CARVER FALLS HYDROELECTRIC PROJECT
FERC Project No. 11475

Operations Compliance Plan

Carver Falls

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1.0 Introduction

1.1 Project Description

The Carver Falls Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project Number 11475, is located on the Poultney River in Washington County, New York, and Rutland County, Vermont. The 1.9-megawatt (MW) Project (Figure 1.1-1) is located on the New York/Vermont border at river mile 3.8 on the Poultney River before it empties into Lake Champlain. Central Vermont Public Service Corporation (CVPS) owns and operates the Project under a FERC license issued on February 25, 2009.

The Project consists of the following existing facilities: (1) the 514-foot-long concrete and stone masonry Carver Falls dam consisting of (i) a 110-foot-long northern spillway currently equipped with 6-foot-high flashboards, (ii) a 146-foot-long southern spillway (crest equals 231.8 feet elevation USGS) equipped with 1.5-foot-high hinged flashboards, (iii) a 10-foot-long concrete sluiceway, and (iv) a 6-foot-long broome gate; (2) a 10-acre reservoir with a normal surface elevation of 233.3 feet elevation USGS; (3) a 10-foot by 13-foot intake structure equipped with trashracks and a Chapman valve; (4) a 200-foot-long, 7-foot-diameter penstock bifurcating into two 150-foot-long, 3-foot and 4-foot-diameter penstocks; (5) two 44-foot-high, 4-foot and 6-foot-diameter surge tanks; (6) a powerhouse containing a 1.1-MW and 0.8-MW turbine generating units with a total installed capacity of 1.9-MW; (7) a 275-foot-long, 2.4-kV transmission line; and (8) appurtenant facilities.

The two turbines have hydraulic capacities of 162 cubic feet per second (cfs) and 92 cfs for a total capacity of 254 cfs. The drainage area above the project is approximately 186 square miles. Dam leakage when the reservoir elevation is at the top of the southern flashboards at elevation 233.3 feet provides a flow of approximately 9.5 cfs to the 450-foot-long reach of the Poultney River bypassed by the project. The lowest 7-day average flow that occurs (on average) once every 10 years (7Q10) is approximately 9 cfs.

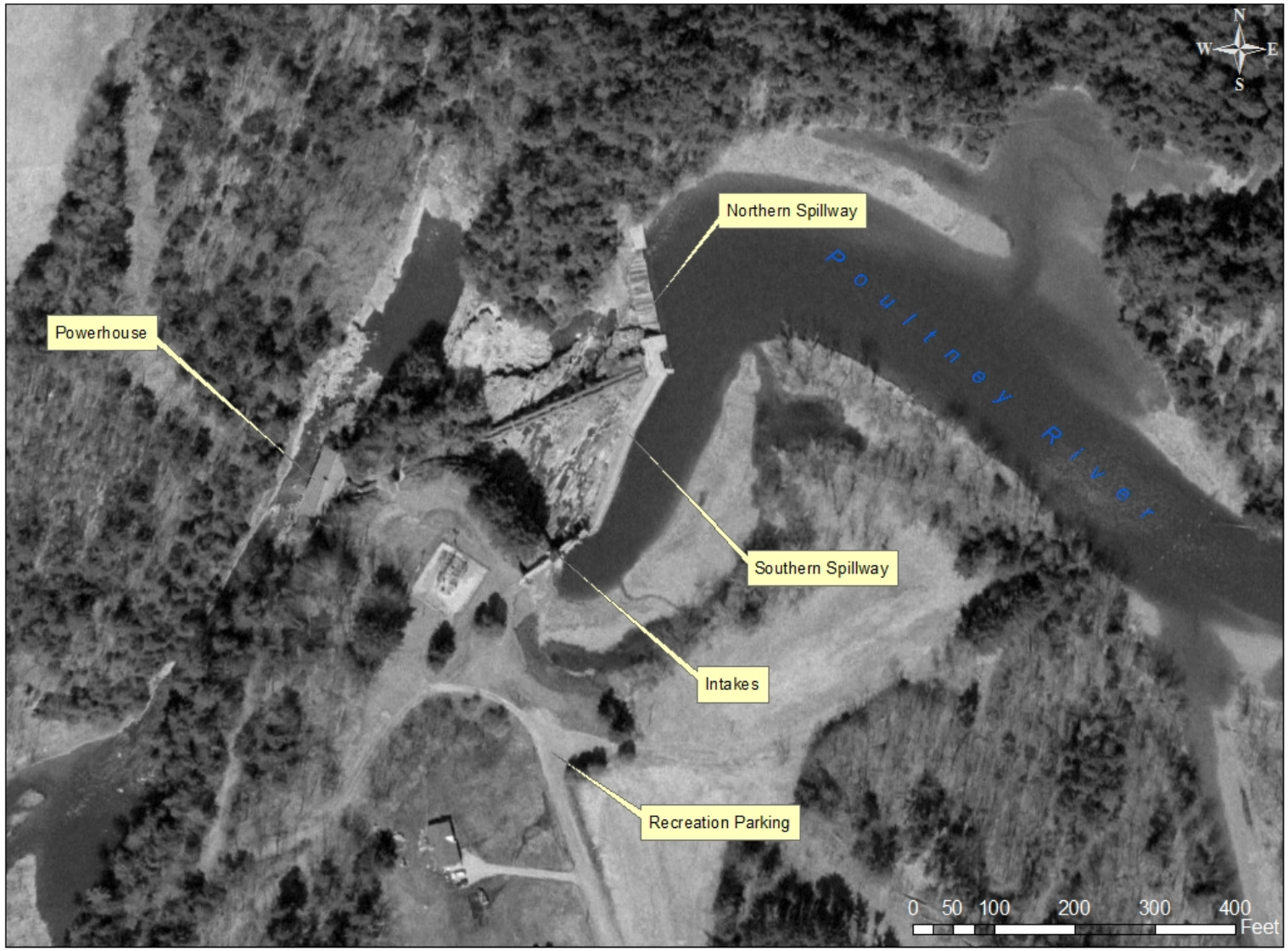
1.2 Operations Compliance Plan Overview

A new FERC license for the Project was issued on February 25, 2009 and a corresponding Water Quality Certification (WQC) was issued by the State of Vermont on December 5, 2008. New York State Department of Environmental Conservation (NYSDEC) previously issued a water quality certificate on April 21, 1995, which was modified on December 13, 1996. The new license and associated water quality certificates require CVPS to develop a Reservoir and Flow Management and Operation Plan. This plan is being filed in accordance with Article 401 (A) of the license.

The intent of this plan is to serve as a comprehensive compliance plan addressing CVPS's obligations related to operating the Project consistent with the flow and water level constraints contained in the FERC license. The plan addresses the following requirements:

- Run-of-river Operations (Section 2)
- Bypassed Reach Conservation and Aesthetic Flows (Section 3)
- Flow Management during Impoundment Refill (Section 4)
- Flashboard Removal and Replacement (Section 5)
- Monitoring and Reporting (Section 6)

Figure 1.1-1: Carver Falls Project Overview.



Black and white digital orthophotography obtained from Vermont Mapping Program.

2.0 Run-of-River Operations

2.1 License Requirements

Both the New York State (Condition 2) and the Vermont (Condition B) Water Quality Certification require that the Project be operated in strict run-of-river mode, where instantaneous flows below the tailrace shall equal instantaneous inflow to the impoundment at all times. When the facility is not operating, all flows shall be spilled at the dam.

Article 402 of the license requires project operation and minimum flows consistent with the certification conditions, but allows for temporary modifications to project operation for emergency conditions beyond the control of the licensee. Run-of-river operation and minimum flow releases may also be temporarily modified for short periods upon agreement among CVPS, the Vermont Agency of Natural Resources (VANR), the NYSDEC, and the U.S. Fish and Wildlife Service (USFWS). If run-of-river operation or any minimum flow is so modified, CVPS shall notify the FERC, VANR, NYSDEC, and the USFWS as soon as possible, but no but no later than 10 days, after each such incident.

2.2 Normal Project Operations

CVPS will operate the project in a strict run-of-river mode with a continuous release of 18.5 cfs, or instantaneous inflow if less, into the bypass. During normal operation, inflows, up to the design flow, are discharged through the generating equipment except for leakage and the minimum flow. The minimum station capacity is approximately 30 cfs. Flows in excess of the station hydraulic capacity and leakage are spilled over the approximately 146-foot long southern spillway section with the 18-inch boards. Note that this section has a top of board elevation 0.5 feet less than the rest of the dam (elevation 233.3 ft.). Approximately 175 cfs can be discharged over this section before reaching El. 233.8 feet. Additionally, the 6' by 9' broome gate, which has a discharge capacity of up to approximately 1,200 cfs, can be used. The broome gate is operated hydraulically by the operator on-site in coordination with CVPS control center. CVPS is proposing to upgrade the gate controls to allow for automation. The broome gate's sill elevation is at elevation 213.55 feet, approximately 20 feet below full pond, and contains markings allowing the opening to be recorded by operators on site. Frequent use of the broome gate for flow management ensures that the gate opening is not obstructed by sediment. Any larger debris lodged behind the gate is manually removed or dislodged and transported downstream. The broome gate rating curve showing flows provided across the range of gate openings is shown in Figure 2.2-1. Figure 2.2-2 shows a separate rating curve for providing flows up to 100 cfs through the broome gate.

CVPS will ensure compliance with run-of-river operations by monitoring the impoundment level and controlling it by making changes to turbine output, as appropriate. When inflows are at or below the design flow plus the minimum bypass flow (254+18.5 cfs) the impoundment will remain constant except following flashboard removal or failure or scheduled dam maintenance. Project operation will be based on an active storage volume of zero cubic feet at all times. CVPS will not permit the elevation of the project impoundment to drop below one inch (0.083 feet) above the top of the flashboards (on the southern spillway) when flashboards are in the raised position, or to drop below one inch above the crest of the dam when flashboards are down, pursuant to NYS WQC Condition 3. Therefore the instantaneous sum of all discharges and releases from the impoundment will equal the instantaneous inflow into the impoundment. Operational changes are made from the CVPS control center in Rutland with on-site assistance from the operator at the Project.

If inflows exceed the station capacity the broome gate is opened to keep the pond elevation below 233.80 feet. Once inflows exceed the project capacity (turbines and broome gate), excess water is spilled over the flashboards.

