LOW IMPACT HYDROPOWER INSTITUTE RECERTIFICATION APPLICATION

Penacook Upper Falls Hydroelectric Project
(FERC No. 6689, LIHI No. 52)

Prepared by:
Essex Power Services, Inc.
55 Union Street, 4th floor
Boston, MA 02108

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PART I. FACILITY DESCRIPTION

The Penacook Upper Falls Hydroelectric Project (the "Project" or "PUF") is located on the Contoocook River in the Village of Penacook, New Hampshire. The Village of Penacook is made up of a small portion of the Town of Boscawen and the northern end of the city of Concord. A section of the tailrace is located across the city line in the Town of Boscawen.

The Project is operated as a run-of-river facility. The estimated average head is 22 feet and the Project is required to maintain a continuous minimum flow of 338 cubic feet per second or the inflow to the reservoir, whichever is less. Project works consist of: (a) a timber stoplog dam with a concrete spillway 21 feet high and 187.0 feet long; (b) 15 gates in the spillway, 6 operable steel gates, 9.5 feet wide and 15.5 feet high, 7 fixed timber stoplog gates, and two operable (ice) gates, 12 feet wide and 3.5 feet high; (c) a reservoir with a surface area of 11.4 acres, a negligible storage capacity, and normal water surface elevation of 306 feet m.s.l.; (d) a powerhouse at the east side of the dam with one generating unit having an installed capacity of 2,800 kW; (e) a 35.0-foot-long, 4.16-kV generator lead; (f) a 4.16/34.5-kV 3.6 MVA three-phase transformer; (g) a 50-foot-long, 34.5-kV transmission line; (h) a tailrace, 47 feet wide and 350 feet long; and (i) appurtenant facilities.

A concrete powerhouse, 81 feet in length and 44 feet in width is located on the east river bank. The powerhouse houses one horizontal shaft tube turbine with a capacity of 2,800 kW. The river banks upstream and downstream of the power house are contained by concrete retaining walls to bedrock. A tailrace with an average width of 47 feet exists at the draft tube exit of the powerhouse and extends downstream for approximately 350 feet. A 15-foot long forebay with a 58-foot average width begins at the powerhouse intake and extends upstream. From the southwest corner of the powerhouse, a concrete, gated spillway extends 187 feet across the Contoocook River.

The Project is located upstream of the Penacook Lower Falls project. The Project utilizes a previously existing impoundment and the plant is unmanned, but operation is monitored on a 24/7 basis.

