UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Geoffrey Shadroui Project No.9541-001

ORDER ISSUING LICENSE
(Minor Project)
(Issued February 23, 1988)

Geoffrey Shadroui has filed a license application under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Fair Haven Project located in Rutland County, Vermont, on the Castleton River. The project would affect the interests of interstate or foreign commerce.

Notice of the application has been published. No protests or motions to intervene were filed on this proceeding, and no agency objected to issuance of this license. Comments received from interested agencies and individuals have been fully considered in determining whether to issue this license, as discussed below.

Recommendations of Federal and State Fish and Wildlife Agencies

Section 10(j) of the Act, as amended by the Electric Consumers Protection Act of 1986 (ECPA), Public Law No. 99-495, requires the Commission to include license conditions based upon recommendations of federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife. In the environmental assessment (EA) for the Fair Haven Hydroelectric Project, the staff addresses the concerns of the federal and state fish and wildlife agencies, except as indicated below, and makes recommendations consistent with those of the agencies.

The Vermont Agency of Environmental Conservation (AEC) has requested authority to approve all plans relating to fish passage facilities. Since the AEC recommendation requests authority to approve plans and does not specify terms and conditions for the protection, mitigation, and enhancement of fish and wildlife, it is considered outside the scope of section 10(j) of the Act. The Commission must retain its final authority to approve or disapprove any plan required to be submitted under this license. The views of the AEC will be given full consideration prior to any Commission action with regard to fish passage facilities.

Recommendations of Water Quality Certifying Agency

The AEC issued a water quality certificate for the Fair Haven Hydroelectric Project on June 2, 1987. Under Commission Order No. 464, because more than 1 year had elapsed from the date of the AEC's receipt of the request, the certification

Check to see if this is in order. AMD
File - Fair Haven

requirements of section 401(a)(1) of the Clean Water Act 1/ for the Fair Haven Hydroelectric Project were deemed waived.

In preparing the environmental assessment for the Fair Haven Hydroelectric Project, the staff directly addresses the concerns AEC raised in the water quality certificate and makes recommendations to protect water quality consistent with the recommendations of the AEC.

Comprehensive Plans

Section 10(a)(2) of the Act, as amended by ECPA, requires the Commission to consider the extent to which a project is consistent with comprehensive plans (where they exist) for improving, developing, or conserving a waterway or waterways affected by the project. The plans must be prepared by an agency established pursuant to federal law that has the authority to prepare such a plan or by the state in which the facility is or will be located.

The Commission considers plans to be within the scope of section 10(a)(2), only if the plans reflect the preparers' balancing of the competing uses of a waterway, based on their data and on applicable policy considerations (i.e., if the preparers consider and balance all relevant public use considerations). With regard to plans prepared at the state level, such plans are within the scope of section 10(a)(2), only if they are prepared and adopted pursuant to a specific act of the state legislature and developed, implemented, and managed by an appropriate state agency. 2/

The Commission has concluded that comprehensive planning under section 10(a)(2)(A), like comprehensive planning under section 10(a)(1), should take into account all existing and potential uses of a waterway relevant to the public interest, including navigation, power development, energy conservation, fish and wildlife protection and enhancement, recreational opportunities, irrigation, flood control, water supply, and other aspects of environmental quality. In order that the Commission may fully understand or independently confirm the contents and conclusions of a comprehensive plan, it provided general guidelines for developing such plans which should contain the following: (1) a description of the waterways that are the subject of the plan, including pertinent maps; (2) a description of the significant resources of the waterway(s); (3) a description of the various existing and planned uses for these

1/ 33 United States Code §1341(a)(1)(1982).

2/ See Fieldcrest Mills, Inc. 37 FERC ¶61,264 (1986).

resources; and (4) a discussion of goals, objectives, and recommendations for improving, developing, or conserving the waterways in relation to these guidelines. The more closely a plan conforms to these guidelines, the more weight it will have on the Commission's decisions. The Commission, however, will consider plans that do not meet the criteria for comprehensive plans, as it considers all relevant studies and recommendations in its public interest analysis pursuant to section 10(a)(1), to the extent that the documentation supports the plan. 3/

The staff identified no comprehensive plans of the type referred to in section 10(a)(2) of the Act relevant to this project. The staff reviewed two resource plans that address various aspects of waterway management under section 10(a)(1) of the Act. 4/ No conflicts were found.

Based on a review of agency and public comments filed in this proceeding, and on the staff's independent analysis, the Fair Haven Project is best adapted to a comprehensive plan for the Castleton River, taking into consideration the beneficial public uses described in section 10(a)(1) of the Act.

Summary of Findings

An EA was issued for this project. Background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment are contained in the EA attached to this order. Issuance of this license is not a major federal action significantly affecting the quality of the human environment.

The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if constructed, operated, and maintained in accordance with the requirements of this license. Analysis and support for related license articles are provided in the Safety and Design Assessment attached to this order.

The Director, Office of Hydropower Licensing, concludes that the project would not conflict with any planned or authorized development, and would be best adapted to comprehensive development of the waterway for beneficial public uses.

3/ See Commission Order No. 481, issued October 20, 1987.

4/ State Comprehensive Outdoor Recreation Plan, 1983-1988, 1983. Vermont Agency of Environmental Conservation. Vermont Rivers Study, 1986. Vermont Agency of Environmental Conservation.

The Director orders:

(A) This license is issued to Geoffrey Shadroui (licensee), for a period of 40 years, effective the first day of the month in which this order is issued, to construct, operate, and maintain the Fair Haven Project. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, as shown by Exhibit G:

Exhibit G-	FERC No. 9541 -	Showing
G-1	6	Location Map
G-2	7	Location Map
G-3	8	Project Map
G-4	9	Project Map

(2) The proposed project would consist of: (a) an upper masonry Depot Street Dam 6 feet high and 75 feet long; (b) a reinforced concrete intake structure; (c) a small reservoir with 1-acre surface area and 4 acre-feet of storage capacity at a surface elevation of 353 m.s.l.; (d) a steel penstock 5 feet in diameter and 60 feet long; (e) a reinforced concrete powerhouse 16 feet by 20 feet by 10 feet high housing a generating unit rated at 215 kW; (f) a short tailrace channel; (g) the 480-volt generator leads (h) an above ground 480-volt transmission line 150 feet long; (i) the 250-KVA, 480/4160-volt,three-phase step-up transformer; (j) the lower masonry Adams Street Dam 9 feet high and 60 feet long with negligible storage at elevation 310 m.s.l.; and (k) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of Exhibits A and F recommended for approval in the attached Safety and Design Assessment.

