WATER QUALITY CERTIFICATION
(P.L. 92-500, Section 401)

In the matter of: Mr. Edwin F. Slowick
Moretown Hydro Energy Company
R.R. 1, Box 474
Hillsboro, NH 03244
Application for Moretown #8
Hydroelectric Project

The Water Quality Division of the Vermont Department of Environmental Conservation (the Department) has reviewed a request made by Mr. Kenneth Mitchnick representing Moretown Hydro Energy Company (the applicant) on April 30, 1987 for recertification of the Moretown #8 Hydroelectric Project. A project description and set of plans have been used as supporting information. The Department has made the following findings:

1. The Moretown #8 Hydroelectric Project has been acquired by Moretown Hydro Energy Company from Pocantico Development Associates, Inc., Richard Hungerford and Kris Dyrland. The Moretown Hydro Energy Company is presently owned by Mr. Edwin F. Slowick.
2. The project has been substantially reconfigured from the original project certified on August 27, 1982. The design for this reconfigured project was presented in a certification application filed by Mr. Ralph B. Lash,

Mr. Thomas Stuwe and Mr. Daniel Myers on June 4, 1986. Except for the shortening of the proposed penstock, the redesign of the project tailrace, the increase in project hydraulic capacity, the enlargement of the powerhouse, and the realignment of the powerhouse access road, the project is the same as that of Messrs. Lash, Stuwe and Meyers, whose application was denied on the basis of a time limitation technicality.

3. The Moretown #8 Hydroelectric Project is proposed for construction at the existing Ward Dam on the Mad River about 1.5 miles upstream of the Winooski River confluence. The site was utilized by Green Mountain Power Corporation for electrical generation up until 1959. The earlier powerhouse, which is in ruins, is located on the north bank about 1,000 feet downstream of the dam. The dam crest is partially breached to elevation 523.02' NGVD, the original design crest being 526.0' NGVD.

4. The project includes the rebuilding of the intake structure to accommodate a second gate, stoplog slots and new trashracks; installation of two 40 foot long, six foot diameter, steel penstocks; construction of a new 27' x 20' x 21' high concrete powerhouse for two turbines; and tailrace excavation. Approximately 2,500

cubic yards of silt would be dredged from around the intake structure.

5. The turbines would have a hydraulic range of 40 cfs to approximately 480-530 cfs. The normal pool level would be 524.50' NGVD, and the design minimum tailwater elevation would be 490.50' NGVD.

6. The project would be operated strictly run-of-the-river, maintaining the pond level at elevation 524.50' NGVD when inflows are within the capacity range of the turbines. A continuous minimum spillage flow of 25 cfs would be provided with one-third of it used seasonally to operate a downstream fish passage facility near to the left abutment. The project would not operate during periods when the inflow is less than 65 cfs. When inflows exceed the upper limit of the turbines plus 25 cfs, the pond level would increase and the excess water would be spilled.

7. Substantial concrete repair work is necessary. The downstream side of the dam will be resurfaced. The thickness of concrete will not exceed twelve inches. This will minimize the encroachment into the plunge pool.

8. A popular, state-owned public access to the Mad River is located about 1.5 miles upstream of the dam. Gravel

shoals at the access provide an excellent beach area, and deep pools are available for swimming. The area's use is heavy on hot summer days. In order to protect this use, the Department has determined that the impoundment must be managed to minimize backwater influences on the beach and swimming area. Loss of beach area and siltation are two issues that have been raised.

The dam crest would be leveled off at elevation 524.50' NGVD. This is higher than the present breach elevation of 523.02' NGVD; however, the upstream stages would be increased only when flows are less than about 300 cfs. With the turbine capacity, stages would be slightly reduced at higher flows.

9. Flows on the Mad River are gaged by the U.S. Geological Survey at a station located about 2.3 miles upstream of the dam. The gaging station (#428800) has been in operation since October, 1928. Flows at the gage are presently unregulated. Prior to 1958, there was some degree of flow regulation due to hydrogeneration upstream. The intervening drainage area between the gaging station (drainage area 139 square miles) and the Ward Dam is 3.4 square miles, giving a total watershed area of 142 square miles at the site. Following are

several hydrologic values for the site, based on a direct drainage area proration using the gage:

Parameter	Value (cfs)
Mean flow	260
95% exceedance	28
50% exceedance (median)	133
10% exceedance	600
7Q10	15

10. The Mad River has an excellent coldwater fishery, comprised primarily of brown, rainbow and brook trout. Due to its geographic location in an important scenic and recreational corridor, it is fairly heavily fished. The river is also considered as a key tributary of the Winooski River in terms of providing spawning grounds for the Vermont Department of Fish and Wildlife's programs for the establishment of steelhead and landlocked Atlantic Salmon fisheries in Lake Champlain and its tributaries.

