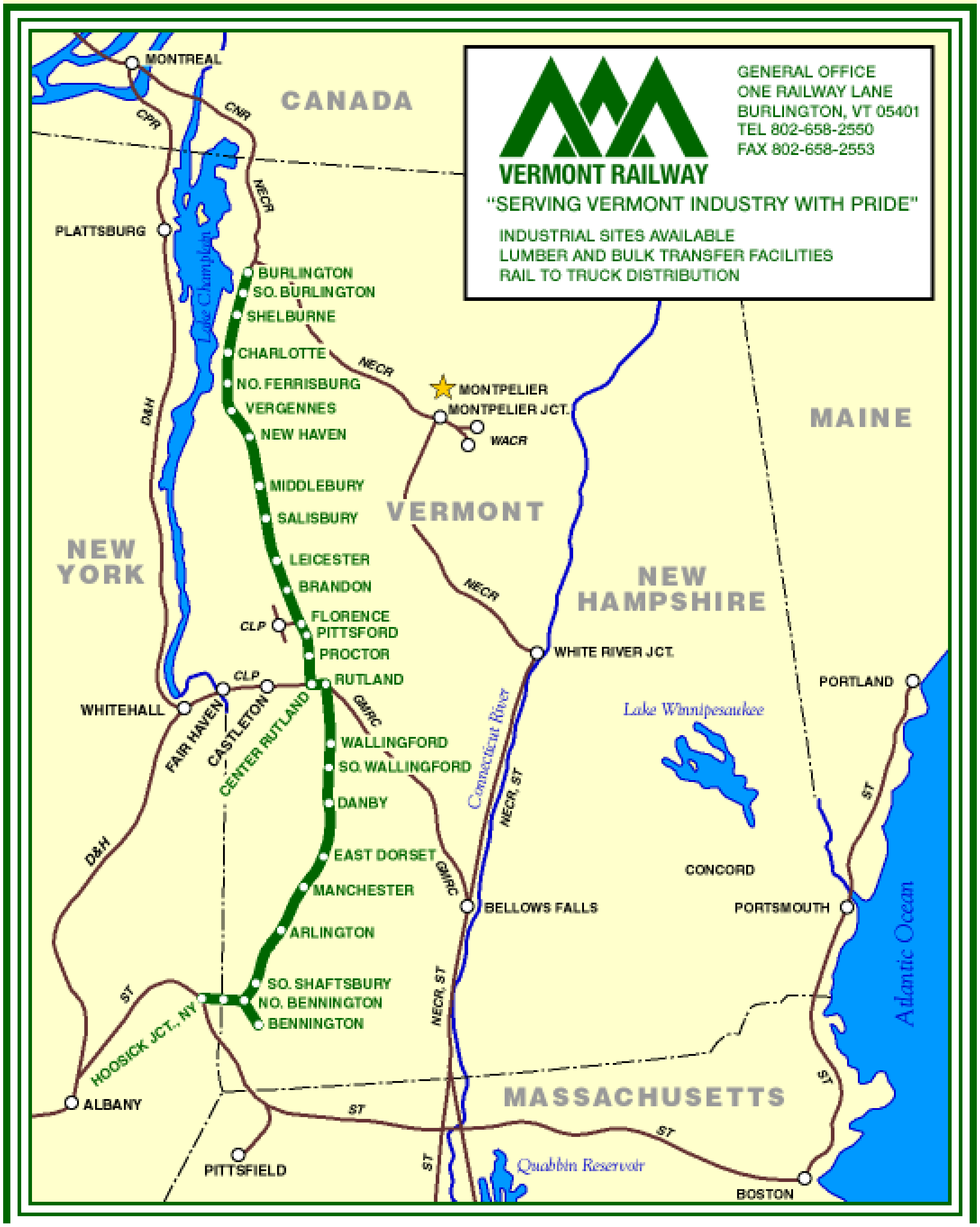
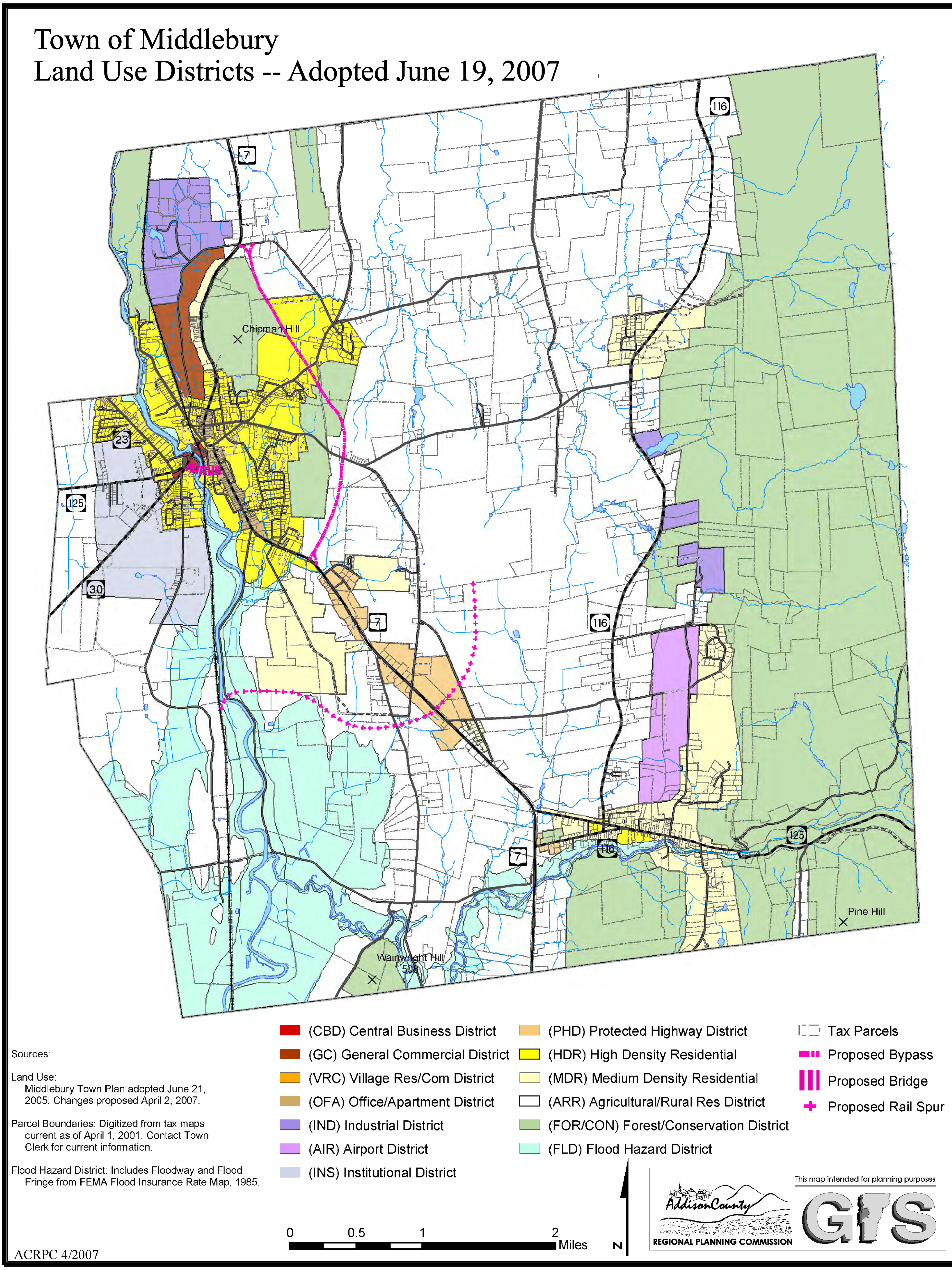
Figure 3.1-3: Location of Vermont Railway and Affiliates





MIDDLEBURY SPUR EIS

TOWN OF MIDDLEBURY ZONING DISTRICTS

SEPTEMBER 2008 FIGURE NO. 3.2-I

SOURCE: MIDDLEBURY TOWN PLAN 2007

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03-OCT-2008
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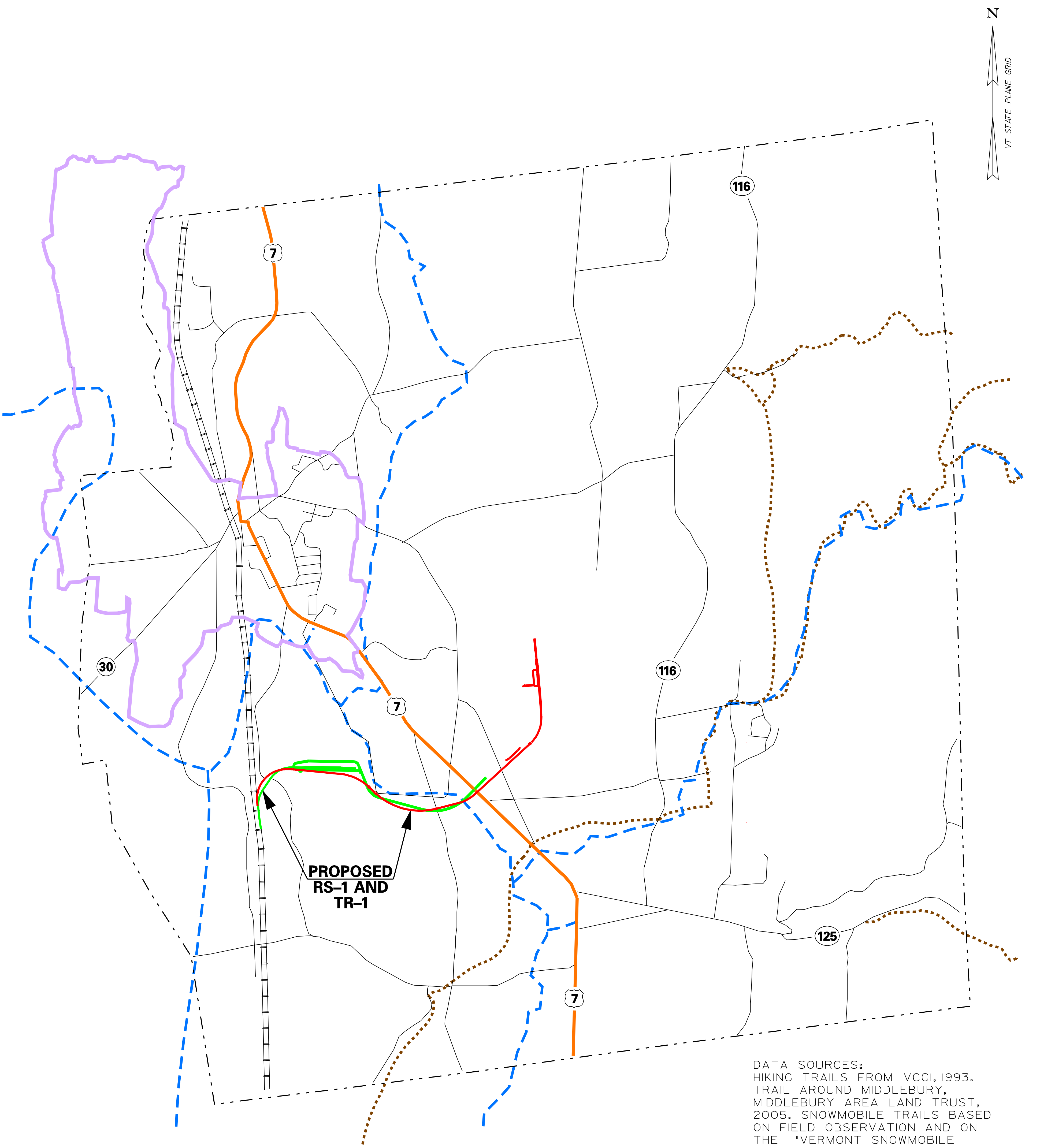

DATA SOURCES:
HIKING TRAILS FROM VCGI, 1993.
TRAIL AROUND MIDDLEBURY, MIDDLEBURY AREA LAND TRUST, 2005. SNOWMOBILE TRAILS BASED ON FIELD OBSERVATION AND ON THE "VERMONT SNOWMOBILE TRAILS MAP," VERMONT ASSOCIATION OF SNOW TRAVELERS, 2005.

NOTE:
THE TRAILS SHOWN HERE ARE BASED ON THE LATEST AVAILABLE INFORMATION. HOWEVER, SNOWMOBILE TRAILS ARE SUBJECT TO CHANGE AND MAY DIVERGE FROM THE TRAILS SHOWN HERE.

RS-I ALIGNMENT
TR-I ALIGNMENT
MIDDLEBURY TOWN LINE
ROUTE 7
ROADS
VERMONT RAILWAY
SNOWMOBILE TRAILS
TRAIL AROUND MIDDLEBURY
HIKING TRAILS

4000 0 4000
SCALE 1" = 4000'

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

TOWN OF MIDDLEBURY RECREATIONAL TRAILS

SEPTEMBER 2008 FIGURE NO. 3.2-2

03-OCT-2008
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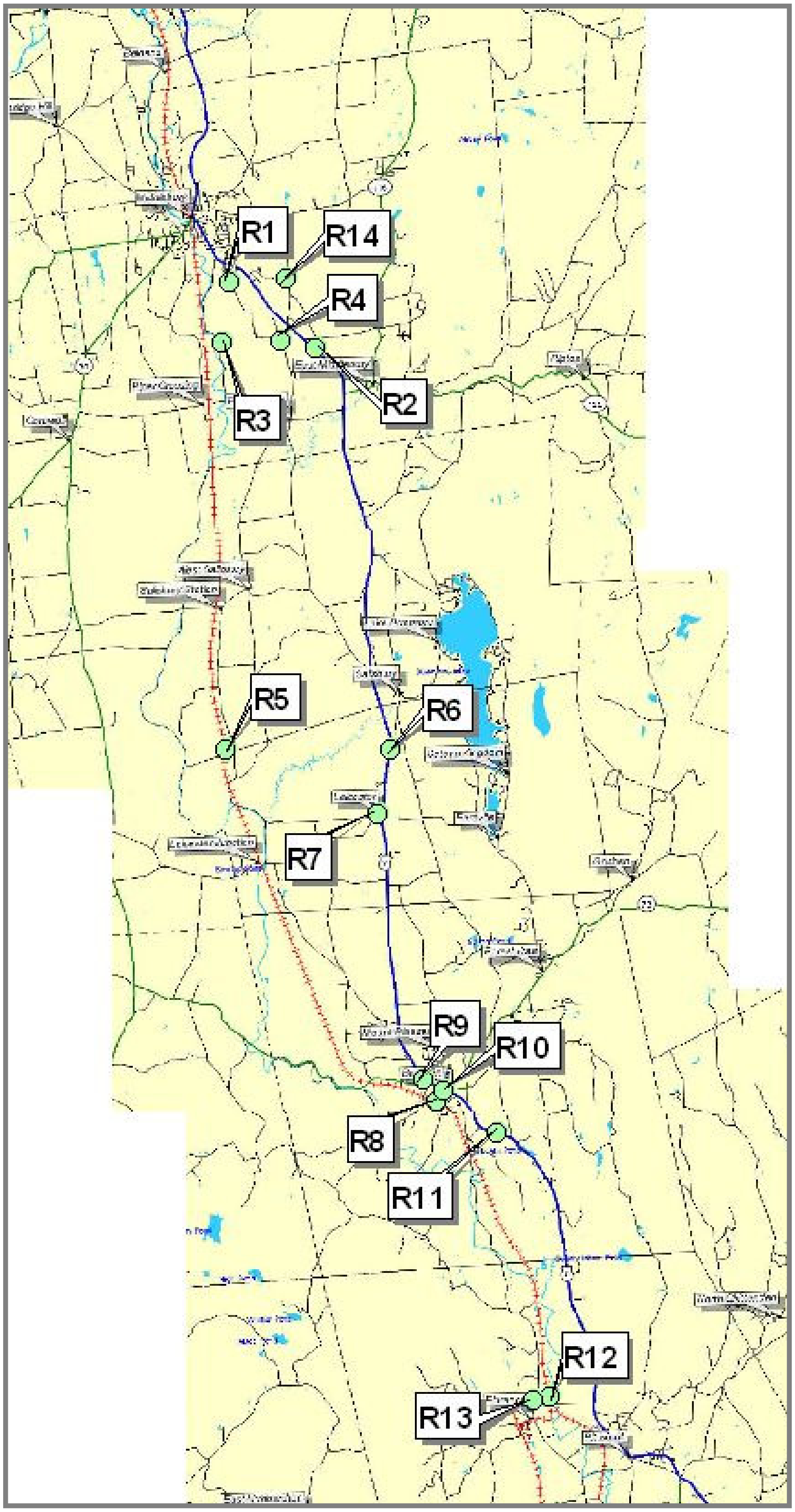
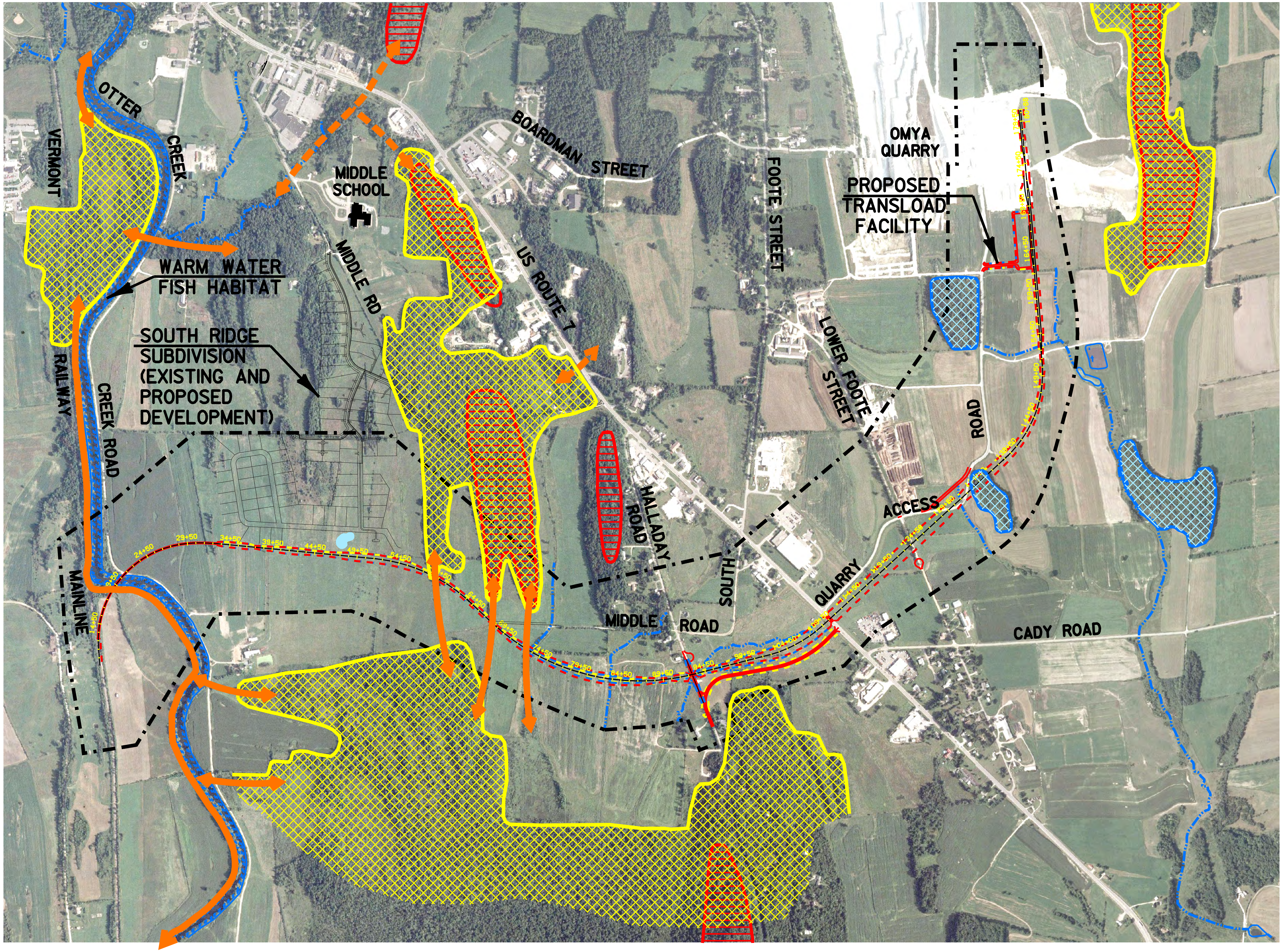
Figure 3.5-1: Noise and Vibration Measurement Locations



Source: Noise and vibration measurement locations provided by K.M. Chng Environmental, Inc.



LEGEND	
	STUDY AREA LIMITS
	SURFACE WATERS
	STREAMS
	LIKELY WILDLIFE CORRIDORS
	POTENTIAL WILDLIFE CORRIDORS
	LARGE BLOCKS (> 75 ACRES) OF FORESTED HABITAT NEAR STUDY AREA
	RIDGE LINES
	POTENTIAL REFUGE HABITAT FOR FORESTED AND WETLAND WILDLIFE

N
VT STATE PLANE GRID

1200 0 1200

DATA SOURCES:
LANDSCAPE AND HABITAT VALUE ANALYSIS
BASED ON FIELD REVIEW AND AERIAL IMAGERY
INTERPRETATION BY MCFARLAND-JOHNSON, INC.
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL
IMAGERY PROGRAM DATA, VCGI, 2005.

BASE MAPPING AND RESOURCE
MAPPING MAY NOT REFLECT
DEVELOPMENT CONSTRUCTED
SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

WILDLIFE AND FISHERIES RESOURCES RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.6-1

03-OCT-2008
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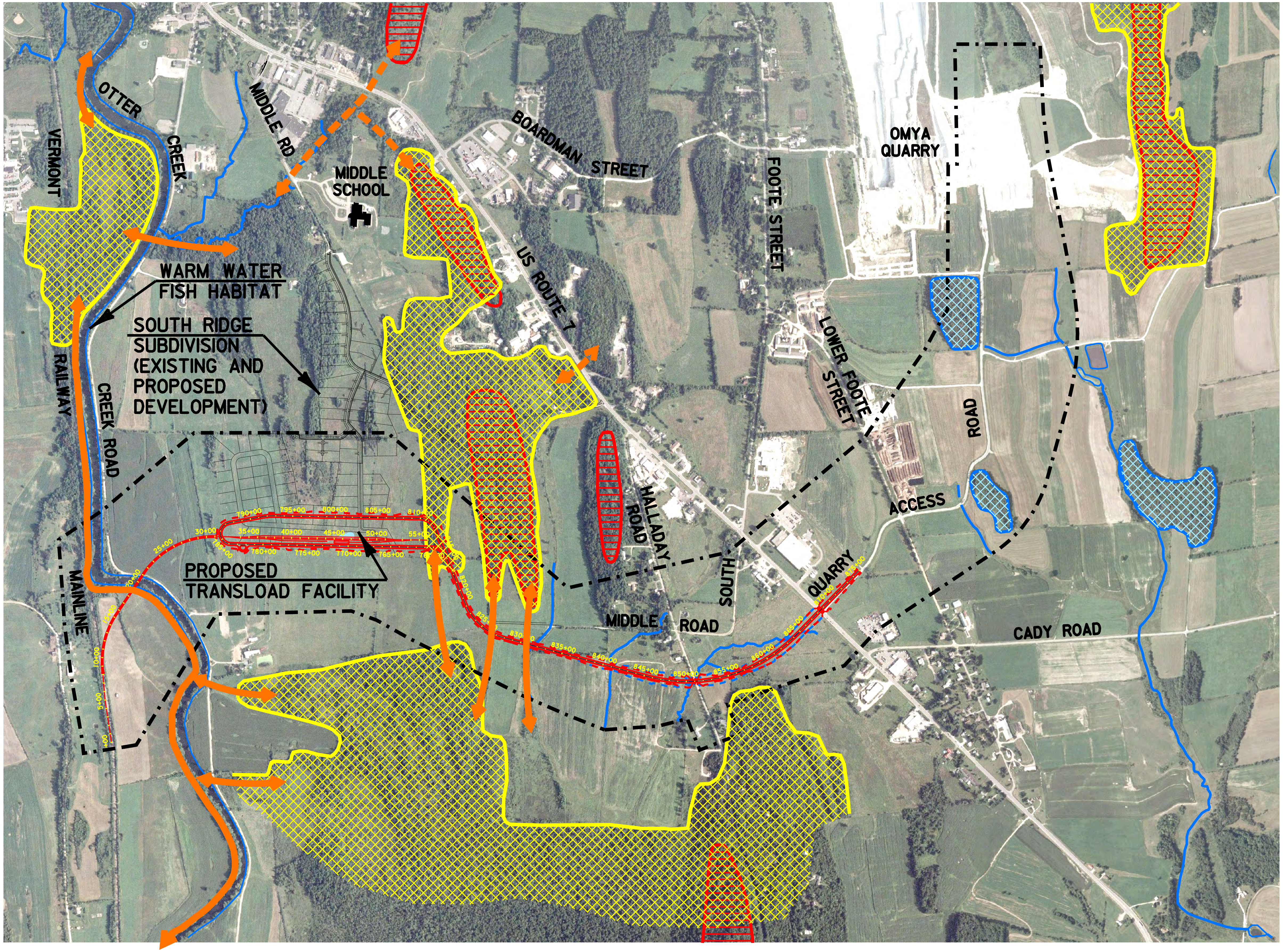

LEGEND

- STUDY AREA LIMITS
- SURFACE WATERS
- STREAMS
- LIKELY WILDLIFE CORRIDORS
- POTENTIAL WILDLIFE CORRIDORS
- LARGE BLOCKS (> 75 ACRES) OF FORESTED HABITAT NEAR STUDY AREA
- RIDGE LINES
- POTENTIAL REFUGE HABITAT FOR FORESTED AND WETLAND WILDLIFE

DATA SOURCES:
LANDSCAPE AND HABITAT VALUE ANALYSIS BASED ON FIELD REVIEW AND AERIAL IMAGERY INTERPRETATION BY MCFARLAND-JOHNSON, INC.
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA, VCGI, 2005.

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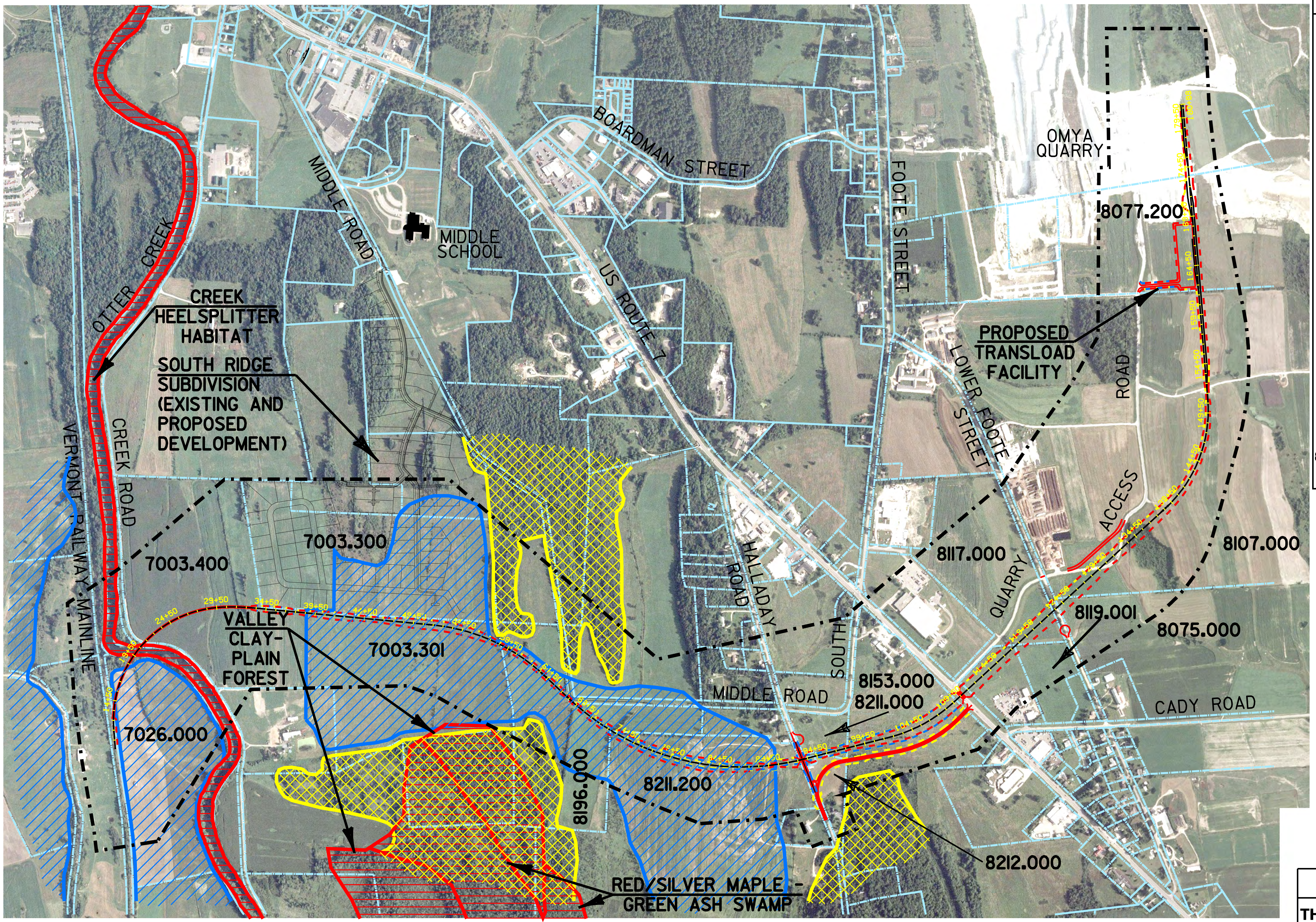
MIDDLEBURY SPUR EIS

WILDLIFE AND FISHERIES RESOURCES TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.6-2

03-OCT-2008
M:\1647400 Midd Spur\HWY\DRAW\Cut_Sheets\CHAPTER_3\Wildlife & Fisheries TR-1.dgn



LEGEND

- SLOPE LIMITS-RS-1 & RS-1 GRADE SEPARATED OVER HALLADAY RD
- SLOPE LIMITS - AT GRADE WITH HALLADAY RD
- SLOPE LIMITS-HALLADAY ROAD RELOCATION
- STUDY AREA LIMITS
- POTENTIAL UPLAND SAND-PIPER AND GRASSHOPPER SPARROW FORAGING HABITAT WITHIN 1000 FEET OF ALTERNATIVES (NOTE: NO KNOWN OCCURRENCES)
- KNOWN OR POTENTIAL INDIANA BAT HABITAT WITHIN 1000 FEET OF ALTERNATIVES
- RARE SPECIES AND SIGNIFICANT NATURAL COMMUNITIES
- PARCEL LINE
- 8107.000 MIDDLEBURY TAX MAP LOT NUMBER

MIDDLEBURY SPUR EIS

THREATENED AND ENDANGERED SPECIES POTENTIAL HABITAT RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.6-3

DATA SOURCES:
POTENTIAL HABITAT MAPPING BASED ON FIELD REVIEW AND ANALYSIS BY MCFARLAND-JOHNSON, INC. AND IN CONSULTATION WITH VERMONT NATURAL HERITAGE PROGRAM STAFF. AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA, VCGI, 2005. RARE SPECIES AND SIGNIFICANT NATURAL COMMUNITIES DATA PROVIDED BY VERMONT NATURAL HERITAGE PROGRAM. TOWN OF MIDDLEBURY TAX MAPS, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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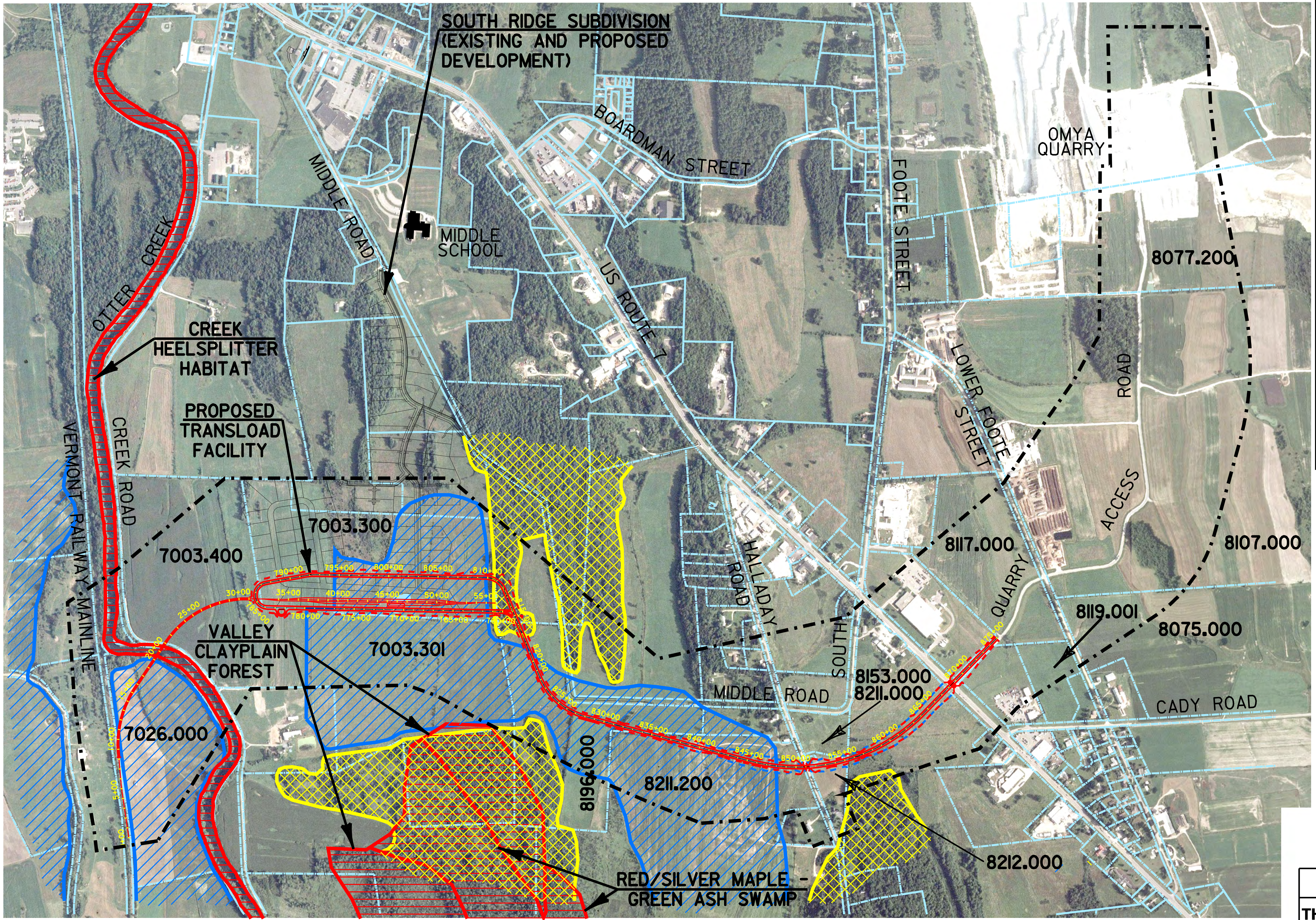

LEGEND

- STUDY AREA LIMITS
- SLOPE LIMITS-TR-1 & TR-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS AT GRADE WITH HALLADAY ROAD
- POTENTIAL UPLAND SANDPIPER AND GRASSHOPPER SPARROW FORAGING HABITAT WITHIN 1000 FEET OF ALTERNATIVES (NOTE: NO KNOWN OCCURRENCES)
- KNOWN OR POTENTIAL INDIANA BAT HABITAT WITHIN 1000 FEET OF ALTERNATIVES
- RARE SPECIES AND SIGNIFICANT NATURAL COMMUNITIES
- PARCEL LINE
- 8107.000 MIDDLEBURY TAX MAP LOT NUMBER

DATA SOURCES:
POTENTIAL HABITAT MAPPING BASED ON FIELD REVIEW AND ANALYSIS BY MCFARLAND-JOHNSON, INC. AND IN CONSULTATION WITH VERMONT NATURAL HERITAGE PROGRAM STAFF. AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA, VCGI, 2005. RARE SPECIES AND SIGNIFICANT NATURAL COMMUNITIES DATA PROVIDED BY VERMONT NATURAL HERITAGE PROGRAM. TOWN OF MIDDLEBURY TAX MAPS, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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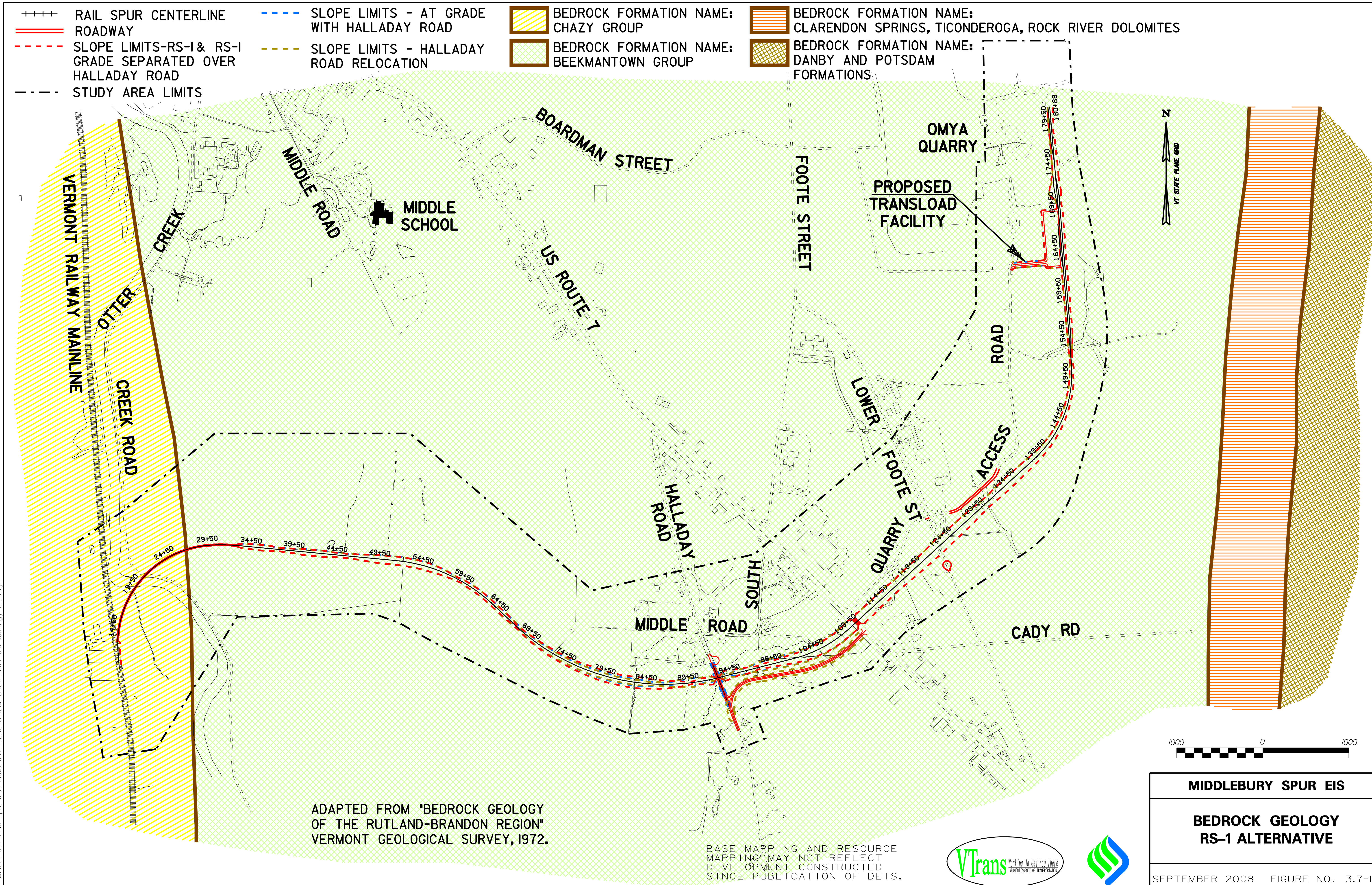
MIDDLEBURY SPUR EIS

THREATENED AND ENDANGERED SPECIES POTENTIAL HABITAT TR-1 ALTERNATIVE

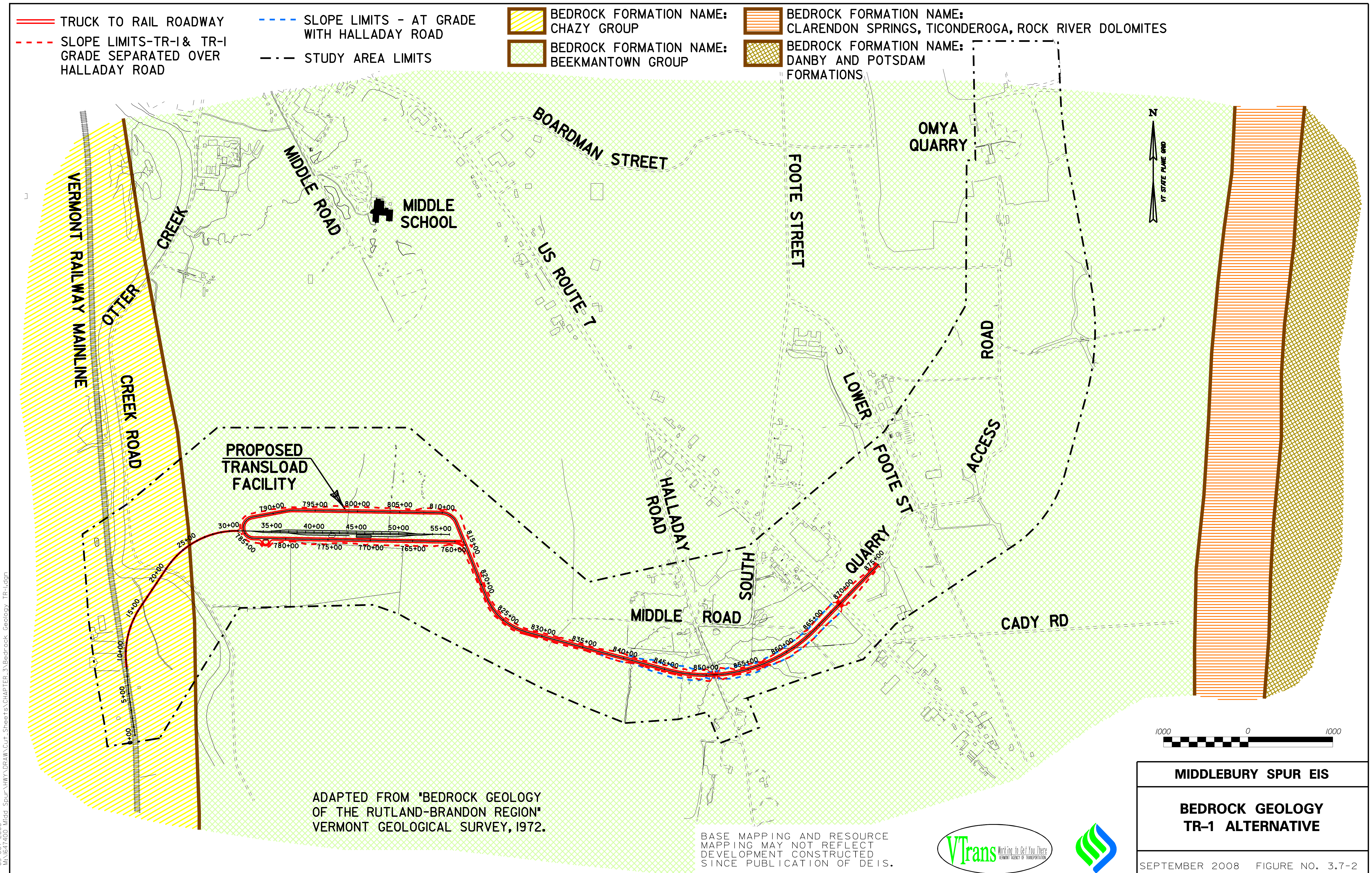
SEPTEMBER 2008 FIGURE NO. 3.6-4



MIDDLEBURY SPUR EIS

BEDROCK GEOLOGY
RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.7-1



TRUCK TO RAIL ROADWAY
SLOPE LIMITS-TR-1 & TR-1 GRADE SEPARATED OVER HALLADAY ROAD
SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
STUDY AREA LIMITS
BEDROCK FORMATION NAME: CHAZY GROUP
BEDROCK FORMATION NAME: BEEKMANTOWN GROUP
BEDROCK FORMATION NAME: CLARENDON SPRINGS, TICONDEROGA, ROCK RIVER DOLOMITES
BEDROCK FORMATION NAME: DANBY AND POTSDAM FORMATIONS
VERMONT RAILWAY MAINLINE
OTTER CREEK
CREEK ROAD
MIDDLE ROAD
MIDDLE SCHOOL
BOARDMAN STREET
US ROUTE 7
FOOTE STREET
OMYA QUARRY
LOWER FOOTE ST
ACCESS ROAD
QUARRY
HALLADAY ROAD
SOUTH
MIDDLE ROAD
CADY RD
PROPOSED TRANSLOAD FACILITY
N
VT STATE PLANE GRID
1000 0 1000
ADAPTED FROM "BEDROCK GEOLOGY OF THE RUTLAND-BRANDON REGION" VERMONT GEOLOGICAL SURVEY, 1972.
BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.
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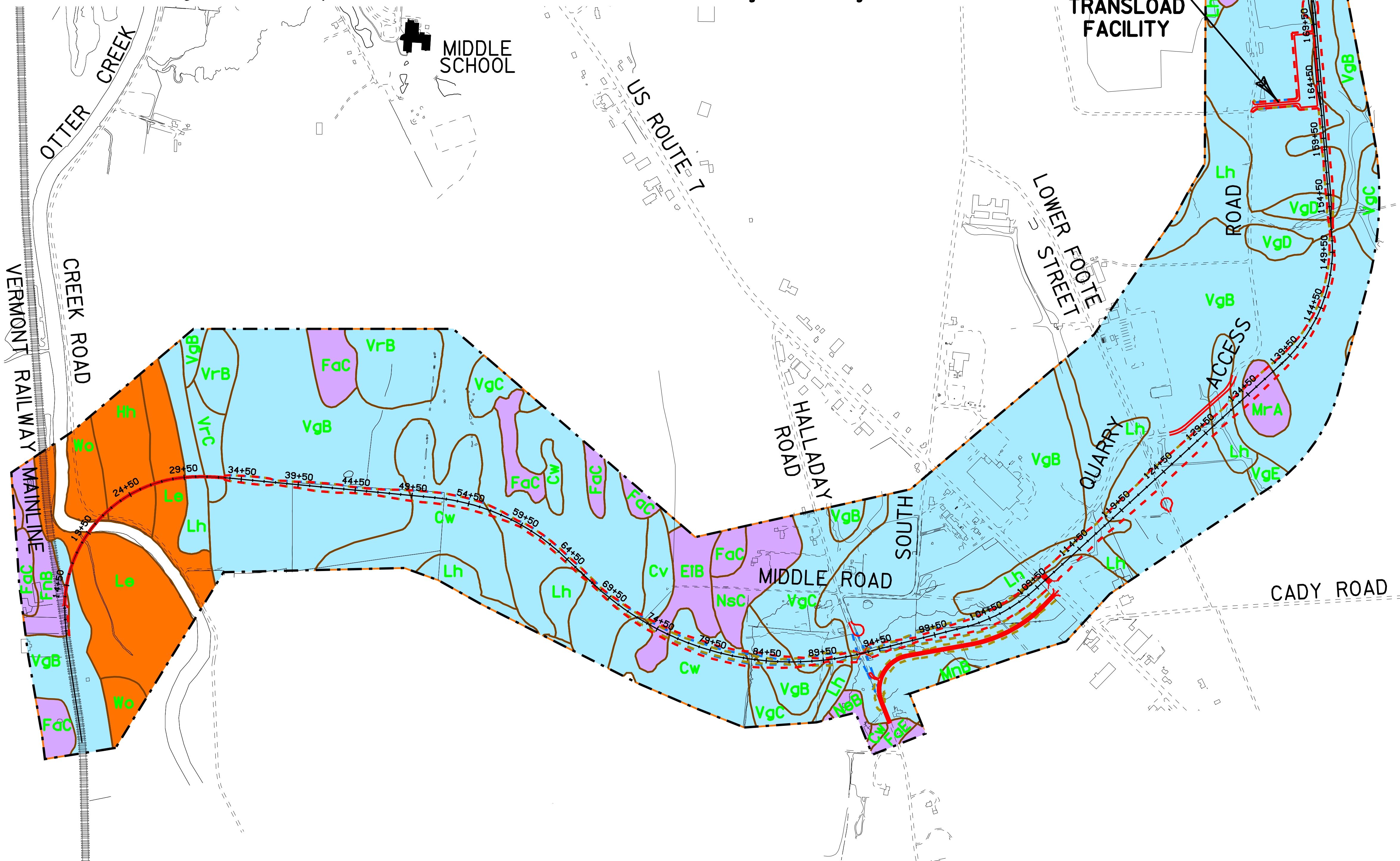
MIDDLEBURY SPUR EIS
BEDROCK GEOLOGY TR-1 ALTERNATIVE
SEPTEMBER 2008 FIGURE NO. 3.7-2
03-OCT-2008

SOIL UNIT KEY

Cw - Covington and Panton Silty Clays
Cv - Covington Silty Clay, Flooded
ElB - Elmwood Fine Sandy Loam, Coarse Variant, 0 to 8% slopes
FaC - Farmington Extremely Rocky Silt Loam, 5 to 20% slopes
FaE - Farmington Extremely Rocky Silt Loam, 25 to 50% slopes
FnB - Farmington-Nellis rocky complex, 5 to 12% slopes
Hh - Hadley Very Fine Sandy Loam, Frequently Flooded
Le - Limerick Silt Loam
Lh - Livingston Clay
MnB - Massena extremely stony silt loam, 0 to 8% slopes
MrA - Melrose fine sandy loam, 0-3% slopes
NeB - Nellis Stony Loam, 3 to 8% slopes
NsC - Nellis Extremely Stony Loam, 3 to 15% slopes
VgB - Vergennes Clay, 2 to 6% slopes
VgC - Vergennes Clay, 6 to 12% slopes
VgD - Vergennes Clay, 12 to 25% slopes
VgE - Vergennes Clay, 25 to 50% slopes
VrB - Vergennes rocky clay, moderately shallow variant, 2 to 6% slopes
VrC - Vergennes Rocky Clay, moderately shallow variant, 6 to 12% slopes
Wo - Winooski very fine sandy loam

LEGEND

RAIL SPUR CENTERLINE
ROADWAY
SLOPE LIMITS-RS-1 & RS-1 GRADE SEPARATED OVER HALLADAY ROAD
SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
SLOPE LIMITS - HALLADAY ROAD RELOCATION
STUDY AREA LIMITS
FaC SOIL TYPE
LAKEBED DEPOSITED CLAY SOILS
GLACIAL TILL SOILS
FLOODPLAIN SOILS



DATA SOURCES:
ADDISON COUNTY SOIL SURVEY, USDA NRCS, 1971.
DIGITAL DATA SOURCE: VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

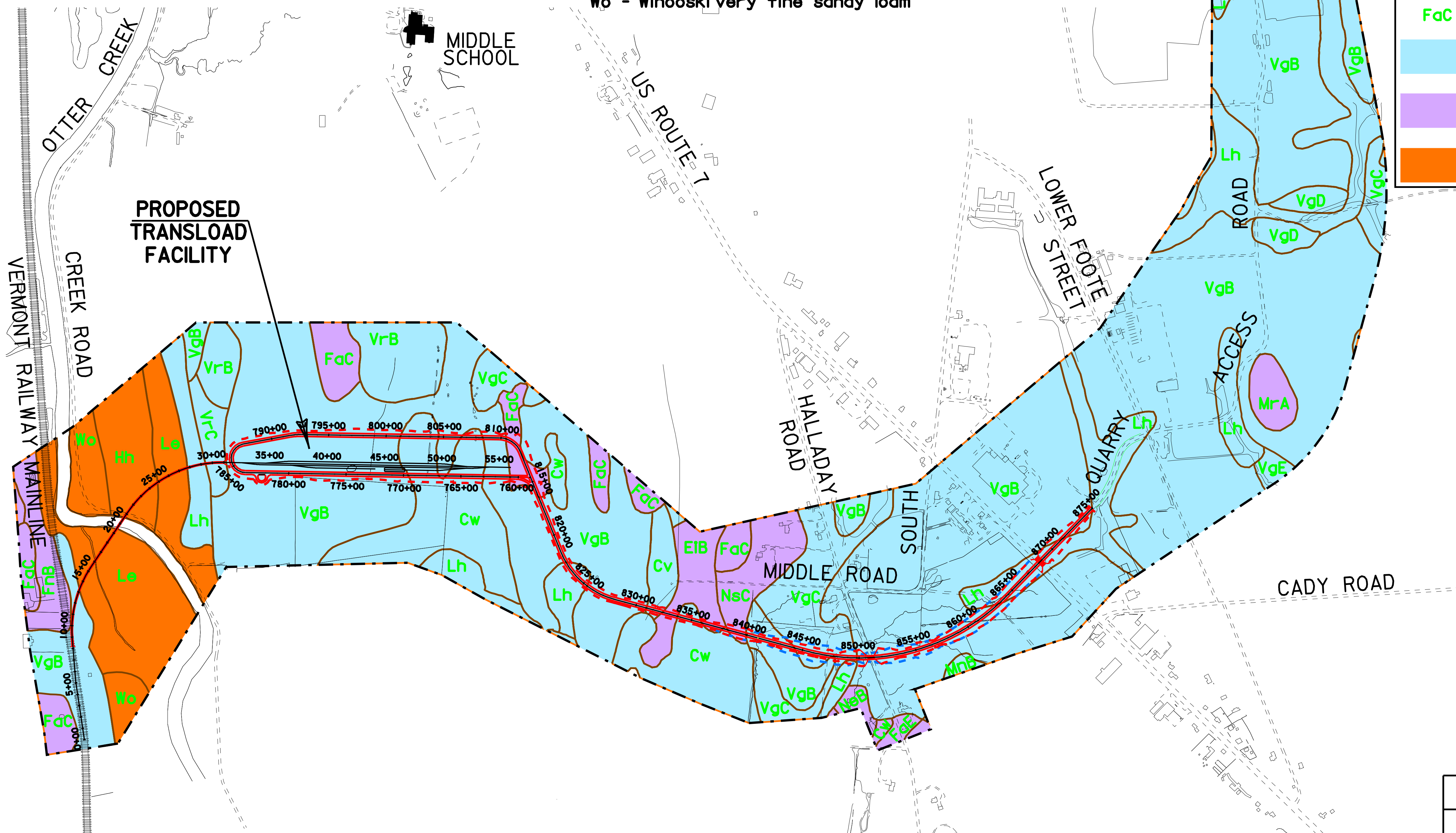
SOIL SURVEY MAPPING RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.7-3

03-OCT-2008 M:\1647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER 3\RS_TR_SoilSurvey Mapping.dgn

SOIL UNIT KEY

Cw - Covington and Panton Silty Clays
Cv - Covington Silty Clay, Flooded
ElB - Elmwood Fine Sandy Loam, Coarse Variant, 0 to 8% slopes
FaC - Farmington Extremely Rocky Silt Loam, 5 to 20% slopes
FaE - Farmington Extremely Rocky Silt Loam, 25 to 50% slopes
FnB - Farmington-Nellis rocky complex, 5 to 12% slopes
Hh - Hadley Very Fine Sandy Loam, Frequently Flooded
Le - Limerick Silt Loam
Lh - Livingston Clay
MnB - Massena extremely stony silt loam, 0 to 8% slopes
MrA - Melrose fine sandy loam, 0 to 3% slopes
NeB - Nellis Stony Loam, 3 to 8% slopes
NsC - Nellis Extremely Stony Loam, 3 to 15% slopes
VgB - Vergennes Clay, 2 to 6% slopes
VgC - Vergennes Clay, 6 to 12% slopes
VgD - Vergennes Clay, 12 to 25% slopes
VgE - Vergennes Clay, 25 to 50% slopes
VrB - Vergennes rocky clay, moderately shallow variant, 2 to 6% slopes
VrC - Vergennes Rocky Clay, moderately shallow variant, 6 to 12% slopes
Wo - Winooski very fine sandy loam



LEGEND

- TRUCK TO RAIL ROADWAY
- SLOPE LIMITS-TR-1 & TR-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- STUDY AREA LIMITS
- FaC SOIL TYPE
- LAKEBED DEPOSITED CLAY SOILS
- GLACIAL TILL SOILS
- FLOODPLAIN SOILS

DATA SOURCES:
ADDISON COUNTY SOIL SURVEY, USDA NRCS, 1971.
DIGITAL DATA SOURCE: VCGI, 2005.

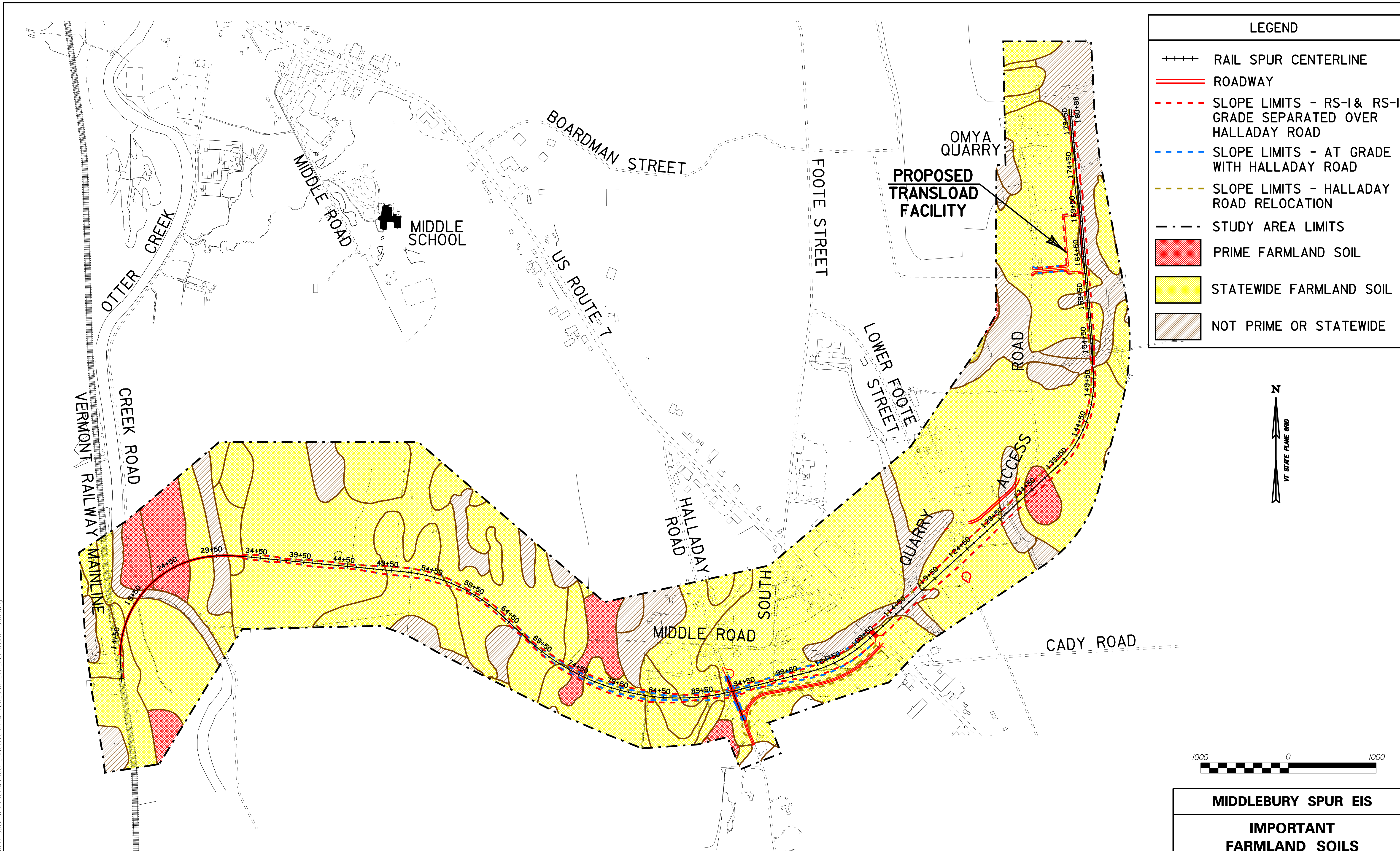
BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

SOIL SURVEY MAPPING
TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.7-4

03-OCT-2008
M:\1647400 Midd Spur\HWY\DRAW\Cut_Sheets\CHAPTER_3\RS_TR_SoilSurvey Mapping.dgn



DATA SOURCES:
SOIL STATUS BASED ON: "FARMLAND CLASSIFICATION SYSTEMS FOR VERMONT SOILS", USDA-NRCS, REVISED JUNE 2006. ADDISON COUNTY SOIL SURVEY, USDA NRCS, 1971. DIGITAL DATA SOURCE: VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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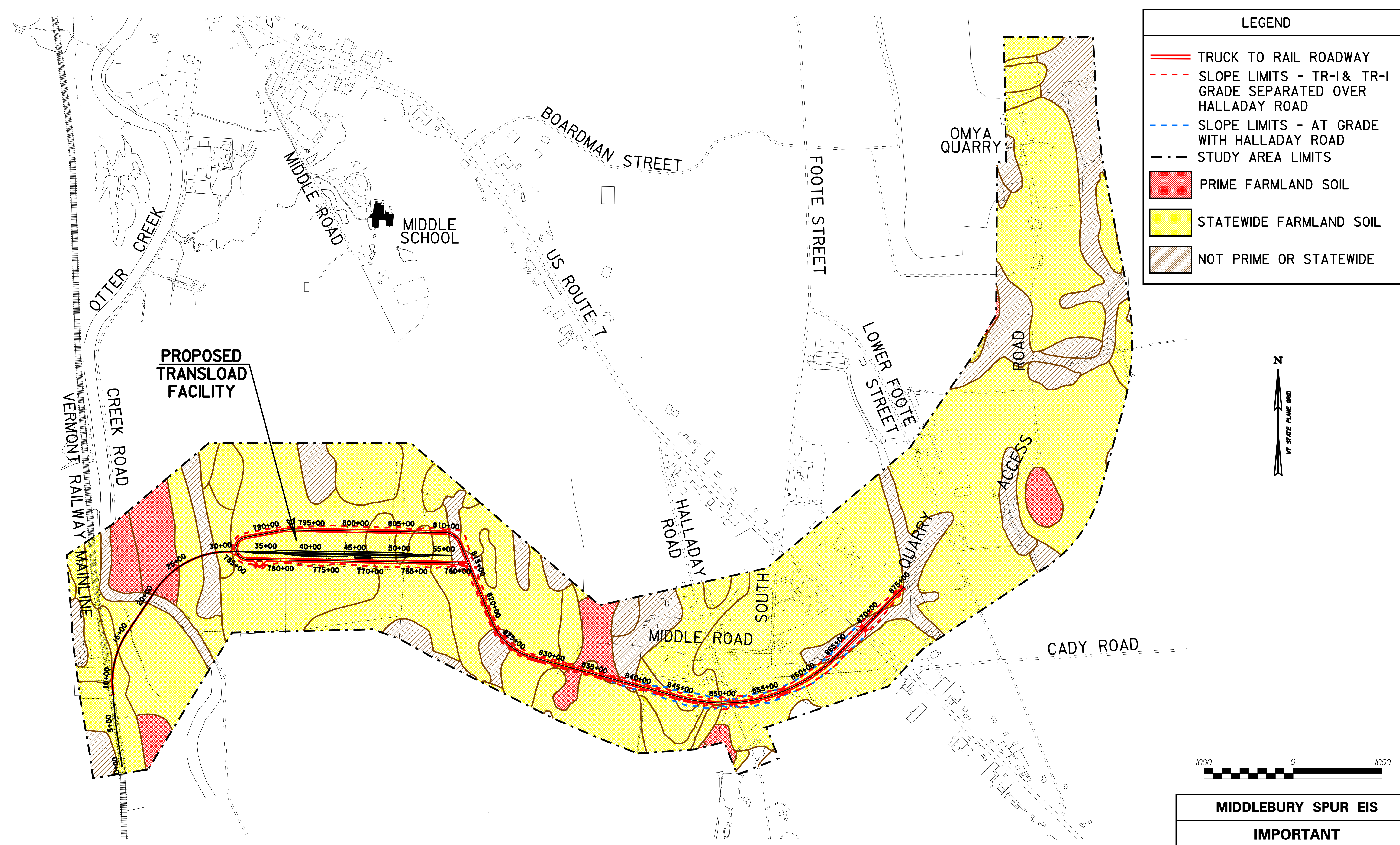
MIDDLEBURY SPUR EIS

IMPORTANT FARMLAND SOILS RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.8-1

03-OCT-2008 M:\647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER_3\RS_TR_Farmland Soils.dgn



MIDDLEBURY SPUR EIS

IMPORTANT FARMLAND SOILS TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.8-2

DATA SOURCES:
SOIL STATUS BASED ON: "FARMLAND CLASSIFICATION SYSTEMS FOR VERMONT SOILS", USDA-NRCS, REVISED JUNE 2006. ADDISON COUNTY SOIL SURVEY, USDA NRCS, 1971. DIGITAL DATA SOURCE: VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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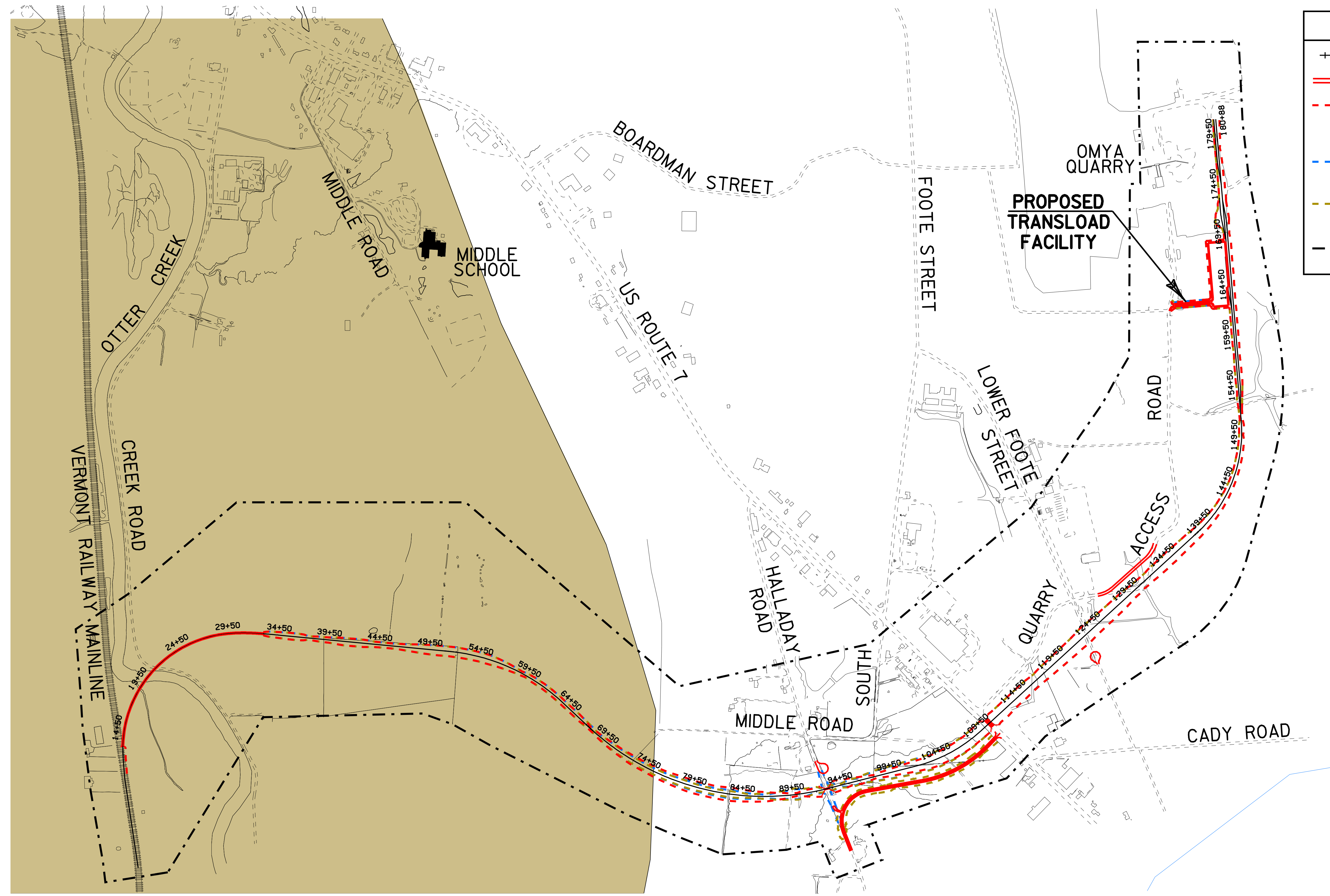

LEGEND

- RAIL SPUR CENTERLINE
- ROADWAY
- SLOPE LIMITS - RS-1 & RS-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS - HALLADAY ROAD RELOCATION
- STUDY AREA LIMITS

DATA SOURCES:
ADAPTED FROM: "GROUND-WATER FAVORABILITY MAP OF THE OTTER CREEK BASIN, VERMONT."
VERMONT DEPARTMENT OF WATER RESOURCES, 1967.

Areas underlain by fine-grained stratified glacial drift and swamp deposits with low ground-water potential. These deposits generally will yield sufficient water for domestic wells only. In places, thin lenses of gravel with higher yields may underlie these deposits, but these lenses may not have adequate storage or recharge to produce high yields on a sustained basis.

Areas underlain by deposits of unstratified glacial drift ("hardpan") and bedrock ("ledge") with low ground-water potential. In general, wells in either till or bedrock will yield only enough water for domestic or light commercial use. Till and bedrock underlie the stratified glacial drift of the map units listed above.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

AQUIFERS
RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.9-1

03-OCT-2008
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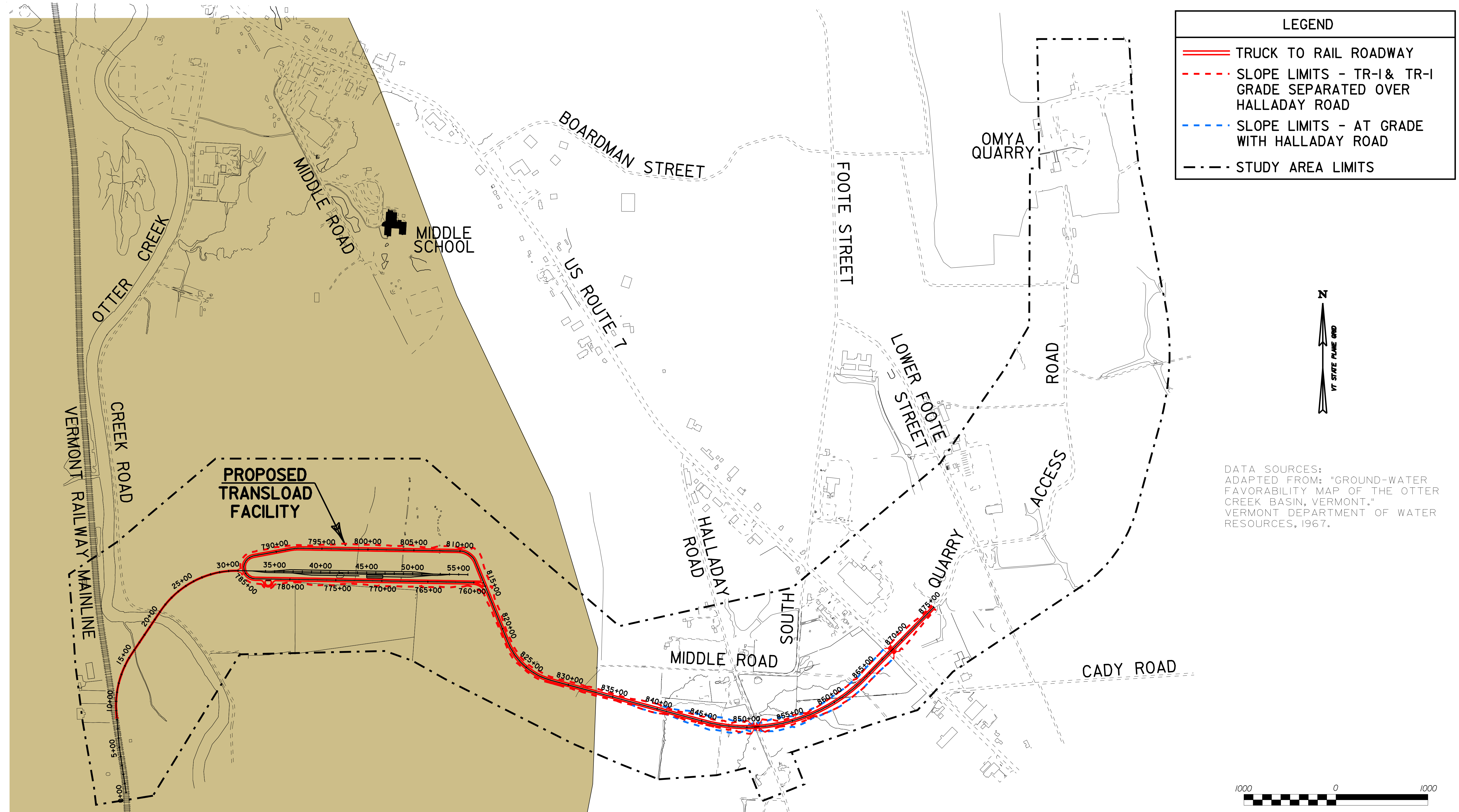

Areas underlain by fine-grained stratified glacial drift and swamp deposits with low ground-water potential. These deposits generally will yield sufficient water for domestic wells only. In places, thin lenses of gravel with higher yields may underlie these deposits, but these lenses may not have adequate storage or recharge to produce high yields on a sustained basis.

Areas underlain by deposits of unstratified glacial drift ("hardpan") and bedrock ("ledge") with low ground-water potential. In general, wells in either till or bedrock will yield only enough water for domestic or light commercial use. Till and bedrock underlie the stratified glacial drift of the map units listed above.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

AQUIFERS
TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.9-2

03-OCT-2008
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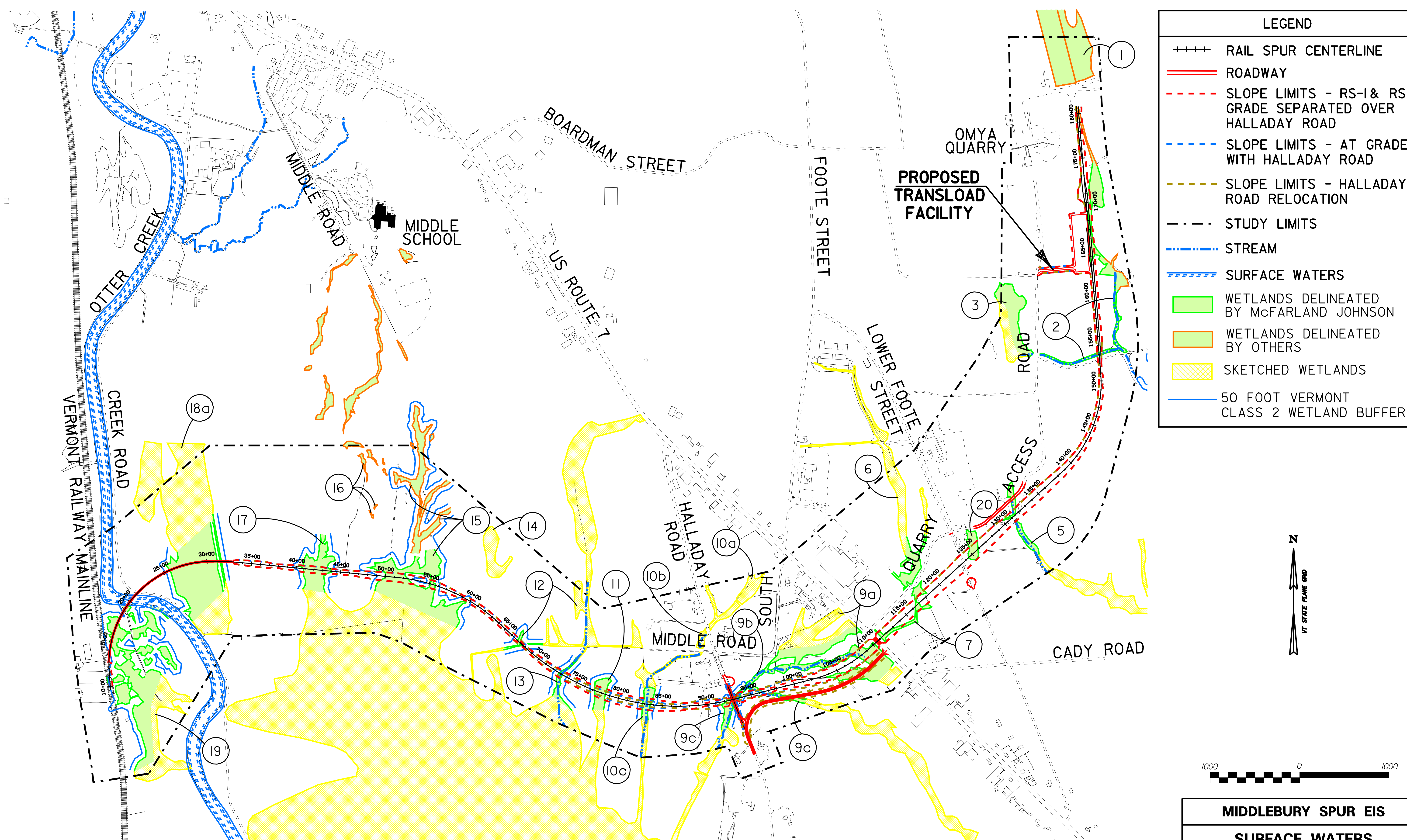

DATA SOURCES: VERMONT SIGNIFICANT WETLAND INVENTORY (VSWI) WETLANDS (1996) AND SURFACE WATERS DATA (2004) FROM VCGI. PORTIONS OF SKETCHED WETLANDS WERE MAPPED OCTOBER 2--OCTOBER 8, 2005 BY MCFARLAND-JOHNSON, INC. WETLANDS DELINEATED BY MCFARLAND JOHNSON OCTOBER 2006 AND SEPTEMBER 2007. ADDITIONAL WETLAND MAPPING PROVIDED BY CIVIL ENGINEERING ASSOCIATES AND VELCO, INC.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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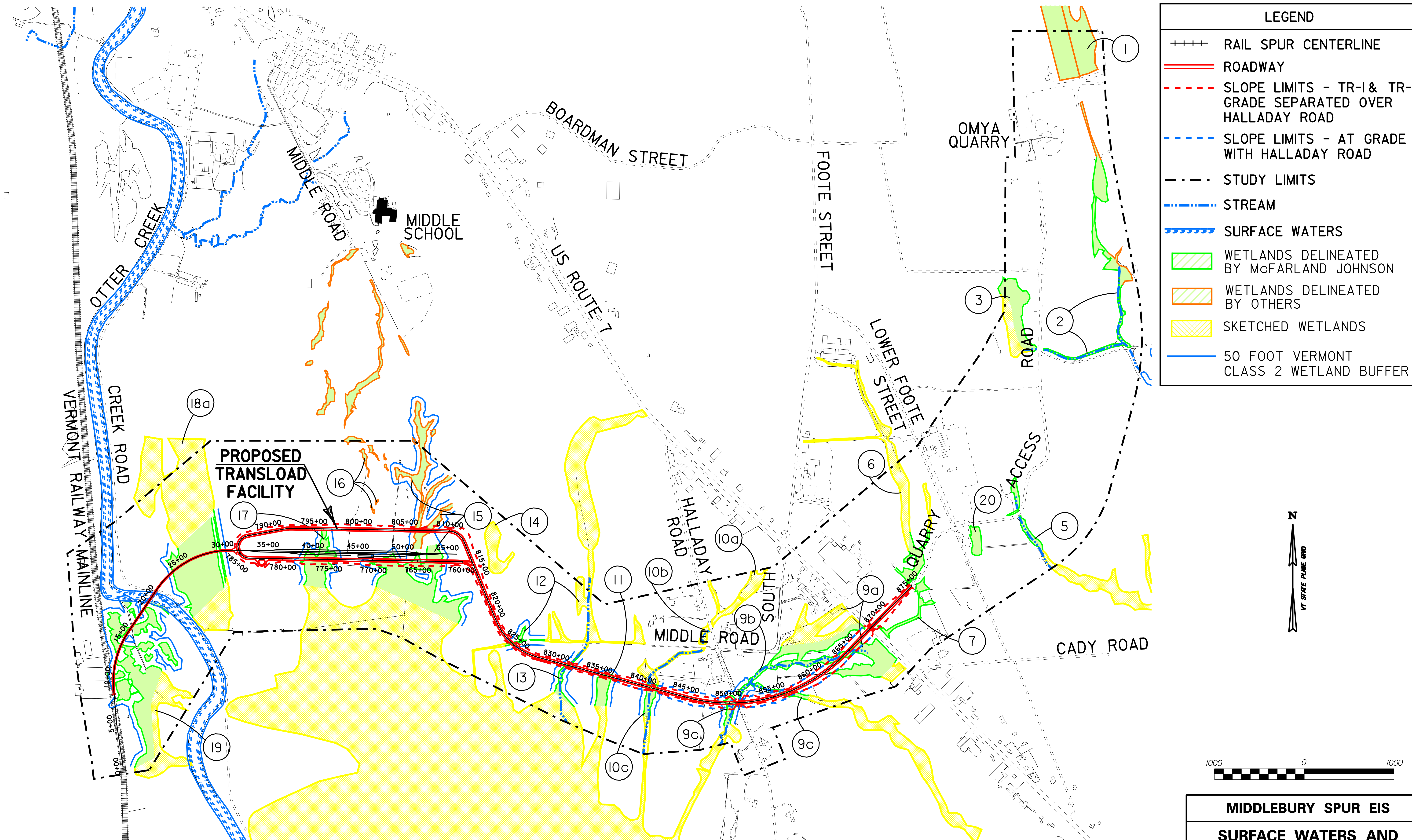
MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.9-3

03-OCT-2008 M:\1647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER_3\RS_TR_SURFWATR.dgn



DATA SOURCES: VERMONT SIGNIFICANT WETLAND INVENTORY (VSWI) WETLANDS (1996) AND SURFACE WATERS DATA (2004) FROM VCGI. PORTIONS OF SKETCHED WETLANDS WERE MAPPED OCTOBER 2--OCTOBER 8, 2005 BY MCFARLAND-JOHNSON, INC. WETLANDS DELINEATED BY MCFARLAND JOHNSON OCTOBER 2006 AND SEPTEMBER 2007. ADDITIONAL WETLAND MAPPING PROVIDED BY CIVIL ENGINEERING ASSOCIATES AND VELCO, INC.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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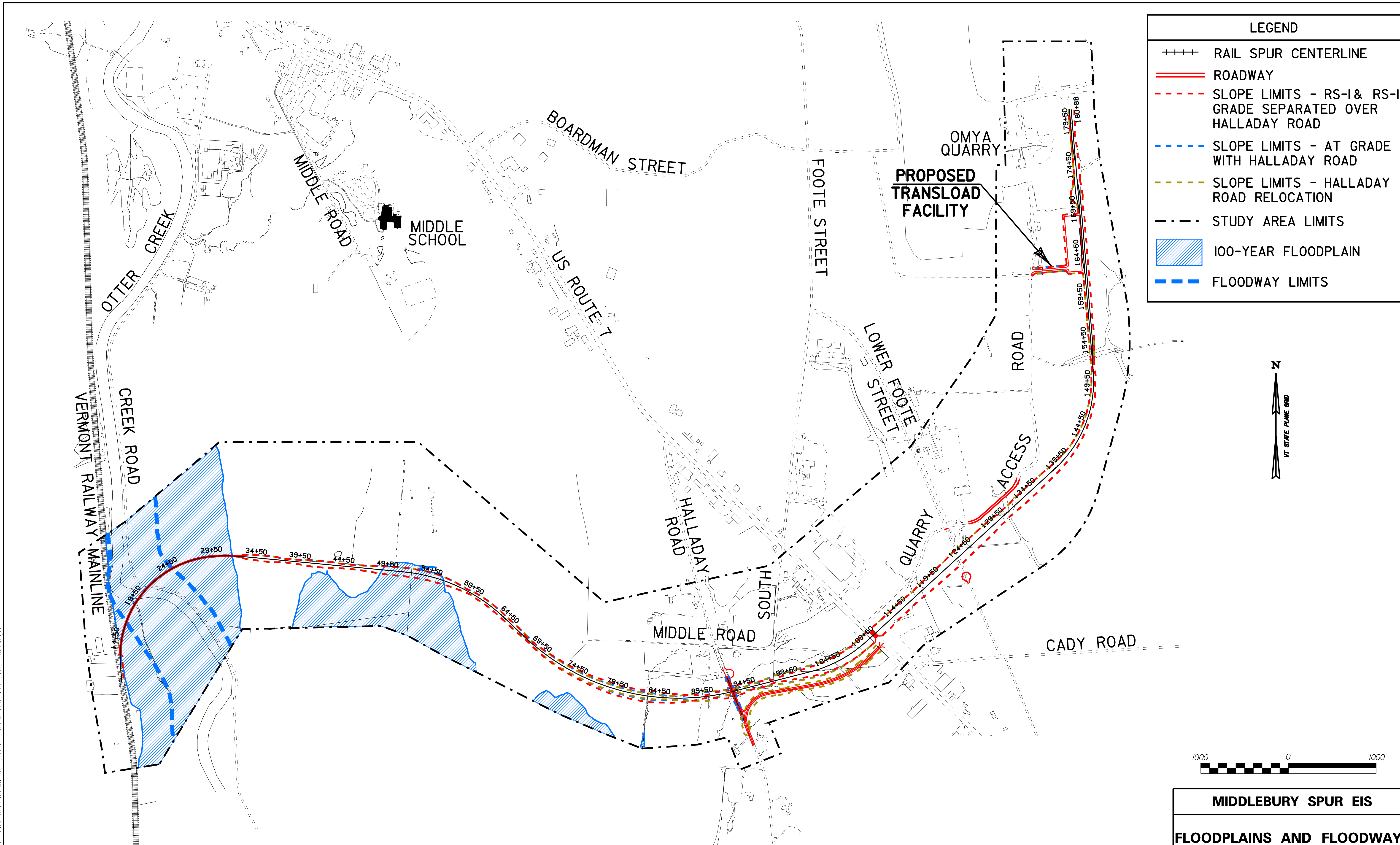
MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.9-4

03-OCT-2008 M:\1647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER_3\RS_TR_SURFWATR.dgn

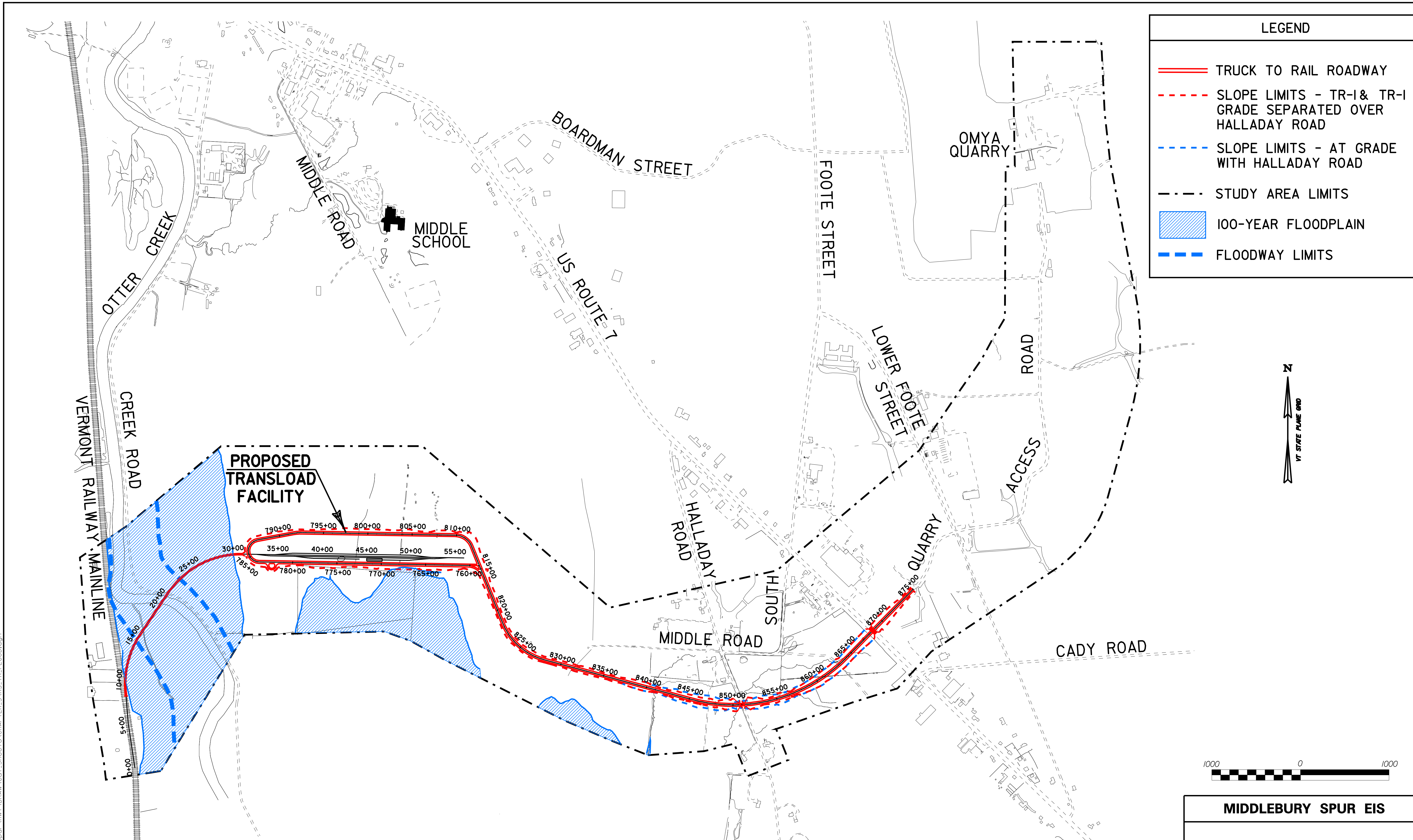


DATA SOURCES:
FLOODPLAIN DELINEATION BASED ON "FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 500008 0011 A, TOWN OF MIDDLEBURY, VERMONT", FEMA, 1985. FLOODWAYS BASED ON "FLOOD INSURANCE STUDY, TOWN OF MIDDLEBURY, VERMONT - ADDISON COUNTY", FEMA, 1984.

MIDDLEBURY SPUR EIS

FLOODPLAINS AND FLOODWAYS RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.9-5



DATA SOURCES:
FLOODPLAIN DELINEATION BASED ON OCTOBER 2, 2008 "FLOOD INSURANCE RATE MAP COMMUNITY PANEL NUMBER 500008 0011 A, TOWN OF MIDDLEBURY, VERMONT", FEMA, 1985. FLOODWAYS BASED ON "FLOOD INSURANCE STUDY, TOWN OF MIDDLEBURY, VERMONT - ADDISON COUNTY", FEMA, 1984.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

FLOODPLAINS AND FLOODWAYS TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 3.9-6

03-OCT-2008
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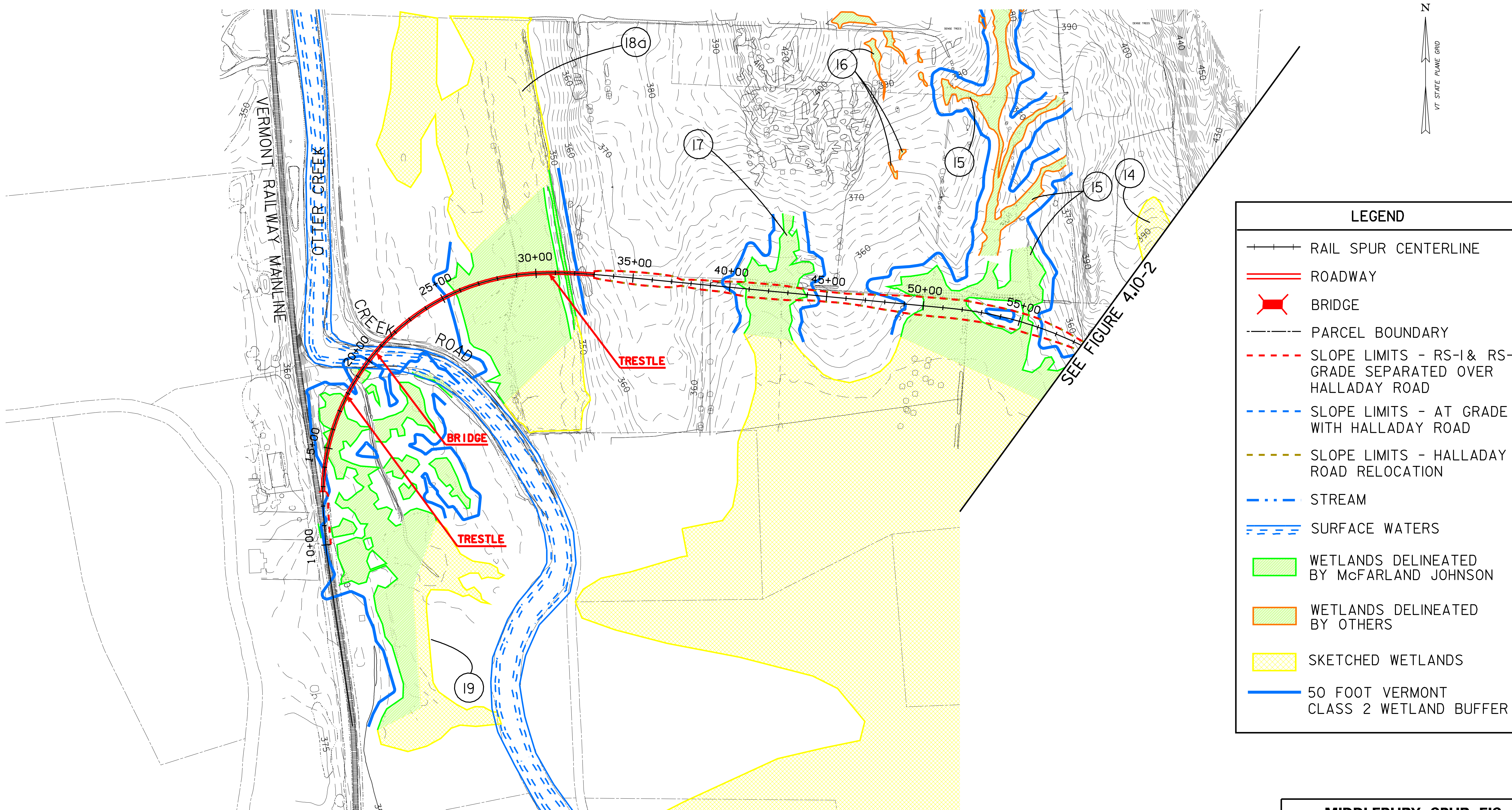

DATA SOURCES:
SURFACE WATER DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED OCTOBER, 2006 AND SEPTEMBER 2007. PORTIONS OF WETLAND 15 AND ALL OF WETLAND 16 ARE BASED ON DELINEATIONS DONE BY OTHERS. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS RS-1 ALTERNATIVE (WEST)

SEPTEMBER 2008 FIGURE NO. 4.10-1

03-OCT-2008
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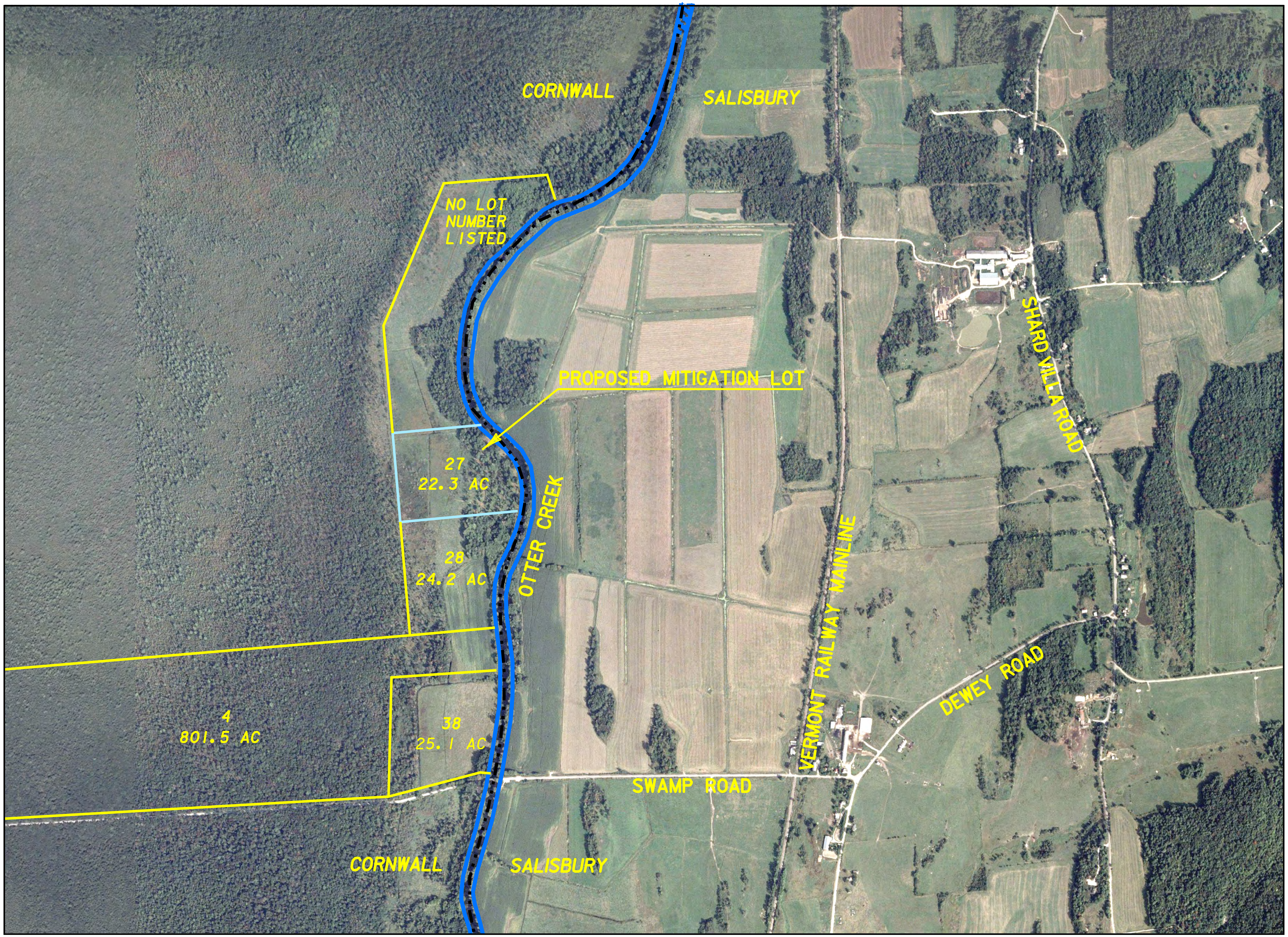


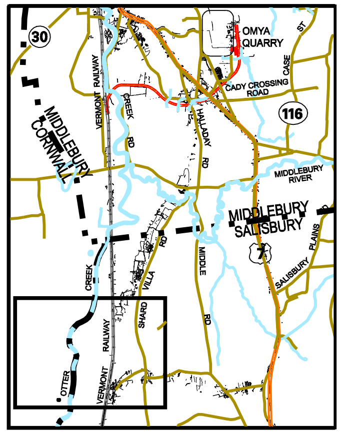
LEGEND

TOWN LINE

POTENTIAL WETLAND MITIGATION SITE

N

VT STATE PLANE GRID



DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA.
VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

POTENTIAL WETLAND MITIGATION SITE (CORNWALL)

SEPTEMBER 2008 FIGURE NO. 4.10-10

03-OCT-2008
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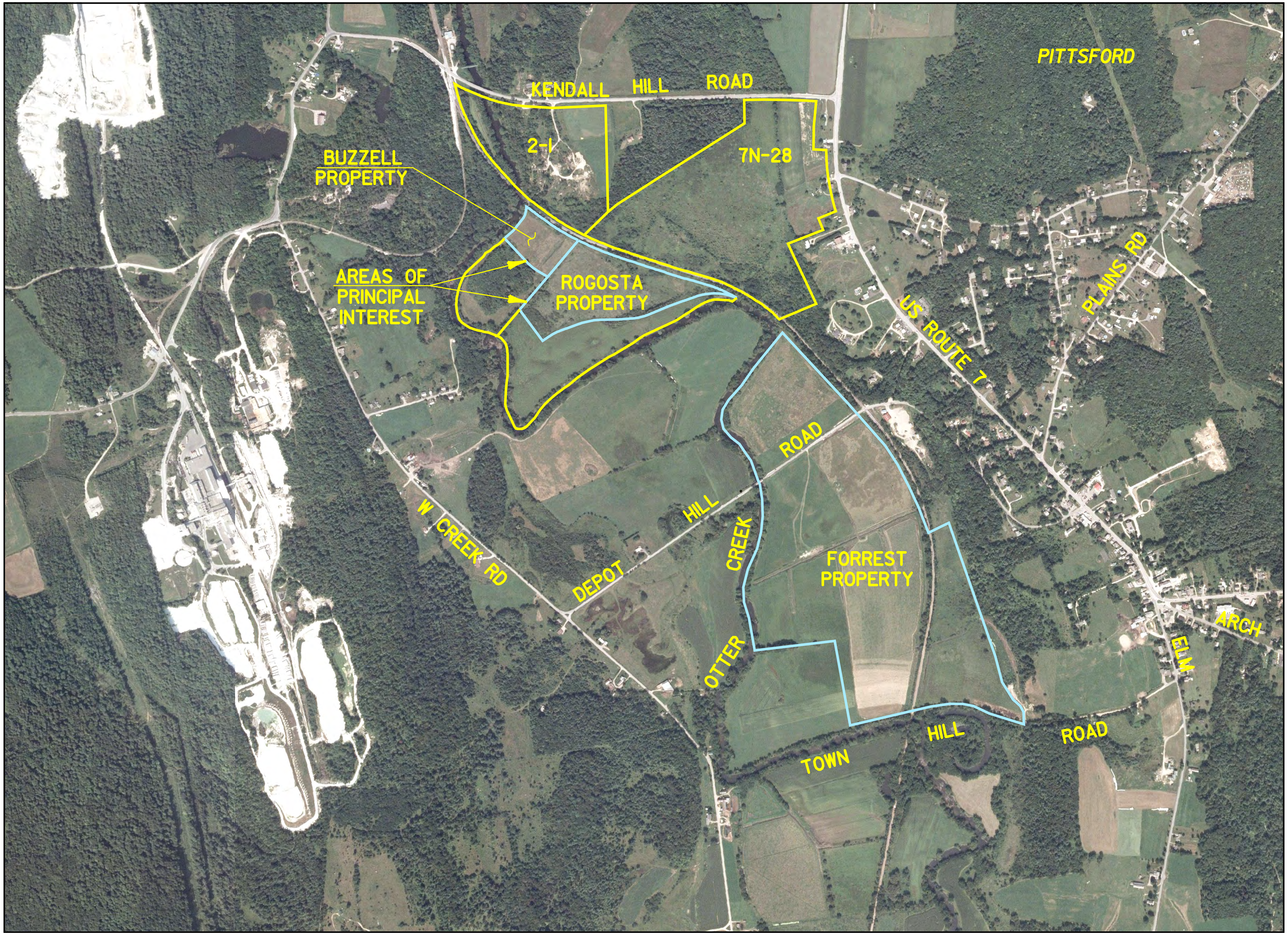

LEGEND

- TOWN LINE
- POTENTIAL WETLAND MITIGATION SITE

DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA. VCGI, 2005. PROPOSED FORREST PROPERTY MITIGATION SITE BOUNDARIES PROVIDED BY RUTLAND COUNTY NRCS.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

POTENTIAL WETLAND MITIGATION SITES (PITTSFORD)

SEPTEMBER 2008 FIGURE NO. 4.10-11

03-OCT-2008
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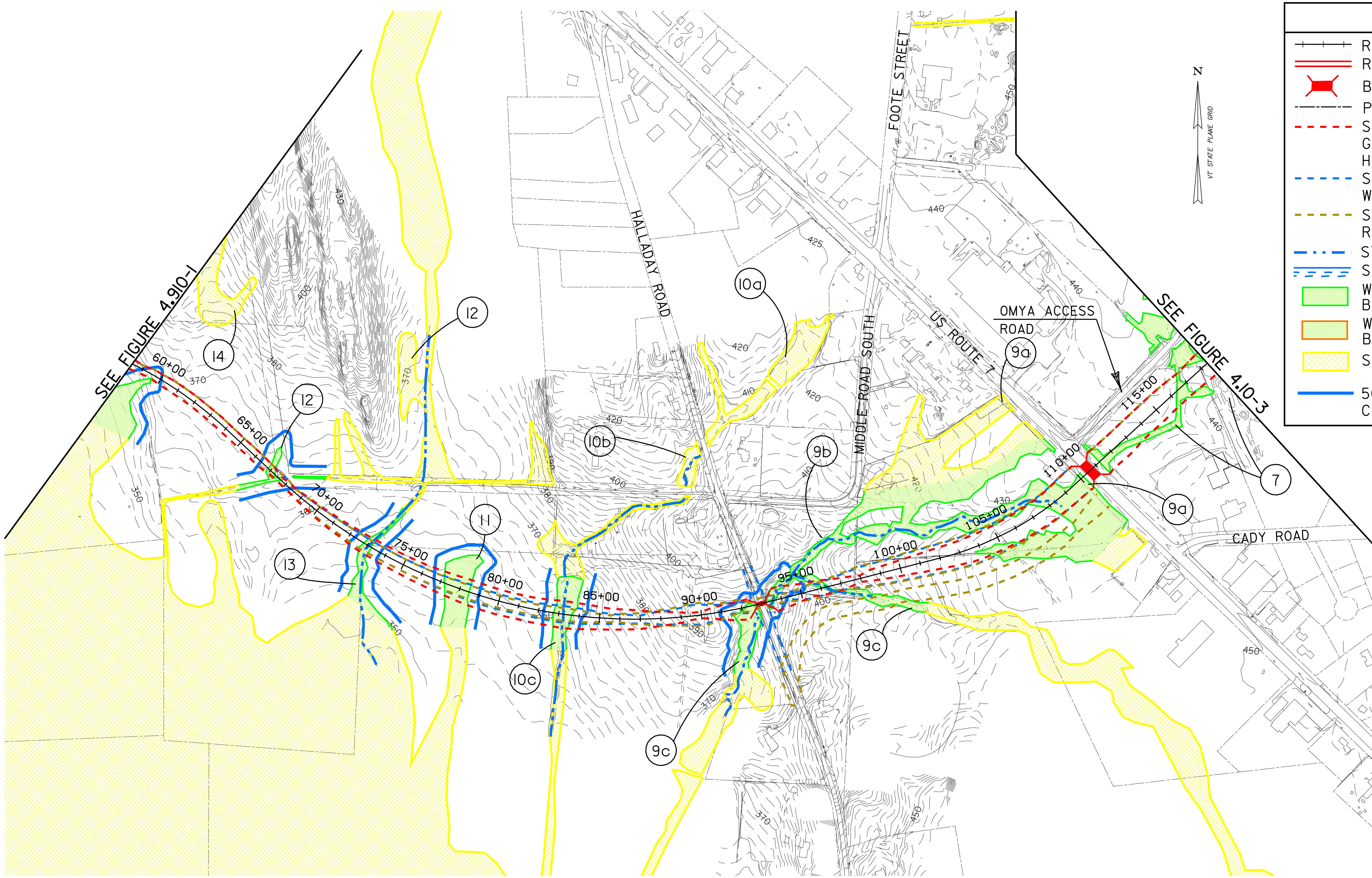