(3) All of the structures, fixtures, equipment or facilities used to operate or maintain the project, all portable property that may be employed in connection with the project, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) The Exhibit G described above and those sections of Exhibits A and F recommended for approval in the attached Safety and Design Assessment are approved and made part of the license.

(D) The following sections of the Act are waived and excluded from the license for this minor project:

4(b), except the second sentence; 4(e), insofar as it relates to approval of plans by the Chief of Engineers and the Secretary of the Army; 6, insofar as it relates to the acceptance and expression in the license of terms and conditions of the Act that are waived here; 10(c), insofar as it relates to depreciation reserves; 10(d); 10(f); 14, except insofar as the power of condemnation is reserved; 15*; 16; 19; 20; and 22.

(E) This license is subject to the articles set forth in Form L-15, (October 1975), entitled "Terms and Conditions of License for Unconstructed Minor Project Affecting the Interests of Interstate or Foreign Commerce," except Article 15. The license is also subject to the following additional articles:

Article 201. The licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 290 horsepower.

Article 202. The licensee shall clear and keep clear to an adequate width all lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which result from maintenance, operation, or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of lands and disposal of unnecessary material shall be done with due diligence to the satisfaction of the authorized representative of the Commission and in accordance with appropriate federal, state, and local statutes and regulations.

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* At the expiration of this license, any license application filed, including the licensee's, will be treated as an original license application. The municipal preference provisions of Section 7(a) of the Federal Power Act will apply.

Article 301. The licensee shall commence construction of project works within two years from the issuance date of the license and shall complete construction of the project within four years from the issuance date of the license.

Article 302. The licensee shall at least 60 days prior to start of construction, submit one copy to the Commission's Regional Director, and two copies to the Director, Division of Inspections, of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse, and water conveyance structures. The Director, Division of Inspections, may require changes in the plans and specifications to assure a safe and adequate project.

Article 303. The licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction and shall ensure that construction of cofferdams and deep excavations is consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the licensee shall submit to the Commission's Regional Director, and Director, Division of Inspections, one copy each of the approved cofferdam construction drawings and specifications and the letter(s) of approval.

Article 304. The licensee shall within 90 days of completion of construction file, for approval by the Commission, revised Exhibits A, F, and G to describe and show the project as built.

Article 401. The licensee after consultation with the Vermont Agency of Environmental Conservation (AEC) shall file for Commission approval a plan for providing and maintaining existing fisherman parking facilities at the Depot street dam. The plan shall provide (1) a description of the size and type of parking facilities to be provided and maintained, (2) a map showing the size and location of the parking facilities, and (3) documentation of consultation with the AEC.

Article 402. The licensee, before starting any land-clearing, or land-disturbing activities associated with the construction of the project, shall implement the cultural resources management plan to protect historical structures and remains in the project area as described in the letter from the Vermont State Historic Preservation Officer (SHPO) dated March 18, 1987. The cultural resources management plan shall be implemented in a manner satisfactory to the SHPO. After construction of the project, and before commencing any commercial operation of the project, the licensee shall file for Commission approval a copy of a letter from the SHPO indicating that the cultural resources management plan has been implemented in such a manner. No land-clearing, land-disturbing, or spoil-producing

activities shall begin until the licensee is notified that the plan complies with the requirements of this article. The licensee shall make funds available in a reasonable amount for implementation of this plan. If the licensee and the SHPO cannot agree on the amount of money to be spent for the plan's implementation, the Commission reserves the right to require the licensee to conduct the necessary work at the licensee's own expense.

Article 403. The licensee shall maintain a continuous minimum flow of 10 cubic feet per second, or inflow to the project, whichever is less, over the dam into the bypass segment of the Castleton River. This flow may be temporarily modified if required by operating emergencies beyond the control of the licensee and for short periods upon mutual agreement among the licensee, the Vermont Agency of Environmental Conservation, and the U.S. Fish and Wildlife Service.

Article 404. The licensee, after consultation with the Vermont Agency of Environmental Conservation and the U.S. Fish and Wildlife Service, and before starting any land-clearing, or land-disturbing activities associated with the construction of the project, shall file for Commission approval a plan for providing the required minimum flow over the dam into the bypassed reach of the Castleton River. The filing must include a description of the method used to provide the minimum flow, hydraulic design calculations, and the comments of the consulted agencies on the plan.

Article 405. The licensee shall operate the Fair Haven Project in an instantaneous run-of-river mode for the protection of fish and wildlife resources in the reservoir and the Castleton River. The licensee, in operating the project in an instantaneous run-of-river mode, shall at all times act to minimize the fluctuation of the reservoir surface elevation, i.e., maintain discharge from the project so that flow in the Castleton River, as measured immediately downstream from the project, approximates the instantaneous sum of the inflows to the project reservoir and shall maintain the elevation of the project reservoir at or above the crest elevation of the dam. Further, to minimize impacts to flow dependent resources, the licensee shall, in operating the project, release flows in excess of the maximum and below the minimum turbine capacity over the dam. Instantaneous run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon mutual agreement among the licensee, the Vermont Agency of Environmental Conservation, and the U.S. Fish and Wildlife Service.

Article 406. The licensee, after consultation with the Vermont Agency of Environmental Conservation and the U.S. Fish and Wildlife Service, and within 6 months of the date of issuance of this license, shall file for Commission approval functional design drawings of the fish screens at the Fair Haven Project, and plans for installing and maintaining the screens. The filing shall include documentation of agency consultation, and any agency comments on the drawings and plans for installing and maintaining the screens. The Commission reserves the right to require modifications to the drawings and to the plans. The licensee shall file as-built drawings with the Commission within 3 months after completing construction.

Article 407. Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or provide for the construction, operation, and maintenance of such fishways as may be prescribed by the Secretary of the Interior. The Commission also reserves authority to require the licensee to permit Interior to inspect project records pertinent to fishways, and to investigate and prepare a report documenting the effectiveness of such fishways.

Article 408.(a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting the enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(F) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(G) This order is issued under authority delegated to the Director and is final unless appealed under Rule 1902 to the Commission by any party within 30 days from the issuance date of this order. Filing an appeal does not stay the effective date of this order or any date specified in this order. The licensee's failure to appeal this order shall constitute acceptance of the license.

Fred E. Springer
Acting Director, Office
of Hydropower Licensing

ENVIRONMENTAL ASSESSMENT

FEDERAL ENERGY REGULATORY COMMISSION
OFFICE OF HYDROPOWER LICENSING, DIVISION OF ENVIRONMENTAL ANALYSIS

Date: December 24, 1987

Project name: Fair Haven FERC No. 9541- 001

A. APPLICATION

1. Application type: Minor, existing dam Date filed: 4/11/86

2. Applicant: Geoffrey Shadroui

3. Water body: Castleton River River basin: Castleton

4. Nearest city or town: Fair Haven

5. County: Rutland State: Vermont

B. PURPOSE AND NEED FOR ACTION

1. Purpose.

The proposed project would provide an estimated 675,000 kilowatthours of electrical energy per year for sale to a local utility.