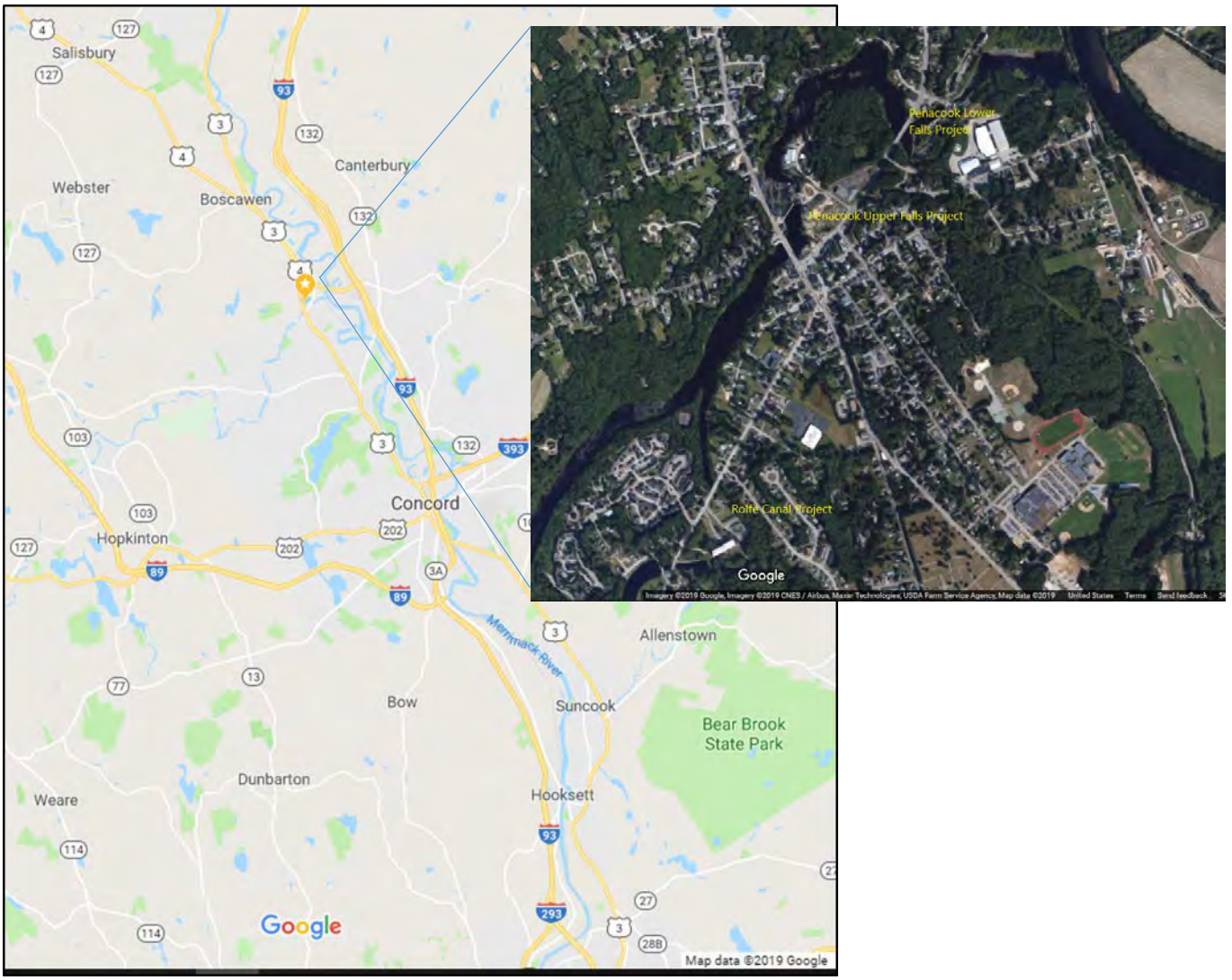


Figure 1 Penacook Upper Falls Hydroelectric Project location and nearby dams

Figure 2 Project Layout

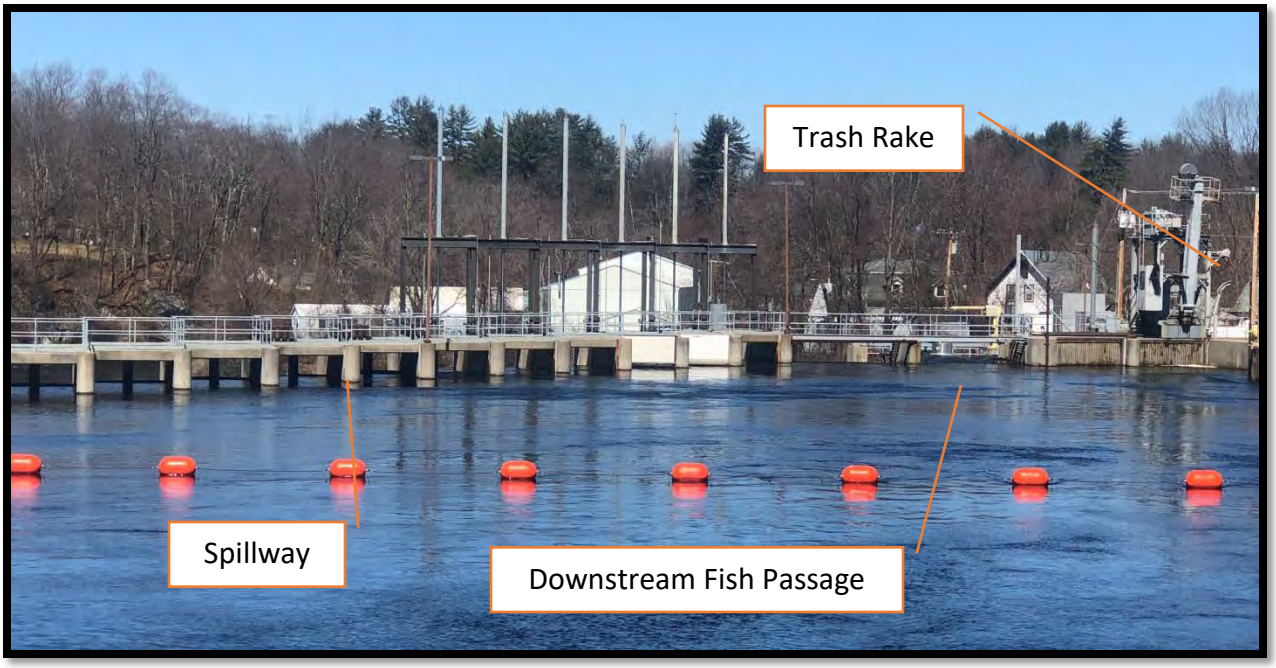


Figure 3 View of Spillway, Downstream Fish Passage and Trash Rake from Impoundment

