

**Appendix E Water Quality Certification (P.L. 92-500, Section 401) Amendment Issued  
March, 1986**

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

ORIGINAL

In the matter of: Sterling Enterprises, Inc.  
24 Mineral Street  
Springfield, Vermont 05156  
Application to Amend Slack Dam  
Hydroelectric Project Water  
Quality Certification

By letters dated November 15 and November 18, 1985, Sterling Enterprises, Inc. (the applicant) requested that the Department of Water Resources and Environmental Engineering (the Department) amend the Water Quality Certification for Slack Dam Hydroelectric Project to reduce the minimum spillage requirement and change the head and elevation values in the document. The Department finds that:

1. On January 31, 1985, the Department certified the Slack Dam Hydroelectric Project. Subsequently, during July and August, 1985, another firm interested in developing hydroelectric projects in Springfield completed a summer water quality sampling program on the Black River. The Department has reviewed the results of this study in the context of whether or not Water Quality Standards would be met if Slack Dam reduced spillage below the requirements in Condition C of the Certification.

2. The Vermont Water Resources Board has classified the Black River in Springfield as Class C waters. Class C waters are managed to provide habitat suitable for aquatic biota, fish and wildlife and for uses including recreational boating and any recreational or other water uses in which contact with the water is minimal and where ingestion of the water is not probable; irrigation of crops not used for human consumption without cooking; and compatible industrial uses.

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The river in the reach is designated as a coldwater fish habitat. The dissolved oxygen minimum standard is 6 mg/l or 70 percent saturation at all times. Higher standards apply to areas which the Secretary of the Agency of Environmental Conservation determines are salmonid spawning or nursery areas important to the establishment or maintenance of the fishery resources.

3. During July and August, 1985, Westinghouse Electric Corporation conducted a water quality sampling program to determine present river temperature/dissolved oxygen levels during the critical summer low flow periods. Five sampling stations were included in the study, the furthest upstream being above Fellows Dam and the furthest downstream being below Lovejoy Dam. Both midday and early morning samples were collected. Flow data for the site was not collected. Gage records for North Springfield were obtained, and approximate flows for the study are estimated.

On each of the sampling dates, the percent saturation of the early morning sample exceeded 80% at the uppermost station. All samples were at or near saturation leaving the project area. The lowest recorded upstream dissolved oxygen concentration was 7.2 mg/l on July 11 at about 5 A.M. Limited sampling in 1983 included a dissolved oxygen of 6.4 mg/l (77% saturation) on August 4 at 9 A.M.

In order to assure that the development of hydroelectric projects in Springfield does not conflict with the operation of the municipal wastewater treatment plant below the village, it is desirable to maintain dissolved oxygen levels downstream of

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Lovejoy Dam at or near saturation. Based on the data provided to date, it appears that the proposed hydroelectric facilities if operated as proposed will not reduce the river's ability to assimilate sanitary wastes.

4. The four other hydroelectric sites on the Black in Springfield are being certified conditional upon the spillage of a minimum of 0.5 inch of water over the dam; strict run-of-the-river operation; and a follow-up study of project impact on water quality. The Slack Dam Project is certified to operate in a strict run-of-the-river mode. The Department believes that Water Quality Standards for dissolved oxygen will be met if all projects operate strictly run-of-the-river and spill 0.5 inch of water over the full length of the dam crest continuously.

5. The spillage rate at 0.5 inch of depth over the crest is about 3 cfs. The applicant has estimated that the plunge pool bypassed by the project has a volume of about 20,000 cubic feet. The pool would be fully changed about once every two hours with the 0.5 inch spillage. This should be sufficient to keep the pool fresh and preserve the fishery.

6. In order to confirm the project's conformance with standards, a follow up study of the dissolved oxygen levels during project operation will be required as a condition of this certification. If standards for dissolved oxygen are not being met or will not be met when the project is being operated as certified, the Department may order further mitigation including but not limited to additional spillage.

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7. The gross head at the project has increased from 19.6 feet to 20.9 feet. The normal pool level has increased from 364.1' NGVD to 364.5' NGVD, and the tailwater level decreased from 344.5' NGVD to 343.6' NGVD. These changes are based on a better survey and do not represent changes to the project design.

8. The applicant has stated that the Lovejoy Dam pool extends up to Slack Dam. If this is the case, fish will be capable of moving between pools and the 3 cfs of spillage would not prevent fish movement. If the Department finds after start of project operation that the headrace penstock bypass of the plunge pool creates a shallow riffle upstream of the tailrace and prevents fish movement, the Department may order an increase in spillage to accommodate fish movement.

9. No plan has been presented to provide for the safe passage of fish downstream at the dam. This certification is being conditioned to require the development and implementation of a plan which will 1) prevent or minimize the passage of fish through the turbine unit, if significant injury or mortality can result; 2) prevent or minimize impingement of fish on screens, trashracks, or other such devices; and 3) convey fish safely and efficiently downstream past the dam.

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CONDITIONS

Based on its review and findings, the Department hereby amends the Slack Dam Hydroelectric Project Water Quality Certification by rewording Condition C and adding Conditions J, K, and L:

C. The project shall spill a continuous minimum flow equivalent to a minimum of 0.5 inch of water depth over the full length of the dam crest. An automatic level sensor shall be installed to insure that this condition is met.

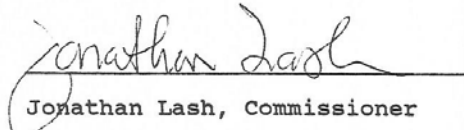
J. During the first summer of operation, the applicant shall conduct a water quality study to determine the effect the project has on dissolved oxygen levels in the river. Prior to undertaking the sampling, the applicant shall submit a plan of study to the Department for review and approval before June 1 of that year. The study results shall be filed with the Department by the end of that year.

K. The applicant shall submit a plan for downstream fish passage to the Department of Fish and Wildlife for approval prior to project construction. This plan shall include the design of the screens, trashracks or other such devices and the means for providing downstream passage of fish at the dam. The project shall not be operated without the approved passage plan in place. The applicant shall file a copy of the approval letter and approved plan with the Department within two weeks of the Department of Fish and Wildlife's action.

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L. No construction may commence until after the Department has issued written approval under Condition D.

  
Jonathan Lash, Commissioner  
Department of Water Resources  
and Environmental Engineering

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