2. Need for power.

The power from the project would be useful in meeting a small portion of the need for power projected for the New England Power Pool area of the Northeast Power Coordinating Council (NPCC) region. From the time the project goes on-line (into commercial operation), it would be available to displace fossil-fueled electric power generation in the NPCC region, thereby conserving nonrenewable fossil fuels and reducing the emission of noxious byproducts caused by the combustion of fossil fuels.

C. PROPOSED PROJECT AND ALTERNATIVES

1. Description of the proposed action.

The proposed project would consist of: (1) an upper existing masonry dam 6 feet high and 75 feet long; (2) a reinforced concrete intake structure; (3) a small reservoir with 1 acre area and 4 acre-feet of storage capacity at a surface elevation of 353 feet mean sea level; (4) a steel penstock 5 feet in diameter and 60 feet long; (5) a reinforced concrete powerhouse 16 feet by 20 feet by 10 feet high housing a generating unit rated 215 kilowatts; (6) a short tailrace channel; (7) an above ground transmission line 100 feet long; (8) a lower existing masonry dam with negligible storage at elevation 310 m.s.l.; and (9) appurtenant facilities.

2. Applicant's proposed mitigative measures.

a. Construction.

Debris removed from the trashracks would be disposed of away from the site; leaves, twigs, and branches would be disposed of at the site.

The removal of sediment from the forebay and tailrace would be done in the dry, using steel pilings to dewater the specific area of excavation, and would not affect water quality. The steel pilings would be located parallel to the existing gate structure of the existing dam. This arrangement would allow all flows to spill by the dewatered forebay. After construction of the intake, the gate would be closed while the steel pilings are removed; then the gates would be opened slowly to minimize the release of sediment. Filtration barriers would be placed downstream during construction as necessary. To minimize the effects of any increase in turbidity, construction in the forebay and tailrace areas would be planned to begin during May, before water levels become low. Excavated material would be deposited 200 or more feet away from the stream, in the empty lot north of the stream. Hay bales would be located between the fill and the stream to prevent any runoff entering the stream.

Angled trashracks with a spacing of 1.5 inches or less would be used to help prevent fish from entering the turbine intake.

The final design of the project would be completed by an architect to ensure the project is compatible with the site. The powerhouse would have a low profile and is planned to have a natural finish, wooden clapboard exterior and a double pitch, shingle roof. The penstock would be partially buried. All disturbed areas would be revegetated. Any exposed areas would be faced with attractive materials to blend with the natural landscape.

When construction is completed, the entire site would be cleaned up and left in an orderly manner.

b. Operation.

The spillage at the dams can be considered scenic, particularly during high flows. A minimum flow of 10 cubic feet per second (cfs) would be spilled at the Depot street dam for water quality and fishery concerns; all flows would be spilled at the Adams street dam. The 10-cfs minimum flow represents approximately 2 inches of water along the Depot street spillway crest, and would maintain the visual quality of water spilling over the dam.

3. Federal lands affected.

X No. ___Yes; agency: _____; acreage = _____;

___The federal land management agency has provided conditions by letter dated : ___/___/___ (attachment ___).

___Conditions have not been provided.

1. Alternatives to the proposed project.

a. X No reasonable action alternatives have been found.
___Action alternative:

b. Alternative of no action.

No action, denial of a license, would preclude the applicant from constructing the proposed project. No action would involve no alterations to the existing environment and would preclude the applicant from producing electrical power at the site.

D. CONSULTATION AND COMPLIANCE

1. Fish and wildlife consultation (Fish & Wildlife Coordination Act).

a. U.S. Fish & Wildlife Service (FWS): X Yes. ___No.
b. State(s): X Yes. ___No.
c. National Marine Fisheries Service (NMFS): X Yes. ___No.

2. Section 7 consultation (Endangered Species Act).

a. Listed species: X None. ___Present:

b. Consultation: X Not required. ___Required; completed: __/__/__.
Remarks: Except for transient individuals, no federally listed or proposed threatened or endangered species inhabit the project area (letter from Gordon E. Beckett, Supervisor, New England Field Office, U.S. Fish and Wildlife Service, Department of the Interior, Concord, New Hampshire. June 24, 1986).

3. Section 401 certification (Clean Water Act).

___Not required.

X Required; the applicant requested § 401 certification on 2/10/86.

Status : ___Granted by the certifying agency on __/__/__.

___Waived by the certifying agency on __/__/__.

X Waived; section 401 certification is waived if not acted upon by the certifying agency within 1 year from the date of the certifying agency's receipt of the request (See Commission Order No. 464, issued February 11, 1987).

___Undetermined; 1 year has not yet elapsed since the applicant's request and the state agency has not yet acted on the request.

The 1-year period would expire on __/__/__.

Remarks: The Water Quality Division of the Vermont Department of Water Resources and Environmental Engineering (WQD) issued water quality certification on June 2, 1987, after the 1-year certifying period had expired. In this environmental assessment, the staff considers the conditions set by the Department to protect water quality in the Castleton River and makes recommendations consistent with these conditions.

4. Cultural resource consultation (Historic Preservation Act).

a. State Historic Preservation Officer (SHPO): X Yes. ___No.
b. National Park Service (NPS): X Yes. ___No.
c. National Register status: ___None. X Eligible or listed.
d. Council: ___Not required. ___Completed: _____.
e. Further consultation: ___Not required. X Required.
Remarks: The SHPO states that ruins of 18th and 19th century iron and slate works in the project vicinity, which are potentially eligible for inclusion in the National Register of Historic Places, would not be adversely affected by construction of the project (letter from Eric Gilbertson, Deputy State Historic Preservation Officer, Vermont Agency of Development and Community Affairs, Montpelier, Vermont, March 18, 1987). The staff is requesting the comments of the Advisory Council on Historic Preservation.

5. Recreational consultation (Federal Power Act).

a. U.S. Owners: ___Yes. X No.
b. NPS: X Yes. ___No.
c. State(s): X Yes. ___No.