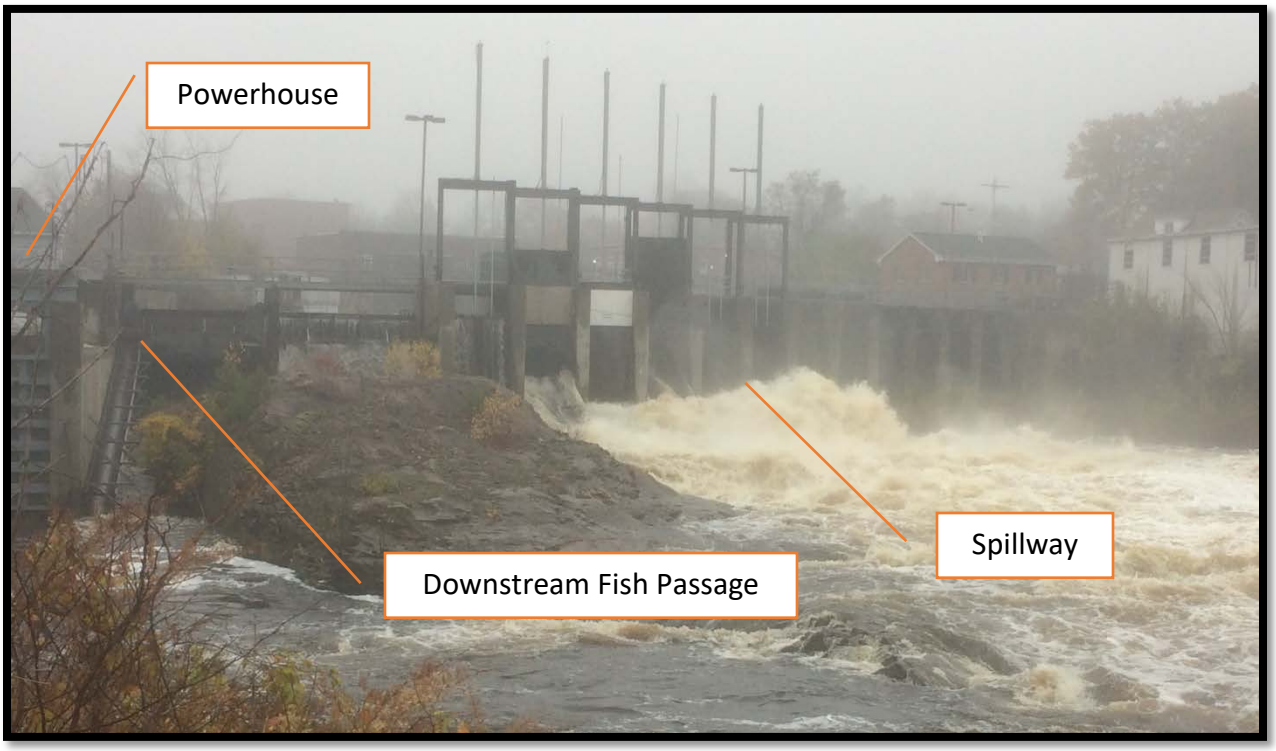


Figure 4 Upstream View of Powerhouse, Downstream Fish Passage and Spillway

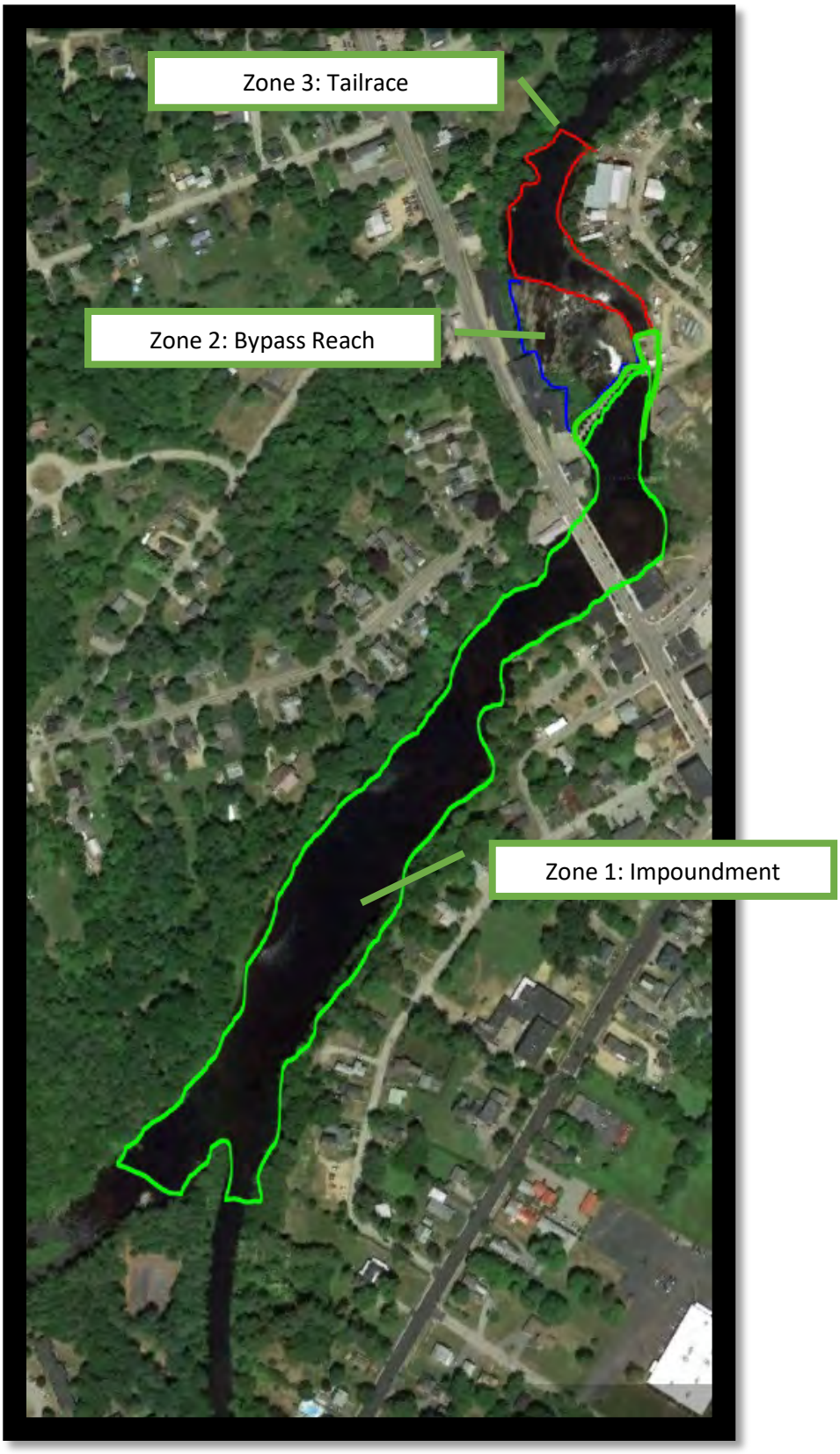


Figure 5 Designated Zones of Effect

Table 1 Facility Description Information

Information Type	*Variable Description*	*Response(and reference to further details)*
Name of the Facility	Facility name (use FERC project name if possible)	Penacook Upper Hydroelectric Project
Location	River name (USGS proper name)	Contoocook River
	River basin name	Merrimack River Watershed
	Nearest town, county, and state	City of Concord and Town of Boscawen, Merrimack County, New Hampshire
	River mile of dam above next major river	River Mile .9
	Geographic latitude	43°16'50"N
	Geographic longitude	71°36'00"W
Facility Owner	Application contact names:	Andrew Locke, Treasurer, Essex Power Services, Inc.
	- Facility owner (individual and company names)	Briar Hydro Associates c/o Essex Hydro Associates, LLC 55 Union Street, 4th Floor Boston, MA 02108
	- Operating affiliate (if different from owner)	Essex Power Services, Inc. 55 Union Street, 4th Floor Boston, MA 02108
	- Representative in LIHI certification	Andrew Locke, Treasurer, Essex Power Services, Inc.
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates	FERC Project No. P-6689 License, Issued December 5, 1984, Expires December 5, 2024
	FERC license type or special classification (e.g., "qualified conduit")	License
	Water Quality Certificate identifier and issuance date, plus source agency name	New Hampshire Water Supply and Pollution Control Commission, May 6, 1983.
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	2019 Inspection Follow Up Report 2019 FERC Inspection Report Other key documents are provided in appendices.
Power Plant Characteristics	Date of initial operation (past or future for operational applications)	1986
	Total name-plate capacity (MW)	3.02 MW
	Average annual generation (MWh)	14,967 MWh