LEGEND

- RAIL SPUR CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - RS-1 & RS-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS - HALLADAY ROAD RELOCATION
- STREAM
- SURFACE WATERS
- WETLANDS DELINEATED BY McFARLAND JOHNSON
- WETLANDS DELINEATED BY OTHERS
- SKETCHED WETLANDS
- 50 FOOT VERMONT CLASS 2 WETLAND BUFFER

DATA SOURCES:
SURFACE WATERS DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED OCTOBER, 2006 AND SEPTEMBER 2007. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS RS-1 ALTERNATIVE (CENTRAL)

SEPTEMBER 2008 FIGURE NO. 4.10-2

03-OCT-2008
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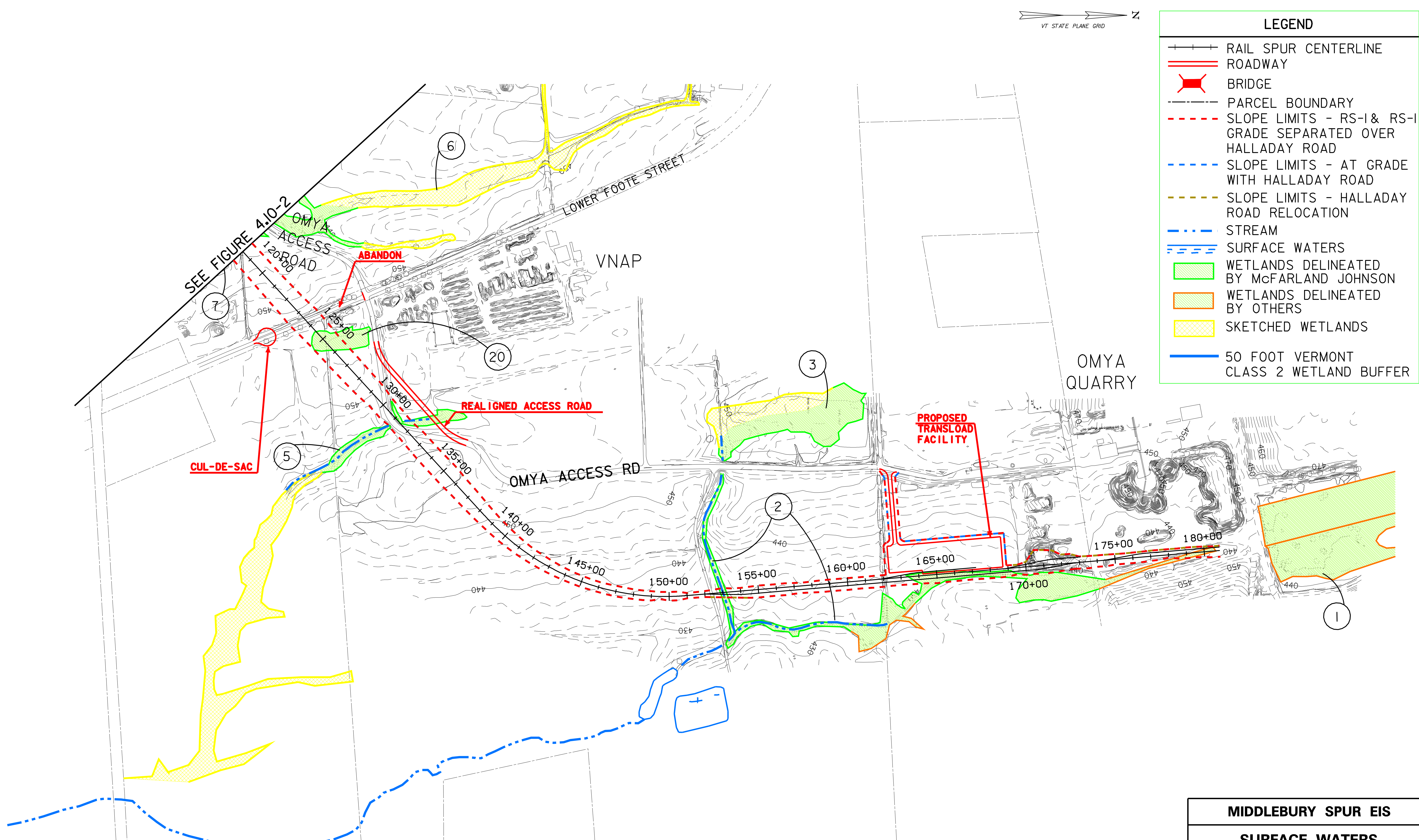

LEGEND

- RAIL SPUR CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - RS-I & RS-I GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS - HALLADAY ROAD RELOCATION
- STREAM
- SURFACE WATERS
- WETLANDS DELINEATED BY McFARLAND JOHNSON
- WETLANDS DELINEATED BY OTHERS
- SKETCHED WETLANDS
- 50 FOOT VERMONT CLASS 2 WETLAND BUFFER

DATA SOURCES:
SURFACE WATERS DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED OCTOBER, 2006 AND SEPTEMBER 2007. PORTIONS OF WETLAND 2, AND ALL OF WETLAND I, ARE BASED ON DELINEATIONS DONE BY OTHERS. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS RS-1 ALTERNATIVE (EAST)

SEPTEMBER 2008 FIGURE NO. 4.10-3

03-OCT-2008
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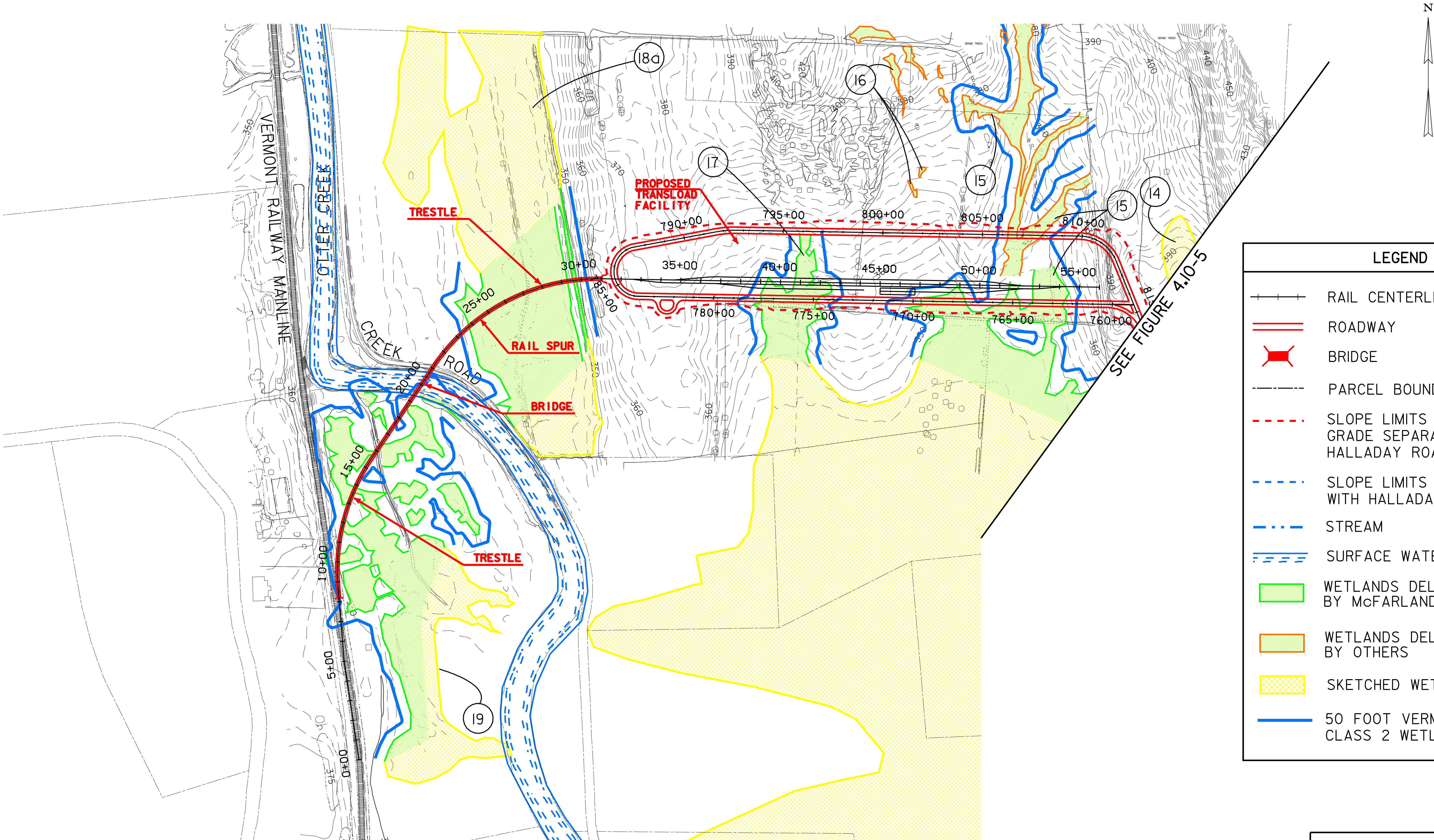

LEGEND

- RAIL CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - TR-1 & TR-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- STREAM
- SURFACE WATERS
- WETLANDS DELINEATED BY McFARLAND JOHNSON
- WETLANDS DELINEATED BY OTHERS
- SKETCHED WETLANDS
- 50 FOOT VERMONT CLASS 2 WETLAND BUFFER

DATA SOURCES:
SURFACE WATERS DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED NOVEMBER, 2006 AND SEPTEMBER 2007. PORTIONS OF WETLAND 15 AND 17, AND ALL OF WETLAND 16, ARE BASED ON DELINEATIONS DONE BY OTHERS. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS TR-1 ALTERNATIVE (WEST)

SEPTEMBER 2008 FIGURE NO. 4.10-4

03-OCT-2008
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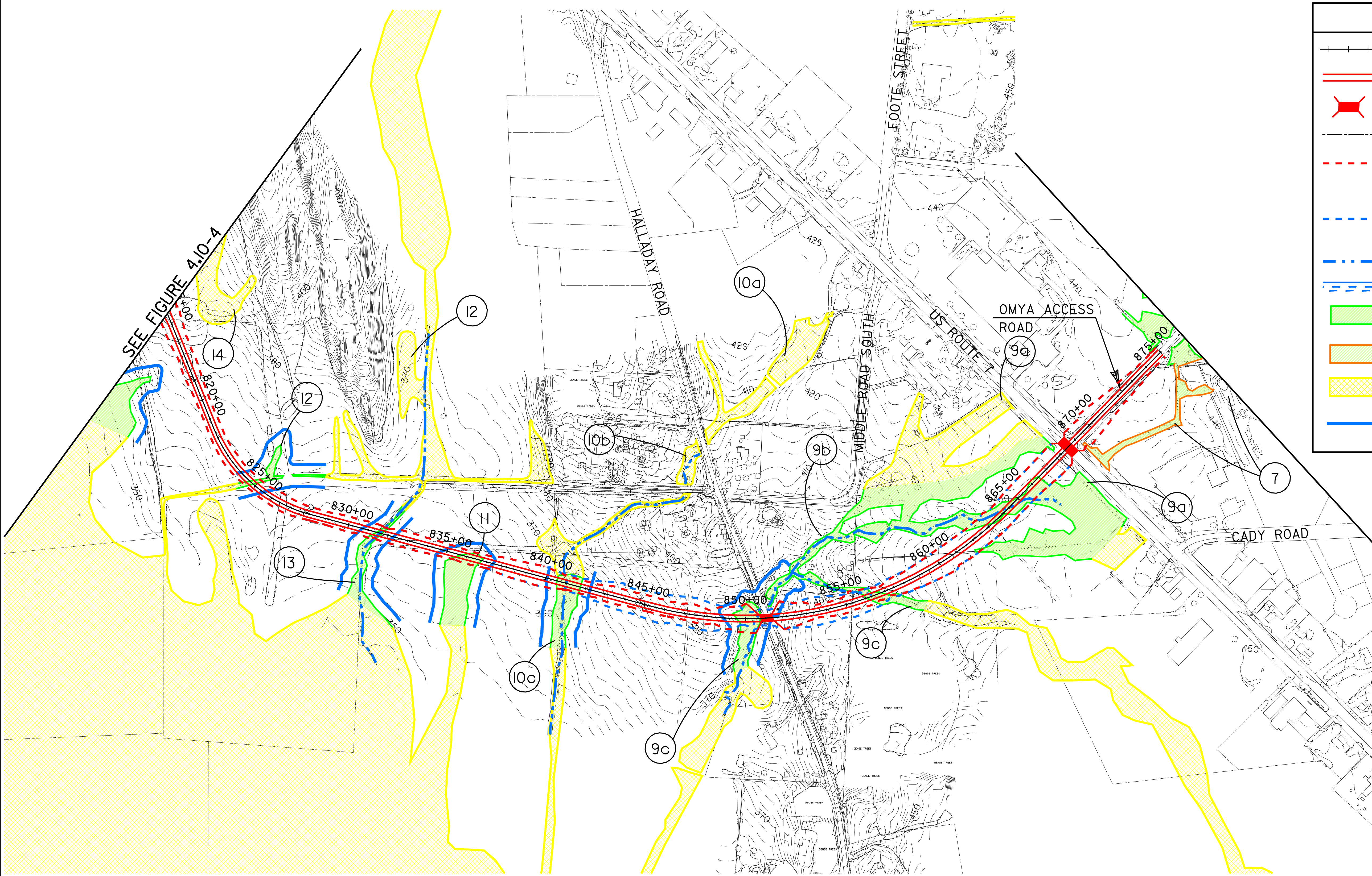

LEGEND

- RAIL CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - TR-1 & TR-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- STREAM
- SURFACE WATERS
- WETLANDS DELINEATED BY McFARLAND JOHNSON
- WETLANDS DELINEATED BY OTHERS
- SKETCHED WETLANDS
- 50 FOOT VERMONT CLASS 2 WETLAND BUFFER

DATA SOURCES:
SURFACE WATERS DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED OCTOBER, 2006 AND SEPTEMBER 2007. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS TR-1 ALTERNATIVE (CENTRAL)

SEPTEMBER 2008 FIGURE NO. 4.10-5

03-OCT-2008
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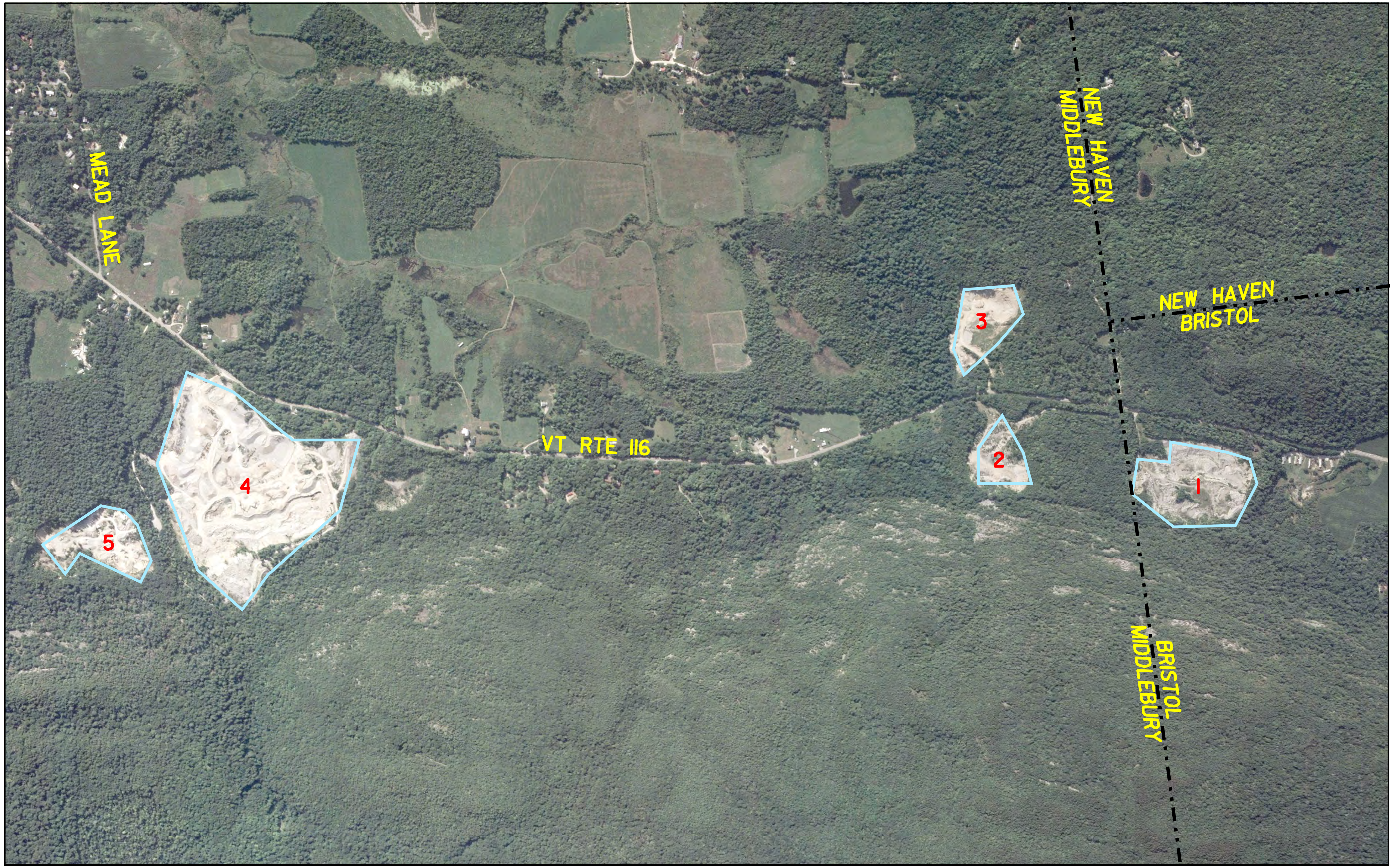


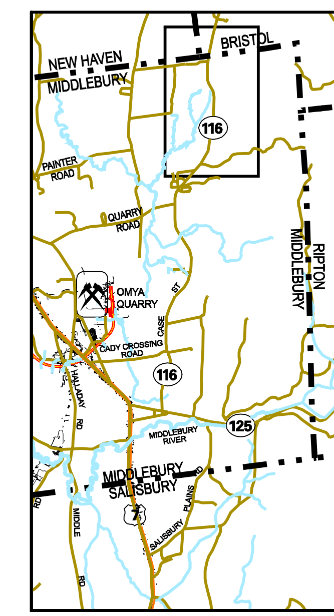
LEGEND

TOWN LINE

POTENTIAL WETLAND MITIGATION SITES

VT STATE PLANE GRID

N



DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA.
VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

POTENTIAL WETLAND MITIGATION SITES (MIDDLEBURY /BRISTOL)

SEPTEMBER 2008 FIGURE NO. 4.10-6

03-OCT-2008
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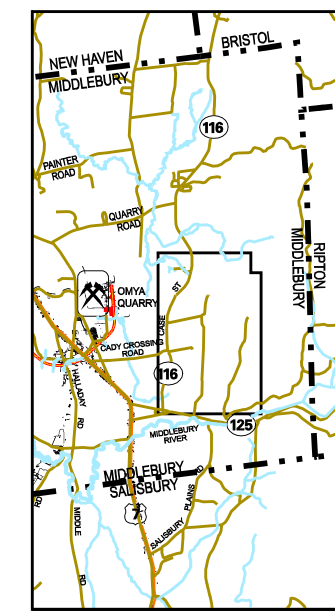
LEGEND

TOWN LINE

POTENTIAL WETLAND MITIGATION SITES

VT STATE PLANE GRID



DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA. VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

MIDDLEBURY SPUR EIS

POTENTIAL WETLAND MITIGATION SITES (EAST MIDDLEBURY)

SEPTEMBER 2008 FIGURE NO. 4.10-7

03-OCT-2008
M:\647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER 4\Wetland Mitigation 5.dgn

MIDDLEBURY SPUR EIS

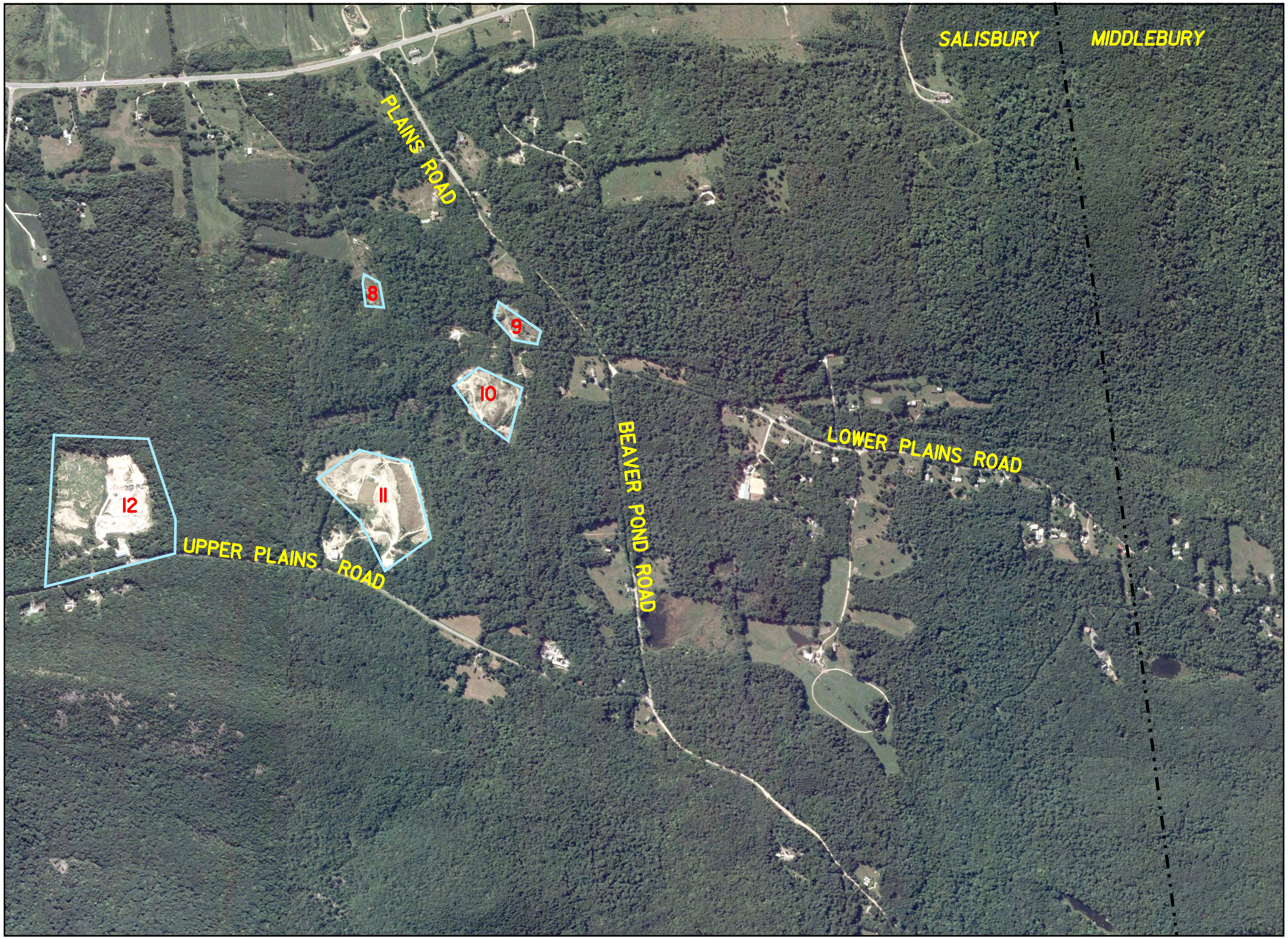
POTENTIAL
WETLAND MITIGATION SITES
(SALISBURY)

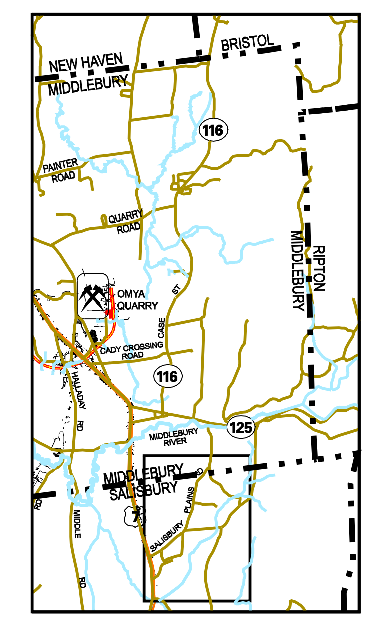
SEPTEMBER 2008 FIGURE NO. 4.10-8

LEGEND

TOWN LINE

POTENTIAL WETLAND MITIGATION SITE





VT STATE PLANE GRID N

DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA.
VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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03-OCT-2008
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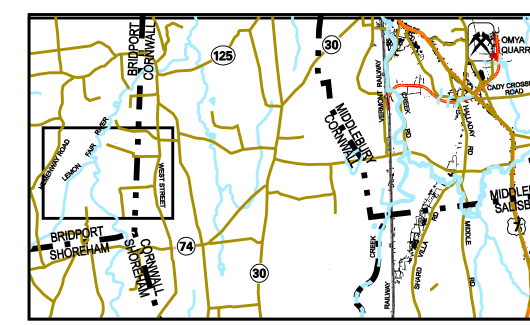
LEGEND

TOWN LINE

POTENTIAL WETLAND MITIGATION SITE

N

VT STATE PLANE GRID



DATA SOURCES:
AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA.
VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

POTENTIAL WETLAND MITIGATION SITE (BRIDPORT)

SEPTEMBER 2008 FIGURE NO. 4.10-9

03-OCT-2008
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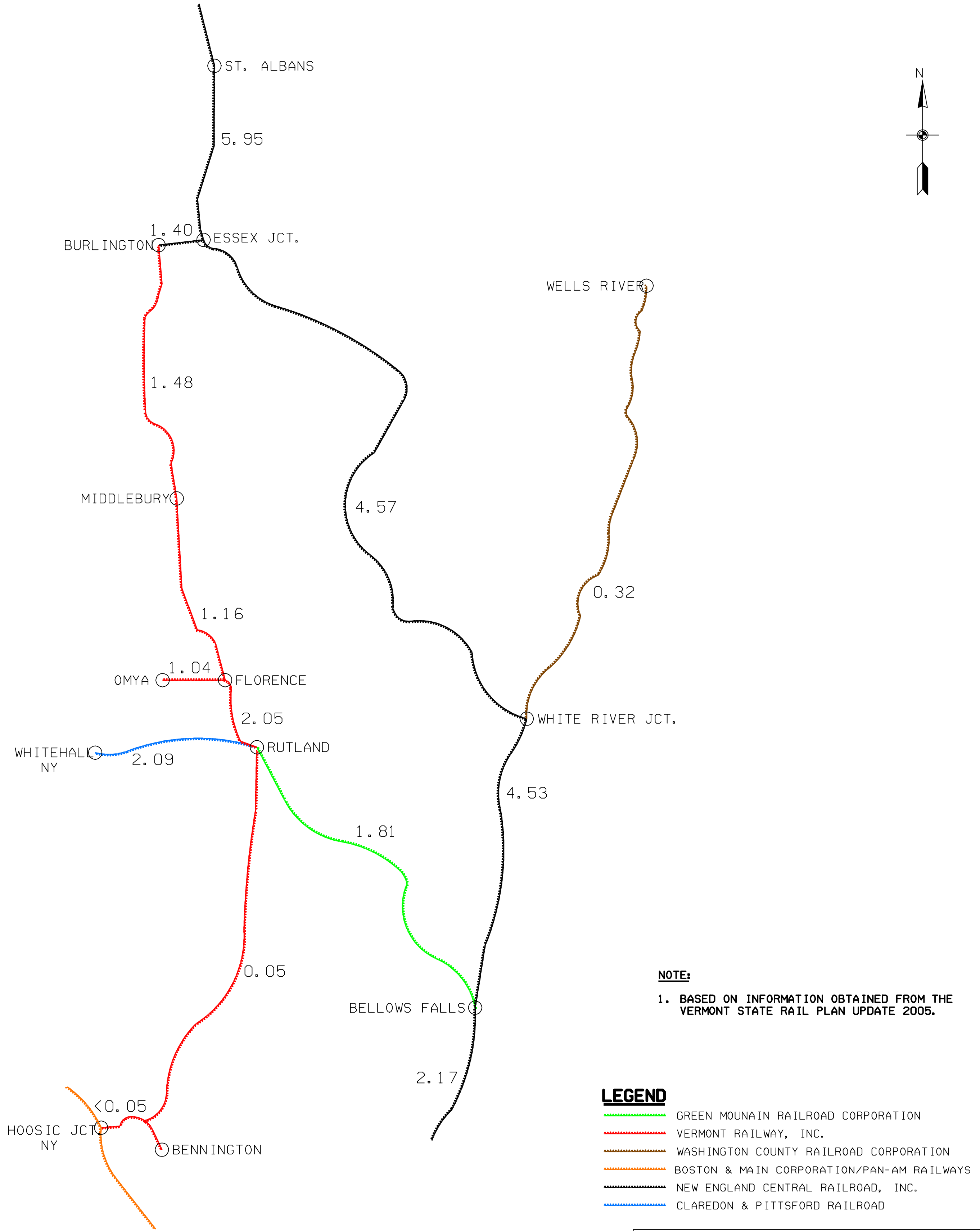

NOTE:

1. BASED ON INFORMATION OBTAINED FROM THE VERMONT STATE RAIL PLAN UPDATE 2005.

TRANSYSTEMS CORPORATION

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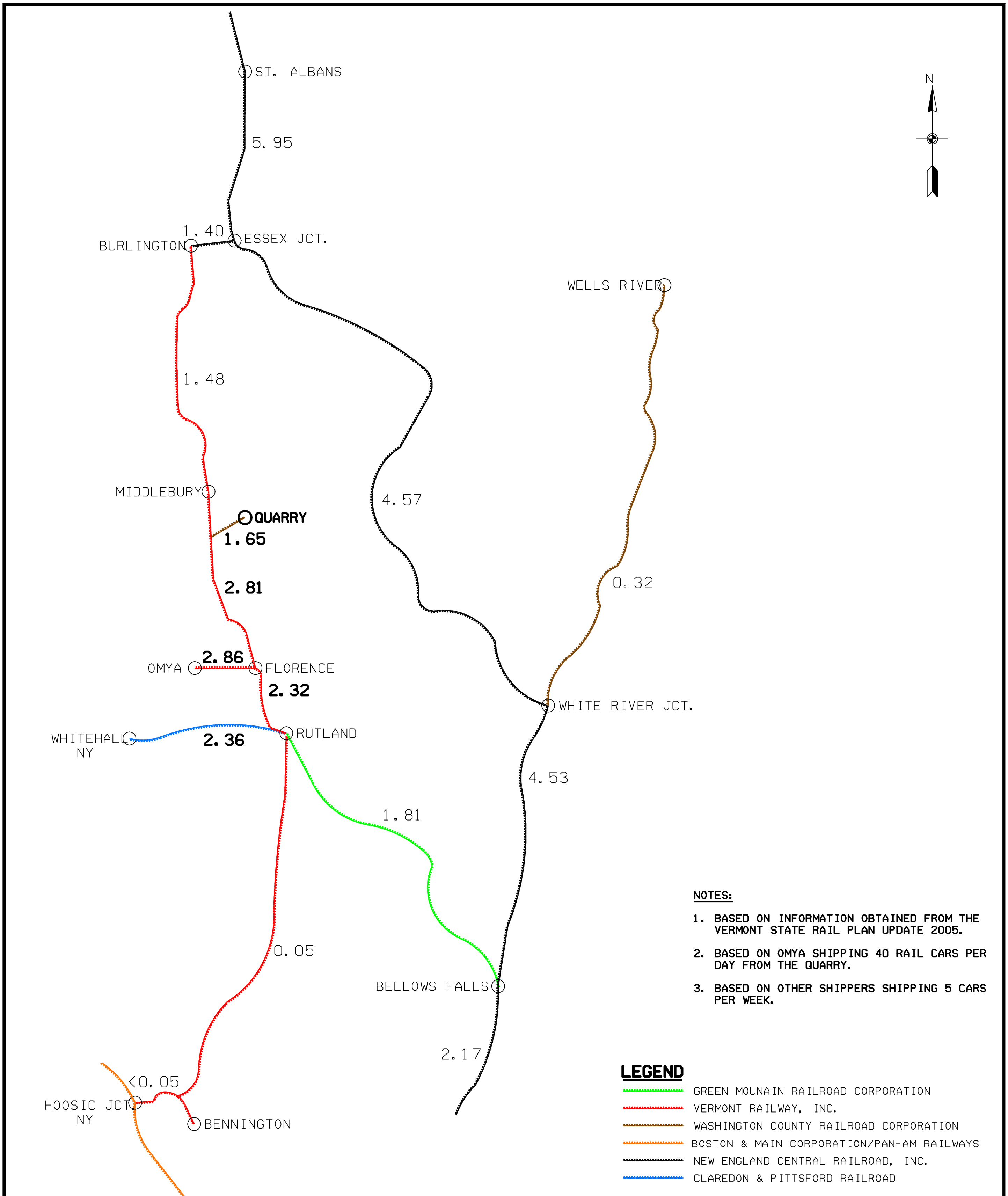
MIDDLEBURY SPUR EIS

MILLION GROSS TON MAP NO BUILD ALTERNATIVE PROJECTED YEAR 2010

SEPTEMBER 2008 FIGURE NO. 4.1-1



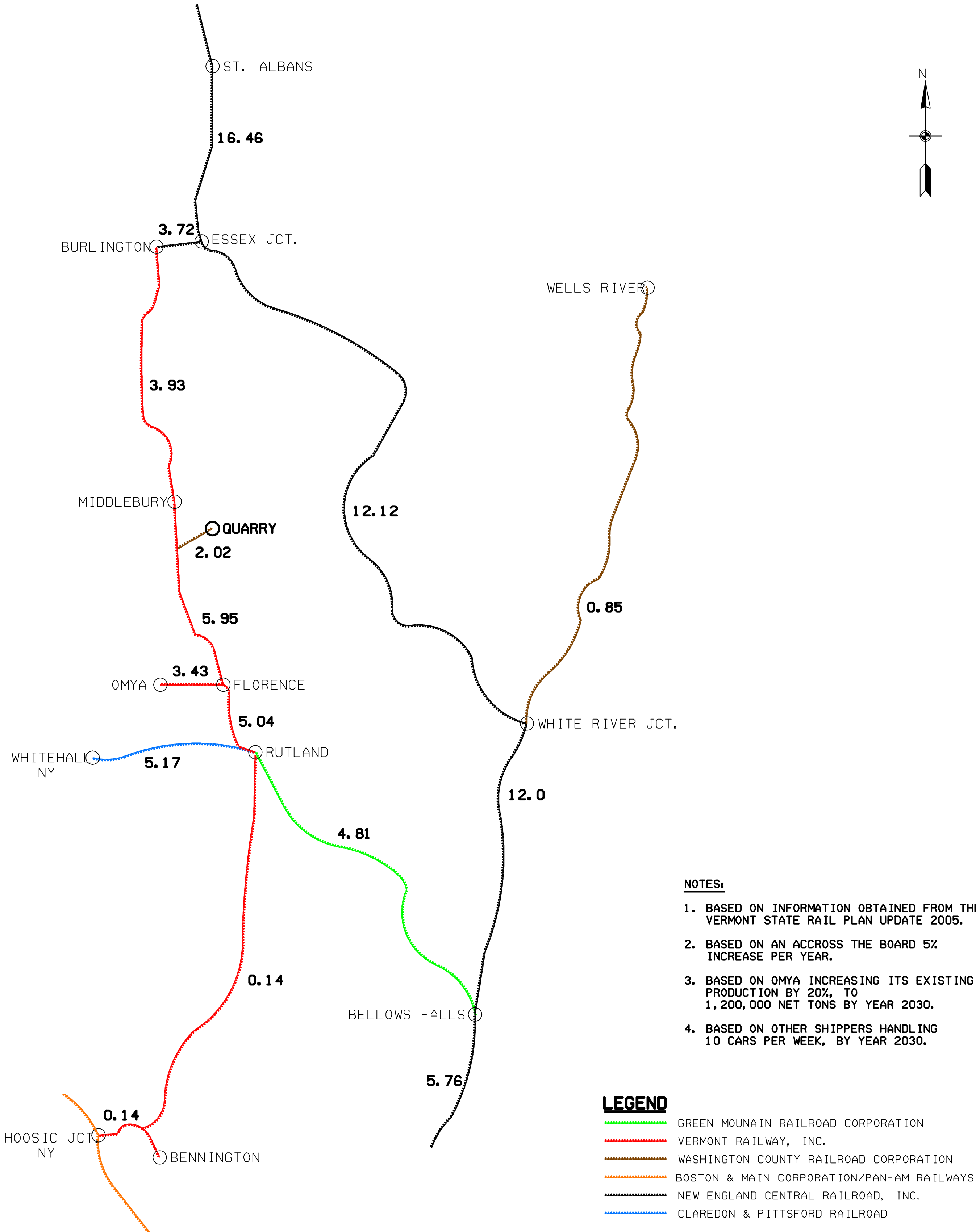
TRANSYSTEMS CORPORATION

VTrans Working to Get You There VERMONT AGENCY OF TRANSPORTATION

MIDDLEBURY SPUR EIS

MILLION GROSS TON MAP
RS-1 AND TR-1
PROJECTED YEAR 2010

SEPTEMBER 2008 FIGURE NO. 4.1-2



NOTES:

1. BASED ON INFORMATION OBTAINED FROM THE VERMONT STATE RAIL PLAN UPDATE 2005.
2. BASED ON AN ACCROSS THE BOARD 5% INCREASE PER YEAR.
3. BASED ON OMYA INCREASING ITS EXISTING PRODUCTION BY 20%, TO 1,200,000 NET TONS BY YEAR 2030.
4. BASED ON OTHER SHIPPERS HANDLING 10 CARS PER WEEK, BY YEAR 2030.

LEGEND

- GREEN MOUNAIN RAILROAD CORPORATION
- VERMONT RAILWAY, INC.
- WASHINGTON COUNTY RAILROAD CORPORATION
- BOSTON & MAIN CORPORATION/PAN-AM RAILWAYS
- NEW ENGLAND CENTRAL RAILROAD, INC.
- CLAREDON & PITTSFORD RAILROAD

TRANSYSTEMS CORPORATION

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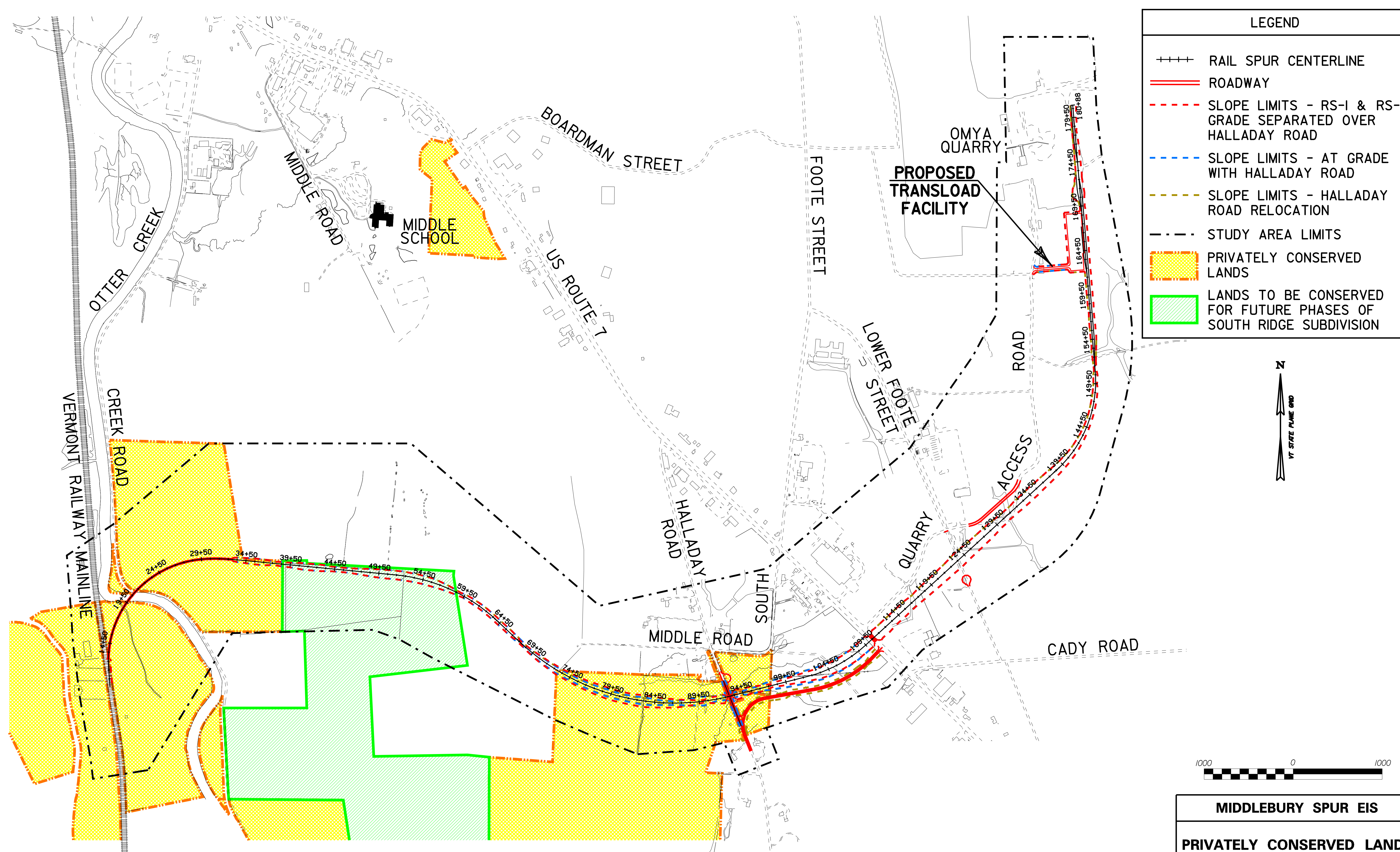
MIDDLEBURY SPUR EIS

MILLION GROSS TON MAP RS-1 AND TR-1 PROJECTED YEAR 2030

SEPTEMBER 2008 FIGURE NO. 4.1-3



SOURCE DATA:
BASED ON MAPPING PROVIDED BY THE MIDDLEBURY AREA LAND TRUST (2005), THE VERMONT LAND TRUST (2005), AND CIVIL ENGINEERING ASSOCIATES, INC.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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VERMONT AGENCY OF TRANSPORTATION

MIDDLEBURY SPUR EIS

PRIVATELY CONSERVED LANDS RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 4.2-I

03-OCT-2008
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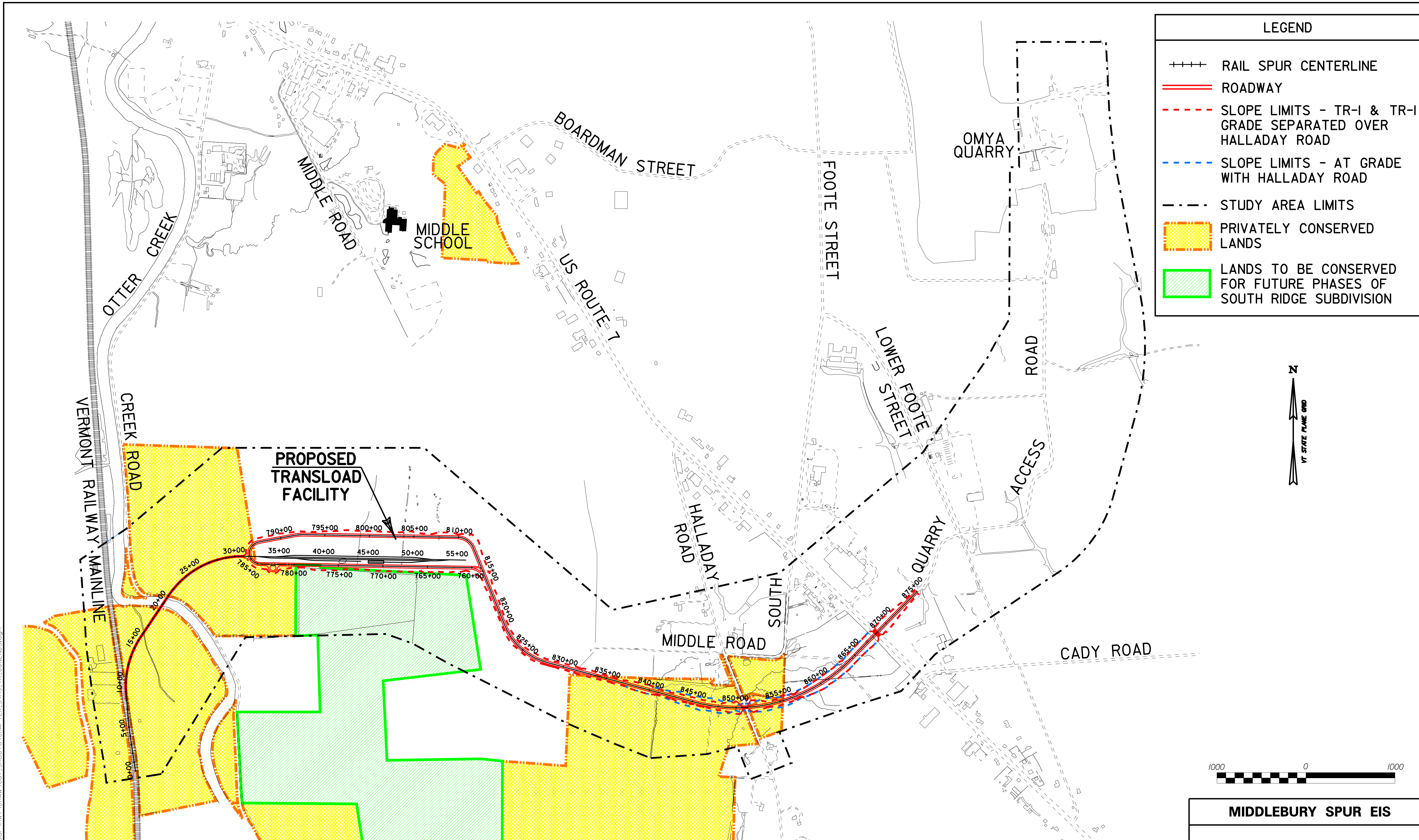

SOURCE DATA:
BASED ON MAPPING PROVIDED BY THE MIDDLEBURY AREA LAND TRUST (2005), THE VERMONT LAND TRUST (2005), AND CIVIL ENGINEERING ASSOCIATES, INC.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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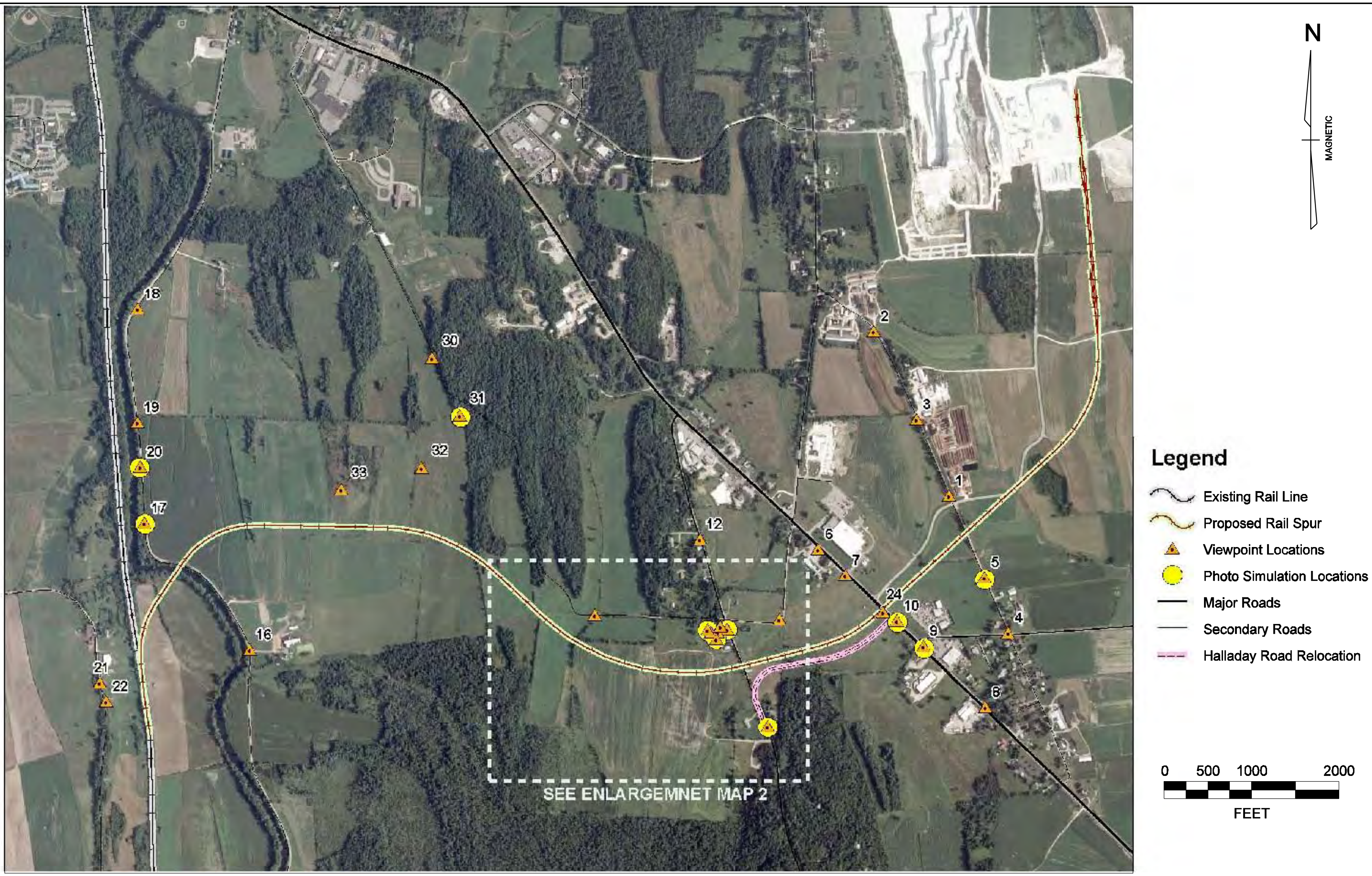
MIDDLEBURY SPUR EIS

PRIVATELY CONSERVED LANDS TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 4.2-2

03-OCT-2008 M:\647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER_3\RS_TR_CONLNDS.dgn



Source: T.J. Boyle and Associates. Aerial Imagery from 2003 National Agricultural Imagery Program Data, VCGI, 2005.

MIDDLEBURY SPUR EIS

VIEWPOINT AND PHOTO SIMULATION LOCATIONS RS-1

JANUARY 2007 FIGURE NO. 4.3-1

Source: T.J. Boyle & Associates. Aerial Imagery from 2003 National Agricultural Imagery Program Data, VCGI, 2005.

MIDDLEBURY SPUR EIS

VIEWPOINT AND PHOTO SIMULATION LOCATIONS RS-1 , HALLADAY ROAD AREA

JANUARY 2007 FIGURE NO. 4.3-2

Source: T.J. Boyle & Associates
Aerial Imagery from 2003 National Agricultural Imagery Program Data, VCGI, 2005.

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MIDDLEBURY SPUR EIS

VIEWPOINT AND PHOTO SIMULATION LOCATIONS TR-1

JANUARY 2007 FIGURE NO. 4.3-3

Location: Lower Foote Street near proposed RS-1 crossing, looking northeast. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates

MIDDLEBURY SPUR EIS

VIEWPOINT 5
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-4

Location: Lower Foote Street near proposed
RS-1 crossing, looking northeast.
Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates

MIDDLEBURY SPUR EIS

VIEWPOINT 5
RS-1

JANUARY 2007 FIGURE NO. 4.3-5

Location: Route 7 at proposed RS-1 crossing, looking east. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MJ

MIDDLEBURY SPUR EIS

VIEWPOINT 24
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-6

Location: Route 7 at proposed RS-1 crossing, looking east. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 24
RS-1 WITH LOWER
FOOTE STREET CUT OFF

JANUARY 2007

FIGURE NO. 4.3-7

Location: Route 7 at proposed RS-1 crossing, looking east. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 24
RS-1 LOWER FOOTE STREET
GRADE SEPARATED

JANUARY 2007 FIGURE NO. 4.3-8

Location: Route 7 just south of proposed RS-1 crossing, looking northwest. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS	
VIEWPOINT 9 EXISTING CONDITIONS	
JANUARY 2007	FIGURE NO. 4.3-9

Location: Route 7 just south of proposed RS-1 crossing, looking northwest. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 9
RS-1

JANUARY 2007 FIGURE NO. 4.3-10

Location: Route 7 just south of proposed RS-1 crossing, looking west. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 10
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-11

Location: Route 7 just south of proposed RS-1 crossing, looking west. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 10
RS-1 GRADE SEPARATED OVER HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-12

Location: Route 7 just south of proposed RS-1 crossing, looking west. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 10
RS-1 AT-GRADE WITH HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-13

Location: Route 7 just south of proposed RS-1 crossing, looking west. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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VERMONT AGENCY OF TRANSPORTATION

MJ

MIDDLEBURY SPUR EIS

VIEWPOINT 10
RS-1 HALLADAY ROAD RELOCATION

JANUARY 2007 FIGURE NO. 4.3-14

Location: Route 7 just south of proposed TR-1 crossing, looking west. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS	
VIEWPOINT 10 TR-1 GRADE SEPARATED OVER HALLADAY ROAD	
JANUARY 2007	FIGURE NO. 4.3-15

Location: Route 7 just south of proposed TR-1 crossing, looking west. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 10
TR-1 AT-GRADE WITH HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-16

Location: Halladay Road in front of Hathaway house, looking southeast. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 13
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-17

Location: Halladay Road in front of Hathaway house, looking southeast. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 13
RS-1 GRADE SEPARATED
OVER HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-18

Location: Halladay Road in front of Hathaway house, looking southeast. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 13
RS-1 HALLADAY ROAD RELOCATION

JANUARY 2007 FIGURE NO. 4.3-19

Location: Halladay Road south of proposed RS-1 or TR-1 crossing, looking northwest. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS
VIEWPOINT 14 EXISTING CONDITIONS
JANUARY 2007 FIGURE NO. 4.3-20

Location: Halladay Road south of proposed RS-1 crossing, looking northwest. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 14
RS-1 GRADE SEPARATED
OVER HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-21

Location: Halladay Road south of proposed RS-1 crossing, looking northwest. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 14
RS-1 AT-GRADE WITH HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-22

Location: Halladay Road south of proposed RS-1 crossing, looking northwest. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 14
RS-1 HALLADAY ROAD RELOCATION

JANUARY 2007 FIGURE NO. 4.3-23

Location: Halladay Road south of proposed TR-1 crossing, looking northwest. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 14
TR-1 GRADE SEPARATED
OVER HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-24

Location: Halladay Road south of proposed TR-1 crossing, looking northwest. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MJ

MIDDLEBURY SPUR EIS

VIEWPOINT 14
TR-1 AT-GRADE WITH HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-25

Location: Creek Road north of the Otter Creek crossing, looking southeast. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 17
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-26

Location: Creek Road north of the Otter Creek crossing, looking southeast. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 17
TRAIN TRESTLE
(RS-1 AND TR-1)

JANUARY 2007 FIGURE NO. 4.3-27

Location: Creek Road further north of the Otter Creek crossing, looking southeast. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 20
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-28

Location: Creek Road further north of the Otter
Creek crossing, looking southeast.
Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 20
TRAIN TRESTLE
(RS-1 AND TR-1)

JANUARY 2007 FIGURE NO. 4.3-29

Location: Rear yard of Hathaway house, looking southwest. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 27
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-30

Location: Rear yard of Hathaway house, looking southwest. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 27
RS-1 GRADE SEPARATED
OVER HALLADAY ROAD

JANUARY 2007

FIGURE NO. 4.3-31

Location: Rear yard of Hathaway house, looking southwest. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 27
RS-1 AT-GRADE WITH HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-32

Location: Rear yard of Hathaway house, looking southwest. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

VTrans Workin' to Get You There VERMONT AGENCY OF TRANSPORTATION

MIDDLEBURY SPUR EIS	
VIEWPOINT 27 RS-1 HALLADAY ROAD RELOCATION	
JANUARY 2007	FIGURE NO. 4.3-33

Location: Front loop drive of Hathaway house, looking south. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

MIDDLEBURY SPUR EIS

VIEWPOINT 28
EXISTING CONDITIONS

JANUARY 2007 FIGURE NO. 4.3-34

Location: Front loop drive of Hathaway house, looking south. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

VTrans Movin' You Get You There VERMONT AGENCY OF TRANSPORTATION

MIDDLEBURY SPUR EIS	
VIEWPOINT 28 RS-1 GRADE SEPARATED OVER HALLADAY ROAD	
JANUARY 2007	FIGURE NO. 4.3-35

Location: Front loop drive of Hathaway house, looking south. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 28
RS-1 AT-GRADE WITH HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-36

Location: Front loop drive of Hathaway house, looking south. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MJ

MIDDLEBURY SPUR EIS

VIEWPOINT 28
RS-1 HALLADAY ROAD
RELOCATION

JANUARY 2007 FIGURE NO. 4.3-37

Location: View from southeast corner of proposed South Ridge subdivision. Original photo taken February 22, 2006.
Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS
VIEWPOINT 31 EXISTING CONDITIONS
JANUARY 2007 FIGURE NO. 4.3-38

Location: View from southeast corner of proposed South Ridge subdivision. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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MIDDLEBURY SPUR EIS

VIEWPOINT 31
RS-1 GRADE SEPARATED
OVER HALLADAY ROAD

JANUARY 2007 FIGURE NO. 4.3-39

Location: View from southeast corner of proposed South Ridge subdivision. Original photo taken February 22, 2006.

Source: T.J. Boyle and Associates.

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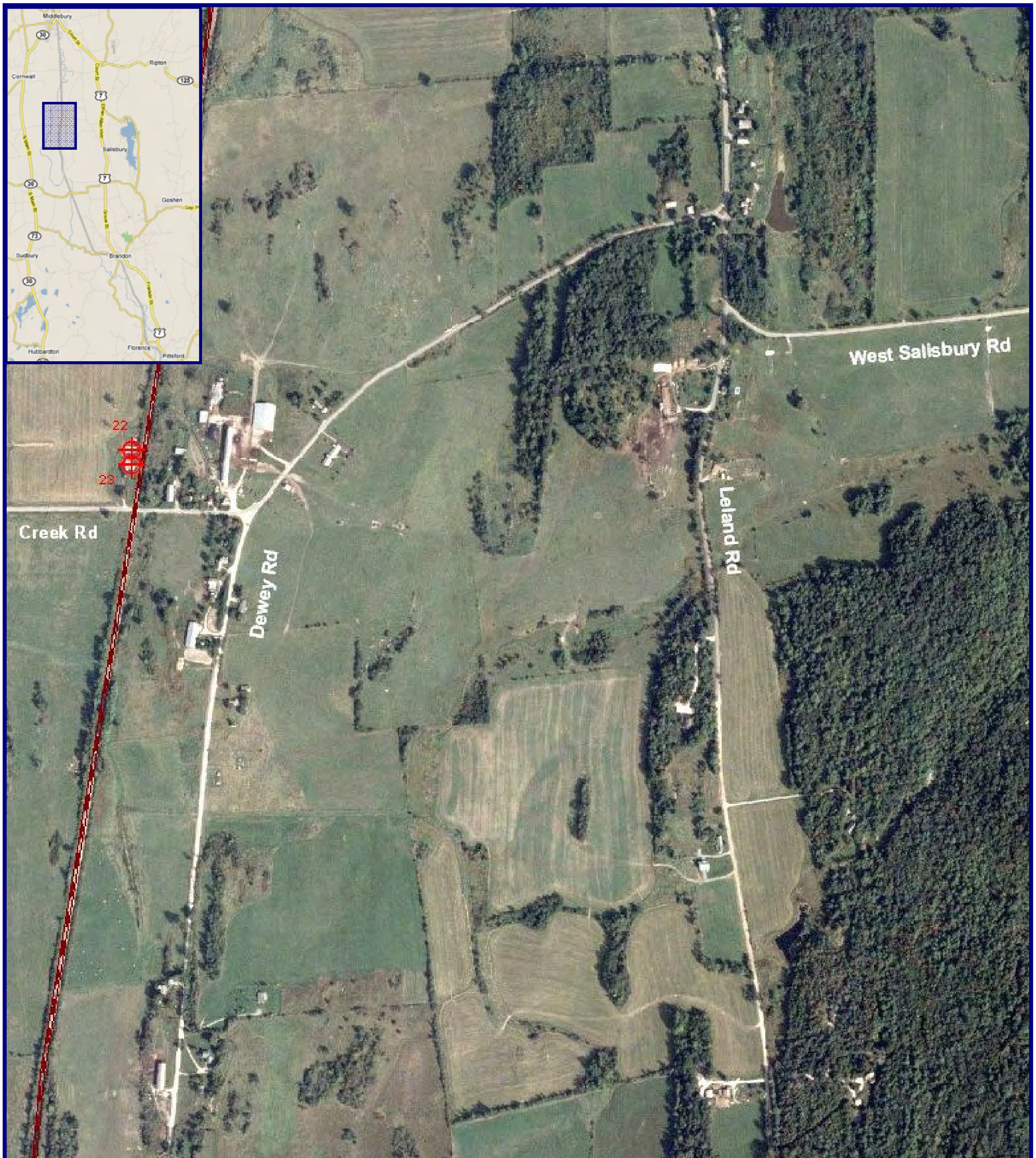
MIDDLEBURY SPUR EIS

VIEWPOINT 31
TR-1 TRANSLOAD FACILITY

JANUARY 2007 FIGURE NO. 4.3-40



NOT TO SCALE

N

Figure 4.5-1
Rail Noise Impacts - Salisbury
2010 and 2030

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

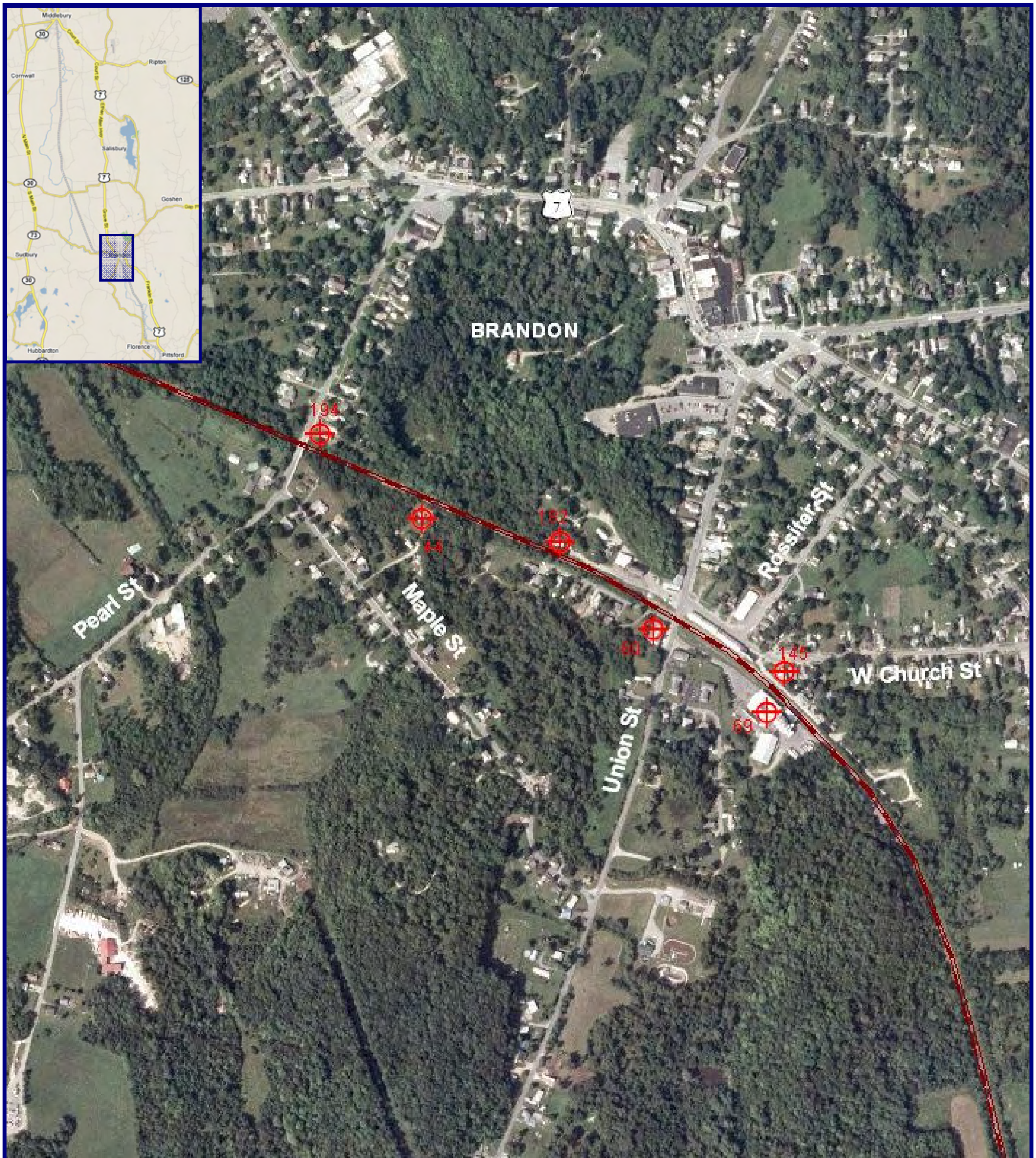
N

NOT TO SCALE

Figure 4.5-2
Rail Noise Impacts - Leceister
2010 and 2030

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

NOT TO SCALE

Figure 4.5-3
Rail Noise Impacts – Brandon Village
2010 and 2030

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

↑ N

NOT TO SCALE

Figure 4.5-4
Rail Noise Impacts – Brandon South
2010 and 2030

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

Commercial

NOT TO SCALE

Figure 4.5-5
Highway Noise Impacts
Existing (2004) (Section 1)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

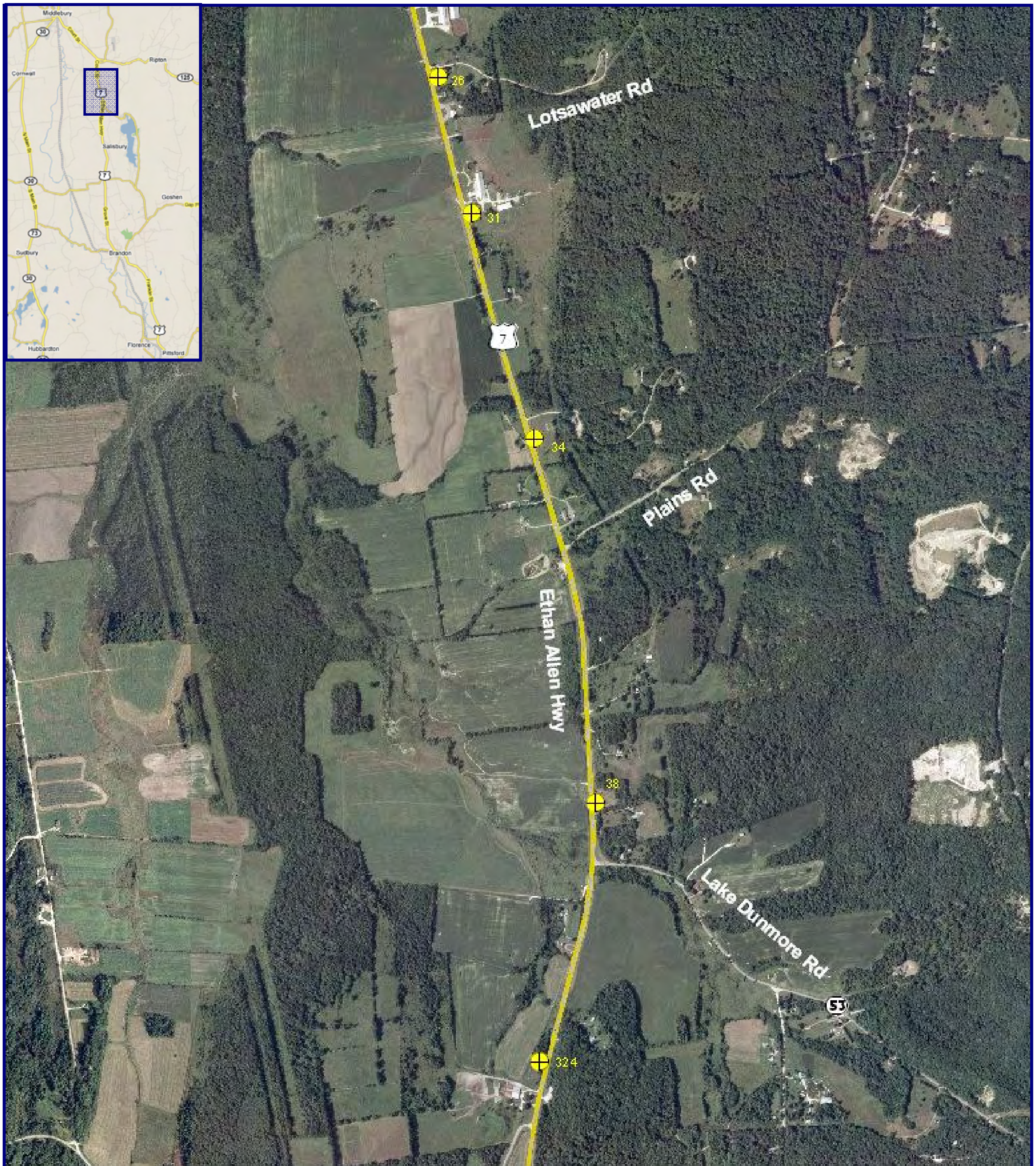
Commercial

NOT TO SCALE

Figure 4.5-11
Highway Noise Impacts
2010 No Build (Section 1)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

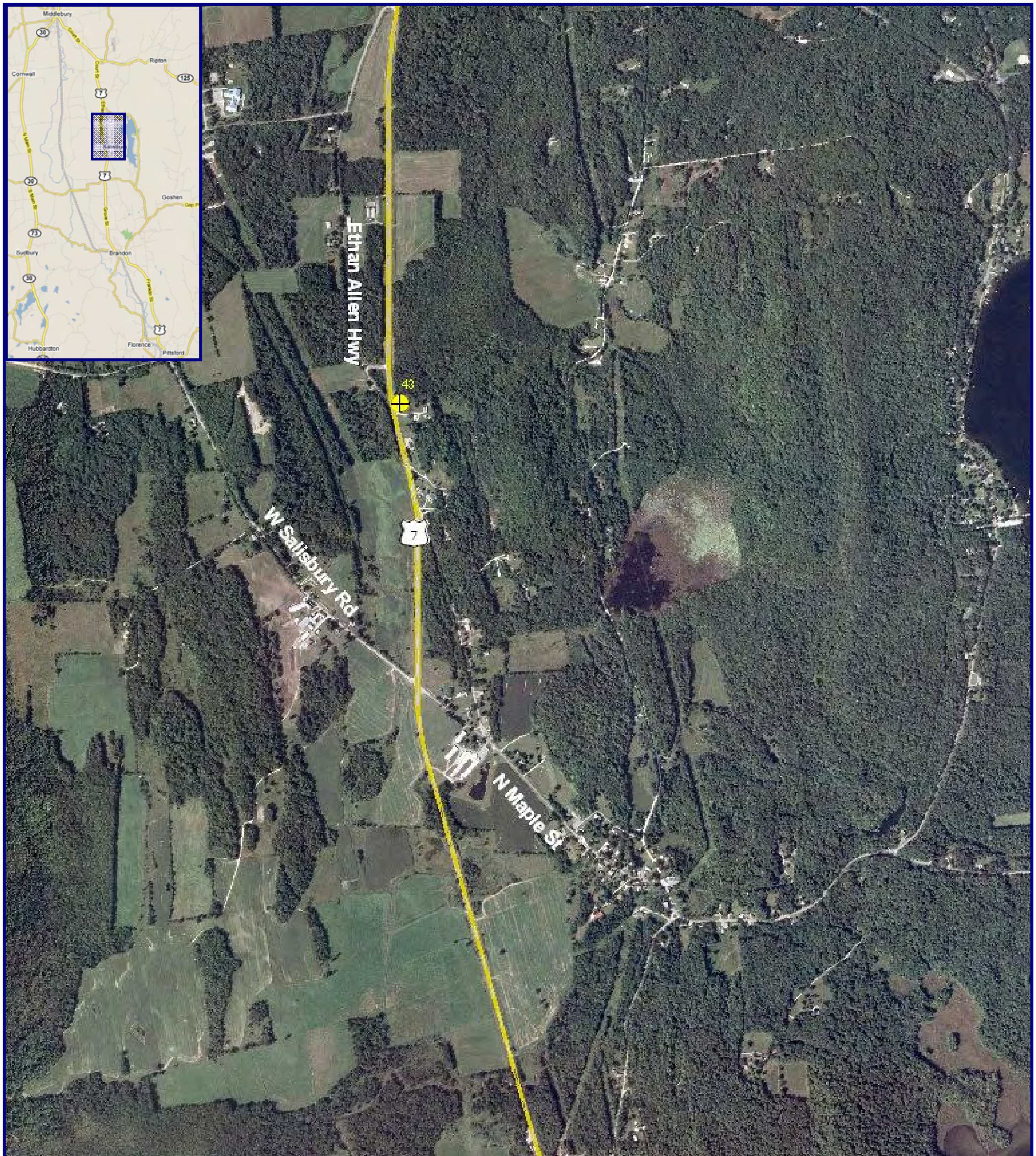
Commercial

NOT TO SCALE

Figure 4.5-12
Highway Noise Impacts
2010 No Build (Section 2)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

Commercial

NOT TO SCALE

Figure 4.5-13

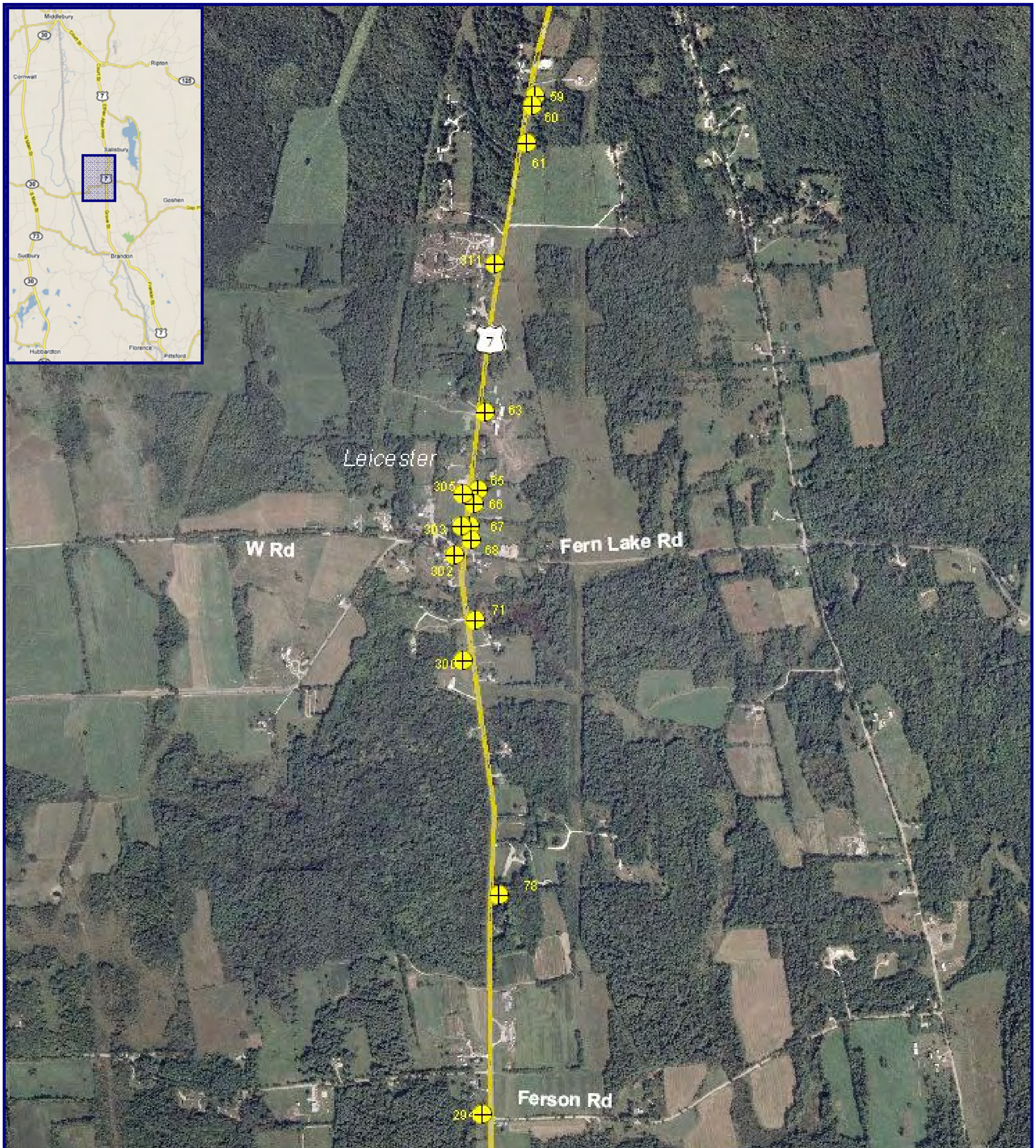
Highway Noise Impacts

2010 No Build (Section 3)

MIDDLEBURY SPUR PROJECT

MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

Commercial

NOT TO SCALE

Figure 4.5-14
Highway Noise Impacts
2010 No Build (Section 4)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

Commercial

NOT TO SCALE

Figure 4.5-15
Highway Noise Impacts
2010 No Build (Section 5)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

Commercial

NOT TO SCALE

Figure 4.5-16
Highway Noise Impacts
2010 No Build (Section 6)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential
Commercial

NOT TO SCALE

Figure 4.5-17
Highway Noise Impacts
2010 No Build (Section 7)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

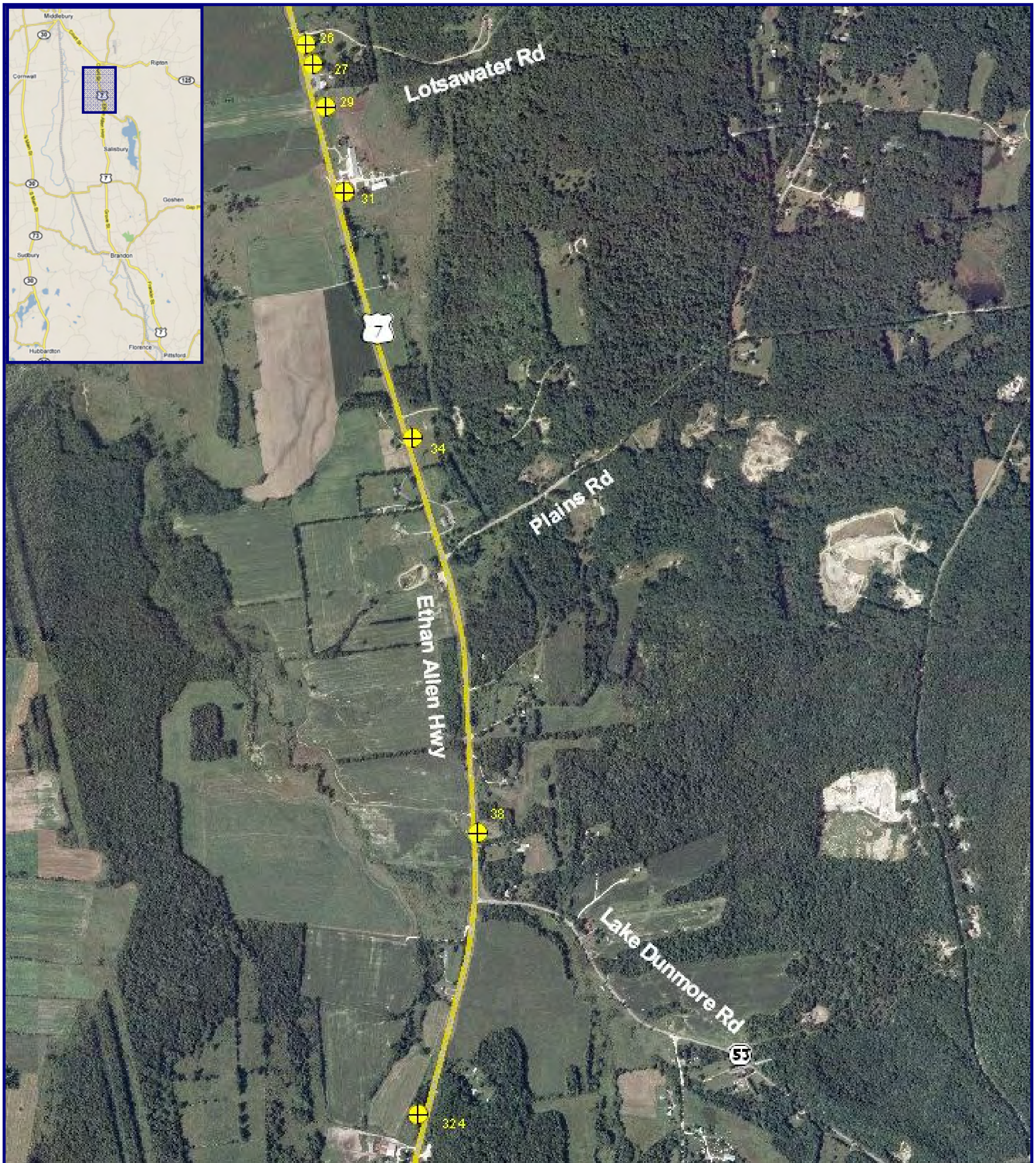
Source: K.M. Chng Environmental, Inc.

Residential
Commercial
N
NOT TO SCALE

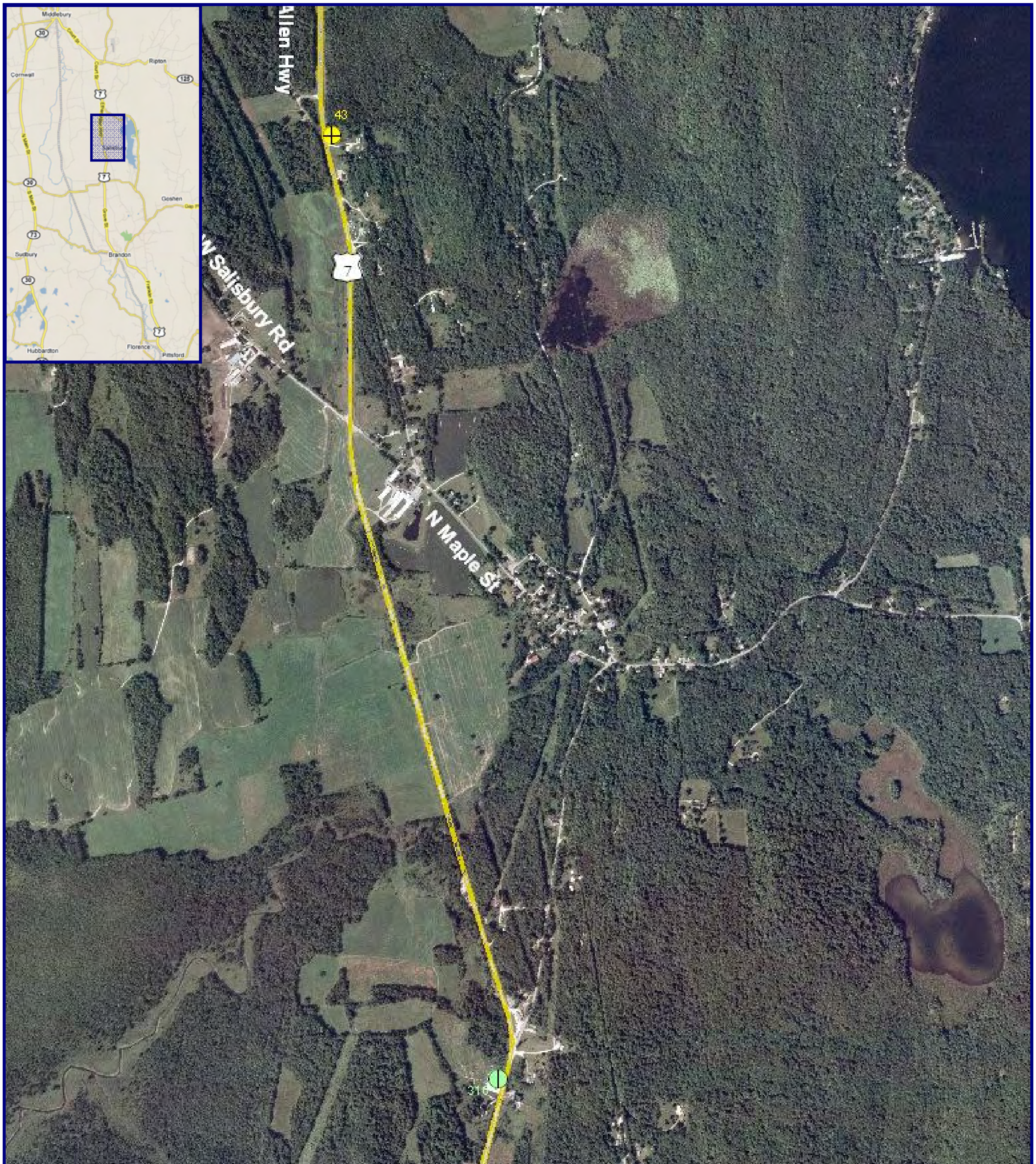
Figure 4.5-18
Highway Noise Impacts
2030 No Build (Section 1)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N Residential Commercial NOT TO SCALE	**Figure 4.5-19** **Highway Noise Impacts** 2030 No Build (Section 2)	**MIDDLEBURY SPUR PROJECT** MIDDLEBURY, VT Source: K.M. Chng Environmental, Inc.



N

Residential

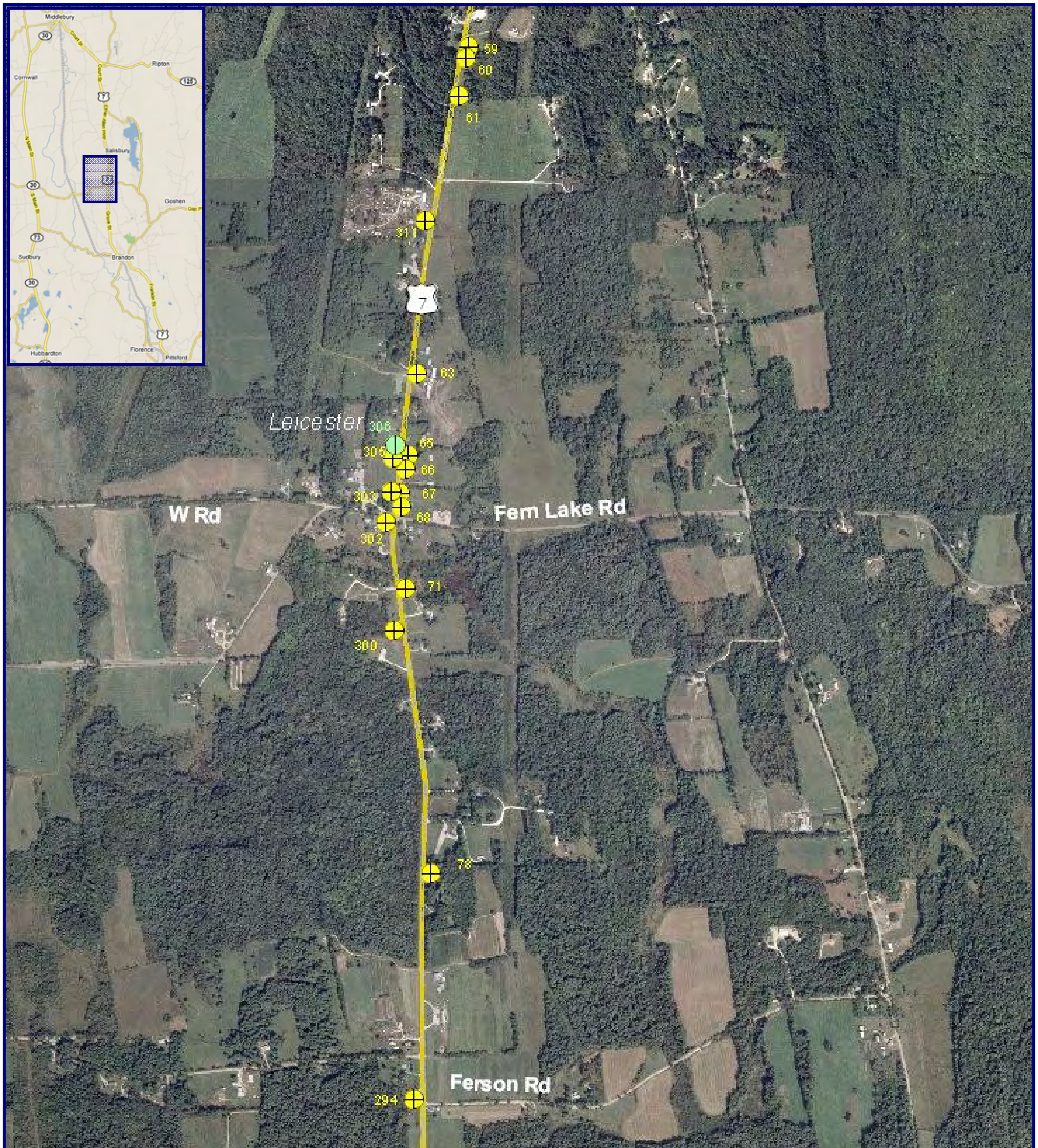
Commercial

NOT TO SCALE

Figure 4.5-20
Highway Noise Impacts
2030 No Build (Section 3)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

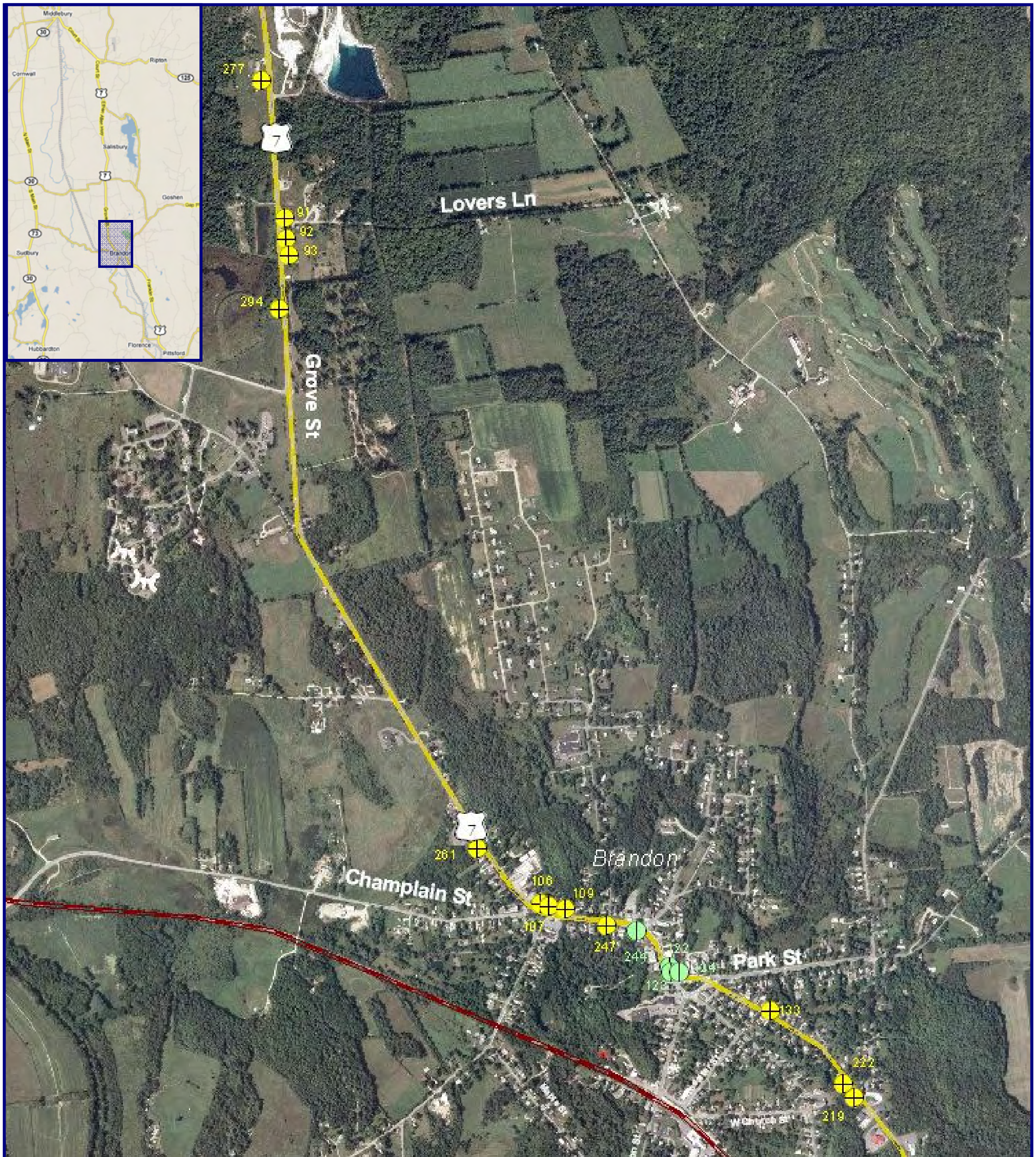


Residential
Commercial
N
NOT TO SCALE

Figure 4.5-21
Highway Noise Impacts
2030 No Build (Section 4)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



Residential

Commercial

N

NOT TO SCALE

Figure 4.5-22
Highway Noise Impacts
2030 No Build (Section 5)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

Commercial

NOT TO SCALE

Figure 4.5-23
Highway Noise Impacts
2030 No Build (Section 6)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

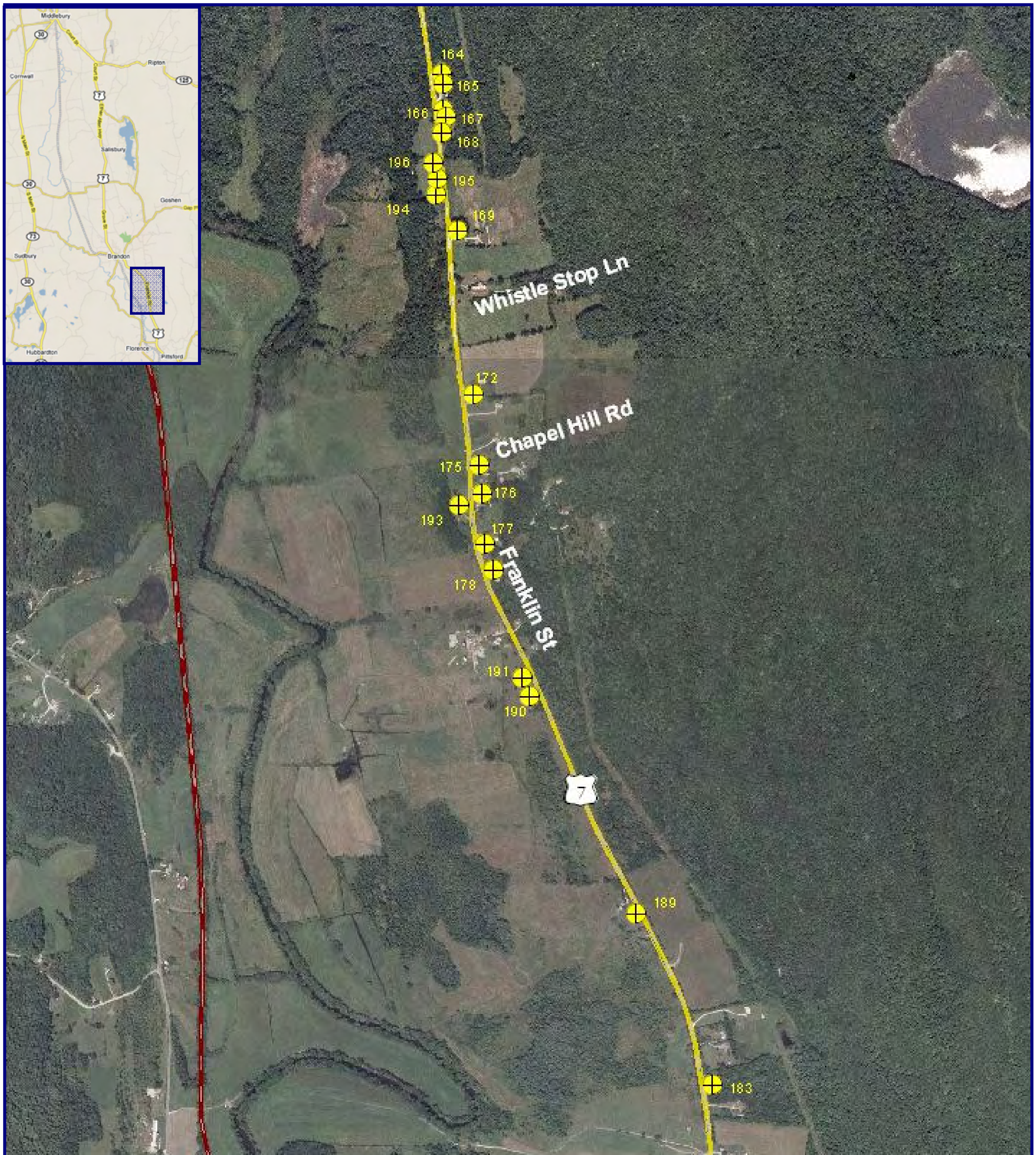
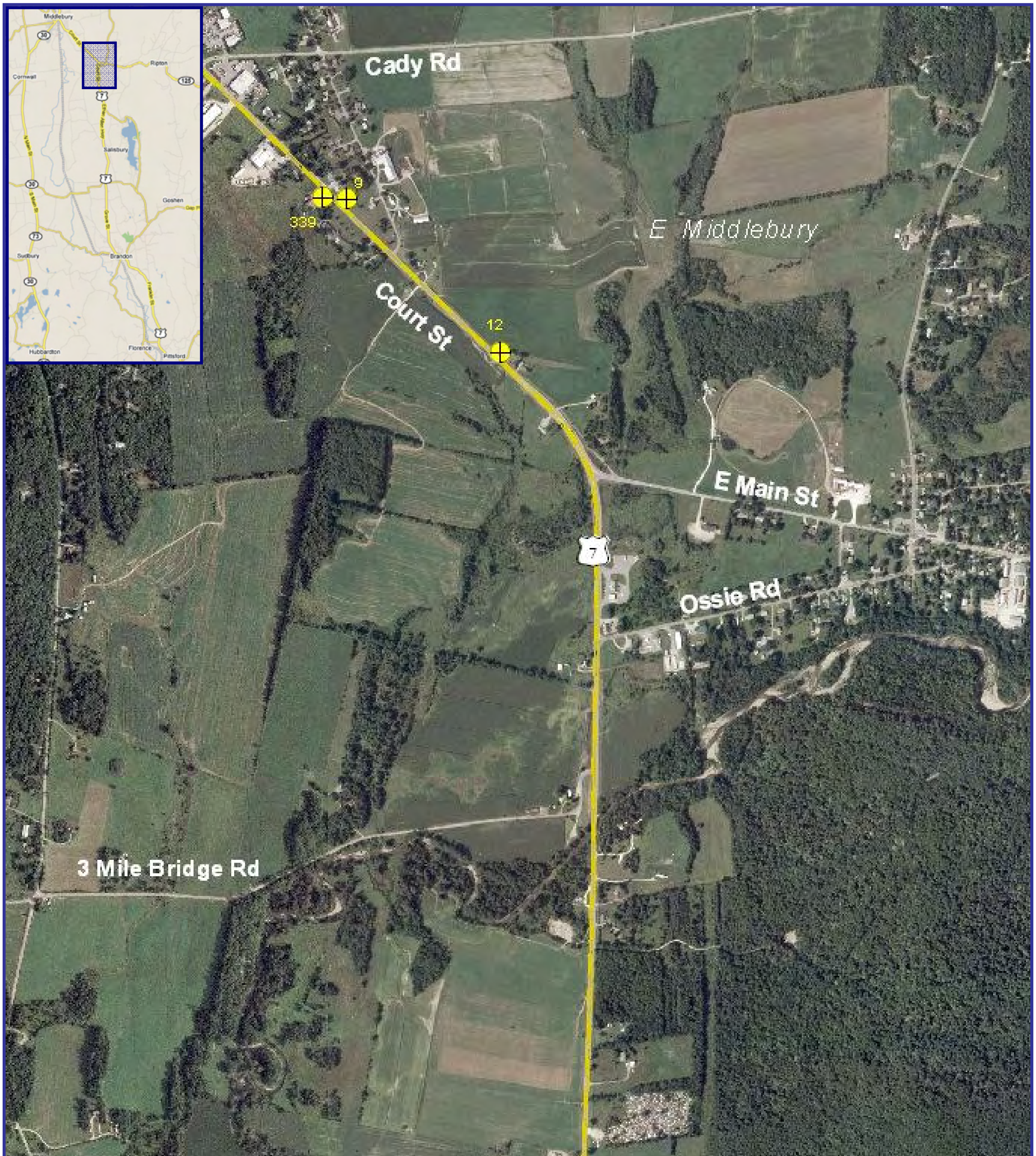


Figure 4.5-24
Highway Noise Impacts
2030 No Build (Section 7)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

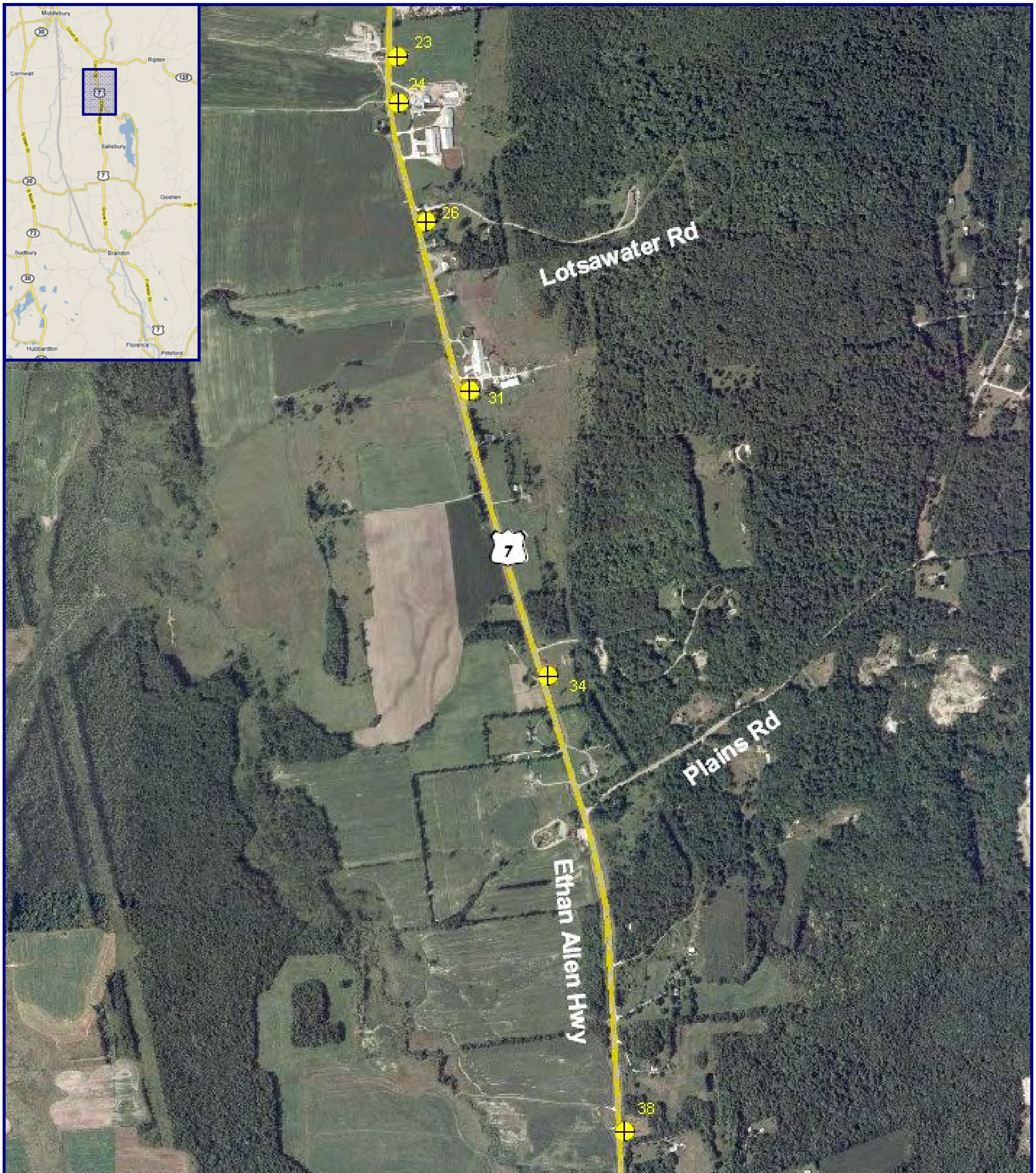
Commercial

NOT TO SCALE

Figure 4.5-25
Highway Noise Impacts
2010 RS-1 and TR-1 Alternatives
(Section 1)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



Residential
Commercial
N
NOT TO SCALE

Figure 4.5-26
Highway Noise Impacts
2010 RS-1 and TR-1 Alternatives
(Section 2)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

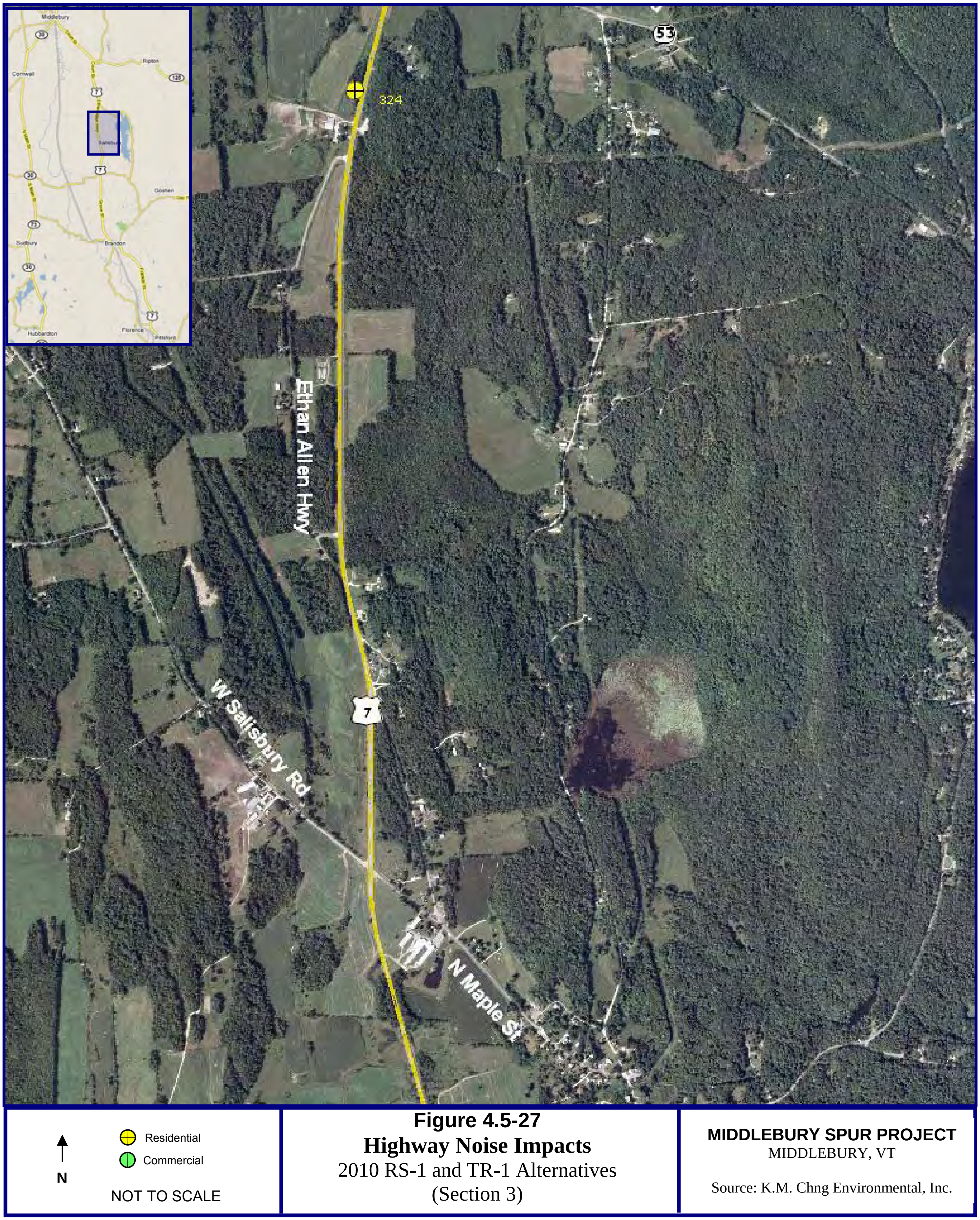
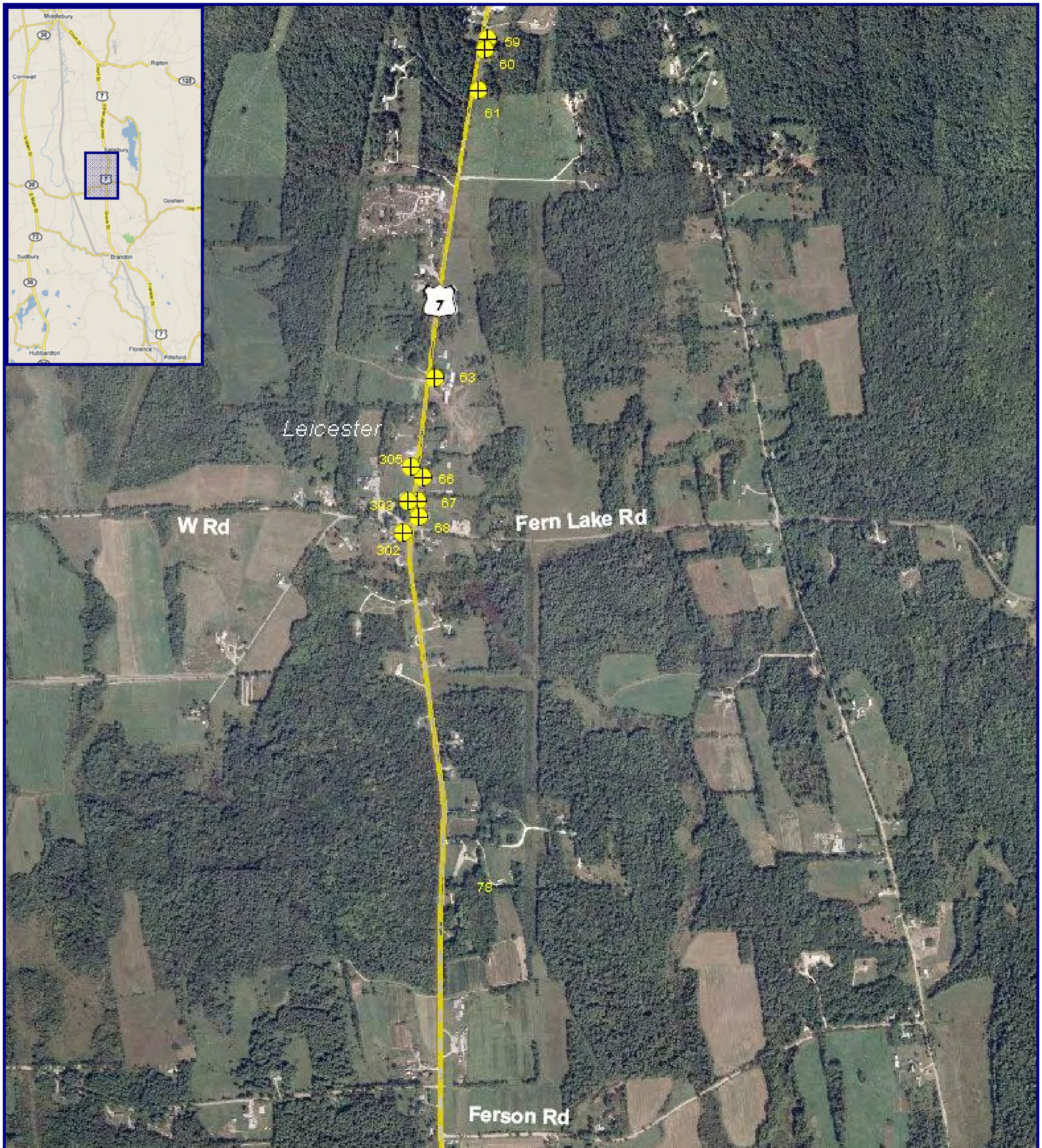


Figure 4.5-27
Highway Noise Impacts
2010 RS-1 and TR-1 Alternatives
(Section 3)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



Residential

Commercial

N

NOT TO SCALE

Figure 4.5-28

Highway Noise Impacts

2010 RS-1 and TR-1 Alternatives

(Section 4)

MIDDLEBURY SPUR PROJECT

MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

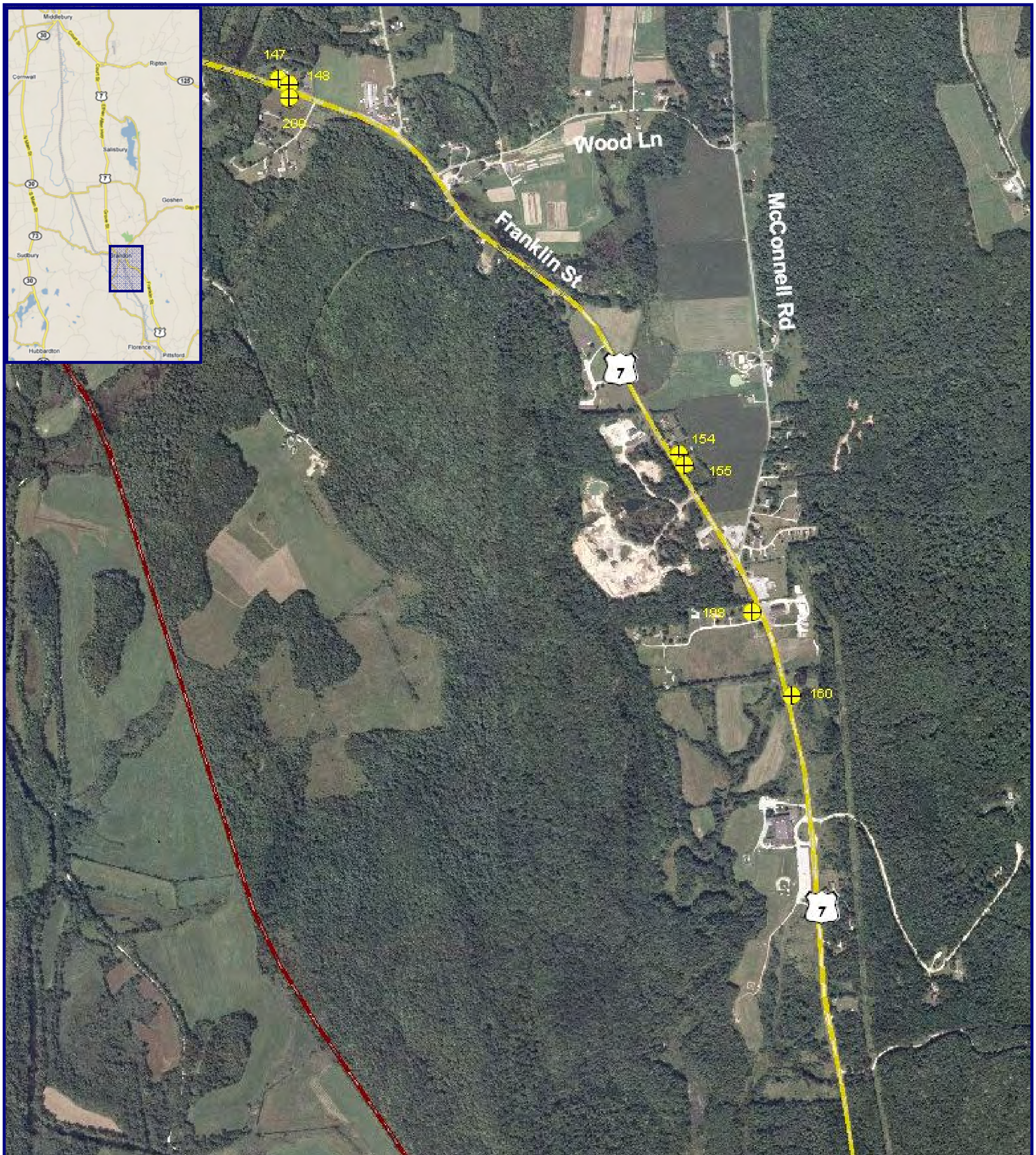
Commercial

NOT TO SCALE

Figure 4.5-29
Highway Noise Impacts
2010 RS-1 and TR-1 Alternatives
(Section 5)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N Residential Commercial NOT TO SCALE	**Figure 4.5-30** **Highway Noise Impacts** 2010 RS-1 and TR-1 Alternatives (Section 6)	**MIDDLEBURY SPUR PROJECT** MIDDLEBURY, VT Source: K.M. Chng Environmental, Inc.

