Unofficial FERC-Generated PDF of 19971002-0156 Issued by FERC OSEC 09/30/1997 in Docket#: P-2731-015

80 FERC ¶ 62,291

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Central Vermont Public Service Corp.	))	Project No. 2731-015

ORDER MODIFYING AND APPROVING UP-RAMPING RECOMMENDATIONS

SEP 30 1997

On October 19, 1994, Central Vermont Public Service Corporation (licensee) filed the results of the up-ramping study required under paragraph (B) of the Commission's July 22, 1994 order, 1/ for the Weybridge Project. The project is located on Otter Creek in the Town of Weybridge, Vermont.

Background

The order issued July 22, 1994 approved the licensee's proposed up-ramping study plan. The licensee, after consulting with the U.S. Fish and Wildlife Service (FWS) and the Vermont Agency of Natural Resources (VANR), proposed to evaluate three up-ramping scenarios to determine their relative impacts to aquatic resources. The licensee would evaluate stage, velocity, and flow in the eastern channel 2/ below the project under three scenarios.

Scenario 1: (full on), bring turbine from offline with the project releasing the 140 cubic feet per second (cfs) minimum flow, to the full turbine discharge of 1,600 cfs;

Scenario 2: (two step), bring project from the 140 cfs minimum flow to a turbine discharge of 450 cfs, allow the eastern channel to stabilize then bring the project to the full turbine discharge of 1,600 cfs;

Scenario 3: (three step), bring the project from the 140 cfs minimum flow to the turbine discharge of 450 cfs, allow the eastern channel to stabilize, then increase turbine discharge to 1,000 cfs, allow the eastern channel to stabilize, then increase the turbine discharge to full, 1,600 cfs.

1/ 68 FERC ¶ 62,069, Order Approving a Ramping Rate Study Plan.

2/ The western channel is sheltered from the direct impact of the flow changes by a cobble/boulder bar and was excluded from the up-ramping study.

FERC - DOCKETED
9710020156-3 SEP 30 1997

Unofficial FERC-Generated PDF of 19971002-0156 Issued by FERC OSEC 09/30/1997 in Docket#: P-2731-015

Licensee's Study Results and Recommendations

The licensee stated that the Weybridge Project outflow is mainly directed down the eastern channel of Otter Creek by a cobble/boulder bar that was built during the channelization of the eastern channel in 1951. The flow in the eastern channel is split in two by an island and about 60 percent of the flow goes to the eastern side of the island. The eastern channels have no large flow obstructions, they are straight, steep, and subsequently have high water velocities. The stream bottom is comprised of cobble and small boulders.

The licensee collected water depth and velocity data from four transects on the eastern channels to quantify each up-ramping scenario using PHABSIM models. The PHABSIM models indicate that the only fish species that might use the eastern channels are juvenile smallmouth bass and trout, and adult trout. This stream section has high water velocities without large instream areas of refuge from the flows, i.e. boulders, ridges, stream bed irregularities. The licensee found that the stream margins in the eastern channels are the only habitat area that provide suitable velocity refugia at any flow.

The licensee stated that the hydraulic data collected indicates that at all flow levels studied, the eastern channel is low quality fish habitat. Even at the minimum flow the juveniles of most fish species would be confined to the stream margins due to high velocities and a lack of instream velocity breaks. The licensee showed that the eastern channels had fairly uniform flow velocities at each generation level and all transects stabilized within 20 minutes of a flow change. The average channel flow velocities generally increased four fold from the minimum flow to maximum generation increasing from about 1 feet per second (fps), to 3.6 to 4.4 fps.

Previous stream channelization has made the stream margins very steep and prevents the stream from widening when moving from the mid-flow step to the high flow step. The use of a second intermediate ramping step did not provide any increase in the area of velocity refugia because the stream margins did not change significantly. Further, after the first step (450 cfs) the mid-stream channel velocities become so high as to discourage adult trout from remaining in the mid stream channel. The licensee stated that the 20 minute stabilization period after the first step should allow (encourage) adult trout to seek refuge along the stream margins before the next flow release step.

Therefore, the licensee recommended that Scenario 2 with a 20 minute flow stabilization period should adequately protect the aquatic fauna. The licensee stated that according to the models, the stream margins are the highest quality habitat structure in

Unofficial FERC-Generated PDF of 19971002-0156 Issued by FERC OSEC 09/30/1997 in Docket#: P-2731-015

the eastern channel sections, and the two step up-ramping scenario should not negatively impact the fish species using this habitat.