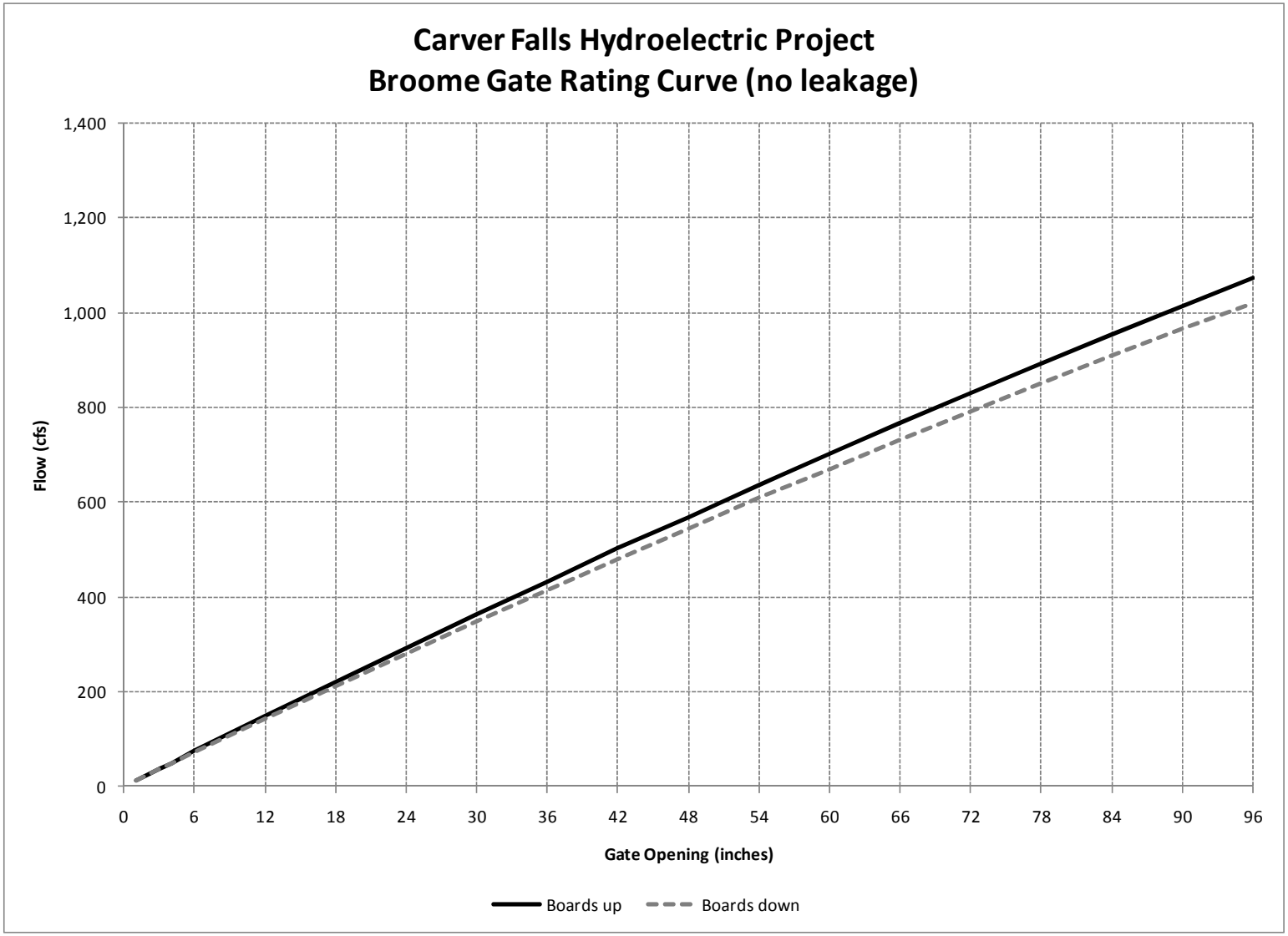
In the event of equipment malfunction such as a unit trip, the project operators are dispatched to the site to monitor and operate the development. CVPS expects that flow and reservoir elevations would be slightly changed at the moment the plant trips off-line, or at the time of flashboard failure. It is not expected that flows and reservoir elevations would be changed by most other equipment malfunctions.

2.3 Lag Times

Condition D requires that lag times be addressed in this plan. To ensure compliance with run-of-river conditions in the event of an unplanned station trip, CVPS is proposing to automate the operation of the broome gate. The broome gate will be automated and the opening will be linked to the SCADA data repository. The gate automation will be programmed to open and close gradually when the Programmable Logic Controller (PLC) upgrade is installed in the summer of 2010. The automation will be based on headpond levels so that natural inflow conditions are simulated. During an unplanned outage, the broome gate will be programmed to provide the amount flow previously being used for generation prior to the shut-down, thus ensuring downstream run-of-river flow requirements.

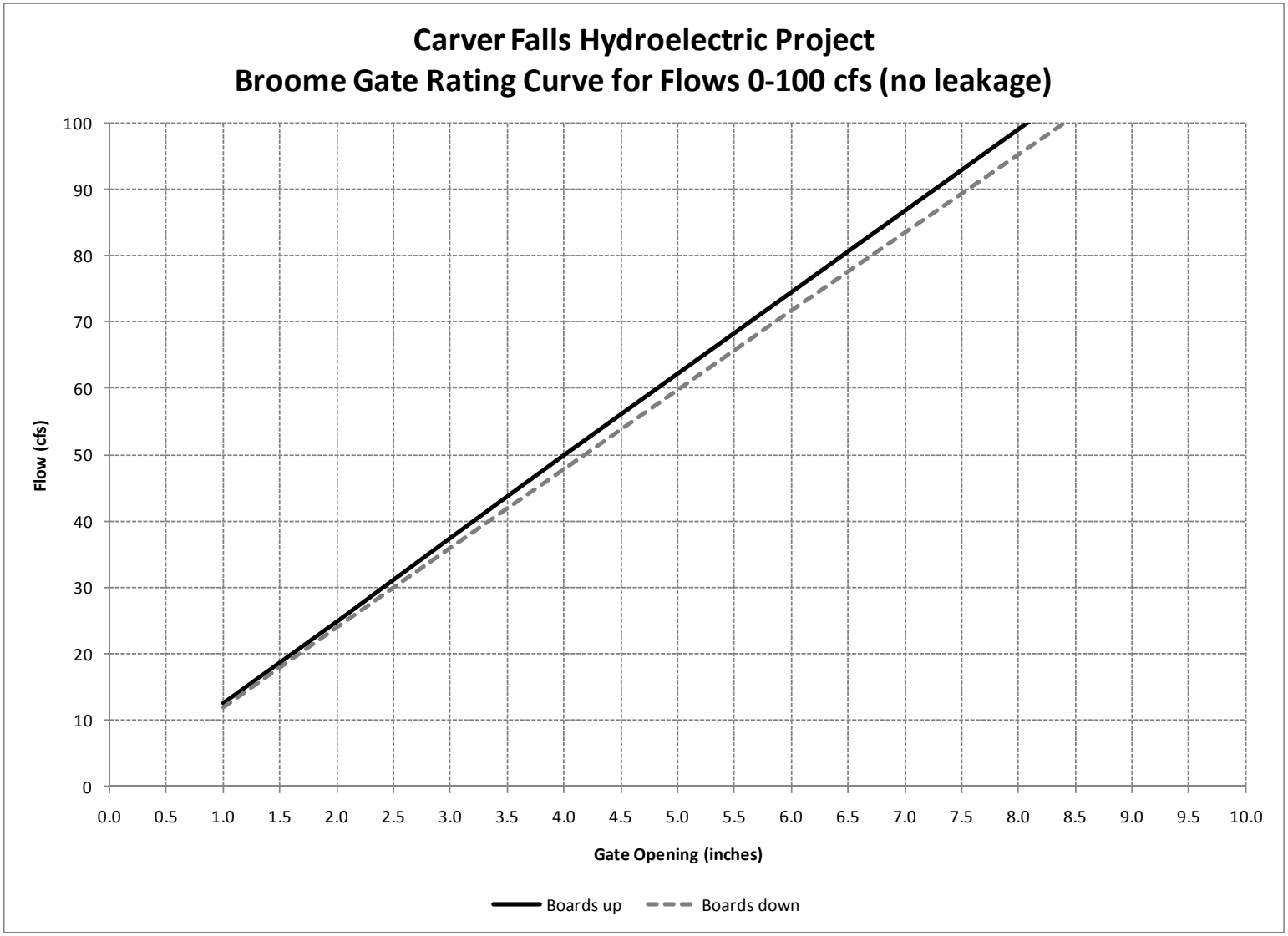
During routine shut-downs, operators scale back turbine output until the headpond elevation increases to a point where inflows are passed as spillage. Turbine output settings can effectively be changed in increments of 50 kW. When the broome gate is used, CVPS operators currently use a gradual process when opening and closing the gate in order to match inflows as closely as practical. When the PLC upgrade is installed in 2010, the gate will be programmed to open and close automatically based on headpond levels and turbine settings so that natural inflow conditions are simulated.

Figure 2.2-1: Broome Gate Rating Curve for Full Range of Gate Openings.



Note: Rating curve based on broome gate opening. Dam leakage is not included.

Figure 2.2-2: Broome Gate Rating Curve for Flows up to 100 cfs.



Notes: Rating curve based on broome gate opening. Dam leakage is not included. Gate must be open at least one inch to provide minimum bypass flow of 18.5 cfs (accounts for leakage). Gate must be open at least 3.5 inches to provide aesthetic flow of 50 cfs (accounts for leakage).

3.0 Bypass Flow Management

This section is intended to provide information on how the project will be managed to ensure compliance with the bypass flow requirements in the license.

3.1 License Requirements

Both the New York State (Condition 3) and the Vermont (Condition B) Water Quality Certification require that CVPS continuously release a flow of 18.5 cfs, or inflow when less, into the Project's bypassed reach. Bypass conservation flows, except for uncontrolled leakage, shall be released as full crest spillage over the southern spillway section. Except during the aesthetic flow release periods noted below, any portion of the flow that would exceed 1.0 inch of spillage may be routed through a gate. The full crest spillage requirement does not apply during the period November through March.

Likewise, aesthetic flow releases specified by the New York State (Condition 16) and the Vermont (Condition B) WQC require CVPS to provide no less than 2.5 inches of spillage (or inflow, if less) over the south spillway during daylight hours on certain holidays (Memorial Day, Independence Day, Labor Day, Columbus Day) and every Sunday during the months of July and August. The flow release shall commence at 9:00 a.m. and continue through the daylight hours.

In addition, Condition 13 of the New York State WQC and Condition B of the Vermont WQC require CVPS to provide a continuous flow to the bypassed reach of 50 cfs (or inflow, if less) from April 1 through May 15 of each year in order to protect walleye spawning.

3.2 Flow Measurements

During the license application phase, CVPS obtained several measurements of leakage and spillage flows at the Project, as shown in Table 3.2-1. Leakage ranged from 8.3 cfs when the impoundment was drawn down just below the concrete crest, to 11.4 cfs when the impoundment was full (just below the flashboard crest). Additionally, the bypass flow was measured to be 20.7 cfs when the impoundment was one inch above the flashboards. These flow measurements were use to negotiate several terms of the new license.

Table 3.2-1: Carver Falls Leakage and Spillage Flow Amounts.

Release	Flow (cfs)		
	Leakage	Spillage	Total Flow
Leakage (concrete crest)	8.3	-	8.3
Leakage (full pond)	11.4	-	11.4
1 inch of spillage	11.4	9.3	20.7
2 inches of spillage	11.4	33.5	44.9
2.5 inches of spillage	11.4	45.8	57.2*
3.25 inches of spillage	11.4	69.2	80.6

Notes: *Flow provided by 2.5 inches of spillage was estimated using the weir equation (CVPS, 1996 – AIR #3).

Figure 3.2-1 shows the discharge rating curve for the flashboards on the southern spillway, which are approximately 146 feet long. The curve shows discharge over the flashboards for elevations ranging from 0.5 to 12.0 inches above the flashboard crest. Note that a leakage amount of 8.3 cfs was added to each discharge value.

3.3 Minimum Bypass Flow

CVPS will pass the minimum bypass flow if 18.5 cfs, or instantaneous inflow if less, through a combination of the leakage flows and spillage over the southern spillway section of the dam. The amount of leakage through the dam that will contribute to the bypass flow will be based on the amount of leakage that occurs when the water level is drawn down to the concrete crest (18 inches below flashboards). The resulting leakage flow will represent the minimum amount of leakage which could be expected at the project due to decreased head.

CVPS has verified through flow metering that at least one inch of spill over this section of flashboards in conjunction with leakage flows will equate to at least 18.5 cfs. A pond level sensor at the dam provides real-time impoundment elevations to the control center in Rutland and these data are stored in CVPS's SCADA system. CVPS will use real-time data from the calibrated pond level sensor when controlling turbine operation to ensure that the impoundment never falls below an elevation one inch above the top of the flashboards when flashboards are raised or one inch above dam crest when flashboards are in the lowered position. This will ensure that the minimum instantaneous flow of 18.5 cfs is maintained.

During flashboard replacement or other situations where an impoundment drawdown is required, bypass flows will be maintained through the broome gate. These procedures are described further in Section 4. In the case of a partial flashboard failure, a look-up table has been developed to ensure minimum bypass flows are provided as the impoundment lowers in response to the flashboard failure. In these situations, local operators, upon discovery of a flashboard failure, will corroborate with the Control Center to determine a new pond elevation set point to utilize until flashboards are reset. The flashboard look-up table (Table 3.3-1) will be consulted to account for flows through the flashboard openings. Turbine output will be adjusted to hold the pond level at the new set point. Flows will be managed at that set point until inflows recede enough to allow drawdown to one inch below the dam crest for flashboard replacement.

3.4 Walleye Spawning

In order to protect walleye spawning requirements, CVPS will provide at least 50 cfs (or inflow, if less) from April 1 through May 15 of each year to the to the Project's bypassed reach. This will be achieved by maintaining at least 2.5 inches of spillage over the southern spillway, which is equal to approximately 57.2 cfs (45.8 cfs spillage and 11.4 cfs leakage). During flashboard replacement or other situations where an impoundment drawdown is required, bypass flows will be maintained through the broome gate, as necessary.