N

Residential

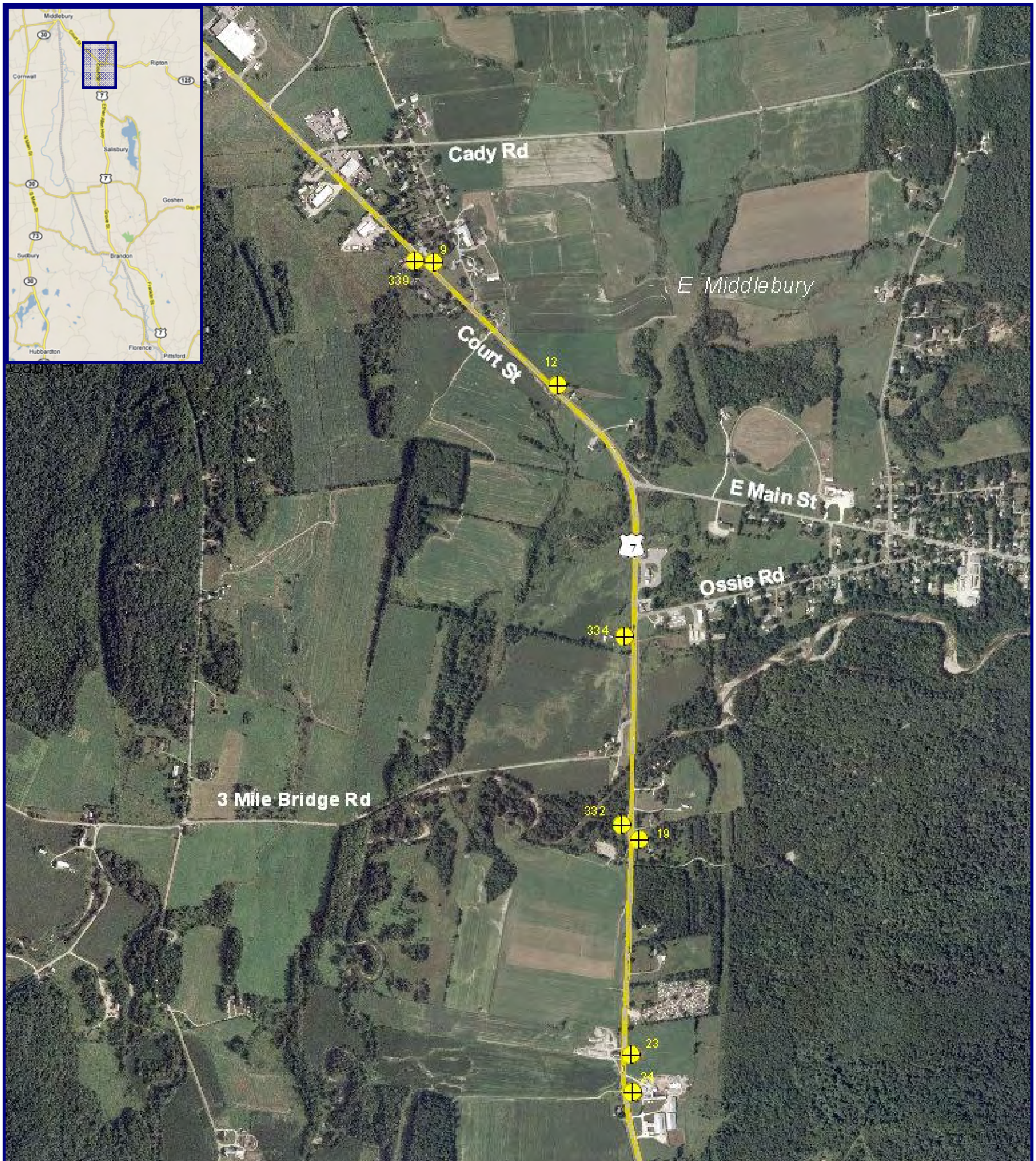
Commercial

NOT TO SCALE

Figure 4.5-31
Highway Noise Impacts
2010 RS-1 and TR-1 Alternatives
(Section 7)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

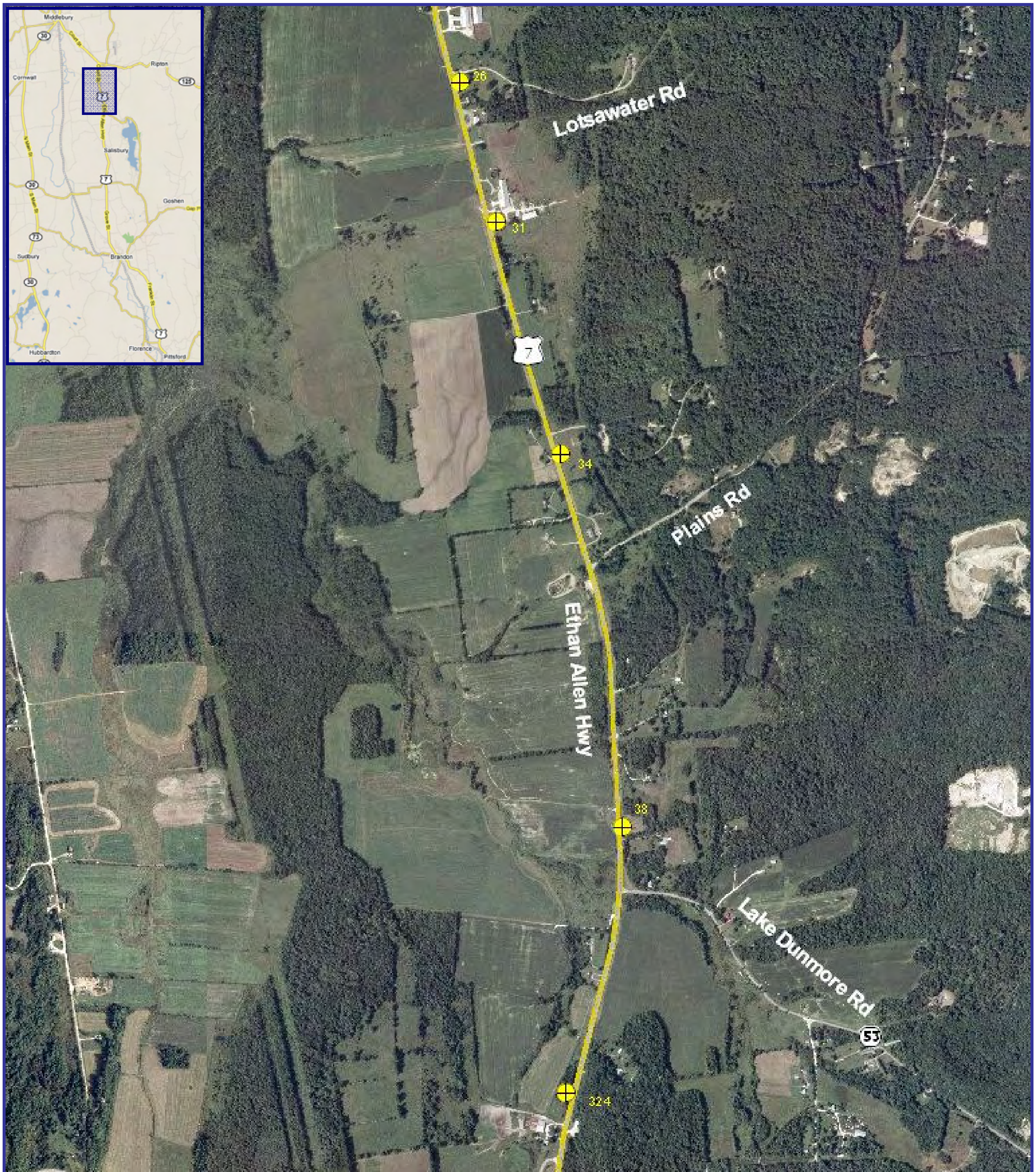
Commercial

NOT TO SCALE

Figure 4.5-32
Highway Noise Impacts
2030 RS-1 and TR-1 Alternatives
(Section 1)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

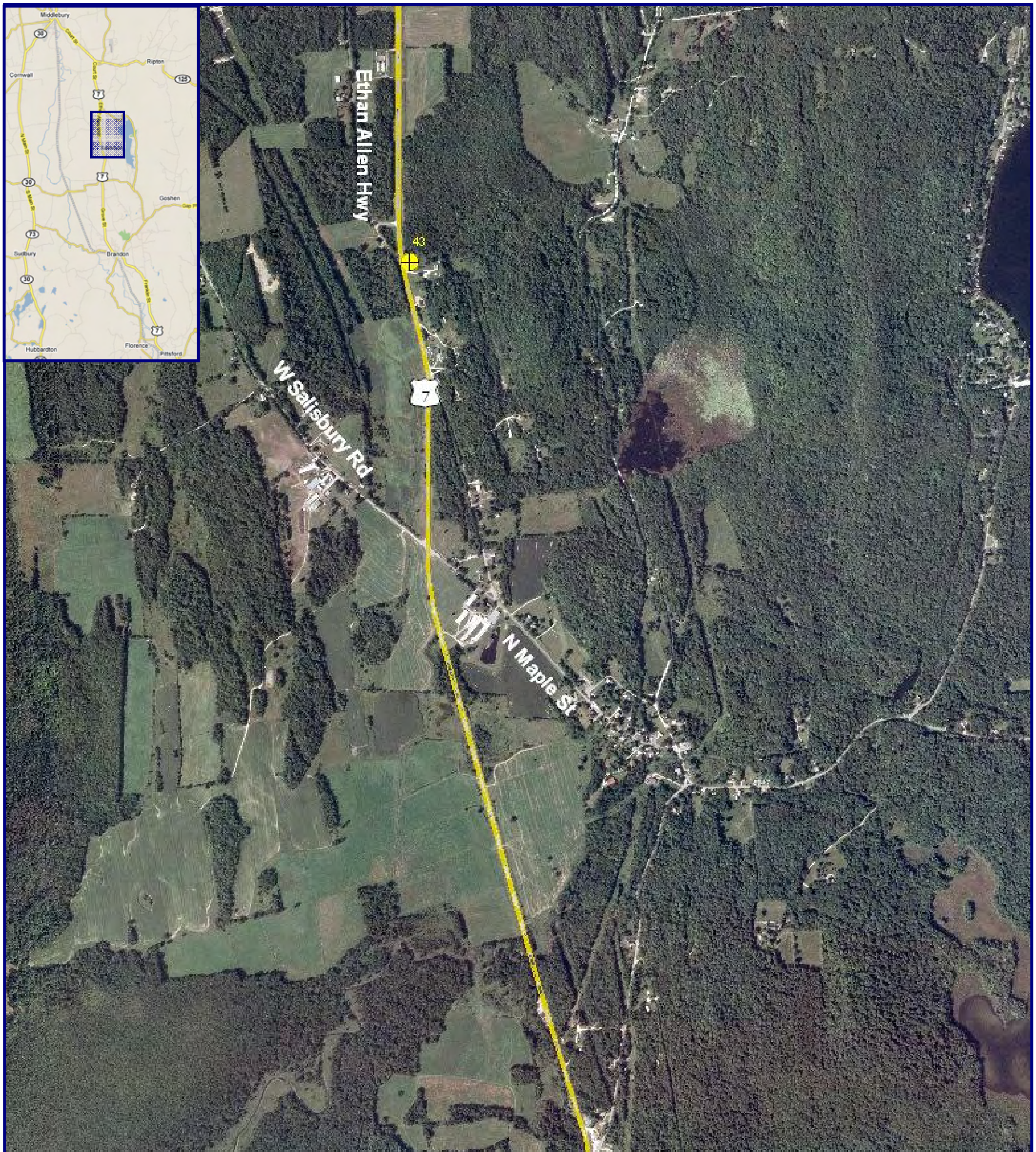
Commercial

NOT TO SCALE

Figure 4.5-33
Highway Noise Impacts
2030 RS-1 and TR-1 Alternatives
(Section 2)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

Commercial

NOT TO SCALE

Figure 4.5-34

Highway Noise Impacts

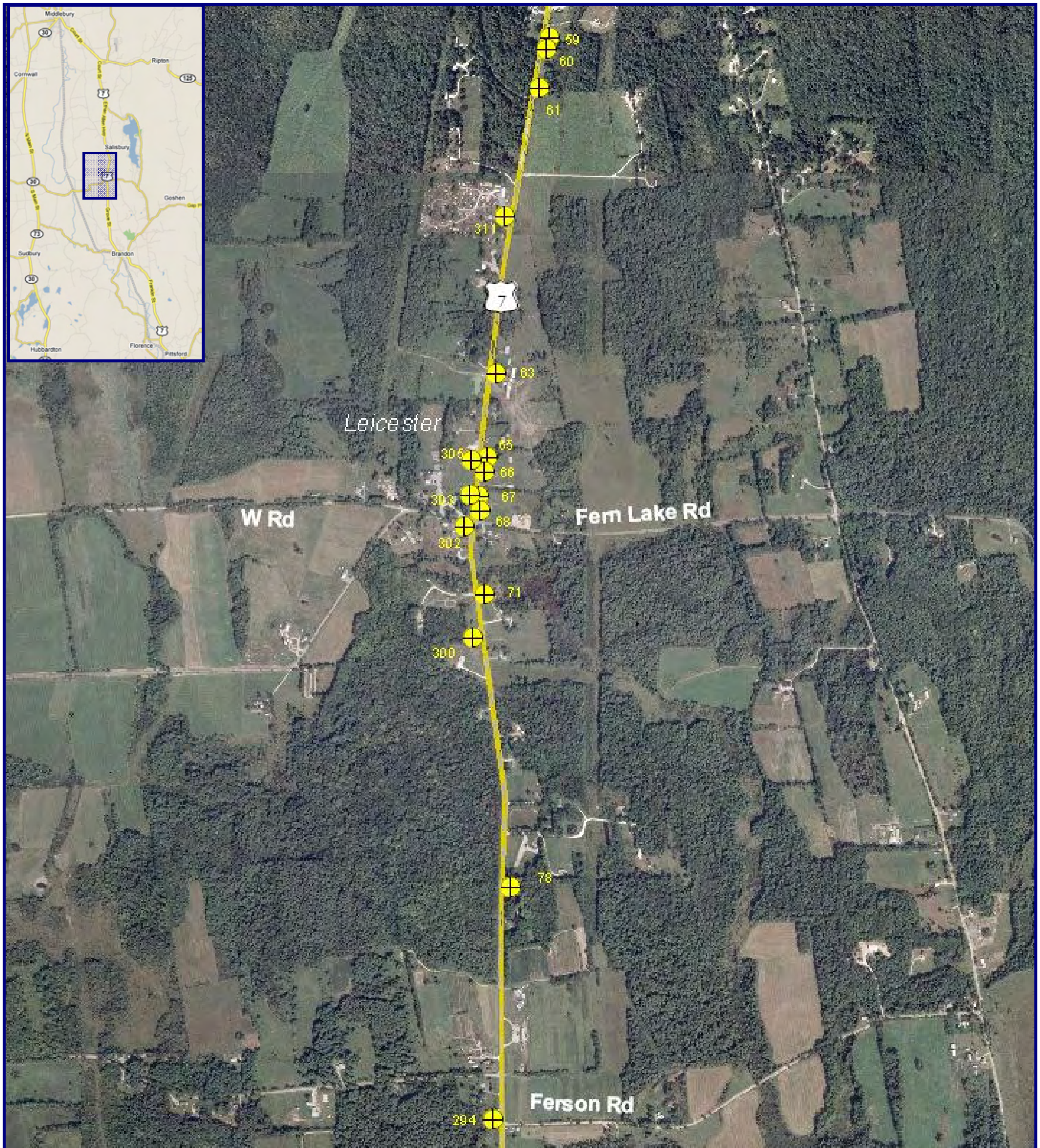
2030 RS-1 and TR-1 Alternatives

(Section 3)

MIDDLEBURY SPUR PROJECT

MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

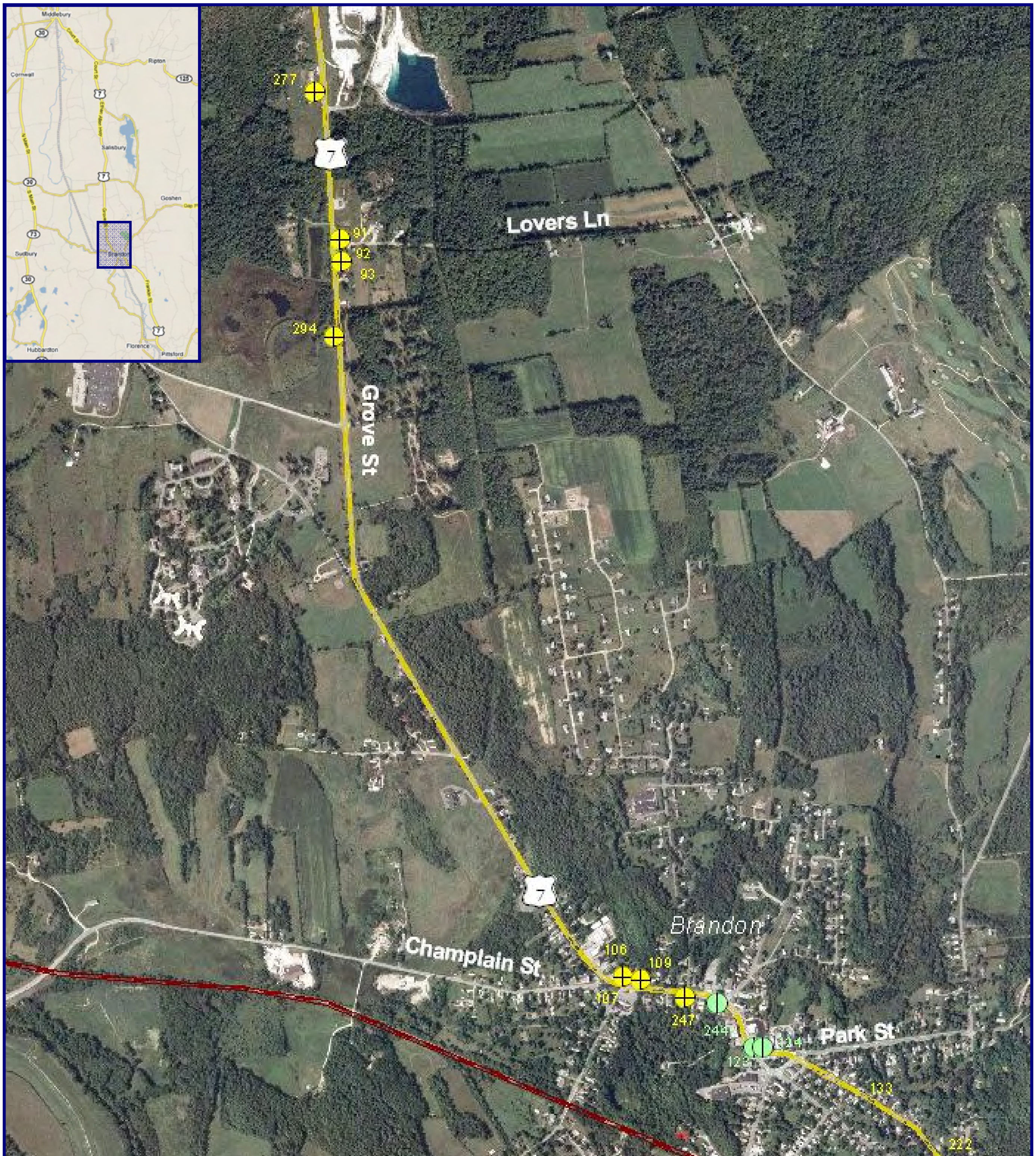
Commercial

NOT TO SCALE

Figure 4.5-35
Highway Noise Impacts
2030 RS-1 and TR-1 Alternatives
(Section 4)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



Residential

Commercial

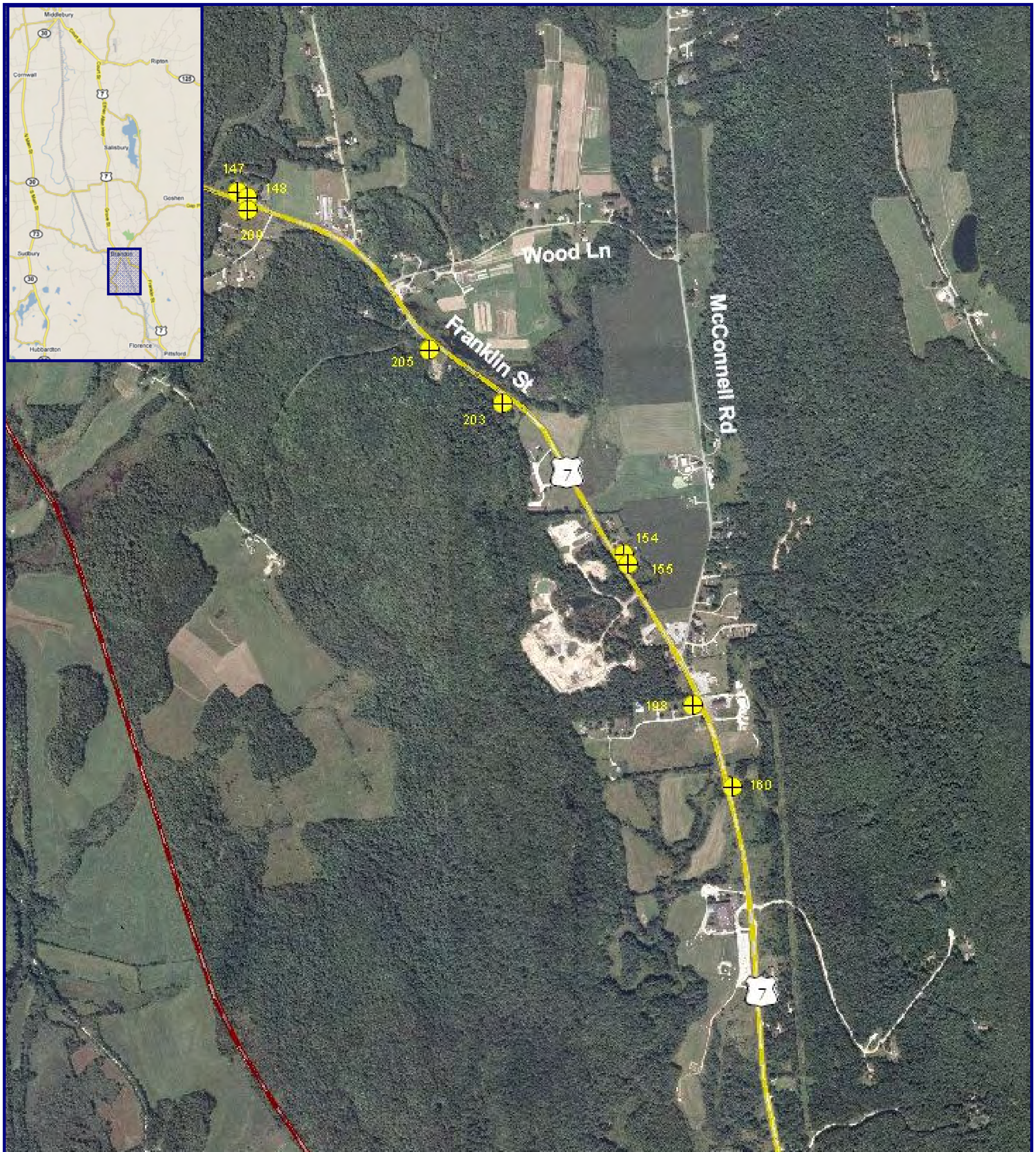
N

NOT TO SCALE

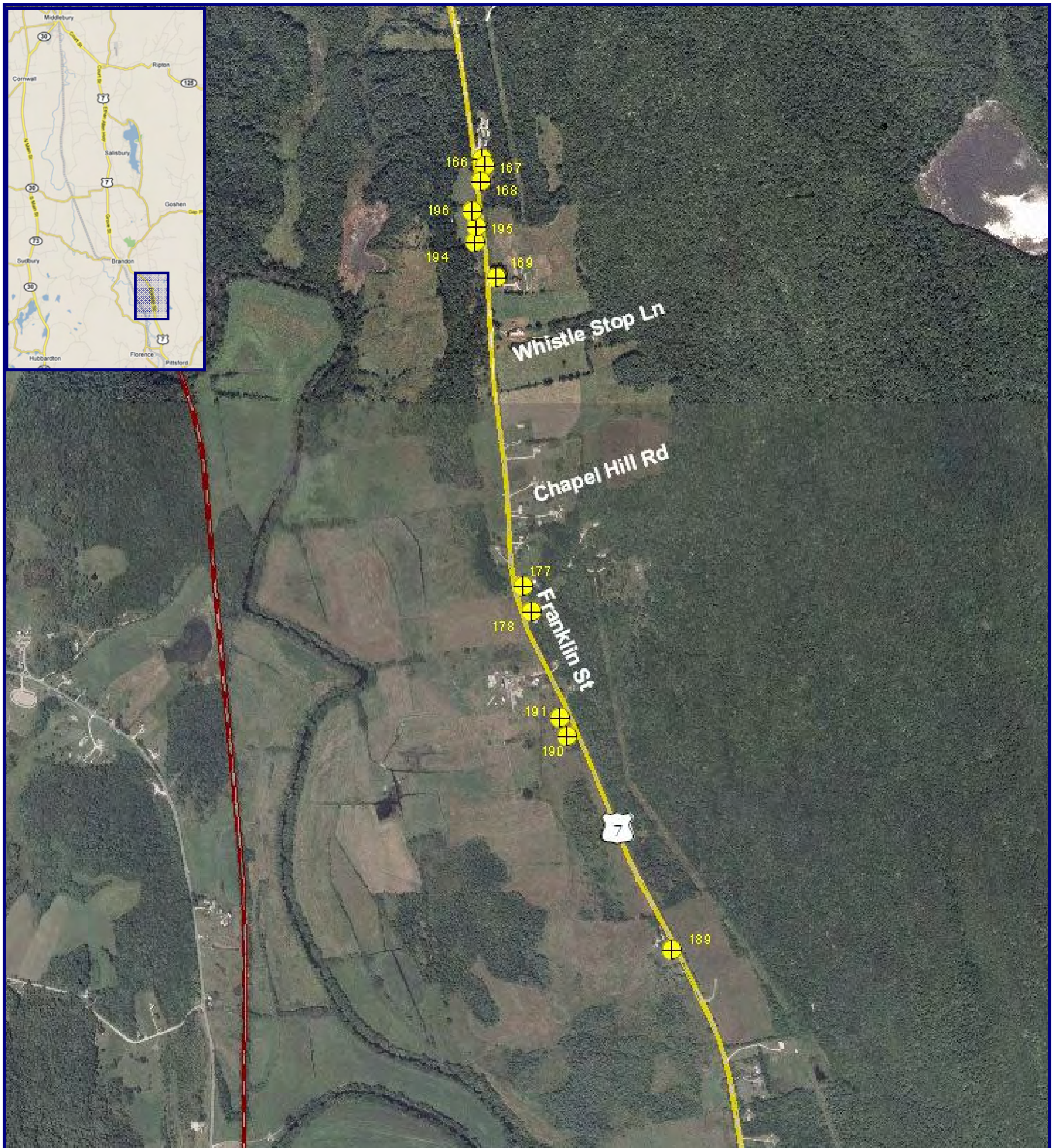
Figure 4.5-36
Highway Noise Impacts
2030 RS-1 and TR-1 Alternatives
(Section 5)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N Residential Commercial NOT TO SCALE	**Figure 4.5-37** **Highway Noise Impacts** 2030 RS-1 and TR-1 Alternatives (Section 6)	**MIDDLEBURY SPUR PROJECT** MIDDLEBURY, VT Source: K.M. Chng Environmental, Inc.



N

Residential

Commercial

NOT TO SCALE

Figure 4.5-38

Highway Noise Impacts

2030 RS-1 and TR-1 Alternatives

(Section 7)

MIDDLEBURY SPUR PROJECT

MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

NOT TO SCALE

Figure 4.5-39
Rail Vibration Impacts - Salisbury
2010 and 2030

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

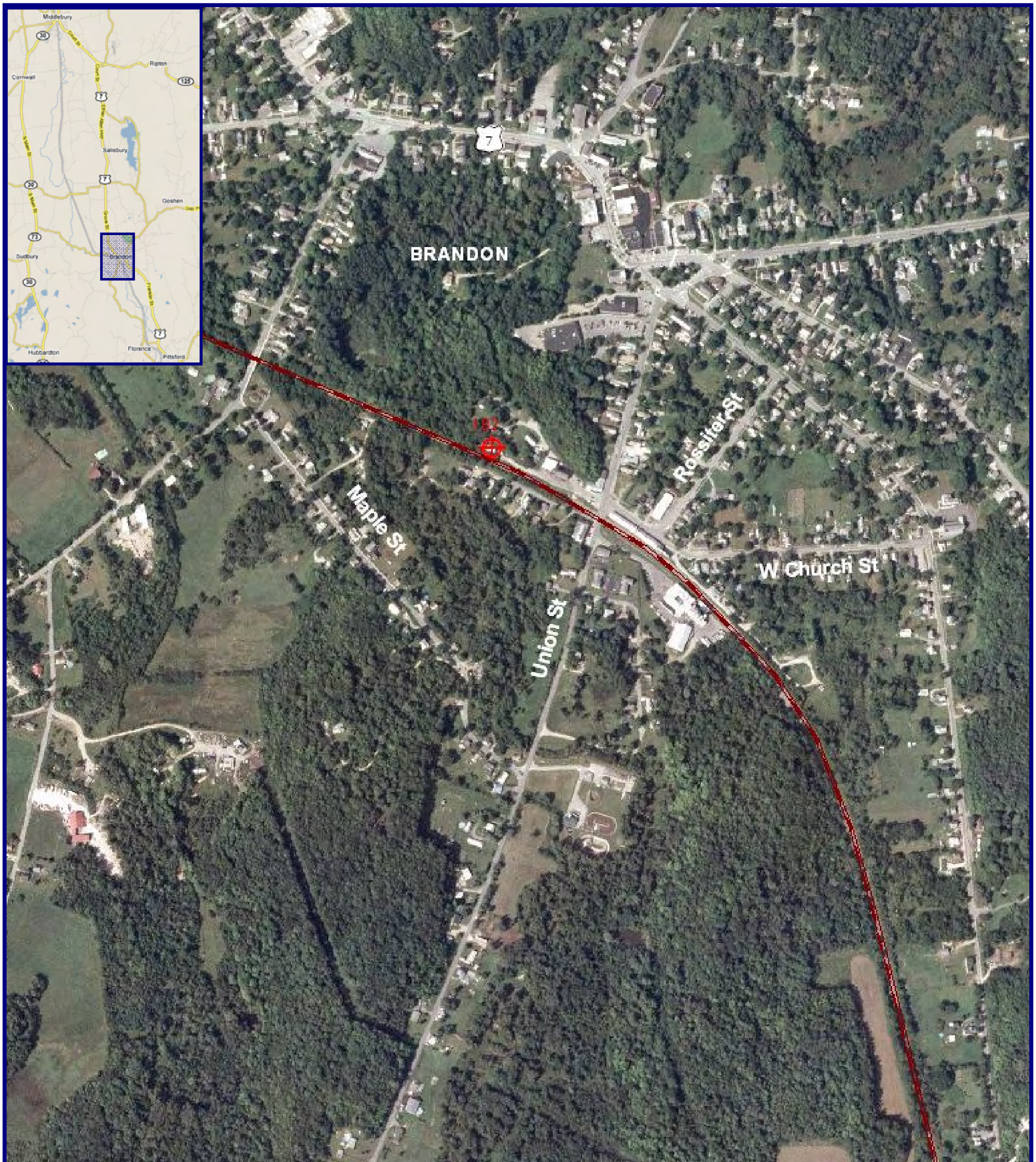
N

NOT TO SCALE

Figure 4.5-40
Rail Vibration Impacts - Leicester
2010 and 2030

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N NOT TO SCALE	**Figure 4.5-41** **Rail Vibration Impacts – Brandon Village** 2010 and 2030	**MIDDLEBURY SPUR PROJECT** MIDDLEBURY, VT Source: K.M. Chng Environmental, Inc.

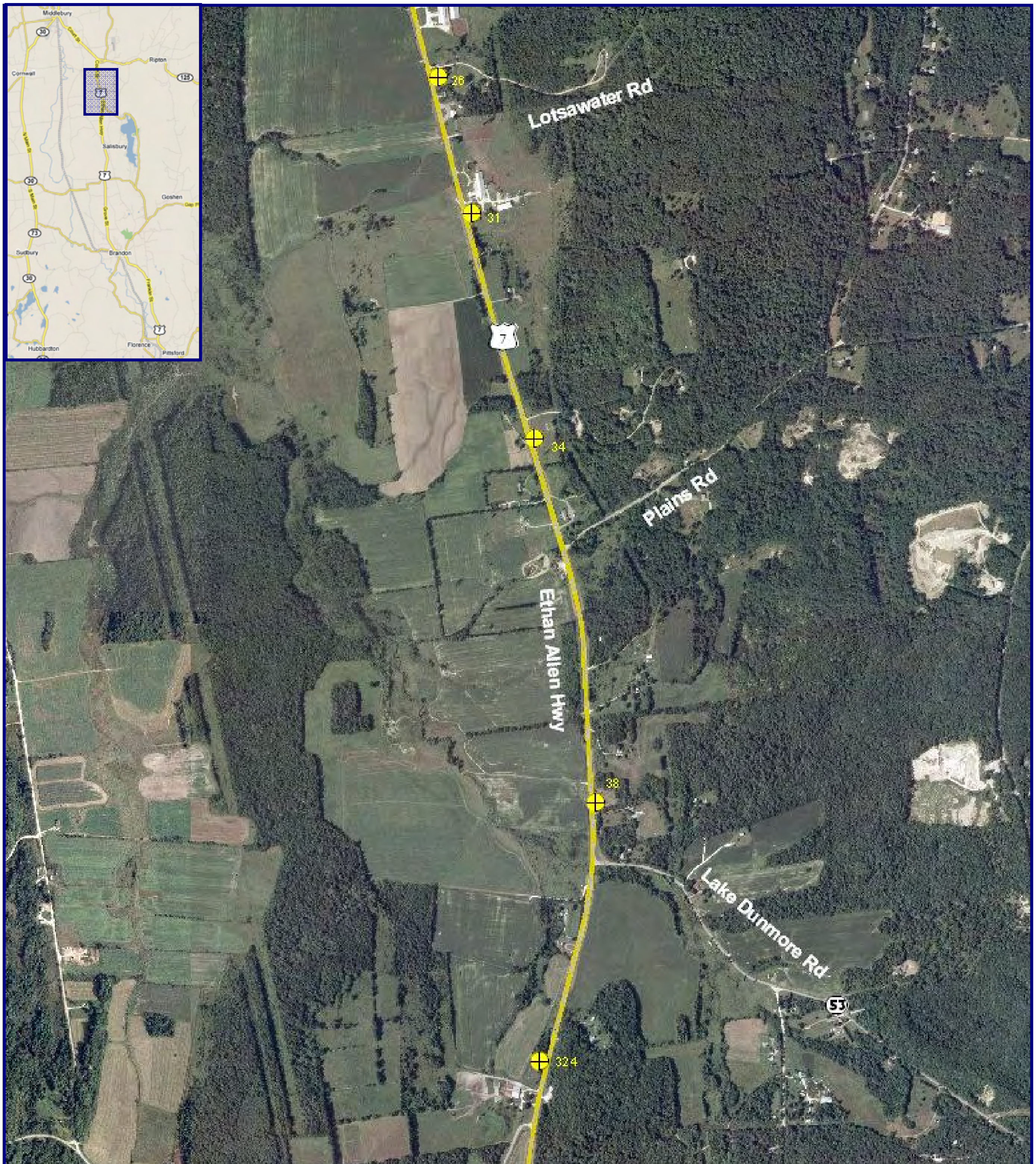
N

NOT TO SCALE

Figure 4.5-42
Rail Vibration Impacts – Brandon South
2010 and 2030

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

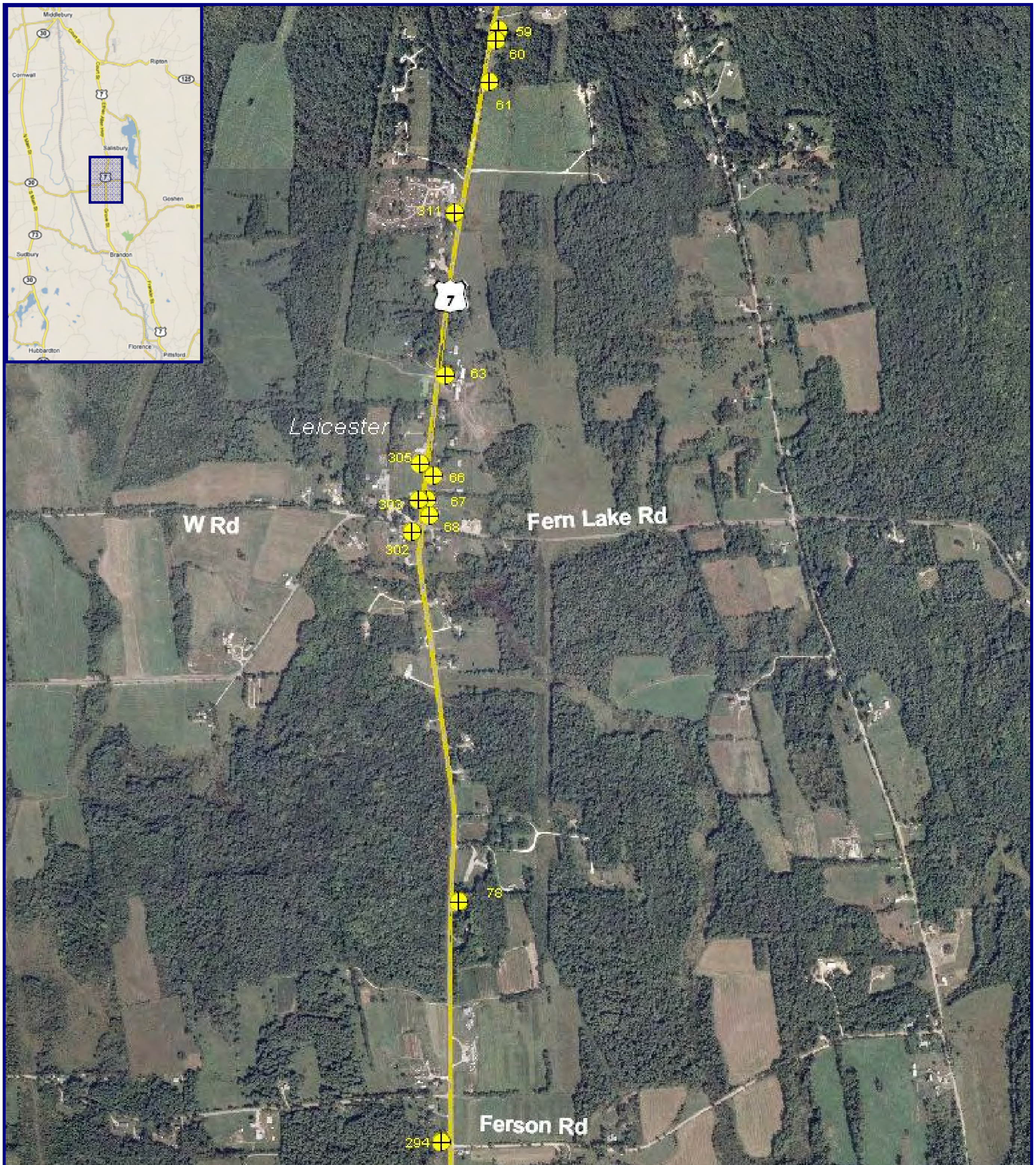
Commercial

NOT TO SCALE

Figure 4.5-6
Highway Noise Impacts
Existing (2004) (Section 2)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential

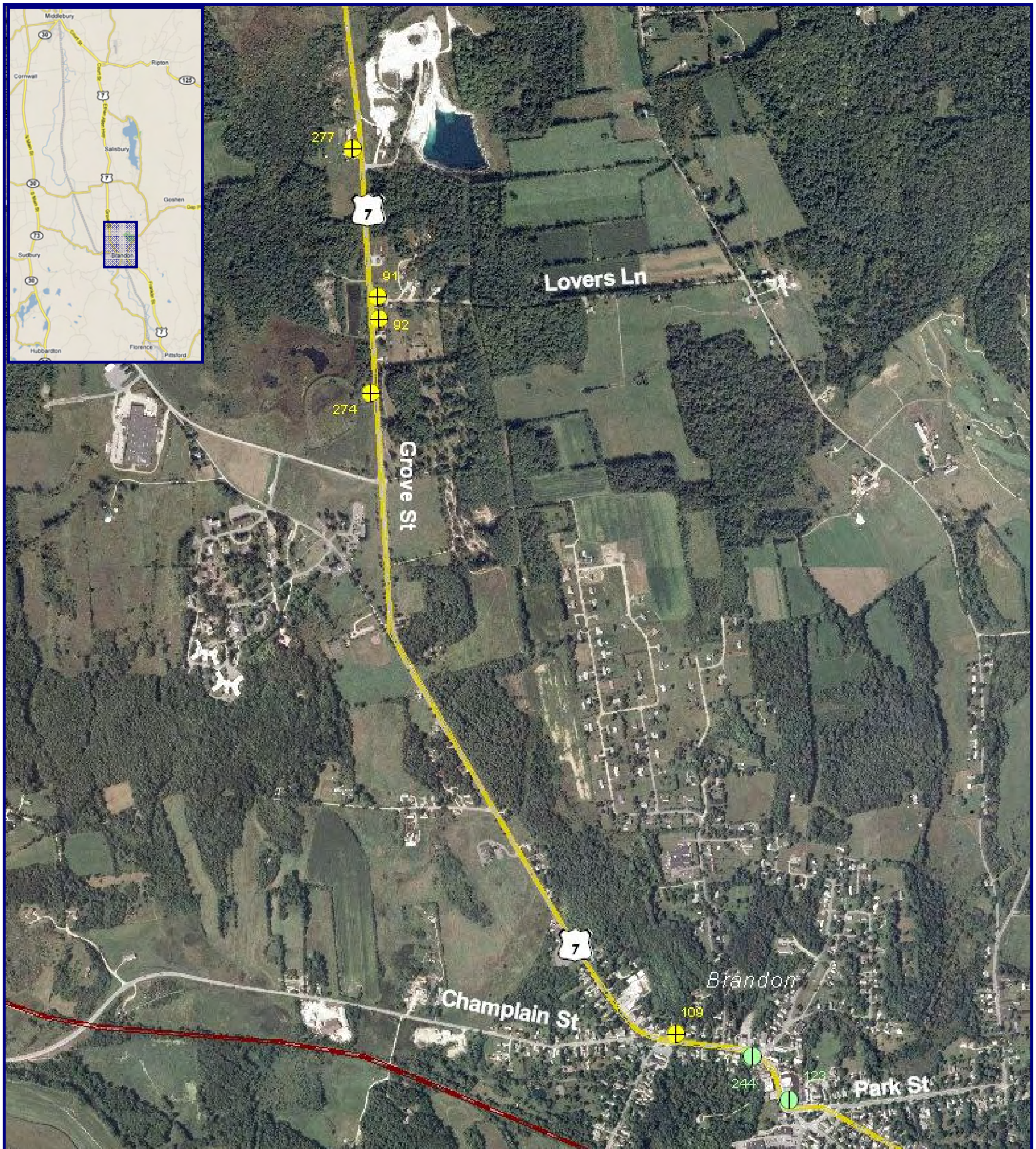
Commercial

NOT TO SCALE

Figure 4.5-7
Highway Noise Impacts
Existing (2004) (Section 3)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.



N

Residential
Commercial

NOT TO SCALE

Figure 4.5-8
Highway Noise Impacts
Existing (2004) (Section 4)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

Commercial

NOT TO SCALE

Figure 4.5-9
Highway Noise Impacts
Existing (2004) (Section 5)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

N

Residential

Commercial

NOT TO SCALE

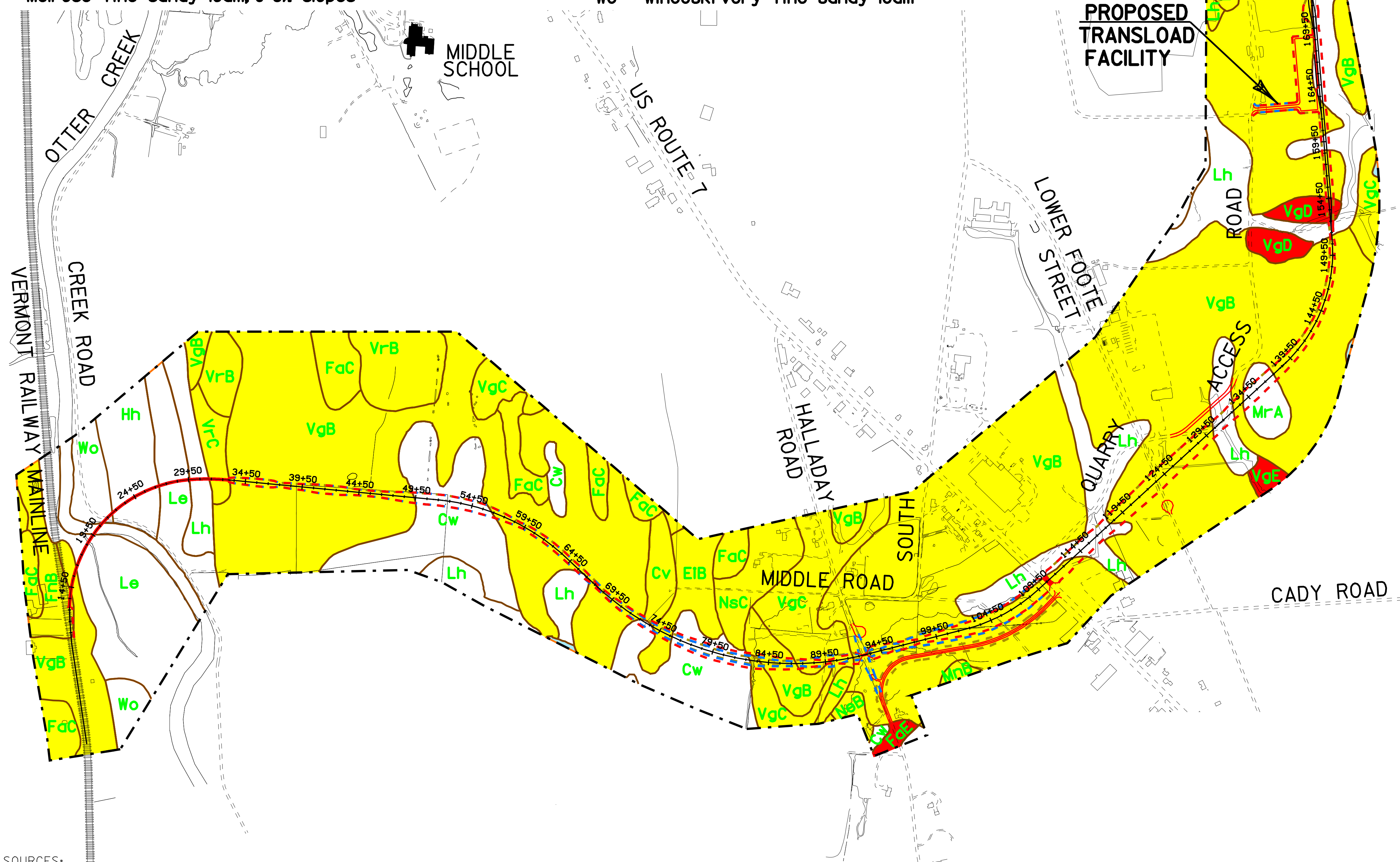
Figure 4.5-10
Highway Noise Impacts
Existing (2004) (Section 6)

MIDDLEBURY SPUR PROJECT
MIDDLEBURY, VT

Source: K.M. Chng Environmental, Inc.

SOIL UNIT KEY

Cw - Covington and Panton Silty Clays
Cv - Covington Silty Clay, Flooded
ElB - Elmwood Fine Sandy Loam, Coarse Variant, 0 to 8% slopes
FaC - Farmington Extremely Rocky Silt Loam, 5 to 20% slopes
FaE - Farmington Extremely Rocky Silt Loam, 25 to 50% slopes
FnB - Farmington-Nellis rocky complex, 5 to 12% slopes
Hh - Hadley Very Fine Sandy Loam, Frequently Flooded
Le - Limerick Silt Loam
Lh - Livingston Clay
MnB - Massena extremely stony silt loam, 0 to 8% slopes
MrA - Melrose fine sandy loam, 0-3% slopes
NeB - Nellis Stony Loam, 3 to 8% slopes
NsC - Nellis Extremely Stony Loam, 3 to 15% slopes
VgB - Vergennes Clay, 2 to 6% slopes
VgC - Vergennes Clay, 6 to 12% slopes
VgD - Vergennes Clay, 12 to 25% slopes
VgE - Vergennes Clay, 25 to 50% slopes
VrB - Vergennes rocky clay, moderately shallow variant, 2 to 6% slopes
VrC - Vergennes Rocky Clay, moderately shallow variant, 6 to 12% slopes
Wo - Winooski very fine sandy loam



LEGEND

++++	RAIL SPUR CENTERLINE
	ROADWAY
	SLOPE LIMITS - RS-I & RS-I GRADE SEPARATED OVER HALLADAY ROAD
	SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
	SLOPE LIMITS - HALLADAY ROAD RELOCATION
	STUDY AREA LIMITS
FaC	SOIL TYPE
	HEL CLASS I HIGHLY ERODIBLE SOILS
	HEL CLASS 2 POTENTIALLY HIGHLY ERODIBLE SOILS
	HEL CLASS 3 NOT HIGHLY ERODIBLE

DATA SOURCES:
"HIGHLY ERODIBLE MAP UNIT LIST"
ADDISON COUNTY, USDA NRCS, 1995.
ADDISON COUNTY SOIL SURVEY,
USDA NRCS, 1971. DIGITAL DATA
SOURCE: VCGI, 2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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MIDDLEBURY SPUR EIS

ERODIBLE SOILS
RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 4.7-I

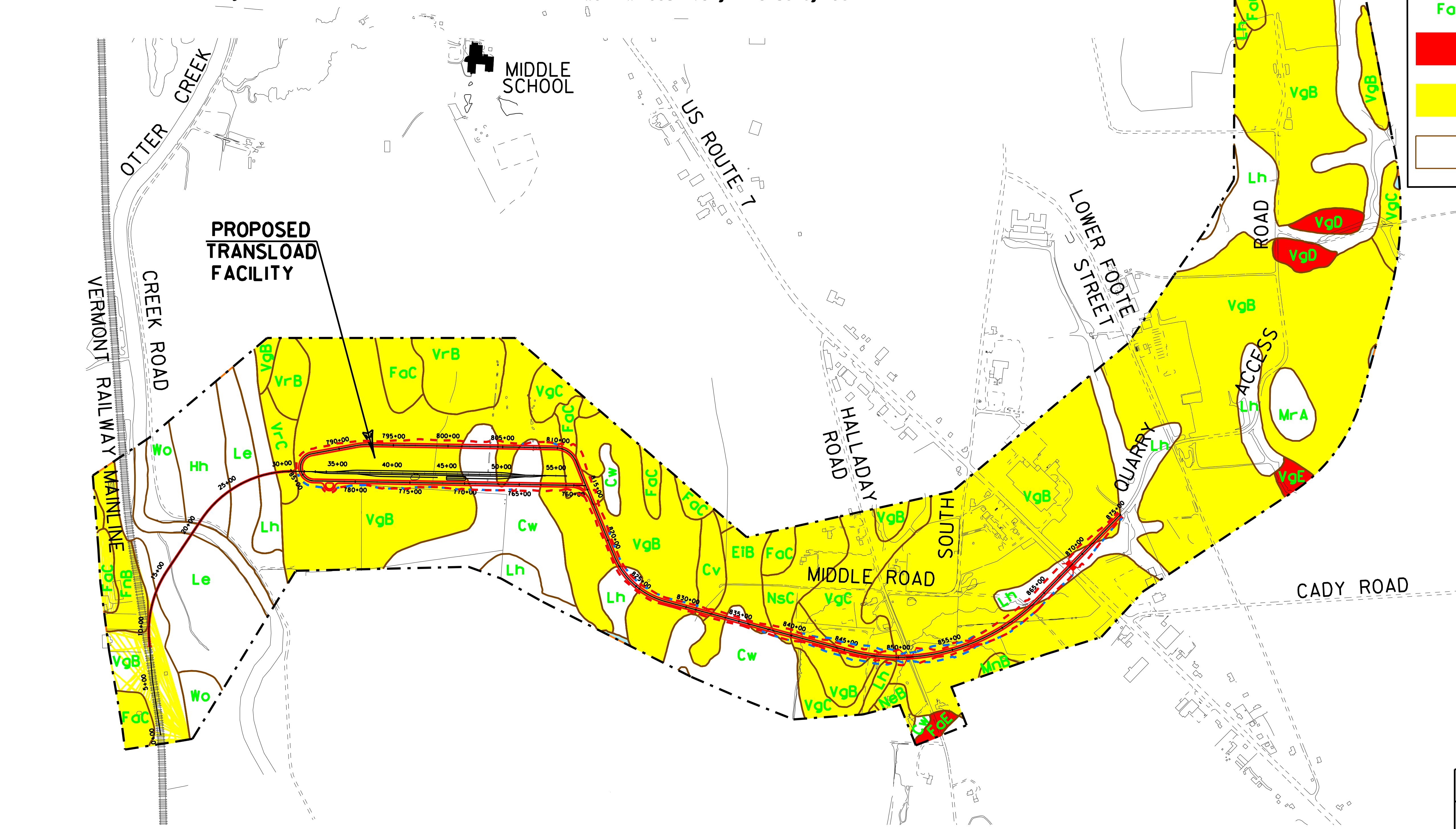
03-OCT-2008
M:\647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER 4\RS_TR_SoilSurvey Mapping.dgn

SOIL UNIT KEY

- Cw - Covington and Panton Silty Clays
- Cv - Covington Silty Clay, Flooded
- ElB - Elmwood Fine Sandy Loam, Coarse Variant, 0 to 8% slopes
- FaC - Farmington Extremely Rocky Silt Loam, 5 to 20% slopes
- FaE - Farmington Extremely Rocky Silt Loam, 25 to 50% slopes
- FnB - Farmington-Nellis rocky complex, 5 to 12% slopes
- Hh - Hadley Very Fine Sandy Loam, Frequently Flooded
- Le - Limerick Silt Loam
- Lh - Livingston Clay
- MnB - Massena extremely stony silt loam, 0 to 8% slopes
- MrA - Melrose fine sandy loam, 0-3% slopes
- NeB - Nellis Stony Loam, 3 to 8% slopes
- NsC - Nellis Extremely Stony Loam, 3 to 15% slopes
- VgB - Vergennes Clay, 2 to 6% slopes
- VgC - Vergennes Clay, 6 to 12% slopes
- VgD - Vergennes Clay, 12 to 25% slopes
- VgE - Vergennes Clay, 25 to 50% slopes
- VrB - Vergennes rocky clay, moderately shallow variant, 2 to 6% slopes
- VrC - Vergennes Rocky Clay, moderately shallow variant, 6 to 12% slopes
- Wo - Winooski very fine sandy loam

LEGEND

- TRUCK TO RAIL ROADWAY
- SLOPE LIMITS - TR-1 & TR-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- STUDY AREA LIMITS
- FaC SOIL TYPE
- HEL CLASS 1 HIGHLY ERODIBLE SOILS
- HEL CLASS 2 POTENTIALLY HIGHLY ERODIBLE SOILS
- HEL CLASS 3 NOT HIGHLY ERODIBLE



DATA SOURCES:
"HIGHLY ERODIBLE MAP UNIT LIST"
ADDISON COUNTY, USDA NRCS, 1995.
ADDISON COUNTY SOIL SURVEY, USDA
NRCS, 1971. DIGITAL DATA SOURCE: VCGI,
2005.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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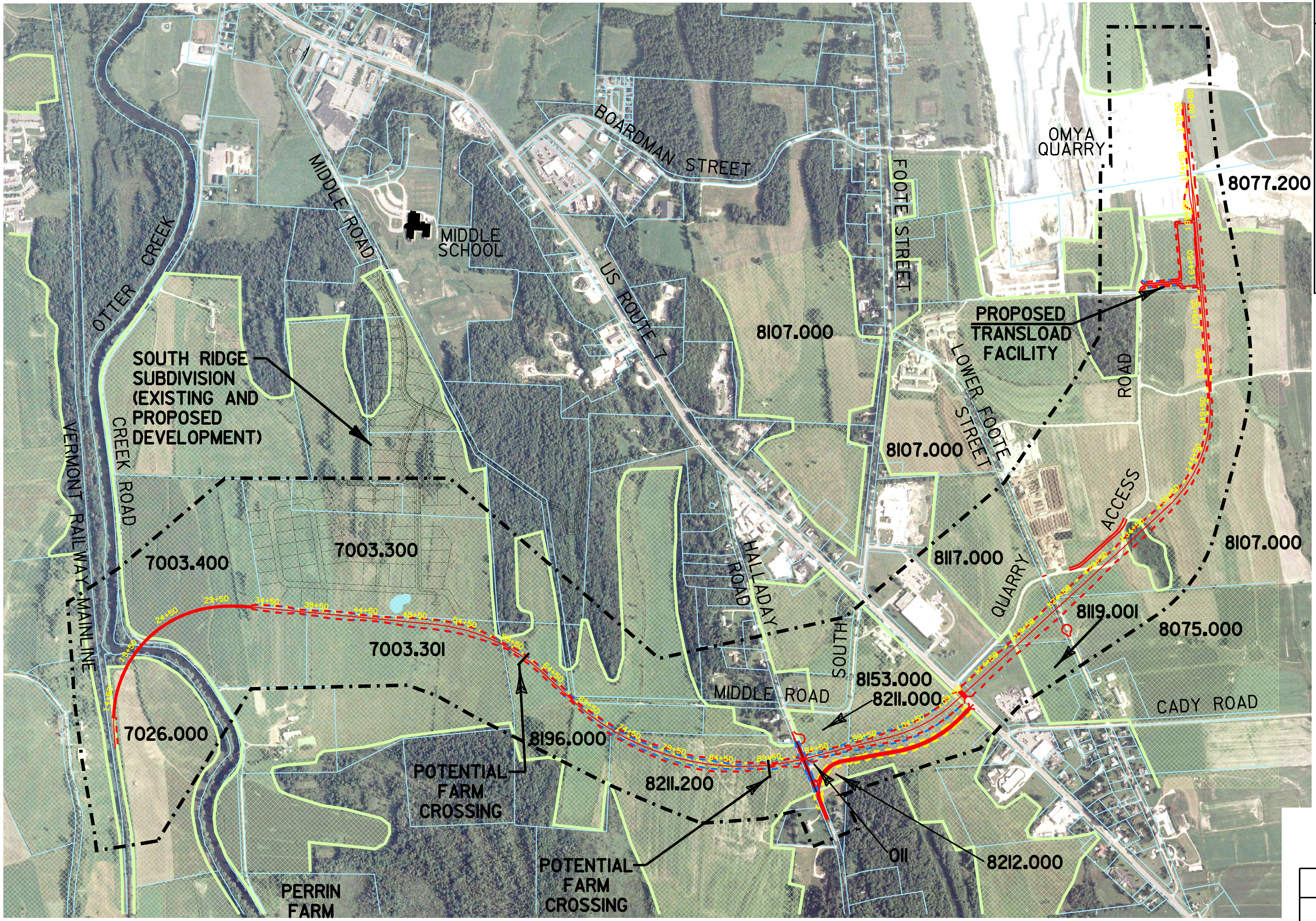
MIDDLEBURY SPUR EIS

ERODIBLE SOILS
TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 4.7-2

03-NOV-2008 M:\647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER 4\RS_TR_SoilSurvey Mapping.dgn



LEGEND

- SLOPE LIMITS-RS-1 & RS-1 GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS-AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS-HALLADAY ROAD RELOCATION
- STUDY AREA LIMITS
- AGRICULTURAL FIELDS
- PARCEL LINE
- 8107.000 MIDDLEBURY TAX MAP LOT NUMBER

N

VT STATE PLANE GRID

NOTE:

AGRICULTURAL FIELDS BASED ON AERIAL PHOTOGRAPHS FROM 2003. LIMITS OF AGRICULTURAL FIELDS ARE APPROXIMATE, AND MAY INCLUDE AREAS OF NON-AGRICULTURAL USE. SOME OF THE AGRICULTURAL FIELDS MAY BE CURRENTLY FALLOW.

AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA. VCGI, 2005. TOWN OF MIDDLEBURY TAX MAPS, 2005.

1000 0 1000

MIDDLEBURY SPUR EIS

ACTIVE AGRICULTURAL FIELDS RS-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 4.8-1

DATA SOURCES:
SOUTH RIDGE SUBDIVISION MAPPING PROVIDED BY CIVIL ENGINEERING ASSOCIATES, INC.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

03-OCT-2008
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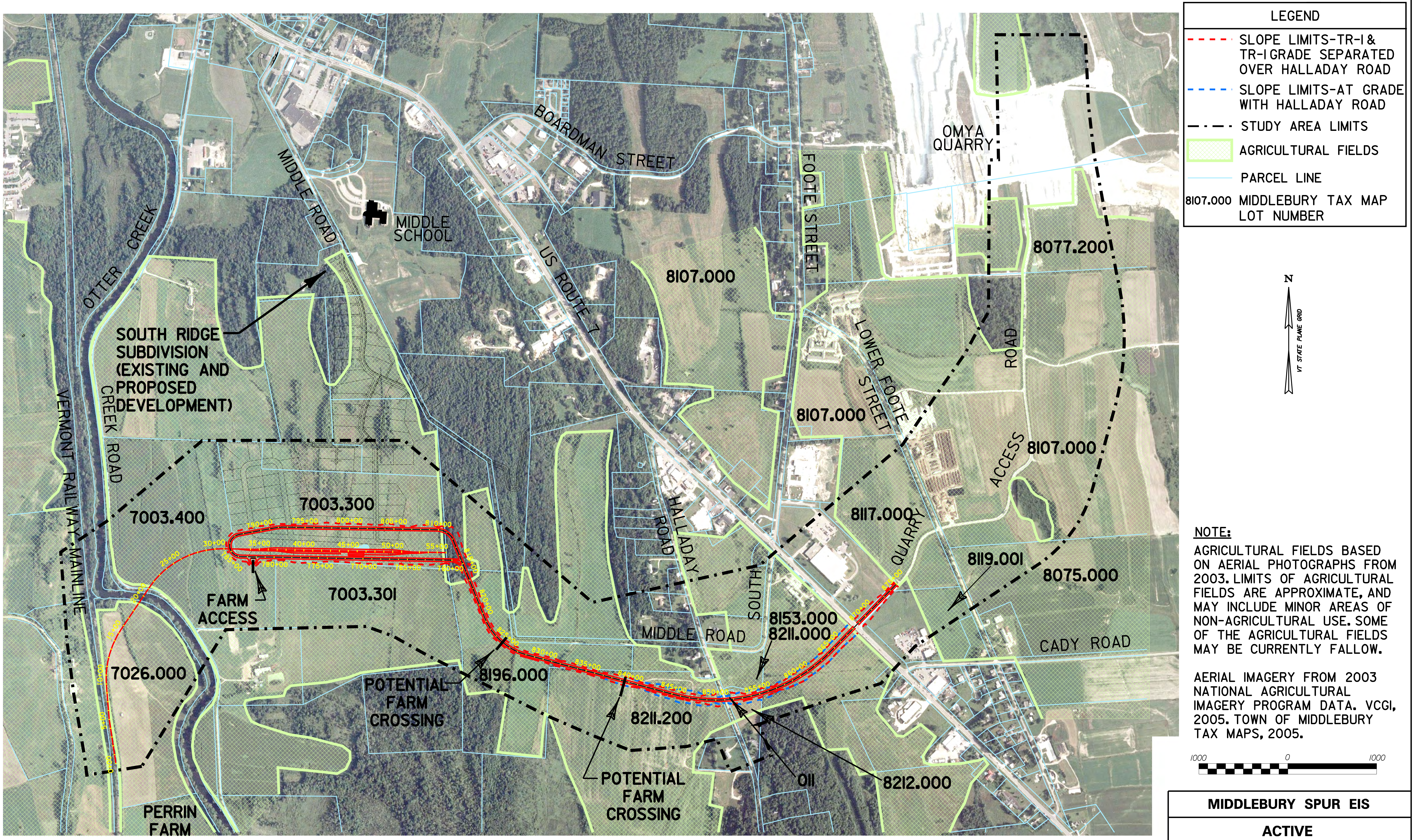

NOTE:
AGRICULTURAL FIELDS BASED ON AERIAL PHOTOGRAPHS FROM 2003. LIMITS OF AGRICULTURAL FIELDS ARE APPROXIMATE, AND MAY INCLUDE MINOR AREAS OF NON-AGRICULTURAL USE. SOME OF THE AGRICULTURAL FIELDS MAY BE CURRENTLY FALLOW.

AERIAL IMAGERY FROM 2003 NATIONAL AGRICULTURAL IMAGERY PROGRAM DATA. VCGI, 2005. TOWN OF MIDDLEBURY TAX MAPS, 2005.

MIDDLEBURY SPUR EIS

ACTIVE AGRICULTURAL FIELDS TR-1 ALTERNATIVE

SEPTEMBER 2008 FIGURE NO. 4.8-2

DATA SOURCES:
SOUTH RIDGE SUBDIVISION MAPPING PROVIDED BY CIVIL ENGINEERING ASSOCIATES, INC.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

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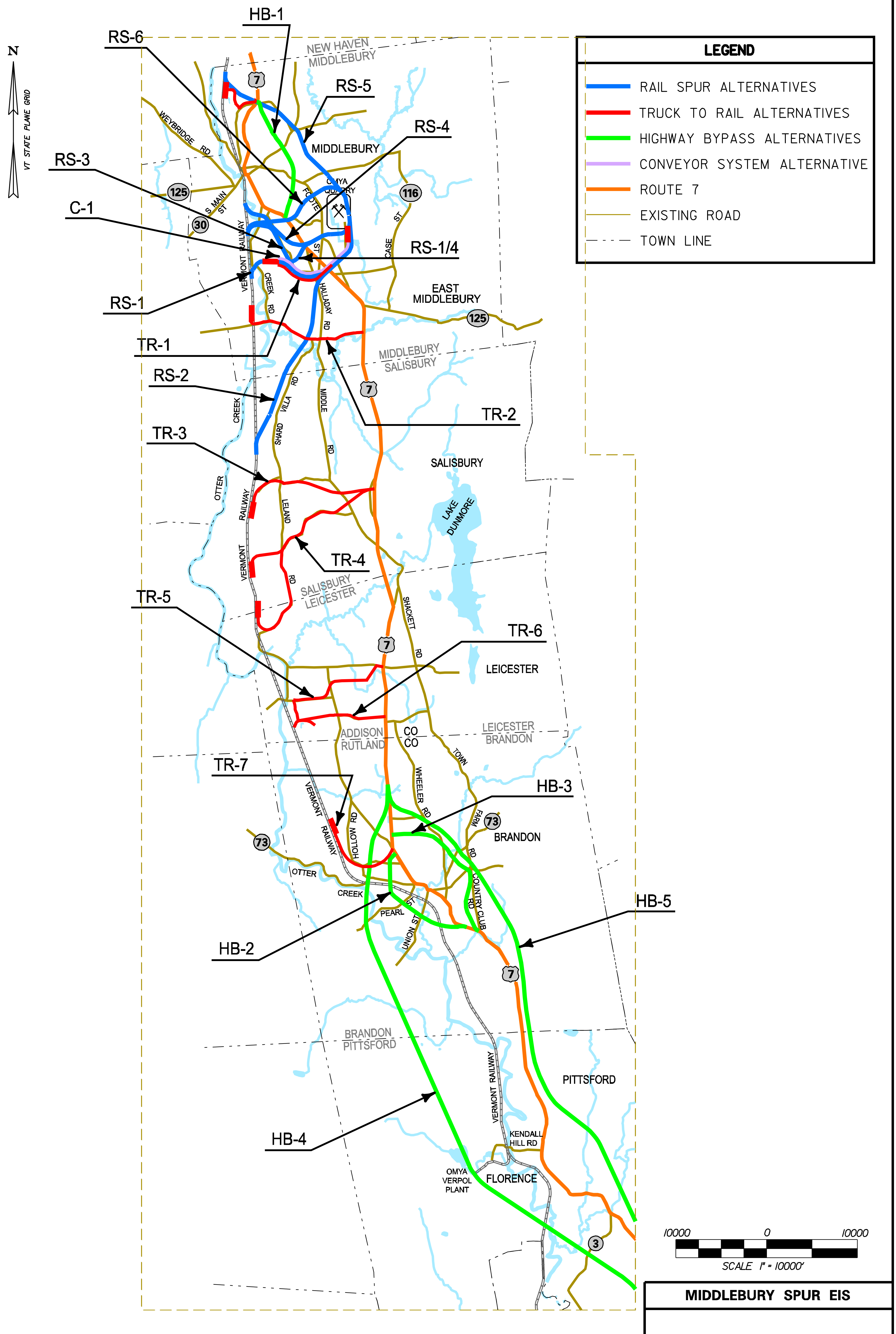

MIDDLEBURY SPUR EIS

PRELIMINARY ALTERNATIVES

JANUARY 2007 FIGURE NO. 2.2-1

DATA SOURCES:
ROADWAY NETWORK (2003), SURFACE WATERS (2004), TOWN BOUNDARIES (2005), VCGI.

20-MAR-2007
M:\1647400 Midd Spur\HWY\DRAW\Cut_Sheets\RS_1_TR_1\Preliminary Alternatives.dgn

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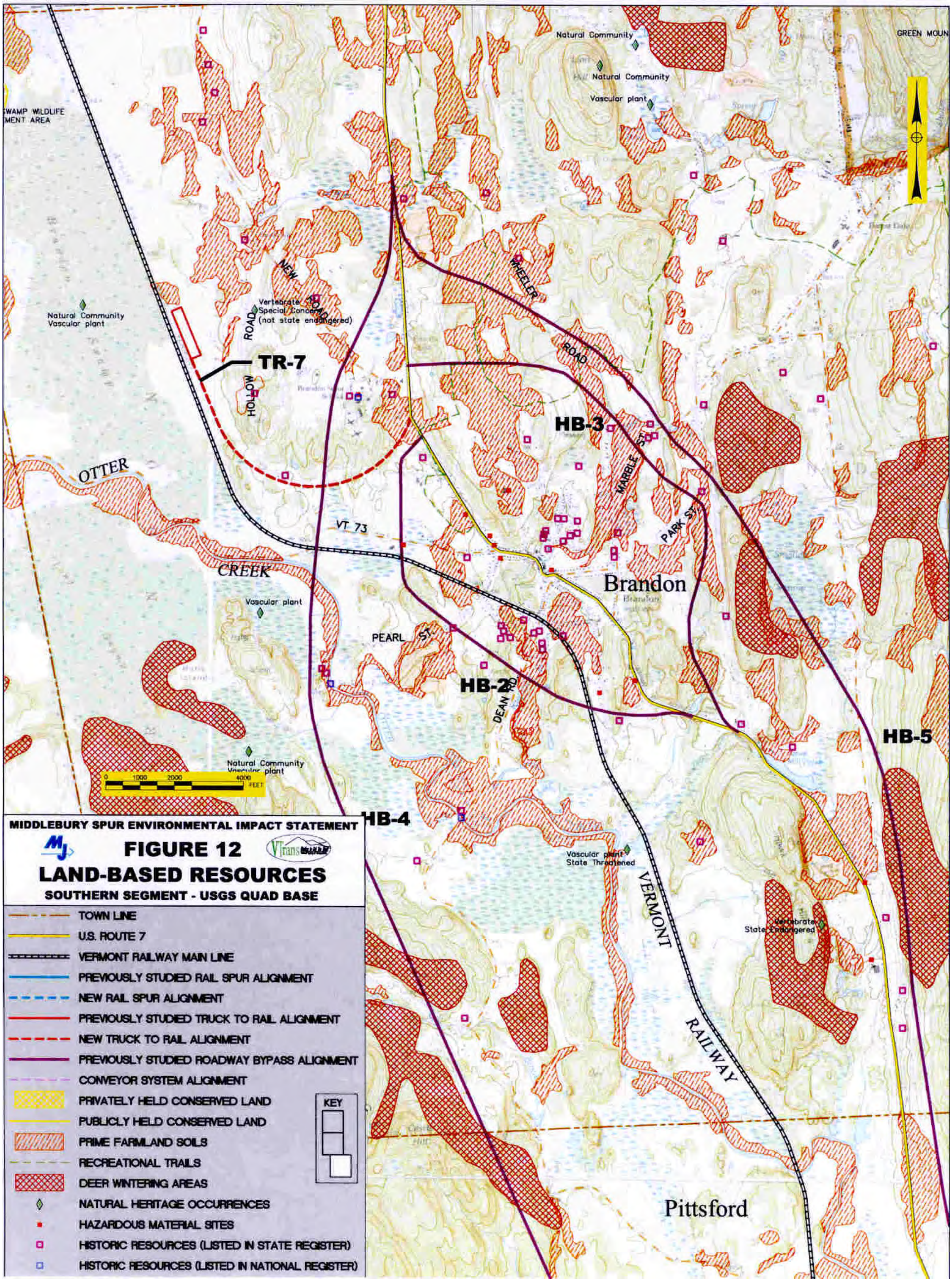
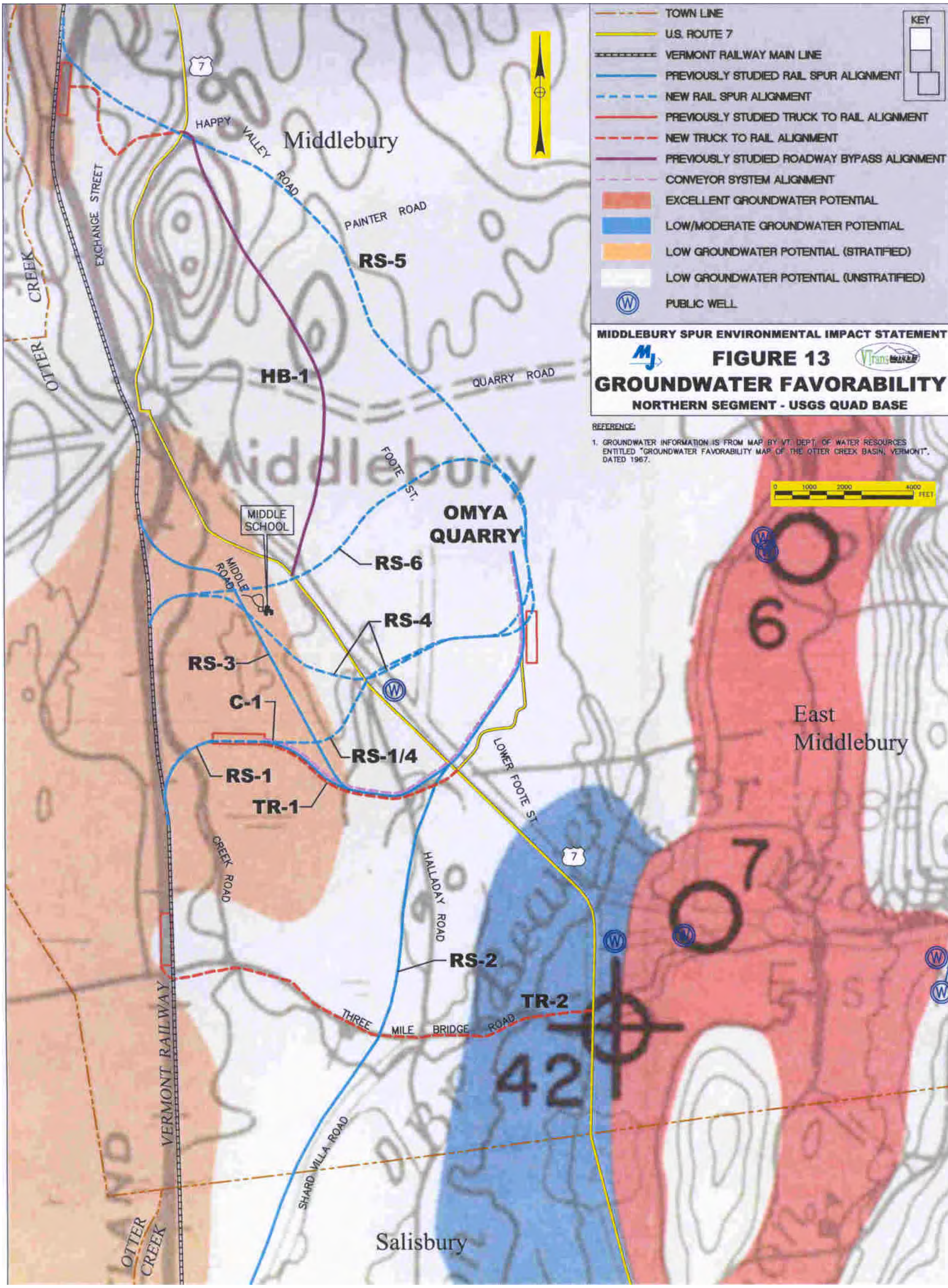
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT

FIGURE 1

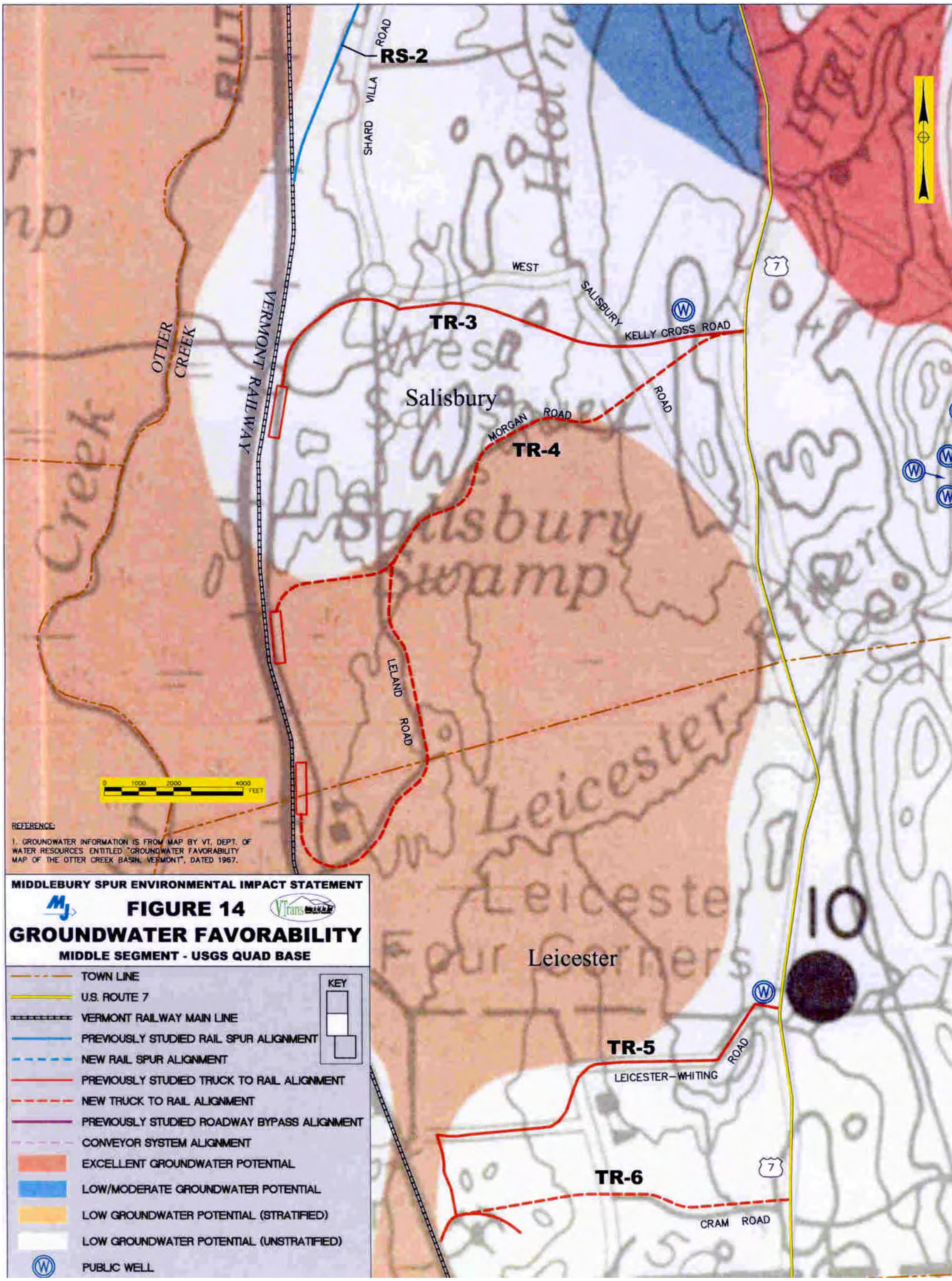
OVERVIEW OF ALTERNATIVES



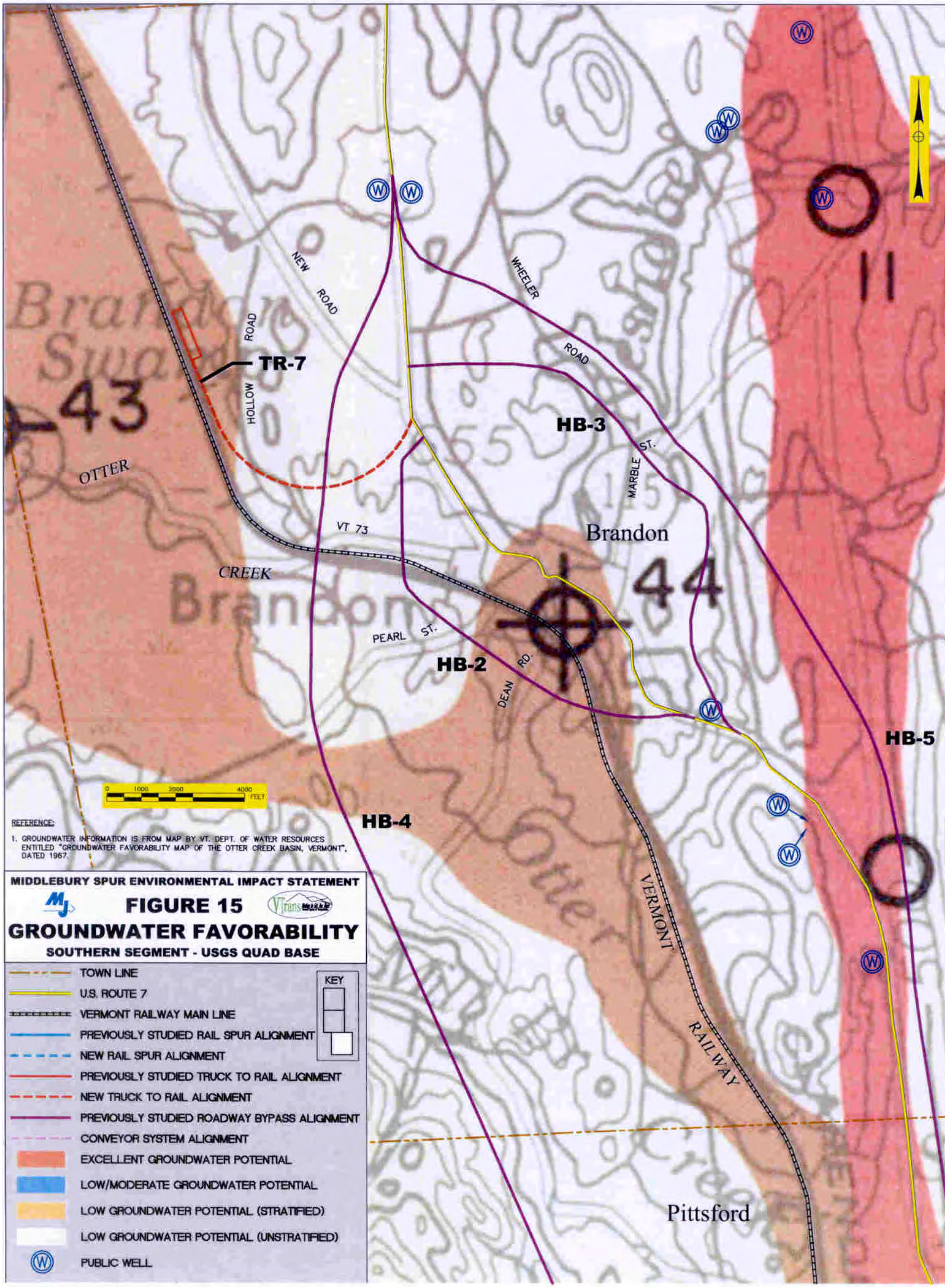
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 12
LAND-BASED RESOURCES
SOUTHERN SEGMENT - USGS QUAD BASE
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
PRIVATELY HELD CONSERVED LAND
PUBLICLY HELD CONSERVED LAND
PRIME FARMLAND SOILS
RECREATIONAL TRAILS
DEER WINTERING AREAS
NATURAL HERITAGE OCCURRENCES
HAZARDOUS MATERIAL SITES
HISTORIC RESOURCES (LISTED IN STATE REGISTER)
HISTORIC RESOURCES (LISTED IN NATIONAL REGISTER)
KEY
0 1000 2000 4000 FEET
TR-7
HB-2
HB-3
HB-4
HB-5
Brandon
Pittsford
OTTER
CREEK
VT 73
NEW ROAD
HOLLOW ROAD
WHEELER ROAD
MARBLE ST.
PARK ST.
PEARL ST.
DEAN RD
VERMONT RAILWAY
GREEN MOUN
SWAMP WILDLIFE
MENT AREA
Natural Community
Vascular plant
Vertebrate Special Concern (not state endangered)
Vascular plant State Threatened
Vertebrate State Endangered



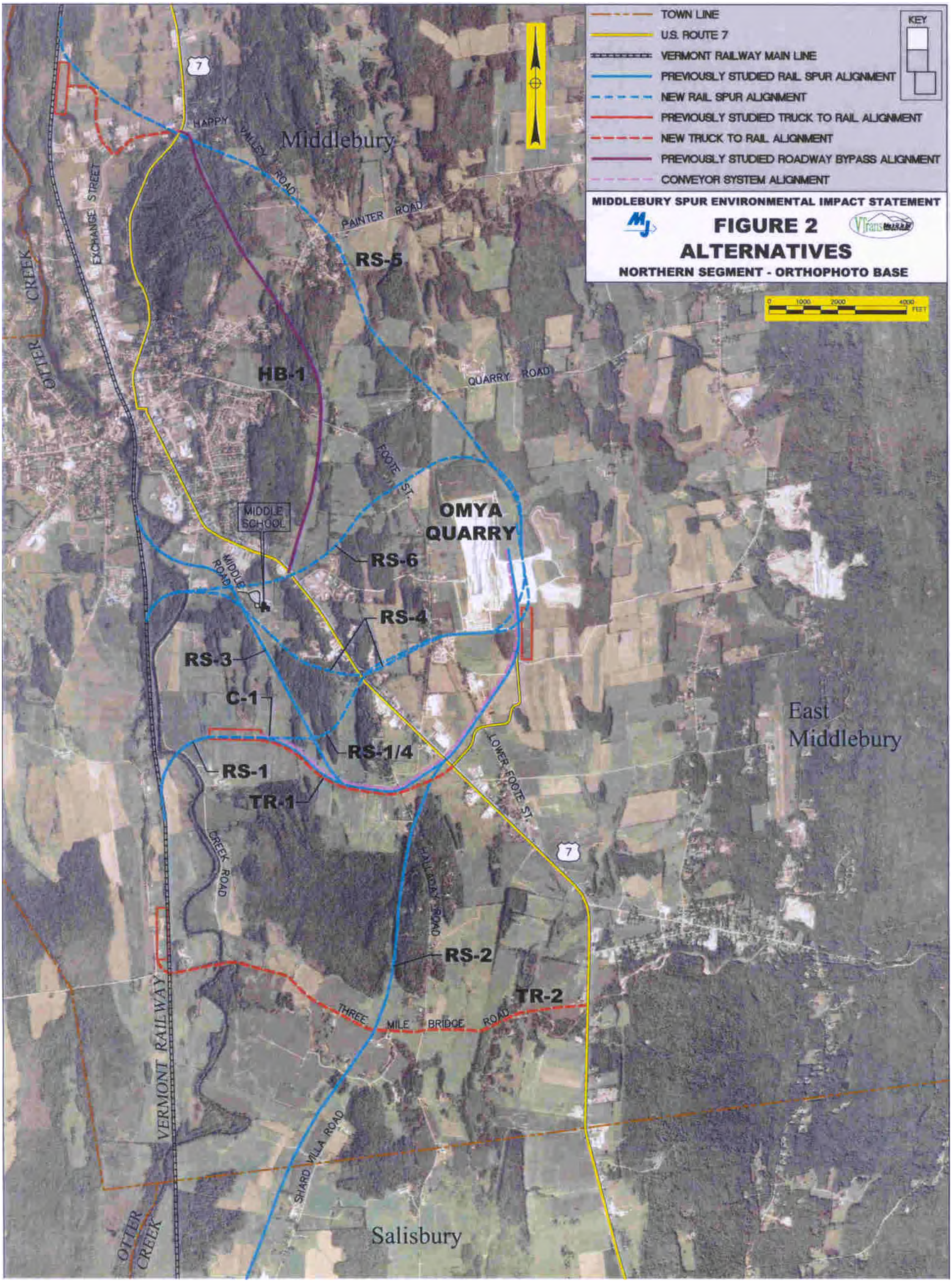
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
EXCELLENT GROUNDWATER POTENTIAL
LOW/MODERATE GROUNDWATER POTENTIAL
LOW GROUNDWATER POTENTIAL (STRATIFIED)
LOW GROUNDWATER POTENTIAL (UNSTRATIFIED)
PUBLIC WELL
KEY
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 13
GROUNDWATER FAVORABILITY
NORTHERN SEGMENT - USGS QUAD BASE
REFERENCE:
1. GROUNDWATER INFORMATION IS FROM MAP BY VT. DEPT. OF WATER RESOURCES ENTITLED "GROUNDWATER FAVORABILITY MAP OF THE OTTER CREEK BASIN, VERMONT", DATED 1967.
0 1000 2000 4000 FEET
Middlebury
HAPPY VALLEY ROAD
PAINTER ROAD
EXCHANGE STREET
OTTER CREEK
RS-5
HB-1
QUARRY ROAD
FOOTE ST.
OMYA QUARRY
MIDDLE SCHOOL
MIDDLE ROAD
RS-6
RS-4
RS-3
C-1
RS-1/4
RS-1
TR-1
LOWER FOOTE ST.
East Middlebury
6
7
CREEK ROAD
HALLADAY ROAD
RS-2
TR-2
THREE MILE BRIDGE ROAD
42
VERMONT RAILWAY
SHARD VILLA ROAD
OTTER CREEK
Salisbury



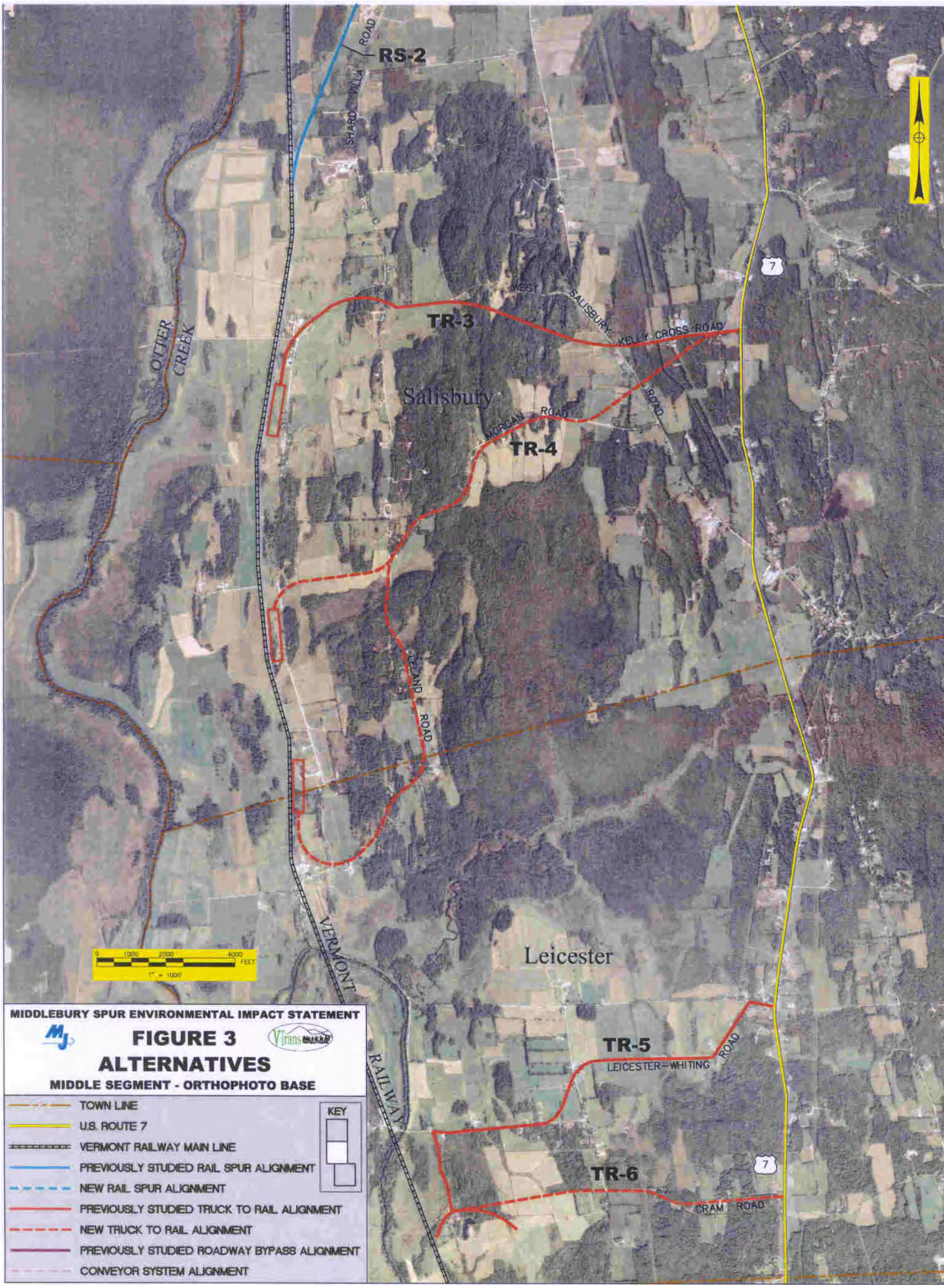
RS-2
SHARD VILLA ROAD
WEST SALISBURY ROAD
KELLY CROSS ROAD
TR-3
OTTER CREEK
VERMONT RAILWAY
Salisbury
MORGAN ROAD
TR-4
LELAND ROAD
Salisbury Swamp
Leicester
Leicester Four Corners
0 1000 2000 4000 FEET
REFERENCE:
1. GROUNDWATER INFORMATION IS FROM MAP BY VT. DEPT. OF WATER RESOURCES ENTITLED "GROUNDWATER FAVORABILITY MAP OF THE OTTER CREEK BASIN, VERMONT", DATED 1967.
TR-5
LEICESTER-WHITING ROAD
TR-6
CRAM ROAD
7
10
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 14
GROUNDWATER FAVORABILITY
MIDDLE SEGMENT - USGS QUAD BASE
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
EXCELLENT GROUNDWATER POTENTIAL
LOW/MODERATE GROUNDWATER POTENTIAL
LOW GROUNDWATER POTENTIAL (STRATIFIED)
LOW GROUNDWATER POTENTIAL (UNSTRATIFIED)
PUBLIC WELL
KEY



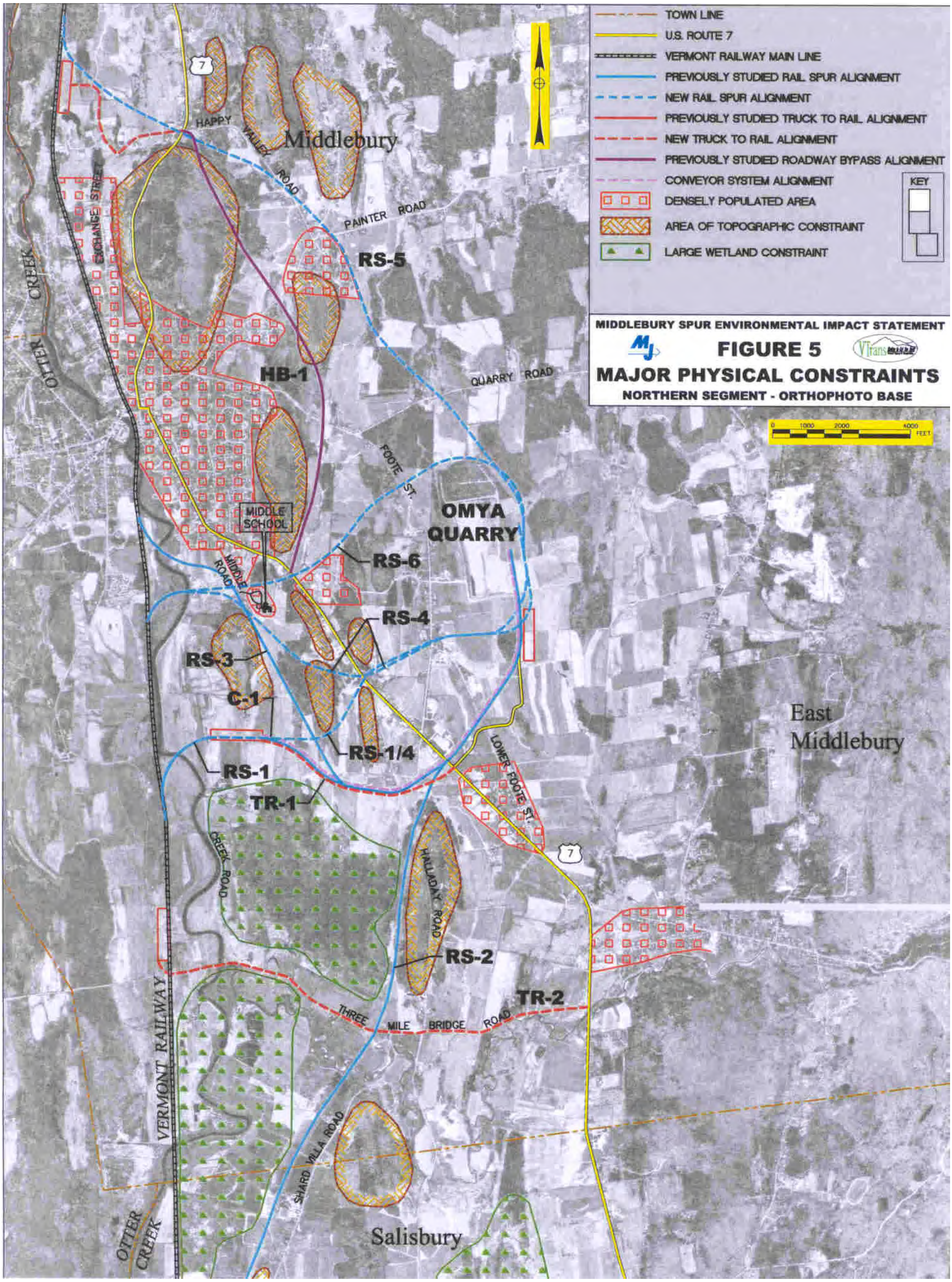
TR-7
HB-3
HB-2
HB-4
HB-5
NEW ROAD
HOLLOW ROAD
WHEELER ROAD
MARBLE ST.
VT 73
PEARL ST.
DEAN RD.
OTTER
CREEK
Brandon
Pittsford
VERMONT RAILWAY
0 1000 2000 4000 FEET
REFERENCE:
1. GROUNDWATER INFORMATION IS FROM MAP BY VT. DEPT. OF WATER RESOURCES ENTITLED "GROUNDWATER FAVORABILITY MAP OF THE OTTER CREEK BASIN, VERMONT", DATED 1967.
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 15
GROUNDWATER FAVORABILITY
SOUTHERN SEGMENT - USGS QUAD BASE
KEY
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
EXCELLENT GROUNDWATER POTENTIAL
LOW/MODERATE GROUNDWATER POTENTIAL
LOW GROUNDWATER POTENTIAL (STRATIFIED)
LOW GROUNDWATER POTENTIAL (UNSTRATIFIED)
PUBLIC WELL



