

AMENDED WATER QUALITY CERTIFICATION

(P.L. 92-500)

In the matter of: Emerson Falls Hydro, Inc.
R.F.F.2
P.O. Box 66
St. Johnsbury, VT 05819
Application for Emerson Falls
Hydroelectric Project

The Water Quality Division of the Vermont Department of Water Resources and Environmental Engineering (the Department) originally issued this certification to Emerson Falls Hydro Associates on September 17, 1984. The Department was informed of a name change by letter dated February 26, 1985. To reflect the change, this certificate is being reissued to Emerson Falls Hydro, Inc. as the new applicant and responsible party. The Department made the following findings based on its review of the March 30, 1984, Water Quality Certification application and the June 1, 1984, Federal Energy Regulatory Commission exemption application:

1. The applicant proposes to develop a hydroelectric facility at Emerson Falls on the Sleepers River in the Town of St. Johnsbury 2 1/2 miles above the river's confluence with the Passumpsic River. The project is located at the former site of a U.S. Fish and Wildlife Service Fish Hatchery. The project would utilize an existing concrete spillway, diversion structure and headworks.

2. The existing diversion structure is approximately 200 feet wide and 1 to 6 feet high. The elevation of the spillway crest is 639.5' (datum unknown). The dam will not be modified.

No flashboards are proposed. The dam creates an impoundment with a surface area of 0.95 acre and negligible storage volume.

3. Proposed construction includes extending the existing intake structure approximately 15 feet in length to facilitate installation of trashracks and a headgate. A 42 inch diameter steel penstock 390 feet long would be installed and completely buried. A powerhouse would be constructed at the base of the falls about 60 feet from the right (west) streambank. A tailrace 60 feet in length would be excavated below the powerhouse to divert flows back into the river. Normal tailwater elevation would be 592.0'.

4. The proposed generating equipment would consist of a single cross flow type turbine and a generator. The installed capacity would be 230 kw under a design head of 47 feet. The hydraulic operating range of the proposed turbine would be 14 to 88.3 cfs.

5. The facility would be operated in a run-of-the-river mode where instantaneous outflow below the tailrace equals instantaneous inflow to the impoundment at all times.

6. The drainage area at the project site is 43 square miles. The U.S. Department of Agriculture operates a weir (watershed I.D. code 67005) 20 yards upstream of the project as part of a program to collect hydrologic data for experimental watersheds in the U.S. The applicant generated a flow duration curve for the project site based on flow records from this weir for the period 1960 to 1974. The following hydrologic values have been estimated for the project site:

<u>Parameter</u>	<u>Value (cfs)</u>
Mean Flow	70
95% Exceedance	7
50% Exceedance (median)	40
10% Exceedance	165

7. The Sleepers River at the project site supports a rainbow trout and brook trout fishery. The 390 foot bypassed section of stream is primarily a steep cascade which presents a natural barrier to the upstream migration of fish. Spawning habitat is limited in the bypassed section due to steepness and substrate composition. Some pools are located at the base of the cascade, however. These pools are important as refuge areas for the fishery during periods of low flow and the loss of these pools due to an insufficient minimum flow in the bypass would have an adverse impact on this fishery.

8. The Sleepers River at the project site is classified as Class B by the State of Vermont Water Resources Board. Class B waters are managed to be of a quality which consistently exhibits good aesthetic value and provides high quality habitat for aquatic biota, fish and wildlife. Managed uses include public water supply with filtration and disinfection; irrigation and other agricultural uses; swimming, and recreation.

The Sleepers River is designated as a cold water fish habitat. Dissolved oxygen content of these waters shall not be less than 6 mg/l or 70 percent saturation at all times. Higher standards may be applied where the Secretary of Environmental Conservation determines significant salmonid spawning or nursery areas exist.

9. The Department uses the U.S. Fish and Wildlife Service Flow Recommendation Policy of 0.5 cfsm as a basis for establishing minimum flow requirements at hydroelectric projects. At the project site this flow is equal to 22 cfs. The applicant originally proposed a minimum flow requirement in the bypassed section of stream equal to 10.0 cfs (0.23 cfsm). The Department found this proposal to be sufficient to maintain water quality standards, however, the Vermont Department of Fish and Wildlife considered it to be inadequate to keep the pools at the base of the falls fresh and maintain them as refuge areas for fish. The Department of Fish and Wildlife felt a minimum flow requirement equal to 15.0 cfs (0.35 cfsm) would be more suitable. The applicant consulted with the District Fisheries Biologist and has accordingly amended the minimum flow proposal by increasing it to 15.0 cfs. The applicant requests the option of reducing this flow requirement if it can be demonstrated after project start-up that a lower flow will adequately satisfy environmental concerns.

10. The Department of Fish and Wildlife finds that some minor streamwork at the downstream end of the bypass may be necessary to concentrate the minimum flow for improved utilization by the fishery resource. The necessity of this work would depend primarily on just where the tailrace enters the stream and the extent of tailrace construction in the actual streambed. According to Exhibit B.3 of the Federal Energy Regulatory Commission application dated June 1, 1984, the majority of tailrace construction would be outside of the stream proper.

11. The Department finds that the proposed minimum flow requirement of 15.0 cfs may not be adequate to maintain the high

aesthetic quality of Emerson Falls. The site is one of the highest cascades in the State and is heavily used by the public for recreational activities. For these reasons, the Department considers it an important public resource which should be protected. These issues, however, are not considered in the Department's review of the project's conformity with the technical requirements of the State Water Quality Standards.

CONDITIONS

Based on its review, the Department certifies that the proposed facility will not violate Vermont Water Quality Standards provided the following conditions are met:

A. When available from inflow, a minimum instantaneous flow of 15.0 cfs shall be maintained in the penstock-bypassed section of stream at all times. If the instantaneous inflow falls below this minimum, all flows shall be spilled at the dam. Before the start of construction, the applicant shall furnish a description, hydraulic design calculations, and plans for the measure to be used to pass this minimum flow.

B. The applicant shall consult with the Vermont Department of Fish and Wildlife during project construction to determine if minor streamwork is necessary to concentrate this minimum flow in the downstream end of the bypassed section of stream. If this work is found to be necessary, streamwork shall be completed prior to project operation.

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

D. The applicant shall file for review and approval, prior to the start of construction, an erosion control and water management plan to cover construction activities. This plan

shall address the maintenance of stream flow and measures taken to prevent the discharge of sediment, wet concrete, and other debris into State waters.

E. Debris associated with project construction and operation shall be disposed of properly.

F. Any desilting of the dam impoundment shall be done in accordance with the Agency of Environmental Conservation's Desilting Policy, a copy of which is attached. The Department shall be contacted prior to any desilting activity.

G. Any significant changes to the project must be submitted to the Department for prior review and written approval.

H. The applicant shall provide the Department with an as-built set of plans for the record.

I. No construction shall commence until after the Department issues written approval under Conditions A and C.


Jonathan Lash, Commissioner
Department of Water Resources
and Environmental Engineering

Dated at Montpelier, Vermont
this 18 day of April, 1985.

AHD/rh