

WATER QUALITY CERTIFICATION
(P.L. 92-500)

In the matter of: Sterling Enterprises, Inc.
24 Mineral Street
Springfield, VT 05156
Application for Slack Dam
Hydroelectric Project

By letter dated May 31, 1984, Mr. Floryan Lohutko, President, Sterling Enterprises, Inc. (the applicant) requested a Water Quality Certification from the Vermont Department of Water Resources and Environmental Engineering (the Department). Because the submission was considered inadequate, and the Department asked for additional information by letter dated June 13, 1984. On June 27, 1984, the applicant forwarded a copy of the Federal Energy Regulatory Commission Exemption Application (December, 1983) and a deficiencies response (June 22, 1984). The Department has reviewed this material and has made the following findings:

1. The applicant proposes to develop Slack Dam located on the Black River in the Village of Springfield. The dam is 4 1/4 miles upstream of the Black River's confluence with the Connecticut River. It is one of a series of five remaining dams on the Black River in the village area:

<u>Dam</u>	<u>River Mile</u>	<u>Crest Elevation</u>
Lovejoy Dam	4.04	343.6' NGVD
Slack Dam	4.26	364.5' NGVD
Comtu Falls Dam	4.36	392.8' NGVD
Gilman Dam (Factory Falls)	4.46	424.2' NGVD
Fellows Dam	4.70	435.5' NGVD

The dam was rebuilt in the 1930's and was a portion of the J.T. Slack Company Shoddy Mill complex. The dam is a gravity concrete structure with a crest length of about 92 feet and a height of 30 feet. It forms an impoundment with a surface area of about 0.9 acre and a volume of 10 acre-feet. The pool extends about 420 feet upstream to Comtu Falls, establishing the tailwater condition for the operating hydroelectric plant at Comtu Falls Dam.

2. The existing intake is located on the right (southwest) bank about 72 feet upstream of the dam. The masonry structure would divert water to two new steel penstocks, 112 feet long and three feet and five feet in diameter. A 250 kw and a 150 kw packaged bulb-type turbine/generator unit are to be installed, with the draft tubes discharging into a tailrace located about 80 feet downstream of the dam. The discharge is into the Lovejoy Dam pool, providing a gross head of 19.6 feet (normal pool levels of 364.1' NGVD and 344.5' NGVD).

3. The project will be "run in a semi-automatic mode with sensing devices signaling an automatic cut-off to the gate valve and turbine system..." (June 27, 1984 letter). The hydraulic (flow) capacity of the two units has not been provided. Using the power equation and a net available head of 19 feet, the capacities may be estimated at 184 cfs (250 kw unit) and 110 cfs (150 kw). The low end capacities are 118 cfs and 63 cfs, respectively.

4. The drainage area at the site is 190 square miles. A USGS surface water gaging station (#01153000) is located on the Black River 800 feet downstream of the North Springfield Flood Control Reservoir and has been in continuous operation since 1929. The drainage area at the gage is 158 square miles. Based on a simple drainage area proration, the following hydrologic values have been estimated for the site:

<u>Parameter</u>	<u>Value (cfs)</u>
Mean Flow	350 (24.9 inches/year)
50% Exceedance (Median)	165
95% Exceedance	35
7Q10	21

5. The Water Resources Board has designated the Black River from North Springfield Dam to the Connecticut River 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 fish indigenous to the region; and such industrial uses as are consistent with other Class uses. For the protection and management of aquatic life, the stream has been designated as Water Management Type I or II, setting the absolute minimum dissolved oxygen (D.O.) concentration at 6 mg/l. Type II streams are managed for mixed populations of rainbow trout, brown trout and smallmouth bass.

6. Seasonal high water temperatures limit the quality of the salmonid fishery in this river; however, a private 1978 fish population survey found that brown trout inhabit the Lovejoy Dam

pool. Also, the Vermont Department of Fish and Wildlife stocks rainbow and brown trout. Smallmouth bass and several other fish species were also sampled in 1978.