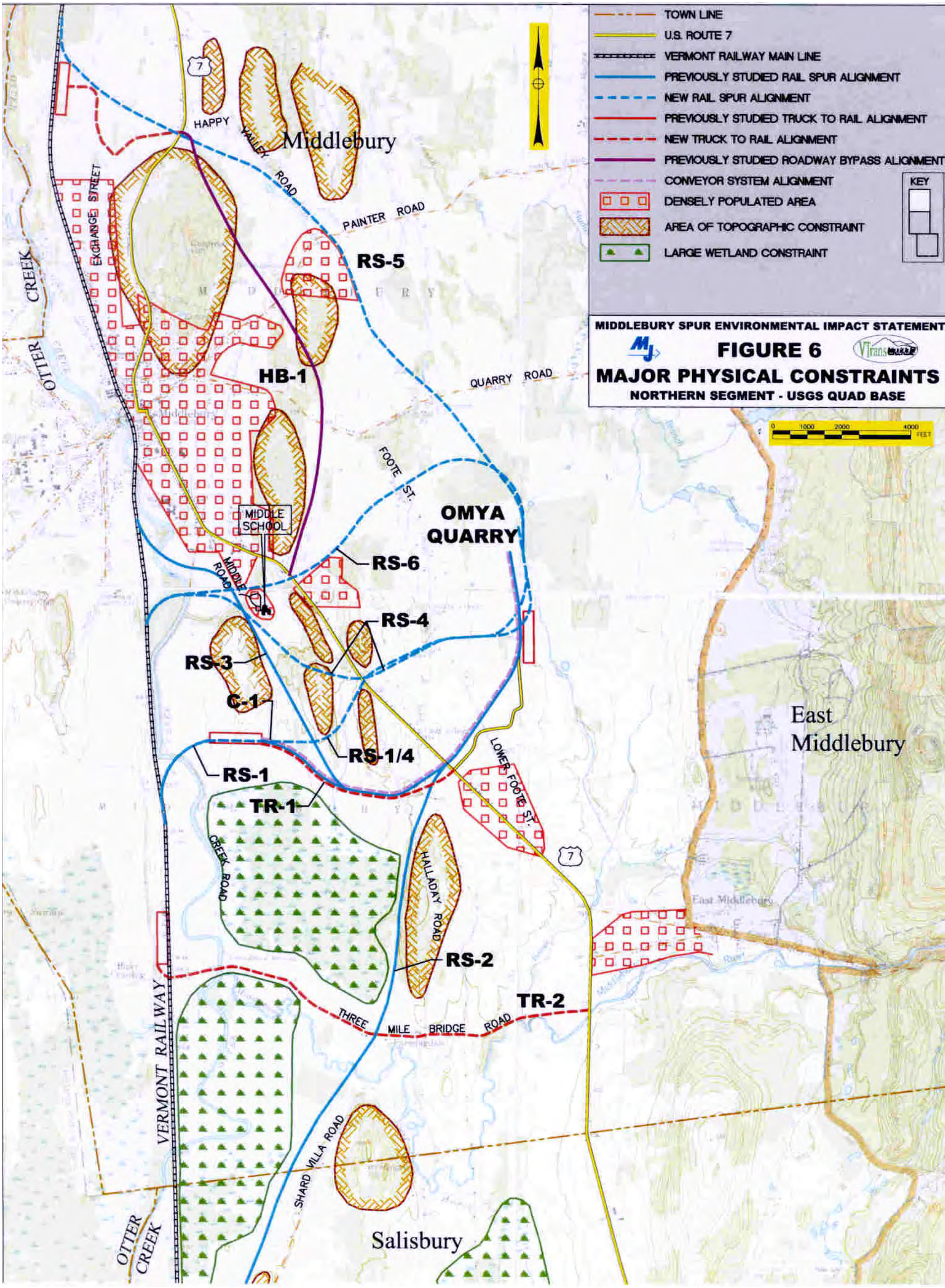
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
KEY
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 2
ALTERNATIVES
NORTHERN SEGMENT - ORTHOPHOTO BASE
0 1000 2000 4000 FEET
Middlebury
HAPPY VALLEY ROAD
PAINTER ROAD
EXCHANGE STREET
OTTER CREEK
RS-5
HB-1
QUARRY ROAD
FOOTE ST.
MIDDLE SCHOOL
MIDDLE ROAD
OMYA QUARRY
RS-6
RS-4
RS-3
C-1
RS-1/4
RS-1
TR-1
LOWER FOOTE ST.
East Middlebury
CREEK ROAD
HALLADAY ROAD
RS-2
TR-2
THREE MILE BRIDGE ROAD
VERMONT RAILWAY
SHARD VILLA ROAD
Salisbury
7


RS-2
SHARD VILLA ROAD
TR-3
WEST SALISBURY ROAD
KELLY CROSS ROAD
OTTER CREEK
Salisbury
MORGAN ROAD
TR-4
7
LELAND ROAD
VERMONT RAILWAY
Leicester
0 1000 2000 4000 FEET
1" = 1000'
TR-5
LEICESTER-WHITING ROAD
TR-6
CRAM ROAD
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 3
ALTERNATIVES
MIDDLE SEGMENT - ORTHOPHOTO BASE
VTrans
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
KEY

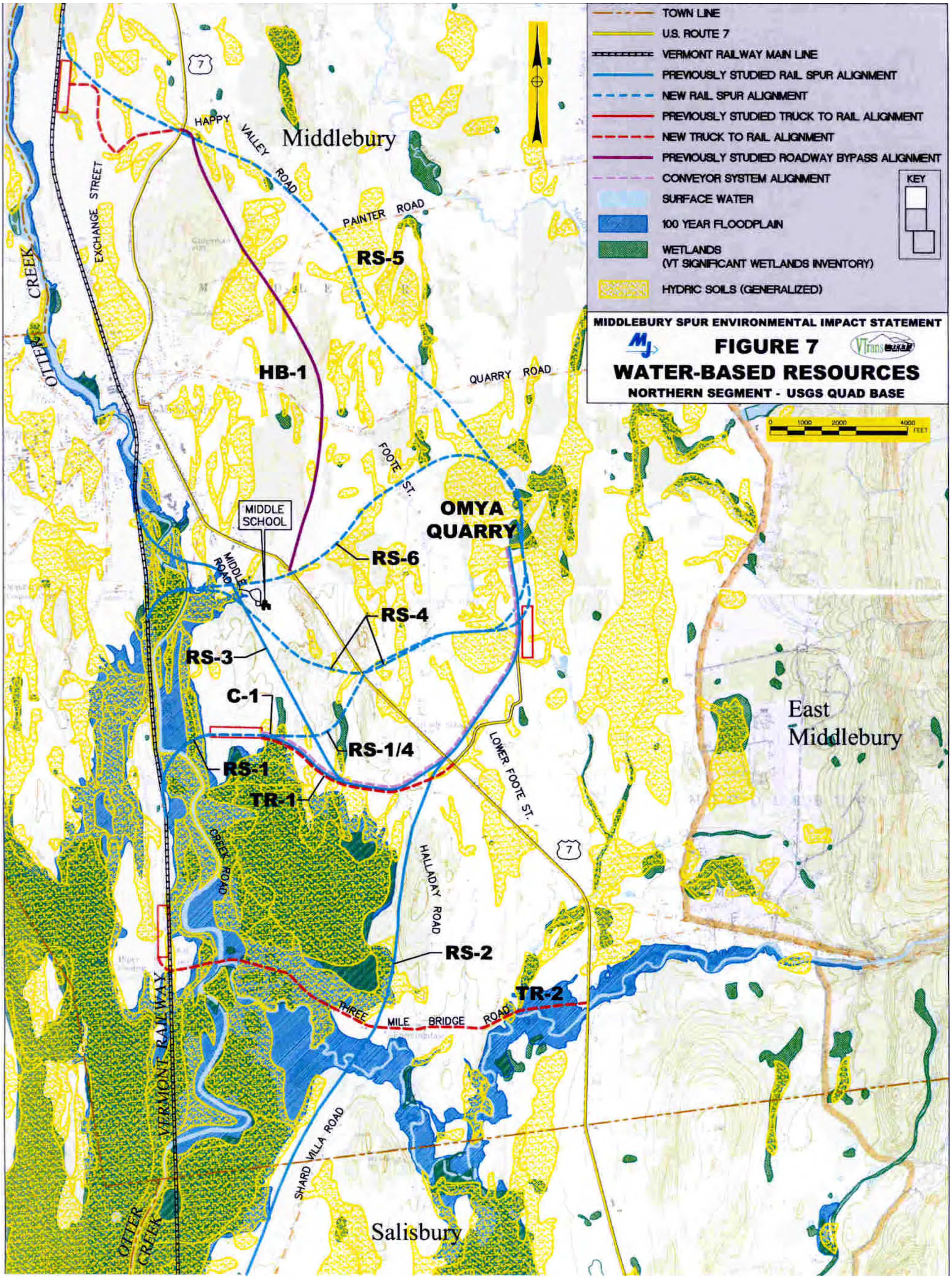
NEW ROAD
HOLLOW ROAD
WHEELER ROAD
TR-7
HB-3
MARBLE ST.
OTTER CREEK
VT 73
Brandon
PARK ST.
PEARL ST.
HB-2
DEAN RD.
HB-5
HB-4
VERMONT RAILWAY
7
Pittsford
0 1000 2000 4000 FEET
1" = 1000'
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 4
ALTERNATIVES
SOUTHERN SEGMENT - ORTHOPHOTO BASE
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
KEY

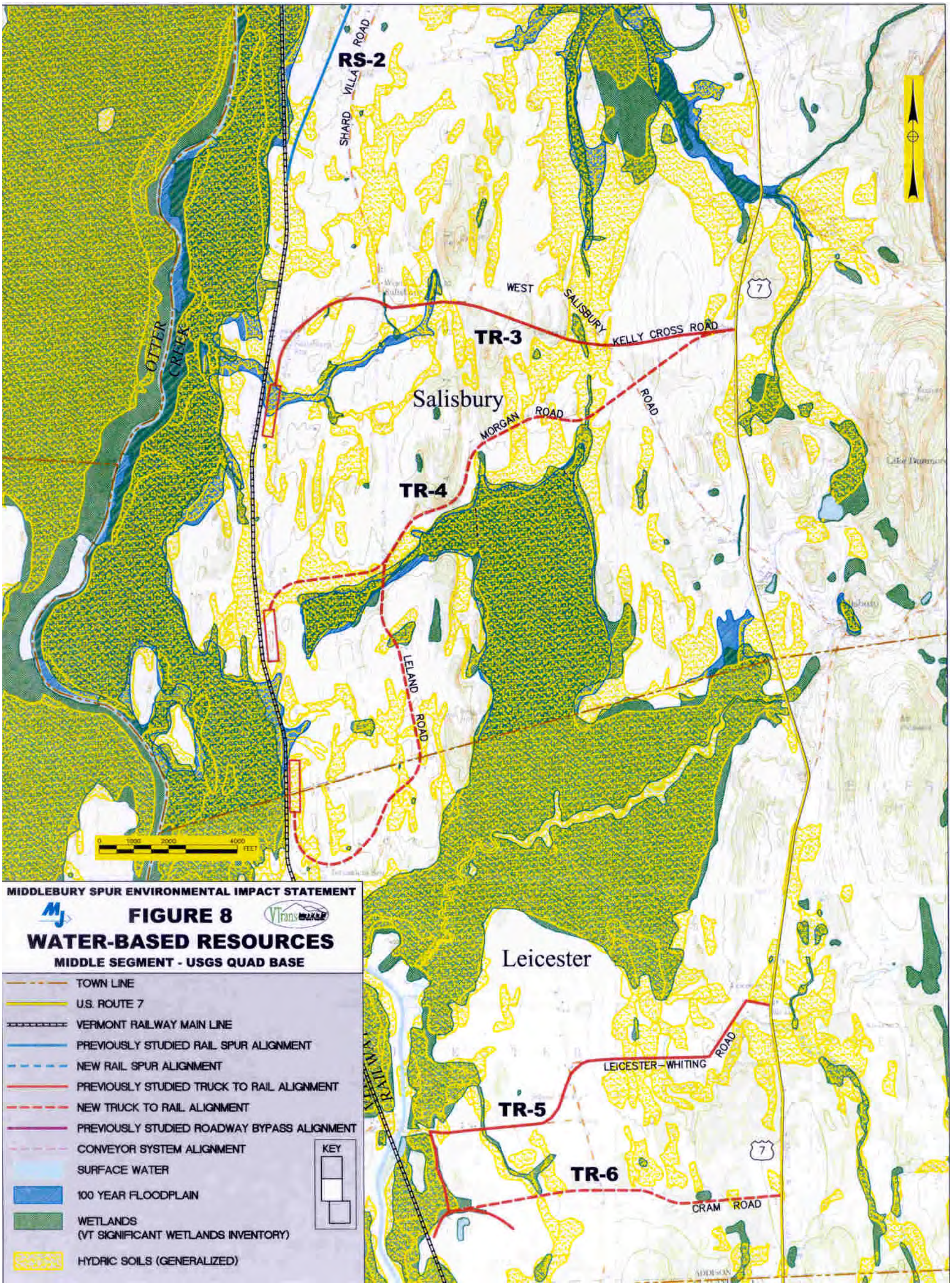


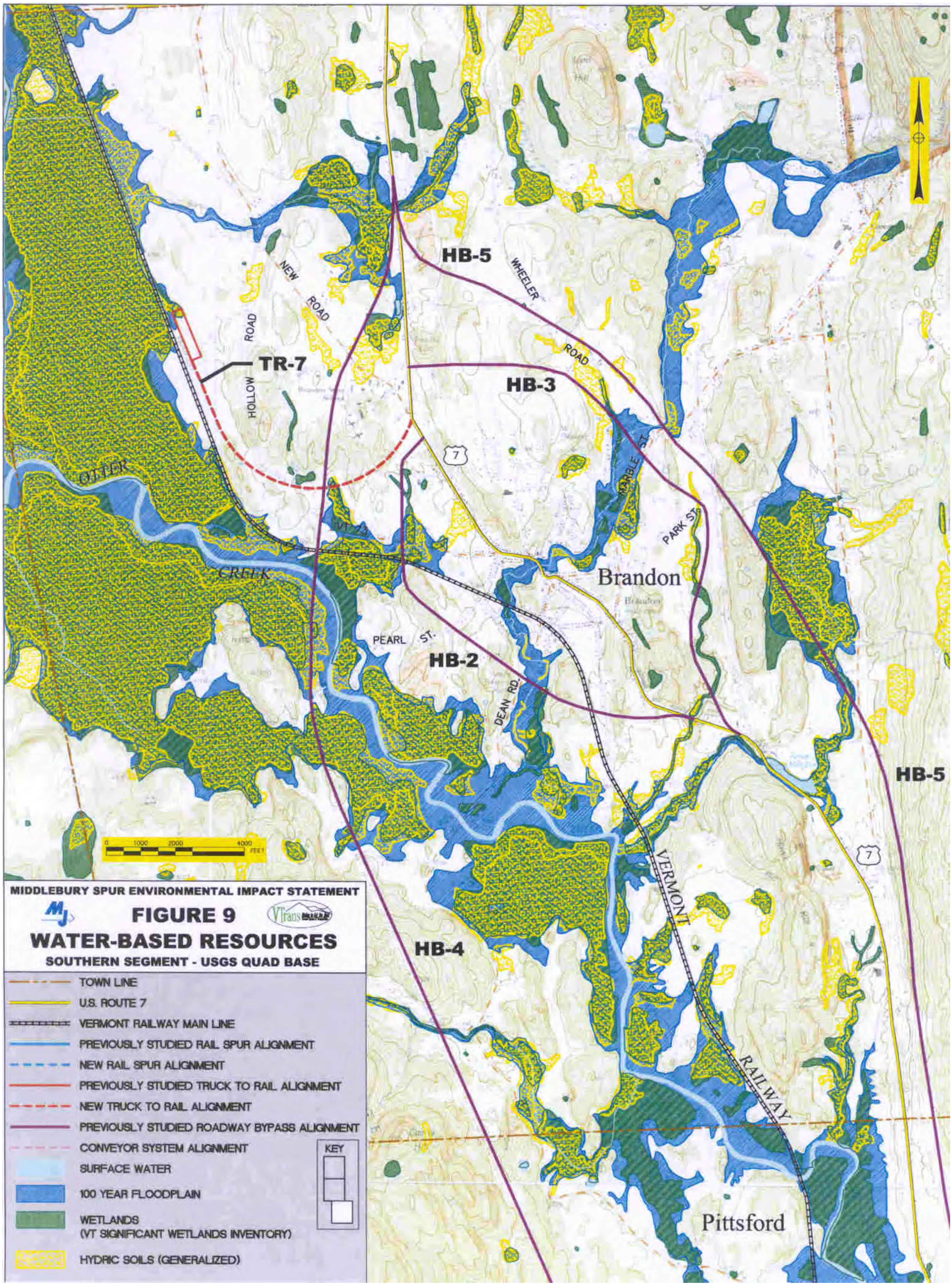
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
DENSELY POPULATED AREA
AREA OF TOPOGRAPHIC CONSTRAINT
LARGE WETLAND CONSTRAINT
KEY
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 5
MAJOR PHYSICAL CONSTRAINTS
NORTHERN SEGMENT - ORTHOPHOTO BASE
0 1000 2000 4000 FEET
Middlebury
HAPPY VALLEY ROAD
PAINTER ROAD
EXCHANGE STREET
OTTER CREEK
RS-5
HB-1
QUARRY ROAD
FOOTE ST.
OMYA QUARRY
MIDDLE SCHOOL
MIDDLE ROAD
RS-6
RS-4
RS-3
C-1
RS-1/4
RS-1
TR-1
LOWER FOOTE ST.
East Middlebury
CREEK ROAD
HALLADAY ROAD
RS-2
TR-2
THREE MILE BRIDGE ROAD
VERMONT RAILWAY
SHARD VILLA ROAD
Salisbury
OTTER CREEK
7



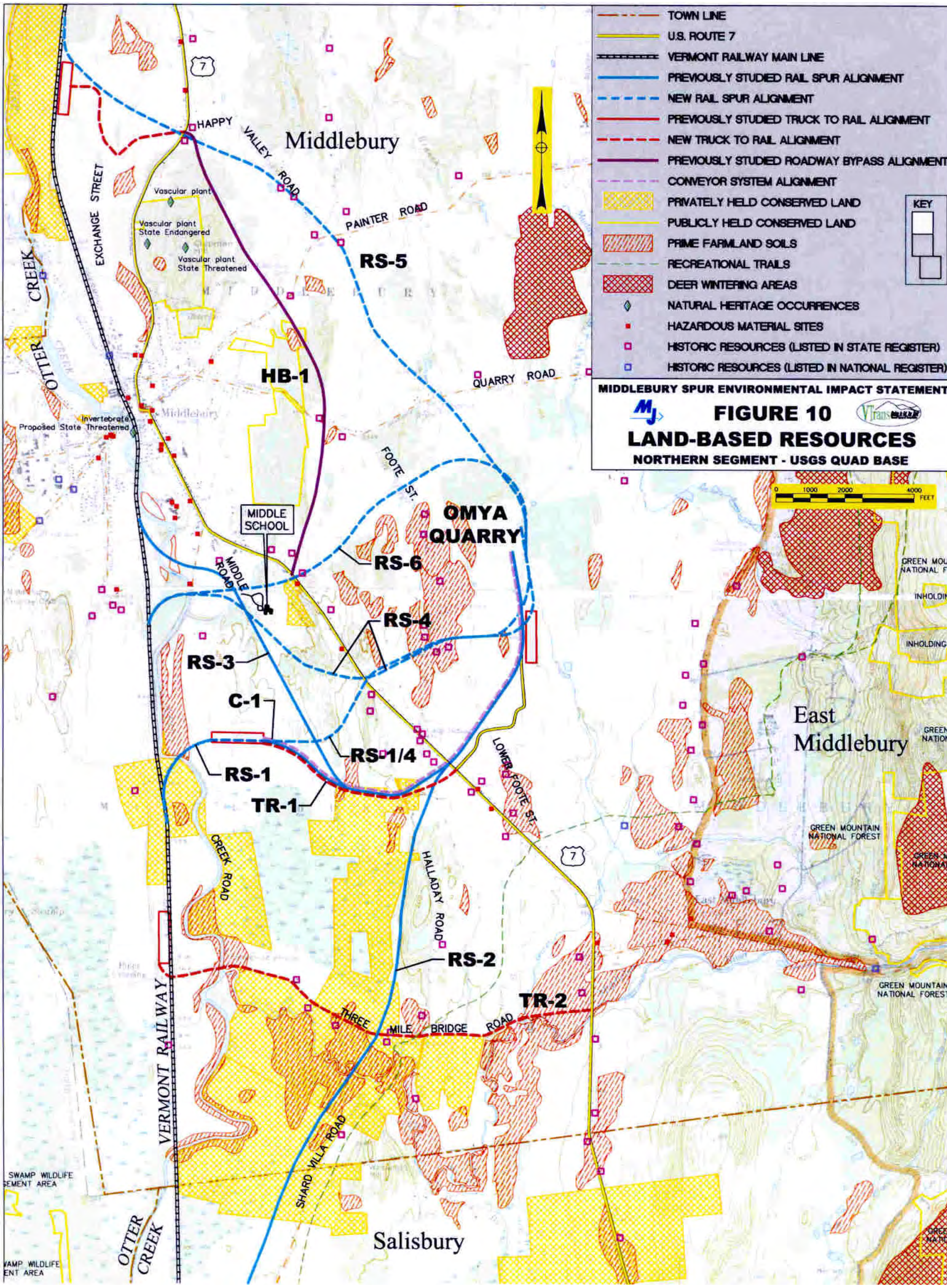
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
DENSELY POPULATED AREA
AREA OF TOPOGRAPHIC CONSTRAINT
LARGE WETLAND CONSTRAINT
KEY
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 6
MAJOR PHYSICAL CONSTRAINTS
NORTHERN SEGMENT - USGS QUAD BASE
0 1000 2000 4000 FEET
Middlebury
HAPPY VALLEY ROAD
PAINTER ROAD
RS-5
EXCHANGE STREET
OTTER CREEK
HB-1
QUARRY ROAD
FOOTE ST.
OMYA QUARRY
MIDDLE SCHOOL
MIDDLE ROAD
RS-6
RS-4
RS-3
C-1
RS-1/4
RS-1
TR-1
LOWER FOOTE ST.
East Middlebury
CREEK ROAD
HALLADAY ROAD
RS-2
TR-2
THREE MILE BRIDGE ROAD
VERMONT RAILWAY
SHARD VILLA ROAD
OTTER CREEK
Salisbury

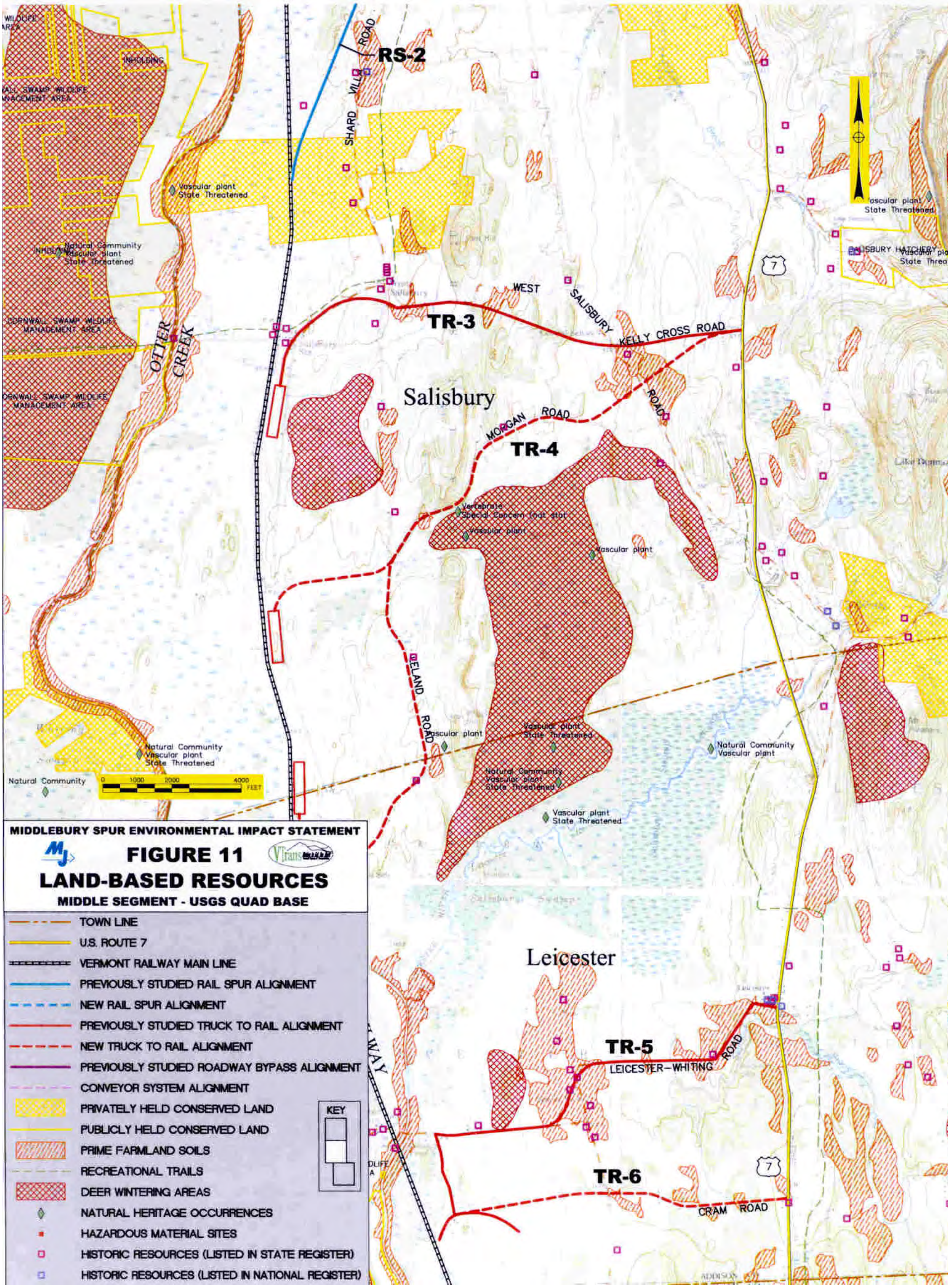

TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
SURFACE WATER
100 YEAR FLOODPLAIN
WETLANDS
(VT SIGNIFICANT WETLANDS INVENTORY)
HYDRIC SOILS (GENERALIZED)
KEY
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 7
WATER-BASED RESOURCES
NORTHERN SEGMENT - USGS QUAD BASE
0 1000 2000 4000 FEET
Middlebury
HAPPY VALLEY ROAD
PAINTER ROAD
EXCHANGE STREET
OTTER CREEK
RS-5
HB-1
QUARRY ROAD
FOOTE ST.
OMYA QUARRY
MIDDLE SCHOOL
MIDDLE ROAD
RS-6
RS-4
RS-3
C-1
RS-1/4
RS-1
TR-1
LOWER FOOTE ST.
CREEK ROAD
HALLADAY ROAD
RS-2
TR-2
THREE MILE BRIDGE ROAD
VERMONT RAILWAY
SHARD VILLA ROAD
East Middlebury
Salisbury
OTTER CREEK


RS-2
SHARD VILLA ROAD
OTTER CREEK
WEST SALISBURY
TR-3
KELLY CROSS ROAD
Salisbury
ROAD
MORGAN ROAD
TR-4
LELAND ROAD
7
0 1000 2000 4000 FEET
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 8
WATER-BASED RESOURCES
MIDDLE SEGMENT - USGS QUAD BASE
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
SURFACE WATER
100 YEAR FLOODPLAIN
WETLANDS
(VT SIGNIFICANT WETLANDS INVENTORY)
HYDRIC SOILS (GENERALIZED)
KEY
Leicester
LEICESTER-WHITING ROAD
TR-5
TR-6
CRAM ROAD
RAILWAY
7



MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 9
WATER-BASED RESOURCES
SOUTHERN SEGMENT - USGS QUAD BASE
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
SURFACE WATER
100 YEAR FLOODPLAIN
WETLANDS
(VT SIGNIFICANT WETLANDS INVENTORY)
HYDRIC SOILS (GENERALIZED)
KEY
0 1000 2000 4000 FEET
HB-5
HB-3
HB-2
HB-4
TR-7
NEW ROAD
HOLLOW ROAD
WHEELER ROAD
MARBLE ST.
PARK ST.
PEARL ST.
DEAN RD.
OTTER CREEK
VERMONT RAILWAY
Brandon
Pittsford


TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
PRIVATELY HELD CONSERVED LAND
PUBLICLY HELD CONSERVED LAND
PRIME FARMLAND SOILS
RECREATIONAL TRAILS
DEER WINTERING AREAS
NATURAL HERITAGE OCCURRENCES
HAZARDOUS MATERIAL SITES
HISTORIC RESOURCES (LISTED IN STATE REGISTER)
HISTORIC RESOURCES (LISTED IN NATIONAL REGISTER)
KEY
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 10
LAND-BASED RESOURCES
NORTHERN SEGMENT - USGS QUAD BASE
0
1000
2000
4000
FEET
Middlebury
East Middlebury
Salisbury
HAPPY VALLEY ROAD
PAINTER ROAD
QUARRY ROAD
FOOTE ST.
LOWER FOOTE ST
EXCHANGE STREET
MIDDLE ROAD
CREEK ROAD
HALLADAY ROAD
THREE MILE BRIDGE ROAD
SHARD VILLA ROAD
VERMONT RAILWAY
OTTER CREEK
MIDDLE SCHOOL
OMYA QUARRY
RS-1
RS-2
RS-3
RS-4
RS-5
RS-6
RS-1/4
HB-1
C-1
TR-1
TR-2
Vascular plant
Vascular plant State Endangered
Vascular plant State Threatened
Invertebrate Proposed State Threatened
GREEN MOUNTAIN NATIONAL FOREST
INHOLDING
SWAMP WILDLIFE MANAGEMENT AREA


RS-2
SHARD VILLA ROAD
INHOLDING
CORNWALL SWAMP WILDLIFE MANAGEMENT AREA
Vascular plant
State Threatened
Natural Community
Vascular plant
State Threatened
OTTER CREEK
TR-3
WEST SALISBURY ROAD
KELLY CROSS ROAD
SALISBURY HATCHERY
Salisbury
MORGAN ROAD
TR-4
Vertebrate
Special Concern (not stat
Vascular plant
Vascular plant
LELAND ROAD
Vascular plant
Vascular plant
State Threatened
Natural Community
Vascular plant
State Threatened
Natural Community
Vascular plant
Vascular plant
State Threatened
Natural Community
Vascular plant
State Threatened
Natural Community
0 1000 2000 4000
FEET
7
Leicester
TR-5
LEICESTER–WHITING ROAD
TR-6
CRAM ROAD
MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT
FIGURE 11
LAND-BASED RESOURCES
MIDDLE SEGMENT - USGS QUAD BASE
TOWN LINE
U.S. ROUTE 7
VERMONT RAILWAY MAIN LINE
PREVIOUSLY STUDIED RAIL SPUR ALIGNMENT
NEW RAIL SPUR ALIGNMENT
PREVIOUSLY STUDIED TRUCK TO RAIL ALIGNMENT
NEW TRUCK TO RAIL ALIGNMENT
PREVIOUSLY STUDIED ROADWAY BYPASS ALIGNMENT
CONVEYOR SYSTEM ALIGNMENT
PRIVATELY HELD CONSERVED LAND
PUBLICLY HELD CONSERVED LAND
PRIME FARMLAND SOILS
RECREATIONAL TRAILS
DEER WINTERING AREAS
NATURAL HERITAGE OCCURRENCES
HAZARDOUS MATERIAL SITES
HISTORIC RESOURCES (LISTED IN STATE REGISTER)
HISTORIC RESOURCES (LISTED IN NATIONAL REGISTER)
KEY

McFarland-Johnson, Inc.

Concord Center, Suite 210
10 Ferry Street, Unit 11
Concord, NH 03301-5022
Phone: (603) 225-2978
Fax: (603) 225-0095
www.mjinc.com

Middlebury ST SPUR (2) – Middlebury Spur EIS

MEMORANDUM

TO: Sue Scribner, Project Manager, Vermont Agency of Transportation

FROM: Jed Merrow, Project Manager, McFarland-Johnson, Inc.

DATE: January 19, 2006

RE: **Additional Screening of RS-3 Alternative**

The "reasonable range of alternatives" to be studied in detail in the Middlebury Spur Environmental Impact Statement (EIS) have been tentatively identified to include RS-1, TR-1, and RS-3. As the studies proceed and more information has become available regarding resource and land use impacts, it has become apparent that the RS-3 rail spur alternative would have certain impacts which are substantially greater than the other remaining alternatives. This has led to questions regarding its appropriateness as one of the reasonable range of alternatives. This memo documents the advantages and disadvantages of this alternative relative to other alternatives, and considers whether it should be included in the reasonable range of alternatives.

RS-3, in previous studies, tied into the mainline railroad west of Otter Creek, just south of downtown Middlebury, more or less across Otter Creek from the high school. Freight trains running from the quarry to the mainline railroad, carrying southbound freight, would have to join the tracks heading in a northerly direction before heading south. For this reason, along with direct impacts to a large development which is under construction and a large recreational field complex, a second, more southerly option was developed. This option would tie into the mainline in an undeveloped area south and west of the Creek Road recreational fields. Trains carrying freight from the quarry would head northward on RS-3 but could then turn south and join the mainline heading in a southerly direction. Because of the greater efficiency of this option and the adverse effects of the original alignment, this option was studied in more detail, and is the subject of the discussion below.

Reasonable Range of Alternatives

Selection of alternatives to study in an EIS is described in CEQ regulations at 40 CFR 1502.14 and in FHWA regulations at 23 CFR 771.123(c). These regulations only require that “all reasonable alternatives” be studied, and do not define what constitutes “reasonable”. FHWA Technical Advisory T 6640.8A states that: “A representative number of reasonable alternatives must be presented and evaluated in the EIS… The determination of the number of reasonable alternatives in the draft EIS, therefore, depends on the particular project and the facts and circumstances in each case.” There is apparently no minimum number of build alternatives which must be studied.

Cost and Efficiency

RS-3 is longer than the other alternatives (3.83 miles of new rail alignment vs. 3.17 miles for RS-1), and therefore probably more costly and less efficient. Because the principal shipper (Omya) is transporting its material to the south, the northward movement also makes it less efficient.

Socioeconomic Impacts

RS-3 has substantially more socioeconomic impact than RS-1 or TR-1. Just north of the split with RS-1, it passes through a large proposed development, Middle Road Ventures, which has received Planned Unit Development approval from the Middlebury Planning Commission. Middle Road Ventures would include 44 single-family house lots, 42 condominiums, and a senior housing facility, along with a network of roads. RS-3 would pass directly through the proposed development, affecting many of the single-family house lots and associated roads. Middle Road Ventures also has a Master Plan that involves future development on adjacent land, which would also be affected by RS-3. North of Middle Road Ventures, RS-3 would pass just west of several residences along Middle Road, directly across the road from the Middle School.

The alignment that proceeds northward would have passed through a portion of a second large development, Middlebury South Village, which is currently under construction. Middlebury South Village will include commercial and residential land use, with 30 townhouse apartments and 56 single-family houses. The northern RS-3 alignment would have passed through the southern portion of the property, affecting several proposed houses and open space. It would then have passed over Creek Road, through a 19.5-acre town recreational field complex, affecting at least 3 athletic fields, across Otter Creek near an existing pedestrian bridge, and across a pedestrian trail.

Not counting proposed developments, the RS-3 alignment would pass within 500 feet of 7 residences, while RS-1 and TR-1 would pass within 500 feet of 2 and 3 residences, respectively (see table below). Since it would be closer to more residences, RS-3 would have more potential for visual, noise, and aesthetic impacts than RS-1 or TR-1. Based on the current slope limit lines and property boundaries, RS-3 would also affect more individual properties (22) than the other alternatives (17 for RS-1 and 14 for TR-1). The total acreage that would be acquired for each alternative has not been determined, but the greater length of RS-3 (3.8 miles vs. 3.2 for RS-1) indicates it would involve proportionately more land acquisition than RS-1. Finally, both RS-1 and TR-1 would affect more conserved land than RS-3.

INVOLVEMENT OF RS-1, TR-1, AND RS-3 WITH RESIDENCES AND PARCELS

	RS-1	TR-1	RS-3
Number of residences within 500 feet of centerline	2	3	7
Actual distances of residences from centerline (feet)	220, 450	440, 240, 440	500, 200, 400, 300, 160, 170, 320
Number of parcels affected (based on slope limit lines)	17	14	22
Conserved land acreage	6.2	5.2	4.1

Resource Impacts

Resource impacts were measured as the overlap of the project footprints and resources. The footprints of the three alternatives under consideration (RS-1, TR-1, and RS-3) were developed based on reasonable assumptions for alignments, grades, profiles, and road crossings. It was assumed that all alternatives would include a trestle over the floodplain from the mainline tracks to the higher ground east of Otter Creek; there would be a bridge over Creek Road; TR-1 would involve a transload facility large enough for Omya and other shippers; all alternatives would bridge over Halladay Road; all alternatives would pass under a roadway bridge at US 7; RS-1 and RS-3 would cut off Lower Foote Street; TR-1 would cross Lower Foote Street at grade; and a transload for shippers other than Omya would be constructed just south of the quarry for RS-1 and RS-3. The initial segment of RS-3 would run north off the mainline tracks and curve to the south, rather than the original plan of coming south off the mainline tracks.

The impacts of the resulting footprints on some of the key resources are listed below. Note that the impacts listed below are based on more detailed information than the macro-level resource screening impacts. Project slope limits were developed for each alternative, and more detailed wetland and floodplain mapping was used. Wetland impacts are based on field-identified wetland boundaries, rather than the wetlands based on existing NWI and soils maps used in the macro-level resource screening. Floodplains were mapped using FEMA floodplain elevations interpolated onto project two-foot and five-foot contour mapping.

PRELIMINARY IMPACTS OF RS-1, TR-1, AND RS-3 ON SELECTED RESOURCES (ACRES)

	RS-1	TR-1	RS-3
Wetlands (Class 2 & 3)	3.4	3.9	4.7
100-Year Floodplain	0.02	0.1	0
Prime Soils	1.7	0.6	1.4
Statewide Soils	31.8	35	14.5

RS-3 would have greater wetland impact, but lower farmland soil impacts. However, much of the wetland impacted by RS-3 is much more valuable than wetlands found along the RS-1/TR-1 corridor. RS-3 would affect forested and emergent floodplain wetlands both east and west of Otter Creek. These wetlands are large, structurally diverse, relatively little disturbed, and appear to be important riparian wildlife corridors. These wetlands are important for a broad range of functions and values. The affected land west of Otter Creek is owned by Middlebury College, and is reportedly used for ecological studies.

Conclusions

Socioeconomic or natural resource impacts alone do not make any of these three alternatives unreasonable. However, the likely effects of RS-3 on the Middle Road Ventures proposed development; the proximity to existing residences and a school; and the effects on important wetland, floodplain, and riparian habitat (or, if the original RS-3 alignment were constructed, the effects on Middlebury South Village, recreational fields, and pedestrian trails) are all impacts which appear to be substantially greater than impacts expected from RS-1 or TR-1. On the other hand, RS-3 would have less farmland soil impact than RS-1 or TR-1. RS-3 may also offer greater efficiencies than TR-1, but would be less efficient than RS-1 and offers no operational benefit over RS-1. In consideration of the much greater socioeconomic impacts, along with somewhat greater natural resource impacts and the lack of greater efficiencies or operational benefits, therefore, it is recommended that RS-3 be eliminated from the reasonable range of alternatives.

Cc: Gene McCarthy, MJ
Gary Bua, TranSystems

APPENDIX

AIR QUALITY ANALYSIS

MOBILE6.2

MOBILE6.2 Input Files

2010 Arterial Summer

MOBILE6 INPUT FILE :
*
* Middlebury Rail Spur EIS Mobile 6.2 2010 Arterial Summer 03/14/2006 M6MBAS10.i51
*
REPORT FILE : c:/apps/Mobile62/Run/Midbury/2010/Summer10/M6MBAS10.o61
SPREADSHEET :
POLLUTANTS : HC NOX

RUN DATA : Middlebury Rail Spur EIS, MOBILE 6.2 2010 Arterial Summer VOC 03/14/2006
MIN/MAX TEMP : 51.4 71.7
EXPRESS HC AS VOC :
FUEL RVP : 8.7
ANTI-TAMP PROG :
97 68 20 22222 22222222 1 11 096 12111111

SCENARIO RECORD : 2.5 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 2.5 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 3 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 3 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 4 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 4 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 5 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 5 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 6 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 6 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 7 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 7 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 8 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 8 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 9 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 9 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 10 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 10 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 11 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 11 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 12 mph 2010 ARTERIAL ONLY

CALENDAR YEAR : 2010
AVERAGE SPEED : 12 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 13 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 13 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 14 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 14 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 15 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 15 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 16 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 16 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 17 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 17 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 18 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 18 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 19 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 19 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 20 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 20 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 21 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 21 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 22 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 22 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 23 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 23 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 24 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 24 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 25 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 25 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 26 mph 2010 ARTERIAL ONLY

CALENDAR YEAR : 2010
AVERAGE SPEED : 26 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 27 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 27 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 28 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 28 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 29 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 29 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 30 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 30 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 31 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 31 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 32 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 32 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 33 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 33 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 34 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 34 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 35 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 35 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 36 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 36 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 37 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 37 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 38 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 38 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 39 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 39 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 40 mph 2010 ARTERIAL ONLY

CALENDAR YEAR : 2010
AVERAGE SPEED : 40 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 41 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 41 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 42 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 42 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 43 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 43 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 44 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 44 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 45 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 45 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 46 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 46 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 47 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 47 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 48 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 48 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 49 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 49 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 50 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 50 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 51 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 51 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 52 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 52 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 53 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 53 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 54 mph 2010 ARTERIAL ONLY

CALENDAR YEAR : 2010
AVERAGE SPEED : 54 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 55 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 55 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 56 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 56 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 57 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 57 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 58 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 58 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 59 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 59 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 60 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 60 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 61 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 61 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 62 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 62 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 63 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 63 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 64 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 64 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 65 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 65 ARTERIAL
EVALUATION MONTH : 7

END OF RUN :

2010 Arterial Winter

MOBILE6 INPUT FILE :
*
* Middlebury Rail Spur EIS Mobile 6.2 2010 Arterial Winter 03/14/2006 M6MBAW10.i51
*
REPORT FILE : c:/Apps/Mobile62/Run/Midbury/2010/Winter10/M6MBAW10.o61
SPREADSHEET :
POLLUTANTS : CO
PARTICULATES :

RUN DATA : Middlebury Rail Spur EIS, MOBILE 6.2 2010 Arterial Winter CO 03/14/2006
MIN/MAX TEMP : 20.9 38.0
EXPRESS HC AS VOC :
FUEL RVP : 13.5
ANTI-TAMP PROG :
97 68 20 22222 22222222 1 11 096 12111111

SCENARIO RECORD : 2.5 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 2.5 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 3 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 3 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 4 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 4 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 5 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 5 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 6 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 6 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 7 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 7 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 8 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010

AVERAGE SPEED : 8 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 9 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 9 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 10 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 10 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 11 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 11 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 12 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 12 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 13 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 13 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 14 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 14 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 15 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 15 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 16 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 16 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 17 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 17 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 18 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 18 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 19 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 19 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 20 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 20 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 21 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 21 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 22 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 22 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 23 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 23 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 24 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 24 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 25 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 25 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10

PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 26 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 26 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 27 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 27 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 28 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 28 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 29 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 29 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 30 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 30 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 31 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 31 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 32 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 32 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 33 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 33 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 34 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 34 ARTERIAL
EVALUATION MONTH : 7

DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 35 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 35 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 36 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 36 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 37 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 37 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 38 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 38 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 39 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 39 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 40 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 40 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 41 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 41 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 42 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 42 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 43 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010

AVERAGE SPEED : 43 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 44 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 44 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 45 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 45 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 46 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 46 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 47 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 47 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 48 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 48 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 49 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 49 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 50 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 50 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 51 mph 2010 ATERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 51 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 52 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 52 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 53 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 53 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 54 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 54 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 55 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 55 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 56 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 56 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 57 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 57 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 58 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 58 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 59 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 59 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 60 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 60 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10

PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 61 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 61 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 62 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 62 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 63 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 63 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 64 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 64 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 65 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 65 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 2.5 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 2.5 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 3 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 3 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 4 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 4 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 5 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 5 ARTERIAL
EVALUATION MONTH : 7

DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 6 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 6 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 7 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 7 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 8 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 8 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 9 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 9 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 10 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 10 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 11 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 11 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 12 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 12 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 13 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 13 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 14 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010

AVERAGE SPEED : 14 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 15 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 15 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 16 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 16 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 17 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 17 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 18 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 18 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 19 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 19 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 20 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 20 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 21 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 21 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 22 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 22 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 23 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 23 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 24 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 24 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 25 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 25 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 26 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 26 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 27 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 27 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 28 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 28 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 29 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 29 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 30 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 30 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 31 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 31 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5

PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 32 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 32 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 33 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 33 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 34 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 34 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 35 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 35 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 36 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 36 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 37 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 37 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 38 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 38 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 39 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 39 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 40 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 40 ARTERIAL
EVALUATION MONTH : 7

DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 41 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 41 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 42 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 42 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 43 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 43 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 44 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 44 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 45 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 45 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 46 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 46 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 47 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 47 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 48 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 48 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 49 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010

AVERAGE SPEED : 49 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 50 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 50 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 51 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 51 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 52 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 52 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 53 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 53 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 54 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 54 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 55 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 55 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 56 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 56 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 57 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 57 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 58 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 58 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 59 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 59 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 60 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 60 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 61 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 61 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 62 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 62 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 63 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 63 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 64 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 64 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 65 mph 2010 ARTERIAL ONLY
CALENDAR YEAR : 2010
AVERAGE SPEED : 65 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

END OF RUN :

2030 Arterial Summer

MOBILE6 INPUT FILE :
*
* Middlebury Rail Spur EIS Mobile 6.2 2030 Arterial Summer 03/14/2006 M6MBAS30.i51
*
REPORT FILE   : c:/apps/Mobile62/Run/Midbury/2030/Summer30/M6MBAS30.o61
SPREADSHEET   :
POLLUTANTS   : HC NOX

RUN DATA   : Middlebury Rail Spur EIS, MOBILE 6.2 2030 Arterial Summer VOC 03/14/2006
MIN/MAX TEMP   : 51.4 71.7
EXPRESS HC AS VOC :
FUEL RVP   : 8.7
ANTI-TAMP PROG   :
97 68 20 22222 22222222 1 11 096 12111111

SCENARIO RECORD   : 2.5 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 2.5 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 3 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 3 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 4 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 4 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 5 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 5 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 6 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 6 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 7 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 7 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 8 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 8 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 9 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 9 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 10 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 10 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 11 mph 2030 ARTERIAL ONLY
CALENDAR YEAR   : 2030
AVERAGE SPEED   : 11 ARTERIAL
EVALUATION MONTH   : 7

SCENARIO RECORD   : 12 mph 2030 ARTERIAL ONLY

CALENDAR YEAR : 2030
AVERAGE SPEED : 12 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 13 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 13 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 14 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 14 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 15 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 15 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 16 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 16 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 17 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 17 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 18 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 18 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 19 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 19 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 20 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 20 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 21 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 21 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 22 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 22 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 23 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 23 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 24 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 24 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 25 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 25 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 26 mph 2030 ARTERIAL ONLY

CALENDAR YEAR : 2030
AVERAGE SPEED : 26 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 27 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 27 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 28 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 28 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 29 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 29 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 30 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 30 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 31 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 31 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 32 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 32 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 33 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 33 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 34 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 34 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 35 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 35 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 36 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 36 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 37 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 37 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 38 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 38 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 39 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 39 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 40 mph 2030 ARTERIAL ONLY

CALENDAR YEAR : 2030
AVERAGE SPEED : 40 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 41 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 41 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 42 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 42 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 43 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 43 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 44 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 44 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 45 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 45 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 46 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 46 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 47 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 47 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 48 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 48 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 49 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 49 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 50 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 50 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 51 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 51 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 52 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 52 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 53 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 53 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 54 mph 2030 ARTERIAL ONLY

CALENDAR YEAR : 2030
AVERAGE SPEED : 54 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 55 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 55 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 56 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 56 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 57 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 57 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 58 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 58 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 59 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 59 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 60 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 60 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 61 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 61 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 62 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 62 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 63 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 63 ARTERIAL
EVALUATION MONTH : 7

SCENARIO RECORD : 64 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 64 ARTERIAL

SCENARIO RECORD : 65 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 65 ARTERIAL
EVALUATION MONTH : 7

END OF RUN :

2030 Arterial Winter

MOBILE6 INPUT FILE :
*
* Middlebury Rail Spur EIS Mobile 6.2 2030 Arterial Winter 03/14/2006 M6MBAW30.i51
*
REPORT FILE : c:/Apps/Mobile62/Run/Midbury/2030/Winter30/M6MBAW30.o61
SPREADSHEET :
POLLUTANTS : CO
PARTICULATES :

RUN DATA : Middlebury Rail Spur EIS, MOBILE 6.2 2030 Arterial Winter CO 03/14/2006
MIN/MAX TEMP : 20.9 38.0
EXPRESS HC AS VOC :
FUEL RVP : 13.5
ANTI-TAMP PROG :
97 68 20 22222 22222222 1 11 096 12111111

SCENARIO RECORD : 2.5 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 2.5 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 3 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 3 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 4 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 4 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 5 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 5 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 6 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 6 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 7 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 7 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 8 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030

AVERAGE SPEED : 8 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 9 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 9 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 10 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 10 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 11 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 11 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 12 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 12 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 13 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 13 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 14 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 14 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 15 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 15 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 16 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 16 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 17 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 17 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 18 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 18 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 19 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 19 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 20 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 20 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 21 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 21 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 22 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 22 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 23 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 23 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 24 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 24 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 25 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 25 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10

PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 26 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 26 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 27 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 27 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 28 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 28 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 29 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 29 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 30 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 30 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 31 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 31 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 32 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 32 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 33 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 33 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 34 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 34 ARTERIAL
EVALUATION MONTH : 7

DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 35 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 35 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 36 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 36 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 37 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 37 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 38 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 38 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 39 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 39 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 40 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 40 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 41 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 41 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 42 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 42 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 43 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030

AVERAGE SPEED : 43 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 44 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 44 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 45 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 45 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 46 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 46 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 47 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 47 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 48 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 48 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 49 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 49 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 50 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 50 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 51 mph 2030 ATERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 51 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 52 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 52 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 53 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 53 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 54 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 54 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 55 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 55 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 56 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 56 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 57 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 57 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 58 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 58 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 59 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 59 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 60 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 60 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10

PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 61 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 61 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 62 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 62 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 63 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 63 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 64 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 64 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 65 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 65 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 10
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 2.5 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 2.5 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 3 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 3 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 4 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 4 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 5 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 5 ARTERIAL
EVALUATION MONTH : 7

DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 6 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 6 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 7 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 7 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 8 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 8 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 9 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 9 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 10 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 10 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 11 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 11 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 12 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 12 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 13 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 13 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 14 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030

AVERAGE SPEED : 14 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 15 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 15 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 16 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 16 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 17 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 17 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 18 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 18 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 19 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 19 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 20 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 20 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 21 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 21 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 22 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 22 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 23 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 23 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 24 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 24 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 25 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 25 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 26 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 26 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 27 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 27 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 28 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 28 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 29 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 29 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 30 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 30 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 31 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 31 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5

PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 32 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 32 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 33 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 33 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 34 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 34 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 35 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 35 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 36 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 36 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 37 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 37 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 38 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 38 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 39 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 39 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 40 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 40 ARTERIAL
EVALUATION MONTH : 7

DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 41 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 41 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 42 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 42 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 43 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 43 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 44 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 44 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 45 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 45 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 46 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 46 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 47 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 47 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 48 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 48 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 49 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030

AVERAGE SPEED : 49 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 50 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 50 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 51 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 51 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 52 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 52 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 53 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 53 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 54 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 54 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 55 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 55 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 56 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 56 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 57 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 57 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 58 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 58 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 59 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 59 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 60 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 60 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 61 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 61 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 62 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 62 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 63 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 63 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 64 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 64 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

SCENARIO RECORD : 65 mph 2030 ARTERIAL ONLY
CALENDAR YEAR : 2030
AVERAGE SPEED : 65 ARTERIAL
EVALUATION MONTH : 7
DIESEL SULFUR : 15.00
PARTICLE SIZE : 2.5
PARTICULATE EF : PMGZML.CSV PMGDR1.CSV PMGDR2.CSV PMDZML.CSV PMDDR1.CSV PMDDR2.CSV

END OF RUN :

MOBILE6.2 Output Files

2010 Arterial Summer

```
***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: C:/APPS/MOBILE62/RUN/MIDBURY/2010/SUMMER (file 1, run 1).   *
***************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 2.5 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	5.166	4.787	8.406	5.712	7.196	0.426	1.039	1.213	8.19	5.191
Composite NOX :	1.026	1.292	1.942	1.459	1.663	0.671	1.169	10.824	1.18	2.118

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 3 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  3.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	4.109	3.873	6.773	4.614	5.872	0.412	1.004	1.164	7.26	4.193
Composite NOX :	0.984	1.241	1.862	1.399	1.678	0.649	1.131	10.469	1.15	2.043

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 4 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  4.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
```

```
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     2.787     2.731     4.731    3.242     4.218     0.393     0.959     1.103      6.10     2.945
    Composite NOX :     0.931     1.176     1.761    1.325     1.696     0.621     1.082    10.025      1.12     1.948
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 5 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of  5.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     1.994     2.045     3.507    2.419     3.225     0.382     0.932     1.066      5.40     2.196
    Composite NOX :     0.899     1.137     1.701    1.281     1.706     0.605     1.054     9.758      1.10     1.891
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 6 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of  6.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     1.709     1.776     3.038    2.098     2.793     0.359     0.876     0.990      4.69     1.904
    Composite NOX :     0.845     1.071     1.606    1.208     1.735     0.571     0.995     9.221      1.08     1.788
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 7 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of  7.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b
```

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.506	1.583	2.703	1.869	2.485	0.343	0.836	0.935	4.19	1.695
Composite NOX :	0.805	1.024	1.537	1.155	1.756	0.548	0.954	8.837	1.06	1.714

* #
* 8 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 7.
* #
M583 Warning:
The user supplied arterial average speed of 8.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.354	1.439	2.452	1.698	2.253	0.331	0.806	0.894	3.81	1.538
Composite NOX :	0.776	0.989	1.486	1.116	1.771	0.530	0.923	8.549	1.05	1.659

* #
* 9 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 8.
* #
M583 Warning:
The user supplied arterial average speed of 9.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.235	1.326	2.256	1.564	2.073	0.321	0.783	0.862	3.52	1.416
Composite NOX :	0.753	0.961	1.447	1.085	1.783	0.516	0.898	8.325	1.04	1.616

* #
* 10 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 9.
* #

```
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      1.140     1.236     2.100     1.457     1.929     0.313     0.765     0.837      3.28     1.319
     Composite NOX :      0.735     0.939     1.415     1.061     1.793     0.505     0.879     8.145      1.03     1.582
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 11 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 10.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 11.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      1.079     1.172     1.994     1.382     1.804     0.300     0.732     0.792      3.09     1.249
     Composite NOX :      0.707     0.906     1.367     1.024     1.816     0.486     0.846     7.845      1.04     1.528
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 12 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 11.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 12.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
```

```
    Composite VOC :      1.028     1.118     1.905     1.319     1.700   0.289     0.704     0.754      2.92     1.190
    Composite NOX :      0.683     0.877     1.327     0.992     1.836   0.470     0.819     7.594      1.04     1.483
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 13 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 13.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.985     1.072     1.830     1.266     1.612   0.279     0.681     0.723      2.78     1.141
    Composite NOX :      0.664     0.854     1.294     0.966     1.853   0.457     0.796     7.382      1.04     1.444
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 14 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 13.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 14.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.948     1.033     1.766     1.220     1.537   0.271     0.661     0.695      2.67     1.098
    Composite NOX :      0.647     0.833     1.265     0.944     1.867   0.446     0.777     7.200      1.05     1.412
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 15 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 14.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 15.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
```

```
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.916    0.999     1.710     1.181     1.471     0.264     0.644     0.672      2.56     1.062
    Composite NOX :     0.632    0.816     1.240     0.924     1.879     0.436     0.760     7.043      1.05     1.383
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 16 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 15.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 16.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.886    0.965     1.657     1.142     1.403     0.255     0.622     0.642      2.48     1.025
    Composite NOX :     0.619    0.800     1.218     0.907     1.901     0.425     0.740     6.858      1.06     1.355
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 17 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 16.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 17.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.859    0.936     1.610     1.108     1.342     0.247     0.602     0.615      2.41     0.993
    Composite NOX :     0.607    0.787     1.199     0.892     1.920     0.415     0.722     6.695      1.07     1.329
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 18 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 17.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 18.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
```

```
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890   0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :      0.835     0.909     1.569     1.078     1.288    0.240     0.585     0.591      2.34     0.965
   Composite NOX :      0.597     0.774     1.181     0.878     1.937    0.406     0.706     6.551      1.09     1.307
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 19 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 18.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 19.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890   0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :      0.814     0.886     1.532     1.051     1.240    0.233     0.570     0.570      2.28     0.939
   Composite NOX :      0.588     0.764     1.166     0.866     1.952    0.397     0.692     6.421      1.10     1.287
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 20 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 19.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890   0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite VOC :      0.794     0.865     1.498     1.027     1.197    0.228     0.556     0.551      2.23     0.916
   Composite NOX :      0.580     0.754     1.152     0.856     1.966    0.390     0.680     6.305      1.10     1.269
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 21 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 20.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 21.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
```

```
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
   VMT Distribution:   0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
  ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.779    0.850    1.473    1.009    1.158    0.221    0.540    0.530     2.18    0.898
     Composite NOX :     0.573    0.745    1.140    0.846    1.986    0.383    0.668    6.194     1.12    1.253
  ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 22 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 21.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 22.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
   VMT Distribution:   0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
  ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.765    0.836    1.450    0.993    1.123    0.215    0.526    0.511     2.14    0.882
     Composite NOX :     0.566    0.737    1.128    0.837    2.005    0.377    0.657    6.094     1.14    1.238
  ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 23 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 22.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 23.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
   VMT Distribution:   0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
  ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.753    0.824    1.428    0.979    1.091    0.210    0.513    0.493     2.10    0.867
     Composite NOX :     0.560    0.729    1.118    0.829    2.022    0.371    0.647    6.002     1.15    1.224
  ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* 24 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 23.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 24.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.741     0.813     1.409     0.965     1.061     0.205     0.501     0.477      2.06     0.854
     Composite NOX :      0.554     0.723     1.108     0.821     2.038     0.366     0.638     5.918      1.16     1.212
  ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 25 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 24.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.730     0.802     1.391     0.953     1.034     0.201     0.491     0.462      2.02     0.841
     Composite NOX :      0.549     0.717     1.099     0.814     2.052     0.361     0.630     5.841      1.18     1.200
  ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 26 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 25.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 26.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

```
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.721     0.794     1.377     0.943     1.009    0.196     0.480     0.447      1.99      0.830
    Composite NOX :      0.544     0.711     1.091     0.808     2.072    0.358     0.623     5.785      1.19      1.191
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 27 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 26.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 27.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.713     0.786     1.363     0.934     0.986    0.192     0.469     0.433      1.96      0.820
    Composite NOX :      0.539     0.705     1.084     0.802     2.091    0.355     0.618     5.733      1.20      1.183
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 28 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 27.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 28.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.705     0.779     1.351     0.925     0.965    0.188     0.460     0.420      1.93      0.811
    Composite NOX :      0.535     0.701     1.077     0.797     2.108    0.352     0.613     5.685      1.22      1.175
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 29 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 28.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 29.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :    0.698     0.773     1.339     0.918     0.945     0.184     0.451     0.408      1.90     0.803
     Composite NOX :    0.531     0.696     1.070     0.792     2.124     0.349     0.608     5.640      1.23     1.168
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 30 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 29.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 30.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :    0.691     0.766     1.329     0.910     0.926     0.181     0.442     0.396      1.87     0.795
     Composite NOX :    0.528     0.692     1.064     0.787     2.139     0.346     0.603     5.598      1.24     1.161
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 31 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 30.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :    0.684     0.760     1.316     0.902     0.909     0.178     0.434     0.385      1.84     0.786
     Composite NOX :    0.525     0.689     1.061     0.784     2.158     0.346     0.602     5.587      1.25     1.159
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 32 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 31.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 32.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
```

```
                 Altitude:  Low
        Minimum Temperature:  51.4 (F)
        Maximum Temperature:  71.7 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   8.7 psi
              Weathered RVP:   8.7 psi
        Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                       ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.678     0.754     1.305     0.895     0.894     0.175     0.427     0.375      1.82     0.778
     Composite NOX :     0.523     0.687     1.058     0.782     2.177     0.345     0.601     5.577      1.26     1.157
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 33 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 32.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                       ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.672     0.748     1.294     0.887     0.879     0.172     0.420     0.365      1.79     0.771
     Composite NOX :     0.522     0.685     1.056     0.780     2.194     0.344     0.600     5.567      1.27     1.155
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 34 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 33.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 34.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                       ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.666     0.742     1.284     0.881     0.865     0.169     0.413     0.356      1.77     0.764
     Composite NOX :     0.520     0.683     1.053     0.778     2.210     0.344     0.599     5.558      1.28     1.153
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 35 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 34.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
```

```
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.660     0.737     1.275     0.875     0.852    0.166     0.407     0.347      1.75     0.758
     Composite NOX :     0.518     0.682     1.051     0.776     2.225    0.343     0.598     5.549      1.29     1.151
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 36 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 35.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 36.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.656     0.734     1.268     0.870     0.840    0.164     0.401     0.339      1.73     0.753
     Composite NOX :     0.520     0.684     1.053     0.778     2.245    0.345     0.601     5.580      1.30     1.156
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 37 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 36.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 37.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.653     0.731     1.262     0.866     0.829    0.162     0.395     0.332      1.71     0.748
     Composite NOX :     0.522     0.686     1.055     0.780     2.263    0.347     0.605     5.610      1.31     1.161
```

* #
* 38 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 37.
* #

M583 Warning:
The user supplied arterial average speed of 38.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.649	0.728	1.256	0.863	0.819	0.160	0.390	0.324	1.70	0.744
Composite NOX :	0.524	0.688	1.057	0.782	2.280	0.349	0.608	5.637	1.31	1.166

* #
* 39 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 38.
* #

M583 Warning:
The user supplied arterial average speed of 39.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.645	0.725	1.250	0.859	0.809	0.157	0.385	0.318	1.68	0.740
Composite NOX :	0.525	0.690	1.059	0.784	2.296	0.350	0.610	5.664	1.32	1.170

* #
* 40 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 39.
* #

M583 Warning:
The user supplied arterial average speed of 40.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.642	0.722	1.245	0.856	0.800	0.156	0.380	0.311	1.67	0.736
Composite NOX :	0.527	0.691	1.061	0.786	2.312	0.352	0.613	5.689	1.33	1.175

* #
* 41 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 40.
* #

M583 Warning:
The user supplied arterial average speed of 41.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.639	0.719	1.240	0.852	0.792	0.154	0.376	0.305	1.66	0.732
Composite NOX :	0.529	0.694	1.064	0.789	2.331	0.357	0.621	5.764	1.33	1.184

* #
* 42 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 41.
* #

M583 Warning:
The user supplied arterial average speed of 42.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.635	0.716	1.234	0.849	0.784	0.152	0.372	0.300	1.65	0.728
Composite NOX :	0.531	0.697	1.068	0.792	2.349	0.361	0.629	5.836	1.34	1.193

* #
* 43 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 42.
* #

M583 Warning:
The user supplied arterial average speed of 43.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi

```
             Weathered RVP:   8.7 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
          Reformulated Gas:  No

    Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:              <6000    >6000    (All)
                    ------    ------   ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:  0.3478    0.3890   0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.632    0.714    1.229    0.845     0.777     0.151     0.368     0.295      1.64     0.725
   Composite NOX :    0.534    0.700    1.070    0.795     2.366     0.365     0.636     5.905      1.34     1.202
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 44 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 43.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
           The user supplied arterial average speed of 44.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
 M 48 Warning:
             there are no sales for vehicle class HDGV8b

             Calendar Year:  2010
                     Month:  July
                  Altitude:  Low
       Minimum Temperature:  51.4 (F)
       Maximum Temperature:  71.7 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:   8.7 psi
             Weathered RVP:   8.7 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
          Reformulated Gas:  No

    Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:              <6000    >6000    (All)
                    ------    ------   ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:  0.3478    0.3890   0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.629    0.711    1.224    0.842     0.770     0.149     0.365     0.290      1.63     0.721
   Composite NOX :    0.536    0.702    1.073    0.797     2.383     0.369     0.644     5.970      1.35     1.210
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 45 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 44.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
           The user supplied arterial average speed of 45.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
 M 48 Warning:
             there are no sales for vehicle class HDGV8b

             Calendar Year:  2010
                     Month:  July
                  Altitude:  Low
       Minimum Temperature:  51.4 (F)
       Maximum Temperature:  71.7 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:   8.7 psi
             Weathered RVP:   8.7 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
          Reformulated Gas:  No

    Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:              <6000    >6000    (All)
                    ------    ------   ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:  0.3478    0.3890   0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.626    0.709    1.219    0.839     0.763     0.148     0.361     0.285      1.62     0.718
   Composite NOX :    0.538    0.705    1.076    0.800     2.398     0.373     0.650     6.033      1.35     1.218
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 46 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 45.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
           The user supplied arterial average speed of 46.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
 M 48 Warning:
             there are no sales for vehicle class HDGV8b
```

```
                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000      (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     0.623     0.706     1.214     0.836     0.757     0.146     0.358     0.281      1.62     0.714
    Composite NOX :     0.540     0.707     1.079     0.803     2.417     0.381     0.664     6.160      1.37     1.233
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 47 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 46.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 47.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000      (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     0.620     0.703     1.208     0.832     0.751     0.145     0.355     0.277      1.61     0.711
    Composite NOX :     0.543     0.710     1.082     0.805     2.435     0.389     0.677     6.282      1.38     1.246
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 48 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 47.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 48.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000      (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     0.617     0.701     1.203     0.829     0.745     0.144     0.353     0.273      1.61     0.708
    Composite NOX :     0.545     0.713     1.085     0.808     2.452     0.396     0.690     6.399      1.40     1.259
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 49 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 48.
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 49.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.614     0.698     1.198     0.826     0.740    0.143     0.350     0.270      1.61     0.704
     Composite NOX :      0.547     0.715     1.088     0.811     2.469    0.403     0.702     6.512      1.42     1.272
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 50 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 49.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 50.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.611     0.696     1.193     0.823     0.734    0.142     0.348     0.267      1.60     0.701
     Composite NOX :      0.549     0.718     1.091     0.813     2.485    0.410     0.714     6.619      1.43     1.284
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 51 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 50.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 51.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
```

```
 Composite Emission Factors (g/mi):
    Composite VOC :      0.608     0.693     1.187     0.819     0.730    0.141     0.346     0.264      1.60     0.698
    Composite NOX :      0.551     0.721     1.095     0.816     2.504    0.422     0.735     6.813      1.46     1.304
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 52 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 51.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 52.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.605     0.690     1.182     0.816     0.726    0.141     0.344     0.262      1.60     0.695
    Composite NOX :      0.554     0.724     1.098     0.819     2.521    0.433     0.755     6.999      1.50     1.323
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 53 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 52.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 53.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.602     0.688     1.177     0.813     0.722    0.140     0.343     0.259      1.60     0.692
    Composite NOX :      0.556     0.726     1.101     0.822     2.539    0.445     0.774     7.179      1.53     1.341
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 54 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 53.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 54.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
```

ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.599	0.685	1.172	0.810	0.718	0.139	0.341	0.257	1.60	0.689
Composite NOX :	0.558	0.729	1.105	0.825	2.555	0.455	0.793	7.351	1.56	1.359

* #
* 55 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 54.
* #
M583 Warning:
The user supplied arterial average speed of 55.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.597	0.683	1.167	0.807	0.714	0.139	0.339	0.255	1.60	0.686
Composite NOX :	0.561	0.732	1.108	0.828	2.571	0.466	0.811	7.518	1.59	1.377

* #
* 56 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 55.
* #
M583 Warning:
The user supplied arterial average speed of 56.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.594	0.681	1.162	0.804	0.711	0.138	0.339	0.254	1.66	0.684
Composite NOX :	0.563	0.735	1.111	0.831	2.590	0.483	0.842	7.802	1.62	1.404

* #
* 57 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 56.
* #
M583 Warning:
The user supplied arterial average speed of 57.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)

Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.592	0.679	1.157	0.801	0.709	0.138	0.338	0.253	1.72	0.682
Composite NOX :	0.566	0.738	1.115	0.834	2.608	0.500	0.871	8.075	1.65	1.431

* #
* 58 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 57.
* #
M583 Warning:
The user supplied arterial average speed of 58.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.589	0.676	1.153	0.798	0.707	0.138	0.337	0.252	1.78	0.680
Composite NOX :	0.568	0.740	1.118	0.837	2.625	0.517	0.900	8.340	1.68	1.457

* #
* 59 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 58.
* #
M583 Warning:
The user supplied arterial average speed of 59.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b

Calendar Year: 2010
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.587	0.674	1.148	0.796	0.704	0.137	0.336	0.251	1.84	0.678
Composite NOX :	0.570	0.743	1.122	0.840	2.642	0.533	0.928	8.595	1.71	1.482

* #
* 60 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 59.
* #
M583 Warning:
The user supplied arterial average speed of 60.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway

```
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
 ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.585    0.672    1.144    0.793    0.702    0.137    0.335    0.250     1.89    0.676
    Composite NOX :      0.572    0.746    1.125    0.843    2.658    0.548    0.954    8.842     1.74    1.507
 ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 61 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 60.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 61.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
 ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.583    0.670    1.140    0.790    0.701    0.137    0.335    0.250     1.95    0.674
    Composite NOX :      0.575    0.749    1.129    0.846    2.676    0.573    0.999    9.254     1.77    1.546
 ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 62 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 61.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 62.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
 ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.581    0.669    1.135    0.788    0.701    0.137    0.335    0.250     2.01    0.672
    Composite NOX :      0.577    0.752    1.132    0.849    2.694    0.598    1.042    9.653     1.81    1.583
 ------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 63 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 62.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 63.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.579     0.667     1.131     0.786     0.700     0.137     0.335     0.250      2.07     0.670
    Composite NOX :     0.580     0.755     1.136     0.852     2.711     0.622     1.084    10.039      1.84     1.620
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 64 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 63.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 64.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.577     0.665     1.128     0.783     0.699     0.137     0.335     0.250      2.13     0.669
    Composite NOX :     0.582     0.757     1.139     0.855     2.728     0.645     1.124    10.413      1.87     1.655
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 65 mph 2010 ARTERIAL ONLY
* File 1, Run 1, Scenario 64.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 65.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
```

VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.575	0.663	1.124	0.781	0.699	0.137	0.335	0.250	2.18	0.667
Composite NOX :	0.584	0.760	1.142	0.858	2.744	0.668	1.164	10.775	1.90	1.689

2010 Arterial Winter

```
***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: C:/APPS/MOBILE62/RUN/MIDBURY/2010/WINTER (file 2, run 1).   *
***************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2.5 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

* Reading Ammonia (NH3) Basic Emissiion Rates
* from the external data file PMNH3BER.D

* Reading Ammonia (NH3) Sulfur Deterioration Rates
* from the external data file PMNH3SDR.D

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     43.09     46.71     63.91     51.11     53.23     2.788     2.288     7.764    109.28    44.874
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 3 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  3.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
```

```
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    38.00     41.45     56.35     45.26     49.66     2.639     2.167     7.288     94.52    39.801
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of  4.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    31.64     34.89     46.91     37.96     45.21     2.453     2.016     6.694     76.08    33.461
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 5 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of  5.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
```

```
                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     27.82     30.95     41.24     33.58     42.53     2.341     1.925     6.338     65.02    29.656
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 6 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  6.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     25.45     28.45     37.75     30.83     37.79     2.136     1.758     5.682     54.60    27.109
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 7 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  7.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV
```

```
* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     23.75     26.67     35.25     28.86     34.40     1.989     1.638     5.213     47.16    25.289
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 8 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  8.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     22.48     25.33     33.38     27.39     31.86     1.878     1.549     4.862     41.58    23.924
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 9 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  9.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
```

```
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     21.49     24.29     31.93     26.24     29.88     1.793     1.479     4.589     37.24    22.862
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 10 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 9.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 10.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     20.70     23.46     30.76     25.33     28.30     1.724     1.424     4.370     33.77    22.013
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 11 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 10.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 11.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV
```

```
* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     20.12     22.83     29.92     24.64     26.00     1.620     1.339     4.038     31.01    21.328
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 12 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 11.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 12.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     19.63     22.30     29.22     24.07     24.09     1.533     1.269     3.762     28.71    20.757
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 13 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 13.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
```

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     19.22     21.86     28.63     23.59     22.48     1.460     1.209     3.528     26.76    20.273
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 14 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 13.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 14.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     18.87     21.48     28.12     23.18     21.09     1.397     1.158     3.327     25.09    19.859
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 15 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 14.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
```

```
           The user supplied arterial average speed of 15.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.57     21.15     27.68     22.82     19.89     1.343     1.114     3.154     23.65    19.500
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 16 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 15.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 16.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.30     20.86     27.29     22.51     18.61     1.282     1.065     2.961     22.48    19.175
 -----------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 17 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 16.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 17.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.07     20.61     26.95     22.23     17.48     1.229     1.021     2.790     21.45    18.888
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 18 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 17.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 18.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
```

```
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      17.86     20.38     26.65     21.98     16.48     1.181     0.983     2.639     20.54    18.633
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 19 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 18.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 19.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      17.67     20.18     26.38     21.76     15.58     1.139     0.948     2.503     19.72    18.405
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 20 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 19.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

```
      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.51     19.99     26.14     21.57     14.77     1.100     0.917     2.382     18.98    18.199
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 21 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 20.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 21.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.37     19.85     25.94     21.40     14.02     1.063     0.887     2.263     18.30    18.027
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 22 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 21.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 22.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm
```

```
             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000    (All)
                         ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.24     19.71     25.77     21.26     13.33     1.029     0.859     2.155     17.68    17.870
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 23 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 22.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 23.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000    (All)
                         ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.13     19.59     25.60     21.13     12.70     0.998     0.834     2.056     17.12    17.727
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 24 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 23.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 24.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
```

```
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     17.03     19.48     25.46     21.00     12.12     0.970     0.811     1.966     16.60    17.595
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 25 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 24.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 25.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     16.93     19.37     25.32     20.89     11.59     0.944     0.790     1.882     16.13    17.475
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 26 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 25.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 26.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
```

```
                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 --------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     16.87     19.31     25.23     20.82     11.13     0.920     0.771     1.807     15.65    17.392
 --------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 27 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 26.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 27.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 --------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     16.82     19.25     25.15     20.76     10.71     0.899     0.753     1.738     15.21    17.315
 --------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 28 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 27.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 28.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV
```

```
* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     16.77     19.20     25.07     20.70     10.32     0.878     0.737     1.673     14.80    17.244
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 29 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 28.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 29.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     16.72     19.14     25.00     20.64      9.95     0.859     0.721     1.613     14.41    17.178
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 30 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 29.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 30.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV
```

```
* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.67     19.10     24.94     20.59      9.61     0.842     0.707     1.557     14.06    17.116
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 31 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 30.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 31.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.68     19.11     24.95     20.61      9.34     0.827     0.695     1.510     13.71    17.113
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 32 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 31.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 32.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
```

```
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                        ------   ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.70    19.13     24.97    20.62      9.09     0.813     0.684     1.466     13.39    17.110
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 33 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 32.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 33.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                        ------   ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.71    19.14     24.99    20.64      8.85     0.800     0.673     1.424     13.08    17.107
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 34 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 33.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 34.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
```

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     16.72     19.15     25.00     20.65      8.63     0.788     0.663     1.385     12.80    17.105
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 35 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 34.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 35.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     16.73     19.16     25.02     20.66      8.42     0.776     0.654     1.348     12.53    17.102
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 36 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 35.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
  M583 Warning:
            The user supplied arterial average speed of 36.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     16.84     19.29     25.18     20.80      8.28     0.767     0.647     1.320     12.29    17.203
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 37 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 36.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 37.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     16.94     19.41     25.33     20.92      8.15     0.759     0.640     1.293     12.07    17.298
  ------------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 38 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 37.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 38.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.04     19.52     25.47     21.04      8.02     0.751     0.634     1.268     11.85    17.388
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 39 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 38.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 39.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

```
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.14     19.63     25.61     21.16      7.90     0.744     0.627     1.244     11.65    17.474
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 40 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 39.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 40.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.23     19.73     25.73     21.27      7.79     0.737     0.622     1.221     11.46    17.555
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 41 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 40.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
          The user supplied arterial average speed of 41.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
 M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
```

Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	17.34	19.86	25.89	21.40	7.75	0.732	0.618	1.207	11.31	17.659

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 42 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 41.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 42.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	17.45	19.97	26.04	21.52	7.72	0.728	0.615	1.194	11.17	17.759

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 43 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 42.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 43.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
```

```
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.55     20.09     26.18     21.65      7.68     0.724     0.612     1.181     11.04    17.854
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 44 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 43.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 44.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.64     20.20     26.32     21.76      7.65     0.720     0.608     1.169     10.91    17.945
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 45 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 44.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 45.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
```

```
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.74     20.30     26.45    21.87      7.62     0.717     0.606     1.158     10.79    18.031
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 46 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 45.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 46.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.85     20.42     26.60    22.00      7.67     0.716     0.605     1.156     10.73    18.140
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 47 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 46.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 47.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
```

```
          there are no sales for vehicle class HDGV8b

                Calendar Year:  2010
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  20.9 (F)
          Maximum Temperature:  38.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:  13.5 psi
                Weathered RVP:  13.5 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  Yes
             Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.95     20.54     26.75     22.13      7.72     0.715     0.605     1.154     10.67    18.243
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 48 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 47.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 48.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                Calendar Year:  2010
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  20.9 (F)
          Maximum Temperature:  38.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:  13.5 psi
                Weathered RVP:  13.5 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  Yes
             Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     18.05     20.65     26.89     22.25      7.77     0.715     0.604     1.152     10.62    18.343
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 49 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 48.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 49.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
```

```
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.15     20.76     27.03     22.36      7.82     0.714     0.604     1.151     10.57    18.438
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 50 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 49.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 50.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.24     20.87     27.16     22.48      7.87     0.714     0.603     1.149     10.52    18.530
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 51 mph 2010 ATERIAL ONLY
* File 2, Run 1, Scenario 50.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 51.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV
```

```
* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.35     20.99     27.31     22.61      8.02     0.717     0.606     1.158     10.52    18.642
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 52 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 51.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 52.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.46     21.11     27.46     22.73      8.17     0.720     0.608     1.168     10.52    18.751
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 53 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 52.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 53.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV
```

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

```
             Calendar Year:  2010
                     Month:  July
                  Altitude:  Low
       Minimum Temperature:  20.9 (F)
       Maximum Temperature:  38.0 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:  13.5 psi
             Weathered RVP:  13.5 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
          Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	18.56	21.22	27.61	22.85	8.32	0.722	0.610	1.176	10.52	18.855

* #
* 54 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 53.
* #

M583 Warning:
The user supplied arterial average speed of 54.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

```
             Calendar Year:  2010
                     Month:  July
                  Altitude:  Low
       Minimum Temperature:  20.9 (F)
       Maximum Temperature:  38.0 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:  13.5 psi
             Weathered RVP:  13.5 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
          Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	18.65	21.33	27.74	22.97	8.45	0.725	0.612	1.185	10.52	18.955

* #
* 55 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 54.
* #

M583 Warning:
The user supplied arterial average speed of 55.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway

```
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     18.75     21.43     27.87     23.08      8.59     0.728     0.615     1.193     10.52    19.051
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 56 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 55.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 56.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     18.86     21.55     28.03     23.21      8.87     0.735     0.620     1.215     11.97    19.177
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 57 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 56.
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.96     21.67     28.17     23.33      9.14     0.741     0.626     1.237     13.37    19.298
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 58 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 57.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 58.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    19.06     21.79     28.32     23.46      9.40     0.748     0.631     1.257     14.73    19.415
```

```
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 59 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 58.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 59.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    19.16     21.89     28.46     23.57      9.66     0.754     0.636     1.277     16.04    19.527
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 60 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 59.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 60.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
```

```
                  ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
 -----------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :      19.25    22.00    28.59    23.69     9.90    0.760    0.641    1.297    17.30   19.636
 -----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 61 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 60.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 61.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:               <6000    >6000    (All)
                  ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
 -----------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :      19.36    22.12    28.74    23.81    10.36    0.772    0.651    1.335    18.75   19.769
 -----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 62 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 61.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 62.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
```

```
                ATP Program:  Yes
           Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                        ------   ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     19.46     22.24     28.89     23.94     10.81     0.784     0.660     1.371     20.15    19.897
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 63 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 62.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 63.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                        ------   ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     19.57     22.35     29.03     24.06     11.24     0.795     0.669     1.407     21.50    20.021
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 64 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 63.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 64.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
```

```
              Weathered RVP:  13.5 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  Yes
           Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     19.66     22.46     29.17     24.18     11.66     0.806     0.678     1.441     22.82    20.142
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 65 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 64.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 65.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

              Calendar Year:  2010
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  20.9 (F)
        Maximum Temperature:  38.0 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:  13.5 psi
              Weathered RVP:  13.5 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  Yes
           Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     19.76     22.57     29.30     24.29     12.06     0.816     0.686     1.475     24.09    20.258
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 2.5 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 65.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

              Calendar Year:  2010
                      Month:  July
```

```
                    Altitude:  Low
         Minimum Temperature:  20.9 (F)
         Maximum Temperature:  38.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:  13.5 psi
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	43.09	46.71	63.91	51.11	53.23	2.788	2.288	7.764	109.28	44.874

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 3 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 66.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of  3.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

               Calendar Year:  2010
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  20.9 (F)
         Maximum Temperature:  38.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:  13.5 psi
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	38.00	41.45	56.35	45.26	49.66	2.639	2.167	7.288	94.52	39.801

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 67.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of  4.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
```

```
M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	31.64	34.89	46.91	37.96	45.21	2.453	2.016	6.694	76.08	33.461

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 5 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 68.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  5.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	27.82	30.95	41.24	33.58	42.53	2.341	1.925	6.338	65.02	29.656

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 6 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 69.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  6.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV
```

```
* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    25.45     28.45     37.75     30.83     37.79     2.136     1.758     5.682     54.60    27.109
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 7 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 70.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  7.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    23.75     26.67     35.25     28.86     34.40     1.989     1.638     5.213     47.16    25.289
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 8 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 71.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  8.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
```

```
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     22.48     25.33     33.38     27.39     31.86     1.878     1.549     4.862     41.58    23.924
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 9 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 72.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  9.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     21.49     24.29     31.93     26.24     29.88     1.793     1.479     4.589     37.24    22.862
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 10 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 73.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 10.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV
```

```
* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                   ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     20.70     23.46     30.76     25.33     28.30     1.724     1.424     4.370     33.77    22.013
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 11 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 74.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 11.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                   ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     20.12     22.83     29.92     24.64     26.00     1.620     1.339     4.038     31.01    21.328
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 12 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 75.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 12.0
          will be used for all hours of the day.  100% of VMT
```

```
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                          Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     19.63    22.30     29.22     24.07     24.09     1.533     1.269     3.762     28.71    20.757
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 13 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 76.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 13.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                          Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478   0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     19.22    21.86     28.63     23.59     22.48     1.460     1.209     3.528     26.76    20.273
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 14 mph 2010 ARTERIAL ONLY
```

```
* File 2, Run 1, Scenario 77.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 14.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.87     21.48     28.12     23.18     21.09     1.397     1.158     3.327     25.09    19.859
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 15 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 78.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 15.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
```

```
   Composite CO  :     18.57     21.15     27.68     22.82     19.89     1.343     1.114     3.154     23.65    19.500
 -----------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 16 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 79.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 16.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
   Composite CO  :     18.30     20.86     27.29     22.51     18.61     1.282     1.065     2.961     22.48    19.175
 -----------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 17 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 80.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 17.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
```

```
            GVWR:              <6000     >6000    (All)
                     ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.07     20.61     26.95     22.23     17.48     1.229     1.021     2.790     21.45    18.888
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 18 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 81.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 18.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
            GVWR:              <6000     >6000    (All)
                     ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.86     20.38     26.65     21.98     16.48     1.181     0.983     2.639     20.54    18.633
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 19 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 82.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 19.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
```

```
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     17.67     20.18     26.38     21.76     15.58     1.139     0.948     2.503     19.72    18.405
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 20 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 83.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     17.51     19.99     26.14     21.57     14.77     1.100     0.917     2.382     18.98    18.199
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 21 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 84.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 21.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
```

```
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.37     19.85     25.94     21.40     14.02     1.063     0.887     2.263     18.30    18.027
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 22 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 85.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 22.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.24     19.71     25.77     21.26     13.33     1.029     0.859     2.155     17.68    17.870
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 23 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 86.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 23.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
```

```
                Month:  July
             Altitude:  Low
  Minimum Temperature:  20.9 (F)
  Maximum Temperature:  38.0 (F)
    Absolute Humidity:   75. grains/lb
     Nominal Fuel RVP:  13.5 psi
        Weathered RVP:  13.5 psi
  Fuel Sulfur Content:   30. ppm

  Exhaust I/M Program:  No
     Evap I/M Program:  No
          ATP Program:  Yes
    Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	17.13	19.59	25.60	21.13	12.70	0.998	0.834	2.056	17.12	17.727

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 24 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 87.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 24.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

        Calendar Year:  2010
                Month:  July
             Altitude:  Low
  Minimum Temperature:  20.9 (F)
  Maximum Temperature:  38.0 (F)
    Absolute Humidity:   75. grains/lb
     Nominal Fuel RVP:  13.5 psi
        Weathered RVP:  13.5 psi
  Fuel Sulfur Content:   30. ppm

  Exhaust I/M Program:  No
     Evap I/M Program:  No
          ATP Program:  Yes
    Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	17.03	19.48	25.46	21.00	12.12	0.970	0.811	1.966	16.60	17.595

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 25 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 88.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 25.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
```

```
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.93     19.37     25.32     20.89     11.59     0.944     0.790     1.882     16.13    17.475
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 26 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 89.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 26.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.87     19.31     25.23     20.82     11.13     0.920     0.771     1.807     15.65    17.392
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 27 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 90.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 27.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV
```

```
* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.82     19.25     25.15     20.76     10.71     0.899     0.753     1.738     15.21    17.315
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 28 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 91.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 28.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.77     19.20     25.07     20.70     10.32     0.878     0.737     1.673     14.80    17.244
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 29 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 92.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 29.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV
```

```
* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    16.72     19.14     25.00     20.64      9.95     0.859     0.721     1.613     14.41    17.178
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 30 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 93.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 30.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    16.67     19.10     24.94     20.59      9.61     0.842     0.707     1.557     14.06    17.116
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 31 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 94.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
```

```
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     16.68     19.11     24.95     20.61      9.34     0.827     0.695     1.510     13.71    17.113
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 32 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 95.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 32.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     16.70     19.13     24.97     20.62      9.09     0.813     0.684     1.466     13.39    17.110
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 33 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 96.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 33.0
```

```
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.71     19.14     24.99     20.64      8.85     0.800     0.673     1.424     13.08    17.107
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 34 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 97.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 34.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.72     19.15     25.00     20.65      8.63     0.788     0.663     1.385     12.80    17.105
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* 35 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 98.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.73     19.16     25.02     20.66      8.42     0.776     0.654     1.348     12.53    17.102
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 36 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 99.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 36.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
```

```
 Composite Emission Factors (g/mi):
     Composite CO  :     16.84     19.29     25.18     20.80      8.28     0.767     0.647     1.320     12.29    17.203
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 37 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 100.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 37.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     16.94     19.41     25.33     20.92      8.15     0.759     0.640     1.293     12.07    17.298
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 38 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 101.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 38.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

```
      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.04     19.52     25.47     21.04      8.02     0.751     0.634     1.268     11.85    17.388
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 39 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 102.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 39.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.14     19.63     25.61     21.16      7.90     0.744     0.627     1.244     11.65    17.474
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 40 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 103.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 40.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.23     19.73     25.73     21.27      7.79     0.737     0.622     1.221     11.46    17.555
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 41 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 104.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 41.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.34     19.86     25.89     21.40      7.75     0.732     0.618     1.207     11.31    17.659
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 42 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 105.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 42.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
```

```
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV   LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890   0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.45    19.97    26.04    21.52      7.72     0.728     0.615     1.194     11.17    17.759
 ------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 43 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 106.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 43.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                 Calendar Year:  2010
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV   LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478   0.3890   0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     17.55    20.09    26.18    21.65      7.68     0.724     0.612     1.181     11.04    17.854
 ------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 44 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 107.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 44.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
```

```
                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:             <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
 ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    17.64    20.20    26.32    21.76     7.65    0.720    0.608    1.169    10.91   17.945
 ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 45 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 108.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 45.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:             <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.3478   0.3890   0.1336            0.0359   0.0003   0.0020   0.0860   0.0054   1.0000
 ------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    17.74    20.30    26.45    21.87     7.62    0.717    0.606    1.158    10.79   18.031
 ------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 46 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 109.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV
```

```
* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.85     20.42     26.60     22.00      7.67     0.716     0.605     1.156     10.73    18.140
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 47 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 110.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 47.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.95     20.54     26.75     22.13      7.72     0.715     0.605     1.154     10.67    18.243
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 48 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 111.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 48.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
```

```
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     18.05     20.65     26.89     22.25      7.77     0.715     0.604     1.152     10.62    18.343
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 49 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 112.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 49.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     18.15     20.76     27.03     22.36      7.82     0.714     0.604     1.151     10.57    18.438
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 113.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 50.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV
```

```
* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.24     20.87     27.16    22.48      7.87     0.714     0.603     1.149     10.52    18.530
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 51 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 114.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 51.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    18.35     20.99     27.31    22.61      8.02     0.717     0.606     1.158     10.52    18.642
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 52 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 115.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 52.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
```

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                      ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.46     21.11     27.46     22.73      8.17     0.720     0.608     1.168     10.52    18.751
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 53 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 116.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 53.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                      ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.3478    0.3890    0.1336             0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.56     21.22     27.61     22.85      8.32     0.722     0.610     1.176     10.52    18.855
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 54 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 117.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
```

```
           The user supplied arterial average speed of 54.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                    ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.65     21.33     27.74     22.97      8.45     0.725     0.612     1.185     10.52    18.955
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 55 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 118.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 55.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                    ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.75     21.43     27.87     23.08      8.59     0.728     0.615     1.193     10.52    19.051
 ----------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 56 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 119.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 56.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                     Calendar Year:  2010
                             Month:  July
                          Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :    18.86     21.55     28.03     23.21      8.87     0.735     0.620     1.215     11.97    19.177
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 57 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 120.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                     Calendar Year:  2010
                             Month:  July
                          Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
```

```
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.96     21.67     28.17     23.33      9.14     0.741     0.626     1.237     13.37    19.298
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 58 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 121.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 58.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     19.06     21.79     28.32     23.46      9.40     0.748     0.631     1.257     14.73    19.415
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 59 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 122.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 59.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	19.16	21.89	28.46	23.57	9.66	0.754	0.636	1.277	16.04	19.527

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 123.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 60.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.3478	0.3890	0.1336		0.0359	0.0003	0.0020	0.0860	0.0054	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	19.25	22.00	28.59	23.69	9.90	0.760	0.641	1.297	17.30	19.636

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 61 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 124.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 61.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                    Calendar Year:  2010
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm
```

```
             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     19.36     22.12     28.74     23.81     10.36     0.772     0.651     1.335     18.75    19.769
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 62 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 125.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 62.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     19.46     22.24     28.89     23.94     10.81     0.784     0.660     1.371     20.15    19.897
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 63 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 126.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 63.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                   Calendar Year:  2010
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
```

```
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     19.57     22.35     29.03     24.06     11.24     0.795     0.669     1.407     21.50    20.021
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 64 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 127.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 64.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b

                  Calendar Year:  2010
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     19.66     22.46     29.17     24.18     11.66     0.806     0.678     1.441     22.82    20.142
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 65 mph 2010 ARTERIAL ONLY
* File 2, Run 1, Scenario 128.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 65.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
```

```
               Calendar Year:  2010
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  20.9 (F)
         Maximum Temperature:  38.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:  13.5 psi
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  Yes
             Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000    (All)
                     ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:   0.3478    0.3890    0.1336              0.0359    0.0003    0.0020    0.0860    0.0054    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :   19.76     22.57     29.30     24.29     12.06     0.816     0.686     1.475     24.09    20.258
 ---------------------------------------------------------------------------------------------------------------------
```

2030 Arterial Summer

```
***************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                              *
* Input file: C:/APPS/MOBILE62/RUN/MIDBURY/2030/SUMMER (file 3, run 1).   *
***************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2.5 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
  -------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      2.550    2.679    3.745    2.952    2.926    0.117    0.280    0.744     8.19    2.666
    Composite NOX :      0.404    0.585    0.867    0.657    0.138    0.045    0.208    1.014     1.18    0.601
  -------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 3 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  3.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
              GVWR:              <6000    >6000    (All)
                       ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
  -------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      2.027    2.166    3.022    2.385    2.352    0.113    0.270    0.714     7.26    2.157
    Composite NOX :      0.387    0.562    0.832    0.631    0.139    0.044    0.202    0.980     1.15    0.577
  -------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  4.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
```

```
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.373	1.525	2.118	1.676	1.635	0.108	0.258	0.677	6.10	1.522
Composite NOX :	0.366	0.533	0.788	0.598	0.141	0.042	0.193	0.937	1.12	0.548

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 5 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  5.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.980	1.140	1.575	1.251	1.205	0.105	0.250	0.654	5.40	1.140
Composite NOX :	0.353	0.515	0.762	0.578	0.142	0.041	0.188	0.911	1.10	0.530

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 6 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  6.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.837	0.984	1.359	1.080	1.034	0.098	0.235	0.607	4.69	0.985
Composite NOX :	0.331	0.485	0.717	0.544	0.144	0.039	0.177	0.860	1.08	0.500

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 7 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 6.
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  7.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.735     0.873     1.205     0.957     0.912     0.094     0.224     0.574      4.19     0.875
     Composite NOX :     0.316     0.463     0.686     0.520     0.146     0.037     0.170     0.823      1.06     0.478
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 8 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  8.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.658     0.789     1.089     0.866     0.820     0.090     0.215     0.549      3.81     0.792
     Composite NOX :     0.304     0.447     0.662     0.502     0.147     0.036     0.164     0.795      1.05     0.461
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 9 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  9.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.598	0.724	0.999	0.794	0.749	0.088	0.209	0.529	3.52	0.727
Composite NOX :	0.295	0.434	0.644	0.487	0.148	0.035	0.160	0.773	1.04	0.448

* #
* 10 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 9.
* #

M583 Warning:
The user supplied arterial average speed of 10.0 will be used for all hours of the day. 100% of VMT has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.550	0.672	0.927	0.737	0.692	0.085	0.204	0.513	3.28	0.676
Composite NOX :	0.287	0.424	0.629	0.476	0.149	0.034	0.156	0.756	1.03	0.438

* #
* 11 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 10.
* #

M583 Warning:
The user supplied arterial average speed of 11.0 will be used for all hours of the day. 100% of VMT has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.518	0.632	0.874	0.694	0.647	0.082	0.195	0.486	3.09	0.636
Composite NOX :	0.276	0.408	0.606	0.459	0.151	0.033	0.151	0.727	1.04	0.422

* #
* 12 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 11.
* #

M583 Warning:
The user supplied arterial average speed of 12.0 will be used for all hours of the day. 100% of VMT has been assigned to the arterial/collector roadway type for all hours of the day and all vehicle types.

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

```
                Calendar Year:  2030
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  51.4 (F)
          Maximum Temperature:  71.7 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   8.7 psi
                Weathered RVP:   8.7 psi
          Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
             Reformulated Gas:   No

     Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:               <6000    >6000    (All)
                      ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
  VMT Distribution:   0.2788    0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :    0.491     0.599    0.830    0.658    0.609    0.078    0.187    0.463     2.92     0.603
    Composite NOX :    0.267     0.395    0.587    0.444    0.152    0.032    0.146    0.703     1.04     0.409
 -----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 13 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 12.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 13.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                Calendar Year:  2030
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  51.4 (F)
          Maximum Temperature:  71.7 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   8.7 psi
                Weathered RVP:   8.7 psi
          Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
             Reformulated Gas:   No

     Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:               <6000    >6000    (All)
                      ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
  VMT Distribution:   0.2788    0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :    0.469     0.571    0.792    0.628    0.577    0.076    0.181    0.443     2.78     0.575
    Composite NOX :    0.259     0.384    0.571    0.432    0.154    0.031    0.142    0.683     1.04     0.398
 -----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 14 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 13.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 14.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                Calendar Year:  2030
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  51.4 (F)
          Maximum Temperature:  71.7 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:   8.7 psi
                Weathered RVP:   8.7 psi
          Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
             Reformulated Gas:   No

     Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:               <6000    >6000    (All)
                      ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
  VMT Distribution:   0.2788    0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :    0.449     0.547    0.760    0.601    0.549    0.073    0.175    0.427     2.67     0.551
    Composite NOX :    0.252     0.374    0.558    0.421    0.155    0.030    0.138    0.665     1.05     0.388
 -----------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 15 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 14.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 15.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.432     0.526     0.733     0.579     0.526     0.071     0.170     0.412      2.56     0.531
    Composite NOX :     0.246     0.366     0.546     0.412     0.156     0.029     0.135     0.650      1.05     0.380
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 16 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 15.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 16.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.416     0.504     0.705     0.556     0.500     0.069     0.164     0.394      2.48     0.509
    Composite NOX :     0.241     0.359     0.536     0.404     0.158     0.029     0.131     0.632      1.06     0.372
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 17 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 16.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 17.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
```

```
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                       ------    ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.401     0.485    0.680    0.535     0.478     0.067     0.159     0.377      2.41     0.490
    Composite NOX :     0.236     0.352    0.526    0.397     0.159     0.028     0.128     0.617      1.07     0.365
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 18 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 17.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 18.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  51.4 (F)
             Maximum Temperature:  71.7 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   8.7 psi
                   Weathered RVP:   8.7 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                       ------    ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.388     0.468    0.659    0.517     0.458     0.065     0.154     0.363      2.34     0.474
    Composite NOX :     0.232     0.347    0.518    0.391     0.161     0.027     0.125     0.603      1.09     0.359
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 19 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 18.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 19.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  51.4 (F)
             Maximum Temperature:  71.7 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   8.7 psi
                   Weathered RVP:   8.7 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                       ------    ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.376     0.453    0.639    0.500     0.440     0.063     0.150     0.350      2.28     0.459
    Composite NOX :     0.228     0.342    0.511    0.385     0.162     0.027     0.123     0.590      1.10     0.354
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 20 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 19.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
```

```
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :      0.365     0.439     0.622     0.486     0.424     0.061     0.146     0.338      2.23     0.445
    Composite NOX :      0.225     0.337     0.504     0.380     0.163     0.026     0.121     0.579      1.10     0.349
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 21 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 20.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 21.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :      0.358     0.430     0.610     0.476     0.411     0.059     0.141     0.325      2.18     0.435
    Composite NOX :      0.222     0.333     0.499     0.375     0.165     0.026     0.118     0.568      1.12     0.345
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 22 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 21.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 22.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :      0.351     0.423     0.599     0.468     0.399     0.058     0.138     0.313      2.14     0.427
```

```
    Composite NOX :      0.219     0.329     0.493     0.371     0.167    0.025     0.117     0.559      1.14     0.341
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 23 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 22.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 23.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.344     0.416     0.589     0.460     0.387    0.056     0.134     0.302      2.10     0.419
    Composite NOX :      0.217     0.326     0.488     0.367     0.168    0.025     0.115     0.550      1.15     0.337
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 24 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 23.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 24.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.338     0.409     0.580     0.453     0.377    0.055     0.131     0.293      2.06     0.411
    Composite NOX :      0.215     0.323     0.484     0.364     0.169    0.025     0.113     0.542      1.16     0.334
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 25 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 24.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
```

```
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                         ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
   ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.333     0.403     0.571     0.446     0.368     0.054     0.128     0.283      2.02     0.405
     Composite NOX :     0.212     0.320     0.479     0.361     0.170     0.024     0.112     0.534      1.18     0.331
   ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 26 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 25.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 26.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                         ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
   ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.328     0.398     0.564     0.441     0.359     0.052     0.125     0.274      1.99     0.399
     Composite NOX :     0.211     0.317     0.476     0.358     0.172     0.024     0.111     0.529      1.19     0.328
   ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 27 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 26.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 27.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                         ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
   ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.324     0.394     0.558     0.436     0.351     0.051     0.122     0.265      1.96     0.394
     Composite NOX :     0.209     0.315     0.472     0.355     0.174     0.024     0.110     0.524      1.20     0.326
   ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 28 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 27.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 28.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
```

```
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                      ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :      0.320     0.390     0.553    0.431     0.344     0.050     0.119     0.257      1.93     0.389
   Composite NOX :      0.207     0.312     0.469    0.352     0.175     0.024     0.109     0.519      1.22     0.324
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 29 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 28.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 29.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                      ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :      0.316     0.386     0.547    0.427     0.337     0.049     0.117     0.250      1.90     0.384
   Composite NOX :      0.205     0.310     0.466    0.350     0.176     0.024     0.108     0.515      1.23     0.322
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 30 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 29.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 30.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000    (All)
                      ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
```

```
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.312     0.382     0.542     0.423     0.330   0.048     0.114     0.243      1.87     0.380
     Composite NOX :      0.204     0.308     0.463     0.348     0.178   0.023     0.107     0.511      1.24     0.320
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 31 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 30.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.309     0.379     0.537     0.419     0.324   0.047     0.112     0.236      1.84     0.375
     Composite NOX :      0.203     0.307     0.461     0.346     0.179   0.023     0.107     0.510      1.25     0.319
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 32 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 31.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 32.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.305     0.375     0.532     0.415     0.319   0.046     0.110     0.230      1.82     0.371
     Composite NOX :      0.203     0.306     0.460     0.345     0.181   0.023     0.106     0.509      1.26     0.318
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 33 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 32.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
```

```
              Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   8.7 psi
                   Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
               GVWR:              <6000    >6000    (All)
                       ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
   VMT Distribution:   0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.302     0.372    0.527    0.412    0.313    0.045    0.108    0.224     1.79     0.368
     Composite NOX :      0.202     0.305    0.459    0.344    0.182    0.023    0.106    0.508     1.27     0.317
  -------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 34 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 33.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 34.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   8.7 psi
                   Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
               GVWR:              <6000    >6000    (All)
                       ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
   VMT Distribution:   0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.299     0.369    0.523    0.409    0.308    0.045    0.106    0.218     1.77     0.364
     Composite NOX :      0.201     0.304    0.458    0.343    0.184    0.023    0.106    0.507     1.28     0.317
  -------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 35 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 34.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 35.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:   8.7 psi
                   Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
               GVWR:              <6000    >6000    (All)
                       ------    ------   ------   ------   ------   ------   ------   ------   ------    ------
   VMT Distribution:   0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.297     0.367    0.519    0.406    0.304    0.044    0.104    0.213     1.75     0.361
     Composite NOX :      0.201     0.304    0.456    0.343    0.185    0.023    0.106    0.506     1.29     0.316
  -------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 36 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 35.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
```

```
          The user supplied arterial average speed of 36.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     0.294     0.365     0.516     0.404     0.299     0.043     0.103     0.208      1.73     0.358
    Composite NOX :     0.201     0.305     0.458     0.344     0.186     0.023     0.107     0.509      1.30     0.317
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 37 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 36.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 37.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     0.293     0.363     0.514     0.402     0.295     0.043     0.101     0.203      1.71     0.356
    Composite NOX :     0.202     0.306     0.459     0.345     0.188     0.023     0.107     0.512      1.31     0.318
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 38 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 37.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 38.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
```

GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.291	0.362	0.512	0.400	0.292	0.042	0.100	0.199	1.70	0.354
Composite NOX :	0.203	0.307	0.460	0.346	0.189	0.024	0.108	0.515	1.31	0.319

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 39 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 38.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 39.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.289	0.360	0.509	0.399	0.288	0.041	0.098	0.195	1.68	0.352
Composite NOX :	0.203	0.307	0.462	0.347	0.191	0.024	0.108	0.517	1.32	0.320

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 40 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 39.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 40.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No
```

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.287	0.359	0.507	0.397	0.284	0.041	0.097	0.191	1.67	0.350
Composite NOX :	0.204	0.308	0.463	0.348	0.192	0.024	0.109	0.520	1.33	0.321

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
* 41 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 40.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 41.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
```

```
                 Altitude:  Low
      Minimum Temperature:  51.4 (F)
      Maximum Temperature:  71.7 (F)
        Absolute Humidity:   75. grains/lb
         Nominal Fuel RVP:   8.7 psi
            Weathered RVP:   8.7 psi
      Fuel Sulfur Content:   30. ppm

      Exhaust I/M Program:  No
         Evap I/M Program:  No
              ATP Program:  Yes
         Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000    (All)
                     ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:   0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.285     0.358     0.505    0.395     0.281     0.040     0.096     0.187      1.66     0.348
   Composite NOX :    0.205     0.310     0.464    0.349     0.194     0.024     0.110     0.527      1.33     0.323
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 42 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 41.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 42.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

            Calendar Year:  2030
                    Month:  July
                 Altitude:  Low
      Minimum Temperature:  51.4 (F)
      Maximum Temperature:  71.7 (F)
        Absolute Humidity:   75. grains/lb
         Nominal Fuel RVP:   8.7 psi
            Weathered RVP:   8.7 psi
      Fuel Sulfur Content:   30. ppm

      Exhaust I/M Program:  No
         Evap I/M Program:  No
              ATP Program:  Yes
         Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000    (All)
                     ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:   0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.284     0.356     0.503    0.394     0.278     0.040     0.095     0.184      1.65     0.346
   Composite NOX :    0.206     0.311     0.466    0.351     0.195     0.024     0.112     0.534      1.34     0.325
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 43 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 42.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 43.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

            Calendar Year:  2030
                    Month:  July
                 Altitude:  Low
      Minimum Temperature:  51.4 (F)
      Maximum Temperature:  71.7 (F)
        Absolute Humidity:   75. grains/lb
         Nominal Fuel RVP:   8.7 psi
            Weathered RVP:   8.7 psi
      Fuel Sulfur Content:   30. ppm

      Exhaust I/M Program:  No
         Evap I/M Program:  No
              ATP Program:  Yes
         Reformulated Gas:  No

     Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000    (All)
                     ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:   0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :    0.282     0.355     0.501    0.392     0.275     0.039     0.094     0.181      1.64     0.344
   Composite NOX :    0.206     0.312     0.468    0.352     0.196     0.025     0.113     0.540      1.34     0.327
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 44 mph 2030 ARTERIAL ONLY
```