Information Type	***Variable Description***	***Response(and reference to further details)***
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	One Alice Chalmers horizontal shaft tube turbine with a capacity of 3,020 kW and a rated maximum hydraulic capacity of 2,000 cfs and a minimum hydraulic capacity of approximately 150 cfs.
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Run-of-river
	Dates and types of major equipment upgrades	None
	Dates, purpose, and type of any recent operational changes	There have been no recent operational changes.
	Plans, authorization, and regulatory activities for any facility upgrades	There are no plans for facility upgrades.
Characteristics of Dam, Diversion, or Conduit	Date of construction	1985-1986
	Dam height	Approximately 22 feet
	Spillway elevation and hydraulic capacity	306 feet m.s.l; 33,000 cfs hydraulic capacity
	Tailwater elevation	284 feet m.s.l
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	N/A
	Dates and types of major, generation-related infrastructure improvements to dam	N/A
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
	Water source	Contoocook River
	Water discharge location or facility	Penacook Upper Tailwater
Characteristics of Reservoir and Watershed	Gross volume and surface area at full pool	Volume: 251 Acre-Feet Surface Area: 11.4 Acres
	Maximum water surface elevation (ft. MSL)	Run-of-River
	Maximum and minimum volume and water surface elevations for designated power pool, if available	Run-of-River – N/A
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	York Dam (part of Rolfe Canal Project), Briar Hydro Associates, FERC No. 3240, River mile 2; Hopkinton Dam, Contoocook Hydro, LLC, FERC No. 5735 , River mile 10.5

<table>
<tr><th>Information Type</th><th>Variable Description</th><th>Response(and reference to further details)</th></tr>
<tr><td rowspan="4"></td><td></td><td>River Mile 272</td></tr>
<tr><td>Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile</td><td>Penacook Lower Falls (FERC # 3342):
Owned by Briar Hydro Associates;
River Mile 0</td></tr>
<tr><td>Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation</td><td>N/A</td></tr>
<tr><td>Area inside FERC project boundary, where appropriate</td><td>15.6 acres</td></tr>
<tr><td rowspan="4">Hydrologic Setting</td><td>Average annual flow at the dam</td><td>773</td></tr>
<tr><td>Average monthly flows (cfs)</td><td><table>
<tr><td>January</td><td>1,016</td></tr>
<tr><td>February</td><td>1,048</td></tr>
<tr><td>March</td><td>1,028</td></tr>
<tr><td>April</td><td>1,479</td></tr>
<tr><td>May</td><td>847</td></tr>
<tr><td>June</td><td>468</td></tr>
<tr><td>July</td><td>233</td></tr>
<tr><td>August</td><td>417</td></tr>
<tr><td>September</td><td>290</td></tr>
<tr><td>October</td><td>645</td></tr>
<tr><td>November</td><td>1,072</td></tr>
<tr><td>December</td><td>847</td></tr>
</table>Calculation Period:
2015-10-01 -> 2019-09-23</td></tr>
<tr><td>Location and name of relevant stream gauging stations above and below the facility</td><td>USGS 01085000 Contoocook River near Henniker, NH
Latitude 43°09'07", Longitude 71°51'28"
Located at River Mile 28,
Approximately 27 miles upstream of PUF Dam</td></tr>
<tr><td>Watershed area at the dam</td><td>766 square miles</td></tr>
<tr><td rowspan="2">Designated Zones of Effect</td><td>Number of zones of effect</td><td>Zone 1 – Impoundment
Zone 2 – Bypass Reach
Zone 3 - Tailrace</td></tr>
<tr><td>Upstream and downstream locations by river miles</td><td>Zone 1 – River Mile .9 (PUF Dam) to 1.33 (Edge of upstream Project Boundary)
Zone 2 – River Mile .9
Zone 3 – River Mile .9 to .8 (Edge of downstream Project Boundary)</td></tr>
</table>

Information Type	*Variable Description*	*Response(and reference to further details)*
	Type of waterbody (river, impoundment, by-passed reach, etc.)	Zone 1 –Impoundment Zone 2 – By passed reach Zone 3 – Free flowing
	Delimiting structures	PUF Dam
	Designated uses by state water quality agency	Class B, Designated River, managed and protected for its outstanding natural and cultural resources in accordance with RSA 483, The Rivers Management & Protection Act. https://www.des.nh.gov/organization/divisions/water/wmb/rivers/documents/contoocook-north-branch.pdf
Additional Contact Information	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	See "PART IV: FACILITY CONTACTS FORM"
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	See "PART IV: FACILITY CONTACTS FORM"
Photographs and Maps	Photographs of key features of the facility and each of the designated zones of effect	See Figure 5 on page 7 for Designated Zones of Effect. See Figures 2, 3 and 4 on pages 5 and 6 for pictures of the facility.
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	See Figures 1 and 2 on pages 4 and 5

PART II. STANDARDS MATRICES

Zone of Effects #1 – Impoundment

	Criterion	*Alternative Standards Applied*				
		1	***2***	***3***	***4***	***Plus***
A	**Ecological Flow Regimes**		***x***			
B	**Water Quality**			***x***		
C	**Upstream Fish Passage**	***x***				
D	**Downstream Fish Passage**		***x***			
E	**Watershed and Shoreline Protection**	***x***				
F	**Threatened and Endangered Species Protection**	***x***				
G	**Cultural and Historic Resources Protection**	***x***				
H	**Recreational Resources**		***x***			

Zone of Effects #2 –Bypass Reach

	Criterion	*Alternative Standards Applied*				
		1	*2*	*3*	*4*	*Plus*
A	Ecological Flow Regimes		*x*			
B	Water Quality			*x*		
C	Upstream Fish Passage		*x*			
D	Downstream Fish Passage	*x*				
E	Watershed and Shoreline Protection	*x*				
F	Threatened and Endangered Species Protection	*x*				
G	Cultural and Historic Resources Protection	*x*				
H	Recreational Resources		*x*			

Zone of Effects #3 – Tailrace

	Criterion	*Alternative Standards Applied*				
		1	*2*	*3*	*4*	*Plus*
A	Ecological Flow Regimes		*x*			
B	Water Quality			*x*		
C	Upstream Fish Passage		*x*			
D	Downstream Fish Passage	*x*				
E	Watershed and Shoreline Protection	*x*				
F	Threatened and Endangered Species Protection	*x*				
G	Cultural and Historic Resources Protection	*x*				
H	Recreational Resources		*x*			

PART III. SUPPORTING INFORMATION

III.A.1 Ecological Flows

Zone of Effects #1 – Impoundment

A	2	Agency Recommendation (see Appendix A for definitions): • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. • Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and

		episodic instream flow variations).

Supporting Information:
A concrete powerhouse, 81 feet in length and 44 feet in width is located on the east river bank. The powerhouse houses one horizontal shaft tube turbine with a capacity of 3,020 kW. The river banks upstream and downstream of the power house are contained by concrete retaining walls to bedrock. A tailrace with an average width of 47 feet exists at the draft tube exit of the powerhouse and extends downstream for approximately 350 feet. A 15-foot long forebay with a 58-foot average width begins at the powerhouse intake and extends upstream. From the southwest corner of the powerhouse, a concrete, gated spillway extends 187 feet across the Contoocook River.