3.5 Aesthetic Releases

CVPS will release a flow over the southern spillway of at least 2.5 inches (or inflow, if less) for aesthetic purposes on Memorial Day, Independence Day, Labor Day, Columbus Day and every Sunday during the months of July and August. Said aesthetic flows shall be released during daylight hours, commencing at 9 a.m. To achieve this, CVPS operators will make the necessary adjustments to operations depending on river inflows.

2.5 inches of spillage over the southern spillway is equal to approximately 57.2 cfs (45.8 cfs spillage and 11.4 cfs leakage). Prior to the aesthetic flow release, the daily flow recorded at the USGS downstream of the project as well as the current impoundment level will be noted. To raise the impoundment, generation will be reduced, as discussed below. If precipitation is forecasted or inflows are unstable, the operator will use best judgment to adjust the times required for impoundment elevation changes to achieve the aesthetic flows. At inflows above 300 cfs, excess water will be spilled over the dam, and the operator will adjust operations to maintain the impoundment water level at least 2.5 inches above the flashboards. At the end of the day, operators will adjust operations, as appropriate, to reduce the impoundment water level, but at no time going below 1.0 inch over the flashboards, thereby ensuring consistent minimum flow releases to the bypassed reach.

In their comments on the draft plan, VANR recommended that the "90% rule" should apply when the headpond is being raised from 1.0-inch spill to 2.5-inch spill as guidance for the operator when deciding how to cut back the turbine discharge to raise the pool. Using Table 3.5-1 for guidance, operators will adjust turbine output in increments of 10 percent, as appropriate, until the required headpond elevation is achieved to provide at least 2.5 inches of spill for aesthetics. Turbine output settings can effectively be changed in increments as low as 50 kW. This will maintain adequate downstream flows while the impoundment elevation is increased.

Table 3.3-1: Southern (NY Spillway) Flashboard Failure Look-Up Table.

Carver Falls Hydroelectric Project
Southern (NY Spillway) Flashboard Failure Look-Up Table

	Spillage, cfs (includes 8.3 cfs dam leakage) per number of 4-foot board sections down									
Elevation (feet)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
233.40	33.2	58.0	82.9	107.7	132.6	157.4	182.3	207.1	232.0	256.8
233.30	30.3	52.4	74.4	96.5	118.5	140.6	162.6	184.7	206.7	228.8
233.20	27.6	47.0	66.3	85.7	105.0	124.4	143.7	163.1	182.4	201.8
233.10	25.4	42.6	59.7	76.8	94.0	111.1	128.2	145.4	162.5	179.6
233.00	23.3	38.4	53.4	68.5	83.5	98.5	113.6	128.6	143.6	158.7
232.90	21.2	34.1	47.1	60.0	72.9	85.8	98.7	111.7	124.6	137.5
232.80	19.3	30.3	41.3	52.3	63.3	74.3	85.3	96.3	107.3	118.3
232.70	17.6	26.9	36.2	45.5	54.7	64.0	73.3	82.6	91.9	101.2
232.60	16.0	23.6	31.3	39.0	46.7	54.3	62.0	69.7	77.3	85.0
232.50	14.5	20.8	27.0	33.2	39.5	45.7	51.9	58.2	64.4	70.6
232.40	13.2	18.1	23.0	27.9	32.8	37.7	42.7	47.6	52.5	57.4
232.30	12.0	15.8	19.5	23.2	27.0	30.7	34.4	38.2	41.9	45.6
232.20	11.0	13.6	16.3	19.0	21.7	24.3	27.0	29.7	32.3	35.0
232.10	10.0	11.8	13.5	15.2	16.9	18.7	20.4	22.1	23.9	25.6
232.00	9.2	10.2	11.1	12.0	13.0	13.9	14.9	15.8	16.7	17.7
231.90	8.6	9.0	9.3	9.6	10.0	10.3	10.6	11.0	11.3	11.6
231.80	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3

Notes: Dam crest = 231.80 feet; Southern flashboard crest = 233.30 feet.
Upon flashboard failure, open broome gate if elevation drops below shaded cell to ensure minimum bypass flow of 18.5 cfs or 50 cfs.

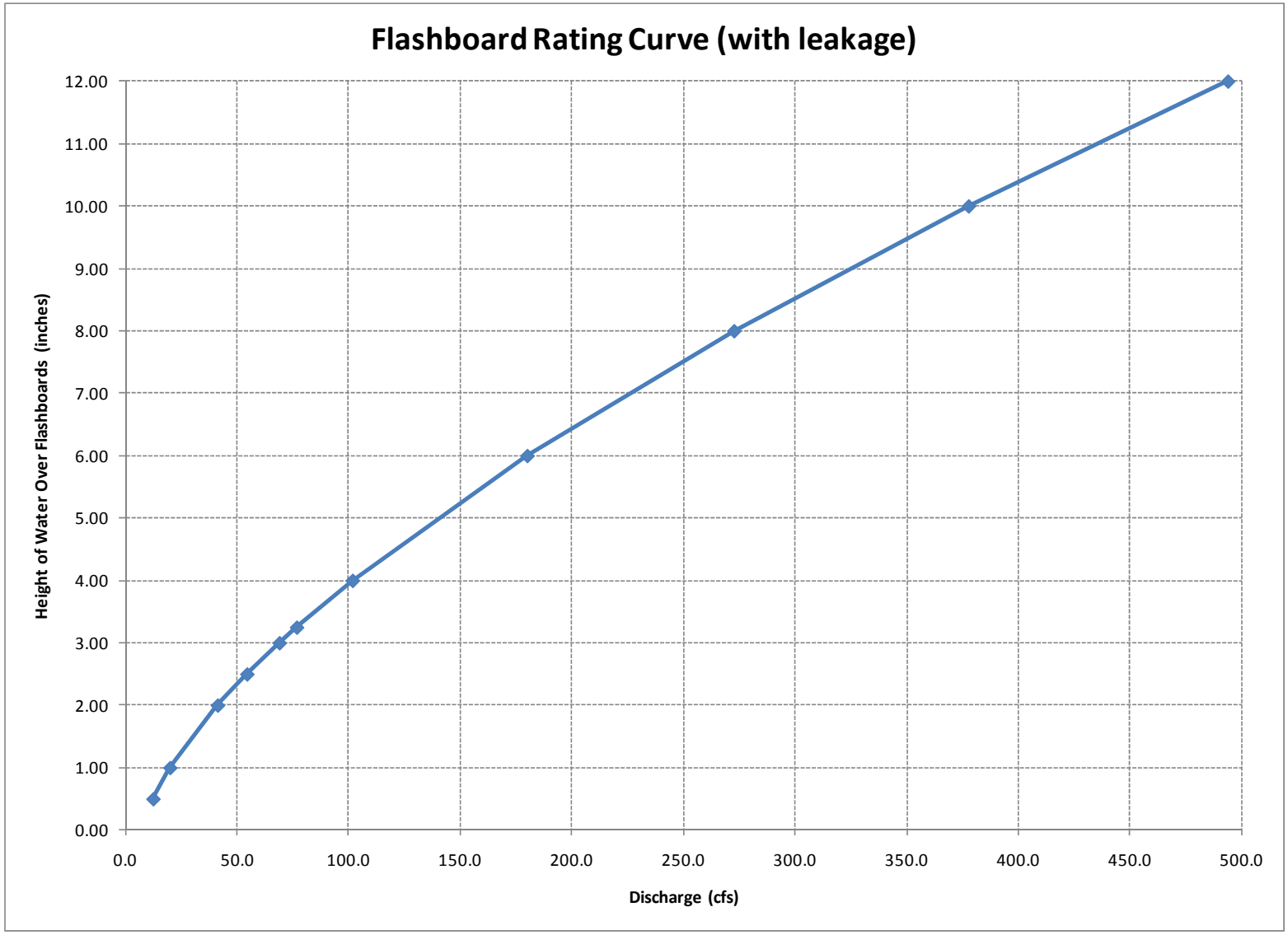
For example: If one 4-foot section of flashboard has failed at the normal full pond elevation (233.40 feet), minimum flows of at least 18.5 cfs can still be provided through the lost board section until the impoundment elevation reaches 232.80 feet. At that point, either the broome gate would be opened to provide minimum bypass flows, or the turbine output reduced to hold the impoundment at 232.80 feet.

Table 3.5-1: Theoretical Time to Raise Impoundment from 1.0 inch to 2.5 inches of Spill for Aesthetic Flow Releases.

Inflow (cfs)	Inflow minus bypass flow (-18.5 cfs)		Time to raise impoundment (minutes)
	90% for generation (cfs)	10% into storage (cfs)	
100	73	8	111
150	118	13	69
200	163	18	50
250	208	23	39
300	253	28	32

Notes: Plant capacity is 30 cfs to 254 cfs. Times to raise impoundment were calculated based on an impoundment surface area of 10 acres. At inflows below 100 cfs, impoundment level increase may commence the previous night to accommodate the 90% rule.

Figure 3.2-1: Carver Falls Flashboard Rating Curve.



Notes: Calculated discharge using a sharp-crested weir equation. Assumed spillway length of 146.3 feet. Added 8.3 cfs to account for leakage.

4.0 Flashboard Replacement and Impoundment Management

4.1 License Requirements

The Carver Falls Project contains two sets of flashboards. Currently there are 6-foot high flashboards on the north spillway. On the southern spillway, there are hinged steel flashboards which can be raised and lowered and are typically upright from early May into the fall. They are laid down in winter and raised the following spring. In accordance with Condition G of the Vermont WQC, CVPS is proposing to replace the existing 6.0 ft high plywood flashboards on the north spillway in summer 2010 with a new system consisting of a lower 4.0 ft steel section and an upper 2.0 ft section of lumber. The existing 6-foot high flashboards occasionally fail under high flows.

Condition C of the Vermont WQC specifies that CVPS manage the flow and impoundment storage rates during impoundment refill. During refilling of the project impoundment after flashboard replacement, at least 90% of instantaneous inflow shall be released and bypass flows shall be met at all times. This section addresses these requirements.

4.2 Flashboard Replacement

License Article 404 requires that CVPS remove (lower) the 1.5-foot-high flashboards from the southern spillway section of the dam on or before September 15, annually, to minimize any water quality impacts downstream and in the reservoir. The steel-hinged flashboards may be raised as early as mid to late April.

CVPS raises the flashboards on the southern spillway annually in the spring when inflows allow for safe access. When the impoundment elevation is at the normal elevation of one inch above the dam crest, CVPS operators will schedule a time to raise the flashboards on the southern spillway. For safety reasons, the impoundment must be lowered at least one inch below the dam crest while the flashboards are being raised. The 18-inch flashboards are steel-hinged, in sections four feet long, and each section is raised manually. During the process of raising the flashboards, CVPS operators will maintain minimum bypass flows and run-of-river conditions by manipulating the broome gate opening until the flashboards are fully raised.

On the northern spillway, the flashboards have a crest elevation of 233.8 feet, which is approximately 0.4 feet above the normal impoundment operating level of 233.3 feet (plus one inch of spillage over the southern flashboards). The upper two-foot high wooden section is designed to fail at an impoundment elevation of 234.8 feet, and the lower, four-foot steel section is designed to fail at an impoundment elevation of 235.8 feet.

CVPS will generally replace any lost flashboard sections from the northern spillway to correspond with the raising and lowering of the southern flashboards, or as necessary depending on the flow status of the river and cause of flashboard failure.

4.3 Flow Management during Impoundment Refill

When the flashboards are being raised/replaced, or during other situations when an impoundment drawdown is required, bypass flows will be maintained through the broome gate and flow through the turbine(s) will be decreased by adjusting generation in order to draw the impoundment down below the crest of the dam. A one-inch opening of the broome gate is equivalent to 12 cfs in the bypassed reach and

a two-inch opening is equivalent to 24 cfs in the bypassed reach. Once the flashboards are raised, turbine discharge will be adjusted to maintain 90 percent of inflow below the tailrace, retaining 10 percent in storage until the impoundment is refilled. Once the required minimum bypass flow is spilling over the boards, the operators will fully close the broome gate.