```
* File 3, Run 1, Scenario 43.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 44.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.280     0.354     0.499     0.391     0.273    0.039     0.093     0.178      1.63     0.343
     Composite NOX :      0.207     0.314     0.470     0.354     0.198    0.025     0.114     0.547      1.35     0.328
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 45 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 44.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 45.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :      0.279     0.353     0.497     0.390     0.270    0.039     0.092     0.175      1.62     0.341
     Composite NOX :      0.208     0.315     0.471     0.355     0.199    0.025     0.115     0.553      1.35     0.330
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 46 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 45.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
```

```
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.277     0.351     0.495     0.388     0.267     0.038     0.091     0.172      1.62     0.339
    Composite NOX :     0.209     0.316     0.473     0.356     0.201     0.026     0.118     0.565      1.37     0.332
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 47 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 46.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.276     0.350     0.493     0.387     0.265     0.038     0.090     0.170      1.61     0.338
    Composite NOX :     0.210     0.318     0.475     0.358     0.202     0.026     0.120     0.577      1.38     0.335
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 48 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 47.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 48.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.274     0.349     0.491     0.385     0.263     0.038     0.089     0.168      1.61     0.336
    Composite NOX :     0.211     0.319     0.477     0.359     0.204     0.027     0.122     0.588      1.40     0.337
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 49 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 48.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 49.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12
```

```
              Calendar Year:  2030
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  51.4 (F)
        Maximum Temperature:  71.7 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   8.7 psi
              Weathered RVP:   8.7 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  Yes
           Reformulated Gas:  No

    Vehicle Type:     LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
            GVWR:             <6000    >6000    (All)
                    ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
VMT Distribution:   0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
-----------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :   0.273    0.348    0.489    0.384    0.261    0.037    0.089    0.166     1.61    0.335
   Composite NOX :   0.212    0.320    0.478    0.361    0.205    0.027    0.125    0.599     1.42    0.339
-----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 49.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
           The user supplied arterial average speed of 50.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
 M 48 Warning:
             there are no sales for vehicle class HDGV8b
 M 48 Warning:
             there are no sales for vehicle class LDDT12

              Calendar Year:  2030
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  51.4 (F)
        Maximum Temperature:  71.7 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   8.7 psi
              Weathered RVP:   8.7 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  Yes
           Reformulated Gas:  No

    Vehicle Type:     LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
            GVWR:             <6000    >6000    (All)
                    ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
VMT Distribution:   0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
-----------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :   0.272    0.347    0.487    0.383    0.259    0.037    0.088    0.164     1.60    0.333
   Composite NOX :   0.212    0.321    0.480    0.362    0.206    0.028    0.127    0.609     1.43    0.341
-----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 51 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 50.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
           The user supplied arterial average speed of 51.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.
 M 48 Warning:
             there are no sales for vehicle class HDGV8b
 M 48 Warning:
             there are no sales for vehicle class LDDT12

              Calendar Year:  2030
                      Month:  July
                   Altitude:  Low
        Minimum Temperature:  51.4 (F)
        Maximum Temperature:  71.7 (F)
          Absolute Humidity:   75. grains/lb
           Nominal Fuel RVP:   8.7 psi
              Weathered RVP:   8.7 psi
        Fuel Sulfur Content:   30. ppm

        Exhaust I/M Program:  No
           Evap I/M Program:  No
                ATP Program:  Yes
           Reformulated Gas:  No

    Vehicle Type:     LDGV   LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
            GVWR:             <6000    >6000    (All)
                    ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
VMT Distribution:   0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
-----------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite VOC :   0.270    0.345    0.485    0.381    0.257    0.037    0.088    0.162     1.60    0.332
   Composite NOX :   0.213    0.323    0.482    0.363    0.208    0.028    0.131    0.628     1.46    0.344
-----------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 52 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 51.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 52.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.269     0.344     0.483     0.380     0.255     0.037     0.087     0.161      1.60     0.331
     Composite NOX :     0.214     0.324     0.484     0.365     0.209     0.029     0.134     0.646      1.50     0.347
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 53 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 52.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 53.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :     0.268     0.343     0.481     0.378     0.253     0.037     0.087     0.159      1.60     0.329
     Composite NOX :     0.215     0.326     0.485     0.366     0.211     0.030     0.138     0.663      1.53     0.350
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 54 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 53.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 54.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:               <6000    >6000    (All)
                       ------    ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :    0.266     0.342    0.479    0.377    0.252    0.036    0.086    0.158     1.60    0.328
     Composite NOX :    0.216     0.327    0.487    0.368    0.212    0.031    0.141    0.680     1.56    0.353
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 55 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 54.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 55.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:               <6000    >6000    (All)
                       ------    ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :    0.265     0.341    0.477    0.376    0.250    0.036    0.086    0.157     1.60    0.327
     Composite NOX :    0.217     0.328    0.489    0.369    0.214    0.031    0.144    0.696     1.59    0.355
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 56 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 55.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 56.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:               <6000    >6000    (All)
                       ------    ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 ---------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite VOC :    0.264     0.340    0.476    0.375    0.249    0.036    0.085    0.156     1.66    0.326
     Composite NOX :    0.218     0.330    0.491    0.371    0.215    0.033    0.150    0.723     1.62    0.359
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 57 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 56.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 57.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
  M 48 Warning:
```

```
           there are no sales for vehicle class HDGV8b
 M 48 Warning:
           there are no sales for vehicle class LDDT12

                 Calendar Year:  2030
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.263     0.339     0.474     0.374     0.248     0.036     0.085     0.155      1.72     0.325
    Composite NOX :     0.219     0.331     0.493     0.372     0.217     0.034     0.155     0.749      1.65     0.363
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 58 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 57.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
         The user supplied arterial average speed of 58.0
         will be used for all hours of the day.  100% of VMT
         has been assigned to the arterial/collector roadway
         type for all hours of the day and all vehicle types.
 M 48 Warning:
           there are no sales for vehicle class HDGV8b
 M 48 Warning:
           there are no sales for vehicle class LDDT12

                 Calendar Year:  2030
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :     0.262     0.338     0.472     0.373     0.247     0.036     0.085     0.154      1.78     0.325
    Composite NOX :     0.219     0.332     0.494     0.374     0.218     0.035     0.160     0.775      1.68     0.366
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 59 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 58.
* # # # # # # # # # # # # # # # # # # # # # # # # #
 M583 Warning:
         The user supplied arterial average speed of 59.0
         will be used for all hours of the day.  100% of VMT
         has been assigned to the arterial/collector roadway
         type for all hours of the day and all vehicle types.
 M 48 Warning:
           there are no sales for vehicle class HDGV8b
 M 48 Warning:
           there are no sales for vehicle class LDDT12

                 Calendar Year:  2030
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  51.4 (F)
           Maximum Temperature:  71.7 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:   8.7 psi
                 Weathered RVP:   8.7 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
```

```
    Composite VOC :      0.261     0.337     0.471     0.372     0.246    0.036     0.085     0.154      1.84     0.324
    Composite NOX :      0.220     0.334     0.496     0.375     0.219    0.036     0.165     0.799      1.71     0.370
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 59.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 60.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.260     0.337     0.469     0.371     0.245    0.036     0.085     0.153      1.89     0.323
    Composite NOX :      0.221     0.335     0.498     0.377     0.221    0.037     0.170     0.823      1.74     0.373
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 61 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 60.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 61.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
                    Weathered RVP:   8.7 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite VOC :      0.260     0.336     0.468     0.370     0.245    0.036     0.085     0.153      1.95     0.323
    Composite NOX :      0.222     0.336     0.500     0.378     0.222    0.039     0.178     0.863      1.77     0.378
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 62 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 61.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 62.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  51.4 (F)
              Maximum Temperature:  71.7 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:   8.7 psi
```

Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.259	0.335	0.466	0.369	0.244	0.036	0.085	0.153	2.01	0.322
Composite NOX :	0.223	0.338	0.502	0.380	0.224	0.041	0.186	0.901	1.81	0.383

* #
* 63 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 62.
* #
M583 Warning:
The user supplied arterial average speed of 63.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.258	0.334	0.465	0.368	0.244	0.036	0.085	0.153	2.07	0.322
Composite NOX :	0.224	0.339	0.504	0.381	0.225	0.042	0.193	0.938	1.84	0.387

* #
* 64 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 63.
* #
M583 Warning:
The user supplied arterial average speed of 64.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.
M 48 Warning:
there are no sales for vehicle class HDGV8b
M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: Jan.
Altitude: Low
Minimum Temperature: 51.4 (F)
Maximum Temperature: 71.7 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 8.7 psi
Weathered RVP: 8.7 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2790	0.4400	0.1500		0.0363	0.0003	0.0022	0.0872	0.0050	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.260	0.322	0.471	0.360	0.247	0.035	0.085	0.153	2.19	0.318
Composite NOX :	0.226	0.322	0.515	0.371	0.228	0.044	0.201	0.991	1.87	0.387

* #
* 65 mph 2030 ARTERIAL ONLY
* File 3, Run 1, Scenario 64.
* #
M583 Warning:
The user supplied arterial average speed of 65.0
will be used for all hours of the day. 100% of VMT

```
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
 M 48 Warning:
            there are no sales for vehicle class HDGV8b
 M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  51.4 (F)
            Maximum Temperature:  71.7 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:   8.7 psi
                  Weathered RVP:   8.7 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite VOC :     0.256     0.333     0.462     0.366     0.243     0.036     0.085     0.153      2.18     0.321
    Composite NOX :     0.226     0.342     0.507     0.384     0.228     0.045     0.207     1.009      1.90     0.396
 -----------------------------------------------------------------------------------------------------------------------
```

2030 Arterial Winter

```
****************************************************************************
* MOBILE6.2.03 (24-Sep-2003)                                               *
* Input file: C:/APPS/MOBILE62/RUN/MIDBURY/2030/WINTER (file 4, run 1).   *
****************************************************************************

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2.5 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 1.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  2.5
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                       ------    ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     31.78     31.45    36.42    32.72     42.24     1.879     1.140     1.131    109.28    30.358
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 3 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 2.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  3.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
```

```
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    28.27     27.98     32.33     29.09     39.41     1.778     1.077     1.062     94.52    27.053
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 3.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  4.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    23.88     23.63     27.22     24.55     35.87     1.651     0.999     0.975     76.08    22.920
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 5 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 4.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  5.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
```

```
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    21.25     21.03     24.15     21.83     33.75     1.575     0.953     0.923     65.02    20.441
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 6 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 5.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  6.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    19.58     19.33     22.17     20.06     29.98     1.435     0.866     0.828     54.60    18.734
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 7 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 6.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  7.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV
```

```
* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     18.39     18.12     20.75     18.79     27.30     1.335     0.805     0.760     47.16    17.514
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 8 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 7.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  8.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     17.50     17.21     19.68     17.84     25.28     1.260     0.759     0.708     41.58    16.600
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 9 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 8.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  9.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
```

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                    ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    16.81     16.51     18.85     17.11     23.71     1.202     0.723     0.669     37.24    15.888
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 10 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 9.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 10.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                    ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    16.25     15.94     18.19     16.52     22.45     1.155     0.694     0.637     33.77    15.319
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* 11 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 10.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 11.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     15.83     15.50     17.67     16.05     20.63     1.085     0.651     0.588     31.01    14.844
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 12 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 11.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 12.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
```

GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):

Composite CO :	15.48	15.13	17.24	15.67	19.12	1.026	0.614	0.548	28.71	14.448

* #
* 13 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 12.
* #

M583 Warning:
The user supplied arterial average speed of 13.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 20.9 (F)
Maximum Temperature: 38.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 13.5 psi
Weathered RVP: 13.5 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000

Composite Emission Factors (g/mi):

Composite CO :	15.19	14.81	16.87	15.34	17.84	0.976	0.583	0.514	26.76	14.113

* #
* 14 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 13.
* #

M583 Warning:
The user supplied arterial average speed of 14.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 20.9 (F)
Maximum Temperature: 38.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 13.5 psi

```
             Weathered RVP:  13.5 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
          Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:     0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     14.93     14.55     16.56     15.06     16.74     0.933     0.557     0.485     25.09    13.825
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 15 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 14.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 15.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

             Calendar Year:  2030
                     Month:  July
                  Altitude:  Low
       Minimum Temperature:  20.9 (F)
       Maximum Temperature:  38.0 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:  13.5 psi
             Weathered RVP:  13.5 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
          Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:     0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     14.71     14.31     16.28     14.82     15.78     0.896     0.534     0.459     23.65    13.576
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 16 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 15.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 16.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
```

```
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.52     14.11     16.04     14.60     14.77     0.855     0.509     0.431     22.48    13.352
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 17 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 16.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 17.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.35     13.93     15.83     14.42     13.87     0.818     0.487     0.407     21.45    13.154
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 18 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 17.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 18.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV
```

```
* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.20     13.77     15.65     14.25     13.08     0.786     0.467     0.384     20.54    12.977
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 19 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 18.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 19.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.07     13.63     15.48     14.10     12.36     0.757     0.449     0.365     19.72    12.820
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 20 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 19.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV
```

```
* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     13.94     13.50     15.33     13.97     11.72     0.731     0.433     0.347     18.98    12.678
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 21 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 20.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 21.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     13.84     13.39     15.20     13.85     11.12     0.706     0.417     0.330     18.30    12.557
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 22 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 21.
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 22.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    13.75     13.29     15.09     13.75     10.57     0.683     0.403     0.314     17.68    12.446
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 23 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 22.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 23.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

```
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.66     13.20     14.99     13.66     10.08     0.662     0.390     0.300     17.12    12.345
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 24 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 23.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 24.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.59     13.12     14.89     13.57      9.62     0.643     0.378     0.286     16.60    12.253
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 25 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 24.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 25.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm
```

```
            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     13.51     13.05     14.81     13.50      9.20     0.625     0.367     0.274     16.13    12.168
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 26 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 25.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 26.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     13.47     13.00     14.76     13.45      8.83     0.609     0.357     0.263     15.65    12.113
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 27 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 26.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 27.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12
```

```
                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788   0.4388   0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     13.44    12.96    14.71    13.41      8.50     0.594     0.348     0.253     15.21    12.063
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 28 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 27.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 28.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788   0.4388   0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     13.40    12.93    14.67    13.37      8.19     0.580     0.340     0.244     14.80    12.016
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 29 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 28.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 29.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
```

* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 20.9 (F)
Maximum Temperature: 38.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 13.5 psi
Weathered RVP: 13.5 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	13.37	12.89	14.62	13.34	7.90	0.567	0.332	0.235	14.41	11.973

* #
* 30 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 29.
* #

M583 Warning:
The user supplied arterial average speed of 30.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 20.9 (F)
Maximum Temperature: 38.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 13.5 psi
Weathered RVP: 13.5 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:		<6000	>6000	(All)						
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	13.34	12.86	14.59	13.30	7.63	0.555	0.325	0.227	14.06	11.932

* #
* 31 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 30.
* #

M583 Warning:
The user supplied arterial average speed of 31.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels

```
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.34     12.87     14.60     13.31      7.41     0.545     0.318     0.220     13.71    11.929
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 32 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 31.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 32.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.35     12.88     14.61     13.32      7.21     0.536     0.313     0.214     13.39    11.926
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 33 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 32.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
```

```
           The user supplied arterial average speed of 33.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.35     12.89     14.62     13.33      7.02     0.527     0.307     0.207     13.08    11.923
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 34 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 33.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 34.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
```

```
 Composite Emission Factors (g/mi):
     Composite CO  :     13.36     12.89     14.63     13.34      6.85     0.519     0.302     0.202     12.80    11.920
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 35 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 34.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 35.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.36     12.90     14.64     13.35      6.68     0.511     0.297     0.196     12.53    11.918
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 36 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 35.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 36.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
```

```
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     13.44     13.00     14.74     13.44      6.57     0.505     0.293     0.192     12.29    11.993
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 37 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 36.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 37.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     13.52     13.08     14.85     13.53      6.46     0.499     0.290     0.188     12.07    12.064
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 38 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 37.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 38.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
```

```
                  Altitude:  Low
       Minimum Temperature:  20.9 (F)
       Maximum Temperature:  38.0 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:  13.5 psi
             Weathered RVP:  13.5 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
         Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    13.60     13.17     14.94     13.62      6.36     0.494     0.287     0.185     11.85    12.132
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 39 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 38.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 39.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

             Calendar Year:  2030
                     Month:  July
                  Altitude:  Low
       Minimum Temperature:  20.9 (F)
       Maximum Temperature:  38.0 (F)
         Absolute Humidity:   75. grains/lb
          Nominal Fuel RVP:  13.5 psi
             Weathered RVP:  13.5 psi
       Fuel Sulfur Content:   30. ppm

       Exhaust I/M Program:  No
          Evap I/M Program:  No
               ATP Program:  Yes
         Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    13.67     13.25     15.03     13.70      6.27     0.489     0.283     0.181     11.65    12.196
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 40 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 39.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 40.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV
```

```
* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.74     13.32     15.12     13.78      6.18     0.484     0.280     0.178     11.46    12.257
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 41 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 40.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 41.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.82     13.42     15.23     13.88      6.15     0.481     0.279     0.176     11.31    12.335
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 42 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 41.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 42.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV
```

```
* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788   0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.90    13.50     15.33     13.97      6.12     0.478     0.277     0.174     11.17    12.409
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 43 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 42.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 43.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788   0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.98    13.59     15.43     14.06      6.09     0.475     0.275     0.172     11.04    12.480
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 44 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 43.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 44.0
          will be used for all hours of the day.  100% of VMT
```

```
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.05     13.67     15.52     14.14      6.07     0.473     0.274     0.170     10.91    12.547
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 45 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 44.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 45.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.12     13.75     15.61     14.22      6.04     0.470     0.272     0.169     10.79    12.612
```

```
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 46 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 45.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 46.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788   0.4388   0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.20     13.84    15.71    14.32      6.09     0.470     0.272     0.168     10.73    12.692
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 47 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 46.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 47.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
```

```
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.28     13.93     15.82     14.41      6.13     0.469     0.272     0.168     10.67    12.769
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 48 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 47.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 48.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.35     14.01     15.91     14.50      6.17     0.469     0.271     0.168     10.62    12.843
 ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 49 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 48.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 49.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
```

```
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     14.43     14.09     16.01     14.58      6.21     0.469     0.271     0.168     10.57    12.913
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 50 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 49.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 50.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     14.50     14.17     16.09     14.66      6.24     0.468     0.271     0.167     10.52    12.981
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 51 mph 2030 ATERIAL ONLY
* File 4, Run 1, Scenario 50.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 51.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
```

```
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.58     14.26     16.20    14.75      6.37     0.470     0.272     0.169     10.52    13.065
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 52 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 51.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 52.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.66     14.35     16.30    14.85      6.48     0.472     0.273     0.170     10.52    13.144
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 53 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 52.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 53.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV
```

```
* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.73     14.43     16.40     14.93      6.60     0.474     0.275     0.171     10.52    13.221
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 54 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 53.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 54.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.80     14.51     16.49     15.02      6.71     0.476     0.276     0.173     10.52    13.295
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 55 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 54.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 55.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.
```

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788   0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.88    14.59     16.58     15.10      6.81     0.478     0.277     0.174     10.52    13.367
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 56 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 55.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 56.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788   0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.96    14.68     16.68     15.19      7.04     0.482     0.280     0.177     11.97    13.461
  -----------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 57 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 56.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 57.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  July
                          Altitude:  Low
               Minimum Temperature:  20.9 (F)
               Maximum Temperature:  38.0 (F)
                 Absolute Humidity:   75. grains/lb
                  Nominal Fuel RVP:  13.5 psi
                     Weathered RVP:  13.5 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  Yes
                  Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.03     14.77     16.79     15.28      7.25     0.487     0.283     0.180     13.37    13.551
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 58 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 57.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 58.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                     Calendar Year:  2030
                             Month:  July
                          Altitude:  Low
               Minimum Temperature:  20.9 (F)
               Maximum Temperature:  38.0 (F)
                 Absolute Humidity:   75. grains/lb
                  Nominal Fuel RVP:  13.5 psi
                     Weathered RVP:  13.5 psi
               Fuel Sulfur Content:   30. ppm

               Exhaust I/M Program:  No
                  Evap I/M Program:  No
                       ATP Program:  Yes
                  Reformulated Gas:  No
```

```
      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.11     14.85     16.88     15.37      7.46     0.491     0.285     0.183     14.73    13.639
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 59 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 58.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 59.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.18     14.93     16.98     15.46      7.66     0.496     0.288     0.186     16.04    13.724
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 59.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 60.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
```

```
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                       ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788   0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     15.25     15.01     17.07     15.54      7.86     0.500     0.290     0.189     17.30    13.805
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 61 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 60.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 61.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                 Calendar Year:  2030
                         Month:  July
                      Altitude:  Low
           Minimum Temperature:  20.9 (F)
           Maximum Temperature:  38.0 (F)
             Absolute Humidity:   75. grains/lb
              Nominal Fuel RVP:  13.5 psi
                 Weathered RVP:  13.5 psi
           Fuel Sulfur Content:   30. ppm

           Exhaust I/M Program:  No
              Evap I/M Program:  No
                   ATP Program:  Yes
              Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                       ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788   0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     15.33     15.10     17.17     15.63      8.22     0.508     0.295     0.194     18.75    13.904
  -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 62 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 61.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 62.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
```

```
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    15.41     15.19     17.27     15.72      8.58     0.516     0.300     0.200     20.15    14.000
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 63 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 62.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 63.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    15.49     15.27     17.37     15.81      8.92     0.523     0.305     0.205     21.50    14.092
  -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 64 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 63.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 64.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
```

```
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.56     15.35     17.46     15.89      9.25     0.531     0.309     0.210     22.82    14.182
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 65 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 64.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 65.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.63     15.43     17.55     15.98      9.57     0.538     0.314     0.215     24.09    14.269
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 2.5 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 65.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  2.5
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
```

```
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
   ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     31.78     31.45     36.42     32.72     42.24     1.879     1.140     1.131    109.28    30.358
   ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 3 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 66.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  3.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
   ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     28.27     27.98     32.33     29.09     39.41     1.778     1.077     1.062     94.52    27.053
   ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 4 mph 2030 ARTERIAL ONLY
```

```
* File 4, Run 1, Scenario 67.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  4.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     23.88     23.63     27.22     24.55     35.87     1.651     0.999     0.975     76.08    22.920
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 5 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 68.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  5.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
```

```
                      ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:   0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 -----------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    21.25    21.03    24.15    21.83    33.75    1.575    0.953    0.923    65.02   20.441
 -----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 6 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 69.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  6.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:              <6000    >6000    (All)
                      ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:   0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 -----------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    19.58    19.33    22.17    20.06    29.98    1.435    0.866    0.828    54.60   18.734
 -----------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 7 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 70.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of  7.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
```

```
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     18.39     18.12     20.75     18.79     27.30     1.335     0.805     0.760     47.16    17.514
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 8 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 71.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  8.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     17.50     17.21     19.68     17.84     25.28     1.260     0.759     0.708     41.58    16.600
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 9 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 72.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of  9.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12
```

```
                Calendar Year:  2030
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  20.9 (F)
          Maximum Temperature:  38.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:  13.5 psi
                Weathered RVP:  13.5 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  Yes
             Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     16.81     16.51     18.85     17.11     23.71     1.202     0.723     0.669     37.24    15.888
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 10 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 73.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 10.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                Calendar Year:  2030
                        Month:  July
                     Altitude:  Low
          Minimum Temperature:  20.9 (F)
          Maximum Temperature:  38.0 (F)
            Absolute Humidity:   75. grains/lb
             Nominal Fuel RVP:  13.5 psi
                Weathered RVP:  13.5 psi
          Fuel Sulfur Content:   30. ppm

          Exhaust I/M Program:  No
             Evap I/M Program:  No
                  ATP Program:  Yes
             Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     16.25     15.94     18.19     16.52     22.45     1.155     0.694     0.637     33.77    15.319
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 11 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 74.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 11.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV
```

```
* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.83     15.50     17.67     16.05     20.63     1.085     0.651     0.588     31.01    14.844
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 12 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 75.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 12.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.48     15.13     17.24     15.67     19.12     1.026     0.614     0.548     28.71    14.448
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 13 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 76.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 13.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV
```

```
* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.19     14.81     16.87     15.34     17.84     0.976     0.583     0.514     26.76    14.113
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 14 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 77.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 14.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     14.93     14.55     16.56     15.06     16.74     0.933     0.557     0.485     25.09    13.825
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 15 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 78.
* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
  M583 Warning:
            The user supplied arterial average speed of 15.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000    (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    14.71     14.31     16.28     14.82     15.78     0.896     0.534     0.459     23.65    13.576
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 16 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 79.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 16.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:     LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:              <6000     >6000    (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:   0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
```

```
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      14.52     14.11     16.04     14.60     14.77     0.855     0.509     0.431     22.48    13.352
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 17 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 80.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 17.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:       LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:                <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:     0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :      14.35     13.93     15.83     14.42     13.87     0.818     0.487     0.407     21.45    13.154
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 18 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 81.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 18.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm
```

```
             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.20     13.77     15.65     14.25     13.08     0.786     0.467     0.384     20.54    12.977
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 19 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 82.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 19.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.07     13.63     15.48     14.10     12.36     0.757     0.449     0.365     19.72    12.820
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 20 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 83.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 20.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
```

```
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  20.9 (F)
         Maximum Temperature:  38.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:  13.5 psi
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.94     13.50     15.33     13.97     11.72     0.731     0.433     0.347     18.98    12.678
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 21 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 84.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 21.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

               Calendar Year:  2030
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  20.9 (F)
         Maximum Temperature:  38.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:  13.5 psi
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                        ------   ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.84     13.39     15.20     13.85     11.12     0.706     0.417     0.330     18.30    12.557
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 22 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 85.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 22.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV
```

```
* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    13.75     13.29     15.09     13.75     10.57     0.683     0.403     0.314     17.68    12.446
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 23 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 86.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 23.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    13.66     13.20     14.99     13.66     10.08     0.662     0.390     0.300     17.12    12.345
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 24 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 87.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 24.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV
```

```
* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.59     13.12     14.89     13.57      9.62     0.643     0.378     0.286     16.60    12.253
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 25 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 88.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 25.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.51     13.05     14.81     13.50      9.20     0.625     0.367     0.274     16.13    12.168
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 26 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 89.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 26.0
```

```
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.47     13.00     14.76     13.45      8.83     0.609     0.357     0.263     15.65    12.113
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 27 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 90.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 27.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                         ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
```

```
    Composite CO  :     13.44     12.96     14.71     13.41      8.50     0.594     0.348     0.253     15.21    12.063
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 28 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 91.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 28.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     13.40     12.93     14.67     13.37      8.19     0.580     0.340     0.244     14.80    12.016
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 29 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 92.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 29.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
```

```
                 ATP Program:  Yes
            Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     13.37     12.89     14.62     13.34      7.90     0.567     0.332     0.235     14.41    11.973
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 30 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 93.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 30.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

               Calendar Year:  2030
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  20.9 (F)
         Maximum Temperature:  38.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:  13.5 psi
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :     13.34     12.86     14.59     13.30      7.63     0.555     0.325     0.227     14.06    11.932
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 31 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 94.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 31.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

               Calendar Year:  2030
                       Month:  July
                    Altitude:  Low
```

```
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 --------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     13.34     12.87     14.60     13.31      7.41     0.545     0.318     0.220     13.71    11.929
 --------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 32 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 95.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 32.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 --------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
   Composite CO  :     13.35     12.88     14.61     13.32      7.21     0.536     0.313     0.214     13.39    11.926
 --------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 33 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 96.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 33.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
```

```
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     13.35     12.89     14.62     13.33      7.02     0.527     0.307     0.207     13.08    11.923
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 34 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 97.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 34.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     13.36     12.89     14.63     13.34      6.85     0.519     0.302     0.202     12.80    11.920
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 35 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 98.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 35.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
```

```
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.36     12.90     14.64     13.35      6.68     0.511     0.297     0.196     12.53    11.918
  ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 36 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 99.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 36.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.44     13.00     14.74     13.44      6.57     0.505     0.293     0.192     12.29    11.993
  ----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 37 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 100.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 37.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
```

```
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    13.52     13.08     14.85     13.53      6.46     0.499     0.290     0.188     12.07    12.064
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 38 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 101.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
           The user supplied arterial average speed of 38.0
           will be used for all hours of the day.  100% of VMT
           has been assigned to the arterial/collector roadway
           type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
             there are no sales for vehicle class HDGV8b
  M 48 Warning:
             there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    13.60     13.17     14.94     13.62      6.36     0.494     0.287     0.185     11.85    12.132
 -----------------------------------------------------------------------------------------------------------------------
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 39 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 102.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 39.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	13.67	13.25	15.03	13.70	6.27	0.489	0.283	0.181	11.65	12.196

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 40 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 103.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 40.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No
```

```
     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:              <6000     >6000     (All)
                       ------   ------    ------    ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507             0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    13.74     13.32     15.12     13.78     6.18    0.484    0.280    0.178    11.46    12.257
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 41 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 104.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 41.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC   All Veh
             GVWR:              <6000     >6000     (All)
                       ------   ------    ------    ------   ------   ------   ------   ------   ------    ------
 VMT Distribution:    0.2788    0.4388    0.1507             0.0365   0.0003   0.0022   0.0876   0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    13.82     13.42     15.23     13.88     6.15    0.481    0.279    0.176    11.31    12.335
 -------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 42 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 105.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 42.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
```

```
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 -------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.90     13.50    15.33    13.97     6.12    0.478    0.277    0.174    11.17   12.409
 -------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 43 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 106.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 43.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12   LDGT34     LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:               <6000    >6000    (All)
                        ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:    0.2788    0.4388   0.1507             0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 -------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     13.98     13.59    15.43    14.06     6.09    0.475    0.275    0.172    11.04   12.480
 -------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 44 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 107.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 44.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
```

```
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.05     13.67     15.52     14.14      6.07     0.473     0.274     0.170     10.91    12.547
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 45 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 108.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 45.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34     LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000    (All)
                       ------    ------    ------   ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507             0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.12     13.75     15.61     14.22      6.04     0.470     0.272     0.169     10.79    12.612
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 46 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 109.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 46.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV
```

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 20.9 (F)
Maximum Temperature: 38.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 13.5 psi
Weathered RVP: 13.5 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	14.20	13.84	15.71	14.32	6.09	0.470	0.272	0.168	10.73	12.692

* #
* 47 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 110.
* #

M583 Warning:
The user supplied arterial average speed of 47.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV

M 48 Warning:
there are no sales for vehicle class HDGV8b

M 48 Warning:
there are no sales for vehicle class LDDT12

Calendar Year: 2030
Month: July
Altitude: Low
Minimum Temperature: 20.9 (F)
Maximum Temperature: 38.0 (F)
Absolute Humidity: 75. grains/lb
Nominal Fuel RVP: 13.5 psi
Weathered RVP: 13.5 psi
Fuel Sulfur Content: 30. ppm

Exhaust I/M Program: No
Evap I/M Program: No
ATP Program: Yes
Reformulated Gas: No

Vehicle Type: GVWR:	LDGV	LDGT12 <6000	LDGT34 >6000	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
VMT Distribution:	0.2788	0.4388	0.1507		0.0365	0.0003	0.0022	0.0876	0.0051	1.0000
Composite Emission Factors (g/mi):										
Composite CO :	14.28	13.93	15.82	14.41	6.13	0.469	0.272	0.168	10.67	12.769

* #
* 48 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 111.
* #

M583 Warning:
The user supplied arterial average speed of 48.0
will be used for all hours of the day. 100% of VMT
has been assigned to the arterial/collector roadway
type for all hours of the day and all vehicle types.

```
* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    14.35     14.01     15.91     14.50      6.17     0.469     0.271     0.168     10.62    12.843
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 49 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 112.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 49.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    14.43     14.09     16.01     14.58      6.21     0.469     0.271     0.168     10.57    12.913
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
```

```
* 50 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 113.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 50.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     14.50     14.17     16.09     14.66      6.24     0.468     0.271     0.167     10.52    12.981
 ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 51 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 114.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 51.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
```

```
             GVWR:              <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :      14.58     14.26     16.20     14.75      6.37     0.470     0.272     0.169     10.52    13.065
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 52 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 115.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 52.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                     ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:              <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :      14.66     14.35     16.30     14.85      6.48     0.472     0.273     0.170     10.52    13.144
 -------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 53 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 116.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 53.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
```

```
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No

      Vehicle Type:     LDGV   LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:             <6000    >6000   (All)
                      ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:   0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 ---------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    14.73    14.43    16.40    14.93     6.60    0.474    0.275    0.171    10.52   13.221
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 54 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 117.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 54.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

               Calendar Year:  2030
                       Month:  July
                    Altitude:  Low
         Minimum Temperature:  20.9 (F)
         Maximum Temperature:  38.0 (F)
           Absolute Humidity:   75. grains/lb
            Nominal Fuel RVP:  13.5 psi
               Weathered RVP:  13.5 psi
         Fuel Sulfur Content:   30. ppm

         Exhaust I/M Program:  No
            Evap I/M Program:  No
                 ATP Program:  Yes
            Reformulated Gas:  No

      Vehicle Type:     LDGV   LDGT12   LDGT34    LDGT     HDGV     LDDV     LDDT     HDDV       MC  All Veh
              GVWR:             <6000    >6000   (All)
                      ------   ------   ------   ------   ------   ------   ------   ------   ------   ------
  VMT Distribution:   0.2788   0.4388   0.1507            0.0365   0.0003   0.0022   0.0876   0.0051   1.0000
 ---------------------------------------------------------------------------------------------------------------
Composite Emission Factors (g/mi):
    Composite CO  :    14.80    14.51    16.49    15.02     6.71    0.476    0.276    0.173    10.52   13.295
 ---------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 55 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 118.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 55.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
```

```
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    14.88     14.59     16.58     15.10      6.81     0.478     0.277     0.174     10.52    13.367
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 56 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 119.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 56.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    14.96     14.68     16.68     15.19      7.04     0.482     0.280     0.177     11.97    13.461
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 57 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 120.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 57.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV
```

```
* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.03     14.77     16.79     15.28      7.25     0.487     0.283     0.180     13.37    13.551
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 58 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 121.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 58.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.11     14.85     16.88     15.37      7.46     0.491     0.285     0.183     14.73    13.639
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 59 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 122.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 59.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV
```

```
* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.18     14.93     16.98     15.46      7.66     0.496     0.288     0.186     16.04    13.724
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 60 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 123.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
          The user supplied arterial average speed of 60.0
          will be used for all hours of the day.  100% of VMT
          has been assigned to the arterial/collector roadway
          type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
            there are no sales for vehicle class HDGV8b
  M 48 Warning:
            there are no sales for vehicle class LDDT12

                  Calendar Year:  2030
                          Month:  July
                       Altitude:  Low
            Minimum Temperature:  20.9 (F)
            Maximum Temperature:  38.0 (F)
              Absolute Humidity:   75. grains/lb
               Nominal Fuel RVP:  13.5 psi
                  Weathered RVP:  13.5 psi
            Fuel Sulfur Content:   30. ppm

            Exhaust I/M Program:  No
               Evap I/M Program:  No
                    ATP Program:  Yes
               Reformulated Gas:  No

     Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
             GVWR:               <6000     >6000     (All)
                      ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ---------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
    Composite CO  :     15.25     15.01     17.07     15.54      7.86     0.500     0.290     0.189     17.30    13.805
  ---------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 61 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 124.
```

```
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 61.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
  ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :    15.33     15.10     17.17     15.63      8.22     0.508     0.295     0.194     18.75    13.904
  ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # # #
* 62 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 125.
* # # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 62.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:                <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
```

```
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     15.41     15.19     17.27     15.72      8.58     0.516     0.300     0.200     20.15    14.000
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 63 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 126.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 63.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm

              Exhaust I/M Program:  No
                 Evap I/M Program:  No
                      ATP Program:  Yes
                 Reformulated Gas:  No

       Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
               GVWR:               <6000     >6000     (All)
                        ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
   VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 -----------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     15.49     15.27     17.37     15.81      8.92     0.523     0.305     0.205     21.50    14.092
 -----------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 64 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 127.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 64.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                    Calendar Year:  2030
                            Month:  July
                         Altitude:  Low
              Minimum Temperature:  20.9 (F)
              Maximum Temperature:  38.0 (F)
                Absolute Humidity:   75. grains/lb
                 Nominal Fuel RVP:  13.5 psi
                    Weathered RVP:  13.5 psi
              Fuel Sulfur Content:   30. ppm
```

```
             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     15.56     15.35     17.46     15.89      9.25     0.531     0.309     0.210     22.82    14.182
 ------------------------------------------------------------------------------------------------------------------------

* # # # # # # # # # # # # # # # # # # # # # # # # #
* 65 mph 2030 ARTERIAL ONLY
* File 4, Run 1, Scenario 128.
* # # # # # # # # # # # # # # # # # # # # # # # # #
  M583 Warning:
            The user supplied arterial average speed of 65.0
            will be used for all hours of the day.  100% of VMT
            has been assigned to the arterial/collector roadway
            type for all hours of the day and all vehicle types.

* Reading PM Gas Carbon ZML Levels
* from the external data file PMGZML.CSV

* Reading PM Gas Carbon DR1 Levels
* from the external data file PMGDR1.CSV

* Reading PM Gas Carbon DR2 Levels
* from the external data file PMGDR2.CSV

* Reading PM Diesel Zero Mile Levels
* from the external data file PMDZML.CSV

* Reading the First PM Deterioration Rates
* from the external data file PMDDR1.CSV

* Reading the Second PM Deterioration Rates
* from the external data file PMDDR2.CSV
  M 48 Warning:
              there are no sales for vehicle class HDGV8b
  M 48 Warning:
              there are no sales for vehicle class LDDT12

                   Calendar Year:  2030
                           Month:  July
                        Altitude:  Low
             Minimum Temperature:  20.9 (F)
             Maximum Temperature:  38.0 (F)
               Absolute Humidity:   75. grains/lb
                Nominal Fuel RVP:  13.5 psi
                   Weathered RVP:  13.5 psi
             Fuel Sulfur Content:   30. ppm

             Exhaust I/M Program:  No
                Evap I/M Program:  No
                     ATP Program:  Yes
                Reformulated Gas:  No

      Vehicle Type:      LDGV    LDGT12    LDGT34      LDGT      HDGV      LDDV      LDDT      HDDV        MC   All Veh
              GVWR:               <6000     >6000     (All)
                       ------    ------    ------    ------    ------    ------    ------    ------    ------    ------
  VMT Distribution:    0.2788    0.4388    0.1507              0.0365    0.0003    0.0022    0.0876    0.0051    1.0000
 ------------------------------------------------------------------------------------------------------------------------
 Composite Emission Factors (g/mi):
     Composite CO  :     15.63     15.43     17.55     15.98      9.57     0.538     0.314     0.215     24.09    14.269
 ------------------------------------------------------------------------------------------------------------------------
```

Locomotive Emission Factors

Middlebury Rail Spur DAE 03/23/06

Locomotive Emission Factor Derivation

Data source except as noted: US EPA file LOCORSD.WK3, which included the statement:
"This spreadsheet contains data which were included in the April 1997 version of the Regulatory Support Document (RSD) for the U.S. EPA's Locomotive Emission Standards Final Rulemaking."

Project Assumptions

All locomotives (GP38 or GP40 per McF.J.) are assumed to use EMD 16-645E3 engine.
For 2010, locomotives are assumed to be model year pre-1973 -- maximizes emissions for conservatism as compliance with "Tier 0" rules is not required. Corresponds to "Baseline" In-Use emissions data in US EPA 1997 rulemaking as shown below.
For 2030, "Tier 0" compliance is assumed. Reductions from 2010 emission factors are applied only for NOx: 34% reduction for line-haul, 28% reduction for switch, other pollutants not reduced, per data in EPA April 1998 version of RSD, Table 4-9.
EPA duty cycle data are assumed to be representative of actual project locomotive duty cycles.

EPA "Baseline" Weighted Average Line-Haul Emissions

Model	Cycle-Wtd Power (hp)	Cycle-Wtd Fuel (lb/hr)	HC g/bhp-hr	CO g/bhp-hr	NOx g/bhp-hr	PM g/bhp-hr
1990 and Earlier Fleet			Emission Factors Before Deterioration			
EMD 16-645E3	853	285	0.48	1.85	13.64	0.29
	Deterioration Factors		1.15	1.00	1.00	1.15
			Emission Factors with Deterioration			
	In-Use Baseline (g/bhp-hr)		0.56	1.85	13.64	0.34
	In-Use Baseline (g/hr)		475	1581	11629	289

EPA "Baseline" Weighted Average Switch Emissions

Model	Cycle-Wtd Power (hp)	Cycle-Wtd Fuel (lb/hr)	HC g/bhp-hr	CO g/bhp-hr	NOx g/bhp-hr	PM g/bhp-hr
			Emission Factors Before Deterioration			
EMD 16-645E3	262	92	0.83	2.12	18.00	0.38
	Deterioration Factors		1.15	1.00	1.00	1.15
			Emission Factors with Deterioration			
	In-Use Baseline (g/bhp-hr)		0.95	2.12	18.00	0.44
	In-Use Baseline (g/hr)		248	554	4707	115
			2.70	6.02	51.14	1.25
			18.80	41.94	356.16	8.71

* Fuel density (lb/gal) = 6.96

Middlebury Rail Spur DAE 03/17/06

Locomotive Emission Factor Derivation for EMD 16-645E3, EPA "Baseline" Case for 2010 Emissions

Data source except as noted: US EPA file LOCORSD.WK3, which included the statement, "This spreadsheet contains data which were included in the April 1997 version of the Regulatory Support Document (RSD) for the U.S. EPA's Locomotive Emission Standards Final Rulemaking."

Columns below added by DAE to calculate duty cycle-weighted fuel rate and emissions in g/lb fuel.
Source: US EPA *Procedures for Emission Inventory Preparation, Vol. IV: Mobile Sources*, EPA420-R-92-009, Dec.1992, Appendix 6-8.

Throttle Notch	Rated Power, bhp	Power in Notch, bhp	Fuel Rate lb/hr	Time in Notch (%) by Cycle Line-Haul	Switch (Yard)	Specific Fuel Consumption lb/bhp-hr	HC g/bhp-hr	CO g/bhp-hr	NOx g/bhp-hr	PM g/bhp-hr
Dyn.Brk.	3000	69	114	12%	0%	1.652	4.28	9.56	59.91	1.16
Idle	3000	17	40	49%	77%	2.353	10.88	33.18	96.18	2.82
1	3000	105	64	4%	7%	0.610	1.48	2.54	26.74	0.34
2	3000	395	167	4%	7%	0.423	0.51	0.74	15.29	0.34
3	3000	686	275	4%	4%	0.401	0.36	0.48	14.84	0.33
4	3000	1034	404	5%	2%	0.391	0.31	0.42	14.90	0.25
5	3000	1461	556	4%	1%	0.381	0.29	0.52	14.30	0.23
6	3000	1971	740	4%	0.5%	0.375	0.31	0.97	12.97	0.28
7	3000	2661	994	3%	0.5%	0.374	0.33	1.89	11.72	0.24
8	3000	3159	1177	11%	1%	0.373	0.37	1.87	11.69	0.26
Weighted	Line-haul	853	284.9	100%	--	1.510	0.48	1.85	13.64	0.29
	Switch	262	92.1	--	100%	1.919	0.83	2.12	18.00	0.38

NONROAD2005

NONROAD2005 Input Files

Middlebury 2010 NONROAD2005 Input File

```
Written by Nonroad interface at 3/20/2006 1:54:54 PM
This is the options file for the NONROAD program.
The data is sperated into "packets" bases on common
information.  Each packet is specified by an
identifier and a terminator. Any notes or descriptions
can be placed between the data packets.

9/2005 epa: Add growth & tech years to OPTIONS packet
  and Counties & Retrofit files to RUNFILES packet.

------------------------------------------------------

                  PERIOD PACKET

This is the packet that defines the period for
which emissions are to be estimated.  The order of the
records matter.  The selection of certain parameters
will cause some of the record that follow to be ignored.
The order of the records is as follows:

1  - Char 10  - Period type for this simulation.
                  Valid responses are: ANNUAL, SEASONAL, and MONTHLY
2  - Char 10  - Type of inventory produced.
                  Valid responses are: TYPICAL DAY and PERIOD TOTAL
3  - Integer  - year of episode (4 digit year)
4  - Char 10  - Month of episode (use complete name of month)
5  - Char 10  - Type of day
                  Valid responses are: WEEKDAY and WEEKEND
------------------------------------------------------
/PERIOD/
Period type        : Annual
Summation type     : Period total
Year of episode    : 2010
Season of year     :
Month of year      :
Weekday or weekend : Weekday
Year of growth calc:
Year of tech sel   :
/END/

------------------------------------------------------

                  OPTIONS PACKET

This is the packet that defines some of the user
options that drive the model.  Most parameters are
used to make episode specific emission factor
adjustments. The order of the records is fixed.
The order is as follows.

1  -  Char 80  - First title on reports
2  -  Char 80  - Second title on reports
3  -  Real 10  - Fuel RVP of gasoline for this simulation
4  -  Real 10  - Oxygen weight percent of gasoline for simulation
5  -  Real 10  - Percent sulfur for gasoline
6  -  Real 10  - Percent sulfur for diesel
7  -  Real 10  - Percent sulfur for LPG/CNG
8  -  Real 10  - Minimum daily temperature (deg. F)
9  -  Real 10  - maximum daily temperature (deg. F)
10 -  Real 10  - Representative average daily temperature (deg. F)
```

```
11 -  Char 10  - Flag to determine if region is high altitude
                     Valid responses are: HIGH and LOW
12 -  Char 10  - Flag to determine if RFG adjustments are made
                     Valid responses are: YES and NO
------------------------------------------------------
/OPTIONS/
Title 1            : MIDDLEBURY RAIL SPUR EIS
Title 2            : 2010
Fuel RVP for gas   : 8.0
Oxygen Weight %    : 0.0
Gas sulfur %       : 0.0339
Diesel sulfur %    : 0.2284
Marine Dsl sulfur %: 0.2637
CNG/LPG sulfur %   : 0.003
Minimum temper. (F): 9.4
Maximum temper. (F): 80.9
Average temper. (F): 36.1
Altitude of region : LOW
/END/

------------------------------------------------------
                  REGION PACKET

This is the packet that defines the region for which
emissions are to be estimated.

The first record tells the type of region and
allocation to perform.

Valid responses are:
US TOTAL   -  emissions are for entire USA without state
              breakout.

50STATE    -  emissions are for all 50 states
              and Washington D.C., by state.

STATE      -  emissions are for a select group of states
              and are state-level estimates

COUNTY     -  emissions are for a select group of counties
              and are county level estimates.  If necessary,
              allocation from state to county will be performed.

SUBCOUNTY  -  emissions are for the specified sub counties
              and are subcounty level estimates.  If necessary,
              county to subcounty allocation will be performed.

The remaining records define the regions to be included.
The type of data which must be specified depends on the
region level.

US TOTAL   -  Nothing needs to be specified.  The FIPS
              code 00000 is used automatically.

50STATE    -  Nothing needs to be specified.  The FIPS
              code 00000 is used automatically.

STATE      -  state FIPS codes

COUNTY     -  state or county FIPS codes.  State FIPS
              code means include all counties in the
              state.
```

```
SUBCOUNTY  -  county FIPS code and subregion code.
------------------------------------------------------
/REGION/
Region Level       : COUNTY
The State of Ver VT: 50000
Addison County VT  : 50001
Rutland County VT  : 50021
/END/

or use -
Region Level       : STATE
Michigan           : 26000
------------------------------------------------------

                  SOURCE CATEGORY PACKET

This packet is used to tell the model which source
categories are to be processed.  It is optional.
If used, only those source categories list will
appear in the output data file.  If the packet is
not found, the model will process all source
categories in the population files.
------------------------------------------------------
/SOURCE CATEGORY/
                   :2270002000
/END/


Diesel Only -
                   :2270000000
                   :2282020000
                   :2285002015
Spark Ignition Only -
                   :2260000000
                   :2265000000
                   :2267000000
                   :2268000000
                   :2282005010
                   :2282005015
                   :2282010005
                   :2285004015
                   :2285006015
------------------------------------------------------
 This is the packet that lists the names of output files
 and some of the input data files read by the model.  If
 a drive:\path\ is not given, the location of the
 NONROAD.EXE file itself is assumed.  You will probably
 want to change the names of the Output and Message files
 to match that of the OPTion file, e.g., MICH-97.OPT,
 MICH-97.OUT, MICH-97.MSG, and if used MICH-97.AMS.
------------------------------------------------------
/RUNFILES/
ALLOC XREF         : data\allocate\allocate.xrf
ACTIVITY           : data\activity\activity.dat
EXH TECHNOLOGY     : data\tech\tech-exh.dat
EVP TECHNOLOGY     : data\tech\tech-evp.dat
SEASONALITY        : data\season\season.dat
REGIONS            : data\season\season.dat
MESSAGE            : c:\nonroad\outputs\template.msg
OUTPUT DATA        : c:\nonroad\outputs\template.out
EPS2 AMS           : c:\tee_share\middlebury spur\air
quality\nonroad\middlebury2010.eps
US COUNTIES FIPS   : data\allocate\fips.dat
```

```
RETROFIT           :
/END/

------------------------------------------------------
This is the packet that defines the equipment population
files read by the model.
------------------------------------------------------
/POP FILES/
Population File    : c:\nonroad\data\pop\vt.pop
/END/

POPULATION FILE    : c:\nonroad\data\POP\MI.POP


------------------------------------------------------
This is the packet that defines the growth files
files read by the model.
------------------------------------------------------
/GROWTH FILES/
National defaults  : data\growth\nation.grw
/END/


/ALLOC FILES/
Air trans. empl.   :c:\nonroad\data\allocate\vt_airtr.alo
Undergrnd coal prod:c:\nonroad\data\allocate\vt_coal.alo
Construction cost  :c:\nonroad\data\allocate\vt_const.alo
Harvested acres    :c:\nonroad\data\allocate\vt_farms.alo
Golf course estab. :c:\nonroad\data\allocate\vt_golf.alo
Wholesale estab.   :c:\nonroad\data\allocate\vt_holsl.alo
Family housing     :c:\nonroad\data\allocate\vt_house.alo
Logging employees  :c:\nonroad\data\allocate\vt_loggn.alo
Landscaping empl.  :c:\nonroad\data\allocate\vt_lscap.alo
Manufacturing empl.:c:\nonroad\data\allocate\vt_mnfg.alo
Oil & gas employees:c:\nonroad\data\allocate\vt_oil.alo
Census population  :c:\nonroad\data\allocate\vt_pop.alo
Allocation File    :c:\nonroad\data\allocate\vt_rail.alo
RV Park establish. :c:\nonroad\data\allocate\vt_rvprk.alo
Snowblowers comm.  :c:\nonroad\data\allocate\vt_sbc.alo
Snowblowers res.   :c:\nonroad\data\allocate\vt_sbr.alo
Snowmobiles        :c:\nonroad\data\allocate\vt_snowm.alo
Rec marine inboard :c:\nonroad\data\allocate\vt_wib.alo
Rec marine outboard:c:\nonroad\data\allocate\vt_wob.alo
/END/
------------------------------------------------------
This is the packet that defines the emssions factors
files read by the model.
------------------------------------------------------
/EMFAC FILES/
THC exhaust        : data\emsfac\exhthc.emf
CO exhaust         : data\emsfac\exhco.emf
NOX exhaust        : data\emsfac\exhnox.emf
PM exhaust         : data\emsfac\exhpm.emf
BSFC               : data\emsfac\bsfc.emf
Crankcase          : data\emsfac\crank.emf
Spillage           : data\emsfac\spillage.emf
Diurnal            : data\emsfac\evdiu.emf
TANK PERM          : data\emsfac\evtank.emf
NON-RM HOSE PERM   : data\emsfac\evhose.emf
RM FILL NECK PERM  : data\emsfac\evneck.emf
RM SUPPLY/RETURN   : data\emsfac\evsupret.emf
RM VENT PERM       : data\emsfac\evvent.emf
HOT SOAKS          : data\emsfac\evhotsk.emf
```

```
RUNINGLOSS          : data\emsfac\evrunls.emf
/END/

------------------------------------------------------
This is the packet that defines the deterioration factors
files read by the model.
------------------------------------------------------
/DETERIORATE FILES/
THC exhaust         : data\detfac\exhthc.det
CO exhaust          : data\detfac\exhco.det
NOX exhaust         : data\detfac\exhnox.det
PM exhaust          : data\detfac\exhpm.det
Diurnal             : data\detfac\evdiu.det
/END/

Optional Packets - Add initial slash "/" to activate

/STAGE II/
Control Factor      : 0.0
/END/
Enter percent control: 95 = 95% control = 0.05 x uncontrolled
Default should be zero control.

/MODELYEAR OUT/
EXHAUST BMY OUT     :
EVAP BMY OUT        :
/END/

SI REPORT/
SI report file-CSV :OUTPUTS\NRPOLLUT.CSV
/END/

/DAILY FILES/
DAILY TEMPS/RVP     :
/END/

PM Base Sulfur
 cols 1-10: dsl tech type;
 11-20: base sulfur wt%; or '1.0' means no-adjust (cert= in-use)
/PM BASE SULFUR/
T2        0.2000    0.02247
T3        0.2000    0.02247
T3B       0.0500    0.02247
T4A       0.0500    0.02247
T4B       0.0015    0.02247
T4        0.0015    0.30
T4N       0.0015    0.30
/END/
```

```
Written by Nonroad interface at 3/20/2006 1:57:06 PM
This is the options file for the NONROAD program.
The data is sperated into "packets" bases on common
information.  Each packet is specified by an
identifier and a terminator. Any notes or descriptions
can be placed between the data packets.

9/2005 epa: Add growth & tech years to OPTIONS packet
  and Counties & Retrofit files to RUNFILES packet.

------------------------------------------------------

                  PERIOD PACKET

This is the packet that defines the period for
which emissions are to be estimated.  The order of the
records matter.  The selection of certain parameters
will cause some of the record that follow to be ignored.
The order of the records is as follows:

1  - Char 10  - Period type for this simulation.
                  Valid responses are: ANNUAL, SEASONAL, and MONTHLY
2  - Char 10  - Type of inventory produced.
                  Valid responses are: TYPICAL DAY and PERIOD TOTAL
3  - Integer  - year of episode (4 digit year)
4  - Char 10  - Month of episode (use complete name of month)
5  - Char 10  - Type of day
                  Valid responses are: WEEKDAY and WEEKEND
------------------------------------------------------
/PERIOD/
Period type        : Annual
Summation type     : Period total
Year of episode    : 2020
Season of year     :
Month of year      :
Weekday or weekend : Weekday
Year of growth calc:
Year of tech sel   :
/END/

------------------------------------------------------

                  OPTIONS PACKET

This is the packet that defines some of the user
options that drive the model.  Most parameters are
used to make episode specific emission factor
adjustments. The order of the records is fixed.
The order is as follows.

1  -  Char 80  - First title on reports
2  -  Char 80  - Second title on reports
3  -  Real 10  - Fuel RVP of gasoline for this simulation
4  -  Real 10  - Oxygen weight percent of gasoline for simulation
5  -  Real 10  - Percent sulfur for gasoline
6  -  Real 10  - Percent sulfur for diesel
7  -  Real 10  - Percent sulfur for LPG/CNG
8  -  Real 10  - Minimum daily temperature (deg. F)
9  -  Real 10  - maximum daily temperature (deg. F)
10 -  Real 10  - Representative average daily temperature (deg. F)
```

```
11 -  Char 10  - Flag to determine if region is high altitude
                     Valid responses are: HIGH and LOW
12 -  Char 10  - Flag to determine if RFG adjustments are made
                     Valid responses are: YES and NO
------------------------------------------------------
/OPTIONS/
Title 1            : MIDDLEBURY RAIL SPUR EIS
Title 2            : 2020
Fuel RVP for gas   : 8.0
Oxygen Weight %    : 0.0
Gas sulfur %       : 0.0339
Diesel sulfur %    : 0.2284
Marine Dsl sulfur %: 0.2637
CNG/LPG sulfur %   : 0.003
Minimum temper. (F): 9.4
Maximum temper. (F): 80.9
Average temper. (F): 36.1
Altitude of region : LOW
/END/

------------------------------------------------------
                  REGION PACKET

This is the packet that defines the region for which
emissions are to be estimated.

The first record tells the type of region and
allocation to perform.

Valid responses are:
US TOTAL   -  emissions are for entire USA without state
              breakout.

50STATE    -  emissions are for all 50 states
              and Washington D.C., by state.

STATE      -  emissions are for a select group of states
              and are state-level estimates

COUNTY     -  emissions are for a select group of counties
              and are county level estimates.  If necessary,
              allocation from state to county will be performed.

SUBCOUNTY  -  emissions are for the specified sub counties
              and are subcounty level estimates.  If necessary,
              county to subcounty allocation will be performed.

The remaining records define the regions to be included.
The type of data which must be specified depends on the
region level.

US TOTAL   -  Nothing needs to be specified.  The FIPS
              code 00000 is used automatically.

50STATE    -  Nothing needs to be specified.  The FIPS
              code 00000 is used automatically.

STATE      -  state FIPS codes

COUNTY     -  state or county FIPS codes.  State FIPS
              code means include all counties in the
              state.
```

```
SUBCOUNTY  -  county FIPS code and subregion code.
------------------------------------------------------
/REGION/
Region Level       : COUNTY
The State of Ver VT: 50000
Addison County VT  : 50001
Rutland County VT  : 50021
/END/

or use -
Region Level       : STATE
Michigan           : 26000
------------------------------------------------------

                  SOURCE CATEGORY PACKET

This packet is used to tell the model which source
categories are to be processed.  It is optional.
If used, only those source categories list will
appear in the output data file.  If the packet is
not found, the model will process all source
categories in the population files.
------------------------------------------------------
/SOURCE CATEGORY/
                   :2270002000
/END/


Diesel Only -
                   :2270000000
                   :2282020000
                   :2285002015
Spark Ignition Only -
                   :2260000000
                   :2265000000
                   :2267000000
                   :2268000000
                   :2282005010
                   :2282005015
                   :2282010005
                   :2285004015
                   :2285006015
------------------------------------------------------
 This is the packet that lists the names of output files
 and some of the input data files read by the model.  If
 a drive:\path\ is not given, the location of the
 NONROAD.EXE file itself is assumed.  You will probably
 want to change the names of the Output and Message files
 to match that of the OPTion file, e.g., MICH-97.OPT,
 MICH-97.OUT, MICH-97.MSG, and if used MICH-97.AMS.
------------------------------------------------------
/RUNFILES/
ALLOC XREF         : data\allocate\allocate.xrf
ACTIVITY           : data\activity\activity.dat
EXH TECHNOLOGY     : data\tech\tech-exh.dat
EVP TECHNOLOGY     : data\tech\tech-evp.dat
SEASONALITY        : data\season\season.dat
REGIONS            : data\season\season.dat
MESSAGE            : c:\tee_share\middlebury spur\air
quality\nonroad\middlebury2020.msg
OUTPUT DATA        : c:\tee_share\middlebury spur\air
quality\nonroad\middlebury2020.out
EPS2 AMS           :
```

```
US COUNTIES FIPS   : data\allocate\fips.dat
RETROFIT           :
/END/

------------------------------------------------------
This is the packet that defines the equipment population
files read by the model.
------------------------------------------------------
/POP FILES/
Population File    : c:\nonroad\data\pop\vt.pop
/END/

POPULATION FILE    : c:\nonroad\data\POP\MI.POP


------------------------------------------------------
This is the packet that defines the growth files
files read by the model.
------------------------------------------------------
/GROWTH FILES/
National defaults  : data\growth\nation.grw
/END/


/ALLOC FILES/
Air trans. empl.   :c:\nonroad\data\allocate\vt_airtr.alo
Undergrnd coal prod:c:\nonroad\data\allocate\vt_coal.alo
Construction cost  :c:\nonroad\data\allocate\vt_const.alo
Harvested acres    :c:\nonroad\data\allocate\vt_farms.alo
Golf course estab. :c:\nonroad\data\allocate\vt_golf.alo
Wholesale estab.   :c:\nonroad\data\allocate\vt_holsl.alo
Family housing     :c:\nonroad\data\allocate\vt_house.alo
Logging employees  :c:\nonroad\data\allocate\vt_loggn.alo
Landscaping empl.  :c:\nonroad\data\allocate\vt_lscap.alo
Manufacturing empl.:c:\nonroad\data\allocate\vt_mnfg.alo
Oil & gas employees:c:\nonroad\data\allocate\vt_oil.alo
Census population  :c:\nonroad\data\allocate\vt_pop.alo
Allocation File    :c:\nonroad\data\allocate\vt_rail.alo
RV Park establish. :c:\nonroad\data\allocate\vt_rvprk.alo
Snowblowers comm.  :c:\nonroad\data\allocate\vt_sbc.alo
Snowblowers res.   :c:\nonroad\data\allocate\vt_sbr.alo
Snowmobiles        :c:\nonroad\data\allocate\vt_snowm.alo
Rec marine inboard :c:\nonroad\data\allocate\vt_wib.alo
Rec marine outboard:c:\nonroad\data\allocate\vt_wob.alo
/END/
------------------------------------------------------
This is the packet that defines the emssions factors
files read by the model.
------------------------------------------------------
/EMFAC FILES/
THC exhaust        : data\emsfac\exhthc.emf
CO exhaust         : data\emsfac\exhco.emf
NOX exhaust        : data\emsfac\exhnox.emf
PM exhaust         : data\emsfac\exhpm.emf
BSFC               : data\emsfac\bsfc.emf
Crankcase          : data\emsfac\crank.emf
Spillage           : data\emsfac\spillage.emf
Diurnal            : data\emsfac\evdiu.emf
TANK PERM          : data\emsfac\evtank.emf
NON-RM HOSE PERM   : data\emsfac\evhose.emf
RM FILL NECK PERM  : data\emsfac\evneck.emf
RM SUPPLY/RETURN   : data\emsfac\evsupret.emf
RM VENT PERM       : data\emsfac\evvent.emf
```

```
HOT SOAKS          : data\emsfac\evhotsk.emf
RUNINGLOSS         : data\emsfac\evrunls.emf
/END/

------------------------------------------------------
This is the packet that defines the deterioration factors
files read by the model.
------------------------------------------------------
/DETERIORATE FILES/
THC exhaust        : data\detfac\exhthc.det
CO exhaust         : data\detfac\exhco.det
NOX exhaust        : data\detfac\exhnox.det
PM exhaust         : data\detfac\exhpm.det
Diurnal            : data\detfac\evdiu.det
/END/

Optional Packets - Add initial slash "/" to activate

/STAGE II/
Control Factor     : 0.0
/END/
Enter percent control: 95 = 95% control = 0.05 x uncontrolled
Default should be zero control.

/MODELYEAR OUT/
EXHAUST BMY OUT    :
EVAP BMY OUT       :
/END/

SI REPORT/
SI report file-CSV :OUTPUTS\NRPOLLUT.CSV
/END/

/DAILY FILES/
DAILY TEMPS/RVP    :
/END/

PM Base Sulfur
 cols 1-10: dsl tech type;
 11-20: base sulfur wt%; or '1.0' means no-adjust (cert= in-use)
/PM BASE SULFUR/
T2        0.2000    0.02247
T3        0.2000    0.02247
T3B       0.0500    0.02247
T4A       0.0500    0.02247
T4B       0.0015    0.02247
T4        0.0015    0.30
T4N       0.0015    0.30
/END/
```

NONROAD2005 Output File

Middlebury 2010/2030 Output File

	VOC	NOx	CO	SO_2	PM10	PM2.5
2010	0.2881	4.0880	1.7222	0.6869	0.3211	0.3115
2030	0.1859	0.8367	0.2419	0.7174	1.0631	1.0312

	TOG exhaust	TOGCrankcase	Total TOG
2010	0.286996855	0.005716689	0.292713544
2030	0.188795019	0.000127866	0.188922884

	NMOG exhaust	NMOGCrankcase	Total NMOG
2010	0.282705313	0.005631206	0.288336519
2030	0.185971915	0.000125954	0.186097869

	NMHC exhaust	NMHCCrankcase	Total NMHC
2010	0.263929818	0.005257217	0.269187034
2030	0.17362084	0.000117589	0.173738428

	VOC exhaust	VOCCrankcase	Total VOC
2010	0.282437091	0.005625863	0.288062955
2030	0.185795472	0.000125834	0.185921306

	PM10 exhaust		PM exhaust	MissingPMexh
2010	0.321123539		0.321123539	0
2030	1.06311027		1.06311027	0

	PM25 exhaust
2010	0.311489833
2030	1.031216962

	CO exhaust	MissingCOexh
2010	1.722222563	0
2030	0.241855223	0

	NOx exhaust	MissingNOxexh
2010	4.088004117	0
2030	0.836690685	0

	CO2 exhaust	MissingCO2exh
2010	490.7366882	0
2030	709.1182982	0

	SO2 exhaust	MissingSO2exh
2010	0.686904933	0
2030	0.717376119	0

Emissions Inventory

Emissions Summary

Middlebury Rail Spur EIS

Emissions Inventory

Total Project-Related Emissions (tons/year)

	2010			2030		
	NB	**RS-1**	**TR-1**	**NB**	**RS-1**	**TR-1**
VOC	1.19	1.59	1.92	0.76	1.07	1.26
NOx	26.20	25.54	30.30	3.33	13.27	13.41
CO	6.83	6.15	8.32	0.95	3.29	3.39
PM10	0.99	1.14	1.43	0.22	0.44	0.45
PM2.5	0.90	1.14	1.42	0.14	0.44	0.44

VOC Emissions (tons/year)

	2010			2030		
	NB	**RS-1**	**TR-1**	**NB**	**RS-1**	**TR-1**
Truck Emissions	0.62	0.00	0.11	0.45	0.00	0.08
Loading Emissions	0.57	0.57	0.85	0.31	0.31	0.46
Train Related Emissions	0.00	1.02	0.96	0.00	0.76	0.72
Total Emissions	**1.19**	**1.59**	**1.92**	**0.76**	**1.07**	**1.26**

NOx Emissions (tons/year)

	2010			2030		
	NB	**RS-1**	**TR-1**	**NB**	**RS-1**	**TR-1**
Truck Emissions	17.70	0.03	1.61	1.88	0.01	0.17
Loading Emissions	8.50	8.50	12.75	1.45	1.45	2.17
Train Related Emissions	0.00	17.01	15.94	0.00	11.81	11.07
Total Emissions	**26.20**	**25.54**	**30.30**	**3.33**	**13.27**	**13.41**

CO Emissions (tons/year)

	2010			2030		
	NB	RS-1	TR-1	NB	RS-1	TR-1
Truck Emissions	3.25	0.01	0.57	0.53	0.00	0.09
Loading Emissions	3.58	3.58	5.37	0.42	0.42	0.63
Train Related Emissions	0.00	2.56	2.37	0.00	2.87	2.67
Total Emissions	**6.83**	**6.15**	**8.32**	**0.95**	**3.29**	**3.39**

PM10 Emissions (tons/year)

	2010			2030		
	NB	RS-1	TR-1	NB	RS-1	TR-1
Truck Emissions	0.44	0.00	0.05	0.17	0.00	0.02
Loading Emissions	0.55	0.55	0.83	0.05	0.05	0.07
Train Related Emissions	0.00	0.59	0.55	0.00	0.39	0.36
Total Emissions	**0.99**	**1.14**	**1.43**	**0.22**	**0.44**	**0.45**

PM2.5 Emissions (tons/year)

	2010			2030		
	NB	RS-1	TR-1	NB	RS-1	TR-1
Truck Emissions	0.35	0.00	0.04	0.09	0.00	0.01
Loading Emissions	0.55	0.55	0.83	0.05	0.05	0.07
Train Related Emissions	0.00	0.59	0.55	0.00	0.39	0.36
Total Emissions	**0.90**	**1.14**	**1.42**	**0.14**	**0.44**	**0.44**

Prepared by: TEE 3/20/06
QA'd by: DAE 3/21/06
Updated by: TEE 5/18/06, CLB 12/11/06, TEE 12/18/06

VOC Emissions Calculations

Middlebury Rail Spur EIS
VOC Emissions

TRUCK OPERATIONS		2010			2030			Ref of Source
		NB	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Trucks Trips per Day		115	138		138	138		10
Other Shipping Trucks per day			5	5		10	10	10
Truck Moving Emissions	Speed							
OMYA Access Road to Rt 7 Distance (miles):	35	1.2	1.2	1.2	1.2	1.2	1.2	10
Rt 7 Distance (miles):	57	20.2	NA	NA	20.2	NA	NA	
Kendall Hill Rd. Distance (miles):	35	1.4	NA	NA	1.4	NA	NA	
West Creek Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	
Whipple Hollow Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	10
New Transload Facility Access Rd. (miles):	35	NA	1.2	NA	NA	1.2	NA	10
Operating Days per Year:		300	250	250	300	300	250	10
Total Truck Vehicle Miles Traveled (VMT)at 35 mph per year:		234600	168600	3000	281520	204720	6000	10
Total Truck Vehicle Miles Traveled (VMT)at 57 mph per year:		1393800	0	0	1672560	0	0	10
35 mph Emission Factor (grams/mile):		0.425	0.425	0.425	0.259	0.259	0.259	10
57 mph Emission Factor (grams/mile):		0.31	0.31	0.31	0.188	0.188	0.188	10
Emissions at 35 mph (grams/year):		99705	71655	1275	72913.68	53022.48	1554	5
Emissions at 57 mph (grams/year):		432078	0	0	314441.3	0	0	10
Total Emission (grams/year):		531783	71655	1275	387355	53022.48	1554	10
Emissions (tons/year):		0.5861904	0.0789861	0.0014054	0.426986	0.058447	0.001713	10
Truck Idle Emissions		Idle	Idle	Idle	Idle	Idle	Idle	
Idle Time at Quarry per Truck (min):		7	7	7	7	7	7	10
Idle Time at Plant per Truck (min):		7	7	NA	7	7	NA	10
Total Truck Idle Time per year (hrs):		8050	8196	146	9660	10010	292	10
Idle Emission Factor (grams/hr):		3.7175	3.7175	3.7175	2.26	2.26	2.26	2
Idle Emissions (grams/year):		29926	30468	542	21832	22623	659	10
Idle Emissions (tons/year):		0.0329876	0.0335852	0.0005976	0.024065	0.024937	0.000727	4
TOTAL TRUCK RELATED EMISSIONS (tons/year):		**0.61918**	**0.11257**	**0.00200**	**0.45105**	**0.08338**	**0.00244**	10

NEW LOADING OPERATIONS	2010			2030			
	NB	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Loaders at Quarry:	2	2	2	2	2	2	10
Loaders at TransLoad Facility:	NA	2	NA	NA	2	NA	10
Loaders at Plant:	2	2	2	2	2	2	10
Loader Operating Time per Day (hrs):	10	12	12	12	12	12	10
Loader Operating Hours per Year (hrs):	12000	18000	12000	14400	21600	14400	10
Emission Factor (grams/hr):	43.001	43.001	43.001	19.2248	19.2248	19.2248	6
Loading Emissions (grams/year):	516012	774018	516012	276837.1	415255.7	276837.1	10
Loading Emissions (tons/year):	0.5688059	0.8532088	0.5688059	0.305161	0.457741	0.305161	10
TOTAL NEW LOADING RELATED EMISSIONS (tons/year):	**0.5688059**	**0.8532088**	**0.5688059**	**0.305161**	**0.457741**	**0.305161**	10

	NB	TR-1	RS-1	NB	TR-1	RS-1	
TRAIN OPERATIONS		**2010**			**2030**		
Locomotives	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in haul operations : Line-Haul		1	1		1	1	10
Number of Train RoundTrips per day:		2	2		2	2	10
Operating Days per Year:		250	250		300	300	10
Quarry to Mainline Trip Distances (mi.):		3.3	NA		3.3	NA	10
TRF to Mainline Trip Distance (mi):		NA	1		NA	1	10
Mainline to Florence siding trip distance (mi):		19.9	19.9		19.9	19.9	10
Haul Time per Round Trip (hrs):		2.00	2.33		2.00	2.33	10
Idle Time per Roundtrip (hrs):		0.33	0.33		0.33	0.33	10
Haul Time per Year(hrs):		1000	1167		1200	1400	10
Idle Time per Year (hrs):		167	167		200	200	10
Total Locomotive Operating Time per Year (hrs):		1167	1333		1400	1600	10
Locomotive Emissions Factors (g/hr) for Line-Haul:		345	345		184	184	7,10,11
Total Line-Haul Loco Related Emissions (tons/year):	0.00	0.44	0.51	0.00	0.28	0.32	10
		2010			**2030**		
Switch Locomotive Operations at Florence Switch	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in Switch Operations : Switch		2	2		2	2	10
# Roundtrips between Florence Siding and Plant per Line-Haul Trip		2	2		2	2	10
Florence Siding to Plant Trip Distance (mi.):		1.30	1.30		1.30	1.30	10
Locomotive #1 Switcher Time per "Quarry to Florence" round-trip (hrs):		1.75	1.75		1.75	1.75	10
Locomotive #2 Switcher Time per "Quarry to Florence" round-trip (hrs):		0.33	0.33		0.33	0.33	10
Loco #1 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.50	1.50		1.50	1.50	10
Loco #2 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.58	1.58		1.58	1.58	10
Total Switcher Operating Time per Year (hrs):		1042	1042		1250	1250	10
Total Switcher Idle Time per Year (hrs):		1542	1542		1850	1850	10
Total Locomotive #1 Operating Time per Day (hrs):		6.50	6.50		6.50	6.50	10
Total Locomotive #2 Operating Time per Day (hrs):		3.83	3.83		3.83	3.83	10
Total Locomotive Operating Time per Year (hrs):		2583	2583		3100	3100	10
Locomotive Emissions Factors (g/hr) for Switching:		180	180		127	127	7,10
Total Switch Loco Related Emissions (tons/year):	0.00	0.51	0.51	0.00	0.43	0.43	10
TOTAL TRAIN RELATED EMISSIONS (tons/year):	**0**	**0.96**	**1.02**	**0**	**0.72**	**0.76**	10
TOTAL PROJECT RELATED EMISSIONS (tons/year):	**1.19**	**1.92**	**1.59**	**0.76**	**1.26**	**1.07**	4,10

Reference of sources:

[1]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[2]Mobile 6.2 run 3/16/2006 utilizing input provided by the Vermont Department of Environmental Conservation in Air Pollution Control Permit Application Requirements - Indirect Sources (Revised 7/1/01).

[3]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[4]Calculations made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006.

[5]Assumptions made based on observations while conducting noise/vibration monitoring operations 26 -28 Oct 05 and 30 Oct - 3 Nov 05 and information provided in email Middlebury Spur Answers, June 6/2006.

[6]NONROAD2005 run 3/20/2006 utilizing input consistent with Mobile6.2 inputs.

[7]Locomotive emission factor calculations from locords CLB.wk3.xls on 12/05/2006.

[8]Middlebury Spur Project Study Area Cut Sheet dtd 06/27/05.

[9]Information provided by McFarland-Johnson, Inc. in email Middlebury Spur Studies dated June 5, 2006.

[10] Middlebury Rail Spur - Operational Assumptions for Use in Air Quality Analysis, 10/19/06

[11]Locomotive emission factor calculations from Emission Factors Tier Two 2030.xls on 12/04/2006.

[12]Locomotive emission factor calculations from Emission Factors Tier Zero 2010.xls on 12/04/2006.

NOx Emissions Calculations

Middlebury Rail Spur EIS
NOx Emissions

TRUCK OPERATIONS	Speed	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Trucks Trips per Day		115	138		138	138		10
Other Shipping Trucks per day			5	5		10	10	10
Truck Moving Emissions	Speed							
OMYA Access Road to Rt 7 Distance (miles):	35	1.2	1.2	1.2	1.2	1.2	1.2	10
Rt 7 Distance (miles):	57	20.2	NA	NA	20.2	NA	NA	10
Kendall Hill Rd. Distance (miles):	35	1.4	NA	NA	1.4	NA	NA	10
West Creek Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	10
Whipple Hollow Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	10
New Transload Facility Access Rd. (miles):	35	NA	1.2	NA	NA	1.2	NA	10
Operating Days per Year:		300	250	250	300	300	250	10
Total Truck Vehicle Miles Traveled (VMT)at 35 mph per year:		234600	168600	3000	281520	204720	6000	
Total Truck Vehicle Miles Traveled (VMT)at 57 mph per year:		1393800	0	0	1672560	0	0	
35 mph Emission Factor (grams/mile):		7.033	7.033	7.033	0.61	0.61	0.61	10
57 mph Emission Factor (grams/mile):		10.142	10.142	10.142	0.902	0.902	0.902	
Emissions at 35 mph (grams/year):		1649941.8	1185764	21099	171727.2	124879.2	3660	
Emissions at 57 mph (grams/year):		14135919.6	0	0	1508649	0	0	10
Total Emission (grams/year):		15785861.4	1185764	21099	1680376	124879.2	3660	
Emissions (tons/year):		17.4009336	1.307081	0.023258	1.852298	0.137656	0.004034	10
Truck Idle Emissions		Idle	Idle	Idle	Idle	Idle	Idle	
Idle Time at Quarry per Truck (min):		7	7	7	7	7	7	10
Idle Time at Plant per Truck (min):		7	7	NA	7	7	NA	10
Total Truck Idle Time per year (hrs):		8050	8196	146	9660	10010	292	10
Idle Emission Factor (grams/hr):		33.8125	33.8125	33.8125	3.0525	3.0525	3.0525	2
Idle Emissions (grams/year):		272191	277122	4931	29487	30556	890	10
Idle Emissions (tons/year):		0.3000388	0.305474	0.005435	0.032504	0.033682	0.000981	4
TOTAL TRUCK RELATED EMISSIONS (tons/year):		**17.70097**	**1.61256**	**0.02869**	**1.88480**	**0.17134**	**0.00502**	10

NEW LOADING OPERATIONS	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Loaders at Quarry:	2	2	2	2	2	2	10
Loaders at TransLoad Facility:	NA	2	NA	NA	2	NA	10
Loaders at Plant:	2	2	2	2	2	2	10
Loader Operating Time per Day (hrs):	10	12	12	12	12	12	10
Loader Operating Hours per Year (hrs):	12000	18000	12000	14400	21600	14400	10
Emission Factor (grams/hr):	642.586	642.5859	642.5859	91.1017	91.1017	91.1017	6
Loading Emissions (grams/year):	7711030.8	11566546	7711031	1311864	1967797	1311864	10
Loading Emissions (tons/year):	8.49995647	12.74993	8.499956	1.446083	2.169125	1.446083	10
TOTAL NEW LOADING RELATED EMISSIONS (tons/year):	**8.49995647**	**12.74993**	**8.499956**	**1.446083**	**2.169125**	**1.446083**	10

	2010			2030			
TRAIN OPERATIONS							
Locomotives	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in haul operations : Line-Haul		1	1		1	1	10
Number of Train RoundTrips per day:		2	2		2	2	10
Operating Days per Year:		250	250		300	300	10
Quarry to Mainline Trip Distances (mi.):		3.3	NA		3.3	NA	10
TRF to Mainline Trip Distance (mi):		NA	1		NA	1	10
Mainline to Florence siding trip distance (mi):		19.9	19.9		19.9	19.9	10
Haul Time per Round Trip (hrs):		2.00	2.33		2.00	2.33	10
Idle Time per Roundtrip (hrs):		0.33	0.33		0.33	0.33	10
Haul Time per Year(hrs):		1000	1167		1200	1400	10
Idle Time per Year (hrs):		167	167		200	200	10
Total Locomotive Operating Time per Year (hrs):		1167	1333		1400	1600	10
Locomotive Emissions Factors (g/hr) for Line-Haul:		5824	5824		3372	3372	7,10,11,12
Total Line-Haul Loco Related Emissions (tons/year):	0.00	7.49	8.56	0.00	5.20	5.95	10
		2010			**2030**		
Switch Locomotive Operations at Florence Switch	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in Switch Operations : Switch		2	2		2	2	10
# Roundtrips between Florence Siding and Plant per Line-Haul Trip		2	2		2	2	10
Florence Siding to Plant Trip Distance (mi.):		1.30	1.30		1.30	1.30	10
Locomotive #1 Switcher Time per "Quarry to Florence" round-trip (hrs):		1.75	1.75		1.75	1.75	10
Locomotive #2 Switcher Time per "Quarry to Florence" round-trip (hrs):		0.33	0.33		0.33	0.33	10
Loco #1 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.50	1.50		1.50	1.50	10
Loco #2 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.58	1.58		1.58	1.58	10
Total Switcher Operating Time per Year (hrs):		1042	1042		1250	1250	10
Total Switcher Idle Time per Year (hrs):		1542	1542		1850	1850	10
Total Locomotive #1 Operating Time per Day (hrs):		6.50	6.50		6.50	6.50	10
Total Locomotive #2 Operating Time per Day (hrs):		3.83	3.83		3.83	3.83	10
Total Locomotive Operating Time per Year (hrs):		2583	2583		3100	3100	10
Locomotive Emissions Factors (g/hr) for Switching:		2968	2968		1717	1717	7,10
Total Switch Loco Related Emissions (tons/year):	0.00	8.45	8.45	0.00	5.87	5.87	10
TOTAL TRAIN RELATED EMISSIONS (tons/year):	**0**	**15.94**	**17.01**	**0**	**11.07**	**11.81**	10
TOTAL PROJECT RELATED EMISSIONS (tons/year):	**26.20**	**30.30**	**25.54**	**3.33**	**13.41**	**13.27**	4,10

Reference of sources:

[1]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[2]Mobile 6.2 run 3/16/2006 utilizing input provided by the Vermont Department of Environmental Conservation in Air Pollution Control Permit Application Requirements - Indirect Sources (Revised 7/1/01).

[3]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[4]Calculations made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006.

[5]Assumptions made based on observations while conducting noise/vibration monitoring operations 26 -28 Oct 05 and 30 Oct - 3 Nov 05 and information provided in email Middlebury Spur Answers, June 6/2006.

[6]NONROAD2005 run 3/20/2006 utilizing input consistent with Mobile6.2 inputs.

[7]Locomotive emission factor calculations from locords CLB.wk3.xls on 12/05/2006.

[8]Middlebury Spur Project Study Area Cut Sheet dtd 06/27/05.

[9]Information provided by McFarland-Johnson, Inc. in email Middlebury Spur Studies dated June 5, 2006.

[10] Middlebury Rail Spur - Operational Assumptions for Use in Air Quality Analysis, 10/19/06

[11]Locomotive emission factor calculations from Emission Factors Tier Two 2030.xls on 12/04/2006.

[12]Locomotive emission factor calculations from Emission Factors Tier Zero 2010.xls on 12/04/2006.

CO Emissions Calculations

Middlebury Rail Spur EIS
CO Emissions

TRUCK OPERATIONS	Speed	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Trucks Trips per Day		115	138		138	138		10
Other Shipping Trucks per day			5	5		10	10	10
Truck Moving Emissions	Speed							
OMYA Access Road to Rt 7 Distance (miles):	35	1.2	1.2	1.2	1.2	1.2	1.2	10
Rt 7 Distance (miles):	57	20.2	NA	NA	20.2	NA	NA	10
Kendall Hill Rd. Distance (miles):	35	1.4	NA	NA	1.4	NA	NA	10
West Creek Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	10
Whipple Hollow Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	
New Transload Facility Access Rd. (miles):	35	NA	1.2	NA	NA	1.2	NA	
Operating Days per Year:		300	250	250	300	300	250	
Total Truck Vehicle Miles Traveled (VMT)at 35 mph per year:		234600	168600	3000	281520	204720	6000	10
Total Truck Vehicle Miles Traveled (VMT)at 57 mph per year:		1393800	0	0	1672560	0	0	10
35 mph Emission Factor (grams/mile):		1.811	1.811	1.811	0.246	0.246	0.246	10
57 mph Emission Factor (grams/mile):		1.661	1.661	1.661	0.225	0.225	0.225	10
Emissions at 35 mph (grams/year):		424860.6	305334.6	5433	69253.92	50361.12	1476	5
Emissions at 57 mph (grams/year):		2315102	0	0	376326	0	0	10
Total Emission (grams/year):		2739962	305334.6	5433	445579.9	50361.12	1476	10
Emissions (tons/year):		3.020292	0.336574	0.005989	0.491168	0.055514	0.001627	10
Truck Idle Emissions		Idle	Idle	Idle	Idle	Idle	Idle	
Idle Time at Quarry per Truck (min):		7	7	7	7	7	7	10
Idle Time at Plant per Truck (min):		7	7	NA	7	7	NA	10
Total Truck Idle Time per year (hrs):		8050	8196	146	9660	10010	292	10
Idle Emission Factor (grams/hr):		26.075	26.075	26.075	3.535	3.535	3.535	2
Idle Emissions (grams/year):		209904	213706	3803	34148	35385	1031	10
Idle Emissions (tons/year):		0.231379	0.235571	0.004192	0.037642	0.039006	0.001137	4
TOTAL TRUCK RELATED EMISSIONS (tons/year):		**3.25167**	**0.57214**	**0.01018**	**0.52881**	**0.09452**	**0.00276**	10

NEW LOADING OPERATIONS	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Loaders at Quarry:	2	2	2	2	2	2	10
Loaders at TransLoad Facility:	NA	2	NA	NA	2	NA	10
Loaders at Plant:	2	2	2	2	2	2	10
Loader Operating Time per Day (hrs):	10	12	12	12	12	12	10
Loader Operating Hours per Year (hrs):	12000	18000	12000	14400	21600	14400	10
Emission Factor (grams/hr):	270.713	270.713	270.713	26.334	26.334	26.334	6
Loading Emissions (grams/year):	3248556	4872834	3248556	379209.6	568814.4	379209.6	10
Loading Emissions (tons/year):	3.58092	5.37138	3.58092	0.418007	0.627011	0.418007	10
TOTAL NEW LOADING RELATED EMISSIONS (tons/year):	**3.58092**	**5.37138**	**3.58092**	**0.418007**	**0.627011**	**0.418007**	10

	2010			2030			
TRAIN OPERATIONS							
Locomotives	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in haul operations : Line-Haul		1	1		1	1	10
Number of Train RoundTrips per day:		2	2		2	2	10
Operating Days per Year:		250	250		300	300	10
Quarry to Mainline Trip Distances (mi.):		3.3	NA		3.3	NA	10
TRF to Mainline Trip Distance (mi):		NA	1		NA	1	10
Mainline to Florence siding trip distance (mi):		19.9	19.9		19.9	19.9	10
Haul Time per Round Trip (hrs):		2.00	2.33		2.00	2.33	10
Idle Time per Roundtrip (hrs):		0.33	0.33		0.33	0.33	10
Haul Time per Year(hrs):		1000	1167		1200	1400	10
Idle Time per Year (hrs):		167	167		200	200	10
Total Locomotive Operating Time per Year (hrs):		1167	1333		1400	1600	10
Locomotive Emissions Factors (g/hr) for Line-Haul:		1036	1036		920	920	7,10,11
Total Line-Haul Loco Related Emissions (tons/year):	0.00	1.33	1.52	0.00	1.42	1.62	10
		2010			2030		
Switch Locomotive Operations at Florence Switch	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in Switch Operations : Switch		2	2		2	2	10
# Roundtrips between Florence Siding and Plant per Line-Haul Trip		2	2		2	2	10
Florence Siding to Plant Trip Distance (mi.):		1.30	1.30		1.30	1.30	10
Locomotive #1 Switcher Time per "Quarry to Florence" round-trip (hrs):		1.75	1.75		1.75	1.75	10
Locomotive #2 Switcher Time per "Quarry to Florence" round-trip (hrs):		0.33	0.33		0.33	0.33	10
Loco #1 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.50	1.50		1.50	1.50	10
Loco #2 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.58	1.58		1.58	1.58	10
Total Switcher Operating Time per Year (hrs):		1042	1042		1250	1250	10
Total Switcher Idle Time per Year (hrs):		1542	1542		1850	1850	10
Total Locomotive #1 Operating Time per Day (hrs):		6.50	6.50		6.50	6.50	10
Total Locomotive #2 Operating Time per Day (hrs):		3.83	3.83		3.83	3.83	10
Total Locomotive Operating Time per Year (hrs):		2583	2583		3100	3100	10
Locomotive Emissions Factors (g/hr) for Switching:		365	365		365	365	7,10
Total Switch Loco Related Emissions (tons/year):	0.00	1.04	1.04	0.00	1.25	1.25	10
TOTAL TRAIN RELATED EMISSIONS (tons/year):	**0**	**2.37**	**2.56**	**0**	**2.67**	**2.87**	10
TOTAL PROJECT RELATED EMISSIONS (tons/year):	**6.83**	**8.32**	**6.15**	**0.95**	**3.39**	**3.29**	4,10

Reference of sources:

[1]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[2]Mobile 6.2 run 3/16/2006 utilizing input provided by the Vermont Department of Environmental Conservation in Air Pollution Control Permit Application Requirements - Indirect Sources (Revised 7/1/01).

[3]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[4]Calculations made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006.

[5]Assumptions made based on observations while conducting noise/vibration monitoring operations 26 -28 Oct 05 and 30 Oct - 3 Nov 05 and information provided in email Middlebury Spur Answers, June 6/2006.

[6]NONROAD2005 run 3/20/2006 utilizing input consistent with Mobile6.2 inputs.

[7]Locomotive emission factor calculations from locords CLB.wk3.xls on 12/05/2006.

[8]Middlebury Spur Project Study Area Cut Sheet dtd 06/27/05.

[9]Information provided by McFarland-Johnson, Inc. in email Middlebury Spur Studies dated June 5, 2006.

[10] Middlebury Rail Spur - Operational Assumptions for Use in Air Quality Analysis, 10/19/06

[11]Locomotive emission factor calculations from Emission Factors Tier Two 2030.xls on 12/04/2006.

[12]Locomotive emission factor calculations from Emission Factors Tier Zero 2010.xls on 12/04/2006.

PM10 Emissions Calculations

Middlebury Rail Spur EIS
PM10 Emissions

TRUCK OPERATIONS	Speed	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Trucks Trips per Day		115	138		138	138		10
Other Shipping Trucks per day			5	5		10	10	10
Truck Moving Emissions	Speed							
OMYA Access Road to Rt 7 Distance (miles):	35	1.2	1.2	1.2	1.2	1.2	1.2	10
Rt 7 Distance (miles):	57	20.2	NA	NA	20.2	NA	NA	10
Kendall Hill Rd. Distance (miles):	35	1.4	NA	NA	1.4	NA	NA	10
West Creek Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	
Whipple Hollow Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	
New Transload Facility Access Rd. (miles):	35	NA	1.2	NA	NA	1.2	NA	
Operating Days per Year:		300	250	250	300	300	300	10
Total Truck Vehicle Miles Traveled (VMT)at 35 mph per year:		234600	168600	3000	281520	204720	250	10
Total Truck Vehicle Miles Traveled (VMT)at 57 mph per year:		1393800	0	0	1672560	0	0	10
35 mph Emission Factor (grams/mile):		0.2422	0.2422	0.2422	0.0797	0.0797	0.0797	10
57 mph Emission Factor (grams/mile):		0.2422	0.2422	0.2422	0.0797	0.0797	0.0797	10
Emissions at 35 mph (grams/year):		56820.12	40834.92	726.6	22437.14	16316.18	19.925	5
Emissions at 57 mph (grams/year):		337578.4	0	0	133303	0	0	10
Total Emission (grams/year):		394398.5	40834.92	726.6	155740.2	16316.18	19.925	10
Emissions (tons/year):		0.43475	0.045013	0.000801	0.171674	0.017986	2.2E-05	10
Truck Idle Emissions		Idle	Idle	Idle	Idle	Idle	Idle	
Idle Time at Quarry per Truck (min):		7	7	7	7	7	7	10
Idle Time at Plant per Truck (min):		7	7	NA	7	7	NA	10
Total Truck Idle Time per year (hrs):		8050	8196	146	9660	10010	350	10
Idle Emission Factor (grams/hr):		0.48425	0.48425	0.48425	0.078	0.078	0.078	2
Idle Emissions (grams/year):		3898	3969	71	753	781	27	10
Idle Emissions (tons/year):		0.004297	0.004375	7.78E-05	0.000831	0.000861	3.01E-05	4
TOTAL TRUCK RELATED EMISSIONS (tons/year):		**0.43905**	**0.04939**	**0.00088**	**0.17250**	**0.01885**	**0.00005**	10

NEW LOADING OPERATIONS	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Loaders at Quarry:	2	2	2	2	2	2	10
Loaders at TransLoad Facility:	NA	2	NA	NA	2	NA	10
Loaders at Plant:	2	2	2	2	2	2	10
Loader Operating Time per Day (hrs):	10	12	12	12	12	12	10
Loader Operating Hours per Year (hrs):	12000	18000	12000	14400	21600	14400	10
Emission Factor (grams/hr):	41.832	41.8317	41.8317	2.9115	2.9115	2.9115	6
Loading Emissions (grams/year):	501980.4	752970.6	501980.4	41925.6	62888.4	41925.6	10
Loading Emissions (tons/year):	0.553339	0.830008	0.553339	0.046215	0.069323	0.046215	10
TOTAL NEW LOADING RELATED EMISSIONS (tons/year):	**0.553339**	**0.830008**	**0.553339**	**0.046215**	**0.069323**	**0.046215**	10

	2010			2030			
TRAIN OPERATIONS							
Locomotives	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in haul operations : Line-Haul		1	1		1	1	10
Number of Train RoundTrips per day:		2	2		2	2	10
Operating Days per Year:		250	250		300	300	10
Quarry to Mainline Trip Distances (mi.):		3.3	NA		3.3	NA	10
TRF to Mainline Trip Distance (mi):		NA	1		NA	1	10
Mainline to Florence siding trip distance (mi):		19.9	19.9		19.9	19.9	10
Haul Time per Round Trip (hrs):		2.00	2.33		2.00	2.33	10
Idle Time per Roundtrip (hrs):		0.33	0.33		0.33	0.33	10
Haul Time per Year(hrs):		1000	1167		1200	1400	10
Idle Time per Year (hrs):		167	167		200	200	10
Total Locomotive Operating Time per Year (hrs):		1167	1333		1400	1600	10
Locomotive Emissions Factors (g/hr) for Line-Haul:		219	219		123	123	7,10,11
Total Line-Haul Loco Related Emissions (tons/year):	0.00	0.28	0.32	0.00	0.19	0.22	10
	2010			**2030**			
Switch Locomotive Operations at Florence Switch	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in Switch Operations : Switch		2	2		2	2	10
# Roundtrips between Florence Siding and Plant per Line-Haul Trip		2	2		2	2	10
Florence Siding to Plant Trip Distance (mi.):		1.30	1.30		1.30	1.30	10
Locomotive #1 Switcher Time per "Quarry to Florence" round-trip (hrs):		1.75	1.75		1.75	1.75	10
Locomotive #2 Switcher Time per "Quarry to Florence" round-trip (hrs):		0.33	0.33		0.33	0.33	10
Loco #1 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.50	1.50		1.50	1.50	10
Loco #2 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.58	1.58		1.58	1.58	10
Total Switcher Operating Time per Year (hrs):		1042	1042		1250	1250	10
Total Switcher Idle Time per Year (hrs):		1542	1542		1850	1850	10
Total Locomotive #1 Operating Time per Day (hrs):		6.50	6.50		6.50	6.50	10
Total Locomotive #2 Operating Time per Day (hrs):		3.83	3.83		3.83	3.83	10
Total Locomotive Operating Time per Year (hrs):		2583	2583		3100	3100	10
Locomotive Emissions Factors (g/hr) for Switching:		93	93		51	51	7,10,12
Total Switch Loco Related Emissions (tons/year):	0.00	0.26	0.26	0.00	0.17	0.17	10
TOTAL TRAIN RELATED EMISSIONS (tons/year):	**0**	**0.55**	**0.59**	**0**	**0.36**	**0.39**	10
TOTAL PROJECT RELATED EMISSIONS (tons/year):	**0.99**	**1.43**	**1.14**	**0.22**	**0.45**	**0.44**	4,10

Reference of sources:

[1]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

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[6]NONROAD2005 run 3/20/2006 utilizing input consistent with Mobile6.2 inputs.

[7]Locomotive emission factor calculations from locords CLB.wk3.xls on 12/05/2006.

[8]Middlebury Spur Project Study Area Cut Sheet dtd 06/27/05.

[9]Information provided by McFarland-Johnson, Inc. in email Middlebury Spur Studies dated June 5, 2006.

[10] Middlebury Rail Spur - Operational Assumptions for Use in Air Quality Analysis, 10/19/06

[11]Locomotive emission factor calculations from Emission Factors Tier Two 2030.xls on 12/04/2006.

[12]Locomotive emission factor calculations from Emission Factors Tier Zero 2010.xls on 12/04/2006.

PM2.5 Emissions Calculations

Middlebury Rail Spur EIS
PM2.5 Emissions

TRUCK OPERATIONS

	Speed	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Trucks Trips per Day		115	138		138	138		10
Other Shipping Trucks per day			5	5		10	10	10
Truck Moving Emissions	Speed							
OMYA Access Road to Rt 7 Distance (miles):	35	1.2	1.2	1.2	1.2	1.2	1.2	10
Rt 7 Distance (miles):	57	20.2	NA	NA	20.2	NA	NA	10
Kendall Hill Rd. Distance (miles):	35	1.4	NA	NA	1.4	NA	NA	10
West Creek Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	
Whipple Hollow Rd. Distance (miles):	35	0.4	NA	NA	0.4	NA	NA	
New Transload Facility Access Rd. (miles):	35	NA	1.2	NA	NA	1.2	NA	
Operating Days per Year:		300	250	250	300	300	250	10
Total Truck Vehicle Miles Traveled (VMT)at 35 mph per year:		234600	168600	3000	281520	204720	6000	10
Total Truck Vehicle Miles Traveled (VMT)at 57 mph per year:		1393800	0	0	1672560	0	0	10
35 mph Emission Factor (grams/mile):		0.1926	0.1926	0.1926	0.0432	0.0432	0.0432	10
57 mph Emission Factor (grams/mile):		0.1926	0.1926	0.1926	0.0432	0.0432	0.0432	10
Emissions at 35 mph (grams/year):		45183.96	32472.36	577.8	12161.66	8843.904	259.2	5
Emissions at 57 mph (grams/year):		268445.9	0	0	72254.59	0	0	10
Total Emission (grams/year):		313629.8	32472.36	577.8	84416.26	8843.904	259.2	10
Emissions (tons/year):		0.345718	0.035795	0.000637	0.093053	0.009749	0.000286	10
Truck Idle Emissions		Idle	Idle	Idle	Idle	Idle	Idle	
Idle Time at Quarry per Truck (min):		7	7	7	7	7	7	10
Idle Time at Plant per Truck (min):		7	7	NA	7	7	NA	10
Total Truck Idle Time per year (hrs):		8050	8196	146	9660	10010	292	10
Idle Emission Factor (grams/hr):		0.44575	0.44575	0.44575	0.07225	0.07225	0.07225	2
Idle Emissions (grams/year):		3588	3653	65	698	723	21	10
Idle Emissions (tons/year):		0.003955	0.004027	7.17E-05	0.000769	0.000797	2.32E-05	4
TOTAL TRUCK RELATED EMISSIONS (tons/year):		**0.34967**	**0.03982**	**0.00071**	**0.09382**	**0.01055**	**0.00031**	10

NEW LOADING OPERATIONS

	2010 NB	2010 TR-1	2010 RS-1	2030 NB	2030 TR-1	2030 RS-1	Ref of Source
Loaders at Quarry:	2	2	2	2	2	2	10
Loaders at TransLoad Facility:	NA	2	NA	NA	2	NA	10
Loaders at Plant:	2	2	2	2	2	2	10
Loader Operating Time per Day (hrs):	10	12	12	12	12	12	10
Loader Operating Hours per Year (hrs):	12000	18000	12000	14400	21600	14400	10
Emission Factor (grams/hr):	41.832	41.8317	41.8317	2.9115	2.9115	2.9115	6
Loading Emissions (grams/year):	501980.4	752970.6	501980.4	41925.6	62888.4	41925.6	10
Loading Emissions (tons/year):	0.553339	0.830008	0.553339	0.046215	0.069323	0.046215	10
TOTAL NEW LOADING RELATED EMISSIONS (tons/year):	**0.553339**	**0.830008**	**0.553339**	**0.046215**	**0.069323**	**0.046215**	10

TRAIN OPERATIONS	**2010**			**2030**			
Locomotives	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in haul operations : Line-Haul		1	1		1	1	10
Number of Train RoundTrips per day:		2	2		2	2	10
Operating Days per Year:		250	250		300	300	10
Quarry to Mainline Trip Distances (mi.):		3.3	NA		3.3	NA	10
TRF to Mainline Trip Distance (mi):		NA	1		NA	1	10
Mainline to Florence siding trip distance (mi):		19.9	19.9		19.9	19.9	10
Haul Time per Round Trip (hrs):		2.00	2.33		2.00	2.33	10
Idle Time per Roundtrip (hrs):		0.33	0.33		0.33	0.33	10
Haul Time per Year(hrs):		1000	1167		1200	1400	10
Idle Time per Year (hrs):		167	167		200	200	10
Total Locomotive Operating Time per Year (hrs):		1167	1333		1400	1600	10
Locomotive Emissions Factors (g/hr) for Line-Haul:		219	219		123	123	7,10,11
Total Line-Haul Loco Related Emissions (tons/year):	0.00	0.28	0.32	0.00	0.19	0.22	10
	2010			**2030**			
Switch Locomotive Operations at Florence Switch	**NB**	**TR-1**	**RS-1**	**NB**	**TR-1**	**RS-1**	
Number of Locomotives used in Switch Operations : Switch		2	2		2	2	10
# Roundtrips between Florence Siding and Plant per Line-Haul Trip		2	2		2	2	10
Florence Siding to Plant Trip Distance (mi.):		1.30	1.30		1.30	1.30	10
Locomotive #1 Switcher Time per "Quarry to Florence" round-trip (hrs):		1.75	1.75		1.75	1.75	10
Locomotive #2 Switcher Time per "Quarry to Florence" round-trip (hrs):		0.33	0.33		0.33	0.33	10
Loco #1 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.50	1.50		1.50	1.50	10
Loco #2 Idle Time During Switcher Operations per Q-F Round-Trip (hrs):		1.58	1.58		1.58	1.58	10
Total Switcher Operating Time per Year (hrs):		1042	1042		1250	1250	10
Total Switcher Idle Time per Year (hrs):		1542	1542		1850	1850	10
Total Locomotive #1 Operating Time per Day (hrs):		6.50	6.50		6.50	6.50	10
Total Locomotive #2 Operating Time per Day (hrs):		3.83	3.83		3.83	3.83	10
Total Locomotive Operating Time per Year (hrs):		2583	2583		3100	3100	10
Locomotive Emissions Factors (g/hr) for Switching:		93	93		51	51	7,10,12
Total Switch Loco Related Emissions (tons/year):	0.00	0.26	0.26	0.00	0.17	0.17	10
TOTAL TRAIN RELATED EMISSIONS (tons/year):	**0**	**0.55**	**0.59**	**0**	**0.36**	**0.39**	10
TOTAL PROJECT RELATED EMISSIONS (tons/year):	**0.90**	**1.42**	**1.14**	**0.14**	**0.44**	**0.44**	4,10

Reference of sources:

[1]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[2]Mobile 6.2 run 3/16/2006 utilizing input provided by the Vermont Department of Environmental Conservation in Air Pollution Control Permit Application Requirements - Indirect Sources (Revised 7/1/01).

[3]Assumption made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006, and in email Middlebury Spur Answers, June 6, 2006.

[4]Calculations made based on information provided by McFarland-Johnson, Inc. in Middlebury Spur EIS Draft Description of Alternatives and Operations, February 14, 2006.

[5]Assumptions made based on observations while conducting noise/vibration monitoring operations 26 -28 Oct 05 and 30 Oct - 3 Nov 05 and information provided in email Middlebury Spur Answers, June 6/2006.

[6]NONROAD2005 run 3/20/2006 utilizing input consistent with Mobile6.2 inputs.

[7]Locomotive emission factor calculations from locords CLB.wk3.xls on 12/05/2006.

[8]Middlebury Spur Project Study Area Cut Sheet dtd 06/27/05.

[9]Information provided by McFarland-Johnson, Inc. in email Middlebury Spur Studies dated June 5, 2006.

[10] Middlebury Rail Spur - Operational Assumptions for Use in Air Quality Analysis, 10/19/06

[11]Locomotive emission factor calculations from Emission Factors Tier Two 2030.xls on 12/04/2006.

[12]Locomotive emission factor calculations from Emission Factors Tier Zero 2010.xls on 12/04/2006.