The Project is operated as a run of river facility. Reservoir level is maintained by means of a pond level control system. River flow is passed through the turbine or through the various spillway gates. The project is required to maintain a minimum flow of 338 cfs or project inflow, whichever is less. The minimum flow amount was recommended by the U.S. Department of the Interior to protect resident and anadromous fishes.

See FERC License 1984 (Appendix 1 and U.S. Department of the Interior 1982 Letter (Appendix 2)

Zone of Effects #2 – Bypass Reach

A	2	<u>Agency Recommendation:</u> • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. • Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

Supporting Information:
See Supporting Information in Zone of Effects #1 in Ecological Flows section above.

Zone of Effects #3 – Tail Race

A	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. • Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

Supporting Information:
See Supporting Information in Zone of Effects #1 in Ecological Flows section above.

III.B.1 Water Quality

Zone of Effects #1 - Impoundment

B	3	Site-Specific Monitoring Studies: • Document consultation with appropriate water quality agency to determine what water quality parameters and sampling methods are required. • Present recent water quality data, explain how it satisfies applicable water quality standards, and provide a letter from the appropriate state of other regulatory agency accepting these results.

Supporting Information:
See Appendix 3, 2017 NH DES Water Quality Meeting Criteria Letter which indicates that sampling conducted in 2015 and 2016 confirmed that project waters meet state water quality standards.

The 2016 New Hampshire list of Impaired Waters (https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2016/index.htm) does not indicate that the Contocook River is impaired in the project area.

Zone of Effects #2 – Bypass Reach

B	3	Site-Specific Monitoring Studies: • Document consultation with appropriate water quality agency to determine what water quality parameters and sampling methods

		are required. • Present recent water quality data, explain how it satisfies applicable water quality standards, and provide a letter from the appropriate state of other regulatory agency accepting these results.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Water Quality Section above.

Zone of Effects #3 – Tail Race

B	3	Site-Specific Monitoring Studies: • Document consultation with appropriate water quality agency to determine what water quality parameters and sampling methods are required. • Present recent water quality data, explain how it satisfies applicable water quality standards, and provide a letter from the appropriate state of other regulatory agency accepting these results.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Water Quality Section above.

III.C.1 Upstream Fish Passage

Zone of Effects #1 - Impoundment

C	1	Not Applicable / De Minimis Effect: • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

Supporting Information:
N/A – No facility barrier exists above the project's dam to further upstream movement.

Zone of Effects #2 – Bypass Reach

C	2	Agency Recommendation: Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement.

		Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

See Supporting Information in Zone of Effects #2 – Tail Race below.

Zone of Effects #2 – Tail Race

C	2	<u>Agency Recommendation:</u> Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Supporting Information:

The FERC license dated September 1984, as amended in September 1986, provided for the construction of fish passage facilities at the Project on a schedule consistent with the 1986 agreement between Public Service of New Hampshire (PSNH) and the state and federal fishery agencies regarding the construction of fish passage facilities at the mainstream dams on the Merrimack River. The license required the Project to file functional design drawings with the Commission within five years after the passage of 15,000 adult American shad at the Garvins Falls Project (FERC No. 1893), or through the fish facilities of the proposed Sewalls Falls Project (FERC No. 7216)[1] if constructed, but in no case later than July 1, 1988. The License required the functional design drawings to be prepared in consultation with the New Hampshire Fish and Game Department and the U.S. Fish and Wildlife service.

The Merrimack fish restoration program did not achieve its original goals. Consequently, an agreement was reached among various state and federal agencies that delayed the installation of upstream fish passage at Garvins Falls until 15,000 American Shad were observed at the Hooksett dam in Hooksett, N.H. (See Appendix 4). This resulted in Penacook Upper Falls' license being amended on September 25, 1986 to require PUF install fish passage facilities within 5 years of the passage of 15,000 American shad at the Garvin Falls project (see Appendix 5).

[1] The Sewalls Falls Project was never built.

A letter dated December 19, 2018 from Central Rivers Power (the new owner of the Garvin Falls project and that during 2018, no American shad or river herring were observed at the Garvin Falls project (see Appendix 6). Because Garvins Falls has not yet been notified it must begin fish passage construction, Penacook Upper Falls is not required to add upstream fish passage and remains in compliance with the requirements of its license

III.D.1 Downstream Fish Passage

ZoE #1 - Impoundment

D	2	Agency Recommendation: • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally protective). • Explain the scientific or technical basis for the agency recommendation, including method and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Supporting Information:

The September 25, 1986 license amendment required PUF to file downstream design drawings no later than July 1, 2004. Following consultation with U.S. Fish and Wildlife (USFW) and New Hampshire Fish and Game (NHFG), the deadline for filing design drawings was delayed until January 31, 2006. Designs were submitted and the downstream passage was installed in 2006 (See Appendix 7).

The downstream passage, shown if Figure 6 below, is twenty-six (26) inches wide and four (4) feet deep located in the gate bay immediately to the left of the powerhouse intake. This passage releases a constant forty (40) cubic feet per second. Outfall from this passage is channeled into a flume running down the left side of the powerhouse and be discharged into the tailrace. A current inducer designed to direct fish toward the passage and away from the

Figure 6 Downstream Fish Passage

turbine intake is installed upstream of the passage on the right downstream retaining wall (see Figure 7 below)

