

## **APPENDIX 4-1**

**WATER QUALITY CERTIFICATION FOR THE DOWNER'S MILLS HYDROELECTRIC PROJECT  
ISSUED BY THE WATER QUALITY DIVISION OF THE VERMONT DEPARTMENT OF WATER  
RESOURCES AND ENVIRONMENTAL ENGINEERING**

**DATED MAY 11, 1982**

WATER QUALITY CERTIFICATION

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

In the matter of: Simon Pearce (U.S.), Inc.  
P.O. Box S  
Quechee, Vermont 05059  
Application for Downers Mill Hydroelectric Project

In making the following findings, the Water Quality Division of the Vermont Department of Water Resources and Environmental Engineering has reviewed the Water Quality Certification application dated July 16, 1981 and a letter dated February 24, 1982:

1. Simon Pearce (U.S.), Inc. (the applicant) proposes to develop the Downers Mill/Emery Mill site on the Ottauquechee River in the Village of Quechee, Town of Hartford, for hydroelectric power generation. The Emery Mill dam is a concrete gravity structure, 14 feet high and 150 feet long, with a crest elevation of approximately 562.1 feet NGVD. The dam creates a small, river impoundment. The new powerhouse is to be contained within the existing, rebuilt Downers Mill building. The intake structure is to be rehabilitated and a new penstock installed. The generating capacity will be approximately 645 kw. The tailrace efficiency will be improved by rock excavation at the outlet. The available head is about 28 feet.

2. Spillage at the dam cascades over a set of falls. The facility will discharge to the river about 50 feet downstream of the left end of the dam. As proposed, the facility is a strict run-of-the-river project, with the provision of a minimum of 7Q10 as spillage over the dam. During non-generation periods, all flow will be spilled over the dam. The hydraulic capacity of the powerhouse will be between about 50 CFS and 400 CFS.

3. The impoundment size will remain unchanged. It has a surface area of about 40 acres. The facility will not be operated from storage, and no desilting will be necessary. The length of the impoundment has been estimated

at approximately 0.5 mile. The impoundment size will remain unchanged. The dam structure is not breached.

4. The Downers Mill building is owned by the applicant. The dam ownership and flowage rights have been transferred from the State of Vermont to the applicant.

5. Flows on the Ottauquechee River are gaged by the U.S. Geological Survey at North Hartland downstream of the flood control reservoir. The gaging station (#115150) has a period of record from 1932 to present. The drainage areas at the gaging station and at Emery Mill are ~~200~~ to 221 square miles and 207 square miles, respectively. Following are several hydrologic values for the hydroelectric site, based on a direct area proration using the gaging station:

<u>Parameter</u>	<u>Value (CFS)</u>
Mean flow	374
95% exceedance	39
50% exceedance (median)	187
10% exceedance	870
7Q10	22

Inflows to the impoundment are controlled to a high degree, depending on the natural flow regime, by the Taftsville Hydroelectric Project operated by CVPS.

6. The Ottauquechee River system contains good populations of brook, brown, and rainbow trout. Rainbow trout comprise the highest percentage of the population. The principal stocking effort by the Vermont Department of Fish and Game is for brook trout and brown trout. Generally, rainbow trout have maintained their population levels through natural reproduction. Both the riffle section below Emery Mill dam and Quechee Gorge provide excellent habitat conditions for salmonids.

7. The Ottauquechee River has been classified by the Vermont Water Resources Board as Class B from the upstream project limit to the Quechee Wastewater Treatment Plant. Below the treatment plant, the river is classified

as Class C to the Dewey Mills dam. The river downstream of the project would be managed as either Type I or Type II waters, requiring a minimum dissolved oxygen (D.O.) level of 6 mg/l. As this is a strict run-of-the-river project with no change to the impoundment morphology, the water quality upstream of the dam will not be affected by the project. The project could, however, impact on dissolved oxygen levels downstream through the loss of reaeration opportunities from spillage over the dam. On July 10, 1981, the applicant took water samples above and below the Emery Mill dam. Stream flows were not recorded. Upstream of the dam, the measured D.O. was 6.0 mg/l, or about 67 percent of saturation. Below the dam, the measured D.O. level was 8.1 mg/l, or about 91 percent saturation. In order to assure that the project will not result in substandard dissolved oxygen levels downstream of the tailrace, the applicant has agreed to spill a minimum of 7Q10 flow over the dam at all times when available from inflow. The short bypassed section of stream affords minimal habitat conditions for aquatic life. Flows higher than 7Q10 in the bypass section are not warranted in terms of needs for aquatic life.

The available data base is insufficient to demonstrate that flow lower than 7Q10 over the dam would be sufficient to maintain Vermont Water Quality Standards. The applicant may opt to do further sampling and data analyses in order to attempt to show that a minimum stream flow of less than 7Q10 would be acceptable. The Department of Water Resources and Environmental Engineering would allow such information to be submitted in support of an application to amend the Water Quality Certificate relating to minimum stream flows.

## CONDITIONS

The Department of Water Resources and Environmental Engineering certifies that this project will meet Vermont Water Quality Standards with the following conditions:

A. The hydroelectric facility shall be operated to maintain instantaneous flows downstream of the tailrace equivalent to the instantaneous inflow into the impoundment. At all times when available from inflow, a minimum stream flow of 7Q10, or 22 CFS, shall be passed over the dam, on an instantaneous basis. If instantaneous inflows are less than 7Q10, all flows shall be passed over the dam. During periods of non-generation, all flows will be passed over the dam. The applicant shall provide the Department of Water Resources and Environmental Engineering with a description and plans detailing how releases will be made at the dam for review and approval before construction may commence.

B. No flashboards shall be installed across the dam crest. The impoundment will not be drawdown without prior approval of the Vermont Department of Water Resources and Environmental Engineering.

C. During the final engineering phase or earlier, the applicant shall submit a description and plans detailing how the tailrace excavation is to be undertaken.

D. 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.

E. Any debris removed from the project area during construction and later operation shall be disposed of properly.

F. Any significant changes to the project including the operational scheme must be submitted to the Department of Water Resources and Environmental Engineering for review and approval.

G. Upon completion of the project, the applicant shall provide the Department of Water Resources and Environmental Engineering with an as-built

set of plans for the record.

H. No construction may commence until the Department of Water Resources and Environmental Engineering has issued written approval under conditions A and C. Operational changes made after project completion are subject to condition F and must be approved prior to effecting the change.

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

Dated at Montpelier, Vermont this  
11<sup>th</sup> day of MAY, 1982.

JRC/rh