Emission Factors

Emission Factors are in (g/hr)

Front End Loader Emission Factors 2010

	VOC	NOx	CO	PM10	PM2.5
2010	43.0010	642.5859	270.7130	41.8317	41.8317
2030	19.2248	91.1017	26.3340	2.9115	2.9115

Locomotive Emission Factors

Line-Haul Locomotives

	VOC	NOx	CO	PM10	PM2.5
2010	345	5824	1036	219	219
2030	184	3372	920	123	123

Switch Locomotives

	VOC	NOx	CO	PM10	PM2.5
2010	180	2968	365	93	93
2030	127	1717	365	51	51

Truck Emission Factors

2010

	VOC	NOx	CO	PM10	PM2.5
Idle	3.7175	33.8125	26.075	0.48425	0.44575
2.5	1.487	13.525	10.43	0.2422	0.1926
3	1.427	13.088	9.791	0.2422	0.1926
4	1.352	12.541	8.993	0.2422	0.1926
5	1.307	12.213	8.514	0.2422	0.1926
6	1.213	11.552	7.633	0.2422	0.1926
7	1.146	11.079	7.003	0.2422	0.1926
8	1.096	10.724	6.531	0.2422	0.1926
9	1.057	10.449	6.164	0.2422	0.1926
10	1.026	10.228	5.871	0.2422	0.1926
11	0.971	9.858	5.425	0.2422	0.1926
12	0.925	9.55	5.053	0.2422	0.1926
13	0.886	9.289	4.739	0.2422	0.1926
14	0.852	9.065	4.47	0.2422	0.1926
15	0.823	8.871	4.236	0.2422	0.1926
16	0.786	8.644	3.977	0.2422	0.1926
17	0.754	8.444	3.748	0.2422	0.1926
18	0.725	8.266	3.545	0.2422	0.1926
19	0.699	8.106	3.363	0.2422	0.1926
20	0.675	7.963	3.199	0.2422	0.1926
21	0.649	7.827	3.04	0.2422	0.1926
22	0.626	7.703	2.895	0.2422	0.1926
23	0.604	7.591	2.762	0.2422	0.1926
24	0.585	7.487	2.64	0.2422	0.1926
25	0.566	7.392	2.529	0.2422	0.1926
26	0.548	7.323	2.428	0.2422	0.1926
27	0.53	7.259	2.334	0.2422	0.1926
28	0.514	7.2	2.248	0.2422	0.1926
29	0.499	7.145	2.167	0.2422	0.1926
30	0.486	7.093	2.092	0.2422	0.1926
31	0.472	7.079	2.028	0.2422	0.1926
32	0.459	7.067	1.969	0.2422	0.1926
33	0.447	7.055	1.913	0.2422	0.1926
34	0.436	7.043	1.86	0.2422	0.1926
35	0.425	7.033	1.811	0.2422	0.1926
36	0.416	7.071	1.773	0.2422	0.1926
37	0.406	7.107	1.737	0.2422	0.1926
38	0.397	7.142	1.703	0.2422	0.1926
39	0.389	7.174	1.671	0.2422	0.1926
40	0.381	7.205	1.64	0.2422	0.1926
41	0.374	7.298	1.622	0.2422	0.1926
42	0.367	7.386	1.604	0.2422	0.1926
43	0.361	7.471	1.587	0.2422	0.1926
44	0.355	7.551	1.571	0.2422	0.1926
45	0.349	7.628	1.555	0.2422	0.1926
46	0.344	7.785	1.553	0.2422	0.1926
47	0.34	7.935	1.55	0.2422	0.1926
48	0.335	8.079	1.548	0.2422	0.1926
49	0.331	8.218	1.546	0.2422	0.1926
50	0.327	8.35	1.543	0.2422	0.1926
51	0.324	8.589	1.556	0.2422	0.1926
52	0.321	8.818	1.568	0.2422	0.1926
53	0.318	9.039	1.58	0.2422	0.1926
54	0.315	9.251	1.592	0.2422	0.1926
55	0.313	9.456	1.603	0.2422	0.1926
56	0.311	9.805	1.633	0.2422	0.1926
57	0.31	10.142	1.661	0.2422	0.1926
58	0.308	10.468	1.689	0.2422	0.1926
59	0.307	10.782	1.716	0.2422	0.1926
60	0.306	11.086	1.742	0.2422	0.1926
61	0.306	11.593	1.793	0.2422	0.1926
62	0.306	12.083	1.842	0.2422	0.1926
63	0.306	12.558	1.89	0.2422	0.1926
64	0.306	13.019	1.936	0.2422	0.1926
65	0.306	13.465	1.981	0.2422	0.1926

2030

	VOC	NOx	CO	PM10	PM2.5
Idle	2.26	3.0525	3.535	0.078	0.07225
2.5	0.904	1.221	1.414	0.0797	0.0432
3	0.868	1.18	1.328	0.0797	0.0432
4	0.822	1.128	1.219	0.0797	0.0432
5	0.794	1.097	1.155	0.0797	0.0432
6	0.738	1.035	1.035	0.0797	0.0432
7	0.697	0.991	0.95	0.0797	0.0432
8	0.666	0.957	0.886	0.0797	0.0432
9	0.643	0.931	0.836	0.0797	0.0432
10	0.624	0.911	0.796	0.0797	0.0432
11	0.59	0.876	0.736	0.0797	0.0432
12	0.562	0.847	0.685	0.0797	0.0432
13	0.538	0.822	0.643	0.0797	0.0432
14	0.518	0.801	0.606	0.0797	0.0432
15	0.501	0.783	0.574	0.0797	0.0432
16	0.478	0.761	0.539	0.0797	0.0432
17	0.458	0.742	0.508	0.0797	0.0432
18	0.441	0.726	0.481	0.0797	0.0432
19	0.425	0.711	0.456	0.0797	0.0432
20	0.411	0.697	0.434	0.0797	0.0432
21	0.395	0.684	0.412	0.0797	0.0432
22	0.381	0.673	0.393	0.0797	0.0432
23	0.367	0.662	0.375	0.0797	0.0432
24	0.355	0.652	0.358	0.0797	0.0432
25	0.344	0.643	0.343	0.0797	0.0432
26	0.333	0.637	0.329	0.0797	0.0432
27	0.323	0.631	0.317	0.0797	0.0432
28	0.313	0.625	0.305	0.0797	0.0432
29	0.304	0.62	0.294	0.0797	0.0432
30	0.295	0.615	0.284	0.0797	0.0432
31	0.287	0.614	0.275	0.0797	0.0432
32	0.279	0.613	0.267	0.0797	0.0432
33	0.272	0.612	0.259	0.0797	0.0432
34	0.265	0.611	0.252	0.0797	0.0432
35	0.259	0.61	0.246	0.0797	0.0432
36	0.253	0.613	0.24	0.0797	0.0432
37	0.247	0.617	0.236	0.0797	0.0432
38	0.242	0.62	0.231	0.0797	0.0432
39	0.237	0.623	0.227	0.0797	0.0432
40	0.232	0.626	0.222	0.0797	0.0432
41	0.227	0.635	0.22	0.0797	0.0432
42	0.223	0.643	0.218	0.0797	0.0432
43	0.219	0.651	0.215	0.0797	0.0432
44	0.216	0.658	0.213	0.0797	0.0432
45	0.212	0.666	0.211	0.0797	0.0432
46	0.209	0.68	0.211	0.0797	0.0432
47	0.206	0.695	0.21	0.0797	0.0432
48	0.204	0.708	0.21	0.0797	0.0432
49	0.201	0.721	0.21	0.0797	0.0432
50	0.199	0.734	0.209	0.0797	0.0432
51	0.197	0.756	0.211	0.0797	0.0432
52	0.195	0.778	0.213	0.0797	0.0432
53	0.193	0.798	0.214	0.0797	0.0432
54	0.192	0.819	0.216	0.0797	0.0432
55	0.19	0.838	0.217	0.0797	0.0432
56	0.189	0.871	0.221	0.0797	0.0432
57	0.188	0.902	0.225	0.0797	0.0432
58	0.188	0.933	0.229	0.0797	0.0432
59	0.187	0.963	0.233	0.0797	0.0432
60	0.186	0.991	0.236	0.0797	0.0432
61	0.186	1.039	0.243	0.0797	0.0432
62	0.186	1.085	0.25	0.0797	0.0432
63	0.186	1.13	0.256	0.0797	0.0432
64	0.186	1.195	0.263	0.0797	0.0432
65	0.186	1.215	0.269	0.0797	0.0432

Truck Speed Calculations

Truck Speeds

Leg Distance (miles)	Average Speed (mph)	Time to Drive Leg (hr)
8.62	60	0.143666667
0.29	40	0.00725
4.41	60	0.0735
0.1	45	0.002222222
0.11	35	0.003142857
0.32	25	0.0128
0.11	35	0.003142857
0.35	45	0.007777778
5.97	60	0.0995

Total Distance (miles):	20.28	
Total Time to Drive (hr):	0.353002381	
Ave Distance Weighted Speed (mph):	57.45003743	**57**

Average roadway speeds are based on physical observations of traffic speeds made by KMC during noise and vibration monitoring events conducted between 26 Oct -28 Oct 2005 and again during 30 Oct - 3 Nov 2005.

The Average Truck Idle Time was based on physical observations made by KMC during noise monitoring events conducted on 3 Nov 2005.

MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT

HALLADAY ROAD OPTION SCREENING

McFarland Johnson
Revised September 6, 2008

Introduction

Following the publication of the DEIS, additional screening of the Halladay Road crossing options was undertaken in order to determine which crossing would be the preferred option. It was found that the impacts of each option could be reduced through design modifications such as steeper rail grades. Because the impacts could affect the selection of the preferred option, a range of design modifications ("sub-options") were developed and their impacts assessed. The sub-options include the following:

- Grade Separated over Halladay Road: 1% railroad grade (DEIS option), 1.5% grade, 2% grade, and 3% grade
- At-Grade with Halladay Road: 1.33% railroad grade (DEIS option), 1.5% grade, 2% grade
- Halladay Road Relocation: 1% railroad grade (DEIS option), 1.5% grade

Below are a summary of public comments and town input received on the original options, and the results of additional study of the options and sub-options. The findings are summarized in the Summary of Findings section and in Table 2.6-1, which appear at the end of this document.

Detailed Findings

Public Comments

Comments received during and after the public hearing did not reveal a strong preference for one option. Most commenters who addressed Halladay Road commented on the Halladay Road Relocation Option, perhaps because it was a new option at the time. Four comments were received about this option, stating that it would be inconvenient, would divide the neighborhood, would create a new road in a field, and would require that school buses make an additional entrance and exit on Route 7. One comment was received that the At-Grade with Halladay Road, as proposed, would involve gates, flashing lights, and horns. From the residents' perspectives, there appear to be pros and cons with each of the options.

Middlebury Town Plan

The Middlebury Town Plan is silent on the Halladay Road crossing specifically, but states generally that highway/rail crossings must be separated (2007 Middlebury Town Plan, page 124). If the At-Grade with Halladay Road option were chosen, it would be incongruous with the town plan.

Resource Impacts

The cultural and environmental resource impacts of each option were reviewed. It was found that the options could be modified to have a smaller footprint and lower embankments, thereby reducing resource impacts. Because resource impacts could affect the selection of the preferred option, a series of “sub-options” were developed and impacts quantified. These sub-options had steeper railroad grades than the original DEIS options, and are listed in Table 2.6-1 below, with new sub-options are shown in italics. Costs, embankment heights, wetland impacts, farmland soil impacts, and cut and fill volumes are listed for each sub-option. Findings of this review are described below.

The Halladay Road Relocation options have substantially more wetland and farmland soil impacts. While the wetland impacts could be reduced by modifying the alignment, it is unlikely they could be reduced to the level of the other two options. Further, any shift of the alignment away from the rail spur alignment would increase the fragmentation of farmland and habitat. An alternative alignment was proposed which would meet existing Halladay Road further south and would pass through a forested area that was found to contain a vernal pool and other wetlands constraints. The Army Corps of Engineers (ACOE) stated that the Halladay Road Relocation option could not be the “Least Environmentally Damaging Practicable Alternative” (LEDPA) because of the greater wetland impacts. For these reasons, it is concluded that the Halladay Road Relocation Option cannot be the LEDPA.

The Grade Separated and At-Grade options have comparable wetland and farmland soil impacts, with the steeper grade sub-options having lower impacts. For this reason, the ACOE determined that 1.5% or steeper grades would be acceptable for the Grade Separated over Halladay Road Option, and 1.33% or steeper would be acceptable for the At-Grade with Halladay Road Option.

The Grade Separated option would have an Adverse Effect on one historic property, due to the effect of the embankment on the integrity of the structure’s setting and feeling. The 1.5% grade sub-option would reduce the embankment height west of Halladay Road by only about 5 feet (compared to the 1% grade), and would not avoid the Adverse Effect finding.

None of the options would result in noise impacts, although the At-Grade option was modeled assuming a quiet zone crossing. Without a quiet zone crossing, train horns would be blown during the four daily crossings expected for the rail spur.

Earthwork

The Grade Separated option would have greater fill volumes, while the At-Grade option would have greater cut volumes. The total earthwork (cut plus fill) of the 1.5% Grade Separated option would be about 35,000 cubic yards, or about 8%, more than the 1.33% At-Grade option. If the cut material can be re-used on site, the Grade Separated option would result in substantially less net earthwork (cut minus fill), about half that of the At-Grade option. However, if the material cannot be re-used, the Grade Separated option would require substantially more fill material from outside sources than the At-Grade option.

Operational Considerations

Vermont Railway provided additional feedback that from an operational standpoint, any grade steeper than 1.5% would require that they use two engines (rather than one) to pull the empty cars back to the quarry, and the second engine would have to be running for the duration of the trip from Florence to Middlebury. This would be undesirable.

Costs

As shown in Table 2.6-1, the Grade Separated and Relocation options would cost approximately $500,000 and $400,000 more to construct, respectively, than the At-Grade option. If the At-Grade option were constructed as a quiet zone, it would cost an additional $60,000 to $70,000 to construct (in 2006 dollars). (Including contingencies, engineering, etc., the total additional cost would be approximately $100,000 to $115,000.) Costs of routine maintenance for bridges, roadways, and at-grade crossing infrastructure are expected to be relatively minor. The annual quiet zone risk factor assessment (which will be addressed in a separate email) is also expected to be minor. At-grade crossing insurance costs are not included in this analysis.

Safety

At-grade road and railroad crossings have the potential for conflicts between automobiles and trains, and therefore are considered less safe than separated crossings. Federal agencies discourage but do not prohibit at-grade crossings.

Summary of Findings

- Public comments do not provide clear direction on the options, although the Relocation option received the most negative comments. From the residents' perspectives, there appear to be pros and cons with each of the options, depending on residents' locations along Halladay Road.

- The Middlebury Town Plan states that highway/rail crossings must be separated.
- The resource impacts of the Relocation option appear to preclude it from being part of the selected alternative.
- The natural resource impacts of the At-Grade and Grade Separated options appear to be similar. Either the DEIS At-Grade option (1.33% rail grade) or the Grade Separated option with 1.5% grade are acceptable to the Army Corps, who will need to issue a permit for this project.
- The Grade Separated option would have an Adverse Effect under Section 106 of the National Historic Preservation Act on one historic property, due to the effect of the embankment on the integrity of the structure's setting and feeling. The Adverse Effect can be mitigated. The 1.5% grade sub-option would reduce the embankment height west of Halladay Road by only about 5 feet, and would not avoid the Adverse Effect finding. There was found to be no use under Section 4(f) of the USDOT Act.
- None of the original options were found to have noise impacts, although the At-Grade option was modeled as a quiet zone.
- The total earthwork (cut plus fill) of the 1.5% Grade Separated would be about 7% more than the 1.33% At-Grade option. If the material can be re-used on site, the Grade Separated option would result in substantially less (about half the volume) net earthwork (cut minus fill).
- Railroad grades over 1.5% are considered unacceptable by Vermont Railway.
- The Grade Separated and Relocation options would cost approximately $500,000 and $400,000 more to construct, respectively, than the At-Grade option. A quiet zone installation would increase the At-Grade option's initial cost by roughly $100,000, and there would be additional set costs to maintaining this system which have not been included.
- The Grade Separated option is preferred from a safety perspective.

Conclusions

Based on this screening, the Grade Separated over Halladay Road option with a 1.5% grade was identified as the preferred Halladay Road crossing option. This option was found to be consistent with FHWA and FRA preferences for grade-separated options for safety reasons and more consistent with the Middlebury Town Plan. This option would also have resource impacts comparable to the At-Grade option, and substantially lower impacts than the Relocation option. The relative costs, resource impacts, embankment heights, and earthwork volumes of these options and sub-options are summarized in Table 2.6-1.

Table 2.6-1 Additional Screening of Halladay Road Options

Note: DEIS options are in regular font; new options are in italics

Option	Cost* (Relative to At-Grade Option)	Wetland Impacts (Acres), Sta. 65+00 to US 7	Important Farmland Soil Impacts (Acres), Sta. 65+00 to US 7	Embankment Height (Feet), at Sta. 83+00 (1,000' west of Halladay Rd.)	Cut Volume (cubic yards), Entire Alternative	Fill Volume (cubic yards), Entire Alternative	Total Volume (cut + fill), Entire Alternative	Net Volume (cut - fill), Entire Alternative
Grade Separated over Halladay Road	+$400,000							
DEIS Design, 1%		2.45	10.97	34.0	345,733	232,756	578,489	112,977
1.5% Grade		*2.31*	*9.28*	*28.8*	*314,308*	*174,569*	*488,877*	*139,739*
2% Grade		*2.18*	*8.26*	*23.0*	*314,725*	*134,550*	*449,275*	*180,175*
3% Grade		*2.08*	*7.68*	*16.5*	*314,978*	*115,572*	*430,550*	*199,406*
At-Grade with Halladay Road	0							
DEIS Design, 1.33%		2.25	8.49	16.1	359,408	94,010	453,418	265,398
1.5% Grade		*2.26*	*8.67*	*14.4*	*352,163*	*89,992*	*442,155*	*262,171*
2% Grade		*2.06*	*8.39*	*10.5*	*349,167*	*84,552*	*433,719*	*264,615*
Halladay Road Relocation	+$500,000							
DEIS Design, 1%		3.40	14.66	25.8	322,127	104,178	426,305	217,949
1.5% Grade		*3.30*	*14.06*	*11.5*	*373,172*	*84,374*	*457,546*	*288,798*

* Costs exclude annual maintenance, operations, and insurance expenses.

HYDRAULIC MEMORANDUM

PROPOSED RAILROAD BRIDGE & TRESTLE OVER OTTER CREEK

VTRANS – MIDDLEBURY SPUR PROJECT
FHWA VT-EIS-07-01-D
MIDDLEBURY ST SPUR(2)

McFarland Johnson

53 Regional Drive
Concord, NH 03301

MJ Project No. 16474.00

McFarland Johnson

53 Regional Drive
Concord, NH 03301

Established 1946
www.mjinc.com

Telephone: (603) 225-2978
Fax: (603) 225-0095

HYDRAULIC MEMORANDUM

VTrans – Middlebury Spur Project (FHWA VT-EIS-07-01-D & Middlebury ST SPUR (2))
Proposed Railroad Bridge and Trestle over Otter Creek Floodplain
Middlebury, Vermont

Hydraulic Analysis Summary Memorandum
MJ Project No: 16474.00
February 2008

This memorandum provides a summary of the hydraulic analysis for a proposed railroad bridge and trestle over Otter Creek in the Town of Middlebury, VT. The proposed railroad structure crossing the Otter Creek is one of the alternatives for the Vermont Agency of Transportation's (VTrans) Middlebury Spur Project. The primary objective of the analyses was to determine the backwater effect, if any, to the water body from the bridge and trestle structure being placed within the floodway and floodplain of Otter Creek. This proposed bridge and trestle structure is located approximately 8,000 feet downstream of the confluence of the Middlebury River with Otter Creek and approximately 12,000 feet upstream of the Route 30 Bridge and dam located in the Village of Middlebury.

The existing Federal Emergency Management Agency's (FEMA) Town of Middlebury, Vermont Flood Insurance Study (FIS) published in 1984 provided the basis for the hydrologic and river hydraulic information used for the analyses. However, McFarland Johnson (MJ) was not able to retrieve the original HEC-2 data from this previous FEMA study to use as a base model for the study because the original data was not in the FEMA archives. Therefore, a new hydraulic model for this reach of the Otter Creek was redeveloped using the U. S. Army Corps of Engineers' Hydrologic Engineering Center's River Analysis System (HEC-RAS) software (Version 3.1.3). From the FEMA FIS study, the hydrologic flow conditions were previously calculated at the Village of Middlebury to be:

Recurrence Event	Peak Flow (cubic feet per second [cfs])
500-Year	16,000
100-Year	13,000
50-Year	11,000
10-Year	7,750

The reach of the river being analyzed is slightly upstream of the closest flow location recorded in the FEMA FIS study. Thus, the contributing watershed for this study reach is slightly smaller than the overall watershed of the FEMA FIS study reach. However, the difference between the contributing watershed areas is relatively minor (i.e. 621 versus 628 square miles, which is about a 1 percent difference). Therefore, the overall watershed FEMA peak discharges for the 500-year, 100-year, 50-year and 10-year recurrence intervals from the FEMA FIS study were used for the analyses.

The base information for the model was developed using available aerial photogrammetric contour information for the flood plain areas, in addition to field survey data of the channel geometries. The new data for the HEC-RAS model was calibrated using water surface elevation (WSE) information from the previous FEMA study. The table (Tables 1A & 1B) provided in Appendix A indicates the new WSE model data correlates quite well with the original FEMA study and is within acceptable modeling tolerances.

As part of the overall analyses, there were two potential horizontal alignments for the railroad structure within the same reach of the creek (i.e. about 200 feet apart) with three different types of pier style and span configurations for each alignment. The first alignment (called Option AA in the analysis) had a more linear crossing of the creek and was located further upstream than the second alignment (called Option BB in the analysis). The second alignment had more curvature across the Otter Creek floodplain as shown in Appendix B. The first pier type and span configuration was a 69-foot span between piers with (2) 5-foot cylindrical piers having a 5.5-foot wide pier cap and a girder depth of approximately 6 feet. The second pier type and span configuration was a 34-foot span between piers with (3) 1.67-foot square pile bent piers having a 3-foot wide pier cap and a girder depth of approximately 4.2 feet. On the second bent style configuration, it is proposed to have a "double" bent configuration on every fourth pier. This "double" bent configuration was modeled assuming (3) 3.33-foot wide square piles having a 7-foot wide pier cap rather than two separate rows of piers using the same pier cap. The third pier type and span configuration was a 34-foot span between piers with (2) 4-foot cylindrical piers having a 4.5-foot wide pier cap and a girder depth of approximately 4.2 feet. Refer to the elevation views of these span and pier configurations in Appendix B.

For Option AA alignment, the 34-foot spacing had 55 piers across the alignment, while the 69-foot spacing had 27 piers. In comparison, the Option BB alignment has 48 piers for the 34-foot spacing and 24 piers for the 69-foot spacing. In addition in Appendix B, a copy of the typical railroad profile is shown which was only modified slightly between Option AA and Option BB to adjust for the differing lengths of the 2 alignments.

Although the bridge and trestle design includes either 2 or 3 piers in a line across the width of the bridge, due to software limitations it was assumed for modeling purposes that there was a single solid pier for the entire width of the bridge. In addition, all piers were assumed to be vertically "plumb" components, even though the square bent style piers are typically installed with a slight angle from a "plumb" position. Furthermore, the actual "curved" horizontal alignments of the bridge configuration could not be duplicated with the 2-dimensional HEC-RAS model. Therefore, the piers were positioned to be perpendicular across the floodplain along a straight line cross section and not in the actual location along the "curved" alignment. In an effort to simulate some of the horizontal alignment curvature and the actual 3-dimensional flow characteristics within the river, some of the piers were skewed for the 34-foot square pier and 69-foot round pier configurations to determine any potential affect on the projected flow of the river. The skewed piers were modeled on the Option AA alignment.

The location of the study is within the reach of the Otter Creek near a bend which has subcritical flow characteristics with significant floodplain flow during large flooding events. In fact, the modeling of the flow characteristics indicate very low Froude numbers (i.e. low velocities within wide flow cross sections), even under extreme flooding conditions. As noted above, the goal of this investigation was to determine if placing a railroad bridge and trestle structure within the channel produced any backwater effects for the 100-year recurrence (Q_{100}) storm event.

The modeling results for Option AA alignment are shown in the tables in Appendix C. The backwater effect from the modeling results for Option AA alignment indicate negligible increases for any of the bridge span and type configurations. In fact, the maximum backwater effect is less than 0.01 foot at the station immediately upstream of the bridge (i.e. Station 104894 for Option AA) for all of the configurations. Also, there is negligible difference when skewing some of the 34-foot square piers and having 34-foot square piers tangent to the flow. In addition, there is no measurable difference between the 34-foot 20-inch square piers and the 34-foot 4-foot round piers. The model also indicates the 69-foot pier spacing performs slightly better than the 34-foot pier spacing, but the difference is negligible.

The modeling results for Option BB alignment are shown in the tables in Appendix D. The results are very similar to the Option AA alignment results. The backwater effect from the modeling results also indicate negligible increases for any of the bridge span and type configurations. In fact, the maximum backwater effect is less than 0.01 foot at the station immediately upstream of the bridge (i.e. Station 104650 for Option BB) for all configurations. Since the deviation in the Option AA modeling for skewing the piers was miniscule, skewing was not analyzed for the Option BB alignment. The model indicates the 34-foot square pier spacing performs slightly better than the 69-foot pier spacing for the Option BB alignment, but the difference was negligible. Although this result seems counter intuitive, it is suspected that the wider piers for the 69-foot spacing (i.e. 5-foot versus 20" for the 34-foot spacing) creates more blocked cross sectional area creates this condition. Furthermore, it appears the round piers versus the square piers do not create enough of a hydraulic improvement to overcome the blocked cross sectional area. In addition, there was negligible difference between the 34-foot square and 34-foot round piers.

Option AA alignment performs slightly better than the Option BB alignment. However, all of the differences are less than 0.01 foot which is a negligible change in the hydraulic conditions. Furthermore, this amount of backwater effect shown on all alignments and span/pier type configurations is less than the accuracy level of the calculations from the HEC-RAS model. It is reasonable to conclude that based on the accuracy level of the backwater model being used for the analysis (which is only to about 0.01 foot), there is no measurable or quantifiable effect from any of the proposed railroad bridge and trestle alignments. It is suspected that the negligible backwater effects of the pier type and span configurations can be attributed to the wide floodplain and low velocities within this reach of the Otter Creek. Therefore, we conclude that proposed bridge and trestle alignments and configurations have basically no impact to the Otter Creek floodplain and floodway elevations and meets the VTrans and National Flood Insurance Program (NFIP) requirement of no backwater effect during the base Q_{100} flood event.

Respectfully submitted,
Brian M. Bennett, P.E.

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APPENDIX A
FEMA STUDY INFORMATION AND CALIBRATION COMPARISONS

TABLE 1A – Option AA Alignment Calibration
TABLE 1B – Option BB Alignment Calibration

FEMA Middlebury, VT FIS – Floodway Data
FEMA Middlebury, VT FIS – Flood Profiles (03P & 04P)
FEMA Middlebury, VT FIS – Floodway Flood Boundary & Floodway Plan

TABLE 1A

Water Surface Elevations Calibration Comparison
Otter Creek FIS Study vs. HEC-RAS Model
Option AA Alignment - Existing Conditions

FIS STA.	Model STA.	Approx. Horz. Diff	FIS Sig Fig 100-Yr	Model to "0.01" 100-Yr	Model Sig Fig 100-Yr
"O"			**350.2**	-------	-------
		2523 ±			
	101960			350.45	**350.5**
		677 ±			
"P" =	**102637**		**350.5**	350.50	**350.5**
		574 ±			
	103211			350.55	**350.6**
		708 ±			
"Q"			**350.6**		
		100 ±			
	104019			350.60	**350.6**
		400 ±			
REF PT					
		435 ±			
	104854			350.67	**350.7**
		482 ±			
	105336			350.69	**350.7**
		664 ±			
	106000			350.73	**350.7**
		200 ±			
"R"			**350.8**	-------	-------

TABLE 1B

Water Surface Elevations Calibration Comparison
Otter Creek FIS Study vs. HEC-RAS Model
Option BB Alignment - Existing Conditions

FIS STA.	Model STA.	Approx. Horz. Diff	FIS Sig Fig 100-Yr	Model to "0.01" 100-Yr	Model Sig Fig 100-Yr
"O"			**350.2**	-------	-------
		2523 ±			
	101960			350.45	**350.5**
		677 ±			
"P" =	**102637**		**350.5**	350.50	**350.5**
		574 ±			
	103211			350.55	**350.6**
		708 ±			
"Q"			**350.6**		
		100 ±			
	104019			350.60	**350.6**
		400 ±			
REF PT					
		231 ±			
	104650			350.66	**350.7**
		686 ±			
	105336			350.69	**350.7**
		664 ±			
	106000			350.73	**350.7**
		200 ±			
"R"			**350.8**	-------	-------

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY (FEET NGVD)	INCREASE
Otter Creek								
A	0	162[2]	2,761	4.7	320.3	320.3	320.6	0.3
B	1,320	196[2]	2,881	4.5	320.9	320.9	321.2	0.3
C	2,270	187	2,796	4.6	321.3	321.3	321.6	0.3
D	3,285	177	2,693	4.8	321.5	321.5	321.9	0.4
E	4,370	196	3,102	4.2	322.0	322.0	322.4	0.4
F	5,515	143	1,830	7.1	322.1	322.1	322.6	0.5
G	5,920	172	1,904	6.8	322.5	322.5	323.0	0.5
H	5,950	167	956	13.6	341.9	341.9	341.9	0.0
I	6,135	147	1,429	9.1	346.3	346.3	346.3	0.0
J	6,985	226	2,692	4.8	348.9	348.9	348.9	0.0
K	7,600	185	2,785	4.7	349.5	349.5	349.6	0.1
L	7,955	191	2,784	4.7	349.5	349.5	349.6	0.1
M	10,035	208	3,809	3.4	349.9	349.9	350.0	0.1
N	11,565	205	3,005	4.3	350.1	350.1	350.1	0.0
O	12,600	380	3,897	3.3	350.2	350.2	350.3	0.1
P	15,795	500	4,636	2.8	350.5	350.5	350.8	0.3
Q	17,075	553	4,243	3.1	350.6	350.6	351.0	0.4
R	19,375	800	7,163	1.8	350.8	350.8	351.4	0.6
S	21,350	1,041	10,455	1.2	350.9	350.9	351.5	0.6
T	24,120	1,660	12,501	1.0	350.9	350.9	351.7	0.8
U	25,670	1,200	8,942	1.5	351.0	351.0	351.8	0.8
V	26,020	1,200	9,401	1.4	351.0	351.0	351.8	0.8
W	28,500	2,150	19,679	0.7	351.0	351.0	351.9	0.9

[1]Feet above Village of Middlebury
[2]This width extends beyond corporate limits

FEDERAL EMERGENCY MANAGEMENT AGENCY

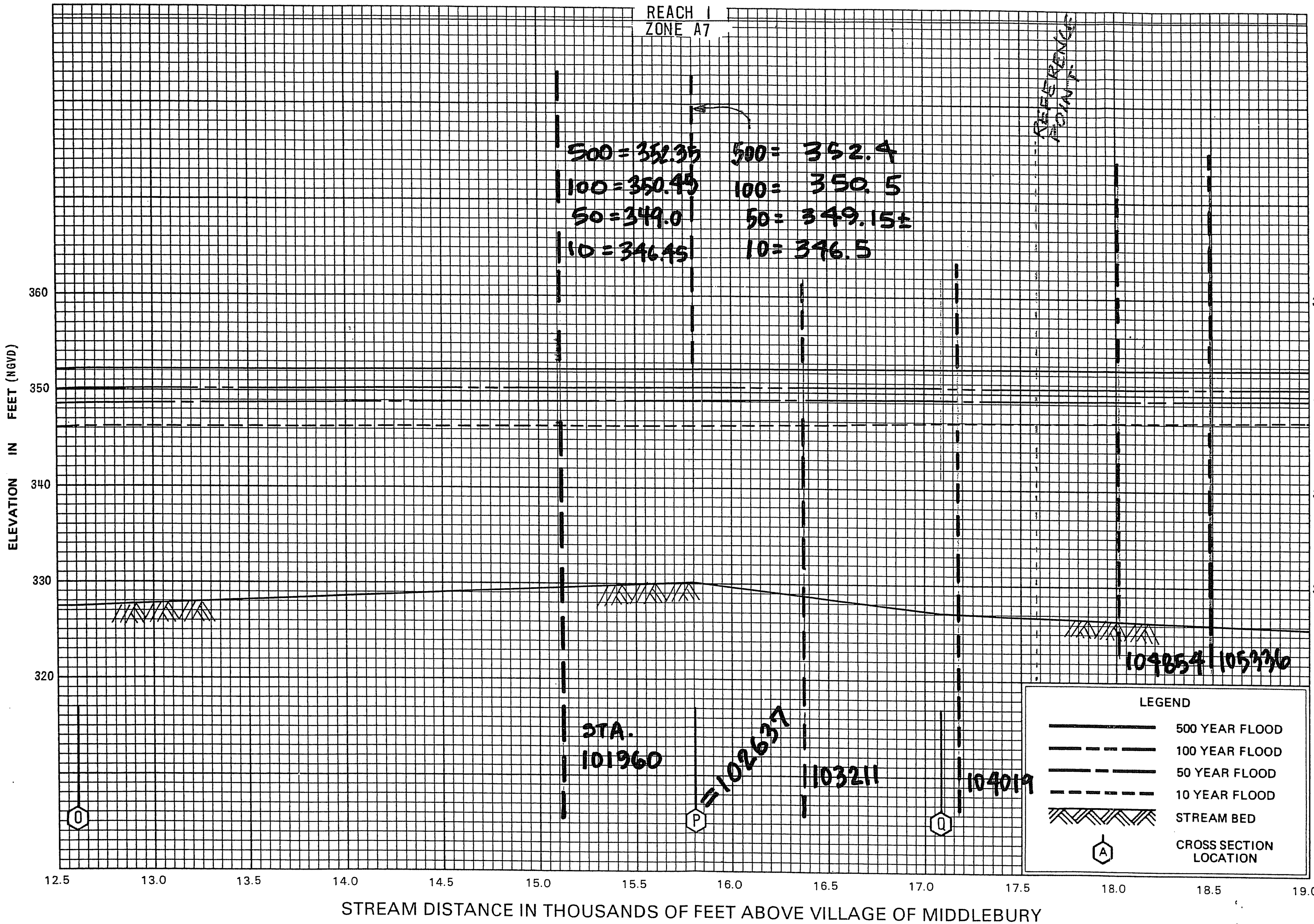
TOWN OF MIDDLEBURY, VT

(ADDISON CO.)

FLOODWAY DATA

OTTER CREEK

TABLE 2



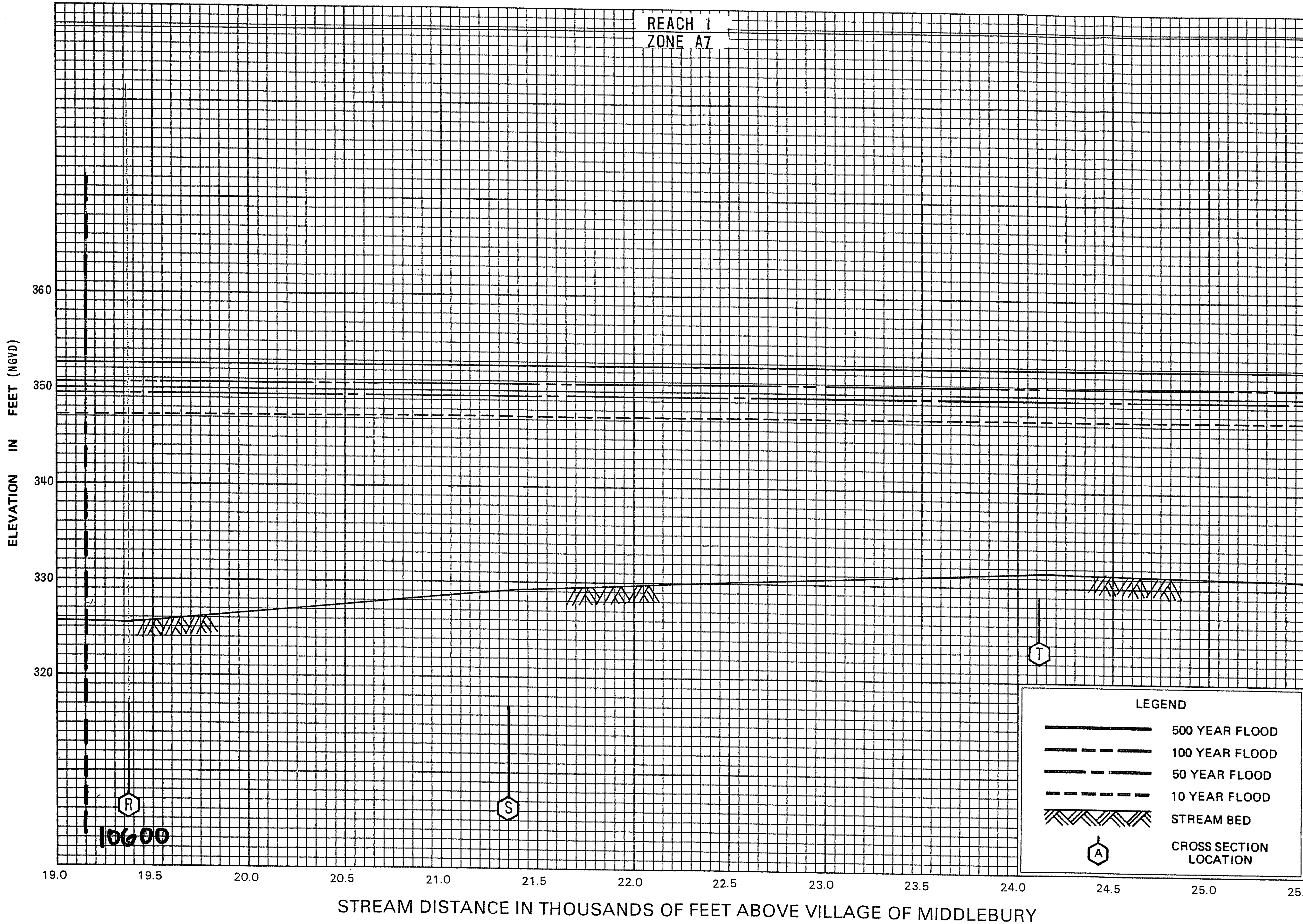
FLOOD PROFILES

OTTER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF MIDDLEBURY, VT.
(ADDISON CO.)

03P



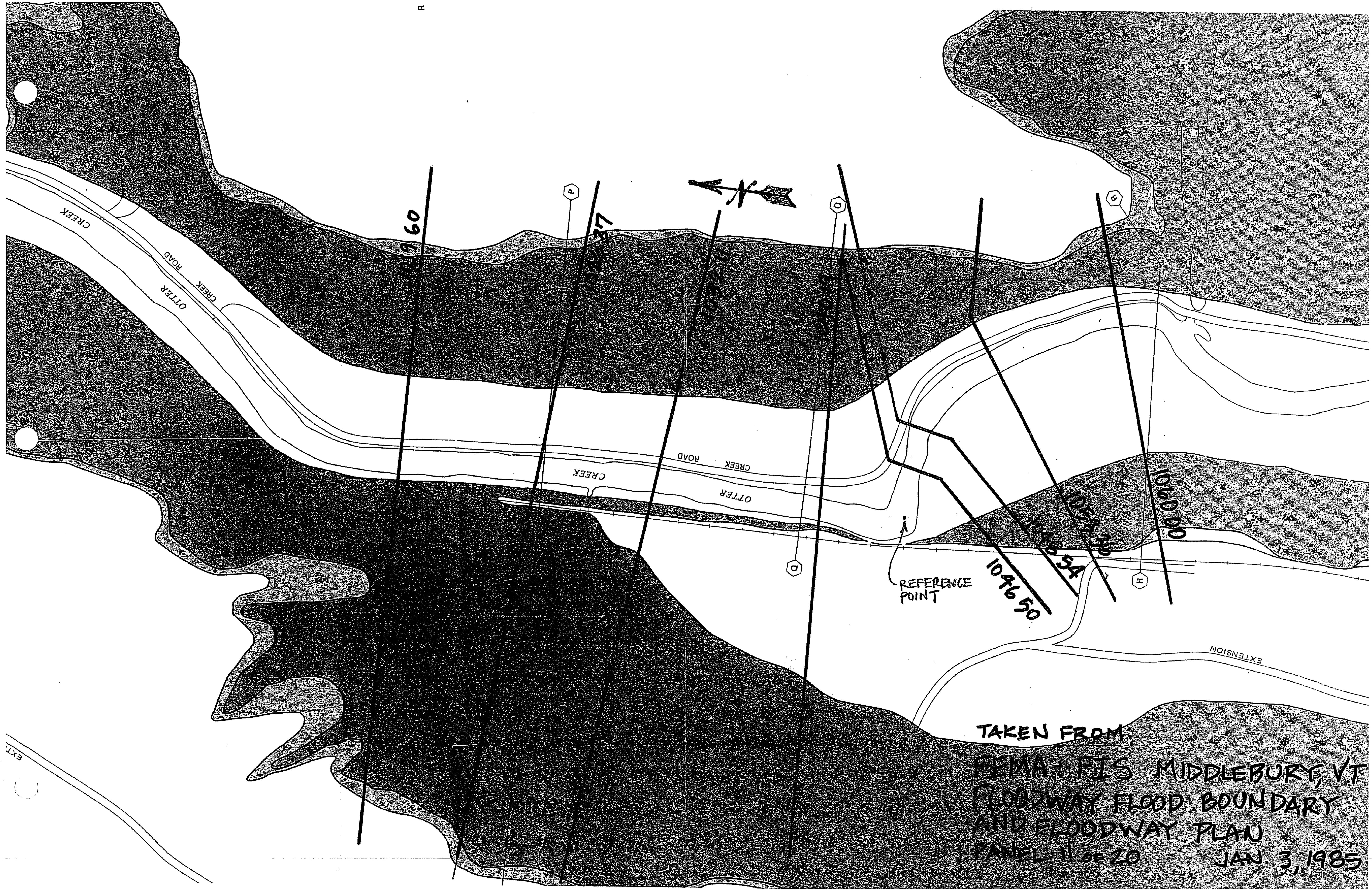
FLOOD PROFILES

OTTER CREEK

FEDERAL EMERGENCY MANAGEMENT AGENCY

TOWN OF MIDDLEBURY, VT.
(ADDISON CO.)

04P



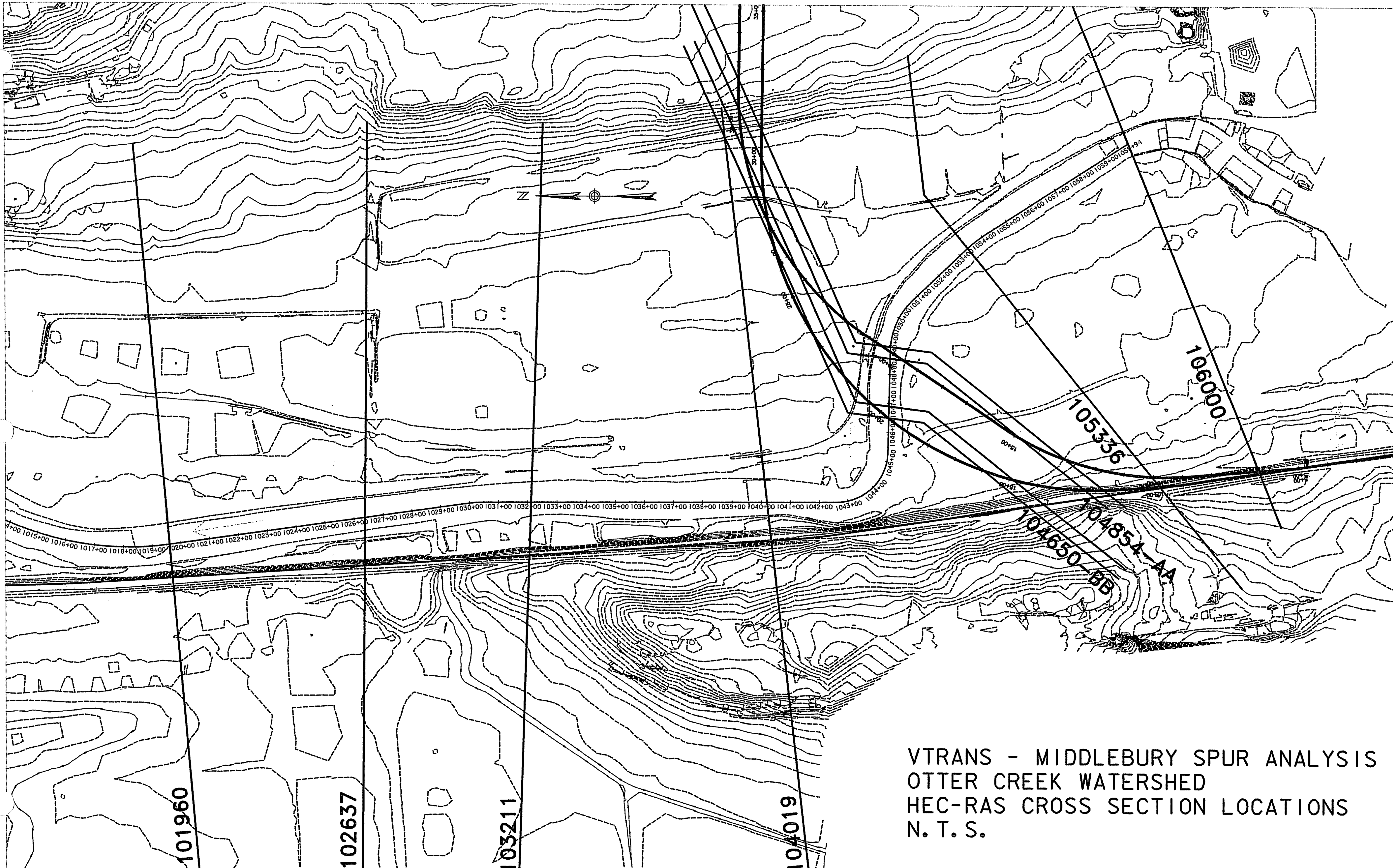
TAKEN FROM:
FEMA - FIS MIDDLEBURY, VT
FLOODWAY FLOOD BOUNDARY
AND FLOODWAY PLAN
PANEL 11 OF 20 JAN. 3, 1985

APPENDIX B

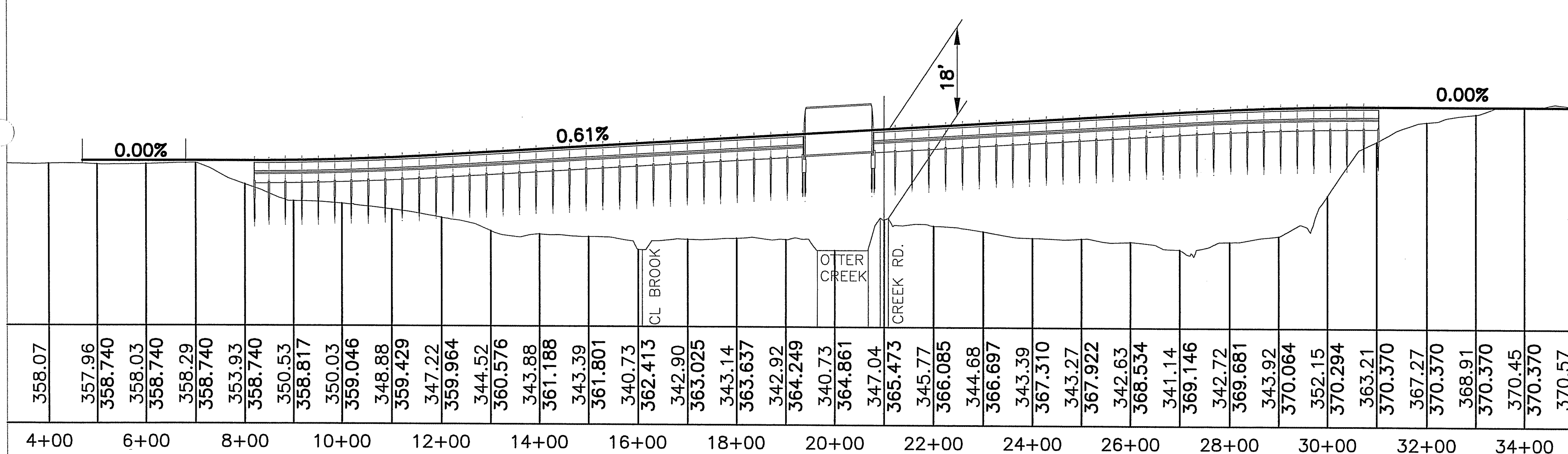
PROPOSED BRIDGE CONDITIONS

HEC-RAS X-SECTION LOCATIONS
ALIGNMENTS, PROFILE AND PIER ELEVATIONS

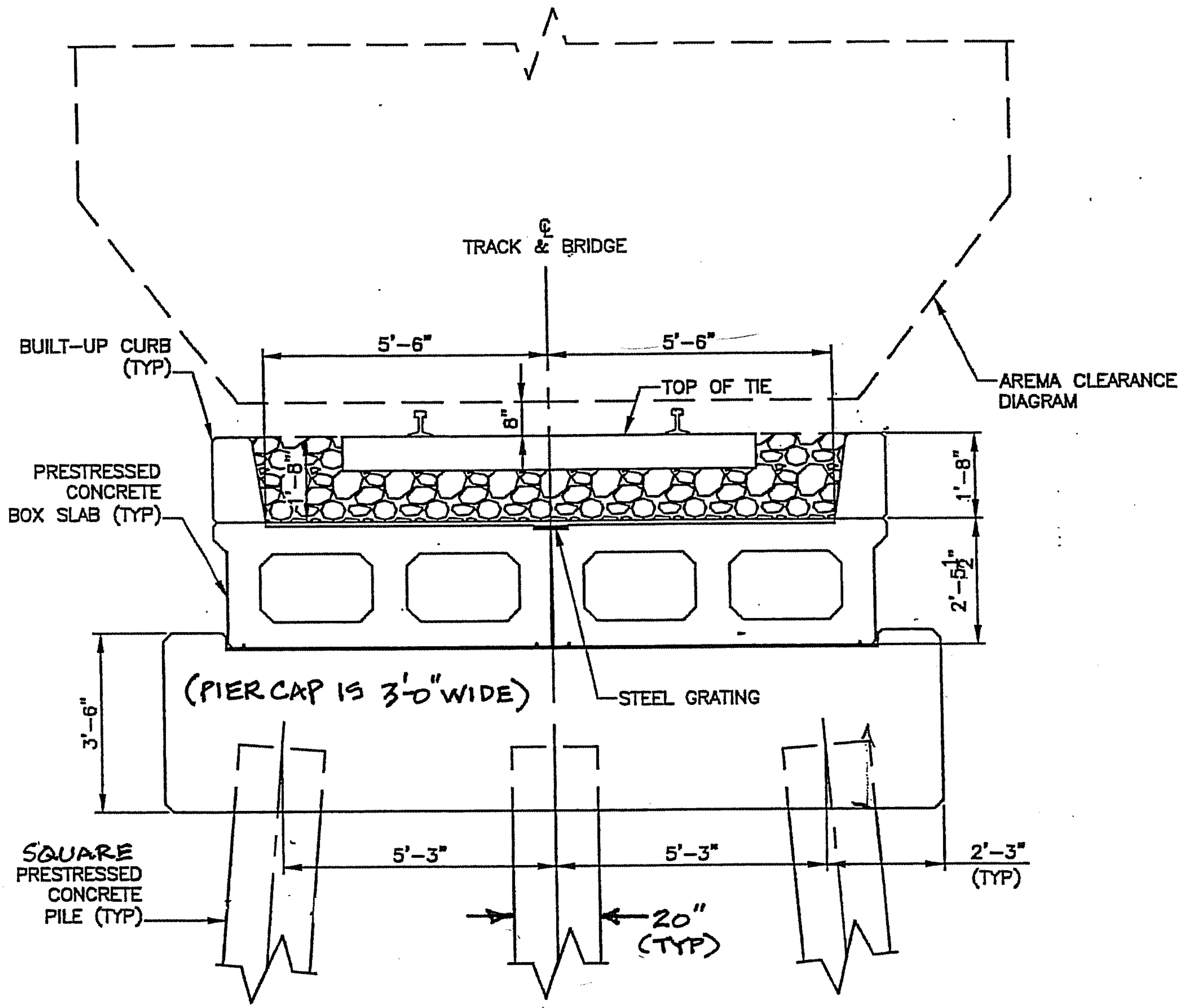
HEC-RAS Cross Section Plan
Proposed Railroad Profile
34-foot 20" Square Pier Bent Elevation
34-foot 4' Diameter Round Pier Bent Elevation
69-foot 5' Diameter Round Pier Bent Elevation



VTRANS - MIDDLEBURY SPUR ANALYSIS
OTTER CREEK WATERSHED
HEC-RAS CROSS SECTION LOCATIONS
N.T.S.

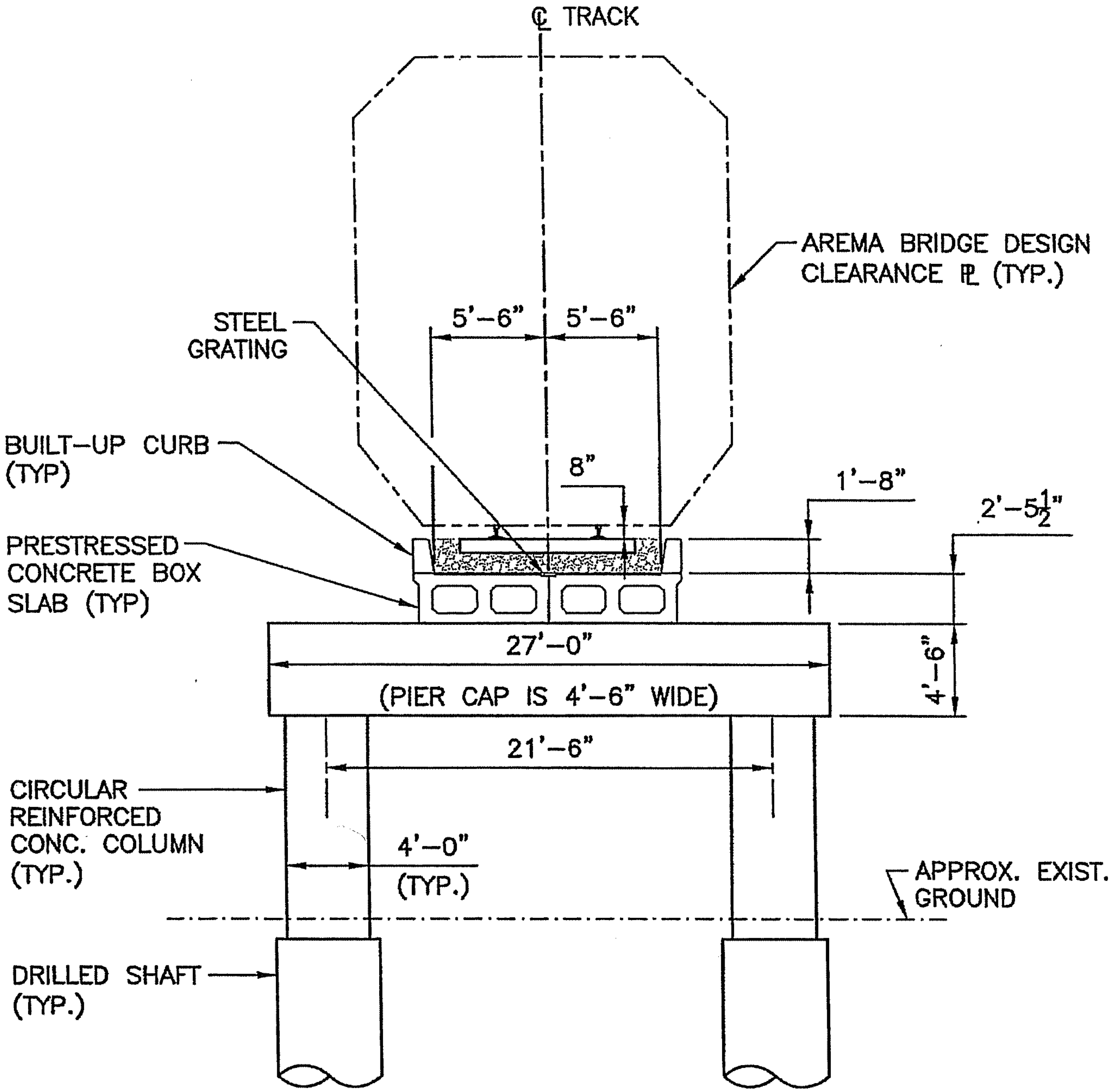


VTRANS - MIDDLEBURY SPUR ANALYSIS
OTTER CREEK WATERSHED
PROPOSED RAILROAD BRIDGE PROFILE
N. T. S.



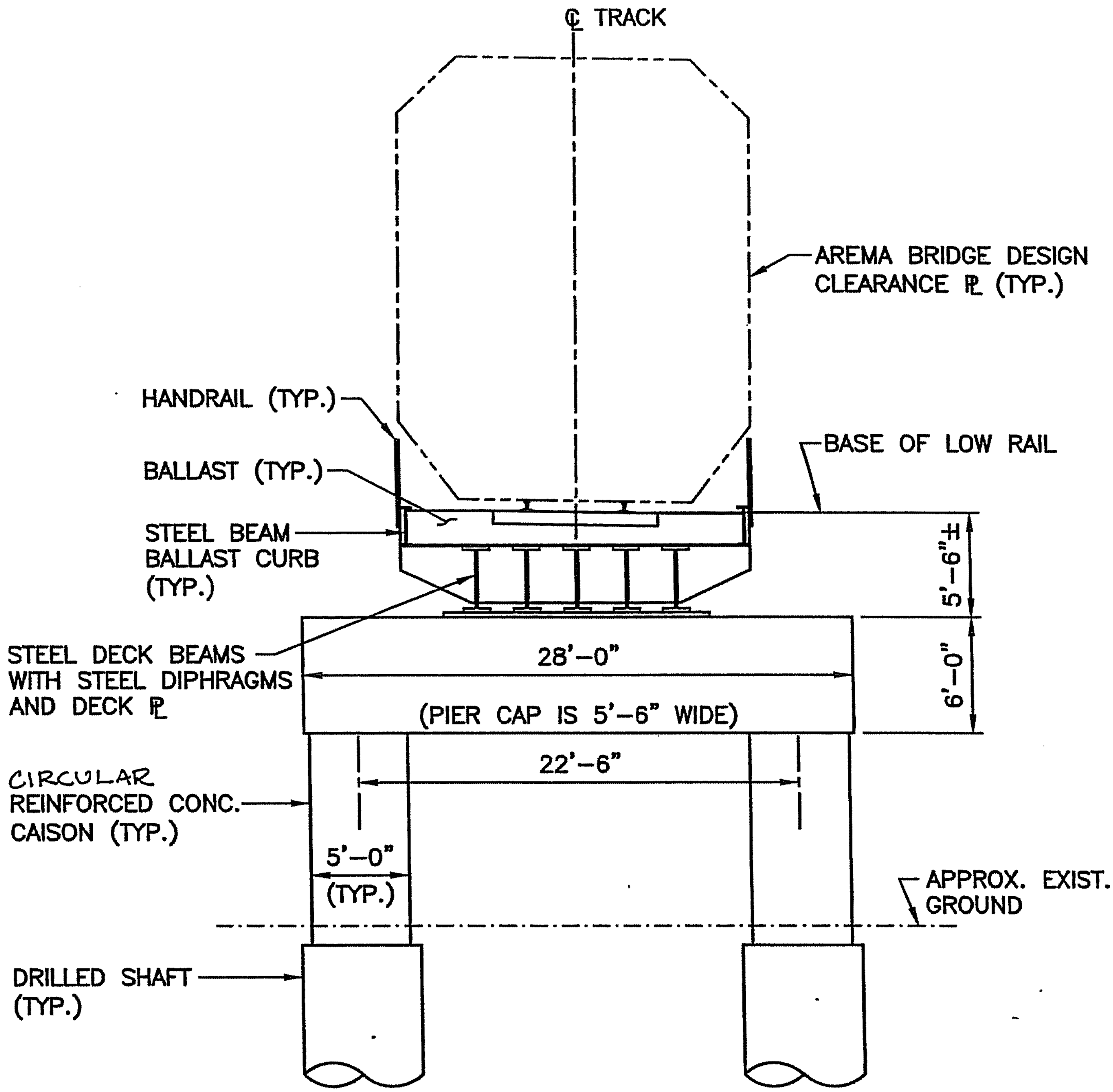
CONCEPTUAL INTERMEDIATE BENT ELEVATION FOR 34' SPAN PRESTRESSED CONCRETE TRESTLE

N.T.S.



CONCEPTUAL INTERMEDIATE BENT ELEVATION FOR 34' SPAN PRESTRESSED CONCRETE TRESTLE

N.T.S.



NOTE: TRACK SHOWN WITH 1" SUPER ELEVATION

CONCEPTUAL INTERMEDIATE BENT ELEVATION FOR 69' SPAN STEEL BEAM TRESTLE

N.T.S.

APPENDIX C

HEC-RAS MODEL RESULTS
OPTION AA ALIGNMENT

TABLE 2:	100-YEAR EVENT – PIER TYPE COMPARISON 34-foot 4' Diameter Bent Type (Pr AA 34 Rnd) Skewed 34-foot 20" Square Bent Type (Pr AA 34 Sk) 34-foot 20" Square Bent Type (Opt AA-34 ft) Skewed 69-foot 5' Diameter Bent Type (Pr AA 69 Sk) 69-foot 5' Diameter Bent Type (Opt AA-69 ft) Existing Conditions (Ex Cond - AA)

34-FOOT BENT PIERS

TABLE 3A:	10-YR, 50-YR, 100-YR 500-YR, EVENT – 34-FOOT SQUARE PIER 34-foot 20" Square Bent Type (Opt AA-34 ft) Existing Conditions (Ex Cond - AA)
TABLE 3B:	10-YR, 50-YR, 100-YR 500-YR, EVENT – SKEW 34-FOOT SQUARE PIER Skewed 34-foot 20" Square Bent Type (Pr AA 34 Sk) Existing Conditions (Ex Cond - AA)
TABLE 3C:	10-YR, 50-YR, 100-YR 500-YR, EVENT – 34-FOOT ROUND PIER 34-foot 4' Diameter Bent Type (Pr AA 34 Rnd) Existing Conditions (Ex Cond - AA)

69-FOOT BENT PIERS

TABLE 4A:	10-YR, 50-YR, 100-YR 500-YR, EVENT – 69-FOOT PIER 69-foot 5' Diameter Bent Type (Opt AA-69 ft) Existing Conditions (Ex Cond – AA)
TABLE 4B:	10-YR, 50-YR, 100-YR 500-YR, EVENT – SKEW 69-FOOT PIER Skewed 69-foot 5' Diameter Bent Type (Pr AA 69 Sk) Existing Conditions (Ex Cond – AA)

OPTION AA ALIGNMENT

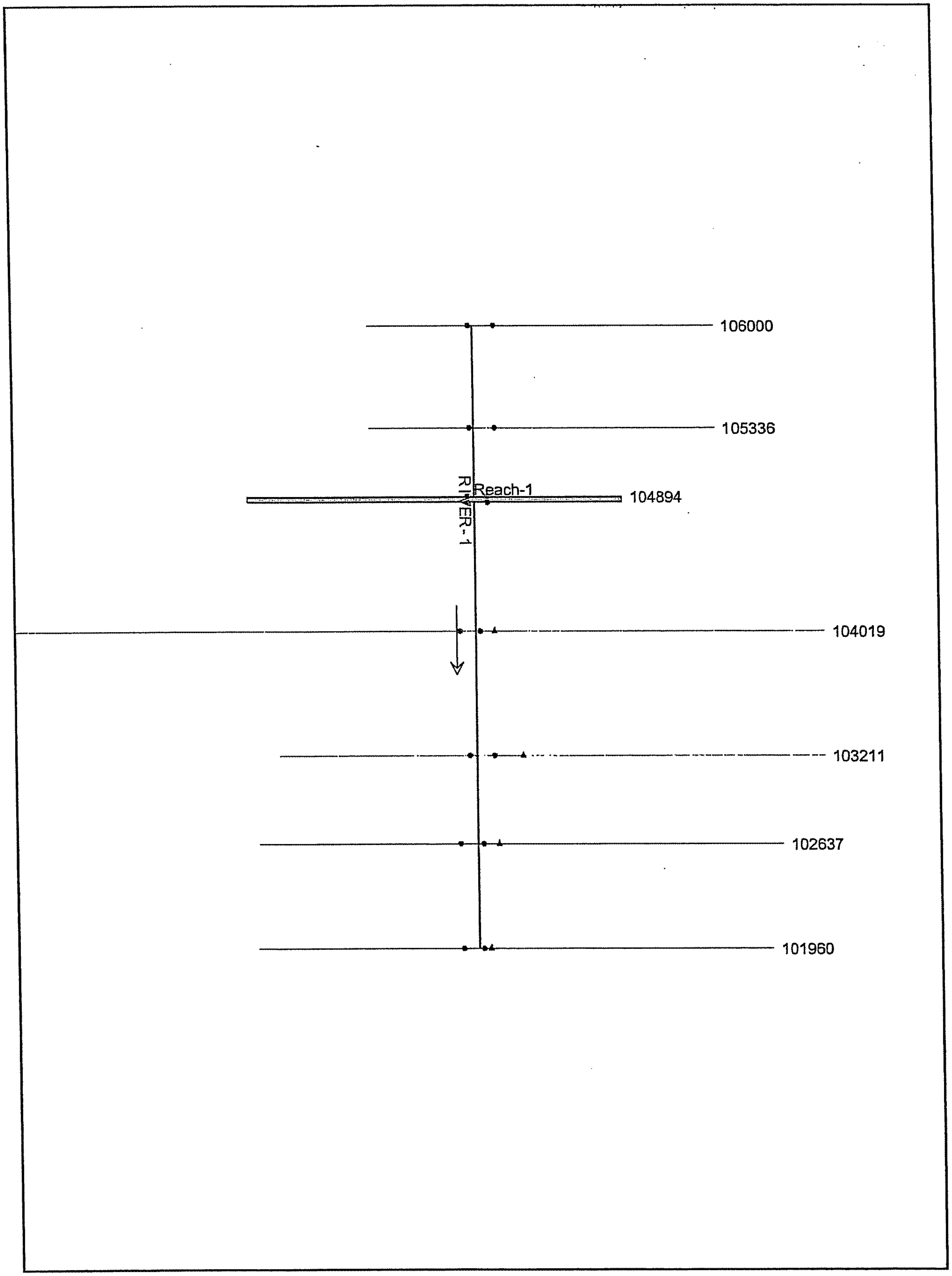


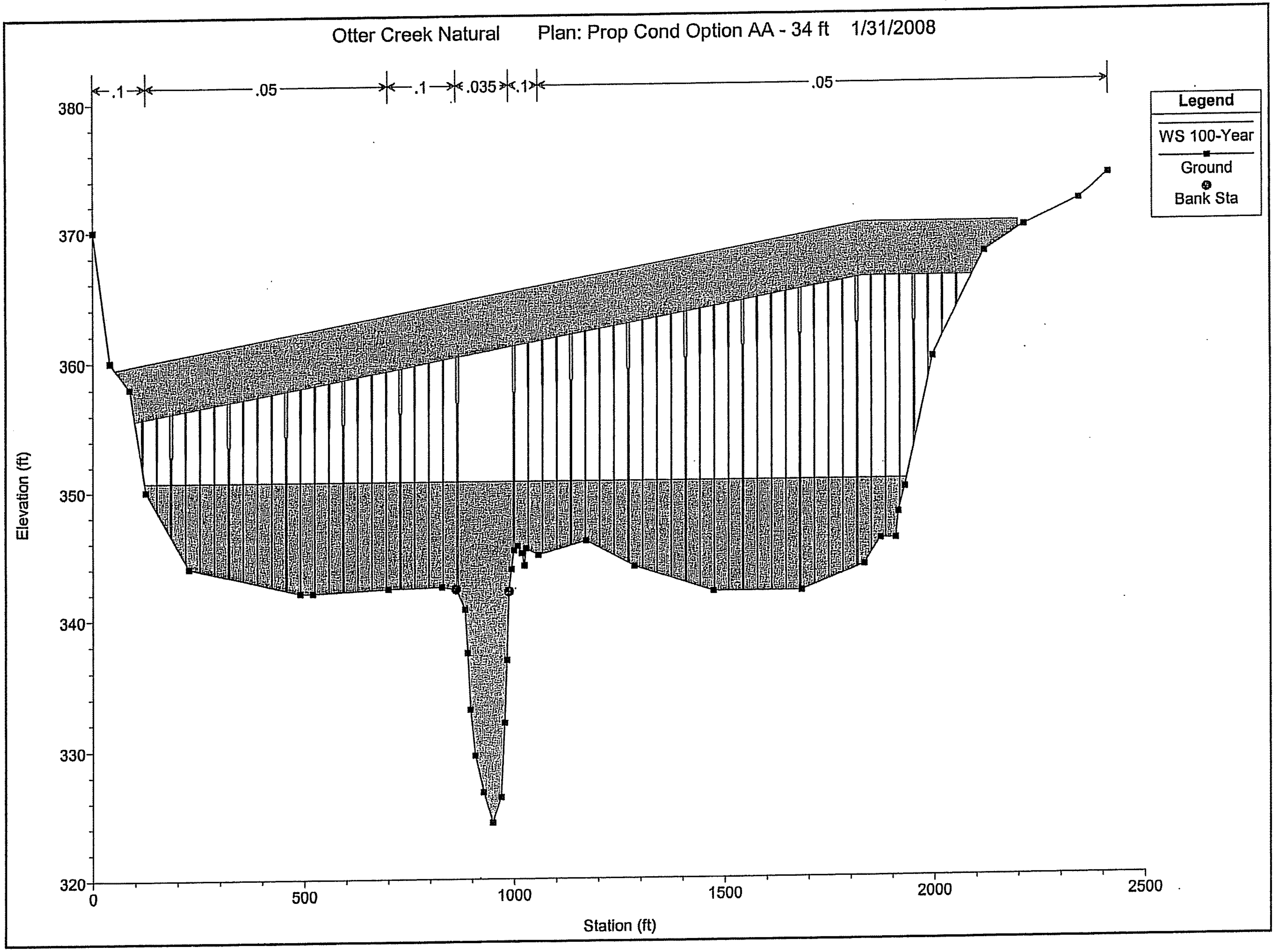
TABLE 2
OPTION AA – PIER TYPE COMPARISON

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	100-Year	Pr AA 34 Rnd	13000.00	327.04	350.732	337.39	350.762	0.000054	1.96	12572.72	1602.52	0.08
Reach-1	106000	100-Year	Pr AA 34 Sk	13000.00	327.04	350.733	337.39	350.763	0.000054	1.96	12574.09	1602.54	0.08
Reach-1	106000	100-Year	Opt AA 34 ft	13000.00	327.04	350.731	337.39	350.762	0.000054	1.96	12571.89	1602.50	0.08
Reach-1	106000	100-Year	Pr AA 69 Sk	13000.00	327.04	350.729	337.39	350.760	0.000054	1.96	12568.12	1602.45	0.08
Reach-1	106000	100-Year	Opt AA 69 ft	13000.00	327.04	350.728	337.39	350.759	0.000054	1.97	12566.80	1602.42	0.08
Reach-1	106000	100-Year	Ex Cond - AA	13000.00	327.04	350.725	337.41	350.755	0.000054	1.97	12561.37	1602.34	0.08
Reach-1	105336	100-Year	Pr AA 34 Rnd	13000.00	327.04	350.693	337.40	350.727	0.000060	2.07	12510.19	1601.53	0.09
Reach-1	105336	100-Year	Pr AA 34 Sk	13000.00	327.04	350.694	337.40	350.728	0.000060	2.07	12511.56	1601.55	0.09
Reach-1	105336	100-Year	Opt AA 34 ft	13000.00	327.04	350.692	337.40	350.727	0.000060	2.07	12509.31	1601.52	0.09
Reach-1	105336	100-Year	Pr AA 69 Sk	13000.00	327.04	350.690	337.40	350.724	0.000060	2.07	12505.50	1601.46	0.09
Reach-1	105336	100-Year	Opt AA 69 ft	13000.00	327.04	350.689	337.40	350.723	0.000060	2.07	12504.18	1601.44	0.09
Reach-1	105336	100-Year	Ex Cond - AA	13000.00	327.04	350.686	337.41	350.720	0.000060	2.07	12498.65	1601.35	0.09
Reach-1	104894	100-Year	Pr AA 34 Rnd	13000.00	324.32	350.678	336.63	350.704	0.000045	1.96	14458.85	1812.69	0.08
Reach-1	104894	100-Year	Pr AA 34 Sk	13000.00	324.32	350.679	336.63	350.705	0.000045	1.96	14460.40	1812.70	0.08
Reach-1	104894	100-Year	Opt AA 34 ft	13000.00	324.32	350.677	336.63	350.704	0.000045	1.96	14457.86	1812.69	0.08
Reach-1	104894	100-Year	Pr AA 69 Sk	13000.00	324.32	350.675	336.63	350.701	0.000045	1.96	14453.54	1812.66	0.08
Reach-1	104894	100-Year	Opt AA 69 ft	13000.00	324.32	350.674	336.63	350.701	0.000045	1.96	14452.05	1812.65	0.08
Reach-1	104894	100-Year	Ex Cond - AA	13000.00	324.32	350.671	336.66	350.697	0.000045	1.96	14445.74	1812.61	0.08
Reach-1	104874			Bridge									
Reach-1	104854	100-Year	Pr AA 34 Rnd	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.31	1812.59	0.08
Reach-1	104854	100-Year	Pr AA 34 Sk	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.31	1812.59	0.08
Reach-1	104854	100-Year	Opt AA 34 ft	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.31	1812.59	0.08
Reach-1	104854	100-Year	Pr AA 69 Sk	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	100-Year	Opt AA 69 ft	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	100-Year	Ex Cond - AA	13000.00	324.32	350.669	336.66	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104019	100-Year	Pr AA 34 Rnd	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.46	2490.37	0.10
Reach-1	104019	100-Year	Pr AA 34 Sk	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.46	2490.37	0.10
Reach-1	104019	100-Year	Opt AA 34 ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.46	2490.37	0.10
Reach-1	104019	100-Year	Pr AA 69 Sk	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Opt AA 69 ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Ex Cond - AA	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	103211	100-Year	Pr AA 34 Rnd	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.06	3053.85	0.10
Reach-1	103211	100-Year	Pr AA 34 Sk	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.06	3053.85	0.10
Reach-1	103211	100-Year	Opt AA 34 ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.06	3053.85	0.10
Reach-1	103211	100-Year	Pr AA 69 Sk	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Opt AA 69 ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - AA	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year (Continued)

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	102637	100-Year	Pr AA 34 Rnd	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.45	2969.16	0.10
Reach-1	102637	100-Year	Pr AA 34 Sk	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.45	2969.16	0.10
Reach-1	102637	100-Year	Opt AA 34 ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.45	2969.16	0.10
Reach-1	102637	100-Year	Pr AA 69 Sk	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Opt AA 69 ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Ex Cond - AA	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	101960	100-Year	Pr AA 34 Rnd	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Pr AA 34 Sk	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Opt AA 34 ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Pr AA 69 Sk	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Opt AA 69 ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - AA	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10



Otter Creek Natural Plan: Prop Cond Option AA - 34 ft 1/31/2008
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
380
370
360
350
340
330
320
0
500
1000
1500
2000
2500
Station (ft)

TABLE 3A
34-FOOT SQUARE PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	10 Year	Opt AA 34 ft	7750.00	327.04	346.912	335.08	346.962	0.000092	2.22	6714.60	1447.51	0.11
Reach-1	106000	10 Year	Ex Cond - AA	7750.00	327.04	346.909	335.09	346.958	0.000092	2.22	6709.96	1447.35	0.11
Reach-1	106000	50 Year	Opt AA 34 ft	11000.00	327.04	349.326	336.58	349.362	0.000065	2.05	10348.60	1556.71	0.09
Reach-1	106000	50 Year	Ex Cond - AA	11000.00	327.04	349.321	336.59	349.356	0.000065	2.05	10340.14	1556.49	0.09
Reach-1	106000	100 Year	Opt AA 34 ft	13000.00	327.04	350.731	337.39	350.762	0.000054	1.96	12571.89	1602.50	0.08
Reach-1	106000	100 Year	Ex Cond - AA	13000.00	327.04	350.725	337.41	350.755	0.000054	1.97	12561.37	1602.34	0.08
Reach-1	106000	500 Year	Opt AA 34 ft	16000.00	327.04	352.596	338.49	352.623	0.000045	1.90	15601.73	1644.62	0.08
Reach-1	106000	500 Year	Ex Cond - AA	16000.00	327.04	352.588	338.54	352.615	0.000045	1.90	15589.18	1644.49	0.08
Reach-1	105336	10 Year	Opt AA 34 ft	7750.00	327.04	346.847	335.09	346.900	0.000102	2.28	6619.91	1444.17	0.11
Reach-1	105336	10 Year	Ex Cond - AA	7750.00	327.04	346.843	335.09	346.897	0.000102	2.28	6615.15	1444.01	0.11
Reach-1	105336	50 Year	Opt AA 34 ft	11000.00	327.04	349.280	336.58	349.319	0.000072	2.14	10276.01	1554.82	0.10
Reach-1	105336	50 Year	Ex Cond - AA	11000.00	327.04	349.274	336.59	349.313	0.000072	2.14	10267.42	1554.60	0.10
Reach-1	105336	100 Year	Opt AA 34 ft	13000.00	327.04	350.692	337.40	350.727	0.000060	2.07	12509.31	1601.52	0.09
Reach-1	105336	100 Year	Ex Cond - AA	13000.00	327.04	350.686	337.41	350.720	0.000060	2.07	12498.65	1601.35	0.09
Reach-1	105336	500 Year	Opt AA 34 ft	16000.00	327.04	352.563	338.49	352.594	0.000050	2.02	15548.23	1644.07	0.08
Reach-1	105336	500 Year	Ex Cond - AA	16000.00	327.04	352.555	338.54	352.586	0.000050	2.02	15535.59	1643.94	0.08
Reach-1	104894	10 Year	Opt AA 34 ft	7750.00	324.32	346.812	333.86	346.861	0.000083	2.29	7601.43	1731.24	0.10
Reach-1	104894	10 Year	Ex Cond - AA	7750.00	324.32	346.808	333.89	346.857	0.000083	2.29	7595.62	1731.17	0.10
Reach-1	104894	50 Year	Opt AA 34 ft	11000.00	324.32	349.260	335.62	349.291	0.000055	2.06	11903.77	1786.50	0.09
Reach-1	104894	50 Year	Ex Cond - AA	11000.00	324.32	349.254	335.66	349.286	0.000055	2.06	11893.79	1786.36	0.09
Reach-1	104894	100 Year	Opt AA 34 ft	13000.00	324.32	350.677	336.63	350.704	0.000045	1.96	14457.86	1812.69	0.08
Reach-1	104894	100 Year	Ex Cond - AA	13000.00	324.32	350.671	336.66	350.697	0.000045	1.96	14445.74	1812.61	0.08
Reach-1	104894	500 Year	Opt AA 34 ft	16000.00	324.32	352.552	337.99	352.575	0.000037	1.89	17875.48	1833.96	0.07
Reach-1	104894	500 Year	Ex Cond - AA	16000.00	324.32	352.544	338.02	352.567	0.000037	1.89	17861.32	1833.87	0.07
Reach-1	104874			Bridge									
Reach-1	104854	10 Year	Opt AA 34 ft	7750.00	324.32	346.805	333.86	346.854	0.000084	2.29	7589.60	1731.10	0.10
Reach-1	104854	10 Year	Ex Cond - AA	7750.00	324.32	346.805	333.89	346.854	0.000084	2.29	7589.65	1731.10	0.10
Reach-1	104854	50 Year	Opt AA 34 ft	11000.00	324.32	349.252	335.62	349.284	0.000055	2.06	11889.65	1786.30	0.09
Reach-1	104854	50 Year	Ex Cond - AA	11000.00	324.32	349.252	335.66	349.284	0.000055	2.06	11889.76	1786.30	0.09
Reach-1	104854	100 Year	Opt AA 34 ft	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.31	1812.59	0.08
Reach-1	104854	100 Year	Ex Cond - AA	13000.00	324.32	350.669	336.66	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	500 Year	Opt AA 34 ft	16000.00	324.32	352.542	338.00	352.565	0.000037	1.89	17858.46	1833.86	0.07
Reach-1	104854	500 Year	Ex Cond - AA	16000.00	324.32	352.543	338.02	352.565	0.000037	1.89	17858.58	1833.86	0.07
Reach-1	104019	10 Year	Opt AA 34 ft	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.87	2143.06	0.12
Reach-1	104019	10 Year	Ex Cond - AA	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50 Year	Opt AA 34 ft	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8679.93	2287.15	0.11
Reach-1	104019	50 Year	Ex Cond - AA	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100 Year	Opt AA 34 ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.46	2490.37	0.10
Reach-1	104019	100 Year	Ex Cond - AA	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500 Year	Opt AA 34 ft	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.38	2990.58	0.10
Reach-1	104019	500 Year	Ex Cond - AA	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	103211	10-Year	Opt AA-34 ft	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.70	2768.68	0.12
Reach-1	103211	10-Year	Ex Cond - AA	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	Opt AA-34 ft	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.03	2965.67	0.10
Reach-1	103211	50-Year	Ex Cond - AA	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	Opt AA-34 ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.06	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - AA	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	Opt AA-34 ft	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.00	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - AA	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	Opt AA-34 ft	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.05	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - AA	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	Opt AA-34 ft	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.04	2859.05	0.11
Reach-1	102637	50-Year	Ex Cond - AA	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	Opt AA-34 ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.45	2969.16	0.10
Reach-1	102637	100-Year	Ex Cond - AA	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	Opt AA-34 ft	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.50	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - AA	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	Opt AA-34 ft	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - AA	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	Opt AA-34 ft	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - AA	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	Opt AA-34 ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - AA	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	Opt AA-34 ft	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - AA	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09

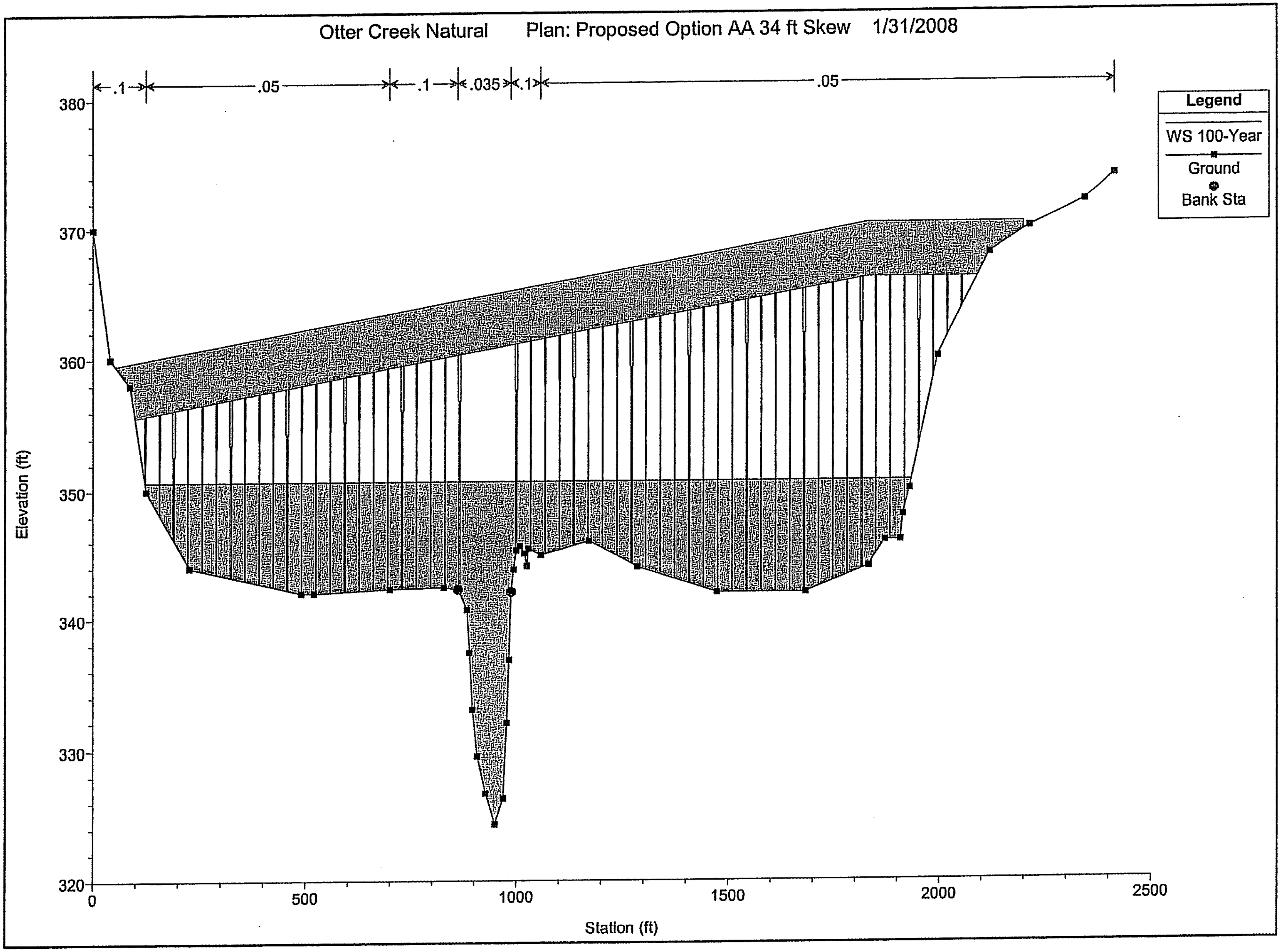

Otter Creek Natural
Plan: Proposed Option AA 34 ft Skew
1/31/2008
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
380
370
360
350
340
330
320
0
500
1000
1500
2000
2500
Station (ft)

TABLE 3B
SKEWED 34-FOOT SQUARE PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	10-Year	Pr AA 34 Sk	7750.00	327.04	346.912	335.08	346.962	0.000092	2.22	6714.64	1447.52	0.11
Reach-1	106000	10-Year	Ex Cond - AA	7750.00	327.04	346.909	335.09	346.958	0.000092	2.22	6709.96	1447.35	0.11
Reach-1	106000	50-Year	Pr AA 34 Sk	11000.00	327.04	349.327	336.58	349.363	0.000065	2.05	10350.36	1556.76	0.09
Reach-1	106000	50-Year	Ex Cond - AA	11000.00	327.04	349.321	336.59	349.356	0.000065	2.05	10340.14	1556.49	0.09
Reach-1	106000	100-Year	Pr AA 34 Sk	13000.00	327.04	350.733	337.39	350.763	0.000054	1.96	12574.09	1602.54	0.08
Reach-1	106000	100-Year	Ex Cond - AA	13000.00	327.04	350.725	337.41	350.755	0.000054	1.97	12561.37	1602.34	0.08
Reach-1	106000	500-Year	Pr AA 34 Sk	16000.00	327.04	352.597	338.49	352.624	0.000044	1.90	15604.74	1644.65	0.08
Reach-1	106000	500-Year	Ex Cond - AA	16000.00	327.04	352.588	338.54	352.615	0.000045	1.90	15589.18	1644.49	0.08
Reach-1	105336	10-Year	Pr AA 34 Sk	7750.00	327.04	346.847	335.09	346.900	0.000102	2.28	6619.95	1444.18	0.11
Reach-1	105336	10-Year	Ex Cond - AA	7750.00	327.04	346.843	335.09	346.897	0.000102	2.28	6615.15	1444.01	0.11
Reach-1	105336	50-Year	Pr AA 34 Sk	11000.00	327.04	349.281	336.58	349.320	0.000072	2.14	10277.81	1554.87	0.10
Reach-1	105336	50-Year	Ex Cond - AA	11000.00	327.04	349.274	336.59	349.313	0.000072	2.14	10267.42	1554.60	0.10
Reach-1	105336	100-Year	Pr AA 34 Sk	13000.00	327.04	350.694	337.40	350.728	0.000060	2.07	12511.56	1601.55	0.09
Reach-1	105336	100-Year	Ex Cond - AA	13000.00	327.04	350.686	337.41	350.720	0.000060	2.07	12498.65	1601.35	0.09
Reach-1	105336	500-Year	Pr AA 34 Sk	16000.00	327.04	352.565	338.49	352.595	0.000050	2.02	15551.29	1644.11	0.08
Reach-1	105336	500-Year	Ex Cond - AA	16000.00	327.04	352.555	338.54	352.586	0.000050	2.02	15535.59	1643.94	0.08
Reach-1	104894	10-Year	Pr AA 34 Sk	7750.00	324.32	346.812	333.86	346.861	0.000083	2.29	7601.49	1731.24	0.10
Reach-1	104894	10-Year	Ex Cond - AA	7750.00	324.32	346.808	333.89	346.857	0.000083	2.29	7595.62	1731.17	0.10
Reach-1	104894	50-Year	Pr AA 34 Sk	11000.00	324.32	349.261	335.62	349.293	0.000055	2.06	11905.84	1786.53	0.09
Reach-1	104894	50-Year	Ex Cond - AA	11000.00	324.32	349.254	335.66	349.286	0.000055	2.06	11893.79	1786.36	0.09
Reach-1	104894	100-Year	Pr AA 34 Sk	13000.00	324.32	350.679	336.63	350.705	0.000045	1.96	14460.40	1812.70	0.08
Reach-1	104894	100-Year	Ex Cond - AA	13000.00	324.32	350.671	336.66	350.697	0.000045	1.96	14445.74	1812.61	0.08
Reach-1	104894	500-Year	Pr AA 34 Sk	16000.00	324.32	352.554	337.99	352.576	0.000037	1.88	17878.89	1833.98	0.07
Reach-1	104894	500-Year	Ex Cond - AA	16000.00	324.32	352.544	338.02	352.567	0.000037	1.89	17861.32	1833.87	0.07
Reach-1	104874			Bridge									
Reach-1	104854	10-Year	Pr AA 34 Sk	7750.00	324.32	346.805	333.86	346.854	0.000084	2.29	7589.60	1731.10	0.10
Reach-1	104854	10-Year	Ex Cond - AA	7750.00	324.32	346.805	333.89	346.854	0.000084	2.29	7589.65	1731.10	0.10
Reach-1	104854	50-Year	Pr AA 34 Sk	11000.00	324.32	349.252	335.62	349.284	0.000055	2.06	11889.65	1786.30	0.09
Reach-1	104854	50-Year	Ex Cond - AA	11000.00	324.32	349.252	335.66	349.284	0.000055	2.06	11889.76	1786.30	0.09
Reach-1	104854	100-Year	Pr AA 34 Sk	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.31	1812.59	0.08
Reach-1	104854	100-Year	Ex Cond - AA	13000.00	324.32	350.669	336.66	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	500-Year	Pr AA 34 Sk	16000.00	324.32	352.542	338.00	352.565	0.000037	1.89	17858.46	1833.86	0.07
Reach-1	104854	500-Year	Ex Cond - AA	16000.00	324.32	352.543	338.02	352.565	0.000037	1.89	17858.58	1833.86	0.07
Reach-1	104019	10-Year	Pr AA 34 Sk	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.87	2143.06	0.12
Reach-1	104019	10-Year	Ex Cond - AA	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50-Year	Pr AA 34 Sk	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8679.93	2287.15	0.11
Reach-1	104019	50-Year	Ex Cond - AA	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100-Year	Pr AA 34 Sk	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.46	2490.37	0.10
Reach-1	104019	100-Year	Ex Cond - AA	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500-Year	Pr AA 34 Sk	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.38	2990.58	0.10
Reach-1	104019	500-Year	Ex Cond - AA	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	103211	10-Year	Pr AA 34 Sk	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.70	2768.68	0.12
Reach-1	103211	10-Year	Ex Cond - AA	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	Pr AA 34 Sk	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.03	2965.67	0.10
Reach-1	103211	50-Year	Ex Cond - AA	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	Pr AA 34 Sk	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.06	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - AA	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	Pr AA 34 Sk	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.00	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - AA	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	Pr AA 34 Sk	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.05	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - AA	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	Pr AA 34 Sk	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.04	2859.05	0.11
Reach-1	102637	50-Year	Ex Cond - AA	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	Pr AA 34 Sk	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.45	2969.16	0.10
Reach-1	102637	100-Year	Ex Cond - AA	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	Pr AA 34 Sk	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.50	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - AA	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	Pr AA 34 Sk	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - AA	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	Pr AA 34 Sk	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - AA	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	Pr AA 34 Sk	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - AA	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	Pr AA 34 Sk	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - AA	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09

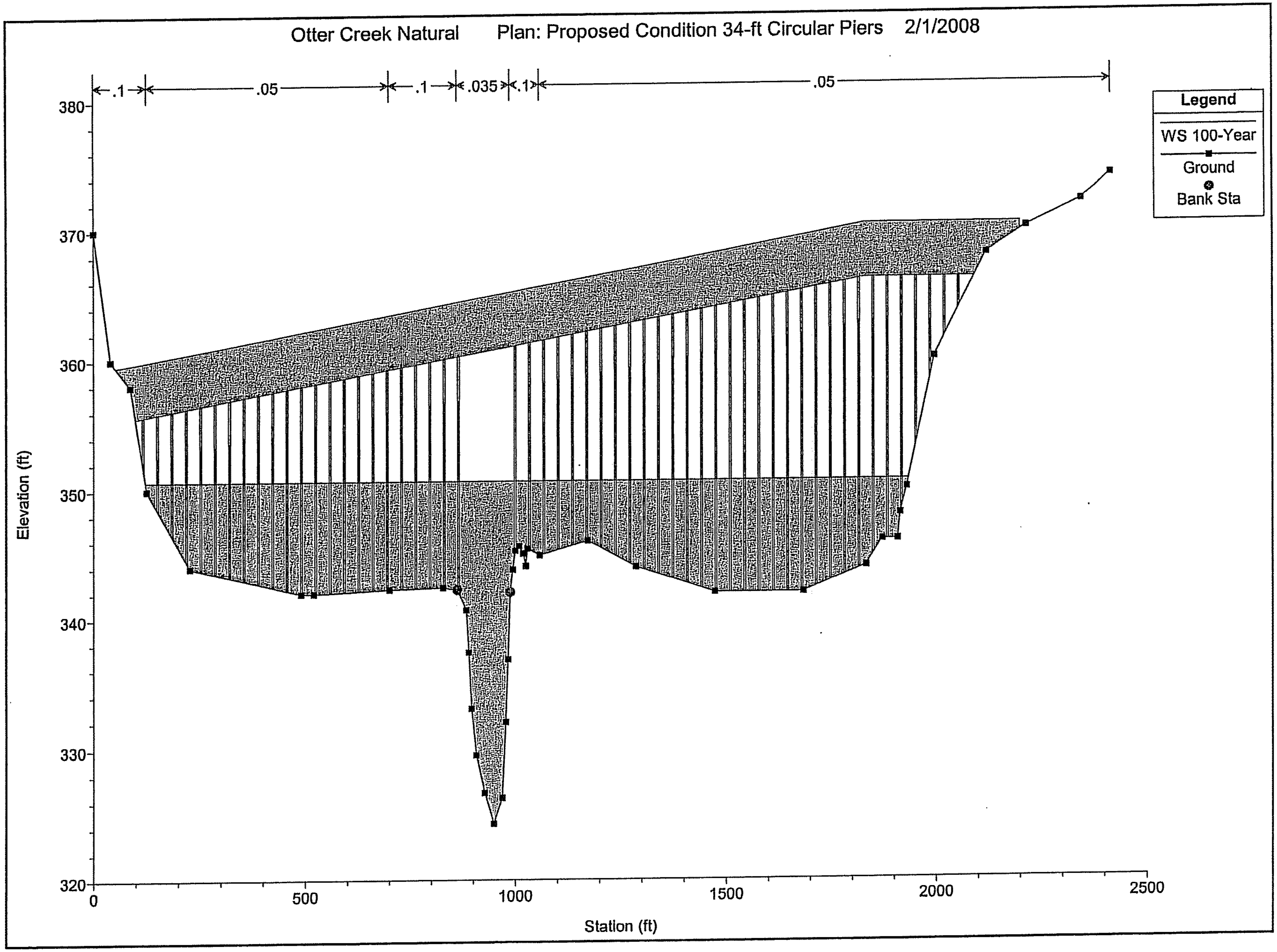

Otter Creek Natural
Plan: Proposed Condition 34-ft Circular Piers
2/1/2008
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
380
370
360
350
340
330
320
Elevation (ft)
0
500
1000
1500
2000
2500
Station (ft)

TABLE 3C
34-FOOT ROUND PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	106000	10-Year	Pr AA 34 Rnd	7750.00	327.04	346.914	335.08	346.964	0.000092	2.21	6717.91	1447.63	0.11
Reach-1	106000	10-Year	Ex Cond - AA	7750.00	327.04	346.909	335.09	346.958	0.000092	2.22	6709.96	1447.35	0.11
Reach-1	106000	50-Year	Pr AA 34 Rnd	11000.00	327.04	349.328	336.58	349.363	0.000065	2.05	10350.55	1556.76	0.09
Reach-1	106000	50-Year	Ex Cond - AA	11000.00	327.04	349.321	336.59	349.356	0.000065	2.05	10340.14	1556.49	0.09
Reach-1	106000	100-Year	Pr AA 34 Rnd	13000.00	327.04	350.732	337.39	350.762	0.000054	1.96	12572.72	1602.52	0.08
Reach-1	106000	100-Year	Ex Cond - AA	13000.00	327.04	350.725	337.41	350.755	0.000054	1.97	12561.37	1602.34	0.08
Reach-1	106000	500-Year	Pr AA 34 Rnd	16000.00	327.04	352.596	338.49	352.623	0.000045	1.90	15602.58	1644.63	0.08
Reach-1	106000	500-Year	Ex Cond - AA	16000.00	327.04	352.588	338.54	352.615	0.000045	1.90	15589.18	1644.49	0.08
Reach-1	105336	10-Year	Pr AA 34 Rnd	7750.00	327.04	346.849	335.09	346.902	0.000102	2.28	6623.30	1444.29	0.11
Reach-1	105336	10-Year	Ex Cond - AA	7750.00	327.04	346.843	335.09	346.897	0.000102	2.28	6615.15	1444.01	0.11
Reach-1	105336	50-Year	Pr AA 34 Rnd	11000.00	327.04	349.281	336.58	349.320	0.000072	2.14	10278.00	1554.88	0.10
Reach-1	105336	50-Year	Ex Cond - AA	11000.00	327.04	349.274	336.59	349.313	0.000072	2.14	10267.42	1554.60	0.10
Reach-1	105336	100-Year	Pr AA 34 Rnd	13000.00	327.04	350.693	337.40	350.727	0.000060	2.07	12510.19	1601.53	0.09
Reach-1	105336	100-Year	Ex Cond - AA	13000.00	327.04	350.686	337.41	350.720	0.000060	2.07	12498.65	1601.35	0.09
Reach-1	105336	500-Year	Pr AA 34 Rnd	16000.00	327.04	352.564	338.49	352.594	0.000050	2.02	15549.09	1644.08	0.08
Reach-1	105336	500-Year	Ex Cond - AA	16000.00	327.04	352.555	338.54	352.586	0.000050	2.02	15535.59	1643.94	0.08
Reach-1	104894	10-Year	Pr AA 34 Rnd	7750.00	324.32	346.814	333.86	346.863	0.000083	2.29	7605.61	1731.28	0.10
Reach-1	104894	10-Year	Ex Cond - AA	7750.00	324.32	346.808	333.89	346.857	0.000083	2.29	7595.62	1731.17	0.10
Reach-1	104894	50-Year	Pr AA 34 Rnd	11000.00	324.32	349.261	335.62	349.293	0.000055	2.06	11906.06	1786.53	0.09
Reach-1	104894	50-Year	Ex Cond - AA	11000.00	324.32	349.254	335.66	349.286	0.000055	2.06	11893.79	1786.36	0.09
Reach-1	104894	100-Year	Pr AA 34 Rnd	13000.00	324.32	350.678	336.63	350.704	0.000045	1.96	14458.85	1812.69	0.08
Reach-1	104894	100-Year	Ex Cond - AA	13000.00	324.32	350.671	336.66	350.697	0.000045	1.96	14445.74	1812.61	0.08
Reach-1	104894	500-Year	Pr AA 34 Rnd	16000.00	324.32	352.552	337.99	352.575	0.000037	1.89	17876.43	1833.97	0.07
Reach-1	104894	500-Year	Ex Cond - AA	16000.00	324.32	352.544	338.02	352.567	0.000037	1.89	17861.32	1833.87	0.07
Reach-1	104874			Bridge									
Reach-1	104854	10-Year	Pr AA 34 Rnd	7750.00	324.32	346.805	333.86	346.854	0.000084	2.29	7589.60	1731.10	0.10
Reach-1	104854	10-Year	Ex Cond - AA	7750.00	324.32	346.805	333.89	346.854	0.000084	2.29	7589.65	1731.10	0.10
Reach-1	104854	50-Year	Pr AA 34 Rnd	11000.00	324.32	349.252	335.62	349.284	0.000055	2.06	11889.65	1786.30	0.09
Reach-1	104854	50-Year	Ex Cond - AA	11000.00	324.32	349.252	335.66	349.284	0.000055	2.06	11889.76	1786.30	0.09
Reach-1	104854	100-Year	Pr AA 34 Rnd	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.31	1812.59	0.08
Reach-1	104854	100-Year	Ex Cond - AA	13000.00	324.32	350.669	336.66	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	500-Year	Pr AA 34 Rnd	16000.00	324.32	352.542	338.00	352.565	0.000037	1.89	17858.46	1833.86	0.07
Reach-1	104854	500-Year	Ex Cond - AA	16000.00	324.32	352.543	338.02	352.565	0.000037	1.89	17858.58	1833.86	0.07
Reach-1	104019	10-Year	Pr AA 34 Rnd	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.87	2143.06	0.12
Reach-1	104019	10-Year	Ex Cond - AA	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50-Year	Pr AA 34 Rnd	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8679.93	2287.15	0.11
Reach-1	104019	50-Year	Ex Cond - AA	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100-Year	Pr AA 34 Rnd	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.46	2490.37	0.10
Reach-1	104019	100-Year	Ex Cond - AA	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500-Year	Pr AA 34 Rnd	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.38	2990.58	0.10
Reach-1	104019	500-Year	Ex Cond - AA	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	103211	10-Year	Pr AA 34 Rnd	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.70	2768.68	0.12
Reach-1	103211	10-Year	Ex Cond - AA	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	Pr AA 34 Rnd	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.03	2965.67	0.10
Reach-1	103211	50-Year	Ex Cond - AA	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	Pr AA 34 Rnd	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.06	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - AA	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	Pr AA 34 Rnd	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.00	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - AA	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	Pr AA 34 Rnd	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.05	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - AA	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	Pr AA 34 Rnd	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.04	2859.05	0.11
Reach-1	102637	50-Year	Ex Cond - AA	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	Pr AA 34 Rnd	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.45	2969.16	0.10
Reach-1	102637	100-Year	Ex Cond - AA	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	Pr AA 34 Rnd	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.50	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - AA	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	Pr AA 34 Rnd	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - AA	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	Pr AA 34 Rnd	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - AA	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	Pr AA 34 Rnd	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - AA	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	Pr AA 34 Rnd	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - AA	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09

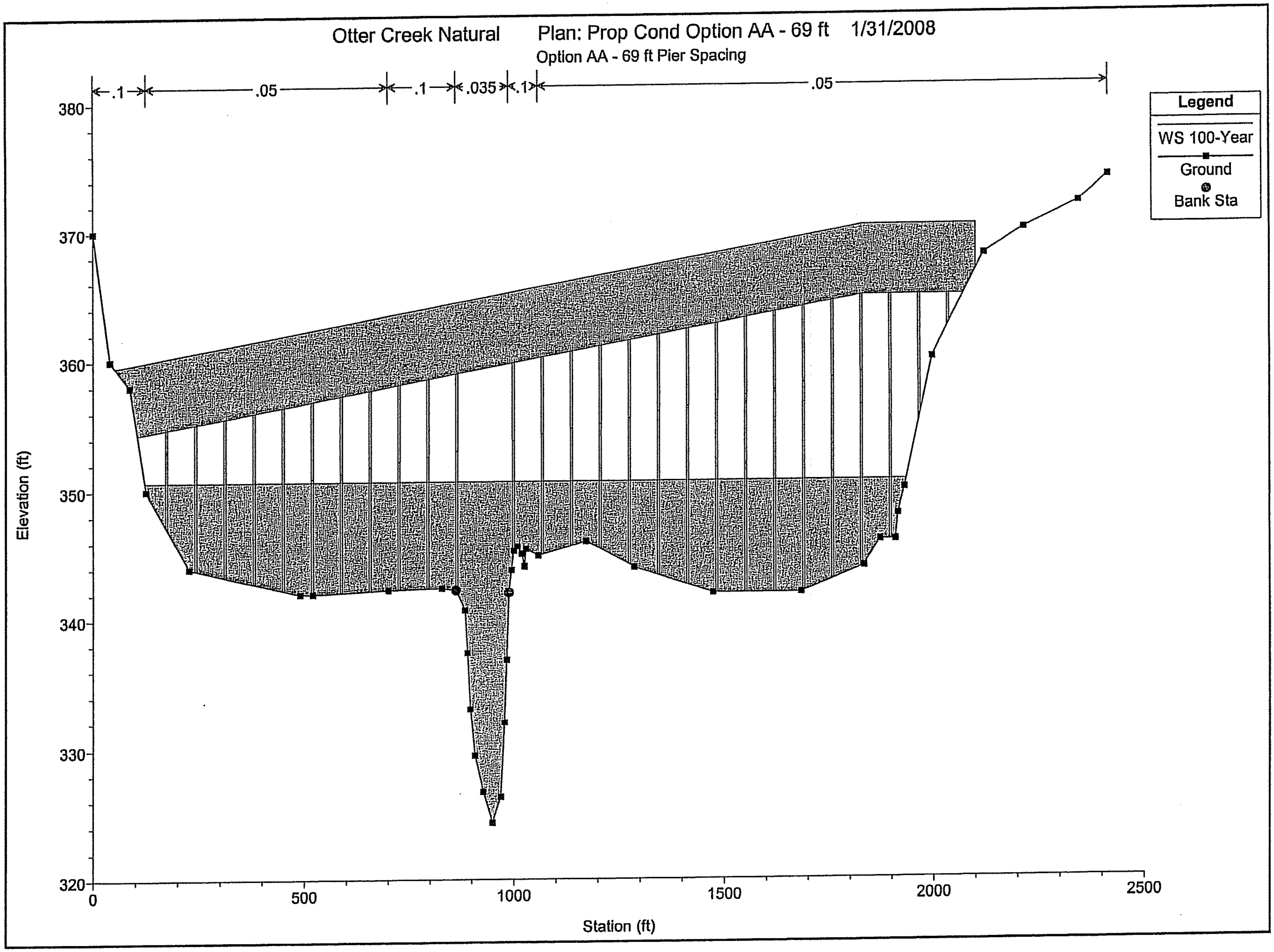

Otter Creek Natural
Plan: Prop Cond Option AA - 69 ft
1/31/2008
Option AA - 69 ft Pier Spacing
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
380
370
360
350
340
330
320
Elevation (ft)
0
500
1000
1500
2000
2500
Station (ft)

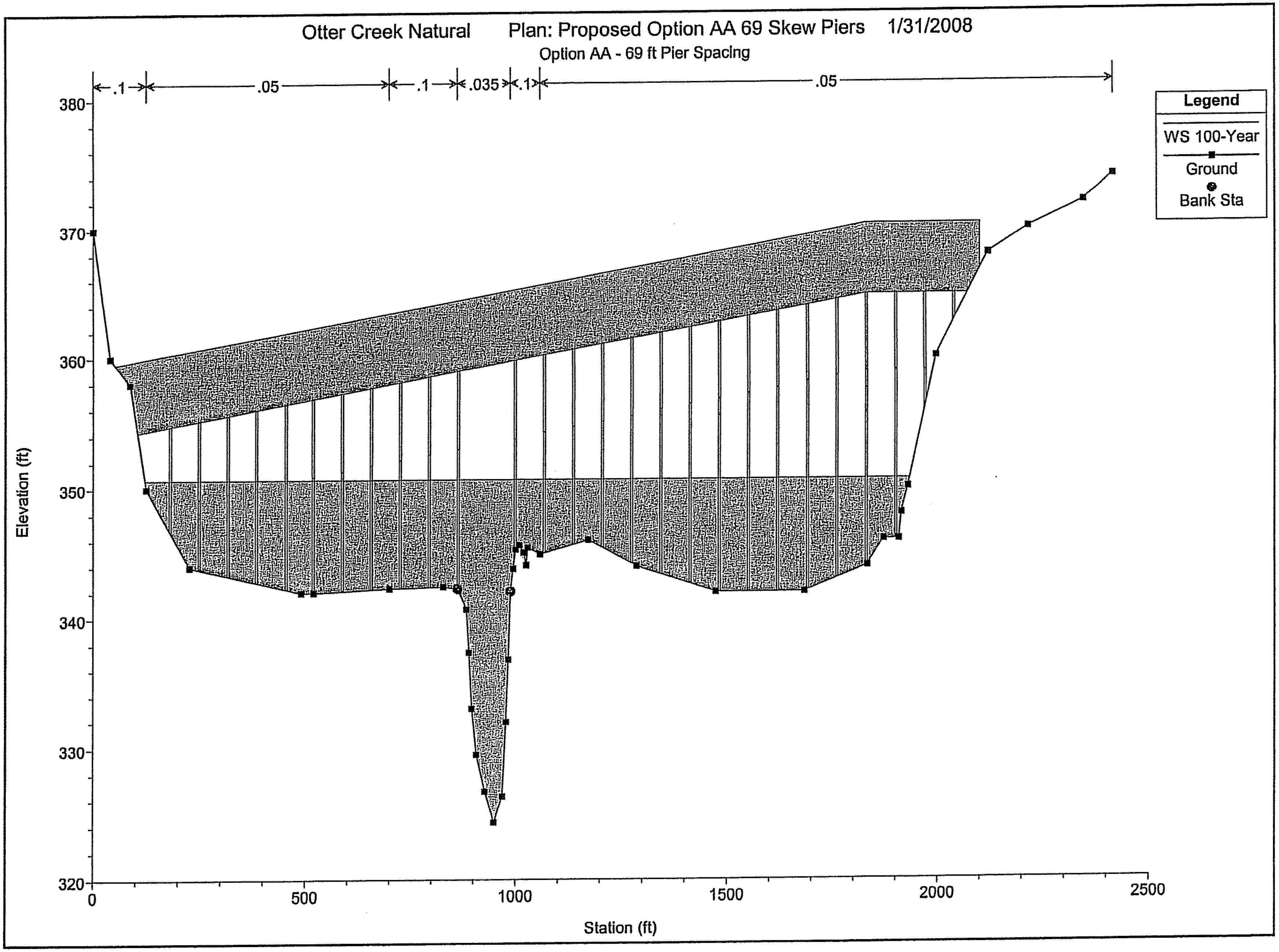
TABLE 4A
69-FOOT ROUND PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	10-Year	Opt AA-69 ft	7750.00	327.04	346.911	335.08	346.961	0.000092	2.22	6713.58	1447.48	0.11
Reach-1	106000	10-Year	Ex Cond - AA	7750.00	327.04	346.909	335.09	346.958	0.000092	2.22	6709.96	1447.35	0.11
Reach-1	106000	50-Year	Opt AA-69 ft	11000.00	327.04	349.324	336.58	349.360	0.000065	2.05	10345.28	1556.63	0.09
Reach-1	106000	50-Year	Ex Cond - AA	11000.00	327.04	349.321	336.59	349.356	0.000065	2.05	10340.14	1556.49	0.09
Reach-1	106000	100-Year	Opt AA-69 ft	13000.00	327.04	350.728	337.39	350.759	0.000054	1.97	12566.80	1602.42	0.08
Reach-1	106000	100-Year	Ex Cond - AA	13000.00	327.04	350.725	337.41	350.755	0.000054	1.97	12561.37	1602.34	0.08
Reach-1	106000	500-Year	Opt AA-69 ft	16000.00	327.04	352.592	338.49	352.619	0.000045	1.90	15595.15	1644.55	0.08
Reach-1	106000	500-Year	Ex Cond - AA	16000.00	327.04	352.588	338.54	352.615	0.000045	1.90	15589.18	1644.49	0.08
Reach-1	105336	10-Year	Opt AA-69 ft	7750.00	327.04	346.846	335.09	346.899	0.000102	2.28	6618.85	1444.14	0.11
Reach-1	105336	10-Year	Ex Cond - AA	7750.00	327.04	346.843	335.09	346.897	0.000102	2.28	6615.15	1444.01	0.11
Reach-1	105336	50-Year	Opt AA-69 ft	11000.00	327.04	349.277	336.58	349.317	0.000072	2.14	10272.64	1554.74	0.10
Reach-1	105336	50-Year	Ex Cond - AA	11000.00	327.04	349.274	336.59	349.313	0.000072	2.14	10267.42	1554.60	0.10
Reach-1	105336	100-Year	Opt AA-69 ft	13000.00	327.04	350.689	337.40	350.723	0.000060	2.07	12504.18	1601.44	0.09
Reach-1	105336	100-Year	Ex Cond - AA	13000.00	327.04	350.686	337.41	350.720	0.000060	2.07	12498.65	1601.35	0.09
Reach-1	105336	500-Year	Opt AA-69 ft	16000.00	327.04	352.559	338.49	352.590	0.000050	2.02	15541.61	1644.01	0.08
Reach-1	105336	500-Year	Ex Cond - AA	16000.00	327.04	352.555	338.54	352.586	0.000050	2.02	15535.59	1643.94	0.08
Reach-1	104894	10-Year	Opt AA-69 ft	7750.00	324.32	346.811	333.86	346.860	0.000083	2.29	7600.11	1731.22	0.10
Reach-1	104894	10-Year	Ex Cond - AA	7750.00	324.32	346.808	333.89	346.857	0.000083	2.29	7595.62	1731.17	0.10
Reach-1	104894	50-Year	Opt AA-69 ft	11000.00	324.32	349.258	335.62	349.289	0.000055	2.06	11899.84	1786.44	0.09
Reach-1	104894	50-Year	Ex Cond - AA	11000.00	324.32	349.254	335.66	349.286	0.000055	2.06	11893.79	1786.36	0.09
Reach-1	104894	100-Year	Opt AA-69 ft	13000.00	324.32	350.674	336.63	350.701	0.000045	1.96	14452.05	1812.65	0.08
Reach-1	104894	100-Year	Ex Cond - AA	13000.00	324.32	350.671	336.66	350.697	0.000045	1.96	14445.74	1812.61	0.08
Reach-1	104894	500-Year	Opt AA-69 ft	16000.00	324.32	352.548	337.99	352.571	0.000037	1.89	17868.03	1833.92	0.07
Reach-1	104894	500-Year	Ex Cond - AA	16000.00	324.32	352.544	338.02	352.567	0.000037	1.89	17861.32	1833.87	0.07
Reach-1	104874			Bridge									
Reach-1	104854	10-Year	Opt AA-69 ft	7750.00	324.32	346.805	333.86	346.854	0.000084	2.29	7589.65	1731.10	0.10
Reach-1	104854	10-Year	Ex Cond - AA	7750.00	324.32	346.805	333.89	346.854	0.000084	2.29	7589.65	1731.10	0.10
Reach-1	104854	50-Year	Opt AA-69 ft	11000.00	324.32	349.252	335.62	349.284	0.000055	2.06	11889.76	1786.30	0.09
Reach-1	104854	50-Year	Ex Cond - AA	11000.00	324.32	349.252	335.66	349.284	0.000055	2.06	11889.76	1786.30	0.09
Reach-1	104854	100-Year	Opt AA-69 ft	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	100-Year	Ex Cond - AA	13000.00	324.32	350.669	336.66	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	500-Year	Opt AA-69 ft	16000.00	324.32	352.543	338.00	352.565	0.000037	1.89	17858.58	1833.86	0.07
Reach-1	104854	500-Year	Ex Cond - AA	16000.00	324.32	352.543	338.02	352.565	0.000037	1.89	17858.58	1833.86	0.07
Reach-1	104019	10-Year	Opt AA-69 ft	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	10-Year	Ex Cond - AA	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50-Year	Opt AA-69 ft	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	50-Year	Ex Cond - AA	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100-Year	Opt AA-69 ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Ex Cond - AA	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500-Year	Opt AA-69 ft	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10
Reach-1	104019	500-Year	Ex Cond - AA	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	103211	10-Year	Opt AA-69 ft	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	10-Year	Ex Cond - AA	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	Opt AA-69 ft	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	50-Year	Ex Cond - AA	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	Opt AA-69 ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - AA	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	Opt AA-69 ft	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - AA	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	Opt AA-69 ft	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - AA	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	Opt AA-69 ft	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	50-Year	Ex Cond - AA	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	Opt AA-69 ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Ex Cond - AA	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	Opt AA-69 ft	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - AA	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	Opt AA-69 ft	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - AA	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	Opt AA-69 ft	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - AA	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	Opt AA-69 ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - AA	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	Opt AA-69 ft	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - AA	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09