6. Wild and scenic rivers (Wild and Scenic Rivers Act).

Status: X None. ___Listed. Determination completed: __/__/__.
Administering agency: _____/

7. LWCFA lands and facilities (Land and Water Conservation Fund Act).

Status: X None. ___Designated. ___Determination completed: __/__/__.
Administering agency: _____

E. COMMENTS

1. The following agencies and entities provided comments on the application or filed a motion to intervene in response to the public notice dated 6/12/86

Commenting agencies and other entities	Date of letter
Department of the Army, North Atlantic Division Corps of Engineers	7/21/86
Depatment of the Interior	8/12/86
Vermont Agency of Environmental Conservation	8/14/86

Motions to intervene	Date of motion
Vermont Office of the Attorney General	7/11/86

2. X The applicant responded to the comments of the Vermont Agency of Environmental Conservation (AEC) 8/14/86 by letter dated 9/16/86.

X The applicant did not respond to the other comments or motion to intervene.

F. AFFECTED ENVIRONMENT

1. General description of the locale.

a. Description of the Castleton River Basin.

The Castleton River, which has a length of 20 miles and a drainage area of 99 square miles, originates in the town of Pittsford and is entirely within the state of Vermont. From Pittsford, the river flows south to the town of West Rutland,Vermont, passes through a swamp north of West Rutland Village,Vermont, turns west and enters the town of Castleton, Vermont. The River then flows west, passing north of the village of Castleton and south of the villages of Castleton Corners and Hydeville; from there, the Castleton River flows 10 miles through the village of Fair Haven to a confluence with the Poultney River.

2. Descriptions of the resources in the project impact area (Source: Fair Haven Water Power Project, filed 4/11/86, application, exhibit E, unless otherwise indicated).

a. Geology and soils: The project area is composed of resistant metamorphic bedrock. The area at the north end of the dam has been filled with waste and slate stone fill.

b. Streamflow:

lowflow:	8 cfs flow exceeded 95 percent of the time.
high flow:	301 cfs flow exceeded 10 percent of the time.
median flow:	66 cfs.*

* Data taken from the water quality certificate issued by the WQD on June 2, 1987.

c. Water quality: Water quality in the project area is generally very good. The Castleton River in the project area is classified by the Vermont Water Resources Board as Class B waters. Class B waters consistently exhibit good visual quality, provide high quality habitat for aquatic biota, fish, and wildlife, and are suitable for public water supply with filtration and disinfection, irrigation, other agricultural uses, swimming, and recreation.

d. Fisheries: Although the Castleton River in the project area has been designated as warm water fish habitat, the river in the vicinity of the project supports a self-sustaining population of rainbow trout and brown trout (salmonids). Other species present in the vicinity of the project include northern pike, bass, and suckers.

Anadromous: X Absent. ___Present.

Resident: ___Absent. X Present.

e. Vegetation: The proposed project is within an urban setting; vegetation is sparse and is limited to scattered trees, shrubs, and grasses. A small marsh is located upstream of the Depot Street dam.

Cover type	Dominant species
herbaceous	burdock, goldenrod, witch grass, timothy, common horse-tail, arrowhead, and jewelweed.
woody	red maple, American beech, and oak.

f. Wildlife: Wildlife species present in the proposed przoject area are those tolerant of urban development. The species include muskrat, raccoon, gray squirrel, white-footed mouse, mourning dove, tree swallow, chimney swift, robin, and starling.

g. Cultural:

___National Register (listed and eligible) properties have not been recorded.

X There are properties listed on, or eligible for listing on, the National Register of Historic Places in the area of the projects potential environmental impact.

Description: A cultural resources survey commissioned by the applicant(Thomas, 1986) identified historic iron and slate works in the vicinity of the proposed project that are potentially eligible for inclusion in the National Register. The main portions of these historic sites are located outside the project impact areas, and only peripheral remains would be affected (Thomas, 1986; letter from Eric Gilbertson, Deputy State Historic Preservation Officer, Vermont Agency of Development and Community Affairs, Montpelier, Vermont, March 18, 1987). The project area does not contain any prehistoric archeological sites. Because industrial development of the area has disturbed subsurface deposits, the project has no potential for affecting any buried prehistoric archeological sites (Thomas, 1986).

h. Visual quality: The visual quality of the area is high. The stream, cascading over the dam and then over rock formations, is framed by nearby trees and shrubs. The site is visited for fishing and viewing.

i. Recreation: Fishing is the primary recreational use in the project area. Parking areas at each project dam allow for easy access to the riverbank for fishing. Although boating in the project area is very limited, boating does occur 4 miles away from the project site at Lake Bomosean.

j. Land use: Land in the project area is used for commerce, industry, and residential development; close to the project area are a factory building, a warehouse, and a pump station.

G. ENVIRONMENTAL ISSUES AND PROPOSED RESOLUTIONS

Mitigative measures recommended by the staff are in addition to those proposed by the applicant, section C(2), and any conditions identified in section C(3). There are 8 issues addressed below.

1.Canoe Portage: The AEC recommends that if it is determined that canoeing occurs in the project area, a canoe portage route would be provided around the project dam. Although canoeing occurs 4 miles upstream of the project site at Lake Bomosean, canoeing or other boating activity in the Castleton River, including the project area, is minimal. Shallow water in the river probably contributes to the lack of boating use. Since boating in the project area is very limited, a canoe portage route around the project site is unnecessary.

2.Fishing access: The applicant indicates that public access for fishing would continue to be available at the project site. The applicant points out that an empty parking lot below the Adams Street Dam provides adequate parking near the edge of the stream. This parking area, however, is located outside of the project boundary. Since there is no data to suggest that the area recieves significant fisherman use, there is no need for the applicant to include this parking area within the project boundary. The applicant would provide parking for fishermen adjacent to the project intake structure and along Depot Street within the project boundary, but does not indicate who would maintain these areas nor describe the size and specific location of these areas. In order to protect existing recreational opportunities at the Depot street dam site, it is important that parking for fishermen is maintained. The licensee therefore should file for Commission approval a plan for providing and maintaining existing parking facilities at the Depot street dam.

3.Avoidance and mitigation of impacts to the historic iron and slate works identified in the project area: The SHPO recommends measures to avoid and mitigate impacts to these historic sites (letter from Eric Gilbertson, Deputy State Historic Preservation Officer, Vermont Agency of Development and Community Affairs, Montpelier, Vermont, March 18, 1987). The staff agrees that the project would not adversely affect these sites, provided that the recommended avoidance and mitigative measures are implemented. These measures include: fencing portions of the sites during construction; documenting several buildings and a millrace associated with the sites if the structures are removed or altered and are determined to be contributing components to the historical significant of the sites; and evaluating and avoiding or mitigating impacts to any historic remains associated with the sites that are discovered during construction.

To comply with the National Historic Preservation Act, the Commission must ensure that avoidance and mitigative measures are implemented to protect and to document the significant historical remains in the project area. To show that these measures have been implemented properly, the licensee should file a copy of a letter from the SHPO, certifying that the measures have been implemented after completion of construction and before any commercial operation of the project.