7. The applicant states that the operation will be run-of-the-river and that at least 0.5 inch of water will be spilled over the dam crest at all times. This corresponds to a minimum spillage of about 2-3 cfs. In the June 27, 1984 letter, the applicant states that the Lovejoy Dam backwater extends to Slack Dam; however, the Vermont Department of Fish and Wildlife District Fisheries Biologist indicates that a small riffle separates the plunge pool and the Lovejoy impoundment during low flows.

The U.S. Fish and Wildlife Service has recommended the passage of a minimum flow of 58 cfs based on their Flow Recommendation Policy for the New England Area. This policy prescribes minimum flows necessary for the perpetuation of indigenous aquatic organisms, using historical base flows during critical, seasonal periods. A flow of 58 cfs is the estimated August median flow for the Black River.

8. Limited water quality data is available at this time and no special studies have been conducted to predict, with any reasonable degree of certainty, what the development of the Springfield dam sites will mean in terms of future water quality in the Black River. It is important that the dissolved oxygen content of the river downstream of Springfield be sufficient to assimilate effluent from the municipal sewage treatment plant.

Lower D.O. levels caused by loss of reaeration at the dams would further limit the waste discharge and/or cause Water Quality Standards violations.

The applicant has submitted the results of five sets of grab samples collected in July/August, 1983. Unfortunately, the samples were collected well after the critical diurnal period for algae respiration (just before day break). The data does suggest that D.O. levels are influenced by respiration.

Without the completion of a detailed water quality study, the Department cannot accept the proposal to provide aeration for only 2-3 cfs. The Department will, therefore, require an interim minimum spillage of 48 cfs, which is the required minimum flow from the proposed North Springfield Project. This minimum flow shall be in force until such time as the applicant demonstrates to the satisfaction of the Department that the project will not significantly reduce D.O. concentrations.

9. If the project is operated strictly run-of-the-river, the downstream flow regime will be unaffected, minimizing the fishery impact of the project. A spillage of 48 cfs will be adequate to maintain the plunge pool fishery.

CONDITIONS

The Department certifies that this project will meet Vermont Quality Standards with the following conditions:

A. The project shall be operated as a strict run-of-the-river facility with instantaneous flows below the tailrace maintained equivalent to instantaneous inflows. No flashboards shall be installed across the dam crest.

B. When the project is not operating, all flows shall be spilled over the dam crest.

C. The project shall spill a continuous minimum flow of 48 cfs, or instantaneous project inflow, if less, over the dam crest. It is noted that the project will not be operational when flows are less than 63 cfs, the low end of the smaller turbine, plus the minimum spillage requirement of 48 cfs. The applicant shall provide the Department with a specific plan, including hydraulic calculations, showing how the 48 cfs will be passed.

D. The pool shall not be drawn down below the dam crest without special written permission from the Department. Any future desilting of the impoundment shall be done in accordance with the Agency of Environmental Conservation Desilting Policy, a copy of which is attached.

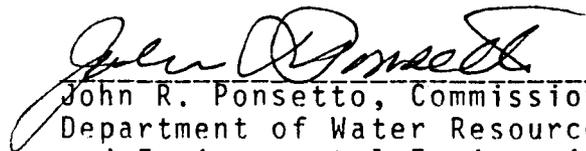
E. The applicant shall not discharge petro chemicals, wet concrete, or debris to State waters during construction or operation of the facility. Any debris removed at the intake structure shall be disposed of properly.

F. The applicant shall file a comprehensive erosion and sediment control plan with the Department. The plan shall cover temporary and permanent measures to be taken during and following construction to control turbidity and sedimentation in the Black River.

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

H. No construction may commence until the Department has issued written approval for Conditions C and F. Operational changes made after project completion are subject to Condition G and must be approved prior to effecting the change.

I. The applicant shall provide the Department of Water Resources and Environmental Engineering with an as-built set of plans for the record.


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

Dated at Montpelier, Vermont
this 31st day of JANUARY, 1985.

JRC/rh