Both the salmon and the steelhead, a migratory rainbow trout, would be trapped at Winooski during the spring spawning run and trucked throughout the Winooski Basin in order to reach spawning areas. Although some of the lower Mad River consists of bedrock gorge sections, the majority of the river contains good substrate conditions for salmonid spawning. Riffle sections with coarse granular streambed material are preferred, and quality sections are found downstream of

the project. Pools in the bypassed reach have good quality for salmonid residence.

The applicant has agreed to participate in the funding of the trap-and-truck operation.

11. The strict run-of-the-river operating mode should ensure that the quality of the river for salmonid residence and spawning will be preserved. Passage of a minimum instantaneous flow of 25 cfs over the dam will maintain the bypassed-section pools fresh.

12. The Mad River has been classified by the Vermont Water Resources Board as Class B waters. Class B waters are managed for a level of quality exhibiting good aesthetic value and providing high quality habitat for aquatic biota, fish and wildlife. Uses include public water supply with filtration and disinfection; irrigation and other agricultural uses; and swimming and recreation.

The river is a coldwater fish habitat. The standard for dissolved oxygen concentration is 6 mg/l or 70 percent saturation at all times except in areas where a higher standard has been prescribed for important salmonid spawning or nursery reaches.

13. The water quality of the Mad River is excellent. The latest available sampling data was collected on June 21, 1957. The lowest D.O. level (7.4 mg/l) was

measured at the U.S.G.S. gage, the most downstream sampling station. At the station the river flow on that date was 49 cfs, and the river temperature was 25°C. The D.O. level was at 88% saturation.

With the elimination of the discharges of domestic waste to the river, it may be expected that water quality has improved somewhat since 1957. Between the gage (datum of 543.93' NGVD) and the proposed pool, good aeration characteristics in riffle sections of stream exist. It is doubtful that the project will significantly affect D.O. levels in the Mad River. During extreme summer low flows, the project will not be operated and all flows will be spilled.

CONDITIONS

In certifying that this project will meet Vermont Water Quality Standards, the Department sets the following conditions:

A. The facility shall be operated in a strict run-of-the-river mode where instantaneous flows below the tailrace shall equal instantaneous inflow to the impoundment at all times. The impoundment may not be drawn down without prior approval by the Department. When the facility is not operating, all flows shall be spilled at the dam.

B. When the project is operating, a minimum instantaneous flow of 25 cfs shall be maintained in the penstock-bypassed section of stream at all times. Before the start of dam rehabilitation, the applicant shall furnish a description, hydraulic design calculations, and plans for the measure to be used to pass this minimum flow. No dam work shall occur until after the measure has been approved by the Department.

C. The project shall be managed to hold the pool level at 524.50' NGVD during operation except when inflows exceed the project capacity.

D. The applicant shall file for review and written approval, prior to the start of construction , a comprehensive erosion control and water management plan to cover construction activities. This plan shall address the maintenance of stream flow during construction and measures taken to prevent the discharge of sediment into State waters. It shall also include plans for the protection of fish inhabiting the plunge pool at the dam during construction. It may be beneficial to consult with the Department during the development of this plan.

E. The applicant shall submit a plan for downstream fish passage to the Department of Fish and Wildlife (Fish and Wildlife) for review and written approval prior to project construction. This plan shall include provisions to:

1) minimize passage of fish into a generation unit(s) if injury or mortality can result
2) minimize impingement of fish on devices or structures used to accomplish 1)
3) and convey fish safely and effectively downstream of the facility

The project shall not be operated without the approved passage plan in place. The applicant shall file a copy of the approval letter and any appropriate

plans with the Department within two weeks of Fish and Wildlife's action. Early consultation with Fish and Wildlife is advised so the intake design conforms with passage requirements.

F. The applicant shall insure that every reasonable precaution is taken during construction to prevent the discharge of petro chemicals, wet concrete and debris to State waters.

G. Debris associated with project construction and operation, including trashrack debris, shall be disposed of properly.

H. Any future desilting of the dam impoundment shall be done in accordance with the Agency of Natural Resources Desilting Policy, a copy of which is attached. The Department shall be contacted prior to any desilting activity.

I. Any significant changes to the project, including project operation, must be submitted to the Department for prior review and written approval. Changes shall not be effected until after approval has been granted.

J. The applicant shall provide the Department with an as-built set of plans and a copy of the turbine rating curves for the record within one year of the completion of construction.

K. The applicant shall notify the Department when project construction has been completed. This shall be done in writing within two weeks of completion.

The Department maintains continuing jurisdiction over water quality aspects of this project including resource management provisions of the Vermont Water Quality Standards.

Dated at Waterbury, Vermont this 29th day of July, 1987.

Reginald A. LaRosa,
Acting Commissioner
Department of
Environmental Conservation

JRC/vld