Agency Comments

The VANR received a copy of the up-ramping study results and the licensee's recommendations but did not provide comments on the study results. The FWS letter dated August 16, 1995, stated that they disagreed with the licensee's proposal and that the licensee should implement the three step scenario.

The FWS stated that the flow velocity data indicates that juvenile smallmouth bass and trout would use a majority of the river channel at the minimum flow of 160 cfs (actual, 140 cfs) at two transects and would be confined to the stream margins at the other two transects. Adult trout would be similarly distributed at the mid-flow step (450 cfs). The FWS stated that the 20 minute stabilization period would not be sufficient for adult trout residing in the main channel to locate velocity refugia before the step to the high flow (1,600 cfs). The FWS therefore disagreed with the licensee's proposal because of the possibility of displacing or flushing-out adult trout from the project area.

Discussion and Conclusions

The licensee's proposed up-ramping procedure would allow both juvenile and adult trout, that might be swept downstream by sudden and excessive increases in water velocity, to retain position and prevent displacement. Our review of the licensee's field investigation data indicates that Scenario 2 (two step) would lessen the displacement of juvenile salmonids in Otter Creek over Scenario 1 (full on). The stream margins are consistent in relation to increasing the flow from 450 to 1,600 cfs due to the steep slope caused by the channelization. The stream margins are steep and the margin displacement between high and low stream levels for juvenile salmonids is less than 10 feet horizontally. This minor stream margin migration allows juvenile and adult fishes to remain in the velocity refuge of the stream margin under Scenario 2. The data also indicates that Scenario 3 (three step) does not provide any increase in protection of juvenile or adult fishes over Scenario 2.

The FWS assertion that adult trout would be displaced by the increase of flows is not supported by other studies. Rapid increases in flow, up to a nine fold flow increase, were determined to have no impact on juvenile salmonids. 3/ The

---

3/ Mark A. Hunter, 1992, Hydropower flow fluctuations and salmonids: a review of the biological effects, mechanical causes and options for mitigation. Technical Report of the

Unofficial FERC-Generated PDF of 19971002-0156 Issued by FERC OSEC 09/30/1997 in Docket#: P-2731-015

before and after index counts during an instream flow study did not produce a significant difference in the salmonid population. Further, juvenile smallmouth bass, another local gamefish species, normally occupy locations over cobble and small boulder substrates and other low velocity positions and only move into high velocity positions to feed.4/ Juvenile bass in Otter Creek should occupy holding locations in the stream margins at the minimum flow and mid-flow step and would be in a velocity refuge position for the high flow step.

Based on our analysis, the licensee's up-ramping procedure should protect the fisheries resources of Otter Creek as required by the February 24, 1994, order. However, if the flows from the project are released in a manner inconsistent with, and exceeding, the approved up-ramping procedure, the licensee should file a report with the Commission within 30 days of the incident. The report should, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report should also include: 1) operational data necessary to determine compliance with the approved up-ramping procedure; 2) a description of any corrective measures implemented at the time of occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and 3) comments or correspondence, if any, received from the resource agencies regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission should reserve the right to require modifications to project facilities and operations to ensure future compliance with the approved up-ramping procedure.

The licensee's recommendation, filed on October 19, 1994, under the July 22, 1994 order, with the modifications described above, should be approved.

The Director orders:

(A) The licensee's recommendation for up-ramping the Weybridge Dam Project generation releases, filed on October 19, 1994, under paragraph (B) of the order issued July 22, 1994, as modified by paragraph (B), is approved.

State of Washington Department of Fisheries, Olympia Washington.

4/ Timothy D. Simonson and William A. Swenson, 1990, Critical Stream Velocities for Young-Of-Year Smallmouth Bass in Relation to Habitat Use. Transactions of the American Fisheries Society. 199:902-909.

Unofficial FERC-Generated PDF of 19971002-0156 Issued by FERC OSEC 09/30/1997 in Docket#: P-2731-015

(B) If the generation flows from the project, are released in a manner inconsistent with, and exceeding, the approved up-ramping procedure, the licensee shall file a report with the Commission within 30 days of the incident. The report shall, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report shall also include: 1) operational data necessary to determine compliance with the approved up-ramping procedure; 2) a description of any corrective measures implemented at the time of occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and 3) comments or correspondence, if any, received from the resource agencies regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission reserves the right to require modifications to project facilities and operations to ensure future compliance with the approved up-ramping procedure.

(C) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days from the date of issuance of this order, pursuant to 18 C.F.R. § 385.713.

Kevin P. Madden
Acting Director
Office of Hydropower Licensing