

Water Quality Certification  
(P.L. 92-500, Section 401)

In the matter of: Sheldon Vermont Hydro Co., Inc.  
Consolidated Hydro, Inc.  
R.R. #2 Box 690H  
Industrial Ave.  
Sanford, ME 04073

APPLICATION FOR SHELDON SPRINGS  
HYDROELECTRIC PROJECT WATER QUALITY  
CERTIFICATION AMENDMENT

The Water Quality Division of the Vermont Department of Environmental Conservation (the Department) has reviewed a Water Quality Certification application dated March 8, 1994 and filed by Sheldon Vermont Hydro Co., Inc. (the applicant). The Department, based on the application and record before it, makes the following findings and conclusions:

**I. Background/Proposal**

1. The applicant has applied to the Federal Energy Regulatory Commission (FERC) for a non-capacity amendment of License No. 7186-VT, Sheldon Springs Hydro Project, located on the Missisquoi River in the town of Sheldon, Vermont. The proposed amendment of license is to: a) add a spillway gate at the dam, and b) construct a flow diversion spur and log boom in the project's forebay area.
2. These changes have been proposed because the project presently cannot achieve its best potential operation efficiency. The applicant has determined that the proposed spillway gate and flow diversion spur will enable the project to more efficiently utilize the available water power resource. (FERC amendment application, February 10, 1994)
3. The project currently operates in a daily peaking mode, with use of the storage between reservoir elevations 326.8 and 328.8 feet NGVD. No change in operating protocol is proposed.
4. The project water quality certification, as amended February 13, 1986, requires a minimum flow

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release into the bypass of 70 cfs through a turbine installed at the dam. An unspecified flow is to be spilled across the entire length of the dam crest at all times for aesthetics.

5. The spillway gate and flow diversion spur have been estimated to result in the production of an average additional 2537 MWH per year and would significantly reduce the amount of the labor required at the headworks structure during the winter and spring, high ice and river-borne debris loading periods. The gate will also increase the spillway capacity of the project, e.g. by 6% during a 100 year flood event. (FERC amendment application, February 10, 1994)
6. The rock spur will be constructed of approximately 7,500 c.y. of rock fill to a length of 175 feet with a top elevation of 330.0 NGVD (1.2 feet above top of flashboards and 3.2 feet above permanent dam crest). The upstream side slope will be 1.5:1, the downstream side slope 2:1, and the top 15 feet wide.
7. The spillway gate will be an 8 foot high by 17 foot wide flap gate, hydraulically controlled. The gate will be equipped with a hydronic heating system and will contain bottom and side seal plates constructed of Ultra High Molecular Weight Plastic. This combination is designed to provide an ice-free working environment for the gate. (Rivers Engineering Corp. letter to the US Corps of Engineers [USCOE], May 4, 1994)
8. The gate will be manually operated, and will not be operated in such a way as to lower the pond below the minimum elevation of 326.8 feet NGVD. (pers. comm. Dan Maxon with Wayne Nelson, CHI, May 20, 1994)
9. The proposed log boom will extend from a point on the west bank just downstream of the existing bridge to the dam. Surface borne small ice and debris will be guided towards the gate by the log boom. (Rivers Engineering Corp. letter to USCOE, April 28, 1994)

## II. River Protection During Construction

10. A water management plan entitled Environmental Management and Construction Plan was provided in the application. During construction of the spur, a silt curtain, supported by a floating boom, will completely enclose the area of fill.
11. A temporary rock fill cofferdam consisting of approximately 750 c.y. of rock fill with an impervious membrane on the upstream face will be constructed to isolate a portion of the dam to facilitate gate installation. The cofferdam will be approximately 120 feet long with 1.5:1 side slopes. A silt curtain will be installed outside the cofferdam prior to placement of fill.
12. During installation and removal of the cofferdam, sufficient flashboards will be removed on the right side of the dam to provide the required 70 cfs bypass flow, then the minimum flow turbine will be shut off.
13. Following construction of the cofferdam, and during installation of the gate, the minimum flow turbine will be utilized to maintain the required bypass flow.
14. A sedimentation pond has been incorporated into the plan to provide for treatment of water pumped out of the work zone utilized for the gate installation. A sump pump will pump water to the pond, where a 12" riser and outlet pipe provide overflow to the bypassed reach of the river. The area of the proposed sedimentation pond is currently a relatively flat, grassed area separated from the river by a concrete retaining wall.
15. Access to the proposed spur will be via existing access points to that side of the dam structure which are within upland areas only. (CHI letter to Barry Cahoon, Department Stream Alteration Engineer, February 2, 1994).
16. Construction is expected to be completed in one construction season.