4. Minimum flows: Operation of the project would reduce the amount of water passing through the approximately 100-foot-long bypassed reach of the Castleton River. Under existing conditions, all flows in the river pass over the project dam. The water that passes over the dam keeps the water quality high and maintains the amount of aquatic habitat at a level that protects aquatic resources in the proposed bypassed reach. The AEC and the Department of the Interior (Interior) recommend that the applicant maintain a minimum flow relase of 10 cfs over the dam into the bypassed reach at all times to preserve water quality and to provide sufficient habitat to protect resident fishery resources. Interior and the AEC also recommend that the applicant file a plan, which the agencies would review, showing the design and hydraulic sizing calculations of the minimum flow release structure or the technique that would be used to pass the required minimum flow. Staff agrees with these recommendations. The applicant agrees to these recommendations.

The proposed bypassed reach is primarily a cascade with a small pool in the downstream end. Reducing the streamflow between dam and the powerhouse discharge would affect the resident fish population of the Castleton River by reducing the quality and quantity of aquatic habitat in the bypassed reach. The habitat between the powerhouse discharge and the base of the dam is used by various species of fish indigenous to the project area, including rainbow trout and brown trout. Any flow reduction caused by the project in the bypassed reach of the river could reduce usable habitat and could inflict long-term, adverse effects on the fish population of the Castleton River. Reductions of flows over the dam might also cause water quality to deteriorate during the summer by reducing the aeration effect of the dam.

To minimize the effects of the project on fishery resources and on water quality of Castleton River, the licensee should release a minimum flow into the bypassed reach from the diversion. The 10-cfs minimum flow, which is exceeded approximately 95 percent of the time, should be adequate to maintain the dissolved oxygen (DO) levels and water temperature of the bypass reach and to provide sufficient habitat to protect resident fishery resources. The licensee therefore should release a minimum flow of 10 cfs over the spillway into the bypassed reach of the river.

To ensure that the required minimum flows are provided at all times, the licensee, after consultation with the AEC and Interior, should file for Commission approval a plan for providing the minimum flow to the bypassed reach of the Castleton River. The plan should include the following information: (1) a description of the method that will be used to provide the minimum flow; (2) hydraulic design calculations of the minimum flow structure; and (3) the comments from the consulted agencies on the plan.

5. Mode of operation: The AEC recommends that the applicant operate the project in a run-of-river mode, so that the instantaneous downstream flow from the project, including spillage, releases, and leakage, is equal to the inflow to the project impoundment. The AEC also requests that the impoundment not be drawn down without prior written approval by the WQD.

The AEC further recommends that all flows less than the combined minimum hydraulic capacity, plus the proposed 10-cfs minimum flow release (a total of 40 cfs), should be spilled over the dam to maintain water quality of the Castleton River. The applicant agrees to this condition. Interior recommends that the applicant release a minimum instantaneous flow below the powerhouse of at least 48 cfs or the inflow to the project, whichever is less, to protect downstream aquatic resources. Operating the project in a run-of-river mode and maintaining the reservoir pool elevation at or above the crest elevation of the

existing dam would minimize the effects on the fishery resources and on the riparian habitat by eliminating water level fluctuations in the project impoundment and by reducing sudden changes in flow downstream of the powerhouse discharge.

Providing the proposed minimum flow to the bypassed reach, as discussed in section G.4., in addition to operating in a run-of-river mode, maintaining the reservoir elevation at or above the crest at the dam, and eliminating reservoir elevation fluctuations, would ensure that all flows less than 40 cfs would be spilled over the dam and would maintain high water quality in the Castleton River.

Further, operating the project in a run-of-river mode would ensure the release of Interior's recommended instantaneous release below the powerhouse of at least 48 cfs or the inflow to the project, whichever is less.

To minimize the impacts to the fishery resources and to the riparian habitat of the Castleton River, the licensee should operate the project in a run-of-river mode and should maintain the reservoir pool elevation at or above the crest elevation of the existing dam. The licensee would be required to reach agreement with the AEC and the FWS to modify the run-of-river mode of operation temporarily under nonemergency circumstances.

6. Impingement and turbine mortality of outmigrating salmonids: To prevent project induced injury or mortality to fish, the AEC recommends that the applicant construct fish passage facilities that would prevent entrainment of fish. These facilities would include racks, screens, or other devices to prevent downstream migrating fish from passing through the turbine. Further, AEC states that, before construction, the applicant must submit plans relating to fish passage facilities to the Fish and Wildlife Department of the AEC for review and written approval. The applicant proposes to screen the intake to prevent entrance of fish.

Rainbow trout and brown trout living in the reach of the Castleton River, that would be affected by the proposed project, occasionally move downstream and pass through the affected reach. Outmigrating salmonids should be protected from impingement and entrainment. An appropriately designed device to minimize impingement and entrainment, located at the project intake, would provide adequate protection.

The licensee, after consultation with the AEC and the Interior, should file for Commission approval functional design drawings of the fish screens and plans for installing and maintaining the facilities, along with the comments from the AEC and Interior on the design and plan. The Commission reserves the right to approve project features, but would consider the comments of the consulted agencies in any decision regarding the design of fish screens.

7. Location of the powerhouse discharge: In the Castleton River immediately below the project dam, there is a high gradient reach or cascade that flows into a small pool. The AEC recommends that the tailrace should empty into this pool to maintain the water circulation in the pool and protect water quality. The applicant response states that there is a misunderstanding and that the AEC previously agreed to allow the tailrace discharge to be located in a second pool immediately below the first pool proposed in the application.

In the water quality certificate issued by the WQD, the AEC modified this position, describing the location of the tailrace discharge to be just below the control section of a small pool located at the base of the cascade.

It is essential to maintain high water quality in the bypassed reach of the Castleton River. Providing a minimum flow to the bypassed reach would maintain water circulation and would protect water quality in the first pool below the cascade. Therefore, locating the tailrace discharge just below the hydraulic control of the first pool below the cascade, as proposed by the applicant, would not adversely affect the water quality in the pool.

8. Future construction of fish passage facilities: Interior recommends that the applicant should provide fish passage facilities when prescribed by the Secretary of the Interior as authorized under Section 18 of the Federal Power Act.

FWS is currently involved in an effort to develop salmonid fisheries in Lake Champlain. The Castleton River is a tributary of the Poultney River which flows into Lake Champlain. It is in the public interest to include in the license a condition that reserves Interior's authority to prescribe fishways if and when they are needed in the future. The licensee, therefore, should construct, operate, and maintain fishways when ordered by the Commission, upon prescription by the Secretary of the Interior, and should permit Interior to inspect project records pertinent to fishways, and to investigate and prepare a report documenting the effectiveness of such fishways.

