

WATER QUALITY CERTIFICATION

(P.L. 92-500, Section 401)

In the matter of: Village of Lyndonville  
Electric Department  
Lyndonville, VT 05851  
Application for Great Falls  
Hydroelectric Project

The Water Quality Division of the Vermont Department of Water Resources and Environmental Engineering (the Department) has reviewed the Water Quality Certification application filed by letter dated November 16, 1983 from the Village of Lyndonville Electric Department (the applicant) and finds:

1. The applicant owns and operates an existing hydroelectric station at Great Falls on the Passumpsic River in the Town of Lyndon. The dam is known as Lyndon Dam. The station consists of three turbine/generator units, one of which was installed in 1979. During the 1979 modification, the two existing units were retired. The applicant is now proposing to reactivate those two units. They need no work outside of regular repair and maintenance.

2. The new 1200 kw unit will be operated automatically using pond level sensing devices. The two reactivated units will be manually operated. They are 430 horsepower, horizontal turbines, and each generator is rated at 350 kw.

3. The dam, constructed in 1927, is a concrete gravity structure with a height of 32 feet and a length of 160 feet.

4. The headrace and tailrace bypass about 750 feet of the Passumpsic River. A gross head of 63 feet is available with

two feet of flashboards in place. The head pond extends upstream to Vail Station, about 1.1 miles. The surface area of the impoundment at the top of the flashboards (elevation 668.4' NGVD) is 12 acres. The gross storage capacity is 85 acre-feet.

5. The drainage area at the site is 210 square miles. The U.S. Geological Survey operates a surface water gaging station (#1135500) at Passumpsic, drainage area 436 square miles. Some flow regulation occurs due to the operation of the hydroelectric projects in the basin, especially during periods of low flow. Without adjustment for regulation, the following hydrologic values for the site have been estimated using the Passumpsic gage:

<u>Parameter</u>	<u>Value</u>
Mean Annual Runoff	354 cfs (22.9 inches)
7Q10	42 cfs
95% Exceedance	63 cfs
75% Exceedance	117 cfs
50% Exceedance (Median)	200 cfs
25% Exceedance	390 cfs

6. The application states that no pond storage will be utilized, making the operation strictly run-of-the-river. The maximum hydraulic capacity of each of the older turbines is 75 cfs. A flow of 75 cfs is also the minimum stream flow constraint set by the Federal Energy Regulatory Commission license under Article 28. The original turbines will be used to pass the minimum flow, when available from inflow and will provide base-load output. When flows exceed 150 cfs, the new unit will be brought on line, and a combination of the units will be used up to the total plant capacity of 1900 kw and 450 cfs. Excess flows will be spilled at the dam.

7. From the upstream village limit of Lyndonville downstream to the dam, the Passumpsic River has been classified by the Vermont Water Resources Board as Class C waters. Class C waters are suitable for recreational boating, irrigation of crops not used for consumption without cooking; habitat for wildlife and for common food and game fishes indigenous to the region; and such industrial uses as are consistent with other Class uses.

From the dam to the EHV Weidmann Industries, Inc. outfall, a distance of about 2.7 miles, the river is managed as Class B waters. Class B waters are suitable for bathing and recreation, irrigation and agricultural uses; good fish habitat; good aesthetic value; and acceptable for public water supply with filtration and disinfection.

8. The river has not specifically been designated as to water management type under the Water Quality Standards. Typing is done for the protection and management of aquatic life. The river is considered Type I or II, which would set 6 mg/l as a minimum dissolved oxygen standard with the possible requirement of 7 mg/l at and near spawning areas.

The basin contains an excellent population of brook, rainbow and brown trout, with brook trout predominating. Habitat suitability for fish and macroinvertebrates is closely related to stream flow. Artificial flow regulation can severely limit the productivity of a stream.

Minimum flow requirements have been negotiated and are included in Article 28 of the FERC license. The project will continue to be strictly run-of-the-river with no operation out of storage. The minimum required release from the powerhouse is 75 cfs (0.36 cfs/square mile). This is supplemented by leakage at the dam. The leakage was estimated at 6 cfs on June 29, 1982 by the Department. A portion of this leakage was probably through the flashboards.

It is understood that manual operation of the older turbines can result in a drawdown of up to about two feet below the top of the flashboards. Also, some pool management has occurred here in the past. This would, of course, constitute operation out of storage. The Department interprets the application to mean that the pool will be held fixed in the future.

The Department of Fish and Game feels there is adequate protection of the fisheries resource in the bypassed section of stream with a leakage of 10 cfs at the dam and the existing backwater condition above the tailrace.

9. There are no known dissolved oxygen related water quality problems on this reach of the Passumpsic River. The Department has not, therefore, required spillage at the dam for reaeration purposes. Limited sampling results on record show dissolved oxygen levels all well above minimum standards.

10. There is no proposal to do any construction which would require earthworks or clearing; therefore, there will be no erosion or sedimentation as a result of this project.

Any future desilting would have to be separately approved by the Department in accordance with the Agency of Environmental Conservation Desilting Policy, a copy of which is attached.

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:

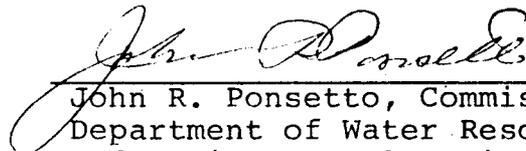
A. The project shall be operated in a strict run-of-the-river manner, with instantaneous flows below the tailrace maintained equivalent to instantaneous inflows to the impoundment. Under special circumstances (following replacement of flashboards or following a drawdown for maintenance operations), a minimum instantaneous flow of 75 cfs, or instantaneous project inflow, if less, shall be maintained below the tailrace until the pool is restored.

B. A minimum instantaneous flow of 10 cfs shall be released at the dam structure at all times.

C. The pool shall be maintained at a fixed elevation during operation. That elevation shall be at the top of the flashboards or at the dam crest when the flashboards are out.

D. Debris which is removed at the dam or trashracks shall be disposed of properly.

E. Any significant changes to the project including the operating scheme shall be submitted to the Department for prior review and approval.

  
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John R. Ponsetto, Commissioner  
Department of Water Resources  
and Environmental Engineering

Dated at Montpelier, Vermont  
this 26 day of Feb, 1986.

JRC/rh