Otter Creek Natural
Plan: Proposed Option AA 69 Skew Piers
1/31/2008
Option AA - 69 ft Pier Spacing
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
380
370
360
350
340
330
320
0
500
1000
1500
2000
2500
Station (ft)

TABLE 4B
SKEWED 69-FOOT ROUND PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	10-Year	Pr AA 69 Sk	7750.00	327.04	346.911	335.08	346.961	0.000092	2.22	6713.58	1447.48	0.11
Reach-1	106000	10-Year	Ex Cond - AA	7750.00	327.04	346.909	335.09	346.958	0.000092	2.22	6709.96	1447.35	0.11
Reach-1	106000	50-Year	Pr AA 69 Sk	11000.00	327.04	349.324	336.58	349.360	0.000065	2.05	10345.28	1556.63	0.09
Reach-1	106000	50-Year	Ex Cond - AA	11000.00	327.04	349.321	336.59	349.356	0.000065	2.05	10340.14	1556.49	0.09
Reach-1	106000	100-Year	Pr AA 69 Sk	13000.00	327.04	350.729	337.39	350.760	0.000054	1.96	12568.12	1602.45	0.08
Reach-1	106000	100-Year	Ex Cond - AA	13000.00	327.04	350.725	337.41	350.755	0.000054	1.97	12561.37	1602.34	0.08
Reach-1	106000	500-Year	Pr AA 69 Sk	16000.00	327.04	352.595	338.49	352.622	0.000045	1.90	15600.72	1644.61	0.08
Reach-1	106000	500-Year	Ex Cond - AA	16000.00	327.04	352.588	338.54	352.615	0.000045	1.90	15589.18	1644.49	0.08
Reach-1	105336	10-Year	Pr AA 69 Sk	7750.00	327.04	346.846	335.09	346.899	0.000102	2.28	6618.85	1444.14	0.11
Reach-1	105336	10-Year	Ex Cond - AA	7750.00	327.04	346.843	335.09	346.897	0.000102	2.28	6615.15	1444.01	0.11
Reach-1	105336	50-Year	Pr AA 69 Sk	11000.00	327.04	349.277	336.58	349.317	0.000072	2.14	10272.64	1554.74	0.10
Reach-1	105336	50-Year	Ex Cond - AA	11000.00	327.04	349.274	336.59	349.313	0.000072	2.14	10267.42	1554.60	0.10
Reach-1	105336	100-Year	Pr AA 69 Sk	13000.00	327.04	350.690	337.40	350.724	0.000060	2.07	12505.50	1601.46	0.09
Reach-1	105336	100-Year	Ex Cond - AA	13000.00	327.04	350.686	337.41	350.720	0.000060	2.07	12498.65	1601.35	0.09
Reach-1	105336	500-Year	Pr AA 69 Sk	16000.00	327.04	352.562	338.49	352.593	0.000050	2.02	15547.23	1644.06	0.08
Reach-1	105336	500-Year	Ex Cond - AA	16000.00	327.04	352.555	338.54	352.586	0.000050	2.02	15535.59	1643.94	0.08
Reach-1	104894	10-Year	Pr AA 69 Sk	7750.00	324.32	346.811	333.86	346.860	0.000083	2.29	7600.11	1731.22	0.10
Reach-1	104894	10-Year	Ex Cond - AA	7750.00	324.32	346.808	333.89	346.857	0.000083	2.29	7595.62	1731.17	0.10
Reach-1	104894	50-Year	Pr AA 69 Sk	11000.00	324.32	349.258	335.62	349.289	0.000055	2.06	11899.84	1786.44	0.09
Reach-1	104894	50-Year	Ex Cond - AA	11000.00	324.32	349.254	335.66	349.286	0.000055	2.06	11893.79	1786.36	0.09
Reach-1	104894	100-Year	Pr AA 69 Sk	13000.00	324.32	350.675	336.63	350.701	0.000045	1.96	14453.54	1812.66	0.08
Reach-1	104894	100-Year	Ex Cond - AA	13000.00	324.32	350.671	336.66	350.697	0.000045	1.96	14445.74	1812.61	0.08
Reach-1	104894	500-Year	Pr AA 69 Sk	16000.00	324.32	352.551	337.99	352.574	0.000037	1.89	17874.36	1833.96	0.07
Reach-1	104894	500-Year	Ex Cond - AA	16000.00	324.32	352.544	338.02	352.567	0.000037	1.89	17861.32	1833.87	0.07
Reach-1	104874			Bridge									
Reach-1	104854	10-Year	Pr AA 69 Sk	7750.00	324.32	346.805	333.86	346.854	0.000084	2.29	7589.65	1731.10	0.10
Reach-1	104854	10-Year	Ex Cond - AA	7750.00	324.32	346.805	333.89	346.854	0.000084	2.29	7589.65	1731.10	0.10
Reach-1	104854	50-Year	Pr AA 69 Sk	11000.00	324.32	349.252	335.62	349.284	0.000055	2.06	11889.76	1786.30	0.09
Reach-1	104854	50-Year	Ex Cond - AA	11000.00	324.32	349.252	335.66	349.284	0.000055	2.06	11889.76	1786.30	0.09
Reach-1	104854	100-Year	Pr AA 69 Sk	13000.00	324.32	350.669	336.63	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	100-Year	Ex Cond - AA	13000.00	324.32	350.669	336.66	350.695	0.000045	1.96	14442.42	1812.59	0.08
Reach-1	104854	500-Year	Pr AA 69 Sk	16000.00	324.32	352.543	338.00	352.565	0.000037	1.89	17858.58	1833.86	0.07
Reach-1	104854	500-Year	Ex Cond - AA	16000.00	324.32	352.543	338.02	352.565	0.000037	1.89	17858.58	1833.86	0.07
Reach-1	104019	10-Year	Pr AA 69 Sk	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	10-Year	Ex Cond - AA	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50-Year	Pr AA 69 Sk	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	50-Year	Ex Cond - AA	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100-Year	Pr AA 69 Sk	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Ex Cond - AA	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500-Year	Pr AA 69 Sk	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10
Reach-1	104019	500-Year	Ex Cond - AA	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	103211	10-Year	Pr AA 69 Sk	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	10-Year	Ex Cond - AA	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	Pr AA 69 Sk	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	50-Year	Ex Cond - AA	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	Pr AA 69 Sk	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - AA	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	Pr AA 69 Sk	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - AA	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	Pr AA 69 Sk	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - AA	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	Pr AA 69 Sk	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	50-Year	Ex Cond - AA	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	Pr AA 69 Sk	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Ex Cond - AA	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	Pr AA 69 Sk	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - AA	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	Pr AA 69 Sk	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - AA	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	Pr AA 69 Sk	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - AA	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	Pr AA 69 Sk	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - AA	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	Pr AA 69 Sk	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - AA	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09

APPENDIX D

HEC-RAS MODEL RESULTS
OPTION BB ALIGNMENT

TABLE 5: 100-YEAR EVENT – PIER TYPE COMPARISON
34-foot 4' Diameter Bent Type (Pr BB 34 Rnd)
34-foot 20" Square Bent Type (Opt BB-34 ft)
69-foot 5' Diameter Bent Type (Opt BB-69 ft)
Existing Conditions (Ex Cond – BB)

34-FOOT BENT PIERS

TABLE 6A: 10-YR, 50-YR, 100-YR 500-YR, EVENT – 34-FOOT ROUND PIER
34-foot 4' Diameter Bent Type (Pr BB 34 Rnd)
Existing Conditions (Ex Cond – BB)

TABLE 6B: 10-YR, 50-YR, 100-YR 500-YR, EVENT – 34-FOOT SQUARE PIER
34-foot 20" Square Bent Type (Opt BB-34 ft)
Existing Conditions (Ex Cond – BB)

69-FOOT BENT PIERS

TABLE 7: 10-YR, 50-YR, 100-YR 500-YR, EVENT – 69-FOOT PIER
69-foot 5' Diameter Bent Type (Opt BB-69 ft)
Existing Conditions (Ex Cond – BB)

OPTION BB ALIGNMENT

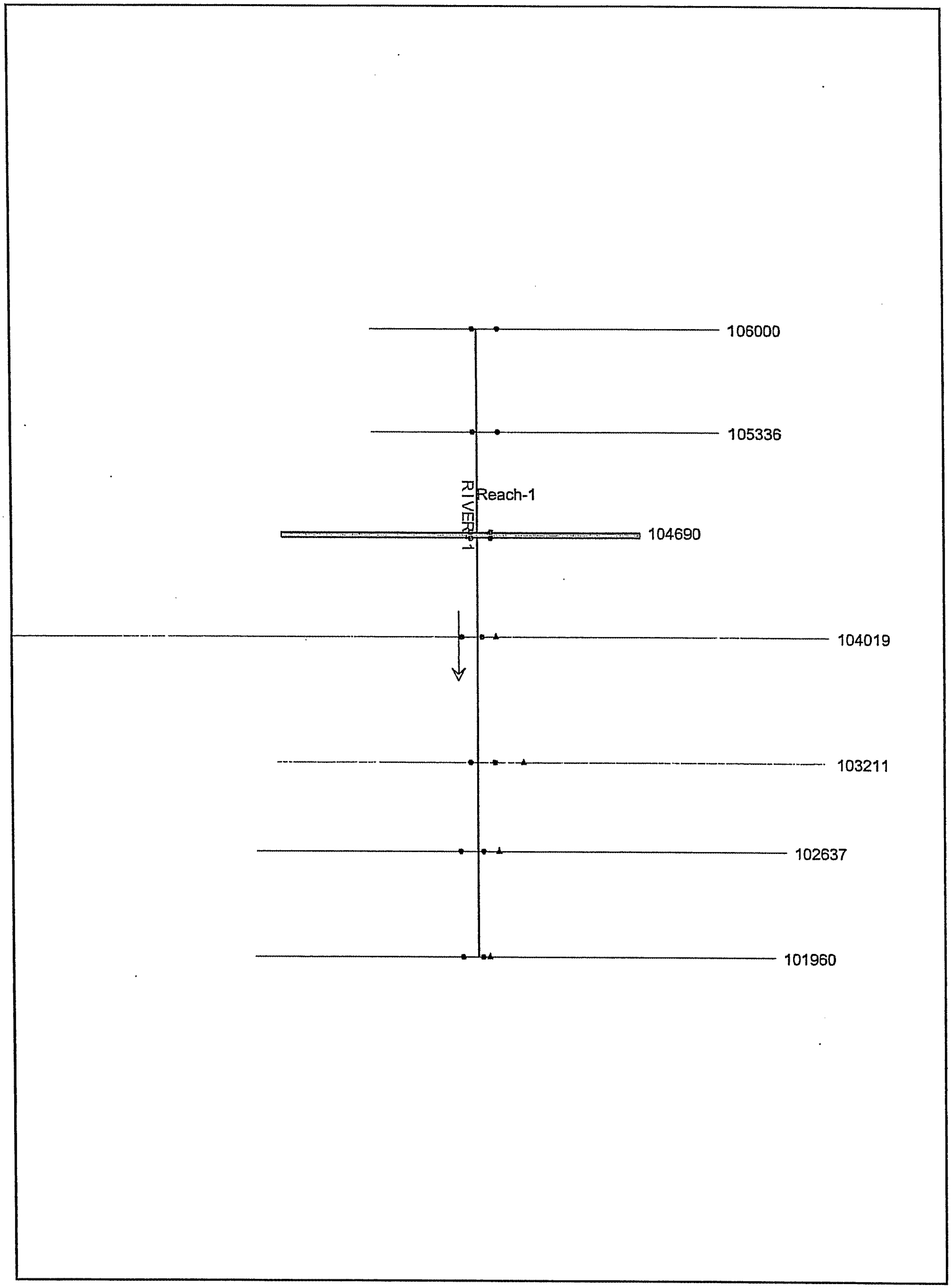
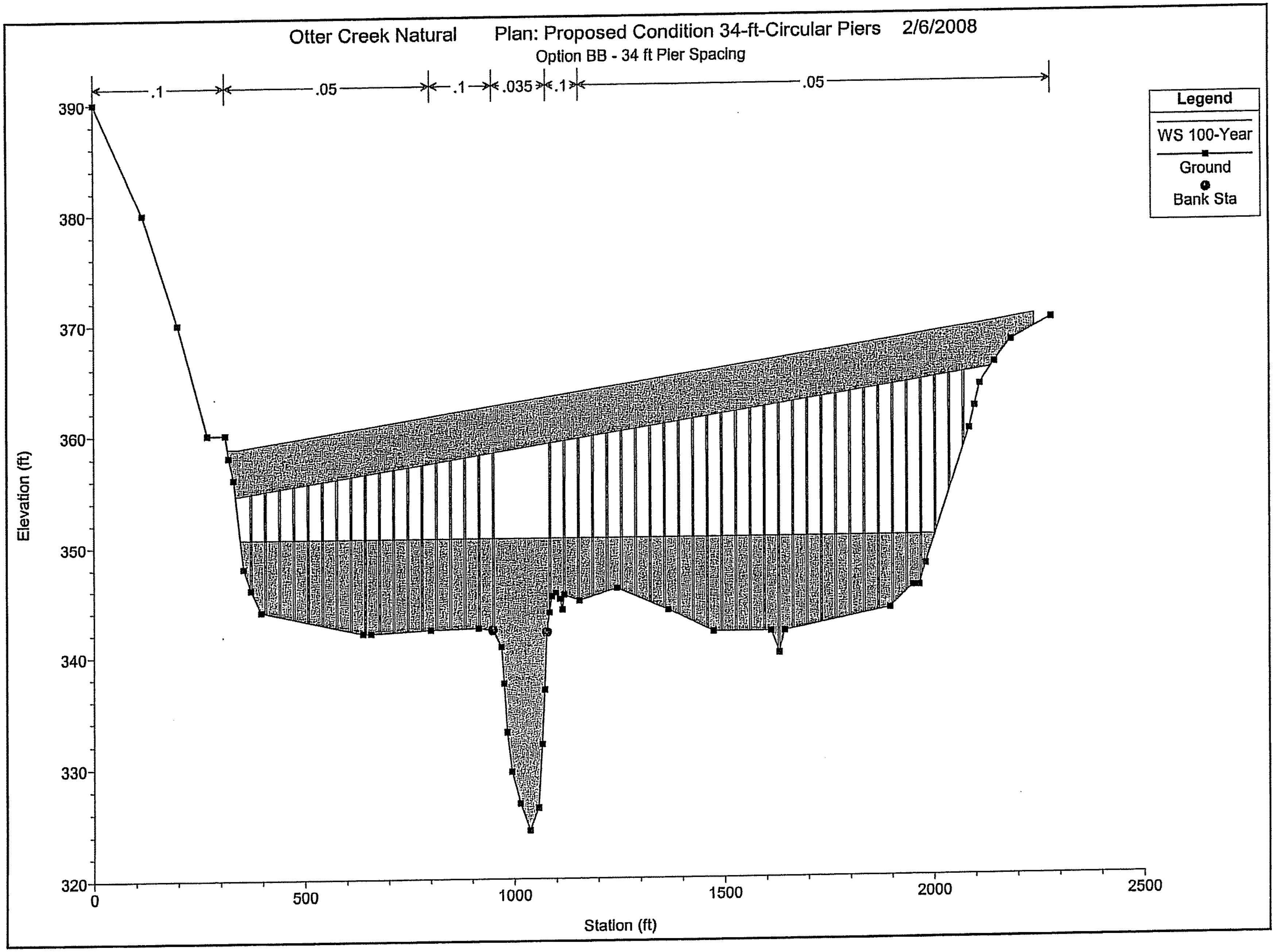


TABLE 5
OPTION BB – PIER TYPE COMPARISON

HEC-RAS River: RIVER-1 Reach: Reach-1 Profile: 100-Year

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	100-Year	Pr BB 34 Rnd	13000.00	327.04	350.735	337.41	350.764	0.000051	1.90	12578.05	1602.60	0.08
Reach-1	106000	100-Year	OptBB - 34ft	13000.00	327.04	350.732	337.41	350.760	0.000051	1.90	12572.42	1602.51	0.08
Reach-1	106000	100-Year	Opt BB 69 ft	13000.00	327.04	350.733	337.39	350.763	0.000053	1.95	12574.48	1602.55	0.08
Reach-1	106000	100-Year	Ex Cond - BB	13000.00	327.04	350.725	337.41	350.756	0.000054	1.97	12562.35	1602.35	0.08
Reach-1	105336	100-Year	Pr BB 34 Rnd	13000.00	327.04	350.695	337.41	350.729	0.000060	2.07	12514.00	1601.59	0.09
Reach-1	105336	100-Year	OptBB - 34ft	13000.00	327.04	350.692	337.41	350.726	0.000060	2.07	12508.33	1601.50	0.09
Reach-1	105336	100-Year	Opt BB 69 ft	13000.00	327.04	350.694	337.40	350.728	0.000060	2.07	12511.51	1601.55	0.09
Reach-1	105336	100-Year	Ex Cond - BB	13000.00	327.04	350.686	337.41	350.721	0.000060	2.07	12499.68	1601.36	0.09
Reach-1	104690	100-Year	Pr BB 34 Rnd	13000.00	324.32	350.667	336.46	350.697	0.000049	2.05	13499.00	1656.87	0.08
Reach-1	104690	100-Year	OptBB - 34ft	13000.00	324.32	350.663	336.46	350.694	0.000049	2.05	13493.09	1656.83	0.08
Reach-1	104690	100-Year	Opt BB 69 ft	13000.00	324.32	350.665	336.43	350.696	0.000049	2.05	13496.38	1656.85	0.08
Reach-1	104690	100-Year	Ex Cond - BB	13000.00	324.32	350.658	336.46	350.688	0.000049	2.05	13484.04	1656.76	0.08
Reach-1	104670			Bridge									
Reach-1	104650	100-Year	Pr BB 34 Rnd	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	100-Year	OptBB - 34ft	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	100-Year	Opt BB 69 ft	13000.00	324.32	350.656	336.43	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	100-Year	Ex Cond - BB	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104019	100-Year	Pr BB 34 Rnd	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	OptBB - 34ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Opt BB 69 ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Ex Cond - BB	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	103211	100-Year	Pr BB 34 Rnd	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	OptBB - 34ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Opt BB 69 ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - BB	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	102637	100-Year	Pr BB 34 Rnd	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	OptBB - 34ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Opt BB 69 ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Ex Cond - BB	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	101960	100-Year	Pr BB 34 Rnd	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	OptBB - 34ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Opt BB 69 ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - BB	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10



Otter Creek Natural
Plan: Proposed Condition 34-ft-Circular Piers
2/6/2008
Option BB - 34 ft Pier Spacing
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
390
380
370
360
350
340
330
320
0
500
1000
1500
2000
2500
Station (ft)

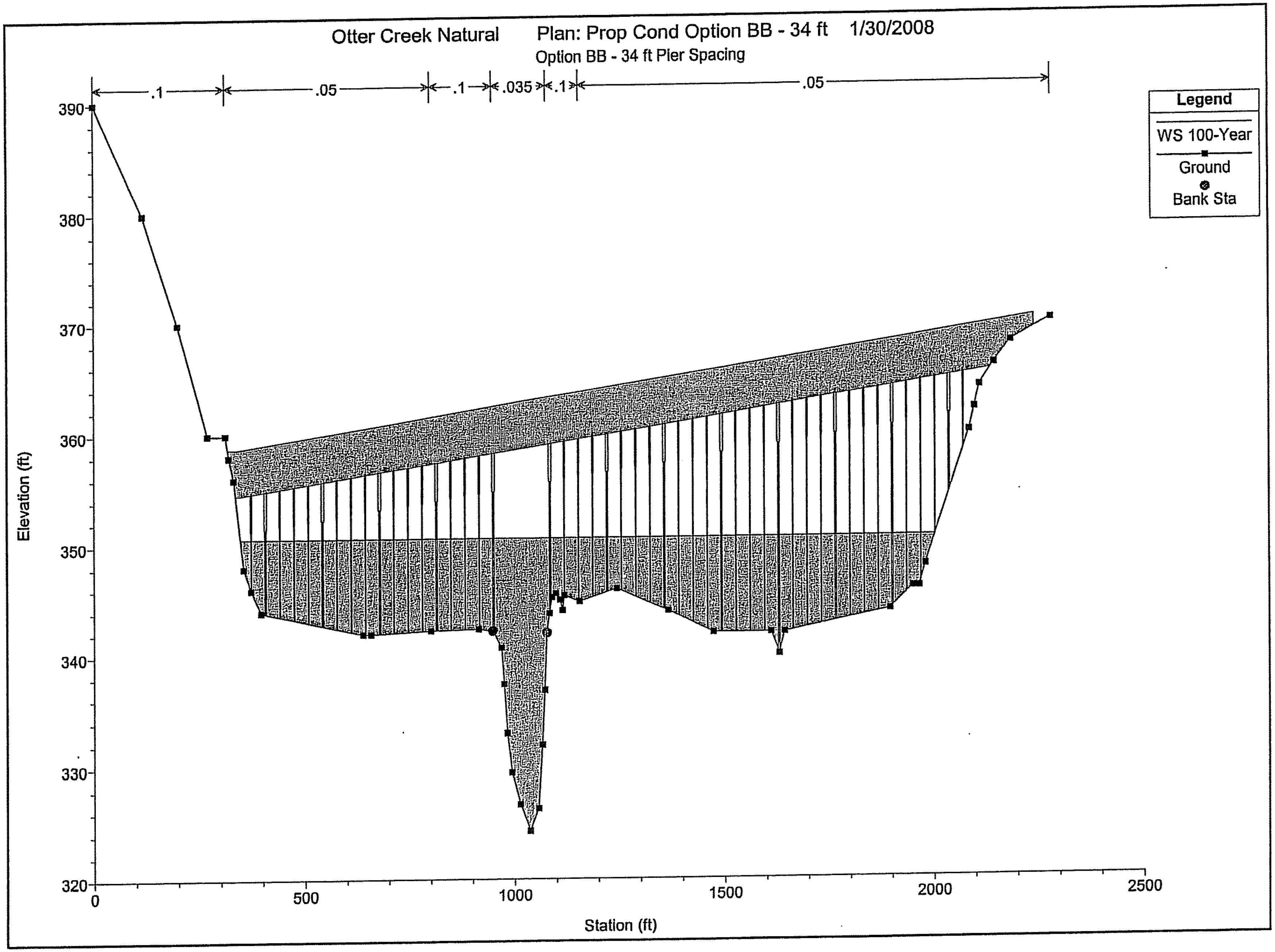
TABLE 6A
34-FOOT ROUND PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	10-Year	Pr BB 34 Rnd	7750.00	327.04	346.917	335.09	346.964	0.000088	2.17	6721.49	1447.76	0.11
Reach-1	106000	10-Year	Ex Cond - BB	7750.00	327.04	346.909	335.09	346.959	0.000092	2.22	6710.36	1447.37	0.11
Reach-1	106000	50-Year	Pr BB 34 Rnd	11000.00	327.04	349.331	336.59	349.364	0.000061	1.99	10356.11	1556.91	0.09
Reach-1	106000	50-Year	Ex Cond - BB	11000.00	327.04	349.322	336.59	349.357	0.000065	2.05	10341.29	1556.52	0.09
Reach-1	106000	100-Year	Pr BB 34 Rnd	13000.00	327.04	350.735	337.41	350.764	0.000051	1.90	12578.05	1602.60	0.08
Reach-1	106000	100-Year	Ex Cond - BB	13000.00	327.04	350.725	337.41	350.756	0.000054	1.97	12562.35	1602.35	0.08
Reach-1	106000	500-Year	Pr BB 34 Rnd	16000.00	327.04	352.599	338.54	352.624	0.000042	1.84	15606.90	1644.67	0.07
Reach-1	106000	500-Year	Ex Cond - BB	16000.00	327.04	352.589	338.54	352.616	0.000045	1.90	15590.03	1644.50	0.08
Reach-1	105336	10-Year	Pr BB 34 Rnd	7750.00	327.04	346.850	335.09	346.903	0.000102	2.28	6624.71	1444.34	0.11
Reach-1	105336	10-Year	Ex Cond - BB	7750.00	327.04	346.844	335.09	346.897	0.000102	2.28	6615.50	1444.02	0.11
Reach-1	105336	50-Year	Pr BB 34 Rnd	11000.00	327.04	349.283	336.59	349.323	0.000072	2.14	10281.79	1554.98	0.10
Reach-1	105336	50-Year	Ex Cond - BB	11000.00	327.04	349.275	336.59	349.314	0.000072	2.14	10268.56	1554.63	0.10
Reach-1	105336	100-Year	Pr BB 34 Rnd	13000.00	327.04	350.695	337.41	350.729	0.000060	2.07	12514.00	1601.59	0.09
Reach-1	105336	100-Year	Ex Cond - BB	13000.00	327.04	350.686	337.41	350.721	0.000060	2.07	12499.68	1601.36	0.09
Reach-1	105336	500-Year	Pr BB 34 Rnd	16000.00	327.04	352.565	338.54	352.596	0.000050	2.02	15552.15	1644.11	0.08
Reach-1	105336	500-Year	Ex Cond - BB	16000.00	327.04	352.556	338.54	352.586	0.000050	2.02	15536.44	1643.95	0.08
Reach-1	104690	10-Year	Pr BB 34 Rnd	7750.00	324.32	346.793	333.72	346.847	0.000087	2.35	7171.20	1606.49	0.11
Reach-1	104690	10-Year	Ex Cond - BB	7750.00	324.32	346.786	333.72	346.840	0.000087	2.35	7160.61	1606.38	0.11
Reach-1	104690	50-Year	Pr BB 34 Rnd	11000.00	324.32	349.248	335.48	349.284	0.000059	2.14	11159.93	1640.34	0.09
Reach-1	104690	50-Year	Ex Cond - BB	11000.00	324.32	349.239	335.48	349.275	0.000059	2.14	11145.76	1640.24	0.09
Reach-1	104690	100-Year	Pr BB 34 Rnd	13000.00	324.32	350.667	336.46	350.697	0.000049	2.05	13499.00	1656.87	0.08
Reach-1	104690	100-Year	Ex Cond - BB	13000.00	324.32	350.658	336.46	350.688	0.000049	2.05	13484.04	1656.76	0.08
Reach-1	104690	500-Year	Pr BB 34 Rnd	16000.00	324.32	352.542	337.79	352.569	0.000041	2.00	16626.88	1678.72	0.08
Reach-1	104690	500-Year	Ex Cond - BB	16000.00	324.32	352.533	337.79	352.560	0.000041	2.00	16610.74	1678.61	0.08
Reach-1	104670			Bridge									
Reach-1	104650	10-Year	Pr BB 34 Rnd	7750.00	324.32	346.783	333.72	346.837	0.000087	2.35	7154.82	1606.32	0.11
Reach-1	104650	10-Year	Ex Cond - BB	7750.00	324.32	346.783	333.72	346.837	0.000087	2.35	7154.82	1606.32	0.11
Reach-1	104650	50-Year	Pr BB 34 Rnd	11000.00	324.32	349.237	335.48	349.273	0.000059	2.14	11141.81	1640.21	0.09
Reach-1	104650	50-Year	Ex Cond - BB	11000.00	324.32	349.237	335.48	349.273	0.000059	2.14	11141.81	1640.21	0.09
Reach-1	104650	100-Year	Pr BB 34 Rnd	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	100-Year	Ex Cond - BB	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	500-Year	Pr BB 34 Rnd	16000.00	324.32	352.531	337.79	352.558	0.000041	2.00	16607.92	1678.59	0.08
Reach-1	104650	500-Year	Ex Cond - BB	16000.00	324.32	352.531	337.79	352.558	0.000041	2.00	16607.92	1678.59	0.08
Reach-1	104019	10-Year	Pr BB 34 Rnd	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	10-Year	Ex Cond - BB	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50-Year	Pr BB 34 Rnd	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	50-Year	Ex Cond - BB	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100-Year	Pr BB 34 Rnd	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Ex Cond - BB	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500-Year	Pr BB 34 Rnd	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10
Reach-1	104019	500-Year	Ex Cond - BB	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	103211	10-Year	Pr BB 34 Rnd	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	10-Year	Ex Cond - BB	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	Pr BB 34 Rnd	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	50-Year	Ex Cond - BB	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	Pr BB 34 Rnd	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - BB	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	Pr BB 34 Rnd	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - BB	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	Pr BB 34 Rnd	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - BB	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	Pr BB 34 Rnd	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	50-Year	Ex Cond - BB	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	Pr BB 34 Rnd	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Ex Cond - BB	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	Pr BB 34 Rnd	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - BB	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	Pr BB 34 Rnd	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - BB	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	Pr BB 34 Rnd	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - BB	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	Pr BB 34 Rnd	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - BB	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	Pr BB 34 Rnd	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - BB	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09



Otter Creek Natural
Plan: Prop Cond Option BB - 34 ft
1/30/2008
Option BB - 34 ft Pier Spacing
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
390
380
370
360
350
340
330
320
0
500
1000
1500
2000
2500
Station (ft)

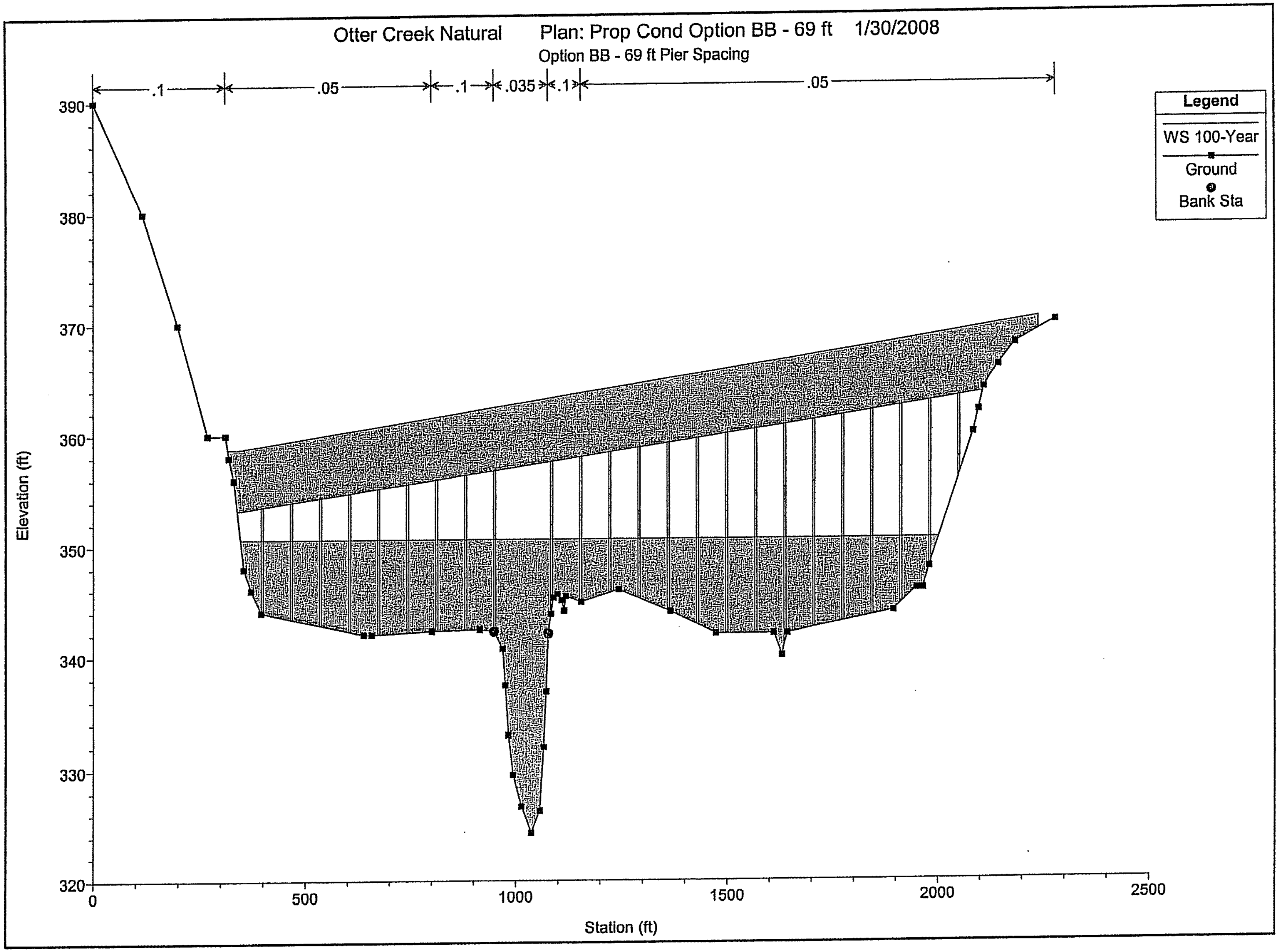
TABLE 6B
34-FOOT SQUARE PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	10-Year	OptBB - 34ft	7750.00	327.04	346.914	335.09	346.961	0.000088	2.17	6717.52	1447.62	0.11
Reach-1	106000	10-Year	ExCond - BB	7750.00	327.04	346.909	335.09	346.959	0.000092	2.22	6710.36	1447.37	0.11
Reach-1	106000	50-Year	OptBB - 34ft	11000.00	327.04	349.328	336.59	349.361	0.000061	1.99	10350.88	1556.77	0.09
Reach-1	106000	50-Year	ExCond - BB	11000.00	327.04	349.322	336.59	349.357	0.000065	2.05	10341.29	1556.52	0.09
Reach-1	106000	100-Year	OptBB - 34ft	13000.00	327.04	350.732	337.41	350.760	0.000051	1.90	12572.42	1602.51	0.08
Reach-1	106000	100-Year	ExCond - BB	13000.00	327.04	350.725	337.41	350.756	0.000054	1.97	12562.35	1602.35	0.08
Reach-1	106000	500-Year	OptBB - 34ft	16000.00	327.04	352.596	338.54	352.621	0.000042	1.84	15601.73	1644.62	0.07
Reach-1	106000	500-Year	ExCond - BB	16000.00	327.04	352.589	338.54	352.616	0.000045	1.90	15590.03	1644.50	0.08
Reach-1	105336	10-Year	OptBB - 34ft	7750.00	327.04	346.847	335.09	346.900	0.000102	2.28	6620.61	1444.20	0.11
Reach-1	105336	10-Year	ExCond - BB	7750.00	327.04	346.844	335.09	346.897	0.000102	2.28	6615.50	1444.02	0.11
Reach-1	105336	50-Year	OptBB - 34ft	11000.00	327.04	349.280	336.59	349.319	0.000072	2.14	10276.48	1554.84	0.10
Reach-1	105336	50-Year	ExCond - BB	11000.00	327.04	349.275	336.59	349.314	0.000072	2.14	10268.56	1554.63	0.10
Reach-1	105336	100-Year	OptBB - 34ft	13000.00	327.04	350.692	337.41	350.726	0.000060	2.07	12508.33	1601.50	0.09
Reach-1	105336	100-Year	ExCond - BB	13000.00	327.04	350.686	337.41	350.721	0.000060	2.07	12499.68	1601.36	0.09
Reach-1	105336	500-Year	OptBB - 34ft	16000.00	327.04	352.562	338.54	352.593	0.000050	2.02	15546.93	1644.06	0.08
Reach-1	105336	500-Year	ExCond - BB	16000.00	327.04	352.556	338.54	352.586	0.000050	2.02	15536.44	1643.95	0.08
Reach-1	104690	10-Year	OptBB - 34ft	7750.00	324.32	346.790	333.72	346.844	0.000087	2.35	7166.44	1606.44	0.11
Reach-1	104690	10-Year	ExCond - BB	7750.00	324.32	346.786	333.72	346.840	0.000087	2.35	7160.61	1606.38	0.11
Reach-1	104690	50-Year	OptBB - 34ft	11000.00	324.32	349.245	335.48	349.280	0.000059	2.14	11154.27	1640.30	0.09
Reach-1	104690	50-Year	ExCond - BB	11000.00	324.32	349.239	335.48	349.275	0.000059	2.14	11145.76	1640.24	0.09
Reach-1	104690	100-Year	OptBB - 34ft	13000.00	324.32	350.663	336.46	350.694	0.000049	2.05	13493.09	1656.83	0.08
Reach-1	104690	100-Year	ExCond - BB	13000.00	324.32	350.658	336.46	350.688	0.000049	2.05	13484.04	1656.76	0.08
Reach-1	104690	500-Year	OptBB - 34ft	16000.00	324.32	352.539	337.79	352.566	0.000041	2.00	16621.50	1678.68	0.08
Reach-1	104690	500-Year	ExCond - BB	16000.00	324.32	352.533	337.79	352.560	0.000041	2.00	16610.74	1678.61	0.08
Reach-1	104670			Bridge									
Reach-1	104650	10-Year	OptBB - 34ft	7750.00	324.32	346.783	333.72	346.837	0.000087	2.35	7154.82	1606.32	0.11
Reach-1	104650	10-Year	ExCond - BB	7750.00	324.32	346.783	333.72	346.837	0.000087	2.35	7154.82	1606.32	0.11
Reach-1	104650	50-Year	OptBB - 34ft	11000.00	324.32	349.237	335.48	349.273	0.000059	2.14	11141.81	1640.21	0.09
Reach-1	104650	50-Year	ExCond - BB	11000.00	324.32	349.237	335.48	349.273	0.000059	2.14	11141.81	1640.21	0.09
Reach-1	104650	100-Year	OptBB - 34ft	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	100-Year	ExCond - BB	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	500-Year	OptBB - 34ft	16000.00	324.32	352.531	337.79	352.558	0.000041	2.00	16607.92	1678.59	0.08
Reach-1	104650	500-Year	ExCond - BB	16000.00	324.32	352.531	337.79	352.558	0.000041	2.00	16607.92	1678.59	0.08
Reach-1	104019	10-Year	OptBB - 34ft	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	10-Year	ExCond - BB	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50-Year	OptBB - 34ft	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	50-Year	ExCond - BB	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100-Year	OptBB - 34ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	ExCond - BB	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500-Year	OptBB - 34ft	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10
Reach-1	104019	500-Year	ExCond - BB	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	103211	10-Year	OptBB - 34ft	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	10-Year	Ex Cond - BB	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	OptBB - 34ft	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	50-Year	Ex Cond - BB	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	OptBB - 34ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - BB	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	OptBB - 34ft	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - BB	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	OptBB - 34ft	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - BB	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	OptBB - 34ft	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	50-Year	Ex Cond - BB	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	OptBB - 34ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Ex Cond - BB	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	OptBB - 34ft	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - BB	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	OptBB - 34ft	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - BB	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	OptBB - 34ft	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - BB	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	OptBB - 34ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - BB	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	OptBB - 34ft	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - BB	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09



Otter Creek Natural
Plan: Prop Cond Option BB - 69 ft
1/30/2008
Option BB - 69 ft Pier Spacing
.1
.05
.1
.035
.1
.05
Legend
WS 100-Year
Ground
Bank Sta
Elevation (ft)
390
380
370
360
350
340
330
320
0
500
1000
1500
2000
2500
Station (ft)

TABLE 7
69-FOOT ROUND PIER BENT

HEC-RAS River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	Plan	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
Reach-1	106000	10-Year	Opt BB-69 ft	7750.00	327.04	346.912	335.08	346.961	0.000091	2.20	6714.69	1447.52	0.11
Reach-1	106000	10-Year	Ex Cond - BB	7750.00	327.04	346.909	335.09	346.959	0.000092	2.22	6710.36	1447.37	0.11
Reach-1	106000	50-Year	Opt BB-69 ft	11000.00	327.04	349.326	336.58	349.360	0.000064	2.03	10347.55	1556.69	0.09
Reach-1	106000	50-Year	Ex Cond - BB	11000.00	327.04	349.322	336.59	349.357	0.000065	2.05	10341.29	1556.52	0.09
Reach-1	106000	100-Year	Opt BB-69 ft	13000.00	327.04	350.733	337.39	350.763	0.000053	1.95	12574.48	1602.55	0.08
Reach-1	106000	100-Year	Ex Cond - BB	13000.00	327.04	350.725	337.41	350.756	0.000054	1.97	12562.35	1602.35	0.08
Reach-1	106000	500-Year	Opt BB-69 ft	16000.00	327.04	352.594	338.51	352.620	0.000044	1.89	15598.46	1644.59	0.08
Reach-1	106000	500-Year	Ex Cond - BB	16000.00	327.04	352.589	338.54	352.616	0.000045	1.90	15590.03	1644.50	0.08
Reach-1	105336	10-Year	Opt BB-69 ft	7750.00	327.04	346.846	335.09	346.899	0.000102	2.28	6619.42	1444.16	0.11
Reach-1	105336	10-Year	Ex Cond - BB	7750.00	327.04	346.844	335.09	346.897	0.000102	2.28	6615.50	1444.02	0.11
Reach-1	105336	50-Year	Opt BB-69 ft	11000.00	327.04	349.279	336.58	349.318	0.000072	2.14	10274.44	1554.78	0.10
Reach-1	105336	50-Year	Ex Cond - BB	11000.00	327.04	349.275	336.59	349.314	0.000072	2.14	10268.56	1554.63	0.10
Reach-1	105336	100-Year	Opt BB-69 ft	13000.00	327.04	350.694	337.40	350.728	0.000060	2.07	12511.51	1601.55	0.09
Reach-1	105336	100-Year	Ex Cond - BB	13000.00	327.04	350.686	337.41	350.721	0.000060	2.07	12499.68	1601.36	0.09
Reach-1	105336	500-Year	Opt BB-69 ft	16000.00	327.04	352.561	338.52	352.591	0.000050	2.02	15544.57	1644.04	0.08
Reach-1	105336	500-Year	Ex Cond - BB	16000.00	327.04	352.556	338.54	352.586	0.000050	2.02	15536.44	1643.95	0.08
Reach-1	104690	10-Year	Opt BB-69 ft	7750.00	324.32	346.789	333.72	346.843	0.000087	2.35	7165.12	1606.43	0.11
Reach-1	104690	10-Year	Ex Cond - BB	7750.00	324.32	346.786	333.72	346.840	0.000087	2.35	7160.61	1606.38	0.11
Reach-1	104690	50-Year	Opt BB-69 ft	11000.00	324.32	349.243	335.44	349.279	0.000059	2.14	11152.07	1640.28	0.09
Reach-1	104690	50-Year	Ex Cond - BB	11000.00	324.32	349.239	335.48	349.275	0.000059	2.14	11145.76	1640.24	0.09
Reach-1	104690	100-Year	Opt BB-69 ft	13000.00	324.32	350.665	336.43	350.696	0.000049	2.05	13496.38	1656.85	0.08
Reach-1	104690	100-Year	Ex Cond - BB	13000.00	324.32	350.658	336.46	350.688	0.000049	2.05	13484.04	1656.76	0.08
Reach-1	104690	500-Year	Opt BB-69 ft	16000.00	324.32	352.538	337.76	352.565	0.000041	2.00	16619.09	1678.66	0.08
Reach-1	104690	500-Year	Ex Cond - BB	16000.00	324.32	352.533	337.79	352.560	0.000041	2.00	16610.74	1678.61	0.08
Reach-1	104670			Bridge									
Reach-1	104650	10-Year	Opt BB-69 ft	7750.00	324.32	346.783	333.72	346.837	0.000087	2.35	7154.82	1606.32	0.11
Reach-1	104650	10-Year	Ex Cond - BB	7750.00	324.32	346.783	333.72	346.837	0.000087	2.35	7154.82	1606.32	0.11
Reach-1	104650	50-Year	Opt BB-69 ft	11000.00	324.32	349.237	335.45	349.273	0.000059	2.14	11141.81	1640.21	0.09
Reach-1	104650	50-Year	Ex Cond - BB	11000.00	324.32	349.237	335.48	349.273	0.000059	2.14	11141.81	1640.21	0.09
Reach-1	104650	100-Year	Opt BB-69 ft	13000.00	324.32	350.656	336.43	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	100-Year	Ex Cond - BB	13000.00	324.32	350.656	336.46	350.686	0.000049	2.05	13480.75	1656.74	0.08
Reach-1	104650	500-Year	Opt BB-69 ft	16000.00	324.32	352.531	337.76	352.558	0.000041	2.00	16607.92	1678.59	0.08
Reach-1	104650	500-Year	Ex Cond - BB	16000.00	324.32	352.531	337.79	352.558	0.000041	2.00	16607.92	1678.59	0.08
Reach-1	104019	10-Year	Opt BB-69 ft	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	10-Year	Ex Cond - BB	7750.00	326.74	346.692	334.70	346.780	0.000119	2.77	5474.90	2143.06	0.12
Reach-1	104019	50-Year	Opt BB-69 ft	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	50-Year	Ex Cond - BB	11000.00	326.74	349.174	336.24	349.237	0.000087	2.61	8680.01	2287.15	0.11
Reach-1	104019	100-Year	Opt BB-69 ft	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	100-Year	Ex Cond - BB	13000.00	326.74	350.597	337.11	350.656	0.000079	2.61	10607.60	2490.40	0.10
Reach-1	104019	500-Year	Opt BB-69 ft	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10
Reach-1	104019	500-Year	Ex Cond - BB	16000.00	326.74	352.475	338.31	352.532	0.000073	2.68	13778.50	2990.59	0.10

HEC-RAS River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Reach-1	103211	10-Year	Opt BB-69 ft	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	10-Year	Ex Cond - BB	7750.00	327.59	346.605	334.94	346.680	0.000125	2.58	5695.74	2768.69	0.12
Reach-1	103211	50-Year	Opt BB-69 ft	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	50-Year	Ex Cond - BB	11000.00	327.59	349.116	336.47	349.168	0.000084	2.37	9060.12	2965.68	0.10
Reach-1	103211	100-Year	Opt BB-69 ft	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	100-Year	Ex Cond - BB	13000.00	327.59	350.551	337.30	350.595	0.000069	2.28	11030.19	3053.85	0.10
Reach-1	103211	500-Year	Opt BB-69 ft	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	103211	500-Year	Ex Cond - BB	16000.00	327.59	352.437	338.43	352.477	0.000058	2.23	13693.08	3133.23	0.09
Reach-1	102637	10-Year	Opt BB-69 ft	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	10-Year	Ex Cond - BB	7750.00	329.34	346.522	335.34	346.608	0.000123	2.70	5238.09	2651.00	0.12
Reach-1	102637	50-Year	Opt BB-69 ft	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	50-Year	Ex Cond - BB	11000.00	329.34	349.057	336.71	349.118	0.000086	2.51	8514.12	2859.06	0.11
Reach-1	102637	100-Year	Opt BB-69 ft	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	100-Year	Ex Cond - BB	13000.00	329.34	350.502	337.44	350.553	0.000072	2.42	10465.58	2969.17	0.10
Reach-1	102637	500-Year	Opt BB-69 ft	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	102637	500-Year	Ex Cond - BB	16000.00	329.34	352.397	338.47	352.442	0.000060	2.37	13099.58	3095.43	0.09
Reach-1	101960	10-Year	Opt BB-69 ft	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	10-Year	Ex Cond - BB	7750.00	327.38	346.450	334.86	346.527	0.000104	2.64	5533.90	2201.58	0.12
Reach-1	101960	50-Year	Opt BB-69 ft	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	50-Year	Ex Cond - BB	11000.00	327.38	349.000	336.34	349.060	0.000080	2.54	8358.28	2434.20	0.10
Reach-1	101960	100-Year	Opt BB-69 ft	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	100-Year	Ex Cond - BB	13000.00	327.38	350.450	337.16	350.504	0.000069	2.50	10005.52	2628.11	0.10
Reach-1	101960	500-Year	Opt BB-69 ft	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09
Reach-1	101960	500-Year	Ex Cond - BB	16000.00	327.38	352.350	338.27	352.399	0.000060	2.47	12239.19	2748.28	0.09

Macro-level Resource Screening of Alternatives

Introduction

Macro-level resource screening of the Middlebury Spur preliminary alternatives was conducted during February, March, and April 2005. A broad range of environmental and cultural resource impacts was assessed in this process. This section describes the results of the macro-level resource screening. All impacts were measured assuming a 100-foot wide footprint and a 300 foot by 1500 foot transload facility, where material would be temporarily stockpiled, and transferred from truck to rail. Figure xx shows an overview of all the alternatives that were assessed, including those that were screened out during the physical and operational screening.

Data Sources

MJ used a variety of data sources to assess resource impacts. Because this is a preliminary impact screening, it was based on available mapping resources with no field verification. The various sources of data have varying levels of accuracy, depending on the original data source, the media used in transferring it, and other factors. Data sources for the resource screening included:

<u>VCGI (Vermont Center for Geographic Information) Website</u>
- Wetlands
- Farmland Soils
- Hazardous Materials Sites
- Deer Wintering Areas
- Conserved Public Lands
- Trails
- Floodplains (Rutland County Only)

<u>Printed Maps</u>
- Parcels
- Conserved Private Lands
- State Listed Historic Properties
- Floodplains (not available for all communities)

<u>1995 and 2003 Orthophotos, and 2004 Aerial Photography</u>
- Structures
- Residences
- Undeveloped Habitat

<u>USGS Topographical Maps</u>
- Water Bodies

Rare and Endangered Species data was received directly from Vermont's Nongame and Natural Heritage Program. National Register properties were located from the National Register Website and 1995 orthophotos.

Resource Identification and Impact Assessment Methods

Resources are mapped on Figures 1-15. The study area has been divided into three regions; north, middle, and south. Figure 1 provides an overview of all the alternatives that were originally under consideration. Figures 2,3, and 4 provide an overview of the alternatives on a 2003 orthophoto base. Major physical constraints for the northern alternatives are mapped on Figures 5 and 6. Water based resources (wetlands, floodplains, surface waters, and hydric soils), are displayed on Figures 7,8, and 9, and land based resources (conserved land, prime farmland soils, recreational trails, deer wintering, natural heritage occurrences, hazardous materials, and historic properties) on Figures 10, 11, and 12. Groundwater favorability is mapped on figures 13, 14, and 15.

Wetlands: Wetland impacts were measured as impacts to hydric soils and Vermont Significant Wetland Inventory (VSWI) wetlands. Hydric soils were identified based on the Natural Resources Conservation Service's Comprehensive Hydric Soils List. Soils that are listed as possibly having hydric inclusions were not counted as hydric soils. Where hydric soils overlapped with VSWI wetlands, the wetland impact was counted only once.

Archaeological Sensitivity and Sites: Archaeological sensitive area mapping was not available from existing sources for the study area, and therefore was not identified or assessed. Archaeologically sensitive land will be identified as part of the Archaeological Resource Assessment during the next phase of the project.

National Register Historic Resources: Locations of National Register-listed historic resources were identified from the National Register's web site. Only listed properties were included, and only those within an alternative's footprint were considered impacts.

State Listed Historic Resources: Historic resources listed on the Vermont State Register of Historic Places were extracted from maps in documents published by the Vermont Division for Historic Preservation. Only those within an alternative's footprint were considered impacts.

Conserved Lands (Public): Conserved public lands were taken from VCGI and Town of Middlebury tax map data.

Conserved Lands (Private): Conserved private lands were taken from information provided by the Middlebury Area Land Trust and from the Town of Middlebury tax maps. Other privately held conserved lands may be added at a later time if other conserved private lands are identified.

Section 4(f) and 6(f) Resources: This level of screening did not include a determination of which resources are regulated under Section 4(f) or Section 6(f), or whether there will be impacts to the resources. This will be addressed in future studies.

Trail Crossings: Trail Crossings for all alternatives were determined from VCGI data, with the number of crossings reported in the matrix.

Right of Way: The number of parcels impacted was extracted from the most recent tax maps available.

Structures Impacted: Structures to be impacted were based upon visual assessment of orthophotos from 1995, and supplemented with aerial photos taken in 2004 (available for all alternatives except RS-5 and HB-1.

Floodplains: Floodplain impacts were assessed based on available FEMA mapping. Digital data for Rutland County was available through VCGI, and printed maps were scanned and scaled for the other alternatives.

Hazardous Material Sites: Possible involvement with hazardous material sites was based on the Vermont Agency of Natural Resources (VANR) quarterly Active Hazardous Sites lists.

Deer Wintering Areas: Deer wintering areas were based upon VANR data, accessed through VCGI.

Rare and Endangered Species: Impacts were based upon data received directly from the Vermont Nongame and Natural Heritage Program (NNHP). According to NNHP, there may be project impacts not reflected in the point data, and NNHP will be providing further comments on the Indiana bat, upland sandpiper, and possibly other species.

Undeveloped Land: Impacts were based upon linear feet of alignment that bisected undeveloped land, evaluated from 1995 orthophotos and 2004 aerial photography. Agricultural land was considered undeveloped for purposes of this category.

Water body Crossings: Water body crossings are based upon stream or river channels that were identified on the USGS topographic maps.

Groundwater Favorability Areas: The 1967 *Ground-Water Favorability Map of the Otter Creek Basin, Vermont* was reviewed to determine whether alternatives intersected areas of “excellent” groundwater favorability.

Residences within 100 feet: This category represents an effort to consider impacts such as air, noise, vibration, and aesthetic concerns in the screening.

Because such impacts are related to the proximity of residences to the alignments, the number of residences within 100 feet of the edge of the impact area (equivalent to within 150 feet of the centerline) was counted using 1995 orthophotos and 2004 aerial photos. For the purposes of this measurement, residences within 100 feet of US Route 7 were not included.

Agricultural Land: Agricultural impacts were based upon an assessment of 1995 orthophotography. Areas that were in active farm use such as hay or crop fields were counted as impacted land if they fell within the 100 foot wide corridor.

Prime and Statewide Farmland Soils: Prime and statewide farmland soils were based solely upon the USDA NRCS soil units identified as such. All areas identified as prime or statewide farmland soils were included, including those that are not currently in agricultural use, such as areas used for housing or covered by roadways. Prime farmland soil impacts were reported separately, to represent the soils of highest importance. Prime and statewide soil impacts were also reported collectively, because they comprise “Primary” soils as defined in Vermont’s Land Use and Development Law (Act 250). Soil units identified as having statewide significance were included when they were impacted, even when those soil units were footnoted (b) or (c). Under NRCS’s definitions, footnote “b’ denotes that “The soils in this map unit have a wetness limitation that may be difficult and/or unfeasible to overcome. Areas of this soil map unit don’t qualify as Prime, Statewide, or local, if artificial drainage is not feasible”. Footnote (c) denotes that “Bedrock outcrops commonly cover more than 2 percent of the surface. Areas of this soil map unit will not qualify as prime, Statewide, or Local, if bedrock outcrops are extensive enough to prohibit efficient farming.”

Results of Macro-Scale Resource Screening

Results of the resource screening are shown in Table 2, *Middlebury Spur Alternatives Macro-Level Resource Screening Evaluation Matrix*. Highlights of the evaluation of each alternative are described below. Figures 16-21 compare the impacts for each alternative to some of the resources.

No-Build Alternative: The no-build alternative travels approximately 22.8 miles on private roads, local roads, and on U.S. Route 7. The no-build alternative would have no impact to wetlands, floodplains, or farmland soils. However, the no-build alternative would continue to impact historic structures in Salisbury and Brandon Village, as trucks continue to pass through these areas.

RS-1 Rail Spur: RS-1 would have 3.17 new miles of rail alignment. As presented, RS-1 would pass through three privately conserved parcels. However, this alignment would not directly impact any structures, or any residences within 100 feet of the impact area. Impacts to active agricultural land (42.8 acres) and prime and statewide farmland soils (48.8 acres) would be relatively high. However, wetland impacts would be moderate (7.1 acres), the lowest of the rail spur alternatives (see fig. 18). Floodplain impacts would be moderate at 4.7 acres. RS-1 would not impact any existing residences. Because RS-1 would be the most direct route with comparatively lower resource impacts, it is being kept for further study.

<u>RS-2 Rail Spur</u>: RS-2 would have 5.22 miles of new rail alignment, more than any other alternative. RS-2 would cross three conserved parcels, and divide 21,500 linear feet of undeveloped habitat. RS-2 would impact 56.6 acres of active farm fields and 73.6 acres of prime and statewide soils, more than any other alternative. It would pass through 29 parcels, and would impact 9.3 acres of wetland. It would directly impact four structures. RS-2 would require excessive earthwork;1,054,306 cubic yards. Given the comparatively high resource impacts of RS-2, it is not being carried forward for further study.

<u>RS-3 Rail Spur</u>: RS-3 would have 3.83 miles of new rail alignment. RS-3 would impact three structures on Middle Road near the middle school. There are no other structures within 100 feet of the alignment. RS-3 would impact 7.6 acres of wetland, which is moderate when compared with other alternatives, and 53.5 acres of prime and statewide soils, which is comparatively high. RS-3 would require 639,105 cubic yards of earthwork. RS-3 is being kept for further consideration because other resource impacts are generally low.

<u>RS-4 Rail Spur</u>: RS-4 would have 2.58 miles of new rail alignment, making it the most direct rail alternative. However, RS-4 would have high wetland impacts (11.9 acres) including 2.5 acres of Class II wetlands and would pass close to two hazardous materials sites. It would impact a state listed historic structure. Given these impacts, and given that RS-4 does not provide any advantages over RS-1 or RS-3, it was eliminated from further consideration.

<u>RS-5 Rail Spur</u>: RS-5 would have 4.08 miles of new rail alignment. RS-5 would have the highest wetland impacts of all alternatives, at 17.8 acres. It also would impact twelve structures, including three state listed historic structures, would have six new road or rail crossings, and six waterbody crossings. Given the high impacts in almost every resource category, RS-5 was eliminated from further consideration.

<u>RS-6 Rail Spur</u>: has 2.76 miles of new rail alignment, making it the second most direct rail option. It would have relatively low impacts to floodplains, farmland soils, and undeveloped habitat. However, RS-6 would have 17.3 acres of wetland impact, including 5.4 acres of Class II wetlands, and would impact four structures. RS-6 was not carried forward for further study because of its wetland and structural impacts, and because it does not offer any distinct advantage over RS-1 and RS-3.

RS-1/RS-4 Combination Rail Spur: has 3.20 miles of new rail alignment. This alternative was proposed at a resource agency meeting on April 13, 2005. The alignment had been considered in a general way prior to the meeting, and had not been included in the resource matrix in part because it did not seem to provide any distinct advantages over RS-1 or RS-4. RS-1/RS-4 would require substantially more earthwork than RS-1: 847,064 cubic yards, compared with 524,927 cubic yards for RS-1.

TR-1 Truck to Rail: has 1.18 miles of new roadway alignment and 0.72 miles of new rail alignment, and uses 1.21 miles of existing private roadway. TR-1 would include a short rail spur to a transload facility in the field east of the rail line. TR-1 would have 2.8 acres of wetland impact, (relatively low), would impact no structures, and would pass through seven parcels. Because many of the impacts would be comparable to or lower than RS-1, TR-1 is being kept for further consideration.

TR-2 Truck to Rail: has no new roadway alignment, 0.30 miles of new rail alignment, and uses 5.34 miles of existing roadway, including 2.54 miles of existing roadway. TR-2 has high floodplain impacts, at 15.0 acres, and 11.0 acres of wetland impacts. Agricultural impacts are comparable to the other alternatives. It has low impacts to undeveloped habitat because it would use existing roadways, although those roads would have to be substantially improved. Given the relatively high wetland and floodplain impacts, TR-2 was eliminated from further study.

HB-1 Middlebury Bypass: would have 2.92 miles of new roadway alignment and 0.30 miles of new rail alignment, and uses 2.07 miles of existing roadway. HB-1 would have no floodplain impacts, and would not directly impact any structures, but would pass within 100 feet of seven residences. Because other resource impacts are generally comparable to the rail spur impacts without some of the advantages of the rail spur alternatives, HB-1 was eliminated from further consideration.

HB-2 Western Brandon Bypass: would have 2.66 miles of new roadway alignment and uses 15.25 miles of existing roadway. HB-2 would have the lowest impacts to active farm fields, at 12.2 acres. It also would have the lowest wetland impacts at 1.6 acres. It would, however, impact seven structures. Although HB-2 would have relatively low resource impacts, it was eliminated on the basis that it does not meet the purpose and need as well as some of the other alternatives.

HB-3 Eastern Brandon Bypass: would have 3.26 miles of new roadway alignment and would use 14.97 miles of existing roadway. HB-3 would have five waterbody crossings. Other impacts are comparable to or lower than impacts of the other alternatives. HB-3 was eliminated from further consideration because, as with

HB-2, it would not meet the purpose and need as well as the alternatives that involve rail.

Summary of Macro-Level Resource Screening

Results of the resource screening were presented to resource agencies on April 13, 2005. Because the resource matrix compares individual resources, and does not compare alternatives in their totality, it was felt that a consensus of the resource agencies would substantiate the recommendations of the project team. Consensus was reached on the status of each alternative, and based on their resource impacts and suitability for addressing the project purpose and need, RS-1, RS-3, and TR-1 were determined to be the only alternatives suitable for further study.

MIDDLEBURY ST SPUR (2)

MIDDLEBURY SPUR

ENVIRONMENTAL IMPACT STATEMENT

SCOPING SUMMARY

June 22, 2005

Federal Highway Administration

Vermont Agency of Transportation

Prepared by

McFarland-Johnson, Inc.

Introduction

The Vermont Agency of Transportation (VTrans) is studying freight transportation improvements in the Middlebury, Vermont area. An Environmental Impact Statement (EIS) is being prepared, and the scoping phase of the EIS was recently completed. This report documents the project activities that occurred and summarizes the findings of the scoping process.

Background

Omya, Inc. maintains a marble quarry in the town of Middlebury, Vermont. The operation involves extracting marble from the site, partially crushing it at the site, and trucking it on US Route 7, local town roads, and on private roads to a processing facility 22 miles away in Florence, Vermont. The operation currently involves approximately 85 round trips per day between Middlebury and Florence. Omya is limited by a Land Use and Development (Act 250) permit to 115 round trips per day.

Prior studies have investigated alternative means of transporting marble between Omya's Middlebury quarry and Florence. In 1999, a study mandated by the Vermont Legislature studied the economics, engineering, and environmental impacts of eleven alternatives for this purpose. Subsequently, Vermont Railway requested that the Army Corps of Engineers determine the Least Damaging Practicable Alternative (LEDPA) for the construction of a rail-based freight transportation system. This "LEDPA" study was completed in 2002.

NEPA and the Scoping Process

Because of the possibility of federal funding and approval actions by federal agencies such as the Surface Transportation Board and the US Army Corps of Engineers, the proposed improvements must comply with the National Environmental Policy Act (NEPA). Regulations state that when a proposed federally funded action is expected to have significant impacts, an Environmental Impact Statement (EIS) must be prepared. Accordingly, the Federal Highway Administration (FHWA), as the lead federal agency, filed a Notice of Intent to prepare an EIS, which was published in the Federal Register on January 11, 2005. (The Notice of Intent is reproduced in Appendix A.) VTrans has contracted with the consulting firm McFarland-Johnson, Inc. (MJ) to assist FHWA and VTrans with meeting their NEPA responsibilities, including development of the EIS.

Regulations state that "There shall be an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. This process shall be termed scoping" (40 CFR 1501.7). Scoping determines in part what will be covered in an EIS, and in what level of detail. As part of scoping, the lead agency may also set time limits for individual actions (parts of the EIS) or page limits for the EIS. Scoping provides an opportunity in the EIS process to air potential issues that may arise early in the process. Council on Environmental Quality (CEQ) regulations require that the lead agency "shall invite the participation of affected

Federal, State, and local agencies, any affected Indian tribe, the proponent of the action, and other interested persons (including those who might not be in accord with the action on environmental grounds)". The CEQ regulations for implementing NEPA do not dictate the course scoping may take, and provide the flexibility to tailor scoping to a specific project. In addition to coordination with the applicable resource agencies, the project team of FHWA, VTrans and project consultants decided that it would be beneficial to assemble an advisory committee to provide input, and that public involvement would be encouraged through the media and through a public scoping meeting.

Purpose and Need

The first step of the EIS was to draft a Purpose and Need Statement for the project. The Purpose and Need Statement was drafted and revised during scoping, but was not officially part of scoping. NEPA regulations provide that an EIS Purpose and Need Statement "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action" (40 CFR 1502.13). FHWA Technical Advisory T6640.8A (*Guidance for Preparing and Processing Environmental Documents*) provides that a Purpose and Need Statement should clearly explain the necessity of a publicly funded project that may have significant environmental impacts. The Purpose and Need Statement is used throughout the EIS process to evaluate alternatives, and guides the choice of a preferred alternative, if any. The content of the Purpose and Need Statement is fluid throughout the drafting of the EIS, and may be changed to reflect new information.

The Purpose and Need Statement for the Middlebury Spur was drafted by FHWA, VTrans and its consultants in consultation with an advisory committee (described later in this document). The Purpose in the Purpose and Need Statement was intentionally written broadly to include any potential users in the Middlebury area. However, the project concept was initially mandated by the Legislature recognizing the need of a private company, Omya, to transport marble. Therefore, the Need section outlines the traffic issues on US 7 and speaks specifically to Omya's freight transportation needs. It also addresses the limitations faced by Omya due to its Act 250 permit, and the negative impacts incurred by Brandon from the volume of truck traffic that passes through the Village. The Purpose and Need Statement also includes supporting documentation from Middlebury's and Brandon's town plans. The text of the Purpose and Need Statement is reproduced in Appendix B of this document.

Scoping Activities

CEQ regulations require that federal, state, local, and tribal agencies and other "interested parties" be invited to participate in the EIS process. The project team of FHWA, VTrans, and its consultants assembled an advisory committee and called upon resource agencies to provide input to the Spur EIS. Prior to and following the filing of the Notice of Intent, the project team held several internal meetings as well as meetings with the advisory committee and resource agency representatives. These meetings were used to coordinate a variety of activities, including:

- Drafting and gaining consensus on the Purpose and Need Statement;
- Brainstorming and gaining consensus on a broad range of transportation alternatives for preliminary consideration;
- Planning and refining the initial alternative screening methodology;
- Planning the public scoping meeting; and
- Reviewing and gaining consensus on elimination of preliminary alternatives.

Identification of Alternatives

A broad range of alternatives was considered at the outset of the project. Any potentially feasible option that might address the Purpose and Need was considered, even if it had been eliminated from consideration in previous studies. Alternatives from the legislative study and the LEDPA study were considered, including several truck-to-rail options, rail spur options, and a conveyor alternative. Four previously studied highway bypasses around Brandon Village were considered, as well as a bypass around Middlebury Village in conjunction with a truck to rail facility north of downtown Middlebury. New alternatives were also considered; specifically, four additional rail spur routes (RS-4, RS-5, and RS-6, and an RS-1/RS-4 combination), and two additional truck to rail options.

Resource Agency Coordination

Resource agencies were involved from the outset in all elements of scoping. VTrans and MJ corresponded with resource agency representatives frequently and met with them on November 18, 2004, prior to the start of scoping, and on March 11, 2005, and April 13, 2005. The agencies included were:

<u>State Agencies</u>
Vermont Agency of Agriculture, Farm and Markets
Vermont Agency of Natural Resources (ANR), Planning Division
ANR Department of Environmental Conservation (DEC), Water Quality Division, Wetlands Section
ANR DEC, Water Quality Division, Rivers Management Section, Stream Alteration
ANR DEC, Water Quality Division, Rivers Management Section, Floodplain Management
ANR Fish and Wildlife Department, District Biologist
ANR Fish and Wildlife Department, Nongame and Natural Heritage Program

<u>Federal Agencies</u>
Army Corps of Engineers
Environmental Protection Agency
USDA Natural Resources Conservation Service
U.S. Fish and Wildlife Service

In the November 18, 2004 meeting, participants agreed that:

- The purpose identified in the NEPA process may differ from both the 1999 legislative and 2002 LEDPA studies.
- The range of alternatives that had been rejected in the earlier studies could potentially suit the purpose of the NEPA process, and should not be eliminated without at least a preliminary review.
- No formal "Memorandum of Agreement" would be necessary to assign cooperating agency responsibilities.

At the March 11, 2005 meeting, guidance was provided on the type of screening that should be conducted at the preliminary level. This guidance was the basis for the "physical and operational screening" that followed. It was also decided that all alternatives should be compared using the same methods, and that information from the prior studies should not be used if the same information was not available for new alternatives.

At the April 13, 2005 meeting, resource agencies were presented with the results of the resource screening and physical and operational screening. Based on the results of this screening, resource agencies agreed that the range of alternatives should be narrowed to four: the no-build alternative, RS-1, RS-3, and TR-1. The results of the screening are detailed in a separate alternatives report.

Advisory Committee

Input to the scoping process was also provided by an advisory committee made up of town officials from Middlebury, Pittsford, Brandon and Salisbury, members of the regional planning commissions representing Rutland and Addison counties, representatives of regional economic development organizations, and representatives from Vermont Railway and Omya. Because Omya was likely to be the primary user of a rail spur, it was felt that their input was crucial to the development of any freight transportation alternatives. Local officials have valuable knowledge of previous rail spur studies and of recent and planned developments in the towns. Vermont Railway provided feedback on logistical matters of rail operations. Omya provided information on operations at the quarry and the plant, and on how a transition to rail might be facilitated. The Middlebury Spur Advisory Committee met on December 6, 2004, on March 16, 2005, and on May 3, 2005.

The December 6 meeting, which preceded the publication of the Notice of Intent and therefore the official start of scoping, was primarily a planning session. Discussion included strategizing for public participation, and a discussion of preliminary alternatives.

The March 16 meeting included a discussion of the draft Purpose and Need Statement, feedback on the January 20 public scoping meeting, and feedback on the alternatives screening that had occurred to date. Specific information about some of the proposed alternatives (RS-4, RS-5) was provided.

The May 3 meeting was used to review the results of the resource and operational screenings, and to confirm the support of the advisory committee on the proposed reasonable range of alternatives.

Public Involvement

The project team has continually strived to maximize public input. A public meeting was scheduled to present the broad range of alternatives and to seek public input scoping. This meeting was noticed in five local newspapers, and an announcement of the meeting was posted in the town halls of Middlebury, Leicester, Salisbury, Brandon, and Pittsford. Press releases were also sent to the same five local newspapers and to six radio stations. Local cable television provided an announcement of the meeting on their news scroll, and a local radio station ran a story about the Spur and the public meeting shortly before the meeting.

The public meeting was held on January 20, 2005, at the Middlebury Municipal Building. Fifty-two people signed in at the meeting. VTrans and the project consultants gave a brief presentation on the history of the project to date, explained the NEPA process, and presented the wide range of alternatives that was being preliminarily screened. The public was invited to provide information on project issues and alternatives, and anyone who requested to speak was given the opportunity to do so. New information about the study area was received from the meeting participants. Information was also received on the process in general, and on specific alternatives. Participants asked a wide range of questions, and in some cases provided comment without seeking answers. As this was not a public hearing, no formal transcript was prepared but a videotape of the meeting was made and was used in the preparation of the public meeting summary.

Some of the comments made by the participants included:

- Impacts to residents of Salisbury from the proposed truck to rail alternatives that pass through Salisbury;
- Information on a major amphibian crossing on Morgan Road in Salisbury, in the path of one of the proposed truck to rail alignments;
- General comments about Omya, the longevity of the quarry, and Omya's environmental record; and
- Information about conservation land in Middlebury in the path of one of the proposed alignments (RS-1).

A summary of comments made at the public scoping meeting is reproduced as Appendix C of this document. Comment forms were available for meeting participants who wished to submit written comments. The public was also invited in the public notices to send written comments by mail, email, or fax, or by calling VTrans directly. Written comments were requested by February 19, 2005. Twenty-four written comments were received during and after the public meeting. Of these, nine were from residents of Middlebury, eleven were from residents of Salisbury, one was from a resident of Brandon, one was from a school district superintendent (Addison County Central Supervisory Union), one was from the Salisbury Conservation Commission, and one was from a non-profit environmental organization (Vermonters for a Clean Environment). The written comments touched on a variety of subjects, including:

- The relative merits of the different proposed alternatives;
- The importance of Salisbury Swamp to wildlife, especially amphibians;
- The negative effects that the truck to rail options through Salisbury would have on residents and local businesses;
- Questions and comments about Omya's operations;
- Comments from residents of Halladay Road in Middlebury expressing concerns about impacts to air quality, groundwater, noise impacts from construction and operation, and safety and aesthetic impacts.

Conclusions

This report summarizes the EIS scoping process for the Middlebury Spur project. Information obtained during scoping will be taken into consideration as the project proceeds with the EIS studies. This included successfully identifying project issues and the views of the public and resource agencies while obtaining information on valuable, previously unknown issues. There will be continued coordination with the advisory committee, resource agencies, and the public throughout the EIS development.

Appendices

A. Notice of Intent
B. Purpose and Need Statement
C. January 20, 2005 Public Meeting Comment Summary

eligibility of countries for the benefits of the ATPA, as amended.

In a **Federal Register** notice dated August 17, 2004, USTR initiated the 2004 ATPA Annual Review and announced a deadline of September 15, 2004 for the filing of petitions (69 FR 51138). Several of these petitions requested the review of certain practices in certain beneficiary developing countries regarding compliance with the eligibility criteria set forth in sections 203(c) and (d) and section 204(b)(6)(B) of the ATPA, as amended (19 U.S.C. 3203 (c) and (d); 19 U.S.C. 3203(b)(6)(B)).

In a **Federal Register** notice dated November 15, 2004, USTR published a list of the responsive petitions filed pursuant to the announcement of the annual review (69 FR 65674). The Trade Policy Staff Committee (TPSC) has conducted a preliminary review of these petitions. It has determined that the petition filed by the American Cast Iron Pipe Company concerning Ecuador does not require action and terminates its review.

With respect to the remaining 2004 petitions, the TPSC is modifying the schedule for this review, in accordance with 15 CFR 2016.2(b). The results will be announced on or about May 31, 2005. The TPSC is similarly modifying the date of the announcement of the results of preliminary review for the remaining 2003 petitions to May 31, 2005. Following is the list of all petitions that remain under review:

Peru: Engelhard;
Peru: Princeton Dover;
Peru: LeTourneau;
Peru: Duke Energy;
Ecuador: AFL–CIO; Human Rights Watch; and US/LEAP;
Ecuador: Chevron Texaco;
Ecuador: Electrolux Home Products, Inc.;
Peru: Parsons Corporation.

Carmen Suro-Bredie,

Chairman, Trade Policy Staff Committee.

[FR Doc. 05–865 Filed 1–14–05; 8:45 am]

BILLING CODE 3190–W5–P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Environmental Impact Statement: Addison and Rutland Counties, VT

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of intent.

SUMMARY: The FHWA is issuing this notice to advise the public that an environmental impact statement will be prepared for proposed improvements to freight transportation to and from Middlebury, Vermont.

FOR FURTHER INFORMATION CONTACT: Rob Sikora, Environmental Program Manager, Federal Highway Administration, P.O. Box 568, Montpelier, Vermont 05601. Telephone: 802–828–4573.

SUPPLEMENTARY INFORMATION: The FHWA, in cooperation with the Vermont Agency of Transportation (VTrans), will prepare an Environmental Impact Statement (EIS) for a proposal to improve the transportation of large amounts of industrial materials to and from Middlebury along the U.S. Route 7 corridor.

Improvements in the corridor are considered necessary to provide for existing and projected movement of freight to and from Middlebury via U.S. Route 7. Alternatives under consideration include (1) taking no action; (2) improving existing U.S. Route 7; and (3) adding a new rail line with associated connector tracks and access roads. Incorporated into and studied with the various build alternatives will be design variations of grade and alignment.

Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who have previously expressed or are known to have an interest in this proposal. A series of public meetings will be held in Middlebury and other communities along Route 7. In addition, a public hearing will be held. Public notice will be given of the time and place of the meetings and hearing. The draft EIS will be available for public and agency review and comment prior to the public hearing. No formal scoping meeting is planned at this time.

To ensure that the full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this proposed action and the EIS should be directed to the FHWA at the address provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program)

Issued on: January 11, 2005.

Kenneth R. Sikora, Jr.,

Environmental Program Manager, Montpelier, Vermont.

[FR Doc. 05–899 Filed 1–14–05; 8:45 am]

BILLING CODE 4910–22–M

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Environmental Impact Statement: New Hanover County, NC

AGENCY: Federal Highway Administration (FHWA), DOT.

ACTION: Notice of intent.

SUMMARY: The FHWA is issuing this notice to advise the public that an environmental impact statement will be prepared for the proposed extension of Independence Boulevard in New Hanover County, North Carolina.

FOR FURTHER INFORMATION CONTACT: John F. Sullivan, III, PE, Division Administrator, Federal Highway Administration, 310 New Bern Avenue, Ste 410, Raleigh, North Carolina 27601–1418, Telephone: (919) 856–4346.

SUPPLEMENTARY INFORMATION: The FHWA, in cooperation with the North Carolina Department of Transportation, will prepare an environmental impact statement (EIS) on a proposal to provide an extension to Independence Boulevard in New Hanover County, North Carolina. The proposed improvement would involve the extension of Independence Boulevard as an urban boulevard with a grass median and partially controlled access between Randall Parkway and Martin Luther King Jr. Parkway for a distance of about 2 miles.

Improvements to the corridor are considered necessary to provide for the existing and projected traffic demand. Also, included in this proposal is the potential construction of a partial cloverleaf interchange at Princess Place (with ramps and loops in the southwest and northeast quadrants, and spanning the CSX Railroad crossing). A trumpet interchange at Martin Luther King, Jr. Parkway may also be necessary. Letters describing the proposed action and soliciting comments will be sent to appropriate Federal, State, and local agencies, and to private organizations and citizens who have previously expressed or are known to have interest in this proposal. Public meetings will be held in Wilmington, North Carolina throughout the development of the EIS. In addition, a public hearing will be held. Public notice will be given of the time and place of the meetings and

DRAFT PURPOSE AND NEED STATEMENT

Purpose

The purpose of the project is to provide for the safe and efficient transportation of freight to and from Middlebury, Vermont.

Need

Traffic studies have shown that trucks, including busses and vehicles with more than four tires or two axles, constitute between 7 and 12% of the total traffic volume on U.S. Route 7 in the Middlebury region. U.S. Route 7 is the primary north-south highway in western Vermont, is part of the National Highway System (NHS), is a two-lane principal arterial, and provides the most important link for travel and mobility in the Middlebury region. The high volume of trucks travelling through Pittsford, Brandon and Middlebury presents safety concerns for pedestrians, restricts access to businesses and side streets, and detracts from the character of these village centers, all of which are National Register Historic Districts. In addition, the level of truck traffic has raised concerns about aesthetics, traffic, vibration, noise, and economic impacts.

A significant portion of the truck traffic along U.S. Route 7 in the Middlebury region are trucks carrying marble to the hamlet of Florence in Pittsford, Vermont. Omya, Inc. operates a marble quarry in Middlebury that supplies its processing plant in Florence. Currently, crushed marble is trucked about 27 miles via private and public roads. The trip includes travel on U.S. Route 7 for about 24 miles through the towns of Middlebury, Salisbury, Leicester, Brandon and Pittsford. The trucks carrying marble are mostly 5- and 6-axle, have an average net load size of 29 tons, and are currently permitted for up to 45 tons gross weight. During their hours of operation, according to Act 250 permit findings, these trucks constitute approximately 25% of the total truck traffic on U.S. Route 7. Omya forecasts continued growth in its business.

Due to concerns about noise, safety, and vibration, Vermont Land Use (Act 250) Permit #9A0107-2 limits the numbers of round trip trucks to and from Omya's Middlebury marble quarry to 115 per day, thus limiting the potential total amount of marble transported between Middlebury and Florence. By limiting the supply of marble from its quarry in Middlebury, Omya's ability to grow and contribute to the economic growth of the region and state will also be limited.

There are currently two north-south transportation corridors in Western Vermont: U.S. Route 7 and the Vermont Railway corridor. U.S. Route 7 currently carries on average between 6,000 and 14,000 vehicles per day in the Middlebury region. Traffic projections conducted for the Pittsford-Brandon U.S. Route 7 Improvement Study predict that traffic on U.S. Route 7 will increase by 35% by the Year 2027 to between 8,100 and 18,900 vehicles per day. This level of traffic would certainly increase congestion and other traffic-related concerns along US 7. By contrast, Vermont Railway operates one round-trip on its corridor each day. A more effective and integrated use of all transportation modes would improve the safety and efficiency of the entire transportation system and better accommodate economic development.

For over two decades, local residents and local and state officials have recognized a need to accommodate increased freight transport to and from Middlebury. In 1998, the Vermont Legislature enacted a statute to study "alternative means for transporting materials from Omya's quarry in Middlebury, Vermont". The resulting *Omya Quarry Material Alternative Transport Legislative Study,* completed in 1999, evaluated eleven alternatives and recommended three for continued evaluation. A *Transportation Alternative Analysis* was completed in 2002 that determined, for purposes of permitting under Section 404 of the Clean Water Act, the Least Environmentally Damaging Practicable Alternative (LEDPA) to be the Middlebury Rail Spur Alternative A-1 (Western Rail Spur). The Middlebury and Brandon town plans support measures, including roadway bypasses and increased rail transport, to reduce traffic impacts to their village centers. The Pittsford Town Plan also supports a roadway bypass. The 2005 Middlebury Town Plan endorses the development of a Middlebury Rail Spur, and supports "greater rail use to reduce truck traffic on roads". The Brandon Town Plan supports increased use of rail for freight transportation.

Public Scoping Meeting Comment Summary
Middlebury Municipal Building
January 20, 2005

The following summary is not presented in the order that comments were given. Comments that were repeated, or where the gist of the comment was repeated, are stated once and identified with a number to show how many times the comment was repeated. Comments are organized generally by category: Comments specific to Omya, comments about the Salisbury alternatives, comments about the Middlebury alternatives, and other general comments.

Salisbury
- There was no representation from Salisbury or Leicester on the advisory committee.
- Old houses in Salisbury will be impacted by the truck traffic.
- The Salisbury route will have an impact on wildlife.
- Morgan Road in Salisbury is a major amphibian crossing area.
- The proposed route will go by the new Salisbury Elementary school, which is an important community center and will endanger the children who go to the school. (3)
- The intersection near the Salisbury Elementary School is already a difficult intersection.
- The increase in truck traffic will devalue homes.
- Salisbury is a tourist destination spot, and the increase in truck traffic will negatively impact tourism.

Omya
- The purpose of the project seemed to be to allow Omya to increase production.
- Omya is not in compliance with the regulations of the Agency of Natural Resources. (3)
- The quarry is rumored to have only a 20 year life span remaining. (2)
- Omya should spread its production over a longer period of time.
- Omya has a poor environmental record.
- Omya's Act 250 permit was issued to protect the environment and moving the noise, traffic and exhaust to Salisbury will only transfer the problem to Salisbury.
- Allowing Omya to increase its production by providing an alternative will allow Omya to circumvent its Act 250 permit.
- Omya is planning to move its entire operation to Salisbury.
- If Omya is not in full compliance with its ACT 250 permit it should not be allowed to expand.
- Someone from Omya should be at the meeting.
- Why isn't Omya underwriting the project?

Middlebury
- The Middlebury alternative may impact conservation land.
- The Middlebury alternatives are not acceptable (no further details were given).

General Comments
- How and why were these particular alignments chosen?
- Is there an existing problem, or is there an anticipated increase that demands a change in freight transportation.
- How will the alternatives be reduced to 3 or 5 if the impacts of all the alternatives are not yet known?
- One person commented that she was angry with VTrans for allowing the project to move forward.
- The project will impact agriculture in Leicester, as tractors regularly use the proposed route.
- There was inadequate notice for he public meeting; it should have been further in advance, and should have been in more newspapers (the Burlington Free Press, the Salisbury Sentinel, and the Brandon dateline).
- Most of the proposals divert traffic to other routes.
- The rail is hardly used now, because trucks use Rte 7 to carry freight for short distances to local businesses, and these freight movers will not use the railway.

- Increased truck traffic will wear out the roads and make them require more upkeep. (2)
- Mass transit should be promoted.
- If VTrans was concerned about Rte 7, why were funds diverted from (repaving?)?
- The no build alternative should be pursued. (3)
- Who are the users of the rail now?
- How many train cars would pass on the tracks each day?
- Increased train traffic will increase the risks of cars being hit by trains.
- The rail spur is an example of silo thinking, and the regulatory agencies are not working in concert with each other.
- Vermont taxpayers should bot be paying for a rail spur when many Vermonters do not have health insurance.
- Taking the trucks off the road will have a positive impact on global warming.
- A rail spur will not help the traffic on Route 7.
- A rail spur could be built through the swamp in Leicester.
- The truck to rail routes will create work for litigators because of an increase in accidents.
- The consultants should come to the other towns to look at the alternatives and speak with the locals.
- A rail link to the quarry is the only one that makes any sense.
- There is existing rail access in Middlebury.
- There don’t need to be any more alternatives studied.

MIDDLEBURY SPUR ENVIRONMENTAL IMPACT STATEMENT

PHYSICAL AND OPERATIONAL SCREENING OF ALTERNATIVES
McFarland-Johnson, Inc.
January 20, 2006

INTRODUCTION

Alternatives for transporting freight to and from the Middlebury area are being studied as part of the Middlebury Spur project. Environmental Impact Statement (EIS) regulations require that a "reasonable range of alternatives" be studied. To determine the reasonable range, a broad range of alternatives is being screened to first determine whether they are physically and operationally feasible, and, if so, whether resource impacts are reasonable or so excessive as to make alternatives non-viable. This document describes the results of the physical and operational screening.

METHODOLOGY

Alternatives are initially screened using three broad criteria, as described below.

1. Ability to meet design criteria.

This criterion refers to the ability of the alternatives to meet design criteria for rail spurs, transload facilities, truck to rail roadway routes, or US Route 7 bypasses, as applicable. The alternatives are evaluated for their ability to meet these criteria with a reasonable amount of impact to local roadways, farms, residences, and other considerations. These criteria are listed below.

<u>Rail Spur</u>

- Track Classification: Secondary Line/Spur
- Design Speed (Freight): 40 mph
- Minimum Horizontal Curve: 6 deg curvature [100' chord definition] (955' radius)
- Vertical Grade
  - Preferred: 1.0%
  - Maximum: 1.5%
- Turnouts
  - To Spur Track from ML: #15
  - To Siding: #10

<u>Transload Facilities</u>

- Length of railcar: 60 feet
- Length of Track for 20 car train (assumes 1,000,000 ton/year, 263,000#/4-axle railcar) including turnouts: 1,600' feet
- Total Width from Mainline Track: 300 feet (estimated)
- Unloading/Loading Area Width: 60 feet
- Minimum Distance from Transload Track to Mainline: 20 feet

- Vertical Grade
  - Preferred: 0.0%
  - Maximum: 0.1%
- Operations:
  - 5 Days per Week
  - 50 Weeks per Year
  - 2 trains per day

Truck to Rail Roadway

- Roadway Classification: Rural Minor Arterial
- Design Speed: 45 mph
- Posted Speed: 40 mph
- Minimum Horizontal Curve Radius: 650 feet
- Maximum Vertical Grade: 6%

US Route 7 Bypass

- Roadway Classification: Rural Principal Arterial
- Design Speed: 55 MPH
- Posted Speed: 50 MPH
- Minimum Horizontal Curve Radius: 1,060 feet
- Maximum Vertical Grade: 5%

2. Relative effectiveness in terms of freight handling and movement

This criterion considers the ability of alternatives to operate efficiently and cost-effectively, and therefore the likelihood that freight shippers would use it. The principal user of this facility is expected to be Omya, Inc., which quarries marble in Middlebury and trucks it along U.S. Route 7 and local roads to its processing plant in Pittsford. For an alternative to be viable, it must be viable for Omya's purposes. Figures cited in the 1999 legislative study[1] show that the annual operating costs of the truck to rail alternatives are much higher than rail spurs. Omya has confirmed that the truck to rail facilities, with the possible exception of the shortest alternatives, would not be cost-effective.

Other potential users include Vermont Natural Agricultural Products (VNAP), JP Carrara & Sons, and Specialty Filaments. VNAP is located just south of Omya's quarry and owns the land through which Omya's access road passes. VNAP may be able to use rail to expand their geographic markets, and is considered a potential user of the facility. A rail spur and transload facility that are on or close to their property would be the most easily accessed and cost-effective for their purposes.

JP Carrara and Specialty Filaments are located on VT Route 116, and would have to use the existing roadway system to access the rail spur or truck to rail facility. For these users, there is probably little difference between rail spur and truck to rail alternatives, although the southern truck to rail alternatives would require more trucking and be somewhat less efficient.

3. Removal of freight traffic from U.S. Route 7 and village centers

This criterion evaluates an alternative's ability to remove trucks from existing roadways, and particularly village centers, where truck traffic has raised concerns about safety, access, noise, dust, and other issues.

SUMMARY OF RESULTS

Rail Spur Alternatives

All rail spur alternatives – RS-1, RS-2, RS-3, RS-4, RS-5, RS-6 and RS-1/4 – would meet minimum design criteria, would be cost-effective for Omya and VNAP, could be accessed by truck and transload facilities by other users, and would remove a portion of the freight traffic from Brandon Village, US 7, and local roads. However, RS-4 and RS-5 would require substantially more cut and fill than the other rail spur alternatives, and RS-5 has the added inefficiency of carrying freight that is mostly south-bound in a northerly direction initially. Nevertheless, all of these alternatives appear to be operationally viable, and are therefore recommended for the next level of screening.

Truck to Rail Alternatives

All truck to rail alternatives – TR-1 through TR-7 – would meet minimum design criteria and would remove Omya's truck traffic from Brandon Village and a portion of US 7. However, they would require trucking and transload operations not needed for the rail spur alternatives, and are unlikely, therefore, to be cost-effective for the principal shipper, Omya. All but TR-1 have the added disadvantage of requiring travel on local roads in rural areas (on both new and existing alignment), although TR-2 would re-establish a former bridge crossing of Otter Creek.

The federal project sponsor, the Federal Highway Administration (FHWA), has requested that at least one truck to rail alternative be considered at this time. TR-1, which appears to be most cost-effective and has relatively little impact on US 7 and local roads, is recommended for the next level of screening. Because they are not cost-effective, the other truck to rail alternatives are not recommended for further study. However, TR-2 has the possible added benefit of an Otter Creek crossing, and will be screened at least until public, resource agency, and other input is received.

Highway Bypass Alternatives

All highway bypass alternatives – HB-1 through HB-5 – have been previously studied, and could presumably be designed to meet minimum criteria. All would have the advantage of removing freight traffic, and all other through traffic, from Middlebury, Brandon, or Pittsford Villages. HB-1 would also remove Omya's trucks from nearly 19 miles of US 7, but would require trucking and transload operations not needed for rail spur alternatives and is unlikely to be cost-effective. HB-2 and HB-3 could be cost-effective, though probably not as cost-effective as rail. The Pittsford-Brandon Bypasses, HB-4 and HB-5, have much more new alignment than any other alternatives, so it does not appear they could be viable for this project in terms of costs or impacts.

Because it is not cost-effective, HB-1 was not recommended for further study, but because it has other benefits, it was screened for resource impacts. HB-2 and HB-3, although not as cost-effective as rail, could still be effective and have other benefits, so we believe further study is warranted.

Conveyor Alternative

The conveyor alternative, C-1, was deemed to meet the first and third criteria. It was believed to be less cost effective than rail spur alternatives, but more cost effective than truck to rail alternatives for Omya. However, due to other concerns, C-1 was not recommended for further study.

The conveyor alternative was originally proposed because a conveyor system has more grade flexibility than a rail spur and would therefore involve less cut and fill and less resource impact. While this is true, the conveyor would have other impacts and limitations that make it less desirable. First, the conveyor envisioned would only accommodate shipments from Omya's quarry. In order to accommodate shipments for other users, a truck to rail route and transload facility would also need to be provided. In essence, Alternative C-1 would be comparable to constructing truck to rail alternative TR-1 plus a conveyor line for Omya. The conveyor itself would have a smaller footprint than a rail spur, but would require a parallel maintenance road.

Because of its lower cost-effectiveness, larger footprint, and restriction to Omya's freight, C-1 is not recommended for further study.

Summary of Recommendations

Recommended for Further Screening:		Not Recommended for Further Screening:
RS-1	TR-1	TR-3
RS-2	TR-2[2]	TR-4
RS-3	HB-1[2]	TR-5
RS-4	HB-2	TR-6
RS-5	HB-3	TR-7
RS-6		HB-4
RS-1/4		HB-5
		C-1

Footnotes

1. Annual operating cost estimates are from the *OMYA Quarry Material Alternative Transport Legislative Study, Volume 1* prepared by R.L. Banks & Associates, Inc. and DuBois & King Inc., published January 1999.

2. Although TR-2 and HB-1 are not recommended for further screening, they have benefits beyond the purpose and need of this project, and will continue to be screened until all public, agency, and other input has been received.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

MIDDLEBURY SPUR PROJECT

PUBLIC HEARING

PROCEEDINGS

taken on Thursday, June 7th, 2007,
at the Middlebury Municipal Building
Middlebury, Vermont

- - -

HEARING REPORTER: Maureen A. Booth, RMR

O'Brien Reporting Services, Inc.
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P R O C E E D I N G S

Thursday, June 7th, 2007, 7:07 p.m.

- - -

MS. SCRIBNER: Excuse me. Can everybody please take a seat? We're going to begin.

(Participants seated.)

MS. SCRIBNER: Well, welcome to this June 7th, 2007 hearing for the Draft Enviromental Impact Statement for the Middlebury Spur Project. Tonight we're going to give a presentation with an overview of the process that we've undertaken and findings that we've made so far.

Following the presentation, there will be an opportunity for comments to be made tonight. As well, there will be an extended comment period if anybody would rather submit some comments.

We have a host of folks from both State and Federal agencies and a large consulting team here. I would like to specifically introduce two representatives from the U. S. Army Corps of Engineers who would like you to know that they're here and available if you have any questions following the hearing. We have Ms. Marty Lefebre and Mike Adams who are back in the corner, and again they wanted you to know if anybody has any questions, they're available to answer them.

So, with that said, I'm going to turn this over to our consulting team which is led by Jed Merrow of McFarland & Johnson.

MR. MERROW: Thank you, Sue. And thanks for coming. We look forward to receiving your comments on the project. We will be considering all of your comments very carefully. It is required by law that we consider all of your comments in preparation of a Final Environmental Impact Statement.

As Sue mentioned, the purpose of the hearing is for collecting your comments. It is not intended to be a question and answer kind of a format. It's more of a comment format. If there are minor clarifications that we need to provide, we will do that, but in general we will be responding to your questions and comments in the Final Environmental Impact Statement.

There is a stenographer here, and it is also being recorded by the Middlebury Community Television, so it will be recorded in two different formats.

In addition to several Vermont Agency of Transportation folks, I also wanted to introduce a few other folks, Rob Sikora of the Federal Highway administration is here. He's in the back corner there. We have a representative of the Federal Circuit Transportation Board here, Danielle Goslin, and we also have many of the consultants, consulting team here. Our rail design consultant, TranSystems, is represented by Gary Bua who is in the front with us here. TJ Boyle Associates did the visual impact studies, and Mike Buscher is here from that firm. Mary Jo Llewellyn did our historic resource consulting work and she's here. Russ Thibeault of Applied Economic Research did the socioeconomic impact right here in the front. And K. M. Ching Environmental did the air, noise, and vibration impact analyses, and Tim Lavelle and Marty Brien are here from that firm.

Just a reminder that the document is available in several locations. We brought some extra CDs of the project at the table as you walked in. That reminds me, if sometime before you leave tonight, you could sign in in the back, that would be appreciated it. We have some extra CDs. You can request CDs or hard copies. That document is available electronically on VTrans' web site, which is listed in the handouts that were at the front. Other addresses where it's available for viewing are also in the presentation handout, and as I said, it's also available on CD.

To provide comments, written comments can be provided to Rob Sikora or Sue Scribner, addresses are provided in the handout. The e-mail address is also provided. There is a special comments e-mail address. Oral comments received at tonight's hearing and the written comment period is open until June 29th, 2007.

All right. I'll talk very briefly about the National Environmental Impact Assessment, National Environmental Policy Act Process. It's a Federal act started way back around 1970. It requires Federal agencies for projects, major projects that will have significant impacts, it requires them to prepare an environmental impact statement. It requires that alternatives -- alternative ways to meet the project purpose are studied. It requires that the alternatives' impacts are compared to the no build alternatives, and the final decision on the project, the EIS, is made by the Federal Agency, in this case, the Federal Highway Administration.

The Environmental Impact Statement Process, just to give you an idea of where we are, the project is kicked off with something called notice of intent, and then scoping identifies the significant issues to be addressed in the EIS. We had a public meeting during scoping you may recall.

We then developed preliminary alternatives that might meet the purpose and need. We also had a public meeting during that phase of the project. We then screen those alternatives to determine which is suitable for detailed study. I will talk about that more in a moment. We also have a public meeting to discuss the results of the screening.

We then identify the resources and the impacts, document it in the Draft EIS. And then there's a public comment period and a public hearing, which is where we are today.

We consider all the comments on the Draft EIS, we did some additional studies that I will describe today, and then publish and circulate the Final EIS, after which the Federal Highway Administration writes a record of decision for the selected alternative for the project.

Can everyone hear me okay? Can anybody not hear me okay?

(No response.)

MR. MERROW: Great. The project was initiated I believe in the mid-eighties in preliminary discussions between VTrans and Vermont Railway. The idea of connecting Omya's quarry in Middlebury to the mainline railway was discussed. In the mid nineties VTrans hired a consultant to study specifically the impacts of a rail spur.

In 1998, milestone for the project, the Vermont Legislature commissioned a study to further explore the feasibility of a rail spur. The studies were published in 1999 and 2000 and are called -- we refer to those as the legislative studies.

In anticipation of Army Corps permitting under the Clean Water Act, additional alternatives were developed and studied in order to facilitate the future Army Corps permitting.

And, finally, in anticipation of future Federal funding of the project, the National Environmental Policy Act Process was initiated with an Environmental Impact Statement prepared, which is where we stand today.

All right. Briefly, project need. U.S. 7 in the project corridor, which is Middlebury to Pittsford roughly, carries between 6,000 and 14,000 vehicles per day. It's projected to increase by 35 percent by the year 2027, and truck traffic makes up a relatively high percentage of the traffic on this particular state highway, 7 to 12 percent of all vehicles.

Omya trucks carry marble, pass through Brandon Village on their way to the processing plant in Pittsford, and make up about one-fourth of the truck volume during their hours of operation.

The high volume of trucks has resulted in safety concerns, concerns over restricted access to side streets, detracts from the character of historic village centers, and there has been other concerns about aesthetics, vibration, economic impacts, et cetera. That's the primary need for the project in a nutshell.

The project purpose has been defined as -- the purpose of the project is to provide for the safe and efficient transportation of freight to and from Middlebury, Vermont.

The project study area extends from Omya's quarry in Middlebury, which is right there on that -- on this particular plan, runs along the private quarry access road to U.S. 7, about 20 miles along U.S. 7 through Brandon Village, through the Towns of Salisbury, Leicester, Brandon and Pittsford. Then it goes to Kendall Hill Road in Pittsford and via two other local roads to the Omya processing plant in Florence in Pittsford.

Early in the project, all reasonably feasible preliminary alternatives -- all alternatives that seemed like they could possibly have any chance of succeeding were identified. They were identified through a number of different channels. The project team brainstorming, coordinating with an advisory community, including local officials and business leaders and agency officials and others, public meetings and other sources of information came up with a relatively exhaustive list of the potential alternatives for the project. They included seven rail spur alternatives, seven truck-to-rail alternatives, which would involve loading the marble onto trucks, trucking it to the mainline railroad tracks, building a transload facility and transferring to rail at the point. The transload would also allow access by other shippers. Several highway bypass alternatives were identified and a conveyer alternative.

The first step in screening the alternatives was determination of the physical and operational feasibility of the alternatives. We looked at three broad criteria. Could the alternatives meet basic design criteria for railroads or roadways, could they effectively handle freight movement, material handling, and would they effectively remove traffic, freight traffic, from U.S. 7 and local roads.

The results of the Physical/Operational Screening, the no build alternatives is required in the NEPA process. We have to study that. The rail spur alternatives all met the three criteria, so they were all advanced for further study.

The truck-to-rail alternatives could all meet the design criteria, but they were less effective at freight handling and movement. They would require two modes of transportation, truck and rail, and an extra material handling step.   Marble would be loaded on the trucks at the quarry and then loaded onto rail at a different location. Only TR-1 would have removed, removed freight traffic from U.S. 7, local roads; all others would have some involvement with U.S. 7 and local roads.

However, even though none of these appeared to be effective compared to the rail spurs in terms of freight handling and movement, it was decided to retain TR-1 as at least one roadway alternative. We wanted to have one roadway alternative included in the project. It was decided to retain TR-2 because it would have other local benefits. That's the three-mile bridge road alternative, which would have provided a restored crossing of Otter Creek, three-mile bridge road alternative and, therefore, a second Otter Creek crossing for the Town of Middlebury.

Highway bypass alternatives. We looked at one bypass around Middlebury. It is the previously proposed Middlebury bypass. Two bypasses around Brandon Village and two bypasses would be much longer and would bypass both Brandon Village and Pittsford Village. HB-1, which was the Middlebury bypass, was found to have the same problems. It would essentially be a truck-to-rail alternative; it would still have the same problems as truck to rail. We decided to study it further, because it had additional benefits to the Town of Middlebury. The Town of Middlebury was very interested in that alternative.

The short Brandon bypasses had some problems. It didn't take traffic completely off of Route 7 and local roads, but it was decided to study further because they would have benefits for Brandon Village, which is one of the needs for the project. The longer Brandon-Pittsford bypasses were rejected at this point, because they were major bypasses with major impacts and major costs well beyond the scope of this project.

Finally, the conveyer alternative, when we looked more closely at the conveyer alternative, we found out that would have some major drawbacks. First of all, it would only be accessible by Omya. It wouldn't be possible for other shippers to access the rail line providing the rail alternative. It would require a maintenance road. It would require a truck to railroad if other shippers could access it. Substantial visual and aesthetic impacts. For a variety of reasons, a rail to conveyer alternative was not advanced.

The net result, all of the truck-to-rail alternatives, except TR-1 and TR-2, were rejected. Longer highway bypass alternatives were rejected and the conveyer alternative was rejected. All the rail spur alternatives and no build were moved forward.

The next step was what we call macro-level resource screening of the alternatives. We took a broadbrush look. We assumed that each alternative would have a hundred-foot wide footprint. We looked only at existing resource mapping and data. We didn't do detailed field study. It was a broad scope resource impact study.

The results of this study showed that again the no build is required, so that was carried forward. We found that RS-1 and TR-1, which are the alternatives that we will be talking about in more detail today, were the most direct routes to the railroad tracks and would have some substantially lower impacts than all the other rail spur and truck-to-rail alternatives. So, those are retained and further studied. The other rail spur and truck-to-rail alternatives were rejected. We can talk more about that after the meeting if you would like. The details are discussed in the Draft EIS.

The highway bypass alternatives had comparable resource impacts to RS-1 and TR-1, but there were concerns that there would be greater long-term impacts because of the reduced development of these new roadways. They also only partially meet the purpose and need. They don't take traffic off of most of U.S. 7 and local roads, and the cost and the time to construct would be substantially greater for those alternatives. So, the highway bypass alternatives were rejected at that point. There was discussion of these findings in a public meeting, several meetings with the regulatory resource agencies which supported the conclusions and also with the advisory committee.

The net result, preliminary alternatives screened out all except for RS-1 and TR-1 and these were the alternatives along with the no build alternative that were advanced in the detailed study in the Draft EIS. From here on out, I will be talking about those, those three alternatives.

The no build, I don't think we need to talk about that too much more. We discussed that, I described that at the beginning of the project. I think you all know what that is.