Table 4.3-1 shows the theoretical time to refill the impoundment (from dam crest to one inch above the raised flashboards) under various inflow conditions while following the 10 percent storage criteria. Depending on inflow conditions, the broome gate may be used to pass 90% of daily inflow, retaining 10% as storage until the impoundment is full.

Table 4.3-1: Theoretical Impoundment Refill Times after Flashboard Replacement.

Inflow (cfs)	Inflow minus bypass flow (-18.5 cfs)		Time to refill impoundment (hours)
	90% for generation (cfs)	10% into storage (cfs)	
100	73	8	24
150	118	13	15
200	163	18	11
250	208	23	8
300	253	28	7

Note: Times to impoundment refill were calculated based on an impoundment surface area of 10 acres.

5.0 Monitoring and Reporting

5.1 License Requirements

The Vermont WQC (Condition E) requires CVPS to develop a plan for continuous monitoring and reporting of flow releases at the project, impoundment levels, flashboard status, and inflows as well as to include procedures for reporting deviations from prescribed operating conditions. The New York State WQC (Condition 4) similarly requires CVPS to submit a flow monitoring plan addressing the required equipment for the purpose of determining project flows through the bypass, and determining project headpond and tailwater elevation.

License Article 402 specifies procedures for CVPS to follow if there is a deviation from run-of-river operation or minimum flow requirements. Specifically, license Article 402 states:

> *The licensee shall operate the project in a run of river mode and release minimum flows as required by condition B of the Vermont water quality certification (appendix B) and conditions 2 and 3 of the New York water quality certification (appendix A) for the protection of aquatic habitat and water quality in the Poultney River. Run of river operation and minimum flow releases may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon agreement among the licensee, the Vermont Agency of Natural Resources (Vermont ANR), the New York State Department of Environmental Conservation (New York DEC), and the U.S. Fish and Wildlife Service (FWS). If run-of-river operation or any minimum flow is so modified, the licensee shall notify the Commission, the Vermont ANR, New York DEC, and the FWS as soon as possible, but no but no later than 10 days, after each such incident.*

Additional requirements include provisions for the inclusion of contemporaneous records from the U.S. Geological Survey gage (Poultney River below Fair Haven, Vermont, Gage No. 04280000) located below the project powerhouse. In addition, Vermont WQC (Condition F) requires CVPS to provide a copy of the turbine rating curves, accurately depicting the flow/production relationship, for the record within one year of the issuance of the license.

5.2 Monitoring

The recorded flows for the Carver Falls Hydroelectric Project are determined by the USGS Gage near Carver Falls. The gage has a drainage area of 187 square miles and is located less than 1 mile downstream of the project (drainage area 186 square miles). The gage flows are representative of the project flows and are generally used without proration to depict flows at the Project. There is no tailwater elevation data collected at the Project.

Impoundment elevation data is measured by a pressure transducer on the dam, and the readings are transmitted to the CVPS control center where hourly records of impoundment elevation are maintained. An alarm system is also integrated to alert CVPS of low water levels in the impoundment. With the 18-inch flashboards up, the low water alarm is triggered at local elevation of 67 inches (one inch above top of boards). When the flashboards are down, the low water alarm is triggered at local elevation of 49 inches (one inch above dam crest). Operators maintain daily logs on-site which are used to record flashboard status, broome gate opening, and other operational notes.

CVPS monitors project operational data such as real-time elevations and generation output through their SCADA system, which is maintained at their offices. The Project's rating curve showing the discharge

rates across the range of turbine output (Figure 5.2-1) is used to determine flow releases at the Project. Carver Falls power versus flow relationships for both turbines were initially provided to FERC in CVPS's response to Additional Information Request number 11, dated March 4, 1996.

5.3 Reporting

CVPS maintains their operations data in SCADA; current parameters include generation output and headpond elevation. Upgrades are planned for 2010 to integrate the broome gate opening into the data repository. CVPS will maintain a spreadsheet with these parameters and the corresponding discharge estimates (see Table 5.3-1) once this automation is completed and provide such records to agencies upon written request. CVPS will allow inspection of the Project, including relevant records, upon reasonable notice by VANR, NYSDEC, or other authorized agents to determine compliance with license and WQC requirements. This plan will remain on display at the Project along with the FERC license and NY and VT water quality certifications (in accordance with Condition P of the Vermont WQC).

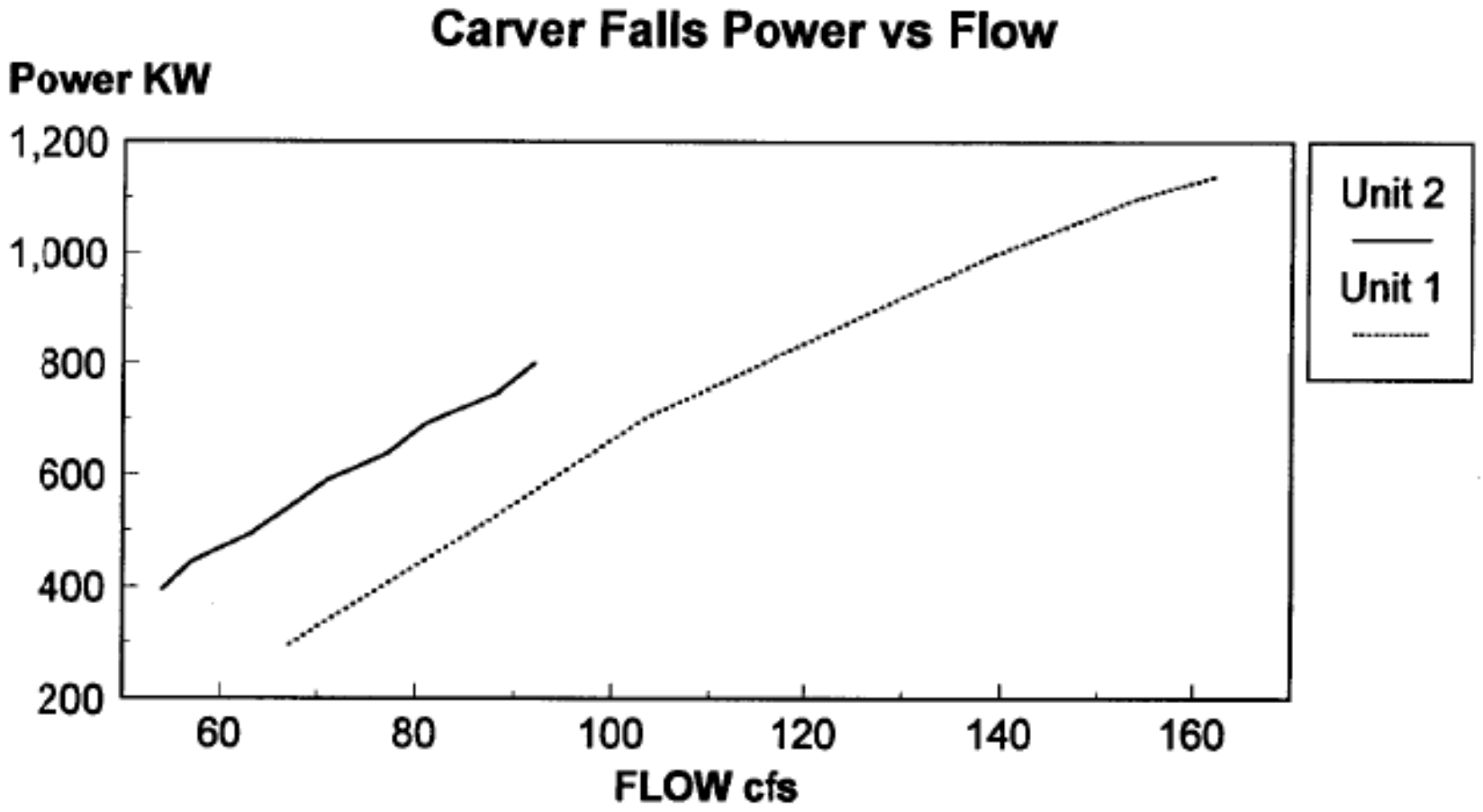
CVPS will operate the project in a run-of-river mode and release minimum flows as specified in this plan. CVPS operators maintain continuous checks on run-of-river conditions through impoundment level control as discussed in Section 2.2. Under normal operations, one turbine will be operated at a base load and the second turbine is throttled as necessary to maintain prescribed impoundment elevations. If CVPS determines that flows through the project deviate from license requirements, then CVPS will self report to FERC, NYSDEC, VANR, and USFWS within 10 days of the date the data becomes available regarding the incident in accordance with license Article 402. 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 operational requirements of the project license; 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.

Table 5.3-1: Example Carver Falls Operations Spreadsheet.

Date/time	Elevation (ft.)	Spillage* (cfs)	Broome Gate (ft.)	Gate Discharge (cfs)	Bypass Discharge (cfs)	Turbine Output (kW)	Turbine Discharge (cfs)	Total Discharge (cfs)	USGS Gage (cfs)	Comments
7/1/2009 1:00										
7/1/2009 2:00										
7/1/2009 3:00										
7/1/2009 4:00										
7/1/2009 5:00										
7/1/2009 6:00										
7/1/2009 7:00										
7/1/2009 8:00										
7/1/2009 9:00										
7/1/2009 10:00										
7/1/2009 11:00										
7/1/2009 12:00										

Notes: * Spillage includes a constant dam leakage of 8.3 cfs and will be calculated based on the flashboard rating curve. Impoundment elevation and turbine output are currently stored in SCADA. Manual records are kept regarding broome gate opening and flashboard status. Once the PLC program is upgraded and tested in 2010, this table will be populated automatically to provide discharge calculated from spillage (including leakage), gate settings and turbine rating curves, respectively. Flashboard status will be noted in operators' notes. The Southern Flashboard Failure Look-up Table will be consulted to determine estimated flows based on flashboard status and impoundment elevation.

Figure 5.2-1: Carver Falls Turbine Rating Curves.



Source: CVPS, 1996 – AIR #11.

6.0 Consultation

Condition 4 of the NYS WQC (Appendix A of the license), initially required that CVPS submit a flow monitoring plan for NYSDEC approval within three (3) months of acceptance of the FERC License. By letter dated May 19, 2009, CVPS requested a three month extension (until August 25, 2009) to allow time for preparation and review of one comprehensive Operations Compliance Plan to correspond with the time frame requirement in the VT WQC and FERC license. A draft of this plan was provided to the VANR, NYSDEC, and USFWS on June 26, 2009.

CVPS is required to submit to FERC documentation of its consultation with the VANR, NYSDEC, and USFWS, copies of comments and recommendations made in connection with the plans, and a description of how the plans and measures accommodate the comments and recommendations. On June 30, 2009, the NYSDEC stated it would defer to comments provided by the VANR. Similarly, on July 21, 2009, the USFWS indicated that they would defer to VANR's and NYSDEC's comments. CVPS received comprehensive and detailed comments from the VANR on July 23, 2009. A copy of the correspondence received is contained in Appendix A.

Since receiving the comments on the draft plan, CVPS applied for a three-month extension of time to file the final plan with FERC. The extension was granted on August 31, 2009; the final plan is now due at FERC by November 23, 2009. The revised plan was submitted to VANR on October 12, 2009 for approval. Additional comments were received from VANR on November 2, 2009. The NYSDEC has confirmed their continued deference to VANR by email dated November 12, 2009. CVPS's responses to the comments received are presented below.

A draft final plan addressing the comments from November 2, 2009 was resubmitted to VANR on November 17, 2009. In response, VANR provided a letter approving the plan on November 18, 2009, which is contained in this plan at the end of Appendix A.

6.1 Responsiveness Summary

VANR July 23, 2009 comments:

<u>VANR Comment 1:</u>

Section 2.2. During normal operation outside of the spring period, CVPS will be spilling 1.0 inch of water. For consistency and accuracy, I would suggest using elevations and measurements in the report that are in feet to the hundredths decimal point and inches to the tenths place.

The report should also make it clear that the top-of-flashboards elevation has to be constant from year to year or recommend a protocol for remeasuring the elevation each time the boards are replaced, entering that elevation in the records, and setting the controls so the low limit assures 1.0 inch of spill. Perhaps there is already some kind of protocol in place that insures the elevation remains fixed from year to year?