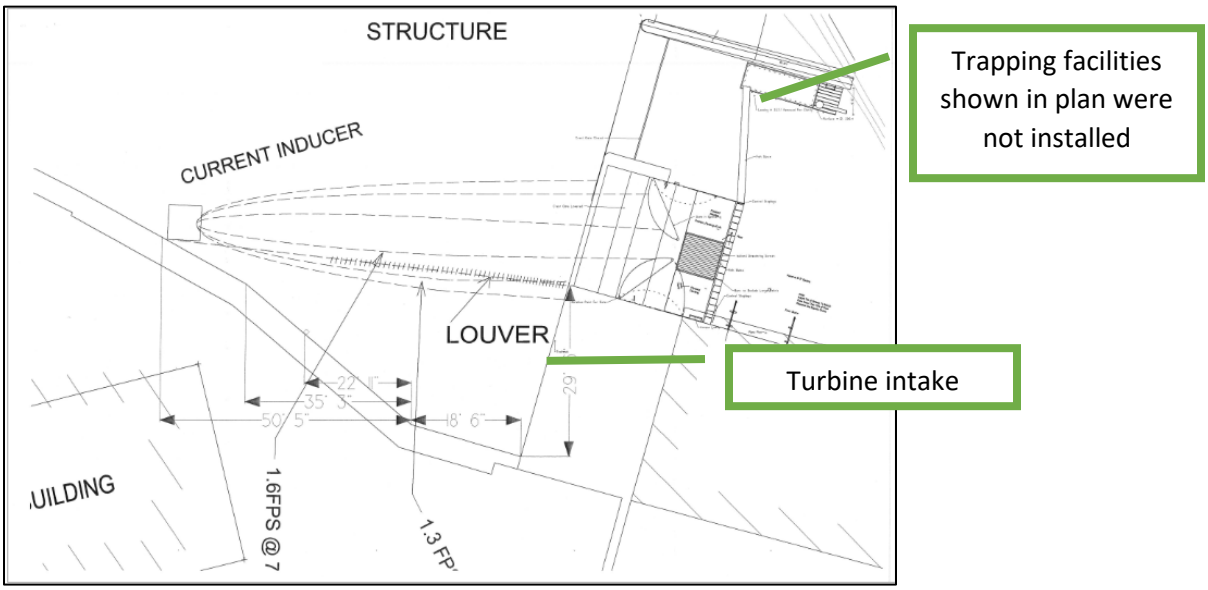


Figure 7 Downstream Fish Passage Plan View

The downstream fish passage was operated from 2006 through 2016. In 2017, following the permanent cancellation of the Atlantic salmon smolt stocking program and river herring and shad for that season and guidance from USFW (see Appendix 8), the downstream passage was not operated. It was operated in 2018 following notice of stocking that year by NHFG. The passage was not operated in 2019 due to no notice of stocking and the project's turbine being taken offline for an overhaul. The passage will be operated prospectively upon notice from NHFG of stocking in the river.

As a condition of the PUF FERC license, the Project has agreed that should it be established in the future that the operation of the project adversely affects fish and wildlife resources the Project may be ordered to undertake appropriate mitigation pursuant to authority reserved to the Commission under Articles 24 and 25 of the License (see Appendix 1).

For a list of resident fish species see Appendix 9.

Zone of Effects #2 – Bypass Reach

D	1	<u>Not Applicable / De Minimis Effect:</u> • Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines). • For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat

		necessary for successful completion of their life cycles. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

Supporting Information:
There is no facility barrier to further downstream movement below the dam and powerhouse.

Zone of Effects #2 – Tailrace

D	1	Not Applicable / De Minimis Effect: • Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines). • For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

Supporting Information:
There is no facility barrier to further downstream movement below the dam and powerhouse.

III.E.1 Watershed and Shoreline Protection

Zone of Effects #1 – Impoundment

E	1	Not Applicable / De Minimis Effect: • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

Supporting Information:
The watershed of the Contoocook River upon which the Penacook Upper Falls Project is located is primarily forested. The Contoocook River contains numerous other small tributaries and many natural lakes. Elevations in the watershed range from 3,165 ft MSL at the top of Mt. Monadnock to 243 ft. MSL at the confluence with the Merrimack. The Contoocook drops about 130 feet in its final 20 miles (6.5 ft/mile), thus explaining the location of the village of Penacook and the development of numerous water-powered mills over the past two centuries.

The Project is located within a heavily developed area of land in the center of the Village of Boscawen (see Figure 1). The impoundment formed by the Project dam is divided by a bridge that crosses the Contoocook River immediately upstream of the Project. A commercial building and an industrial building are situated on the western riverbank below the bridge. The western riverbank immediately upstream of the bridge is occupied by a commercial building and the remainder of this riverbank is heavily sloped and vegetated. None of the western riverbank is owned by Briar Hydro Associates ("Briar") nor is the riverbank suitable for watershed protection. Commercial buildings are located on the eastern and western riverbanks immediately above the bridge. The Penacook Downtown River Park is located further upstream on the eastern riverbank. During project construction Briar provided funds to assist in the construction of this Boscawen waterfront park. The eastern riverbank below the bridge also has been subjected to extensive development. Part of this riverbank is occupied by a commercial/residential building and the remainder consists of land formerly occupied by a leather mill. That leather mill land is now vacant. In 2008 Briar entered into an agreement with the City of Concord that amended certain property rights held by Briar to assist the City of Concord in development of a river walk related to other city development plans.

Figure 8 Watershed

Given the very small impoundment area of the Project and prior commercial and industrial

development in and around the Project there is little need nor opportunity for Project watershed protection other than the Boscawen Riverfront Park and the potential development of the riverwalk.

No Shoreline Management Plan is in effect, nor are the any protection requirements for the facility.

Zone of Effects #2 –Bypass Reach

E	1	Not Applicable / De Minimis Effect: • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Watershed and Shoreline Protection above.

Zone of Effects #3 –Tailrace

E	1	Not Applicable / De Minimis Effect: • If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Watershed and Shoreline Protection above.

III.F.1 Threatened and Endangered Species

Zone of Effects #1 –Impoundment

F	1	Not Applicable / De Minimis Effect: • Document that there are no listed species in the facility area or affected riverine zones downstream of the facility. • If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species. • If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.

Supporting Information:

The New Hampshire National Heritage Bureau Report indicates there are no federally listed threatened or endangered species in the project area although the threatened bald eagle and spotted turtle have been reported within one mile of the project. See Appendix 10 for September 2019 New Hampshire report.

An online inquiry in September 2019 of the US Fish and Wildlife Service IPaC site (https://ecos.fws.gov/ipac/) indicated that the project is within the range of the federally threatened Northern long eared bat but there are no critical habitats in the project area. See Appendix 11 for print out of the IPaC report.

Zone of Effects #2 –Bypass Reach

F	1	Not Applicable / De Minimis Effect: • Document that there are no listed species in the facility area or affected riverine zones downstream of the facility. • If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species. • If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Threatened and Endangered Species above.