H. ENVIRONMENTAL IMPACTS

1. Assessment of adverse and beneficial impacts expected from the project as proposed by the applicant (P) (section C(2)); the proposed project with the staff's recommended mitigation (Ps) (section G); and any other alternative considered (A) (section C(4)).*

Resource	Impact P	Impact Ps	Impact A	Remarks
a. Geology-Soils	1AS			
b. Streamflow	1AL			b. Project operation would cause a reduction of flow in the bypassed reach.
c. Water quality: Temperature	0			
Dissolved oxygen	0			c. Project construction would cause a minor, short-term increase in turbidity and sedimentation.
Turbidity and sedimentation	1AS			
d. Fisheries: Anadromous	0			d. Increased turbidity and sedimentation during construction would result in minor impacts to fishery resources.
Resident	1AS			
e. Vegetation	1AS			e. Less than one acre of sparse vegetation would be removed and replanted.
f. Wildlife	1AS			f. Wildlife would avoid the project area during the construction phase.
g. Cultural: Archeological	0			
Historical	2AL	1AL		
h. Visual quality	1AL			
i. Recreation	1AS			i. Construction activities would create minor, short-term disturbances to fishermen using the immediate project area.
j. Land use	0			
k. Socioeconomics	0			

* The assessment reflects the adoption of any terms and conditions set by the fish and wildlife agencies, in addition to the applicant's proposed mitigation. Assessment symbols indicate the following impact levels:

0 = No impact; 1 = Minor impact; 2 = Moderate impact; 3 = Major impact;
A = Adverse; B = Beneficial; L = Long-term impact; S = Short-term impact.

2. Impacts of the no-action alternative.

Under the no-action alternative, there would be no construction of project facilities and no changes to the existing physical, biological, or cultural components of the area. Electrical power that would be generated by the proposed hydroelectric project would have to be generated from other available sources or offset by conservation measures.

3. Recommended alternative (including proposed, required, and recommended mitigative measures): _X_ Proposed project. ___ Alternative. ___ No action.

4. Reason for selecting the preferred alternative.

The proposed project is the preferred alternative because the generation of electricity from a renewable resource would reduce the use of fossil-fueled plants and because the applicant could adequately mitigate the environmental effects of building and operating the project.

I. UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS OF THE RECOMMENDED ALTERNATIVE

During project construction, increased erosion, turbidity, and sedimentation would have minor, short-term effects on water quality and fish. During project operation, there would be a minor, long-term reduction of flows in the bypassed reach.

J. CONCLUSION

_X_ **Finding of No Significant Impact.** Approval of the recommended alternative [H(3)] would not constitute a major federal action significantly affecting the quality of the human environment; therefore, an environmental impact statement (EIS) will not be prepared.

___ **Intent to Prepare an EIS.** Approval of the recommended alternative [H(3)] would constitute a major federal action significantly affecting the quality of the human environment; therefore, an EIS will be prepared.

K. LITERATURE CITED

1. Geoffrey Shadroui. 1986. Application for license for Fair Haven Water Power Project, FERC Project No. 9541, Vermont. April 11, 1986.

2. Thomas, P. 1986. Preliminary archeological assessment for the Fair Haven Hydroelectric Project, Fair Haven, Vermont. report no. 27. Department of Anthropology, University of Vermont, Montpelier, Vermont. 18 pp.

L. LIST OF PREPARERS

Name	Position title
Thomas C. Camp	Landscape Architect (Coordinator)
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Spencer Gakner	Ecologist
James Keany	Ecologist
John Mitchell	Writer/Editor

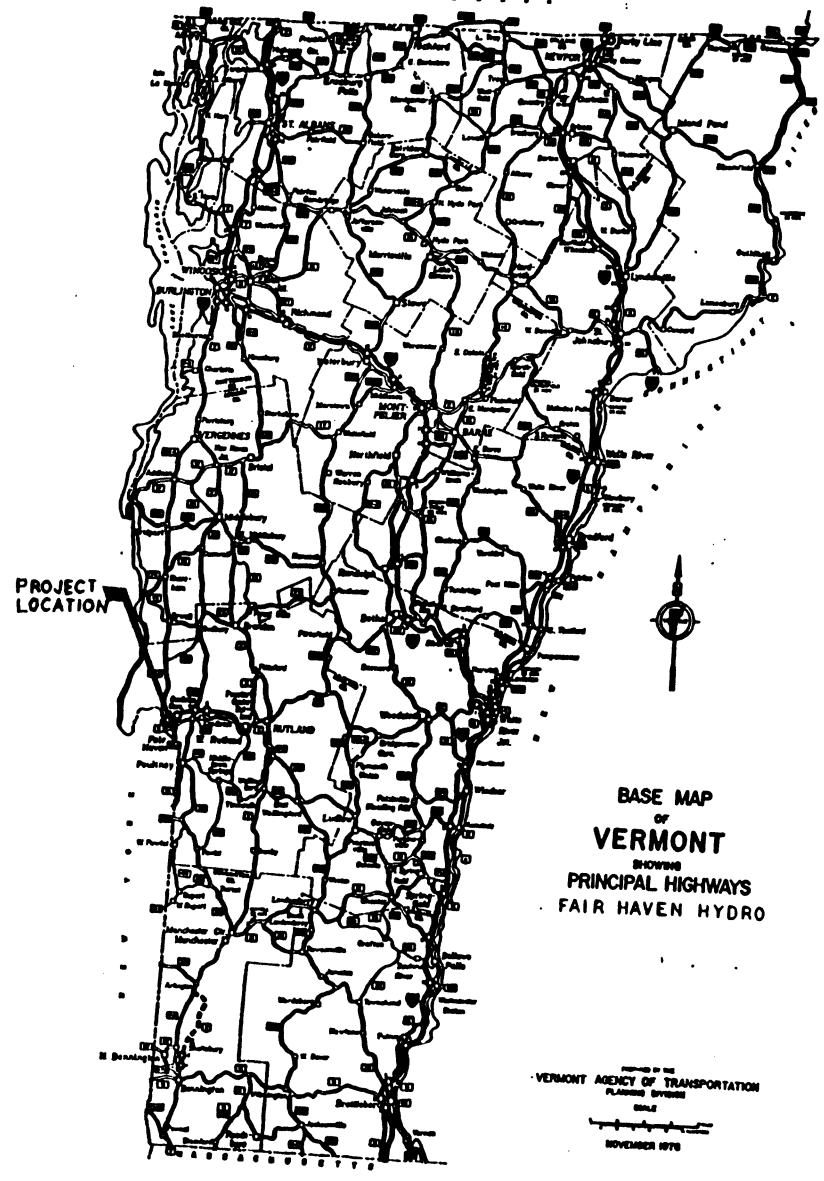

Figure 1. Fair Haven hydroelectric project, FERC no. 9541 (Source: Geoffrey Shadroui, 1986, application, exhibit G).