> <u>CVPS Response:</u>
>
> CVPS is planning to upgrade their instrumentation and controls at the Project in the summer of 2010. The real-time trending screens as well as the SCADA data will display elevations and measurements to the nearest 0.01 foot.

The 1.5 foot flashboards on the southern spillway were replaced in 1998 and are now hinged steel flashboards in four-foot sections. The boards are not removed and replaced. They are raised and lowered. Therefore, the elevation of the crest of the flashboards when raised is consistent from year to year.

VANR Comment 2:

The broome gate will provide a means of passing conservation flows into the bypass under several circumstances. Given that, it is important to accurately rate the gate, especially for the lower range of flows to be released through the gate. With the USGS gage below the project, there is an opportunity to make gate adjustments, record changes in the stage at the USGS gage, and use the data to refine the gate rating. I assume the rating curves in Figure 2.1-1 were based on use of an empirical gate equation with an assumed coefficient value. The derivation should be provided, but I also strongly recommend a gate-specific rating. The plan should also mention the importance of maintaining the gate entrance free of silt and debris.

The empirical gate equation should be provided along with the figure.

The gate opening should be recorded to the closest 0.01 foot. It might be a good idea to include a second figure that shows the gate rating curves for flows of 0-100 cfs if that would help the operator. For this gate, does raising it 1.0 inch from fully closed equal a 1.0-inch opening, or does it have to be raised a certain distance before outflow begins?

CVPS Response:

The broome gate rating curve was based on an empirical calculation. The curve has been updated using an orifice flow calculation with a coefficient of 0.7. The calculation used was derived from The Design of Small Dams (Second Edition, 1973), and is as follows:

$$Q = CA\sqrt{2gH}$$

Where:

A=area of the opening (broome gate is 6 feet long by 9 feet high)
H=head
C=the coefficient of discharge for submerged orifice flow (0.7 was used based on the width of the sill (8 inches))

The calculations of flow through the broome gate were plotted and are included in this plan as Figure 2.2-1. In addition, a functional look-up spreadsheet was provided to the operators allowing them to determine appropriate gate openings to pass flow under various scenarios, such as during an unplanned outage, or when adjusting bypass flows, etc. This rating curve will be field checked against the USGS gage. This calibration will occur during low flow conditions upon FERC acceptance of the plan and after the equipment upgrades are complete. This plan will be revised accordingly to include the supporting analysis.

Raising the gate does equal the actual reported opening because the gate is flush with the sill. The broome gate will be automated and the opening will be recorded in SCADA to the nearest 0.01 foot when the PLC upgrade is installed in 2010.

The plan has been clarified to describe how the broome gate opening is kept free of silt and debris.

VANR Comment 3:

I assume the compliance records spreadsheet will use the [broome gate] equation. The spreadsheet will include spillage, leakage, gate release (if any), turbine(s) release, and headpond level (reflecting zero change in storage contents normally). Together the data should reflect the flow being measured at the USGS gage as a check on run-of-river conditions.

The USGS data should be entered into the spreadsheet, and CVPS should be checking consistency on a ongoing basis. Note that there is a small amount of intervening drainage between the gage and the project, primarily a small trib on the NYS side of the river with a drainage area of about ½ square mile.

CVPS Response:

CVPS maintains their operations data in SCADA. Current parameters include generation output and headpond elevation. Upgrades are planned for 2010 to integrate broome gate opening into the data repository. CVPS will maintain a spreadsheet with these parameters (see Table 5.3-1) once this automation is completed. USGS data is viewed real-time on the internet. Data from the USGS can be requested from the local office or downloaded periodically from the internet.

CVPS operators maintain continuous checks on run-of-river conditions through impoundment level control. Under normal operations, one turbine will be operated at a base load and the second turbine is throttled as necessary to maintain prescribed impoundment elevations.

SCADA data can be translated into flows using the turbine rating curves, broome gate equation, and weir equation for spillage, as shown in Table 5.3-1. These spreadsheets will allow CVPS to ensure compliance with run-of-river conditions as well as provide records to agencies upon request.

VANR Comment 4:

The gate is operated to keep the headpond below the top of the north flashboards during high flows. The text should clarify how the gate is operated as inflows recede. Optimally, the gate would be shut gradually as the headpond is declining rather than shut all at once when the headpond drops back down to 1.0-inch spill.

CVPS Response:

CVPS operators currently use a gradual process when opening and closing the gate in order to match inflows as closely as practical. The gate automation will be programmed to open and close gradually when the PLC upgrade is installed next summer. The automation will be based on headpond levels so that natural inflow conditions are simulated. During an unplanned outage, the broome gate will be programmed to provide the amount flow previously being used for generation prior to the shut-down, thus ensuring downstream flow requirements. Section 2 has been revised to address lag times during planned and unplanned outages.

VANR Comment 5:

The plan mentions unplanned events like station trips. Since stations are no longer manned, the response times can result in significant deviations from run-of-river conditions. Condition D requires that lag time be addressed in the plan. You mention lag time in the Section 3 introduction on bypass flow management. It relates more to the run-of-river requirement. When the station is taken off line, whether intentional or not, the headpond must build up several inches before outflow = inflow. So please move the lag time issue to Section 2 and give further consideration to how it will be addressed. Rivers differ on their sensitivity to flow fluctuations. Worst case here, the downstream flow could go from 254 + 18 = 272 cfs to 18 cfs if the station is taken off line when operating at full capacity with an inflow of 272 cfs, unless the gate is opening in advance or the operator ramps the units down as the headpond builds up. For events like station trips, the gate should be automated if necessary to avoid ecological damage.

CVPS Response:

Currently, after a plant trip CVPS dispatches an operator to the station, the broome gate is opened manually to correspond with last turbine output setting, then the operator will diagnose the problem. As mentioned, CVPS is automating the broome gate and turbine output through PLC. When this upgrade is completed in summer of 2010, turbine output can be programmed to minimize the lag time in downstream flows.

Section 2 has been revised to address lag times during planned and unplanned outages.

VANR Comment 6:

Under Section 3.1, the third paragraph, the VT 401 (Condition B) also requires the 50 cfs.

CVPS Response:

Section 3.1 has been revised to incorporate the above comment.

VANR Comment 7:

Section 3.2. Leakage through the limestone bedrock may increase over time. I didn't go back to review the prior flow measurement information from the licensing studies. In Table 3.2-1, you show leakage at two different water levels. It is a bit surprising that an extra 1.5 feet of head would increase the leakage by 37%. This may have been attributable to flashboard leakage, since one would not expect the bedrock leakage to change significantly for such a small head change.

Consequently, I agree that the 8.3 cfs leakage value should be assumed unless additional work is done to define the actual bedrock leakage. In the table, it should be noted that the flow at 2.5-inch spillage was not measured. It was estimated using the weir equation. The C values for the spillages of 2.0 and 3.25 inches are consistent at about 3.27 (assuming the 11 cfs leakage). The calculated C value for 1.0 inch is quite a bit lower at 2.58. I'm not sure what the explanation is. I'd suggest adding a third column to the table showing the estimated spillage flow (e.g., 1 inch spill = 20.7 - 11.4 = 9.3 cfs). AIR #6 uses a crest length of 146 feet but the plan uses 150 feet. The C value probably differs between whether it's over the boards or over the concrete crest; it would vary with depth as well, especially for shallow flows.

CVPS Response:

Table 3.2-1was revised for clarity. At the time of the referenced studies, it was likely that there was some flashboard leakage. Dam leakage measured when the water level was at the dam crest

is closer to 8.3 cfs. CVPS agrees that 8.3 cfs is the minimum leakage flow, until field measurements prove otherwise.

The exhibit F drawings indicate that the length of the southern spillway sections totals approximately 146 feet.

VANR Comment 8:

If I recall correctly, the leakage has been sufficient at times to cause the headpond to drop well below the crest during drought periods.

CVPS Response:

Under the rare situation when inflows are less than leakage, the project is shut-down and inflows are passed downstream as leakage. Theoretical pond level draw-downs related to drought condition inflows were discussed in AIR #3 (CVPS, March 1996).

VANR Comment 9:

Section 3.3. Is it CVPS's intent to spill through the winter instead of switch to a gate release? Given icing problems, it may be easier to assure compliance by using the gate.

CVPS Response:

Utilizing the broome gate for continuous flow management in the winter proves troublesome for CVPS due to icing concerns. It is CVPS's intent to spill through the winter.

VANR Comment 10:

Section 3.4. Would it be easier to make up the difference between 18.5 and 50 cfs by using the broome gate instead of spilling 2.5 inches of water? Also, if your text assumes 11.4 cfs of leakage, but previously you state that 8.3 cfs will be assume. Either way, the 2.5 inch spill will comply. (same comment relative to Section 3.5)

CVPS Response:

CVPS's current operating protocol is to provide the aesthetic flows as at least 2.5 inches of spillage. This is accomplished by using headpond and unit controls.

VANR Comment 11:

Section 3.5. There may be times during these events when the station has to be shut down in order to provide the spillage. This would be another circumstance when lag time should be considered (as well as normal operational shutdowns for recessions to low flows). Ideally, there would be some ramping down for the transition, and ramping up to protect the bypass when the station is brought back on line. Also, the "90% rule" should apply when the headpond is being raised from 1.0-inch spill to 2.5-inch spill. That should be the guidance for the operator when the operator is deciding how to cut back the turbine discharge to raise the pool.

CVPS Response:

Section 3.5 relates to relates to providing a minimum flow of 50 cfs for aesthetics. Operators prepare for the transition by closely monitoring turbine output and downstream flows using the USGS gage. To address lag time, operators adjust turbine output in increments of 10 percent, as appropriate. Adjustments are made until the required headpond is achieved to provide at least 2.5 inches of spill for aesthetics.

As it relates to raising the headpond from 1.0 to 2.5 inches of spill – a look-up table is presented in Table 3.5-1. For example at inflows of 250 cfs, turbine discharges will be decreased so that 10 percent of flow goes into storage; this results in 40 minutes until the impoundment is raised from 1.0 inch to 2.5 inches of spillage.

VANR Comment 12:

Section 4.0. Please indicate how far the pond is drawn below the crest to facilitate raising the flashboards.

CVPS Response:

CVPS's protocol for raising the flashboards requires the impoundment to be at least one inch below the crest for safety reasons. The broome gate is used to pass the required inflows while holding the impoundment steady during this process.

VANR Comment 13:

Flashboards may fully or partially collapse during high flows. Please indicate how the operator responds to such events. It's particularly important to indicate how to set the headpond controls when the boards have partially collapsed. The minimum flow could be supplied via a gate release pending the resetting of the boards. Otherwise, the plan should provide guidance (perhaps a lookup table) for the operator to know what the headpond level has to be as a function of the number of flashboard sections that have dropped. This issue may be more appropriate to cover in Section 3 as it relates more to bypass flows than flashboard replacement.

CVPS Response:

The flashboards are in 4-foot sections. If the flashboards fail, inflows will be well above the required minimum flow. In the event that inflows are not high, the broome gate will be used to pass inflows until the boards can be reset.

VANR Comment 14:

Section 5.0. CVPS will have information available from its SCADA system in Rutland, records maintained by the operator at the project site, and the USGS records. To enable CVPS to monitor its compliance on an ongoing basis (and to provide records to FERC or the states when requested), the information should be entered into a spreadsheet that is set up to calculate flow values (gate, spill (flashboards up, down, partially up), and powerhouse discharge) and check those values against the bypass flow requirements and run-of-river operation constraints.

I'd recommend that GSE work with CVPS to set up such a system, test it for a period of time, and report to the agencies on the results.

CVPS Response:

CVPS maintains continuous records of turbine output, broome gate opening, and impoundment levels and provide such records to agencies upon written request. An example of the spreadsheet that CVPS contemplates using to maintain operational records is provided in Table 5.3-1. CVPS will ensure compliance with run-of-river operations by monitoring the impoundment level and controlling it by making changes to turbine output and gate settings, as appropriate. The current upgrade proposal will allow for continuous recordkeeping of broome gate settings and resulting discharges.

Also refer to response to VANR Comment 3.

VANR Comment 15:

I assume, but am not certain, that CVPS is operating under the draft plan now in order to comply with the flow regime set forth in the new license. Condition D of the VT 401 requires addressing lag time. I looked at the last 60 days of real time data available through the USGS.