Zone of Effects #2 – Tailrace

F	1	Not Applicable / De Minimis Effect: • Document that there are no listed species in the facility area or affected riverine zones downstream of the facility. • If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species. • If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Threatened and Endangered Species above.

III.G.1 Cultural and Historic Resources

Zone of Effects #1 – Impoundment

G	1	Not Applicable / De Minimis Effect: • Document that there are no cultural or historic resources located on

		facility lands that can be affected by construction or operations of the facility. • Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are present on facility lands.

Supporting Information:
During the license application, agencies were consulted during the application process and no properties of historic, architectural, or archaeological significance were included in or eligible for inclusion in the National Register of Historic Places. A September 29, 1982 letter (see Appendix 12) from the New Hampshire Department of Resources and Economic Development indicates

"The Historic Preservation Office has determined that the project will have no effect upon known architectural, historical, archeological or other cultural resources. Should such resources be discovered as a result of project planning or implementation, appropriate measures should be undertaken according to 36 CFR 800 and other appropriate federal laws and regulations that apply to historic and cultural resources."

Based on a web search in September 2019 there are no historic structures associated with the project that are listed on the National Register, and there have been no material changes to the project. If structural changes or ground disturbing activity were to occur at the project, the applicable state historic preservation office would be consulted in advance.

Zone of Effects #2 –Bypass Reach

G	1	<u>Not Applicable / De Minimis Effect:</u> • Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility. • Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are present on facility lands.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Cultural and Historic Resources above.

Zone of Effects #3 –Tailrace

G	1	<u>Not Applicable / De Minimis Effect:</u> • Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility. • Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are

		present on facility lands.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Cultural and Historic Resources above.

III.H.1 Recreational Resources

Zone of Effects #1 – Impoundment

H	2	Agency Recommendation: • Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.

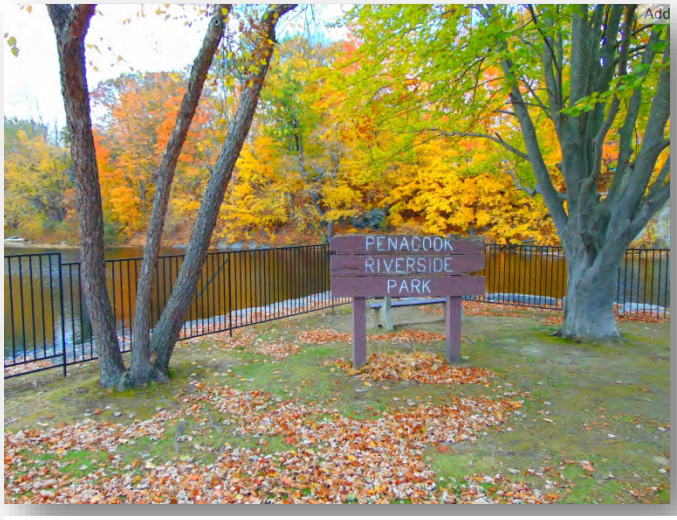
Supporting Information:
For Recreation Access the FERC license states:

"Interior recommended that, because annual runs of shad and salmon will likely develop on the Contoocook River, the Applicant should be required to provide access for public utilization of fish and wildlife resources whenever possible. Article 13 of the license provides for public recreational access to the project to the extent that public safety is not jeopardized."

Access to the Contoocook River in the project vicinity is not readily available. The right bank is steep and rocky and access on the left bank would involve crossing over private residential property. Access for fishing and boating is available downstream in the vicinity of the Penacook Lower Falls Project (FERC projects #3342).

In conjunction with the City of Concord, Briar helped to develop a recreational facility known as the Penacook Downtown River Park (aka Riverside Park) (see Figure 4 and Figure 5). The park borders and overlooks the project's impoundment area and has two focal points; the first, a stone structure on site which is used as a theater and stage, and the second, the Contoocook River itself, the major emphasis of the park being the benches and grassy areas which allow visitors to enjoy the visual and audio aspects of the river. The Penacook Downtown River Park was developed using grants provided by the Penacook Upper Falls Hydroelectric Project and numerous other donors and is maintained by the City of Concord. The park is open twelve months a year and is provided free of charge to visitors.

In 2008 the Project granted to the City of Concord certain easement rights that will permit the City of Concord to develop a river walk immediately downstream of the Main Street Bridge. This river walk will provide direct access to the eastern riverbank immediately upstream of the powerhouse fore bay.



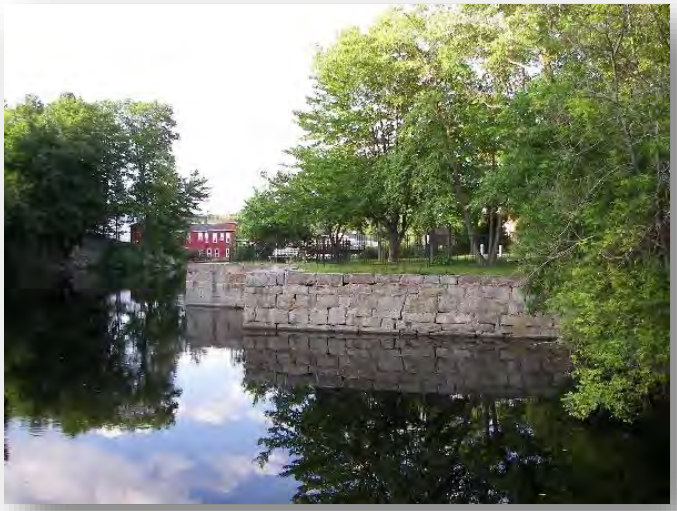


Figure 9 Penacook Riverside Park

Zone of Effects #2 –Bypass Reach

H	2	<u>Agency Recommendation:</u> • Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Recreational Resources above.

Zone of Effects #3 –Tailrace

H	2	<u>Agency Recommendation:</u> • Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.

Supporting Information:
See Supporting Information in Zone of Effects #1 in Recreational Resources above.