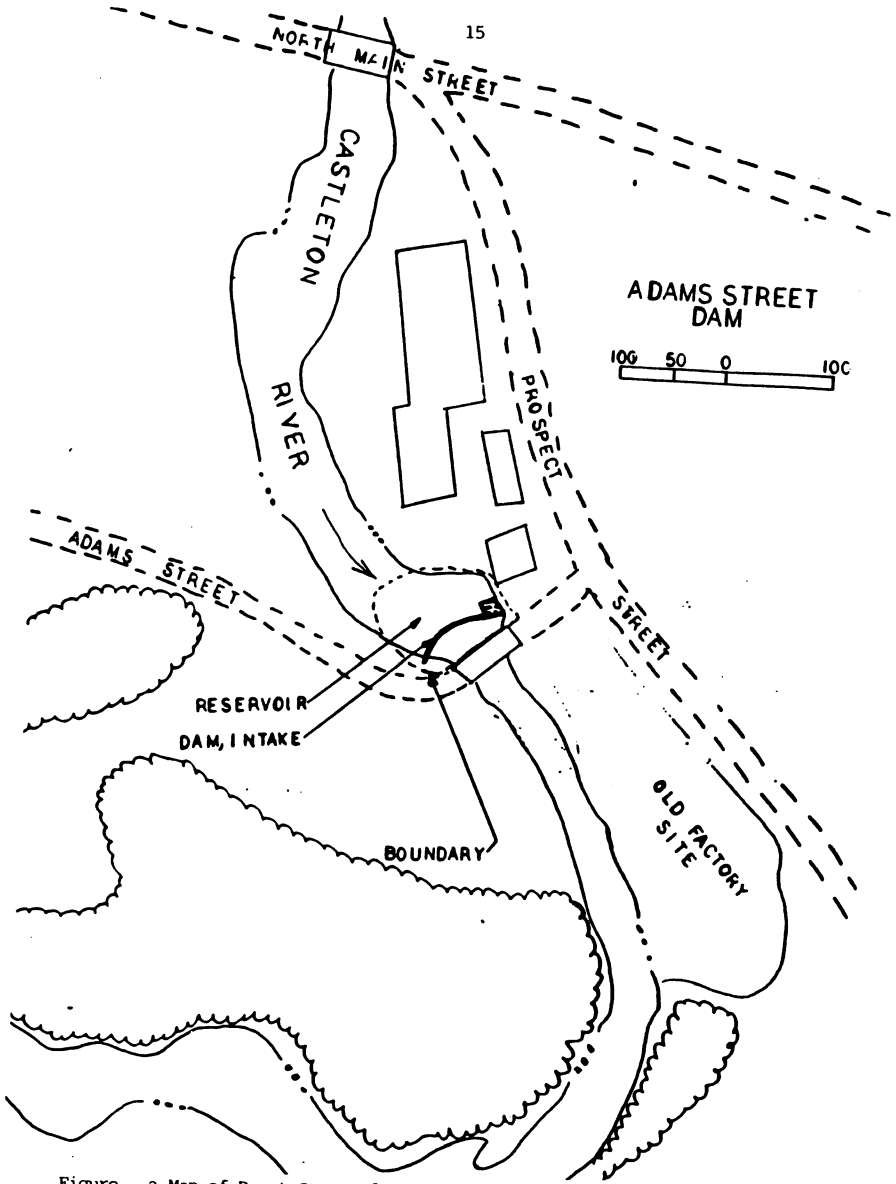

Figure 2. Map of Depot Street dam site, FERC no. 9541 (Source: Geoffrey Shadroui, 1986, application, exhibit G).

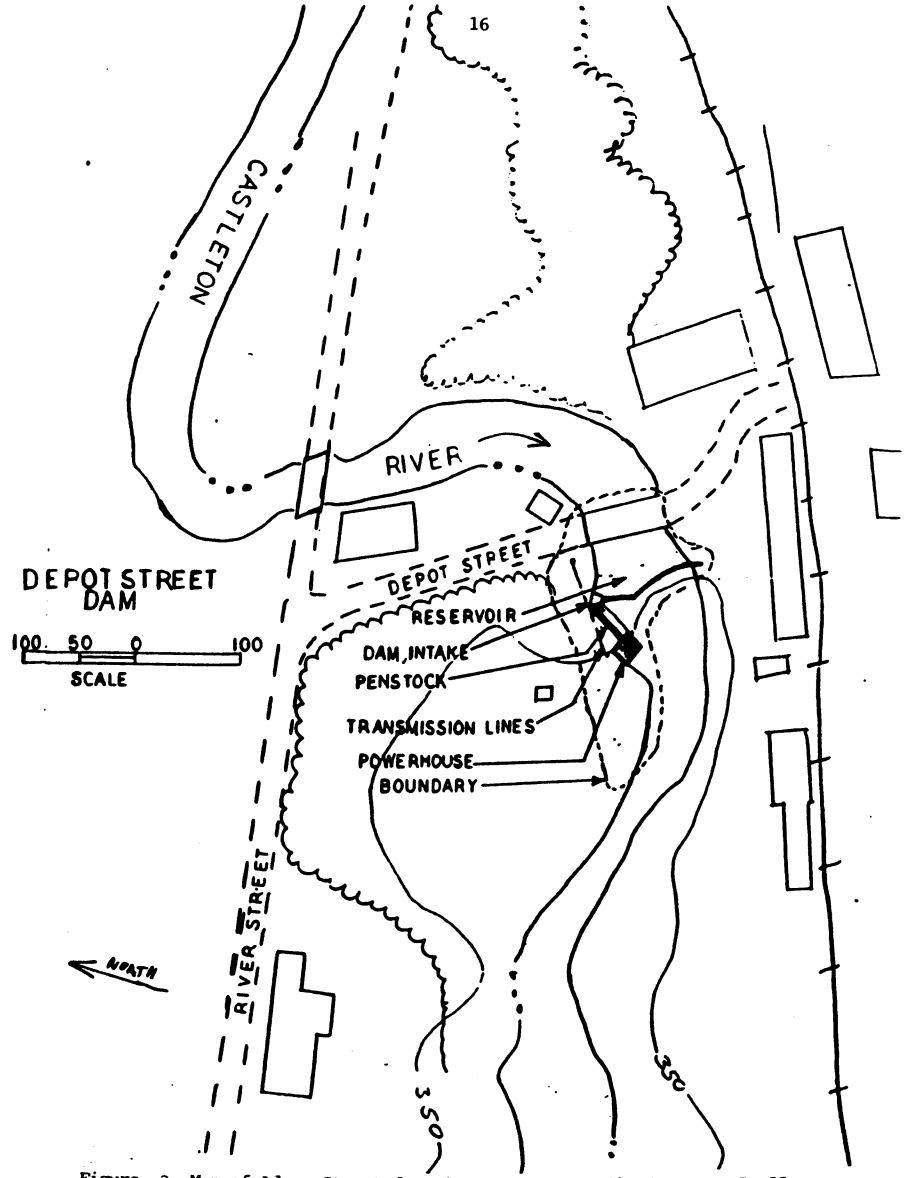

Figure 3. Map of Adams Street dam site, FERC no. 9541 (Source: Geoffrey Shadroui, 1986, application, exhibit G).