There are several downward "spikes," the two most significant pasted below. [See comments in Appendix A for data.] These occurred when the river was within control of the station and with the bypass minimum at 18.5 cfs. The data is provisional. It shows the flow dropping from about 130 cfs to 17 cfs on the 3th [of June] and from about 118 cfs to 25 cfs the following morning. You might inquire as to what happened to see if the plan as drafted is adequate.

CVPS Response:

In these particular situations, the downward flow spikes were caused by short-term plant shut-downs due to CVPS maintenance work on electrical equipment at the Project.

Normally, the operators will initiate a ramped shut-down sequence when outages are planned to ensure run-of river compliance. However, in these cases, the ramp down sequence was not performed due uncoordinated timing of the shut-downs between the operators and linemen.

Following the ramp down procedures described in Section 2.3, and completion of CVPS's planned upgrade to automation of a ramp down sequence of turbines, will prevent this in the future. CVPS believes that this plan will adequately address this issue. Any incidents of deviation from run-of-river or bypass flow requirements will be reported as described in Section 5.3 of this plan.

VANR Comment 16:

The turbine rating curves (Figure 5.2-1) are for each of the units operating independently. Using the USGS gage, CVPS may want to generate a curve for the units operating together since it wouldn't necessarily be additive.

CVPS Response:

CVPS currently uses the turbine rating curves for the units operating independently.

VANR November 2, 2009 comments:

Comment 1. CVPS will be completing equipment upgrades next summer. Pending the equipment upgrades, what will be the compliance and/or record keeping limitations? In other words, what types of problems can we expect until the new equipment is up and running?

> CVPS Response: Equipment upgrades will consist of: 1) automating the broome gate controls, 2) upgrading the PLC to provide expanded functionality, and 3) improving the turbine governing controls to allow for finer operating capability. Current limitations are related to lag times as explained in Section 2.3, which include a lag time after a station trip due to having to open the broome gate manually. Because station trips are rare, CVPS anticipates infrequent compliance problems with true run-of-river conditions after an unplanned trip until the broome gate is fully automated and tested. The improvements will also allow for better control of the impoundment elevation.
>
> CVPS currently maintains continuous records of turbine output, broome gate opening, and impoundment levels. CVPS will ensure compliance with run-of-river operations by monitoring the impoundment level and controlling it by making changes to turbine output and gate settings, as appropriate. The current upgrade proposal will allow for continuous recordkeeping of broome gate settings and the resulting discharges. Current limitations to record keeping involve manually recording the broome gate opening. CVPS is not anticipating any other compliance problems in the interim period until the upgrades are performed.

Comment 2. The response states, "The [broome gate] rating curve will be field checked against the USGS gage." I assume this means the gage [sic] coefficient will be calibrated based on the comparison. Please indicate 1) when this calibration will occur and 2) that the plan will be revised accordingly and will include the supporting analysis. It may also make sense to use the USGS gage data to reestimate leakage and to calibrate the weir coefficient for spillage (flashboards up/down). Again, since flows below 100 cfs are particularly critical, there should be a separate rating curve for 0-100 cfs (reference Fig. 2.2-1).

> CVPS Response: To calibrate the broome gate, the gate will be opened incrementally and the USGS gage reading will be recorded upon stabilization for a range of gate openings. The broome gate coefficient can be refined upon corroboration of the flow versus gate opening relationship. A separate rating curve has been developed for gate openings that relate to flows in the 0-100 cfs range. The rating for this range of flows is based on the existing calculation used, as shown in Figure 2.2-2.
>
> Leakage can be confirmed using the USGS gage, if practical, and in consultation with the USGS. The minimum daily flow recorded at the gage historically is 14 cfs measured in 1964. Leakage was field measured at 8.3 cfs. This calibration will occur during low flow conditions upon FERC acceptance of this Operations Compliance Plan and after the equipment upgrades are complete. This plan will be revised accordingly to include the supporting analysis.

Comment 3. The compliance spreadsheet (Fig. 5.3-1) should show spillage and leakage separately and should include the status of the flashboards. It's unclear why the broome gate opening will not be entered until the equipment upgrades. Is that because it is logged separately and not part of the SCADA system data yet?

> CVPS Response: Leakage is included in the spillage column. The calculation used to translate elevation to discharge in SCADA will account for leakage (i.e., if the impoundment is below the flashboard or dam crest and not spilling, the value will be reported as 8.3 cfs). In terms of

flashboard status, CVPS operators conduct daily project inspections which include visual observation of flashboard condition. In the case of a flashboard failure, until river conditions allow for safe resetting of the flashboards, the operator will corroborate with the Control Center to determine a new pond elevation set point to utilize until flashboards are reset. The flashboard look-up table will be consulted to account for flows through the flashboard openings. Turbine output will be adjusted to hold the pond level at the new set point until flashboard replacement can occur. This procedure is similar to that used at other CVPS riverine hydroelectric projects.

The broome gate opening is currently not recorded in SCADA; it is manually recorded in operators' logs. This parameter will be stored in SCADA upon completion of the upgrades.

Comment 4. If I understand this correctly, when inflows are receding (e.g., after a high flow event) and the headpond starts to drop below the top of the north flashboards, the gate will initially be used to hold the headpond level steady (outflow = inflow). Once the gate is shut, the headpond will drop naturally as inflows continue to decline.

CVPS Response: When inflows are above normal operating levels, natural inflows will be passed downstream using the broome gate and station turbines until the headpond drops to normal levels, at which point the broome gate will be fully closed. When the PLC upgrade is installed in 2010, the gate will be programmed to open and close automatically based on headpond levels and turbine settings so that natural inflow conditions are simulated.

Comment 12. Please indicate the maximum drawdown below the crest for resetting the flashboards.

CVPS Response: CVPS's protocol for raising the flashboards requires the impoundment to be at least one inch below the crest on the dam for safety reasons. Under normal circumstances, the maximum drawdown would be one inch below crest, or approximately 231.70 feet elevation USGS when the southern flashboards need to be reset. The maximum drawdown for resetting the northern flashboards is 227.70 feet elevation (one inch below the spillway crest).

Comment 13. Unless the station will be shut down whenever the boards have partially failed, there needs to be a method for estimating spillage when the headpond falls below 1.0-inch (or 2.5 inch) above the top of the boards.

CVPS Response: A look-up table based on flashboard status has been developed and added to the plan. Local operators will corroborate with the Control Center to determine a new pond elevation set point to utilize until flashboards are reset. The flashboard look-up table will be consulted to account for flows through the flashboard openings. Turbines output will be adjusted to hold the pond level at the new set point. Flows will be managed at that set point until inflows recede enough to allow drawdown to one inch below the dam crest for flashboard replacement.

Appendix A: Agency Correspondence

Central Vermont Public Service Corporation

May 19, 2009

Michael J. McMurray
Environmental Permits
Region 5 Headquarters
NYS Dept. of Environmental Conservation
Rt 86, P.O. Box 296
Ray Brook, NY 12977-0296

Central Vermont Public Service
Carver Falls Hydroelectric Project - FERC No. 11475-000
New York State Water Quality Certificate, License Article 4, Flow Monitoring Plan
Request for an Extension of Time:

Dear Mr. McMurray:

The Carver Falls Hydroelectric Project (FERC Project No. 11475) was issued an original FERC license on February 25, 2009. The Project is located on the Poultney River in Washington County, New York, and Rutland County, Vermont and is owned and operated by Central Vermont Public Service Corporation (CVPS). The license incorporates and is subject to the conditions issued by the New York State Department of Environmental Conservation (NYSDEC) under section 401(a)(1) of the Clean Water Act, set forth in Appendix A of the license.

Condition 4 of the NYSDEC Water Quality Certification (WQC), issued April 21, 1995 and modified December 13, 1996, requires CVPS to file a Flow Monitoring Plan with the NYSDEC within 3 months of acceptance of the FERC License.

In order to comply with conditions of the Vermont Agency of Natural Resources Water Quality Certification (VANR), issued December 5, 2008, CVPS is developing a comprehensive Operations Compliance Plan. This Plan will include the elements required by Condition 4 of the NYSDEC WQC.

CVPS respectfully requests a three month extension (until August 25, 2009) to allow time in order to prepare and submit one comprehensive Operations Compliance Plan to both the NYDEC and VANR..

If you have any questions regarding this request please call me at (802) 747-5594.

Sincerely,

Beth Eliason
Environmental Engineer

cc: M. Scarzello, CVPS
J. George, Gomez & Sullivan
Bill Schoch, Manager, Bureau of Fisheries, Region 5 Headquarters, NYS DEC
Mark Woythal, Instream Flow & Wind Unit Leader, NYS DEC, Div. of Fish Wildlife & Marine Resources, Habitat Unit

Jason George

From: John_Warner@fws.gov
Sent: Tuesday, July 21, 2009 1:29 PM
To: Cueto, Jeff
Cc: Eliason, Beth; Jason George; Michael McMurray; Scarzello, Michael
Subject: Re: Carver Falls Flow Management Plan
Attachments: pic14771.gif

Jeff, and others - Due to staffing limitations we will defer to Vermont and NYDEC on the review of this plan -- thank You -- John Warner

---

John P. Warner, Energy/Hydropower Coordinator
New England Field Office, U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301
(603) 223-2541 - ext.15
(603) 223-0104 - FAX

www.fws.gov.northeast/newenglandfieldoffice

"Cueto, Jeff" <Jeff.Cueto@state.vt.us>

"Cueto, Jeff"
<Jeff.Cueto@state.vt.us>

07/16/2009 12:18 PM

ToMichael McMurray <mjmcmurr@gw.dec.state.ny.us>, John Warner <John_Warner@FWS.gov>

ccJason George <jgeorge@gomezandsullivan.com>, "Scarzello, Michael" <MScarze@cvps.com>, "Eliason, Beth" <beliaso@cvps.com>

SubjectCarver Falls Flow Management Plan

Mike and John – Gomez and Sullivan distributed a draft flow management plan by letter dated June 26. The plan is subject to approval by both NYS and VT under the respective water quality certifications. The VT certification requires consultation with the USFWS. After approval by the states, the plan is subject to FERC approval under license Article 401(A). The deadline for filing the plan with FERC is August 25. We have been asked to respond by Monday, July 27. I was going to start reviewing it today hopefully. I'd suggest that we coordinate our reviews and jointly comment (or approve it if it is fine in its present form).

Mike – NYS required that it be filed within 3 months of licensing. I'm assuming you gave CVPS an extension.

John – If you don't have time to get involved, that's okay, but just send me the confirmation of that.

Thanks.
Jeff

><{{{˜> ***Jeffrey R. Cueto, P.E., Chief Hydrologist***
><{{{˜> VT Department of Environmental Conservation

><{{{˜> Dam Safety and Hydrology Section
><{{{˜> Facilities Engineering Division, Laundry Bldg.
><{{{˜> 103 South Main Street, Waterbury, VT 05671-0511
><{{{˜> (802) 241-3758
><{{{˜> jeff.cueto@state.vt.us

Jason George

From: Cueto, Jeff [Jeff.Cueto@state.vt.us]
Sent: Thursday, July 23, 2009 11:24 AM
To: Jason George
Cc: Michael McMurray; John_Warner@fws.gov; Scarzello, Michael; Eliason, Beth
Subject: Carver Falls Flow Management and Monitoring Plan

Jason – Thanks for June 26 filing of the draft plan in response to the several conditions in the Vermont and NYS water quality certifications and the FERC license as related to flow and water level management and compliance monitoring and record keeping (conditions D and E of the Vermont certification). Your intent is to finalize the plan and get it approved by the two states, then file the plan with FERC by the August 25 deadline set forth in the license. My comments follow.

Section 2.2. During normal operation outside of the spring period, CVPS will be spilling 1.0 inch of water. For consistency and accuracy, I would suggest using elevations and measurements in the report that are in feet to the hundredths decimal point and inches to the tenths place. The report should also make it clear that the top-of-flashboards elevation has to be constant from year to year or recommend a protocol for remeasuring the elevation each time the boards are replaced, entering that elevation in the records, and setting the controls so the low limit assures 1.0 inch of spill. Perhaps there is already some kind of protocol in place that insures the elevation remains fixed from year to year?