### III. Aquatic Biota

17. The impoundment contains warmwater fishes, with the primary game species being smallmouth and rock bass. Walleye have been noted above the project as far upriver as Enosburg Falls.
18. Substrate in the affected impoundment area is rock and ledge covered with muck and silt, with a limited benthic community. (FERC License Application, 1983)

### IV. Analysis

19. Temporary increased levels of turbidity may occur as a result of the placement of the rock spur, and both the installation and removal of the temporary cofferdam. The applicant proposes to utilize silt curtains supported by floating booms to contain the area of increased turbidity levels and to prevent the release of silt into the bypass and downstream of the project.
20. Bypass flows will not be affected by construction activities for the spur and the cofferdam. The applicant proposes to pass minimum flows over the crest of the dam during cofferdam installation and removal, and through the minimum flow turbine at other times. This certification is explicitly conditioned to insure at least 70 cfs remain in the bypass at all times during construction, consistent with the project license. Downstream minimum flow requirements conditioned in the license and current certification and amendments remain in effect.
21. The spur will have a footprint of approximately 10,000 ft<sup>2</sup>. The loss of this relatively poor aquatic habitat will be mitigated by approximately 7,500 ft<sup>2</sup> of improved habitat provided by the submerged side slopes of the spur, suitable for aquatic vegetation, periphyton and a variety of macroinvertebrates.
22. The combination of expected low velocities in the pool just upstream of the dam and the significant decrease in the effective channel width caused by

the spur dike will increase the frequency of ice arching and ice accumulation in the immediate vicinity of the dike. (USCOE Cold Regions Research and Engineering Lab [CRREL] memorandum for the record, April 20, 1994)

23. Although the proposal could potentially increase the frequency of ice jam related floods (ice runs through this reach of river are typically massive with large ice sheets), this issue is beyond the scope of this certification, and is expected to be addressed by FERC.

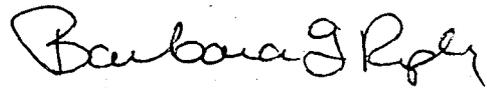
**ACTION OF THE DEPARTMENT**

Based on its review and findings, the Department concludes that there is reasonable assurance that installation of the flow diversion spur and flap gate in accordance with the following conditions will not cause a violation of Vermont Water Quality Standards and will be in compliance with the applicable provisions of sections 301, 302, 303, 306, and 307 of the Federal Clean Water Act, P.L. 92-500, as amended, and other appropriate requirements of state law:

- A. 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.
- B. Debris associated with project construction shall be disposed of in accordance with State law.
- C. Any significant changes to the construction project must be submitted to the Department for prior review and written approval.
- D. Prior to construction, the applicant shall provide the Department with a plan including hydraulic calculations showing how the bypass flow will be provided at the dam while the minimum flow turbine is shut down. Flow over the dam will be instituted prior to shutting off the turbine, and ceased only after returning flow to the turbine.
- E. At least 7 days prior to commencement of construction, the Department (Dan Maxon, 241-3770) shall be notified of the intent to commence construction.
- F. The applicant shall notify the Department (Dan Maxon, 241-3770) within 7 days of project completion.
- G. The applicant shall allow the Department to inspect the project area at any time to monitor compliance with the conditions of this certification.

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- H. The disturbed area outside of the channel shall be restored to the satisfaction of the Department.
- I. The Department reserves the right to add and alter terms and conditions as appropriate to carry out its responsibilities during construction of the project with respect to water quality.



Barbara Ripley, Secretary  
Agency of Natural Resources

Dated at Waterbury, Vermont  
this 25 day of August, 1994