Alternative RS-1. RS-1 and TR-1 are both entirely in the Middlebury -- the build portions anyway. RS-1 would begin at the -- in the Omya quarry, the marble would be loaded onto the truck, proceed directly south to there. A transload facility would be constructed just south of the quarry. Shippers other than Omya could access the facility via the existing quarry access road and the transload facility. It would then turn to the southwest, cross Lower Foote Street. There are two options for crossing Lower Foote Street I'll talk about in a moment, and it would pass under U.S. Route 7, cross Halladay Road, there's three options for crossing Halladay Road, and then continue through the farm fields to the west crossing Creek Road and Otter Creek. And from about this point, which is where the floodplain begins, to the existing mainline railroad tracks, about 2000 feet, this alternative would be constructed on a trestle and bridges to keep it out of the floodplain with a bridge over Otter Creek and Creek Road.

The options, three options for crossing Halladay Road. First is grade separated over Halladay Road. This is a bridge that would span over Halladay Road. Halladay Road traffic would be uninterrupted. This requires a relatively substantial fill section west of Halladay Road. The RS-1 alternatives also in order to get under U.S. 7 would require a relatively deep cut section. It would be about 28 feet under U.S. 7. So, you go from a deep cut to a relatively large fill here.

At grade with Halladay Road. We would meet Halladay Road at grade. There would be gates and flashers at the road crossing here that would close when the train was going by, which would be four times per day as is projected. This would require little -- oops. Back. This would require a little bit deeper cut section over here and a substantially lower fill section to the west. And, finally, the Halladay Road relocation would involve severing Halladay Road and constructing a cul-de-sac to the north, it would dead-end Halladay Road and relocating Halladay Road out to U.S. Route 7 South of the rail spur alignment. At Lower Foote Street, the two options are pretty simple, either Lower Foote Street would be severed or there would be a bridge constructed over the rail spur.

Truck-to-rail alternative TR-1, that would involve loading material on the trucks in the quarry as currently occurs, trucking along the existing quarry access road. And at this point, the new construction would begin just east of U.S. Route 7 in order to carry the truck-to-rail alternative under U.S. 7. It would then cross Halladay Road, the two options, which I'll talk about, and continue to the west. There would be a transload facility that would allow Omya to transfer marble from trucks to rail cars, and it would also allow other shippers to access, access the rail line. This transload facility would be quite a bit larger than the RS-1 transload facility, because this has to allow space for Omya to stockpile material on its way to the railroad line.

There are some traffic implications for these. For example, users other than Omya, if they're coming from the south on U.S. 7, might come up Lower Foote Street and access the facility that way. If it were an at grade location, it could be accessed by the Halladay Road for example.

The two options for crossing Halladay Road. Grade separated over Halladay Road. The cuts to the east and the fills to the west are much lower than they are with the RS-1 facility and that's because roadways have less severe grade restrictions than rail does. At grade with Halladay Road is pretty straightforward. It adds a little bit more of a cut to the east and the west of Halladay Road.

All right. Those are the alternatives and now I would like to talk about the impacts of alternatives. Traffic impacts first of all. This is a slide of Brandon Village. It is one showing one of the marble trucks in the village.

The no build alternative which would be business as usual. There would be no reduction in freight traffic. Traffic volumes would continue to increase with normal growth. Omya currently has permit restrictions that limit its trucks from the Middlebury quarry to a hundred and fifteen round trips per day. They don't run that many now.

For the purposes of this study, we assumed that they would -- by the year 2010, they would be running a hundred and fifteen round trips per day and that they would find a way through amendments to existing Act 250 permits or other means to increase the shipments by about 20 percent by the year 2030.

RS-1 and TR-1 of course would both reduce freight traffic on U.S. 7 and some local roads compared to the no build alternative. They could result in some very small increases in freight traffic on local roads if shippers other than Omya access the transload facilities of RS-1 and TR-1, the volumes of local roads as I mentioned earlier.

Safety. There have been concerns about safety with the truck traffic, particularly in Brandon Village. There's a higher than normal crash rate along U.S. 7 in this corridor. The no build alternative would not address that issue. Traffic volumes, of course, as I mentioned would be expected to continue to increase with normal growth. The build alternatives, RS-1 and TR-1, would remove 230 or more truck trips per day from U.S. 7 and local roads, which is expected to improve safety.

The pedestrian and bicycle safety is

expected to be improved with the build alternatives. RS-1 at grade with Halladay Road does present the potential for vehicle-train conflicts at Halladay Road.

Impacts on the rail system. The mainline railroad currently is an underutilized resource. It has plenty capacity. The RS-1 and TR-1 results in two additional train round trips between Middlebury and Pittsford per day, five days a week in 2010 and six days a week in 2030. The mainline has plenty of capacity for that, and it won't cause conflicts with other rail traffic.

And then I would like to turn to resource impacts. I'm not going to list all these resources. These are not all the resources studied, but the principal resources studied in the EIS. NEPA, the National Environmental Policy Act, is a very broad and inclusive law that requires consideration of a large range of environmental resources.

Let's start with social and economic resources. Economic development. Having fewer freight trucks in Brandon is expected to improve the economic climate in Brandon Village, which is experiencing something of a renaissance there.

In terms of employment, RS-1 would result in substantially fewer jobs. I think it's in the neighborhood of 60 or 63 jobs or something like that than the no build condition. There would be less need for trucking basically. TR-1, there would still be some need for trucking. It would result in about 16 fewer jobs. And when I say fewer jobs, I'm referring to both direct and indirect jobs. Direct jobs being those who are employed directly by the trucking companies, for example, indirect jobs, jobs that might support service, provide services to those people.

Land acquisition. RS-1 and TR-1, are somewhat comparable. RS-1 would take more land east of U.S. 7. TR-1 would take more land west of Halladay Road to the transload facility.

Land use planning. The rail spur is identified in Middlebury's Town plan and Brandon's Town plan. It's also mentioned in the Addison County Regional Plan and supported -- with conditions, it's supported by those plans. And there are no public recreational lands or public parks that would be affected by the project.

Also mitigation for social and economic resources would include constructing farm access where farm access to fields are severed. Landowner compensation as well for land that's acquired or for uneconomic remnants that were left over and severed by the project.

Visual resource impacts. As I mentioned earlier, consulted T. J. Boylan Associates compared photo simulations of what the build alternatives RS-1 and TR-1 would look like. They took photos of existing conditions and they married those with the design plans and determined, developed a simulation of what the build alternatives would look like. This shows the locations where these photo simulations were developed. I'm going to be showing you simulations from the area of U.S. 7, Halladay Road, and Creek Road so you have a visual impact of what this thing would look like when it's constructed.

This is at U.S. 7 looking east at the point where the rail spur RS-1 would cross under U.S. 7. And you can just see, the existing quarry access road is to the left here. And that shows what the rail spur would look like from that same point.

Looking west from U.S. 7 -- and these photos are also shown on the boards in the back, and they're also included in the Draft EIS-1 with a number of other simulations. Looking west from U.S.

7, not directly at the project, but a little bit at a skewed angle, that is the grade separated over Halladay Road options. You can just see it going around a corner there. This is the at grade with the Halladay Road option. Little difference. And this would be the Halladay Road relocation option.

The truck-to-rail grade separated over Halladay Road is a little less visible yet, and this is a TR-1 at grade with Halladay Road. Again, trucks require lower grade restrictions, and we can get away with some smaller cuts. It will be a little bit less visible.

At Halladay Road, this is looking south toward the project crossing on Halladay Road roughly in front of the Hathaway House. This is existing conditions. RS-1 grade separated over Halladay Road. Rail spur bridge over Halladay Road and the Halladay Road relocation. This is just the cul-de-sac here. The relocated portion of Halladay Road would be over there and the rail spur is at a lower elevation between. Actually, I think that's the rail spur right there. Yeah.

This is from a little bit south on Halladay Road looking north, existing conditions. RS-1 grade separated over Halladay Road. RS-1 at grade with

Halladay Road, and you can see on here the gates and flashers that would be required. And the RS-1 Halladay Road relocation. This is the rail line.

This is TR-1 grade separated over Halladay Road. It's not as clear as it could be, but this is truck shown going over that proposed bridge. This is TR-1 at grade with Halladay Road.

This is a photo taken from Creek Road looking south and east toward the Perrin farm, existing conditions, and the proposed trestle that would span the floodplain. Again existing, proposed trestle.

Also mitigation for visual resource impacts. Modifying the cut and fill slopes. Landscape screening. Retaining existing vegetation where possible. Manipulating the topography, for example, providing more fill so that the steep embankments are softened and it looks like a more natural land form. And other design features such as bridge design features, trestle appearance.

Air quality impacts. The results for air quality were a little bit counterintuitive. The no build alternative, despite an increase in traffic, would be expected to have lower emissions for the model pollutants by the year 2030, and that's because of projected advances in the vehicle fleet and emission controls in the vehicle fleet.

In 2010, alternative RS-1 would have mixed results compared to the no-build alternatives. Some of the constituents would be higher and some of the air quality constituents would be lower, and it was very surprising to find that two round-trip trains could have higher amounts of some pollutants than the trucks, but that's due to the train emissions have not been controlled as much or for as long as regular roadway vehicle emissions. We've looked at those numbers very closely. We have a lot of confidence in those numbers, but it's a somewhat controversial finding, and we will be looking at those further as we progress in the Final EIS.

And 2030, RS-1 is projected to have higher pollutant emissions for air quality constituents than the no build alternative, and the TR-1 alternative, which would involve trucking and rail, would have the highest levels of all pollutants in 2010 and 2030.

On a regional scale, the project-related emissions are relatively small. No violations of air quality criteria are expected and that no mitigations are thought to be necessary.

Noise impacts from rail traffic. Warning horns would be required at grade crossings. As a result, there would be 13 so-called moderate noise impacts for both years 2010 and 2030. I believe those are also existing noise impacts from existing train traffic.

Mitigation for rail noise impacts could involve lowering the sound level of warning horns, having stationary warning horns at crossings, installing quad gates to eliminate the need for horns, or establishing quiet zones at crossings. These will be looked at as the project moves forward.

Noise impacts from vehicle traffic. As you might expect, the no build alternative has much higher noise impact levels than the build alternatives because there will be more freight traffic on existing roads adjacent to existing residences.

In 2010, the no build would have 58 impacted receptors, for example, residences, whereas the build alternatives, RS-1 and TR-1, would have 34 impacted receptors. In 2030, the no build would have 8 impacted receptors versus 61 for RS-1 and TR-1.

There are four impacted receptors currently in Brandon Village in the year 2010, that is, I should say under the no build. Under the build alternatives, there would be no impacted receptors from vehicle noise. Because the impacts are lower under the build alternatives, the build alternatives would not require noise mitigation.

Vibration impacts and mitigation. Under the no build conditions, five receptors are currently experiencing vibration impacts as defined by Federal Transit Administration criteria. Under RS-1 and TR-1, no additional receptors would be impacted, and possible mitigation includes reduced train speeds and ballast mats.

Wildlife habitat impacts. Virtually the entire project alternative corridor for RS-1 and TR-1 is open farm fields, some of which are active, some of with are fallow; there's pasture; there's cropland. There are hedgerows. There's a few isolated patches of forest along the corridors and larger areas of forest outside the corridor.

The RS-1 alternative would affect mostly open field habitat, a small amount of forested land. West of Halladay Road, it would cross an area where there's a special concern, salamanders. This is actually a hybrid between a Jefferson Salamander and a Blue-Spotted Salamander. Special concern species in the State of Vermont. They move back and forth between the forested ridges to the north and the large wooded swamp to the south between Halladay Road and Creek Road.

The TR-1 habitat impact would be similar to RS-1, a slightly different location. More impacts near the transload facility; less impacts closer to U.S. 7. This gives you an idea of what most of the impacted habitat is like. TR-1 would affect a small amount of forested habitat west of Halladay Road. I will talk more about that in a moment.

Mitigation for habitat impacts. The selection of the alternatives to study has resulted in a great deal of minimization of potential habitat impacts. Further mitigation could be achieved by minimizing the project footprint, particularly adjacent to hedgerows and streams, which could be traffic corridors for wildlife species and providing plantings where there are known wildlife corridors, possible wildlife passage structures to allow critters like these salamanders to get back and forth across the rail spur and the truck rail. And perhaps preserving wildlife habitat.

I mentioned earlier threatened and endangered species. I mentioned the special concern salamander species. There are rare grassland bird species which has been found in the general project area and various places scattered around Vermont, upland sandpipers and grasshopper sparrows. A survey was done on these species, and they were not found in the corridor during the breeding season. They are not going to occur in the corridor.

Also what was found in this general area is the federally endangered Indiana bat and there have been roost trees within a couple miles of the project. It's part of a study for a different project. An Indiana bat was captured near the project in the forested area. Indiana bats roost in trees with peeling bark, including dead trees, shag bark hickory and sometimes silver maple. This shows a shag bark hickory tree. I know it's not very clear in this photo. This is the shag bark hickory tree near the alignments. TR-1 would affect a forested -- a small area of the forest that would have some shag bark hickory trees and, therefore, potentially Indiana bat habitat. No other rare species impacts are expected.

The mitigation would be essentially the same as the mitigation for general wildlife habitat impacts with the possible exception of the Indiana bat habitat impacts where it might be required, for example, to plant some additional trees or similar measures.

Turning to agricultural land and farmland soils. RS-1 and TR-1 affect between 26 and 35 acres of soils that are designated as either prime farmland soils or important farmland soils. As I said, most of the corridor, most of the land affected is farmland, some of it's fowl, but much of it is active cropland or pastureland, and there might be some additional effect on agricultural from problems in access, farm fields that are crossed by the alternatives or where there is small patches of fields that are left from fields that are bisected by the alternatives.

Mitigation could include adjusting the alignment to minimize these areas of -- these remnants that are left over from bisecting the field. Farm crossings would be constructed where needed and where physically feasible, and there would be an ongoing dialogue with State and Federal agencies that have jurisdiction over agricultural land.

Groundwater Resource Impacts. No impacts are expected to ground water resources. The area includes a low yield aquifer and there's no water quality impact expected. I'll talk more about that in a moment. VTrans monitors wells that could be affected by the construction projects.

Water Quality Impacts and Mitigation. Both RS-1 and TR-1 would have new impervious acreage for transload facilities and access roads or roadway pavement, and the possible effects of runoff on water quality and receiving waters would be mitigated by implementing best management practices like retention basins and swales, which are required by various State and Federal laws and regulations.

Floodplain and Floodway Impacts. I mentioned earlier that RS-1 and TR-1 have identical trestle elements from the beginning of the floodplain near Creek Road across Otter Creek and adjoining the mainline. RS-1 and TR-1 are identical in this section. That's pretty much the only floodplain impact in the project.

To avoid excessive floodplain impacts, the trestle was designed to span the entire floodplain area and the floodway. The floodway is indicated by these dashed lines, the area within that is floodway. Our very preliminary studies for the Draft EIS showed that the back water behind the trestle structure would be raised a half foot to one foot during floodplain conditions, during flood conditions.

We're aware that Creek Road floods seasonally. We're aware that the Perrin farm down here is relatively low lying on the landscape, and we're also aware that the floodplain from this area extending to the south, which is upstream, is virtually flat for quite a distance, and an increase of a half foot to a foot could be a substantial impact for quite a large area.

Further study is proposed for floodplain impacts upstream of the project. We also will be looking at doing a more detailed analysis, and we'll also be looking at an alternative trestle design that would have fewer, more widened spaced piles which support the tresses.

Mitigation. This is TR-1, again essentially identical floodway, floodplain and floodway impacts to RS-1. Possible mitigation for floodplain and floodway impacts include what we've already proposed in constructing a trestle and bridges above the hundred-year floodplain elevation, minimizing fill in floodplain and floodway. We're going to look at alternative structure size and design options. Other mitigation could include constructing flood storage areas, widening floodplain channels, constructing levees, or other measures.

Wetlands. The RS-1 and TR-1 would impact roughly 45 acres of wetlands. Most of the wetland in the project area is ditches and swales and wet meadows and existing farm fields with small areas of forest and shrub land, but primarily it's wetland that looks somewhat like this. This is actually the Eddy farm on the west side of Otter Creek in roughly the area of the trestle crossing. You can see that there's a wet ditch here and much of the land on either side of the ditch is also as a result of wetland.

Impacts there would be minimized to some degree by proposing a trestle section that would be elevated above the wetlands. The impacts would be limited to -- the direct impacts would be limited to the footprint of the piles in the wetlands. The principal wetland functions of these wetlands are water quality, particularly in farm fields where there's manure, there's fertilizer applied, pesticides applied; these wetlands can play an important function in filtering out some of the water quality problems that can come from agriculture.

The wetlands also have limited amounts of wildlife habitat value. This shows the wetland impacts to RS-1. The green are the wetlands that were identified in a field review for this study, the smaller green areas. The larger green areas are larger areas that have been identified from National Wetlands Inventory Maps, a much cruder level of wetland mapping.

As the project moves forward, formal wetland deliniation lines will be incorporated into the project plans and impacts will be defined a little better for the wetlands. This shows the RS-1 impacts and the TR-1 impacts.

Mitigation could include further minimizing impacts, for example, steepening side slopes, extending trestle sections, replacing the wetland water quality functions with stormwater management structures, detention basins, swales, for example. Consideration is being given to restoring or enhancing or preserving wetlands to compensate for the impacts. We have looked at a large number of potential wetland mitigation sites where the impacts could be compensated, and there are two in particular that are of interest, the locations of those are shown in the Draft EIS. One is in Cornwall by the Cornwall Covered Bridge, a parcel of land on the west side of Otter Creek. It's in the floodplain. It's ditched. Wetland there could be enhanced and preserved. Another site is in Pittsford along I believe it's Kendall Hill Road where the, where the railroad, the mainline railroad tracks cross Otter Creek just south of Kendall Hill Road. There is a couple of parcels of farmland that are ditched wetlands basically where wetland could be enhanced, restored, or preserved.

The UVM Consulting Archaeology Program have identified areas that are sensitive or potential archaeological resource. These are not areas where there is known archaeological resources. These are areas that are sensitive; and based on their land forms, soil types and other features are determined to have the possibility of having archaeological resources present. This shows the RS-1, and you can see there are several broad areas of sensitivity, likewise in TR-1.

Further field study is required to determine whether these areas that would be affected actually do have archaeological remains present. We can't really determine what the impacts are until those field studies are completed, and mitigation can't be determined until the impacts are defined, so --

Historic structures and farmsteads that are either on or eligible for the National Register of Historic Places were identified on this project. RS-1 grade separated over Halladay Road, which is the RS-1 which would have a larger fill section west of the Halladay Road, we project to have an adverse effect on one historic resource, one national registered eligible resource, that's the Hathaway House on Halladay Road, largely because of the views, the change in the views from that structure. All of the other RS-1 and TR-1 alternatives and options would have no effect on historic resources or no adverse effect on historic resources. Likely mitigation measures for the impacts could include screening or some kind of plantings. Also modifying the land forms to make the structures fit in the landscape better.

Those are the major resource categories. In light of the resource impacts and because of deficiencies in the effectiveness of TR-1, TR-1 again would involve two modes of transportation, extra material handling steps. The no build alternative does not meet the needs of the project. In light of these factors, RS-1 is identified in the Draft EIS as the preferred alternative. It does not mean it will be the selected alternative in the end, but at this point, pending public comment and further studies, we believe RS-1 is the preferred alternative.

Next Steps. As I mentioned, the comment period ends June 29th, 2007. We do want to get your comments on this project. We will consider each and every comment. We'll respond to the comments. We'll do these further studies that I've described, and we'll prepare a Final Environmental Impact Statement.

After the Final EIS is circulated, the lead Federal agency, which is the Federal Highway Administration in this case, issues a record of decision which identifies a selected alternative, environmental permits that were made in the document, any outstanding unresolved issues for the project, and will respond to any additional comments that have been made on the Final EIS. That will conclude the EIS phase of the project.

After that, the project goes to final

design. Permits would be obtained, right-of-way would be acquired, and the project would be constructed.

Again, document availability, the VTrans web site, other addresses where it can be viewed is in the handout. It's also available on CD, and to provide written comments, the addresses are provided. The e-mail address is provided for e-mail comments. Oral comments tonight. And again you're reminded the comment period ends June 29th.

Some grounds rules before we begin the comment phase. This is a comment hearing. It's not intended to be a question and answer kind of a format. If there are minor clarifications that we can provide, we will provide that, but we're trying to avoid getting into detailed dialogue back and forth. This is really meant for you folks to have an opportunity to comment.

When you do comment, we would like you to come up to the microphone in the front. Every time you come up to the microphone, we would like you to state your name before providing your comments. And with that --

MS. SCRIBNER: Jed.

MR. MERROW: Yes.

MS. SCRIBNER: I would just like to make a few clarifying comments.

MR. MERROW: Sure.

MS. SCRIBNER: The first was to do with the archeological studies that need to be conducted, and I would just like to make it clear that those will be done between this point and when the Final Environmental Impact Statement is published. That's not something that will be done way in the future. It is something that will be done almost immediately, so we will have more concrete findings in that area.

As well, I just want to clarify we will be responding to comments, however, the response will be done via the Final Environmental Statement. There won't be individual responses to the comments you folks made. You will be able to find the responses in the document. I just wanted to clarify those two points.

MR. MERROW: Thank you. And with that, I'll open it up to any comments folks may have.

MR. RACINE: Yeah. Thank you, Mr. Moderator. My name is Bud Racine from Brandon. I'm the Economic Development Coordinator for the town. My comment is I agree with your overview of the impact of the truck traffic on the Town of Brandon. Although the truckers, the Omya truckers that go through Brandon are very courteous and law-abiding folks, it is pass-through traffic, and it has no direct impact, economic value to the Town of Brandon other than the road congestion in the village.

One thing that I would add to that is that your first slide that showed the truck, the Omya truck in the town of -- in the village, which was obstructing the view of my office, also it is obstructing the view of the bridge right there in front of the town office, and VTrans has identified that bridge has needing significant repair in the short term. So, reducing the truck traffic on Route 7 in that area would probably elongate the need for that bridge to be repaired. So, I welcome the opportunity to speak and support your project. Thank you.

MR. MERROW: Did you get the name, Maureen?

THE STENOGRAPHER: I would just like him to spell his last name, please.

MR. MERROW: Could you spell your last name, please?

MR. RACINE: R-A-C-I-N-E.

MR. MERROW: Thank you.

MS. CORNWALL HUNTER: My name is Francis Cornwall Hunter, and I grew up in what I guess you call the Hathaway House, which my family owned for 90 years, and I would like to say that it is historic house. I'm sorry. I don't have much of a voice. I have had radiation that injured one of my vocal cords. I would like to say that I think that the floodplain that you're talking about is a lot bigger than what you have there. There were years when we could take a boat out and paddle it over the fences on our farm, not every year obviously, but that did happen. The land there is very fertile and very rich, and it's a shame to put a railroad over it.

And I have one question to ask you, one alternative that you haven't considered is Omya can find its powder somewhere else. There's a lot of marble in Vermont, and it seems to me we're going to great lengths and great expense to accommodate Omya. I know the quarry they have is a very good quarry, but in the end, just like at least for the time being, we're not supposed to drill for oil in the Alaskan Wildlife Refuge, not to drill for oil along the coast of the Gulf of Mexico and outside Los Angeles and so forth, but you haven't considered that possibility apparently at all.

MR. PERRIN: Hi. Mark Perrin. I noticed in the RS-1 plans that the rail spur currently as it's outlined in the drawings goes right through some water retention ponds from a development that's known as Middle Road Ventures. I would assume -- well, I'm making the assumption that that rail spur would have to be moved south and does that -- how does that affect all the studies that you've done so far, especially since the wetlands and some of the impacts are further south of where the rail spur is?

MR. MERROW: I would just say that a number of factors went into that alignment, and we will -- we are aware of the Middle Road Ventures' subdivision, and we're also aware of your property interests. So, we'll continue to look at that as the project moves forward.

MR. SHONNARD: My name is Wally Shonnard. I live in Ferrisburg, Vermont where Otter Creek enters Lake Champlain. My concerns are, number one, the number of -- I'll put it this way. I would like to see a comparison of the economics of one truck and its impacts by the highway department on what damage one truck has been doing to the roads and then multiply that by the number of vehicles per day to get a report on the economic impact.

The second concern would be how this will affect the carbon cycle down the road in the virtue, versus the rail, versus the trucking and so forth. I'm not either for or against it. I'm just asking for more information I think.

And the third thing I would like to see in there somewhere is what the estimated impacts would be on Otter Creek entering Lake Champlain at Fort Cassin (phonetic) at Kellogg Bay where we live. I would like to see some estimate of that impact.

Thank you very much for the opportunity to present, and your work and so forth on these various alternatives, it's very encouraging. Thank you.

MR. MERROW: Thank you.

THE STENOGRAPHER: Sir, could you spell your last name?

MR. SHONNARD: Yes, the last name is S-H-O-N-N-A-R-D. First name is Wally.

THE STENOGRAPHER: Thank you.

ATTORNEY JIM SWIFT: Good evening. I'm Jim Swift. I represent some of the folks involved here and just one sort of common discretion, I've heard a lot of trying to avoid overpasses, underpasses, and grade crossings both from aesthetic purposes and also from safety concerns.

Halladay Road, for instance, in particular, the current junction with Route 7 is notorious for having some rather severe accidents and other things; and if anything could be done to perhaps eliminate that, it would be helpful, and it's also the idea of the aesthetics that could work better that way.

You know, I think a lot of folks prefer that this never happened at all as you can probably understand, and I do appreciate you taking the time to come here and talk to them, and I'm sure that they'll have lots of comments to make probably in writing to help ameliorate as much as possible any impact if this project does, in fact, go forward. Thank you.

MS. TIPPETT: Hi. I'm Holly Tippett. It's T-I-P-P-E-T-T. I just had a couple of questions. Has Omya made a written commitment to reducing or eliminating the road traffic in Brandon as a result of this investment? And also what other businesses -- there has been some speculation that other businesses would take advantage of this rail spur opportunity. I would like to hear a little bit about who they are, what their commitment is, what kind of impact it would have on jobs in the area, and what kind of pollution impact that would have as well? Thank you.

MR. LEVIN: Good evening. My name is Matt Levin. I am an Outreach and Development Director for Vermonters for a Clean Environment. I have a number of comments to go over this evening and will be submitting some written comments as well, some of them echo the comments of Ms. Tippett as it turns out.

On a technical note, we notice that there seems to be an error in the information about how much material goes to the Omya quarry per day in Florence. About 40 trucks a day from the Hogback quarry to the Florence plant are not mentioned. This would seem to throw off all the other calculations about how much Omya could expand its operations in Florence once the rail spur is built and in use. We would like to see those numbers corrected and the new estimate of Omya's expanded capacity based on what is actually happening now.

In any case, this document clearly indicates that one of the purposes of this rail spur is to enable Omya to increase its output at its plant in Florence by getting more raw material to process.

Unfortunately for the neighbors at the Omya plant in Florence, that means more water, chemical and oil usage, more air pollution and more water pollution, more dust and more noise.

Given the independent scientific study that is currently taking place at the Omya site in Florence regarding its impact on human health and the environment, the lack of permits for waste disposal, and the currently unresolved issues Omya's neighbors have with Omya's operations that they're having on their quality of life, we ask for Omya to not expand its operations in Florence until all those issues are resolved.

Further, there are a variety of permitting and legal processes outstanding regarding the operation of the Florence facility and their waste management that could have serious impacts on Omya operations in the coming years. In short, for these and other reasons, we believe it is very hard to say for sure what Omya's operations will look like in 2010.

We understand that the Draft EIS is not meant to be an economic analysis of the rail spur project and that some of these questions we are raising are technically financial as opposed to environmental issues. However, the draft EIS is based on and built around significant economic assumptions about Omya's operation. Until these issues are resolved, we suggest that some of the underlying assumptions of this Draft EIS need to be reexamined; that these issues be clearly outlined in this study, and that the appropriate amount of uncertainty be factored into the analysis.

Second, we have some questions about the assumptions of Omya truck traffic in 2010. The Draft EIS states, implies or suggests in numerous places that, once the spur is built, Omya will remove all their truck traffic from Route 7. This occurs in Section 2.3.1.1 in Table 4.1-1 and 4.1.2.1.2 among other places. The clear implication from Table 4.1-1 is that the day the spur opens in 2010, Omya truck traffic on Route 7 will decrease to zero. This is a promise we have heard for years and have never seen any evidence to support that it will in fact occur. We ask that you please provide VCE and the public with whatever evidence VTrans has been provided by Omya to support this assumption and make it available as part of the Final EIS.

Finally, one of the most distressing aspects of the Draft EIS is its complete disregard for or ignorance of the preemption this railroad enjoys of any state or local regulation. On over a dozen occasions, the Draft EIS refers to state permitting and regulatory processes in such a way as to infer that they will provide some level of protection for the neighbors and the environment and some level of accountability for the project itself.

However, as VTrans staff are well aware, recent Supreme Court rulings have made it clear that railroad projects are, in fact, exempt from these regulations.

MR. MERROW: Slow down please.

MR. LEVIN: I'm trying to not take up too much time.

MR. MERROW: That's all right.

MR. LEVIN: In fact, it was Vermont's very own Act 250 that was the key regulation under review in the most recent Federal case on the issue. By repeatedly referring to Act 250 and other required State permits, the Draft EIS is promising a level of protection, scrutiny and oversight that will, in fact, not occur. The implied protections are made in reference to agricultural lands, wetlands, waterways, groundwater, floodplains and on and on.

While there is some question as to how a

State-funded project can, in effect, be exempt from the State's own laws, we do not understand why the Draft EIS fails to address or even mention this critical legal issue. We hope more information about this will be forthcoming before the Final EIS is drafted; and once that occurs, that appropriate changes would be made to the language, presumptions, and analysis in the Final EIS.

We have other comments on other issues which we will be submitting in writing, and we look forward to more conversations about this project. Thank you.

MR. MERROW: Thank you.

MR. CHAMPLIN: I'm Bob Champlin, C-H-A-M-P-L-I-N. You say, you indicated that there would be an estimated 35 percent increase in traffic on Route 7 through Brandon by the year 2027, assuming that 12 percent of this is truck traffic, what would the breakeven point be as far as Brandon seeing just as much traffic as they see now even if the bypass or TR-1 was built? Do you have any answer on that, or is it like five years or eight years?

MR. MERROW: I don't have it right now, no. No.

MR. CHAMPLIN: Okay. I just was interested if this is enough of a long-term solution or whether Brandon is going to be right back to where they were in a fairly short period of time.

MR. MERROW: Any other comments?

MR. PATTIS: I'm Louis Pattis from Brandon. We run the Brandon Inn, and we have had a long history with Omya over the years in trying to contain the permitting through trucks and being involved in Act 250. As we say, numbers never lie so does not reality. We are sitting down there for 20 years now and we have the impact of the truck traffic, and over the years we had numerous occasions where we lost big time business because of the Omya trucks, specifically because they start early in the day, they run at times at full capacity, and it was very detrimental to our business.

I appreciate all your detailed study. We have been following it, have been too many meetings, and every time it seems to be more detailed and more information and more answers and less questions, and I would also thank the people in Middlebury who consider their neighbor, Brandon, which takes the full impact of this traffic. If there is a way that we can go about and take some of the traffic off Route 7, that would be a great thing. Thank you.

MS. BUDDAH: Hello. I'm Lisa Buddah (phonetic) of Middlebury. I just wanted to comment on a couple of things and a couple other people have commented on it, but I felt it was helpful to express it.

On one of the slides where it says that TR-1 would remove traffic from roads, if this was actually a rail spur that's accessible for other trucking companies or, you know, companies who want to use it, it could actually increase traffic on the local roads, so I'm not sure how you could make that sort of absolute statement in this presentation.

I also think that without any kind of incentives or assurances that Omya would actually reduce their truck trips down to Florence, you can't make a statement that the rail would remove 230 truck trips a day, and I think you were projecting that out. I think that was -- I didn't get it, but maybe by 2030, but without any kind of absolute assurance, I mean I see where the rail would go, I see how it might be built, I see how it might impact some things, but it just seems it's really up in the air in terms of traffic.

And when you said the no build solution does not meet the purpose and the need of the project, the purpose and need of the project is to provide safe and efficient transportation for freight to Middlebury, from Middlebury to Florence, to and from Middlebury, I guess. I think the roads are currently doing that, and I don't think this is meeting the needs of a lot of other truck trips that are going on the roads.

So, it seems interesting to say to not build it, we don't meet that need already, and I think that unless you can assure us you're actually taking trucks off the road, that you can't say the no build doesn't meet what we already have.

MR. PERRIN: Mark Perrin. Curious as to the RS-1, the land that would be affected that's currently under the Middlebury Area Land Trust and how that will be impacted?

MR. MERROW: Any other comments? If there are no other comments, we'll end the hearing. We do hope that if you have substantive comments, you provide them to us either written or e-mail. We have comment forms at the back, the handouts include several places where you can provide comments.

Thank you very much for coming this evening.

We'll stick around for a little bit if you have some issues that you would like to discuss with us or some of the consultants who are here. Thank you very much.

(Whereupon, the hearing was concluded at 8:31 p.m.)

C E R T I F I C A T E

I, Maureen A. Booth, Registered Merit Reporter, Court Reporter and Notary Public, hereby certify that the foregoing pages, numbered 2 through 52, inclusive, are a true record of the Proceedings - Draft Environmental Impact Statement - Middlebury Spur Project - Public Hearing, taken before me on the 7th day of June, 2007, at the Middlebury Municipal Building, Middlebury, Vermont.

Dated this 21st day of June, 2007.

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Maureen A. Booth, RMR

Middlebury Spur Project

Wetland Delineation Report

Prepared for:

Vermont Agency of Transportation

Prepared by:

McFarland Johnson

July 2008

Middlebury Spur Project
Wetland Delineation Report

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Introduction

McFarland Johnson (MJ) is preparing a Final Environmental Impact Statement (FEIS) for the Middlebury Spur Project on behalf of the Vermont Agency of Transportation (VTrans). The project involves freight transportation improvements within the Town of Middlebury, Vermont, to allow movement of calcium carbonate and possibly other products over the existing railroad system. The build alternatives follow a common alignment from Omya's existing marble quarry to the mainline railroad. The preferred alternative, RS-1, involves approximately 3.2 miles of new railroad track. The corridor within which the alternatives are proposed is referred to below as the "alternatives corridor", and is generally the study area for wetland delineation.

Landscape Setting

The alternatives corridor lies within the Otter Creek watershed. Three drainages that traverse the eastern part of the alternatives corridor, east of Lower Foote Street, drain south into the Middlebury River, which in turn flows into Otter Creek at a point south (upstream) of the alternatives corridor. Several other drainages, in various locations from Lower Foote Street and extending nearly to Creek Road, drain into an extensive forested wetland just south of the alternatives corridor; this wetland in turn drains to Otter Creek. On both sides of Otter Creek, in the western part of the alternatives corridor, there are wet meadows and ditches in the floodplain that drain into Otter Creek.

Wetland Delineation Methods

Section 404 of the federal Clean Water Act provides that discharges of dredged or fill materials into waters of the United States require a permit from the U.S. Army Corps of Engineers (ACOE). "Waters of the United States" include any non-isolated wetlands that meet the three parameters (hydrology, soils, and vegetation) as defined in the 1987 ACOE Wetlands Delineation Manual.[1]

Vermont's Wetland Rules distinguish between Class One, Class Two, and Class Three wetlands, with Class One wetlands being of the highest value. The regulations also protect upland buffers around Class One and Class Two wetlands. The Vermont Wetland Rules provide that wetlands that appear on the NWI maps (published by the USFWS) are presumed to be Class Two wetlands. The State of Vermont publishes "Vermont Significant Wetland Inventory" (VSWI) maps based on the NWI maps. All wetlands identified as Class One or Class Two wetlands, and all wetlands contiguous to Class One or Class Two wetlands on the VSWI maps are protected as "significant" in the Vermont Wetland Rules.

[1] U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. U.S. Army Corps of Engineers Waterways Experiment Station. Vicksburg, MS

Wetlands within the alternatives corridor were delineated in October 2006 and September 2007 according to ACOE methods, which also meet the Vermont standards. For the delineation, wetland limits were mapped using a Trimble GPS unit accurate to within one meter.

Problem Soil Areas and Wetland Delineation

Soil series found in the alternatives corridor are shown on Figures 3.7-3 and 3.7-4 of the FEIS. In general, soils in the proglacial Lake Vermont region are inceptisols, which are mineral soils that show minimal soil development. Inceptisols lack differences in horizons that have resulted from weathering, illuviation (deposition of humus, chemical substances, or minerals in the lower layers of a soil profile from the upper layers due to the movement of water) or eluviation (removal of humus, chemical substances, and minerals from the upper layers of a soil profile to the lower layers by water movement).

Most of the soils within the alternatives corridor derive from fine-grained sediments deposited in lake bottoms. These include the Covington, Panton, Livingston, and Vergennes soil series, which were formed from lacustrine (lake-bottom) and estuarine (mixed fresh and salt water) sediments. These soils have high clay content or are underlain by clay at depths of two to three feet.[2] Because of their high clay contents, none of the soils are well drained.

Interpretation of wetland boundaries was complicated by the disturbed ground conditions and “problem soils”. Most of the study area is actively farmed, and the resulting plowing, planting, and ditching may obscure natural vegetation and evidence of hydrology. Furthermore, most of the soils within the corridor are identified as “’Problem’ Soil Areas – Soils Requiring Special Evaluation for Hydric Conditions” by the New England Interstate Water Pollution and Control Commission (NEIWPCC).

The Problem Soil Areas refer specifically to the Vergennes-Covington-Livingston soil catena. A summary of the soil profiles of these soil series is provided in Table 1 below, with emphasis on features useful for wetland delineation. The soil profiles are based on those described in the Addison County Soil Survey cited above. The parent material of these soils typically has colors of chroma 2 or less, making it difficult to see hydric soil indicators such as redox depletions or a depleted matrix. In addition, the soils may have a value of 3, which is too bright to be included in the NEIWPCC definition of a depleted matrix, even if they are saturated for a sufficient portion of the growing season to otherwise be identified as hydric. The key features differentiating hydric from non-hydric conditions for these soils were the darker A horizon, lower chroma B horizon, and more common and prominent mottling in the B horizon.

1 Addison County Soil Survey, USDA, SCS, October 1971 (p. 112)

Table 1. Soil Profiles of the Vergennes-Covington-Livingston Soil Catena*

Vergennes Clay (moderately well drained)				**Covington Silty Clay (poorly to somewhat poorly drained)**				**Livingston Clay (very poorly drained)**			
Horizon	**Depth**	**Matrix**	**Redox**	**Horizon**	**Depth**	**Matrix**	**Redox**	**Horizon**	**Depth**	**Matrix**	**Redox**
Ap	0-6	2.5Y4/2 to 10YR 4/2		Ap	0-8	10YR 2/2		A	0-7	10YR 2/1	
B21	6-16	2.5Y4/2 to 10YR 4/2	10YR 4/4 few faint	B21	8-11	10YR 4/2	7.5YR 4/4 many prominent, 7.5 YR 5/8 many prominent, and 10YR 6/2 coatings	B21g	7-20	N 4/0	2.5Y 4/4 mp with 10YR 6/8 centers
B22	16-25	2.5Y 3/2		B22g	11-20	10YR 4/1	10YR 4/4 mp and 10YR 5/1 many distinct				
KEY DIFFERENTIATORS FOR DETERMINING HYDRIC CONDITIONS											
Lighter A, 2-chroma B, few faint mottles				Darker A, 2-chroma to 1-chroma B, Many high chroma mottles with low chroma coatings, grading to many high and low chroma mottles				Darkest A, gleyed B, many high chroma mottles			

* Soil profiles are based on profiles in the *Addison County Soil Survey* published by the USDA Soil Conservation Service in 1971.

Description of Wetlands

Wetland resources within the alternatives corridor include wet meadows and farmed wetlands in the heavy clay soils close to Otter Creek, drainages, forested wetlands, and man-made ponds. Wetlands are described below, federal and Vermont classifications are listed in Table 2, and the wetlands and data point locations are shown on the figures in Appendix C. Photos of representative wetlands are included in Appendix A, and data forms documenting delineation methods are included in Appendix B. Functions and values are described following the general description of wetlands. The descriptions start at the quarry and follow the alignment to the mainline. All wetlands described below are believed to be subject to ACOE Section 404 jurisdiction.

Table 2. Wetlands within the Alternatives Corridor

Wetland ID	Vermont Class	Cowardin Wetland Classification	Key to Cowardin[3] Classification
1	Two	PEM1/SS1C	P= Palustrine (vegetated or shallow water) EM = Emergent Vegetation 1 = Persistent SS= Scrub Shrub Vegetation 1 = Broad Leaved Deciduous FO = Forested 1 = Broad Leaved Deciduous Vegetation 4 = Needle Leaved Evergreen Vegetation C = Seasonally Flooded d = Partially Drained/Ditched f = farmed R= Riverine 2 = Lower Perennial UB = Unconsolidated Bottom 3 = Mud 4 = Intermittent SB = Streambed 1= Cobble 5 = Mud 7 = Vegetated
2	Two	PEM1Cd/R4SB5d	
3	Two	PFO1/4	
5	Two	PEM1Cd/R4SB5d	
6	Three	PEM1Cd - R4SB5d	
7	Three	PEM1Cd	
8	Three	PEM1Cf	
9a	Three	PEM1Cf	
9b	Three	PEM1Cf - R4SB5d	
9c	Three	PEM1Cf - R4SB5d	
10a	Three	PEM1Cd	
10b	Three	PEM1C	
10c	Three	PEM1Cd – R4SB1	
11	Three	PEM1Cf	
12	Two	PEM/SS1Cd - R4SB7	
13	Two	PEM/FO1Cf R4SB7	
14	Three	PEM1Cf	
15	Two	PEM1Cf	
16	Three	PEM1Cf	
17	Two	PEM/FO1Cf	
18a	Two	PEM1Cf	
18b	Three	PEM1Cf	
19	Two	PEM1Cf - R4SB5	
20	Three	PEM1Cf	
Otter Creek	-------	R2UB3	

[3] Cowardin, Lewis M. et al. Classification of Wetlands and Deepwater Habitats of the United States (Washington D.C., U.S. Fish and Wildlife Service, U.S. Department of the Interior, 1979) 131 p

General Description of Wetlands

Wetland 1

North of the quarry is an extensive wet meadow (Vermont Class Two), measuring approximately seven acres, that supports cattails (*Typha latifolia*), reed canarygrass (*Phalaris arundinacea*), and shrubs such as red-twig dogwood (*Cornus stolonifera*), alders (*Alnus spp.),* and witherod (*Viburnum cassinoides*). The wetland drains to the north and eventually into the Muddy Branch, and then into the New Haven River. Soil in this wetland is identified in the Addison County Soil Survey as Livingston Clay, which is very poorly drained. This wetland may support a variety of songbirds, although its habitat value may be limited somewhat by the adjacent quarry activity.

Wetland 2

South of the quarry, two lateral ditches flow towards the east and into a larger ditch that eventually flows into Beaver Brook to the south. The lateral ditches are approximately 750' long and 900' long, and the longitudinal ditch is approximately 850' long. The ditches vary from approximately 10' to 20' wide. These ditches support cattails and other herbaceous vegetation (grasses and sedges) along their margins. It is not known whether the ditches were originally excavated on dry land, but their size suggests there was some natural drainage in the area. The ditches and associated wetlands along their banks are Vermont Class Two wetlands, due to their connection to a VSWI wetland downstream. Soil is mapped as Vergennes clay, which is moderately well drained with minor components of Covington (poorly drained), Livingston (very poorly drained) and Panton (poorly drained) soils. The habitat value of these wetlands is limited by their disturbed condition and agricultural surroundings, although they likely support certain songbirds (such as red-winged blackbirds (*Agelaius phoeniceus*)), amphibians, and aquatic invertebrates (see Section 3.6).

Wetland 3

To the west of Omya's access road, just south of the quarry, is a forested area with upland and wetland inclusions (Vermont Class Two), approximately five acres in size. Soil in the wetland is mapped as Livingston clay. Vegetation includes green ash (*Fraxinus pensylvanica*), yellow birch (*Betula alleghaniensis*), hemlock (*Tsuga canadensis*) and red maple (*Acer rubrum*), with touch-me-nots (*Impatiens sp*), sedges, horsetails (*Equisetum sp.*), ferns (*Dryopteris sp.*), asters (*Aster sp*.), and grasses in the herbaceous layer. Wetland portions of the forested area exhibit pit and mound topography. The forested wetland drains to the south and to the east, and eventually into a ditch that flows under the Omya access road (Wetland 2). This wetland, as discussed in Section 3.6.1.2, is a forest "island" within an agricultural landscape, and may serve as a refuge for certain species (raccoon, deer, possibly amphibians).

Wetland 4 (non-wetland)

The area identified in the DEIS as Wetland 4 was identified as wetland on VSWI maps, and superficially appears to have evidence of wetland indicators. Closer investigation revealed that soils over nearly the entire area were non-hydric, vegetation included both upland and facultative wetland indicators, and what appeared to be pit-and-mound microtopography was from ground disturbance. The area was reviewed in the field with ACOE and VANR wetlands regulatory staff, and was determined to be non-wetland.

Wetland 5

West of Wetland 4 is a ditched drainage in an agricultural field approximately 30 feet wide (Vermont Class Two). The portion in the alternatives corridor is approximately 690 feet long. Wetland 5 drains southeast into Beaver Brook, which in turn drains into the Middlebury River. Soils in this wetland are mapped as Vergennes and Livingston clays. The habitat value is limited by its disturbed condition and agricultural surroundings.

Wetland 6

On the north side of the access road, a broad cattail and Phragmites (*Phragmites australis*) dominated ditch flows south from the dairy barn north of the alternatives corridor for approximately 2,400 feet before meeting the access road. This wetland has no direct hydrologic connection to any Class Two wetland, and is therefore Class Three. A narrower ditch, approximately 700' long, parallels this broad ditch and joins it near the road. Soil in this wetland is mapped as Livingston clay. As with Wetland 5, the habitat value is limited by the disturbed setting.

Wetland 7

Wetland 6 drains under the access road into Wetland 7, a small pocket of forested and scrub shrub wetland measuring approximately one-third of an acre, which in turn flows into a vegetated swale measuring approximately 800' long. This wetland has no direct connection to any Class Two wetland (except via culverts and long ditches, as described below under Wetland 9), and is therefore Class Three. The swale is mowed, and supports herbaceous vegetation such as grasses and sedges. A detention basin to the east feeds into the swale. The area around the detention basin is maintained as a lawn, and supports reed canarygrass, sedges, and other vegetation. Soils in the wetland are mapped as Livingston and Vergennes clays. Although this wetland has some structural diversity, its value is limited by its disturbed condition and surroundings, including lawn and roadways.

Wetland 8

On the east side of US 7, behind the former Standard Register building, is a wet meadow supporting reed canarygrass, broadleaved cattails, smartweed (*Polygonum sp.*), and millet (*Echinochloa crus-galli*) measuring approximately 1.7 acres. This is a Class Three wetland. The wet meadow lies within a farm field and appears to be farmed occasionally. Ditches parallel the edge of pavement for the parking lot of Standard Register both north and south of the wet meadow. The ditches appear to drain to dry ditches south of Standard Register and along US 7, and ultimately to the wetlands west of US 7. Soil in the wetland is mapped as Vergennes clay. The farmed wet meadow and man-made ditches have minimal habitat value.

Wetland 9

Wetland 7 flows southeast through a culvert under US 7 and into a broad cattail dominated swale that is the eastern-most portion of Wetland 9. North of the cattail swale, the wetland is characterized as a wet meadow, supporting reed canarygrass, asters, goldenrod (*Solidago spp.*), with a ditch running through it (Wetland 9a). Southwest of the wet meadow, the slope becomes steeper, and the drainage becomes deeply incised (Wetland 9b). The drainage is fed by another stream to the south, which flows through a well vegetated area supporting basswood (*Tilia americana*), buckthorn (*Rhamnus frangula*), gray birch (*Betula populifolia*), river grapes (*Vitis riparia*), red osier dogwood, and herbaceous vegetation such as sensitive fern (*Onoclea sensibilis*), boneset (*Eupatorium perfoliatum*), asters, and rough stemmed goldenrod (*Solidago rugosa*). The ditch then flows under Halladay Road and into a broad wet meadow (Wetland 9c) dominated by goldenrod, asters, and reed canary and other grasses. The meadow grades into a broad leaved cattail marsh south of the alternatives corridor. Soil in wetland 9 is mapped predominantly as Vergennes clay, with a small area of Nellis stony loam (well drained) at the southern end of the alternatives corridor. Total acreage of wetland 9 is approximately 15 acres. West of Halladay Road, Wetland 9 is connected to the large Class Two wetland to the south by a long, broad swale, so this portion of Wetland 9 is Class Two. The Class Two wetland continues east of Halladay Road and terminates at the junction of two small stream channels. East and upslope of this point, the wetland becomes too narrow to qualify as Class Two; therefore it is Class 3. The wet meadow area may support blackbirds, green frogs, and certain other species. The habitat value of the swales and ditches are limited by their disturbed condition and relatively linear form.

Wetland 10

Roughly paralleling Wetland 9 is a drainage extending from the northern edge of the alternatives corridor to the southern edge. North of Middle Road it is a broad (approximately 130 feet wide) ditch dominated by narrow-leaved cattails (*Typha angustifolia*) (Wetland 10a). This swale flows under Halladay Road into a small forested wetland pocket, with green ash, elm, river grapes, and wetland shrubs (Wetland 10b). The stream then crosses under Middle Road and becomes a narrower (approximately 20' wide) rocky stream with forested banks for approximately 200 feet before it opens up into a farm field (Wetland 10c). Soil in wetland 10 is mapped as Vergennes clay. The stream may provide habitat for certain amphibians and aquatic invertebrates, as described in Section 3.6.1.2 above. Because of the lack of a connection to any Class Two wetland other than the ditch, Wetland 10 is also a Class Three wetland.

Wetland 11

Wetland 11 is a broad, shallow depression in Covington and Panton silty clays (both poorly drained) that lies within a hayfield and drains to the south to wetland 13. This wet meadow supports a mixture of grasses, sedges, and other herbaceous species, and is similar in character and habitat to the upland portion of the hayfield. Its habitat value is limited somewhat by its small size, farmed condition. Wetland 11 has a direct hydrologic connection to a Class Two wetland, and is therefore also Class Two.

Wetland 12

In the agricultural fields that lie west of Halladay Road, ditches have altered the hydrology of the site. Wetlands are currently linear in nature and found only along the margins of the ditch line, whereas before the fields were ditched the wetlands probably extended beyond the ditches. Several small longitudinal ditches feed into a lateral ditch, measuring approximately 1,900 feet long, which in turn feeds into the large wetland to the south. Many of these ditches are dominated by reed canarygrass. In some cases the ditch lines are vegetated with small trees and shrubs, such as common buckthorn, red osier dogwood, and gray birch. The soils around the ditch lines vary from the well drained Nellis and Elmwood, moderately well drained Vergennes, and poorly drained Covington, to very poorly drained Livingston. As with other ditches and swales in the area, the disturbed condition and surroundings of these areas limits their habitat value. Because of the direct hydrologic connection with Wetland 13 (described below), this is a Class Two wetland.

Wetland 13

South of the proposed alignments between Creek Road and Halladay Road is a large forested wetland that extends south to Three Mile Bridge Road. The northernmost fringes of the swamp, which are in pasture or cut for hay, extend into the alternatives corridor (Wetlands 17 and 13). This swamp ultimately outlets to Otter Creek to the west, via ditched stream channels. Soils in this portion of the wetland are mapped as Covington and Panton silty clays. The forested wetland provides important habitat for a variety of forest and wetland wildlife species. The northern, wet meadow fringes of this wetland are disturbed by farming or grazing and have less structural diversity, but nevertheless may support certain songbirds, amphibians, and reptiles (see Section 3.6.1.2).

Wetland 14

To the west of Wetland 12 are several small wetlands (some isolated) in depressions in the pasture that generally drain southward. Wetland 14 is a broad swale in a field, measuring approximately two acres, supporting reed canarygrass, *Scirpus*, boneset, bugleweed (*Lycopus americanum*), and sedges. Soils in Wetlands 14 are mapped as Covington and Panton silty clays and Vergennes clays. The habitat value is limited by the low structural diversity and farmed surroundings, but the wetland may support grassland wildlife species such as deer, bobolinks, or green snakes. These pockets lack a hydrologic connection to any Vermont Class Two wetlands, and are therefore Class Three.

Wetland 15

A drainage fed by several smaller connected drainages lies to the west of Wetland 14, flowing south towards the large forested wetland. These drainages, totaling approximately six acres, are swales dominated by reed canarygrass, with woolgrass (*Scirpus cyperinus*), boneset, bugleweed, and other herbaceous vegetation. Soils in Wetland 15 are mapped as Vergennes clay and Vergennes rocky clay. The habitat value is similar to other ditches and swales in the area, described above. This wetland is directly connected to Wetland 17, and is therefore Class Two.

Wetland 16

West of Wetland 15 are several small wetland pockets within a pasture, also in Vergennes clay. In terms of vegetation and habitat, these wetland pockets are similar to Wetlands 14 and 15. Soil in Wetland 16 is Vergennes clay. These pockets lack a hydrologic connection to any Vermont Class Two wetlands, and are therefore Class Three.

Wetland 17

As mentioned above, Wetland 17 is the northern end of an extensive forested wetland (Vermont Class Two), which is mostly within the 100 year floodplain of Otter Creek. A small man-made farm pond sits within the proposed TR-1 transload facility, at the northern end of Wetland 17. Wetland 17 is several hundred acres, and only the northern fringe (25 acres) lies within the alternatives corridor. The portion of Wetland 17 that lies within the alternatives corridor is vegetated with grasses, sedges, asters, goldenrod, and other herbaceous vegetation.

Wetlands 18a and 18b

On the eastern side of the river there is an agricultural field (Wetland 18a) that has retained hydric soils, although it is used to grow corn. Approximately ten acres of the field lie within the alternatives corridor. Wetland 18a is identified on the VSWI, and is therefore Class Two. Soils in the field are identified as Limerick silt loam and Livingston clay. West of Wetland 18a is a narrow strip of farmed wetland (Wetland 18b) along Creek Road that extends to the north. (Wetland 18b is Vermont Class Three.) The habitat value is limited primarily to those species which may be found within croplands, such as Canada geese and woodchucks.

Wetland 19

On the west side of the river, within the Otter Creek floodplain, is a large, (approximately 22 acres within the alternatives corridor) ditched wet meadow with small patches of upland inclusions. The ditch is approximately six feet wide and supports a mixture of wetland shrubs and red maple saplings along its banks. Wet meadow areas support a mixture of grasses, sedges, and herbaceous vegetation such as buttercups (*Ranunculus sp*.), vervain (*Verbena hastata.*), and sensitive fern. Upland inclusions support common milkweed (*Asclepias variegata*), plantain (*Plantago major*), and other upland vegetation. Soils in this area are Limerick silt loams, which are deep, poorly drained, and loamy. Along the banks of the river, there are fringes of floodplain forest supporting silver maple, shagbark hickory, American elm, green ash, and herbaceous vegetation such as ostrich fern (*Matteuccia struthiopteris*), violets (*Viola sp*.), arrowwood (*Viburnum recognitum*), false nettles (*Boehmeria cylindrica*), horsetails, and grapes. The association of this wetland with the railroad corridor and the Otter Creek corridor indicate it is part of an important habitat corridor. Wetland 19 is a Vermont Class Two wetland.

Wetland 20

South of the access road is an area measuring less than an acre, most of which is currently under cultivation for corn, which exhibits hydric soils and wetland hydrology. Soil in the wetland is mapped as Vergennes clay. This wetland drains via overland flow to a network of ditches to the south, and eventually to Beaver Brook. Wildlife habitat is limited to species that inhabit or visit cropland, such as Canada geese, woodchucks, raccoons, blackbirds, and small mammals.

Wetland Functions and Values

Wetland functions and values were evaluated using the descriptive approach of the ACOE's *Highway Methodology Workbook Supplement*[4] and in consideration of the provisions of the Vermont Wetland Rules regarding wetland functions and values. In general, the ditches provide water quality functions as their primary functions, and the forested and scrub shrub areas provide wildlife habitat as their primary functions. A summary of the functions and values is listed in Table 3. Brief descriptions of the types of wetlands found in the alternatives corridor, and the functions they provide, are listed below.

Forested Wetlands (PFO1/4C)

Forest land in the alternatives corridor is limited to unfarmable areas such as wetlands and steeper terrain. Wetland 3 and most of Wetlands 13 and 17 are forested wetlands (PFO1/4C). These are typically seasonally flooded wetlands with some degree of pit-and-mound microtopography. Plant species include red maple trees and saplings, green ash, high bush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), arrowwood, cinnamon fern (*Osmunda cinnamomea*), and sensitive fern. Soils range from mineral hydric to organic. Forested wetlands may provide habitat for certain animal species (e.g., northern waterthrush (*Seiurus motacilla)*, Canada warbler (*Wilsonia canadensis*), veery (*Catharus fuscescens*), garter snake, and white-tail deer). Wetland 3, which is a forested "island" surrounded by open fields, probably provides cover and refuge for many species. The variable microtopography and erect vegetation may store or slow floodwater flows. The degree of sediment, toxicant, and nutrient retention depends on the surrounding land use, outlet type, and other features.

Wet meadows (PEM1Cf)

Wet meadows are usually found where wet areas are used for pasture or cropland, or are otherwise mowed or maintained in low vegetation. Several large wet meadow wetlands occur within the alternatives corridor, including most or all of Wetlands 9a, 9b, 9c, 11, 12, 14, 15, 16, 19, and 20; and the northern portions of the large forested Wetlands 13 and 17. Typical vegetation includes sedges, soft rush (*Juncus effusus*), reed canarygrass, asters, willows (*Salix spp.),* meadowsweet (*Spirea latifolia*), goldenrod, silky dogwood (*Cornus amomum*), and many other species. Generally, these wetlands are marginally wet; soils are mineral hydric with depleted B horizons or low-chroma redoximorphic features, and water regimes are seasonally flooded or saturated with infrequent standing water during the growing season. Most of the wet meadows in the alternatives corridor have been altered by ditching.

[4] US Army Corps of Engineers New England District. 1999. *Highway Methodology Workbook Supplement: Wetland Functions and Values, a Descriptive Approach*. NAEEP-360-1-30a.

Table 3. Wetland Functions and Values

Wetland ID	1	2	3	5	6	7	8	9a	9b	9c	10a	10b	10c	11	12	13	14	15	16	17	18a	18b	19	20
Groundwater Recharge/ Discharge																x				x				
Floodflow Alteration																				**P**	**P**	**P**	**P**	
Fish and Shellfish Habitat																								
Sediment/ Toxicant/ Pathogen Retention	**P**	**P**	x	x	**P**	x	x	**P**	x	x	**P**	x	**P**	**x**	x	**P**	x	x	x	x	x	x	x	x
Nutrient Removal/ Retention/ Transfor-mation	**P**	**P**	x		**P**	x				x	**P**	x	**P**	x	x	**P**	x	x		**P**	x	x	**P**	x
Production Export														x		x				x	x	x	x	
Sediment/ Shoreline Stabilization		x			x	x																		
Wildlife Habitat	x	x	**P**	x	x	x		x	x	x	x	**P**	x	x	x	**P**	x	x	x	x	x	x	**P**	**P**
Recreation																							x	
Educational/ Scientific Value																								
Uniqueness/ Heritage																x				x				
Visual Quality/ Aesthetics																x							x	
Threatened or Endangered Species Habitat																								

Key to Wetland Functions:

P: Functions listed as "P" are principal functions of a wetland, that is, they have important or multiple factors contributing to that particular function.

x: Functions listed as "x" are present in the wetland but have less important or fewer factors contributing to that particular function.

No designation means the function is not present in the wetland, or has minimal value in the wetland.

Wet meadows used for pasture can provide important water quality functions. The wetland vegetation may help bind the frequently disturbed soil, reducing erosional potential. The vegetation may also help trap sediments and absorb nutrients, particularly important considering the enrichment from livestock fecal matter. Wetlands adjacent to croplands perform a similar function, helping filter the relatively heavy sediment and nutrient loads from cropland runoff. Wetlands that are regularly tilled (such as Wetlands 18a and 18b), however, typically do not develop thick native vegetation and are therefore less effective at these functions. Tilled wetlands have limited wildlife habitat value, although certain species (such as cowbirds (*Molothrus ater*), star-nosed mole (*Condylura critata*), deer, and garter snakes) may use these habitats. Other wetland functions and values are limited by the disturbed condition of the wetlands. Some of the wet meadows within the alternatives corridor, such as Wetland 9a, 14, and 15, have been fallow for a few years, and are starting to develop early successional vegetation. These areas provide more structural diversity for wildlife than more frequently mown meadows such as Wetland 19.

Ditches (PEM/SS1Cd, R4SB7)

Because of the heavy clay soils in the alternatives corridor, much of the farmland has been ditched and drained to facilitate farming. Under Vermont law if the areas surrounding the ditches retain wetland characteristics (soils and vegetation) they are regulated under the Vermont Wetlands Program. Ditches that were created in wetlands and that retain wetland characteristics are also regulated under Section 404 of the Clean Water Act. Jurisdictional ditches in the alternatives corridor include both emergent vegetation (PEM1C) and scrub-shrub areas (PSS1C). Well-vegetated ditches typically filter stormwater runoff and thereby improve water quality, although there may be little time for water to stand and for contaminants to settle out. The vegetation may also help anchor the substrate and reduce the erosional potential of stormwater runoff. Wildlife habitat value, floodwater storage capacity, and other wetland functions in ditches are typically negligible. However, in the alternatives corridor, some of the ditches lie along hedgerows that provide important cover for birds, amphibians, and mammals, and that link larger forested areas.

Disturbed Wetlands /Invasive Species (PEM1Cd)

Some of the alternatives corridor wetlands (Wetlands 2, 6,10a) are dominated by monocultures of aggressive or invasive species. These species colonize areas with appropriate conditions, usually wet meadow, marsh, or sometimes scrub-shrub wetlands, and aggressively spread through the wetland, crowding out established species. The result is a wetland with fewer plant species and little structural diversity, providing limited wildlife habitat. These aggressive or invasive species include the following:

Phragmites *(Phragmites australis):* Also called common reed or giant reed, Phragmites is a very tall (up to 8 feet or more) and very aggressive plant that forms thick monocultural stands. The roots are large and deep in the substrate, so the plant is extremely difficult to eradicate. It does particularly well in brackish areas, i.e., where salt is present from either road runoff, sea water, or from agricultural operations. Phragmites is prevalent in the northern portions of Wetland 6, possibly due to salt in the runoff from the barn to the north.

Cattails *(Typha latifolia, T. angustifolia):* Broadleaf and narrowleaf cattail are both native species that can aggressively colonize large areas of marshland. They typically grow in standing water and can form large monocultural stands. They also have habitat value, however, and are a favorite food source of muskrats. Thick cattail stands will typically attract muskrats, which thin the stands and help maintain habitat diversity. Broad-leaved cattail is more common; narrow-leaved cattail usually grows where the water is somewhat brackish, such as around road runoff discharge points or downstream of agricultural operations. Wetlands 2, 6, and 10a are dominated by cattails.

Reed canarygrass (*Phalaris arundinacea*): Reed canarygrass is a species that has historically been planted for stabilization of ditch banks and as a forage grass. However, it out-competes native grass species, and its value as a forage grass when fresh is limited. Its status as a native or non-native species is debatable, but it is likely that the cultivars that invade wetland areas are a result of agronomic breeding that have been developed for drought tolerance and vigor. Most of the wet meadows and ditches within the study area feature reed canarygrass.

Middlebury Spur Project
Wetland Delineation Report

APPENDIX A

PHOTO LOG

Wetland 1, north of Omya quarry, looking north from quarry

Wetland 2, looking south in vicinity of RS-1 alignment, south of proposed transload facility (September 2007)

McFarland Johnson	Middlebury Spur WETLAND REPORT Middlebury, VT	**PHOTO LOG** ***WETLANDS 1 AND 2***

Wetland 3, view from quarry access road toward south end of wetland (September 2007)

Wetland 5, view south from quarry access road (October 2005)

McFarland Johnson	Middlebury Spur WETLAND REPORT Middlebury, VT	**PHOTO LOG** ***WETLANDS 3 AND 5***

Wetland 6, view facing east along north side of quarry access road (May 2005)

Wetland 7, from RS-1 alignment facing southwest toward Foster Motors (September 2007)

McFarland Johnson	**Middlebury Spur** **Middlebury, VT**	**PHOTO LOG** ***WETLANDS 6 AND 7***

Wetland 9a, showing fallow fields with wet meadow west of Route 7

Wetland 9b, view east of Halladay Road facing northeast toward hillside and intermittent stream

McFarland Johnson	Middlebury Spur Middlebury, VT	**PHOTO LOG** ***WETLANDS 9a and 9b***

Wetland 9c, view west of Halladay Road looking south

McFarland Johnson

Middlebury Spur

Middlebury, VT

PHOTO LOG

WETLAND 9c

Wetland 10c, facing south, showing vicinity of proposed alignment

Wetland 11, facing northwest, showing wet meadow in area of proposed RS-1 alignment

McFarland Johnson	**Middlebury Spur** **Middlebury, VT**	**PHOTO LOG** ***WETLANDS 10c and 11***

Wetland 12, from vicinity of proposed alignment facing east, showing wet meadow and ditches

Wetland 13, from old Middle Road facing south

McFarland Johnson

Middlebury Spur

Middlebury, VT

PHOTO LOG
WETLANDS 12 and 13

Wetland 15, from vicinity of proposed alignment facing west toward Perrin farm (May 2005)

Blue-spotted/Jefferson hybrid salamander in Wetland 15 (October 2006)

McFarland Johnson	**Middlebury Spur** **Middlebury, VT**	**PHOTO LOG** ***WETLAND 15***

Wetland 17, view south from proposed alignment, just east of Perrin farm

Northern fringe of Wetland 17, looking north

McFarland Johnson	**Middlebury Spur** **Middlebury, VT**	**PHOTO LOG** ***WETLAND 17***

Hydric soils within Wetland 18a

Wetland 18a, view north from east of Creek Road

McFarland Johnson	Middlebury Spur Middlebury, VT	**PHOTO LOG** ***WETLAND 18a***

Wetland 19, view from vicinity of railroad, facing north and east

Wetland 19, facing south from vicinity of proposed alignment, showing ditch in field

McFarland Johnson	**Middlebury Spur** **Middlebury, VT**	**PHOTO LOG** ***WETLAND 19***

Middlebury Spur Project
Wetland Delineation Report

APPENDIX B

DATA FORMS

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 2 U

Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0.5-0	Oi		--	
0-8	Ap1	2.5Y 3/2	--	c or si c
8-12	Ap2	2.5Y 3/2	10YR 4/6 md	c, very firm in place
12-15	Ap3	2.5Y 3/2	2.5Y 5/2 md	c, very firm in place
15-20	B	2.5 Y 3/2	2.5Y 6/1 mottles	c, very firm in place
20+		G1 6/104	2.5Y 4/2 md	c, very firm in place

HYDRIC SOIL INDICATORS

NEIWPCC Manual VII, more or less

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☐	vegetation not definitive
Hydric soils criterion met?	☑	☐	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 2 U
Delineators: J. Merrow D. Gagne **Date:** 9/27/2007

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
total basal area, all species=											0			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Taraxacum officinale	38.0%	25%	X	FACU-
Trifolium pratense	10.5%	7%		FACU-
vetch sp.	3.0%	2%		
grasses sp.	90.0%	59%	X	unknown
few scattered sedges, thicker downslope	10.5%	7%		
	1.0%	1%		FACU-
total coverage=	153.0%			

DOM. HYDROPHYTES **0-1** DOM NON-HYDROPHYTES **1-2**

Percent Hydrophytes = 0-50%

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 2 W

Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
				No O--loose matter
0-5	A1	2.5Y 4/2	--	c
5-16	A2	2.5Y 4/2	2.5Y 5/1 (20%) 10YR 4/6 (8%)	c
16+		G1 5/N	10YR 4/6 cd	c

HYDRIC SOIL INDICATORS

NEIWPCC VII Depleted below dark surface

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification__________________________________

Aerial photography Identification__________________________________

other Identification__________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☑	☐	
Wetland hydrology criterion met?	☑	☐	
IS THIS DATAPOINT IN A WETLAND?	☑	☐	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 2 W
Delineators: J. Merrow D. Gagne **Date:** 9/27/2007

Vegetation:

TREES												total basal area	Percent dom	DOM	NWI status
Ulmus americana	DBH	8	15	14											
	B.A.	50	177	154	0	0	0	0	0	0		381	100%	X	FACW-
	DBH														
	B.A.	0	0	0	0	0	0	0	0	0		0			
	DBH														
	B.A.	0	0	0	0	0	0	0	0	0		0			
	DBH														
	B.A.		0	0	0	0	0	0	0	0		0			
	DBH														
	B.A.		0	0	0	0	0	0	0	0		0			
total basal area, all species=												**381**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
Rhamnus cathartica	20.5%		X	UPL
Viburnum cassinoides	10.5%			FACW
total coverage=	31.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Phalaris arundinacea	100.0%	95%	X	FACW+
Bidens sp.	3.0%	3%		
vetch sp.	1.0%	1%		
Equisetum sp.	1.0%	1%		
total coverage=	105.0%			

DOM. HYDROPHYTES 2 DOM NON-HYDROPHYTES 1

Percent Hydrophytes = 67%

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 3-U

Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0.5-0	Oi			(all moist)
0-3	A	10YR 3/2 (moist)	--	vfsl, dry
3-10	B1	2,5Y 4/4	--	fsl, dry
10-12	E?	10YR 5/2 (moist) 10YR 7/1 (dry)	--	fsl, dry, discontinuous, very friable, SA blocky, weak structure
12-14	B2	10YR 4/6 (moist)	--	fsl, dry, discontinuous, very friable, SA blocky, weak structure
14+	B3	2.5Y 4/4	--	fsl, dry, discontinuous, very friable, SA blocky, weak structure

HYDRIC SOIL INDICATORS

non-hydric

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☐	no veg data sheet
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 3-W
Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0.5-0	Oi		--	
0-5	A	2.5Y 3/1	--	si l, moist
5-7	B1	2.5Y 5/2 (60%) 10YR 5/6 (40%)	--	si c
7-14	B2	10YR 4/2	10YR 4/6 (20%) cd	c
14-18		becomes 2.5Y 5/1 @14"		c
18+		2.5Y 5/1 (50%)	10YR 3/6 (50%)	c

HYDRIC SOIL INDICATORS

Hydric Soil Indicator VI, Depleted or Gleyed Matrix, NEIWPCC manual

OPTIONAL SOIL DATA

Taxanomic subgroup
Soil drainage class
Depth to active water table
NTCHS hydric soil criterion

HYDROLOGY

- ☐ Recorded data
  - stream, lake, or tidal gage Identification________________________________
  - Aerial photography Identification________________________________
  - other Identification________________________________
- ☐ NO RECORDED DATA
- ☐ OBSERVATIONS:
  - Depth to Free Water
  - Depth to Saturation (including capillary fringe)
  - Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☑	☐	
Wetland hydrology criterion met?	☑	☐	
IS THIS DATAPOINT IN A WETLAND?	☑	☐	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 3-W
Delineators: J. Merrow D. Gagne **Date:** 9/27/2007

Vegetation:

TREES												total basal area	Percent dom	DOM	NWI status
Tsuga canadensis	DBH	11	14	8	6	6	11	14	10	16					
	B.A.	95	154	50	28	28	95	#	79	#		884	81%	X	FACU*
Betula papyrifera	DBH	8													
	B.A.	50	0	0	0	0	0	0	0	0		50	5%		FACU
Acer rubrum	DBH	14													
	B.A.	154	0	0	0	0	0	0	0	0		154	14%		FAC
	DBH														
	B.A.		0	0	0	0	0	0	0	0		0	0%		
	DBH														
	B.A.		0	0	0	0	0	0	0	0		0	0%		
total basal area, all species=												**1088**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
Ulmus americana	20.5%	66%	X	FACW-
Tsugus canadensis	10.5%	34%	X	FACU*
total coverage=	**31.0%**			

SHRUBS	percent coverage	percent dom	DOM	NWI status
Tsugus canadensis	20.5%	60%	X	FACU*
Ulmus americana	10.5%	31%	X	FACW-
Quercus rubra	3.0%	9%		FACU-
total coverage=	**34.0%**			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Dryopteris intermedia	3.0%	50%	X	FACU
Dryopteris marginalis	1.0%	17%		FACU-
Ulmus americana	1.0%	17%		FACW-
Impatiens capensis	1.0%	17%		FACW
total coverage=	**6.0%**			

DOM. HYDROPHYTES **5** DOM NON-HYDROPHYTES **1**

* hemlock has shallow roots and is counted as hydric

Percent Hydrophytes = 83%

Middlebury Rail Spur, Middlebury, Vermont
Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 4-1

Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-8	Ap	10YR 3/2		fsl
8-13	B	2.5Y 5/3	--	fsl
refusal at 13"				

HYDRIC SOIL INDICATORS

Not a hydric soil under NEIWPCC manual

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification__________________________________

Aerial photography Identification__________________________________

other Identification__________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☐	undetermined
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Middlebury Rail Spur, Middlebury, Vermont

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 4-1

Delineators: J. Merrow D. Gagne **Date:** 9/27/2007

Vegetation:

TREES											total basal area	Percent dom	DOM	
Pinus strobus	DBH	24	20											
	B.A.	452	314	0	0	0	0	0	0	0	766	67%	X	FACU
Acer saccharum	DBH	10	8	8	6	10	6	6						
	B.A.	79	50	50	28	79	28	28	0	0	342	30%	X	FACU-
Quercus (prinus or bicolor)	DBH	6												
	B.A.	28	0	0	0	0	0	0	0	0	28	2%		?
Quercus alba	DBH	8												
	B.A.	50	0	0	0	0	0	0	0	0	50	4%		FACU-
Acer rubrum	DBH	12	6	8	8	8								
	B.A.	113	28	50	50	50	0	0	0	0	292	26%	X	FAC
Fraxinus sp.	DBH	12	6	8	8	8								
	B.A.	113	28	50	50	50	0	0	0	0	292	26%	X	?
total basal area, all species=											**1137**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
Carya ovata	20.0%	38%	X	FACU-
Pinus strobus	10.0%	19%		FACU
Fraxinus sp.	20.0%	38%	X	?
Quercus (prinus or michauxii)	3.0%	6%		?
total coverage=	53.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
Fraxinus sp.	60.0%	69%	X	?
Viburnum cassinoides	20.0%	23%	X	FACW
Lonicera sp.	3.0%	3%		
Prunus sp.	1.0%	1%		
Rhamnus cathartica	3.0%	3%		
total coverage=	87.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Mitchella repens	10.0%	11%		FACU
Onoclea sensibilis	75.0%	82%	X	FACW
Dryopteris marginalis	3.0%	3%		FACU
other fern	3.0%	3%		
total coverage=	91.0%			

DOM. HYDROPHYTES **2-5** DOM NON-HYDROPHYTES **3-6**

Percent Hydrophytes = 29-71%

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 4-2

Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0.5-0	Oi			
0-5	A	10YR 4/2	--	fsl, friable, somewhat dry
5-13	B	2.5Y 4/3 (70%)	10YR 5/4 (10%) 2.5Y 6/3 (20%)	vfsl
13+	B2	10YR 4/4 (65%)	2.5Y 4/3 (35%)	ls, firm in place

HYDRIC SOIL INDICATORS

Not a Hydric Soil under the NEIWPCC Manual

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 5-1

Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-8	A	10YR 3/2	--	fsl, very dry
8-13	B	2.5Y 5/3	--	fsl, stoney below, so dry that determination of matrix and mottle colors was difficult

HYDRIC SOIL INDICATORS

Not a Hydric Soil under NEIWPCC manual

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 5-1
Delineators: J. Merrow D.Gagne **Date:** 9/27/2007

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
total basal area, all species=											**0**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Phalaris arundinacea	63.0%	50%	X	FACW+
unidentified grasses	38.0%	30%	X	unknown
Trifolium repens	20.5%	16%		
millet sp.	1.0%	1%		FACU-
2 sedges, unidentified, scattered	1.0%	1%		
Taraxacum officinale	3.0%	2%		FACU-
(mowed to 4" +/- tall)				
total coverage=	126.5%			

DOM. HYDROPHYTES **1-2** DOM NON-HYDROPHYTES **0-1**

Percent Hydrophytes = 50-100%

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 5-2

Delineators: J. Merrow, D. Gagne **Date:** 9/27/2007

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0.5-0	Oi			
0-9	Ap	2.5Y 4/1	--	firm, clay, strong structure
9-16	B1	10YR 4/3	10YR 4/4 ff	clay
16+	B2	10YR 4/2	10YR 4/1 cf ped coatings 10YR 4/3 cf small	clay, strong structure

HYDRIC SOIL INDICATORS

Not a hydric soil under NEIWPCC manual

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☐	no veg data sheet
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 5-2
Delineators: J. Merrow D. Gagne **Date:** 9/27/2007

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
total basal area, all species=											0			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Trifolium pratense	20.5%	15%		FACU-
Plantago major	38.0%	28%	X	FACU
Taraxacum officinale	3.0%	2%		FACU-
Medicago sp?	1.0%	1%		
Alopecurus sp.	10.5%	8%		
other grasses	50.0%	37%	X	unknown
Trifolium repens	10.5%	8%		FACU-
(mowed)				
total coverage=	133.5%			

DOM. HYDROPHYTES 0-1 DOM NON-HYDROPHYTES 1-2

Percent Hydrophytes = 50-100%

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 7-1

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-13	Ap1	10YR2/1	2.5Y 5/2	silt loam
13-22	Ap2	10YR2/1	few faint high chroma	clay laom
22-24	Ap3	10YR 2/1	10YR 5/2 5% 10YR 3/3 5%	gravelly clay loam
24+	B	2.5Y 4/1	10YR 4/2 30%	gravelly clay loam

HYDRIC SOIL INDICATORS Soils are hydric under NEIWPCC VII, depleted below dark surface. Although the A horizon is thicker than described in the parameters, (24 inches), there are signs of depletions within the A, and there are redoximorphic features directly below the A horizon.

OPTIONAL SOIL DATA

Taxonomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	A very thick - depleted in B. Vegetation all reed canary grass
Hydric soils criterion met?	☑	☐	
Wetland hydrology criterion met?	☑	☐	
IS THIS DATAPOINT IN A WETLAND?	☑	☐	

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 9-1

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
1-0	thatch			
0-9	A	2.5Y 3/2	2.5Y 5/2	silty clay loam
9-16	B1	10YR 5/2 30% 10YR 4/3 25% 10YR 4/2 45%	10YR 5/1 4% 10YR 4/3 25%	sitly clay
16 ->	B2	10YR 5/2 60% 10YR 4/3 10% 10YR 4/2 30%		silty clay

HYDRIC SOIL INDICATORS non-hydric

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

- ☐ Recorded data
  - stream, lake, or tidal gage Identification________________________________
  - Aerial photography Identification________________________________
  - other Identification________________________________
- ☐ NO RECORDED DATA
- ☐ OBSERVATIONS:
  - Depth to Free Water
  - Depth to Saturation (including capillary fringe)
  - Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	vegetation is dominated by reed canary grass
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 9-2

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-9.5	A	10YR 4/3	10YR 5/3 common, faint 5% 10YR 4/4 common, faint 15%	silty clay
9.5 -13	B1	10YR 4/1	10YR 5/1 4% 10YR 4/3 25%	silty clay
13-20+	B2	10YR 4/3	few, faint	silty clay

HYDRIC SOIL INDICATORS Soil is hydric under NEIWPCC VI, depleted or gleyed matrix.

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification____________________________

Aerial photography Identification____________________________

other Identification____________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO
Hydrophytic vegetation criterion met?	☑	☐
Hydric soils criterion met?	☑	☐
Wetland hydrology criterion met?	☑	☐
IS THIS DATAPOINT IN A WETLAND?	☑	☐

REMARKS

Vegetation is dominated by reed canary grass, with small white aster, spotted Joe Pye weed, goldenrod, and other wetland forbs.

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 11-1

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-9.5	Ap	10YR 3/2		clay loam
9.5 -> 20+	B	10YR 5/3 50% 7.5YR 4/4 25% 10YR 5/2 25%		clay loam

HYDRIC SOIL INDICATORS Soil is hydric under NEIWPCC VI, depleted or gleyed matrix.

OPTIONAL SOIL DATA

Taxanomic subgroup
Soil drainage class
Depth to active water table
NTCHS hydric soil criterion

HYDROLOGY

- ☐ Recorded data
  - stream, lake, or tidal gage Identification________________
  - Aerial photography Identification________________
  - other Identification________________
- ☐ NO RECORDED DATA
- ☐ OBSERVATIONS:
  - Depth to Free Water
  - Depth to Saturation (including capillary fringe)
  - Altered Hydrology (explain)

☑ Inundated	☐ Water Marks	☐ Sediment Deposits
☑ Saturated in upper 12"	☐ Drift Lines	☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☑	☐	Some grit in B horizon. Vegetation in this datapoint was cut hay, difficult to identify. However given the hydric soils and hydrology present, it is assumed that this point is within a wetland.
Wetland hydrology criterion met?	☑	☐	
IS THIS DATAPOINT IN A WETLAND?	☑	☐	

Middlebury Rail Spur, Middlebury, Vermont

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 11-1

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
										total basal area, all species=	0			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
		0%		
grass sp.	90.0%	87%	x	unknown
Trifolium pratense	10.0%	10%		FACU-
Phalaris arundinacea	1.0%	1%		FACW+
Ranunculus sp.	1.0%	1%		
sedges sp.	1.0%	1%		
total coverage=	103.0%			

DOM. HYDROPHYTES 0-1 DOM NON-HYDROPHYTES 0-1

Percent Hydrophytes = 0-100%

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 11-2

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-10	Ap	10YR 2/2		clay loam
10-19+	B	10YR 4/1	10YR 4/3	silty clay

HYDRIC SOIL INDICATORS Soil is hydric under NEIWPCC VI, depleted or gleyed matrix.

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☑	☐	Hayfield - predominantly reed canary grass with rabbit's foot clover and red clover
Wetland hydrology criterion met?	☑	☐	
IS THIS DATAPOINT IN A WETLAND?	☑	☐	

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 11-3

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-10	Ap	10YR 3/2		silty clay
10-20	B1	10YR 4/2 50% 10YR 3/3 25% 10YR 5/2 25%		clay
20->	B2	10YR 4/2 40% 10YR 3/3 20% 10YR 5/2 40%		clay

HYDRIC SOIL INDICATORS non-hydric soil is borderline but not depleted - gray parent material.

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☐	no veg data sheet
Hydric soils criterion met?	☐	☑	low chroma mottles more common with depth
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 11-4

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-10	Ap	10YR 3/2		very fine sandy loam
10-20+	B2	10YR 3/2	10YR 5/2 10% 10YR 4/4 30%	silty clay

HYDRIC SOIL INDICATORS Soil is non-hydric

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☑	red clover, rabbit's foot clover, RC grass, other grasses
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 13-1

Delineators: J. Merrow V. Chase **Date:** 10/27/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-10	Ap1	10YR 3/2		clay loam
10-20	B	10YR 4/2	2.5 Y 5/2 10% 10 YR 4/4 many, distinct 25%	silty clay

HYDRIC SOIL INDICATORS Soil is hydric under NEIWPCC VI, depleted matrix

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☑	☐	Data point is in a hayfield dominated by reed canary grass,
Wetland hydrology criterion met?	☑	☐	with clover and other grasses
IS THIS DATAPOINT IN A WETLAND?	☑	☐	soil has a gray matrix- gray parent material

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-1

Delineators: J. Merrow V. Chase **Date:** 10/24/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0.5-0	thatch			
0-9	Ap1	10YR 5/2	10YR 4/4 2%	mottles start at 3" - silty clay
9-15	B1	10YR 5/3	10 YR 4/4 30% 10YR 5/2 10%	silty clay
15-20	B2	10YR 4/2		silty clay

HYDRIC SOIL INDICATORS Soil is borderline but appears to be non-hydric.

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☑	
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-1
Delineators: J. Merrow V. Chase **Date:** 10/24/2006

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
total basal area, all species=											**0**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
red clover	5.0%	5%		
white clover	10.0%	9%		
dandelion	2.0%	2%		
Queen Anne's lace	T	T		
timothy	90.0%	84%	x	FAC U
vetch	T	T		
total coverage=	107.0%			

DOM. HYDROPHYTES 0 DOM NON-HYDROPHYTES 1

Percent Hydrophytes = 0%

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-2

Delineators: J. Merrow V. Chase **Date:** 10/25/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-9	Ap	10YR 4/2	10YR 5/3 common, faint 10% 10YR 5/1 few, faint	silty clay
9-12	B	10YR 4/1	10YR 5/1 4% 10YR 4/3 25%	sitly clay
12-20+	B2		10YR 4/2 60% 10 YR 4/3 20% 10 YR 4/1 20%	silty clay

HYDRIC SOIL INDICATORS Soil is hydric under NEIWPCC VI, depleted or gleyed matrix

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☑	☐	
Wetland hydrology criterion met?	☑	☐	
IS THIS DATAPOINT IN A WETLAND?	☑	☐	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-2
Delineators: J. Merrow V. Chase **Date:**

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
total basal area, all species=											0			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Phalaris arundinacea	100.0%	100%	X	FACW+
total coverage=	100.0%			

DOM. HYDROPHYTES DOM NON-HYDROPHYTES

Percent Hydrophytes = 100%

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-3

Delineators: J. Merrow V. Chase **Date:** 10/25/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-10	Ap	2.5Y 4/2		nearly saturated silty clay
10-18+	B	10YR 5/2	10YR 5/1 4% 10YR 4/3 25%	silty clay

HYDRIC SOIL INDICATORS

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

- ☐ Recorded data
  - stream, lake, or tidal gage Identification__________________
  - Aerial photography Identification__________________
  - other Identification__________________
- ☐ NO RECORDED DATA
- ☐ OBSERVATIONS:
  - Depth to Free Water
  - Depth to Saturation (including capillary fringe)
  - Altered Hydrology (explain)

☑ Inundated	☐ Water Marks	☐ Sediment Deposits
☑ Saturated in upper 12"	☐ Drift Lines	☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	
Hydric soils criterion met?	☐	☑	Soil is borderline but appears to be non-hydric - gray parent material. No evidence of hydrology.
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-3
Delineators: J. Merrow V. Chase **Date:**

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
										total basal area, all species=	**0**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
reed canary grass	25.0%	21%	x	FACW
timothy	5.0%	4%		
grass sp.	75.0%	64%	x	unknown
birds foot trefoil	2.0%	2%		
small white aster	10.0%	9%		
total coverage=	117.0%			

DOM. HYDROPHYTES **DOM NON-HYDROPHYTES**

Percent Hydrophytes = **50-100%**

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-4

Delineators: J. Merrow V. Chase **Date:** 10/25/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
.5-1	thatch			
0-6	Ap	2.5Y 3/1		silty clay
6-20+	B	10YR 4/2	10YR 5/2 15% 10YR 4/4 20%	silty clay

HYDRIC SOIL INDICATORS NEIWPCC VI, depleted matrix

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification_______________________________

Aerial photography Identification_______________________________

other Identification_______________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	pockets of standing water
Hydric soils criterion met?	☑	☐	
Wetland hydrology criterion met?	☑	☐	
IS THIS DATAPOINT IN A WETLAND?	☑	☐	

Middlebury Rail Spur, Middlebury, Vermont

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 17-4

Delineators: J. Merrow V. Chase **Date:** 10/25/2006

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
total basal area, all species=											**0**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	**0.0%**			

SHRUBS	percent coverage	percent dom	DOM	NWI status
Cornus stolonifera	1.0%	100%	X	OBL
total coverage=	**1.0%**			

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Phalaris arundinacea	40.0%		X	FACW+
Carex stricta	20.0%		X	OBL
Lotus corniculatus	15.0%			FACU-
Aster vimineus	15.0%			FAC
grass sp. (festuca?)	25.0%		X	unknown
Lycopus sp.	1.0%			OBL
Solidago sp.	1.0%			unknown
total coverage=	**117.0%**			

DOM. HYDROPHYTES 3-4 **DOM NON-HYDROPHYTES** 0-1

Percent Hydrophytes = **75-100%**

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 18-1

Delineators: J. Merrow V. Chase **Date:** 10/26/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-12	Ap	10YR 3/1		silt loam
12-14	A/B			intermixed A and B
14-20+	B	5Y 5/2 30% 2.5 Y 5/2 50% 10YR 4/4 20%		silt

HYDRIC SOIL INDICATORS Hydric under NEIWPCC VII depleted below dark surface

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO
Hydrophytic vegetation criterion met?	☑	☐
Hydric soils criterion met?	☑	☐
Wetland hydrology criterion met?	☑	☐
IS THIS DATAPOINT IN A WETLAND?	☑	☐

REMARKS

Pockets of standing water. Cornfield with some herbaceous weeds growing between rows.

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 18-2
Delineators: J. Merrow V. Chase **Date:** 10/26/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-10	Ap1	10YR 3/2		
10-20	B1	2.5Y 5/4	7.5 YR 4/4 20% 5 Y 5/2 5%	

HYDRIC SOIL INDICATORS non-hydric

OPTIONAL SOIL DATA

Taxanomic subgroup
Soil drainage class
Depth to active water table
NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data
stream, lake, or tidal gage Identification________________________________
Aerial photography Identification________________________________
other Identification________________________________

☐ NO RECORDED DATA
☐ OBSERVATIONS:
Depth to Free Water
Depth to Saturation (including capillary fringe)
Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits
☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☐	☐	no veg data sheet
Hydric soils criterion met?	☐	☑	B horizon has subtle gradations of color.
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 19-1

Delineators: J. Merrow V. Chase **Date:** 10/26/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	(*USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0.5-0	thatch			
0-3.5	Ap1	10YR 3/2		silt loam
3.5-7	Ap2	2.5Y 4/2	10YR 3/4 many, distinct 25%	silt loam
7-10	B1	2.5Y 4/4	7.5YR 4/6 many, prominent 30% 2.5Y 5/3 common, faint 10%	silt loam
10-20	B2	10YR 4/3	10YR 3/6 common, distinct 10% 2.5Y 5/1 common, distinct 10%	silt loam

HYDRIC SOIL INDICATORS non-hydric

OPTIONAL SOIL DATA

Taxanomic subgroup
Soil drainage class
Depth to active water table
NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data
stream, lake, or tidal gage Identification________________________________
Aerial photography Identification________________________________
other Identification________________________________

☐ NO RECORDED DATA
☐ OBSERVATIONS:
Depth to Free Water
Depth to Saturation (including capillary fringe)
Altered Hydrology (explain)

☐ Inundated ☐ Water Marks ☐ Sediment Deposits

☐ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO	REMARKS
Hydrophytic vegetation criterion met?	☑	☐	free water at 18"
Hydric soils criterion met?	☐	☑	
Wetland hydrology criterion met?	☐	☑	
IS THIS DATAPOINT IN A WETLAND?	☐	☑	

Middlebury Rail Spur, Middlebury, Vermont

Vegetation Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 19-1

Delineators: J. Merrow V. Chase **Date:** 10/25/2006

Vegetation:

TREES											total basal area	Percent dom	DOM	NWI status
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.	0	0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
	DBH													
	B.A.		0	0	0	0	0	0	0	0	0			
total basal area, all species=											**0**			

SAPLINGS	percent coverage	percent dom	DOM	NWI status
total coverage=	0.0%			

SHRUBS	percent coverage	percent dom	DOM	NWI status
Salix sp.	3.0%	100%	X	FACW
		0%		
total coverage=	3.0%	100%		

SEEDLINGS & HERBS	percent coverage	percent dom	DOM	NWI status
Phalaris arundinacea	10.0%			FACW+
sedge-like strata	1.0%			
clover	10.0%			
Taraxacum officinale	3.0%			FACU-
Vicia sp.	1.0%			FACU-
Onoclea sensibilis	3.0%			OBL
grass sp.	90.0%		X	unknown
Ranunculus sp.	3.0%			
total coverage=	121.0%			

DOM. HYDROPHYTES **1-2** DOM NON-HYDROPHYTES **0-1**

Percent Hydrophytes = 50-100%

McFarland Johnson

Middlebury Rail Spur, Middlebury, Vermont

Soil Data Sheet

Project Title: Middlebury Rail Spur **Transect:** **Plot:** 19-2

Delineators: J. Merrow V. Chase **Date:** 10/26/2006

SOIL

DEPTH	HORIZON	MATRIX COLOR	REDOXIMORPHIC FEATURES	COMMENTS
			(Color, abundance, size, contrast)	*(USDA texture, nodules, concretions, masses, pore linings, restrictive layers, root distribution, soil water, etc.)*
0-3	Ap1	2.5YR 3/2		silt loam
3-9	Ap2/B	Gley 1 4/10Y	7.5 YR 3/3 common, prominent 15%	silt loam
9-20	B1	2.5Y 5/2	7.5YR 3/4 many, prominent 15% 2.5Y 5/1 common 5%	silt loam

HYDRIC SOIL INDICATORS NEIWPCC VI

OPTIONAL SOIL DATA

Taxanomic subgroup

Soil drainage class

Depth to active water table

NTCHS hydric soil criterion

HYDROLOGY

☐ Recorded data

stream, lake, or tidal gage Identification________________________________

Aerial photography Identification________________________________

other Identification________________________________

☐ NO RECORDED DATA

☐ OBSERVATIONS:

Depth to Free Water

Depth to Saturation (including capillary fringe)

Altered Hydrology (explain)

☑ Inundated ☐ Water Marks ☐ Sediment Deposits

☑ Saturated in upper 12" ☐ Drift Lines ☐ Drainage Patterns within Wetland

Conclusions

	YES	NO
Hydrophytic vegetation criterion met?	☑	☐
Hydric soils criterion met?	☑	☐
Wetland hydrology criterion met?	☑	☐
IS THIS DATAPOINT IN A WETLAND?	☑	☐

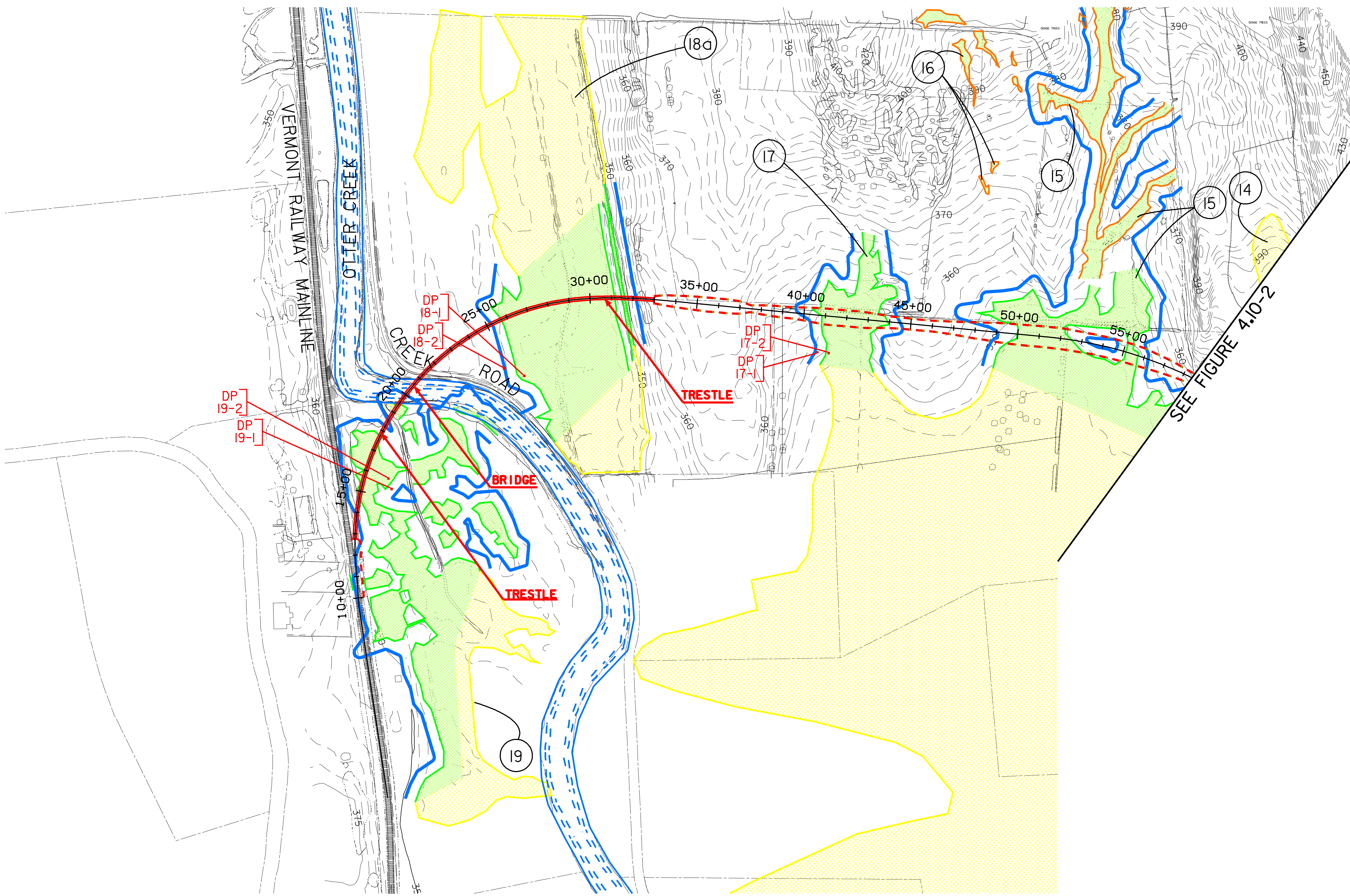
REMARKS

low chroma mottles are more prominent deeper down. Reed canary grass is dominant vegetation (No veg data sheet)

Middlebury Spur Project
Wetland Delineation Report

APPENDIX C

FIGURES



LEGEND

	RAIL SPUR CENTERLINE
	ROADWAY
	BRIDGE
	PARCEL BOUNDARY
	SLOPE LIMITS - RS-1 & RS-1 GRADE SEPARATED OVER HALLADAY ROAD
	SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
	SLOPE LIMITS - HALLADAY ROAD RELOCATION
	STREAM
	SURFACE WATERS
	WETLANDS DELINEATED BY McFARLAND JOHNSON
	WETLANDS DELINEATED BY OTHERS
	SKETCHED WETLANDS
	50 FOOT VERMONT CLASS 2 WETLAND BUFFER

DATA SOURCES:
SURFACE WATER DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED OCTOBER, 2006 AND SEPTEMBER 2007. PORTIONS OF WETLAND 15 AND ALL OF WETLAND 16 ARE BASED ON DELINEATIONS DONE BY OTHERS. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

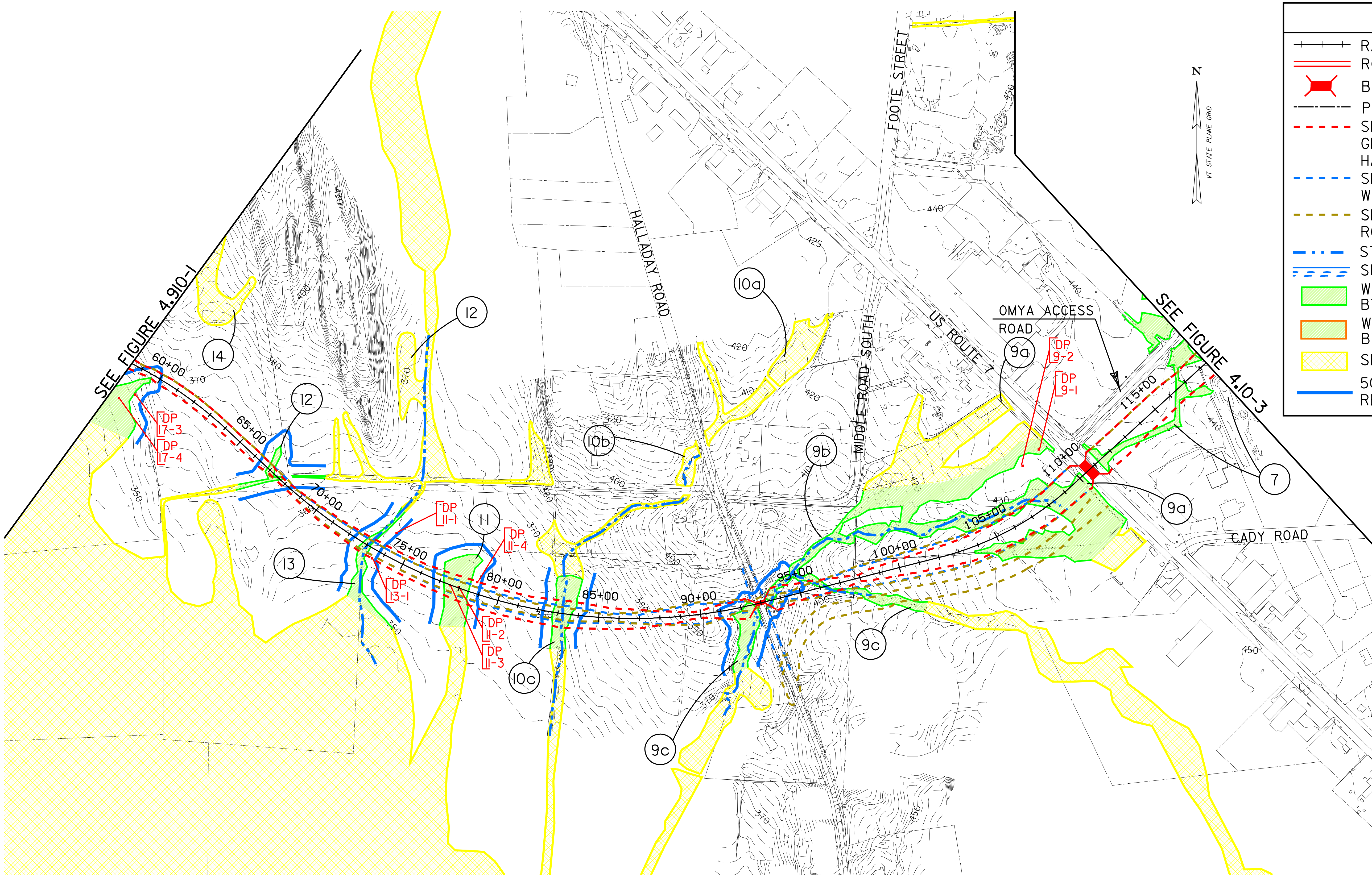
VTrans Working to Get You There

MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS RS-1 ALTERNATIVE (WEST)

SEPTEMBER 2008 FIGURE NO. 4.10-1

11-SEP-2008 M:\1647400 Midd Spur\HWY\DRAW\Cut_Sheets\CHAPTER_4\West\Surface Water & Wetlands RS-1W.dgn



LEGEND

- RAIL SPUR CENTERLINE
- ROADWAY
- BRIDGE
- PARCEL BOUNDARY
- SLOPE LIMITS - RS-I & RS-I GRADE SEPARATED OVER HALLADAY ROAD
- SLOPE LIMITS - AT GRADE WITH HALLADAY ROAD
- SLOPE LIMITS - HALLADAY ROAD RELOCATION
- STREAM
- SURFACE WATERS
- WETLANDS DELINEATED BY McFARLAND JOHNSON
- WETLANDS DELINEATED BY OTHERS
- SKETCHED WETLANDS
- 50 FOOT VERMONT REGULATORY BUFFER

DATA SOURCES:
SURFACE WATERS DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED OCTOBER, 2006 AND SEPTEMBER 2007. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

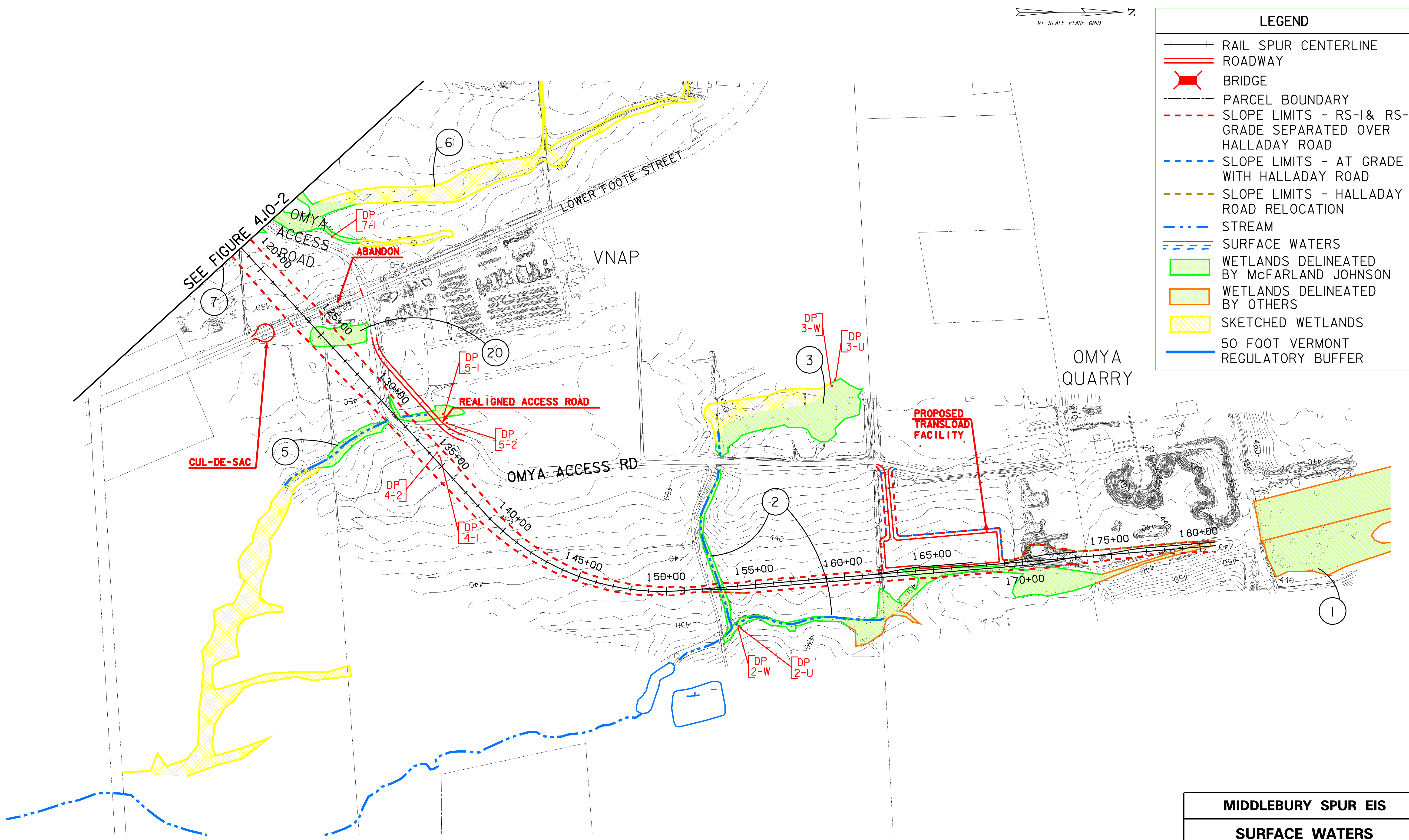
VTrans Working to Get You There

MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS RS–1 ALTERNATIVE (CENTRAL)

SEPTEMBER 2008 FIGURE NO. 4.10-2

11-SEP-2008 M:\1647400 Midd Spur\HWY\DRAW\Cut Sheets\CHAPTER 4\2 Central\Surface Water & Wetlands RS-1C.dgn



DATA SOURCES:
SURFACE WATERS DATA (2004) FROM VCGI. DELINEATED WETLANDS WERE MAPPED OCTOBER, 2006 AND SEPTEMBER 2007. PORTIONS OF WETLAND 2, AND ALL OF WETLAND 1, ARE BASED ON DELINEATIONS DONE BY OTHERS. SKETCHED WETLANDS ARE NEITHER DELINEATED NOR SURVEYED DEPICTIONS OF WETLANDS BUT ARE ESTIMATED BASED ON AERIAL PHOTOGRAPHY AND TOPOGRAPHY.

BASE MAPPING AND RESOURCE MAPPING MAY NOT REFLECT DEVELOPMENT CONSTRUCTED SINCE PUBLICATION OF DEIS.

VTrans Working to Get You There

MIDDLEBURY SPUR EIS

SURFACE WATERS AND WETLANDS RS-1 ALTERNATIVE (EAST)

SEPTEMBER 2008 FIGURE NO. 4.10-3

11-SEP-2008 M:\1647400 Midd Spur\HWY\DRAW\Cut_Sheets\CHAPTER_4\3 East\Surface Water & Wetlands RS-1E.dgn