The broome gate will provide a means of passing conservation flows into the bypass under several circumstances. Given that, it is important to accurately rate the gate, especially for the lower range of flows to be released through the gate. With the USGS gage below the project, there is an opportunity to make gate adjustments, record changes in the stage at the USGS gage, and use the data to refine the gate rating. I assume the rating curves in Figure 2.1-1 were based on use of an empirical gate equation with an assumed coefficient value. The derivation should be provided, but I also strongly recommend a gate-specific rating. The plan should also mention the importance of maintaining the gate entrance free of silt and debris.

The empirical gate equation should be provided along with the figure. I assume the compliance records spreadsheet will use the equation. The spreadsheet will include spillage, leakage, gate release (if any), turbine(s) release, and headpond level (reflecting zero change in storage contents normally). Together the data should reflect the flow being measured at the USGS gage as a check on run-of-river conditions. The USGS data should be entered into the spreadsheet, and CVPS should be checking consistency on a ongoing basis. Note that there is a small amount of intervening drainage between the gage and the project, primarily a small trib on the NYS side of the river with a drainage area of about ½ square mile.

The gate opening should be recorded to the closest 0.01 foot. It might be a good idea to include a second figure that shows the gate rating curves for flows of 0-100 cfs if that would help the operator. For this gate, does raising it 1.0 inch from fully closed equal a 1.0-inch opening, or does it have to be raised a certain distance before outflow begins?

The gate is operated to keep the headpond below the top of the north flashboards during high flows. The text should clarify how the gate is operated as inflows recede. Optimally, the gate would be shut gradually as the headpond is declining rather than shut all at once when the headpond drops back down to 1.0-inch spill.

The plan mentions unplanned events like station trips. Since stations are no longer manned, the response times can result in significant deviations from run-of-river conditions. Condition D requires that lag time be addressed in the plan. You mention lag time in the Section 3 introduction on bypass flow management. It relates more to the run-of-river requirement. When the station is taken off line, whether intentional or not, the headpond must build up several inches before outflow = inflow. So please move the lag time issue to Section 2 and give further consideration to how it will be addressed. Rivers differ on their sensitivity to flow fluctuations. Worst case here, the downstream flow could go from 254 + 18 = 272 cfs to 18 cfs if the station is taken off line when operating at full capacity with an inflow of 272 cfs, unless the gate is opening in advance or the operator ramps the units down as the headpond builds up. For events like station trips, the gate should be automated if necessary to avoid ecological damage.

Under Section 3.1, the third paragraph, the VT 401 (Condition B) also requires the 50 cfs.

Section 3.2. Leakage through the limestone bedrock may increase over time. I didn't go back to review the prior flow measurement information from the licensing studies. In Table 3.2-1, you show leakage at two different water levels. It is a bit surprising that an extra 1.5 feet of head would increase the leakage by 37%. This may have been attributable to flashboard leakage, since one would not expect the bedrock leakage to change significantly for such a small head change. Consequently, I agree that the 8.3 cfs leakage value should be assumed unless additional work is done to define the actual bedrock leakage. In the table, it should be noted that the flow at 2.5-inch spillage was not measured. It was estimated using the weir equation. The C values for the spillages of 2.0 and 3.25 inches are consistent at about 3.27 (assuming the 11 cfs leakage). The calculated C value for 1.0 inch is quite a bit lower at 2.58. I'm not sure what the explanation is. I'd suggest adding a third column to the table showing the estimated spillage flow (e.g., 1 inch spill = 20.7 – 11.4 = 9.3 cfs). AIR #6 uses a crest length of 146 feet but the plan uses 150 feet. The C value probably differs between whether it's over the boards or over the concrete crest; it would vary with depth as well, especially for shallow flows.

If I recall correctly, the leakage has been sufficient at times to cause the headpond to drop well below the crest during drought periods.

Section 3.3. Is it CVPS's intent to spill through the winter instead of switch to a gate release? Given icing problems, it may be easier to assure compliance by using the gate.

Section 3.4. Would it be easier to make up the difference between 18.5 and 50 cfs by using the broome gate instead of spilling 2.5 inches of water? Also, if your text assumes 11.4 cfs of leakage, but previously you state that 8.3 cfs will be assume. Either way, the 2.5 inch spill will comply. (same comment relative to Section 3.5)

Section 3.5. There may be times during these events when the station has to be shut down in order to provide the spillage. This would be another circumstance when lag time should be considered (as well as normal operational shutdowns for recessions to low flows). Ideally, there would be some ramping down for the transition, and ramping up to protect the bypass when the station is brought back on line. Also, the "90% rule" should apply when the headpond is being raised from 1.0-inch spill to 2.5-inch spill. That should be the guidance for the operator when the operator is deciding how to cut back the turbine discharge to raise the pool.

Section 4.0. Please indicate how far the pond is drawn below the crest to facilitate raising the flashboards.

Flashboards may fully or partially collapse during high flows. Please indicate how the operator responds to such events. It's particularly important to indicate how to set the headpond controls when the boards have partially collapsed. The minimum flow could be supplied via a gate release pending the resetting of the boards. Otherwise, the plan should provide guidance (perhaps a lookup table) for the operator to know what the headpond level has to be as a function of the number of flashboard sections that have dropped. This issue may be more appropriate to cover in Section 3 as it relates more to bypass flows than flashboard replacement.

Section 5.0. CVPS will have information available from its SCADA system in Rutland, records maintained by the operator at the project site, and the USGS records. To enable CVPS to monitor its compliance on an ongoing basis (and to provide records to FERC or the states when requested), the information should be entered into a spreadsheet that is set up to calculate flow values (gate, spill (flashboards up, down, partially up), and powerhouse discharge) and check those values against the bypass flow requirements and run-of-river operation constraints. I'd recommend that GSE work with CVPS to set up such a system, test it for a period of time, and report to the agencies on the results.

I sent you the following email on Monday. Please consider it in your response:

Jason – I'll try to get comments to you by the end of the week. I assume, but am not certain, that CVPS is operating under the draft plan now in order to comply with the flow regime set forth in the new license. Condition D of the VT 401 requires addressing lag time. I looked at the last 60 days of real time data available through the USGS. There are several downward "spikes," the two most significant pasted below. These occurred when the river was within control of the station and with the bypass minimum at 18.5 cfs. The data is provisional. It shows the flow dropping from about 130 cfs to 17 cfs on the 3th and from about 118 cfs to 25 cfs the following morning. You might inquire as to what happened to see if the plan as drafted is adequate.
Jeff

06/04/2009 06:15	2.48	136
06/04/2009 06:30	2.48	136

06/04/2009 06:45	2.48	136
06/04/2009 07:00	2.47	134
06/04/2009 07:15	2.47	134
06/04/2009 07:30	2.47	134
06/04/2009 07:45	2.37	116
06/04/2009 08:00	1.82	39
06/04/2009 08:15	1.55	17
06/04/2009 08:30	1.78	35
06/04/2009 08:45	2.09	72
06/04/2009 09:00	2.33	109
06/04/2009 09:15	2.39	119
06/04/2009 09:30	2.41	123
06/04/2009 09:45	2.43	127
06/04/2009 10:00	2.43	127
06/04/2009 10:15	2.44	129
06/04/2009 10:30	2.45	130
06/04/2009 10:45	2.45	130

06/05/2009 07:00	2.38	118
06/05/2009 07:15	2.38	118
06/05/2009 07:30	2.38	118
06/05/2009 07:45	2.38	118
06/05/2009 08:00	2.38	118
06/05/2009 08:15	2.37	116
06/05/2009 08:30	1.97	56
06/05/2009 08:45	1.66	25
06/05/2009 09:00	1.84	41
06/05/2009 09:15	2.05	66
06/05/2009 09:30	2.18	85
06/05/2009 09:45	2.29	102
06/05/2009 10:00	2.32	107
06/05/2009 10:15	2.53	145
06/05/2009 10:30	2.88	208
06/05/2009 10:45	2.81	195
06/05/2009 11:00	2.71	176
06/05/2009 11:15	2.61	159
06/05/2009 11:30	2.55	148

06/05/2009 11:45	2.51	142
06/05/2009 12:00	2.48	136

The turbine rating curves (Figure 5.2-1) are for each of the units operating independently. Using the USGS gage, CVPS may want to generate a curve for the units operating together since it wouldn't necessarily be additive.

Thanks.
Jeff

><{{{˜> ***Jeffrey R. Cueto, P.E., Chief Hydrologist***
><{{{˜> VT Department of Environmental Conservation
><{{{˜> Dam Safety and Hydrology Section
><{{{˜> Facilities Engineering Division, Laundry Bldg.
><{{{˜> 103 South Main Street, Waterbury, VT 05671-0511
><{{{˜> (802) 241-3758
><{{{˜> jeff.cueto@state.vt.us

Jason George

From: Michael McMurray [mjmcmurr@gw.dec.state.ny.us]
Sent: Thursday, July 30, 2009 4:48 PM
To: Jason George
Cc: Beth Eliason; Michael Scarzello; John_Warner@fws.gov; Bill Schoch; Mark Woythal; William Little; Jeff Cueto
Subject: Re: Carver Falls Flow Management and Monitoring Plan

Jason,

Due to time constraints, NYS DEC will defer to the State of Vermont and concur with their very thorough comments on the draft Flow Management and Monitoring Plan.

Thank you.

Mike

Central Vermont Public Service Corporation

August 12, 2009

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code: DLC, HL-11.2
888 First Street NE, Room 1A
Washington, DC 20426

Central Vermont Public Service
Carver Falls Hydroelectric Project – FERC No. 11475
Request for an Extension – Article 401(A) Reservoir and Flow Management and Operation/Monitoring Plans

Dear Secretary Bose:

Central Vermont Public Service (CVPS) is filing this request for an extension of time to comply with Artile 401(A) of the Order on Offer of Settlement and Issuing Original License (126 FERC ¶62,144) dated February 25, 2009 for the Carver Falls Hydroelectric Project.

Article 401(A) requires CVPS to file the following plans, required by conditions of the New York and Vermont water quality certificates, to the Commission for approval within six (6) months of license issuance:

Reservoir and Flow Management and Operation Plan
Reservoir and Flow Management Monitoring Plan

The required plans were prepared as one comprehensive Operations Compliance Plan. On June 26, 2009 a draft Operations and compliance Plan was submitted to the US Fish and Wildlife Service (USFWS), New York State Department of Environmental Services (NYSDES) and the Vermont Agency of Natural Resources (VANR) for review.

Comprehensive and detailed comments were received from VANR on July 23, 2009. On June 30 NYDES deferred comment and concurred with those provided by VANR. USFWS indicated that due to staffing limitations they would defer to VANR and NYDES comments.

Given the length and detailed nature of VANR's comments, CVPS requires additional time to research, respond and make revisions to the draft Operations Compliance Plan, which will then require final approval from VANR. Therefore, CVPS respectfully requests a three month extension (until November 23, 2009) to allow time for finalization and VANR approval of the Operations Compliance Plan prior to submitting to the FERC.

If you have any questions regarding this request please contact me at (802) 747-5594 or beliaso@cvps.com.

Sincerely,

Beth Eliason
Environmental Engineer

Electronic cc:

P. Valeri, NYRO
M. Scarzello, CVPS
J. George, Gomez & Sullivan

20090831-3011 FERC PDF (Unofficial) 08/31/2009

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Central Vermont Public Service Corporation Project No. 11475-003

ORDER GRANTING EXTENSION OF TIME

(Issued August 31, 2009)

1. On August 12, 2009, Central Vermont Public Service Corporation (licensee) filed a request for extension of time to comply with Article 401(A), Condition D and Condition E of the Order on Offer of Settlement and Issuing Original License, issued February 25, 2009,[1] for the Carver Falls Hydroelectric Project No. 11475. The project is located on the Poultney River in Washington County, New York, and Rutland County, Vermont.

2. Article 401(A), Condition D and Condition E required the licensee to file a Reservoir and Flow Management and Operation Plan and a Reservoir and Flow Management Monitoring Plan (Plans) required by the Vermont Agency of Natural Resources (Vermont ANR) and the New State York Department of Environmental Conservation (New York DEC) within 6 months of the license issuance date.