SAFETY AND DESIGN ASSESSMENT
FAIR HAVEN PROJECT
FERC No. 9541-001-Vermont

DAM SAFETY

The Commission's New York Regional Director classified both the existing upper Depot Street Dam and the lower Adams Street Dam as low hazard on July 9, 1986. The dams are stone gravity type structures with their entire lengths acting spillways. Both the dams show sign of surface deterioration but are in sound condition otherwise. The Depot Street Dam is 6 feet high and 75 feet long with an impoundment of 4 acre-feet. It is located at the top of a small cascade about 60 feet long. The Adams Street Dam is 9 feet high and 60 feet long with an impoundment of 3.5 acre-feet. The dams are classified low hazard because their failure would not cause loss of life or result in intensive property damage; therefore the safety of the dam is adequate.

PROJECT DESIGN

Only the Depot Street Dam would be utilized for generation purposes. The powerhouse would contain a 215-kW generating unit equipped with an Ossberger Crossflow turbine to provide generation over a wide range of flows. The Adams Street Dam included in the project would provide oxygenation for flows spilled over the dam.

ECONOMIC EVALUATION

A proposed project is economically beneficial so long as its projected levelized cost is less than the long-term levelized cost of alternative energy to any utility in the region that can be served by the project. The staff has identified projected long-term levelized alternative energy costs in the region of up to 111 mills/kWh. Since the levelized cost of energy from the project is estimated to be 72.7 mills/kWh, the project is estimated to provide a levelized economic benefit of 38.3 mills for each kilowatt hour of energy produced, or about $32,000 annually.

Based on the 38.3 mills/kWh differential between the levelized cost of the project energy, and the long-term levelized cost of alternative energy, the staff is reasonably confident that there will be a market for the project power at prices sufficient to support the financing and operation cost of the project.

WATER RESOURCE PLANNING

The project would operate run-of-river. The single-unit powerplant would operate between the hydraulic range of 30 cfs and 170 cfs at an average head of 22 feet. The average annual generation is estimated at 850,000 kWh.

The State of Vermont Agency of Environmental Conservation recommended a minimum flow of 10 cfs or inflow, whichever is less, for the protection of fisheries, water quality and aesthetics. The applicant agreed to the proposed minimum flow requirement.

The drainage area at the project site located on Castleton River is 95 square miles. The Castleton River is a tributary to Poultney River. The drainage area at the USGS gaging station located downstream on Poultney River at Poultney, Vermont is 187 square miles. Of the 187 square miles, drainage area for the Castleton River makes up 99 square miles. A stream flow of 180 cfs, which is the combined minimum flow and hydraulic capacity of the powerplant is equalled or exceeded 21 percent of the time on the flow-duration curve. The estimated average annual generation of 850,000 kWh is based on a minimum flow of 10 cfs. The project site is adequately developed.

No specific State and Federal agency comments or recommendations were made addressing flood control, navigation, water supply, or irrigation requirements in the basin.

The Lake Champlain Drainage Basin Planning Status Report includes no projects, either proposed or constructed on Poultney River or its tributaries that this project would impact and the project would not conflict with any pending applications for exemption, license or preliminary permit.

Based on the above, staff concludes that the proposed Fair Haven Project adequately utilizes the available flow and head at the site and would not conflict with any existing or planned water resource developments in the basin.

CONSERVATION PLANNING

The proposed project is being proposed by a private developer and therefore not subject to the provisions of ECPA.

EXHIBITS

The following portions of Exhibit A and the following Exhibit F drawings conform to the Commission's rules and regulations and are included in the license.

Exhibit A: Item 1(i) entitled "Generating Unit."
Item 1(ii) entitled "Hydraulic Turbine."
Item 1(vii)(a) entitled "Transmission Line."

Exhibit F Drawing	FERC No.	Descriptions
1	1	Project Profile
2	2	Existing Dam-Depot Street
3	3	Proposed Powerhouse-Plan and Section
4	4	Proposed Powerhouse-Section
5	5	Existing Dam-Adams Street

Form L-15
(October, 1975)

FEDERAL POWER COMMISSION

TERMS AND CONDITIONS OF LICENSE FOR UNCONSTRUCTED MINOR PROJECT AFFECTING THE INTERESTS OF INTERSTATE OR FOREIGN COMMERCE

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project works shall be constructed in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes

made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Upon the completion of the project, or at such other time as the Commission may direct, the Licensee shall submit to the Commission for approval revised exhibits insofar as necessary to show any divergence from or variations in the project area and project boundary as finally located or in the project works as actually constructed when compared with the area and boundary shown and the works described in the license or in the exhibits approved by the Commission, together with a statement in writing setting forth the reasons which in the opinion of the Licensee necessitated or justified variation in or divergence from the approved exhibits. Such revised exhibits shall, if and when approved by the Commission, be made a part of the license under the provisions of Article 2 hereof.

Article 4. The construction, operation, and maintenance of the project and any work incidental to additions or alterations shall be subject to the inspection and supervision of the Regional Engineer, Federal Power Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of the project and for any subsequent alterations to the project. Construction of the project works or any feature or alteration thereof shall not be initiated until the program of inspection for the project works or any such feature thereof has been approved by said representative. The Licensee shall also furnish to said representative such further information as he may require concerning the construction, operation, and maintenance of the project, and of any alteration thereof, and shall notify him of the date upon which work will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow said representative and other

officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction, maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative.

The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 7. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 8. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 9. The operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Commission may prescribe for the purposes hereinbefore mentioned.

Article 10. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 11. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 12. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall

permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 13. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 14. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 15. The Licensee shall consult with the appropriate State and Federal agencies and, within one year of the date of issuance of this license, shall submit for Commission approval a plan for clearing the reservoir area. Further, the Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition,

all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. Upon approval of the clearing plan all clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 16. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 17. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 18. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.