3. The licensee combined the Plans as one Comprehensive Operations Compliance Plan (COCP). The COCP was submitted to the U.S. Fish and Wildlife Service (FWS), the Vermont ANR, and the New York DEC on June 26, 2009, for review.

4. On June 30, 2009, the New York DEC stated it would defer to comments provided by the Vermont ANR. FWS indicated that due to staffing limitations they would defer to Vermont ANR's and New York DEC's comments. The licensee received the comprehensive and detailed comments from the Vermont ANR on July 23, 2009.

5. The licensee requested the extension of time to comply with Article 401(A), Condition D and Condition E because of the length and detailed nature of Vermont ANR's comments and requires additional time to research, respond, and make revisions to the COCP, which will then require final approval from Vermont ANR.

[1] See 126 FERC ¶ 62,144.

20090831-3011 FERC PDF (Unofficial) 08/31/2009

6. The reasons advanced by the licensee in support of the requested extension of time are reasonable and we are granting the extension. We are extending the due date, for filing the requirements pursuant to Article 401(A), Condition D and Condition E of the February 25, 2009 order, to November 23, 2009.

The Director orders:

(A) The request filed on August 12, 2009, to extend the deadline to November 23, 2009, for filing the requirements pursuant to Article 401(A), Condition D and Condition E of the February 25, 2009 order, is granted.

(B) 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 CFR § 385.713.

William Guey-Lee
Chief, Engineering & Jurisdiction Branch
Division of Hydropower Administration
and Compliance

GOMEZ AND SULLIVAN
Engineers, P.C.

55 North Stark Highway
Weare, NH 03281
T - (603) 529-4400
F - (603) 529-4411

October 12, 2009

Jeffrey R. Cueto, P.E., Chief Hydrologist
Vermont Department of Environmental Conservation
Facilities Engineering Division, Laundry Bldg.
103 South Main Street
Waterbury, VT 05671-0511

Re: Carver Falls Hydroelectric Project, FERC Project No. 11475
Revised Operations Compliance Plan

Dear Mr. Cueto:

The Draft Operations Compliance Plan for the Carver Falls Hydroelectric Project (FERC Project No. 11475) was initially sent you for review on June 26, 2009. On July 30, 2009, the New York State Department of Environmental Conservation (NYSDEC) stated it would defer to comments provided by the Vermont Agency of Natural Resources (VANR). Similarly, on July 21, 2009, United State Fish and Wildlife Service (USFWS) indicated that they would defer to VANR's and NYSDEC's comments.

Central Vermont Public Service Corporation (CVPS) received comprehensive and detailed comments from the VANR on July 23, 2009. Since receiving the comments on the draft plan, CVPS applied for a three-month extension of time to file the final plan with FERC. The extension was granted on August 31, 2009; the final plan is now due at FERC by November 23, 2009.

The Operations Compliance Plan has been revised to address the comments received from Vermont ANR and is attached for your review and approval. This plan must be filed with FERC in accordance with Article 401 (A) of the license, which requires that CVPS submit documentation of its consultation with the VANR, NYSDEC, and USFWS. In addition, Appendix A of the license contains the New York State Water Quality Certification conditions; Condition 4 of which requires NYSDEC approval of the flow monitoring plan. Likewise, Appendix B of the FERC license contains the Vermont Water Quality Certification whereby Condition D requires VANR approval of the flow management plan. These requirements are addressed in the Operations Compliance Plan.

It is CVPS's intent to gain approval on the Operation Compliance Plan and file the final plan with FERC by November 23, 2009. We are requesting that you provide your comments on the revised plan within 30 days (by November 12, 2009). Although NYSDEC and USFWS deferred to VANR, courtesy copies are being provided. Please contact me if you have any questions. Thank you.

Sincerely,

Jason George
Environmental Scientist

C: M. McMurray, NYSDEC (electronic only)
J. Warner, USFWS (electronic only)
M. Scarzello, CVPS
B. Eliason, CVPS

Enclosure

Jason George

From: Cueto, Jeff [Jeff.Cueto@state.vt.us]
Sent: Monday, November 02, 2009 3:20 PM
To: Jason George
Cc: Melissa_Grader@fws.gov; Michael McMurray; John_Warner@fws.gov; 'Mike Scarzello'; Eliason, Beth; Mark Woythal; William G. Little
Subject: Carver Falls Flow Management Plan

Jason -

Per our conversation today, here are some comments to consider in finalizing the draft for VTANR approval. I understand that you are contacting NYSDEC to see if they will also be approving the plan, in which case I will want to get their concurrence on the final plan before granting approval. They previously deferred on the technical review. My comments follow the comment numbers used in your draft report.

Comment 1. CVPS will be completing equipment upgrades next summer. Pending the equipment upgrades, what will be the compliance and/or record keeping limitations? In other words, what types of problems can we expect until the new equipment is up and running?

Comment 2. The response states, "The [broome gate] rating curve will be field checked against the USGS gage." I assume this means the gage coefficient will be calibrated based on the comparison. Please indicate 1) when this calibration will occur and 2) that the plan will be revised accordingly and will include the supporting analysis. It may also make sense to use the USGS gage data to reestimate leakage and to calibrate the weir coefficient for spillage (flashboards up/down). Again, since flows below 100 cfs are particularly critical, there should be a separate rating curve for 0-100 cfs (reference Fig. 2.2-1).

Comment 3. The compliance spreadsheet (Fig. 5.3-1) should show spillage and leakage separately and should include the status of the flashboards. It's unclear why the broome gate opening will not be entered until the equipment upgrades. Is that because it is logged separately and not part of the SCADA system data yet?

Comment 4. If I understand this correctly, when inflows are receding (e.g., after a high flow event) and the headpond starts to drop below the top of the north flashboards, the gate will initially be used to hold the headpond level steady (outflow = inflow). Once the gate is shut, the headpond will drop to naturally as inflows continue to decline.

Comment 12. Please indicate the maximum drawdown below the crest for resetting the flashboards.

Comment 13. Unless the station will be shut down whenever the boards have partially failed, there needs to be a method for estimating spillage when the headpond falls below 1.0-inch (or 2.5 inch) above the top of the boards.

Jeff

><{{{°> ***Jeffrey R. Cueto, P.E., Chief Hydrologist***
><{{{°> VT Department of Environmental Conservation
><{{{°> Dam Safety and Hydrology Section
><{{{°> Facilities Engineering Division, Laundry Bldg.
><{{{°> 103 South Main Street, Waterbury, VT 05671-0511
><{{{°> (802) 241-3758
><{{{°> jeff.cueto@state.vt.us

Jason George

From: Michael McMurray [mjmcmurr@gw.dec.state.ny.us]
Sent: Thursday, November 12, 2009 4:16 PM
To: Jason George
Cc: Bill Schoch; Mark Woythal
Subject: RE: Carver Falls Flow Management Plan

Hello Jason,

Yes, I have concurrence from our Regional Fisheries Manager and Habitat Manager that we will continue to defer to Vermont for their review of the plan. Thanks.

Mike

Michael J. McMurray
Environmental Permits
Region 5 Headquarters
NYS Dept. of Environmental Conservation
Rt 86, P.O. Box 296
Ray Brook, NY 12977-0296
Telephone (518) 897-1234
Fax (518) 897-1394

>>> "Jason George" <jgeorge@gomezandsullivan.com> 11/12/2009 9:45 AM >>>
Hi Mike, I'm following up with you regarding your potential review and approval of the above referenced plan. I am preparing a response to the VT comments below.

I'm wondering if you have determined the NYSDEC's involvement in the review of the revised plan.

Thanks.

Jason George

Gomez and Sullivan Engineers, P.C.

55 North Stark Highway

Weare, NH 03281

603.529.4400

From: Cueto, Jeff [mailto:Jeff.Cueto@state.vt.us]
Sent: Wednesday, November 04, 2009 11:02 AM
To: Jason George
Cc: Melissa_Grader@fws.gov; 'Michael McMurray'; John_Warner@fws.gov; 'Mike Scarzello'; 'Eliason, Beth'; 'Mark Woythal'; 'William G. Little'
Subject: RE: Carver Falls Flow Management Plan

Jason - Please develop a final draft based on the technical comments you receive, then file it with me (and I assume Mike as well) for approval.
Then you can file it with FERC along with the approval letters. If you have time, you might send a redline markup around before submittal a final version for approval by the states. That would help assure that the final draft gets approved without more edits being requested. I don't plan on making any more comments unless there is an issue with respect to how you respond to the comments I already provided. Melissa and I just went through this process with a project on the Passumpsic River.

Jeff

><{{{~> Jeffrey R. Cueto, P.E., Chief Hydrologist

><{{{~> VT Department of Environmental Conservation

><{{{~> Dam Safety and Hydrology Section

><{{{~> Facilities Engineering Division, Laundry Bldg.

><{{{~> 103 South Main Street, Waterbury, VT 05671-0511

><{{{~> (802) 241-3758

><{{{~> jeff.cueto@state.vt.us

From: Jason George [mailto:jgeorge@gomezandsullivan.com]
Sent: Wednesday, November 04, 2009 9:59 AM
To: Cueto, Jeff
Cc: Melissa_Grader@fws.gov; 'Michael McMurray'; John_Warner@fws.gov; 'Mike Scarzello'; 'Eliason, Beth'; 'Mark Woythal'; 'William G. Little'
Subject: RE: Carver Falls Flow Management Plan

Jeff,

I just spoke with Mike McMurray regarding the NYSDEC review of the Carver Falls Revised Draft Operations Compliance Plan (distributed on October 12, 2009). Mike said that NYSDEC is circulating the revised draft internally and mentioned that he should be able to get back to me in few days regarding the status of their review/approval.

Regarding your comments below, can you clarify if you need a response to facilitate your review of the revised draft you now have, or is another submittal of the plan addressing your comments necessary? Also, are you intending on providing additional comments?

I am trying to understand the logistics and timing of the review and approvals in conjunction with the FERC filing date.

Thanks,

Jason George

Gomez and Sullivan Engineers, P.C.

55 North Stark Highway

Weare, NH 03281

603.529.4400

From: Cueto, Jeff [mailto:Jeff.Cueto@state.vt.us]
Sent: Monday, November 02, 2009 3:20 PM
To: Jason George
Cc: Melissa_Grader@fws.gov; Michael McMurray; John_Warner@fws.gov; 'Mike Scarzello'; Eliason, Beth; Mark Woythal; William G. Little
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Jeff

><{{{~> Jeffrey R. Cueto, P.E., Chief Hydrologist

><{{{~> VT Department of Environmental Conservation

><{{{~> Dam Safety and Hydrology Section

><{{{~> Facilities Engineering Division, Laundry Bldg.

><{{{~> 103 South Main Street, Waterbury, VT 05671-0511

><{{{~> (802) 241-3758

VERMONT

Vermont Department of Environmental Conservation
Dam Safety and Hydrology Section
103 South Main Street [phone] 802-241-3758
Waterbury, VT 05671-0511 [fax] 802-244-4516
http://www.anr.state.vt.us/dec/fed/dss.htm

Agency of Natural Resources

TRANSMITTED ELECTRONICALLY

November 18, 2009

Michael Scarzello, P.E.
Central Vermont Public Service
77 Grove Street
Rutland, VT 05701

RE: Carver Falls Hydroelectric Project – FERC No. 11475
Operations Compliance Plan

Dear Mr. Scarzello:

On behalf of Central Vermont Public Service Corporation (CVPS), GSE filed a revised flow management plan for the Carver Falls Hydroelectric Project by email on November 17, 2009. The plan is subject to Department approval under Condition D of the water quality certification. We appreciate CVPS and GSE working with us through various revisions to the earlier versions of the plan and hereby grant the Department's approval.

As with any of these plans, operational experience after plan implementation may lead to further refinements. Additionally, CVPS plans to calibrate the rating equation for the broome gate and to update the dam leakage estimate. Please coordinate with and obtain approval of the Department with respect to any future plan revisions.

Please feel free to contact me if you should have questions.

Very truly yours,

Jeffrey R. Cueto

Jeffrey R. Cueto, P.E.
Chief Hydrologist

c Rod Wentworth, DFW
Brian Chipman, DFW
Melissa Grader, USF&WS
Michael McMurray, NYDEC
Jason George, GSE
Beth Eliason, CVPS