PART IV. CONTACTS

Company Contacts

Project Owner: Briar Hydro Associates	
Name and Title	Andrew Locke, President
Company	Essex Hydro Associates, A General Partner
Phone	(617) 367-0032
Email Address	alocke@essexhydro.com
Mailing Address	55 Union Street, Boston, MA 02108
Project Operator (if different from Owner):	
Name and Title	David Sherman, Operations Manager
Company	Essex Power Services, Inc.
Phone	617-367-0032
Email Address	dsherman@essexhydro.com
Mailing Address	c/o Essex Hydro Associates, 55 Union St, 4th Floor Boston, MA 02108
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Andrew Locke, Treasurer
Company	Essex Power Services, Inc.
Phone	(617) 367-0032
Email Address	alocke@essexhydro.com
Mailing Address	c/o Essex Hydro Associates, 55 Union Street, Boston, MA 02108
Party responsible for accounts payable:	
Name and Title	Maureen Donnelly, Accounts Payable
Company	Essex Power Services, Inc.
Phone	(617) 367-0032
Email Address	mdonnelly@essexhydro.com
Mailing Address	c/o Essex Hydro Associates, 55 Union Street, Boston, MA 02108

Agency Contacts

Agency Contact (Check area of responsibility: Flows_X_, Water Quality __, Fish/Wildlife Resources _X_, Watersheds _X_, T/E Spp. _, Cultural/Historic Resources __, Recreation __):	
Agency Name	US Fish and Wildlife Service
Name and Title	Melissa Grader, Biologist
Phone	413-548-8002, ext 8124
Email address	melissa_grader@fws.gov
Mailing Address	New England Field Office 70 Commercial Street, Suite 300 Concord, NH 03301

Agency Contact (Check area of responsibility: Flows__, Water Quality _X_, Fish/Wildlife Resources __, Watersheds _X_, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	New Hampshire Department of Environmental Services, Water Division
Name and Title	Greg Comstock, Supervisor, Water Quality Planning Section
Phone	603-271-2983
Email address	Gregg.Comstock@des.nh.gov
Mailing Address	6 Hazen Drive P.O. Box 95

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources _, Watersheds __, T/E Spp. _X_, Cultural/Historic Resources __, Recreation __):	
Agency Name	New Hampshire Natural Heritage Bureau
Name and Title	Amy Lamb
Phone	(603) 271-2214
Email address	Amy.lamb@des.nh.gov
Mailing Address	172 Pembroke Rd. Concord, NH 03301

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation _X_):	
Agency Name	National Parks Service, Rivers and Special Studies Branch
Name and Title	Kevin Mendik
Phone	(617) 223-5299
Email address	Kevin_mendik@nps.gov
Mailing Address	15 State Street, Boston, MA 02109

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources _X_, Recreation _ _):	
Agency Name	New Hampshire Division of Historical Resources
Name and Title	Nadine Miller Preservation Project Reviewer
Phone	(603) 271-6628
Email address	Nadine.Miller@dcr.nh.gov
Mailing Address	19 Pillsbury Street - 2nd floor Concord, NH 03301-3570

Agency Contact (Check area of responsibility: Flows__, Water Quality _ _, Fish/Wildlife Resources _X_, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	National Marine Fisheries Service (NOAA)
Name and Title	Susan Tuxbury, Fisheries Biologist
Phone	978-281-9176
Email address	Susan.tuxbury@noaa.gov
Mailing Address	55 Great Republic Drive

Agency Contact (Check area of responsibility: Flows_X_, Water Quality __, Fish/Wildlife Resources _X_, Watersheds _X_, T/E Spp. _, Cultural/Historic Resources __, Recreation __):	
Agency Name	NH Fish and Game Department
Name and Title	Carol Henderson
Phone	(603) 271-3511
Email address	Carol.henderson@wildlfe.nh.gov
Mailing Address	11 Hazen Drive, Concord, NH 03301

PART V. SWORN STATEMENT

All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:

SWORN STATEMENT

As an Authorized Representative of Briar Hydro Associates the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's certification program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The Undersigned further acknowledges that if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified®.

The Undersigned further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's certification program.

Company Name: Briar Hydro Associates

Authorized Representative:

Name: Andrew Locke

Title: President, Essex Hydro Associates
A General Partner, Briar Hydro Associates

Authorized Signature: 

Date: October 7, 2019

List of Appendices

- Appendix 1: FERC license
- Appendix 2: U.S. Department of the Interior 1982 Letter
- Appendix 3: 2017 NH DES Water Quality Meeting Criteria Letter
- Appendix 4: U.S. Department of the Interior 1986 Letter
- Appendix 5: FERC license amendment
- Appendix 6: December 19, 2018 Central Rivers Power Letter
- Appendix 7: Agency consultation and downstream fish passage design
- Appendix 8: Agency consultation for downstream fish passage operation
- Appendix 9: List of resident fish species
- Appendix 10: 2019 New Hampshire National Heritage Bureau Report
- Appendix 11: 2019 IPaC Report
- Appendix 12: 1982 New Hampshire Department of Resources and Economic Development Letter

Penacook Upper Falls LIHI Recertification Application

List of Appendices

Click on box to go to document.

29 FERC ¶62,230

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Penacook Hydro Associates) Project No. 6689-000

ORDER ISSUING LICENSE (MAJOR)

(Issued December 5, 1984)

Penacook Hydro Associates (PHA) filed on October 7, 1982, an application for a license under Part I of the Federal Power Act (Act) to construct, operate, and maintain the Penacook Upper Falls Project No. 6689. 1/ The project would be located on the Contoocook River in Merrimack County, New Hampshire and would affect the interests of interstate or foreign commerce.

Notice of the application has been published and comments have been received from interested Federal, state, and local agencies. Briar-Hydro Associates (BHA) submitted a protest and was granted intervention. 2/ The significant concerns of the protestor, intervenor, and commenting agencies are discussed below.

Protests and Interventions

BHA which has a pending license application for the upstream Rolfe Canal Project No. 3240 3/ was granted a motion to intervene in order to be a party to the proceeding and to protect its interests. BHA also filed a protest to the issuance of the license for Project No. 6689, because the headwater elevation of this project could encroach on the tailwater of BHA's Rolfe Canal Project and adversely

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1/ Authority to act on this matter is delegated to the Director, Office of Hydropower Licensing, under §375.314 of the Commission's regulations, 49 Fed. Reg. 29,369 (1984) (Errata issued July 27, 1984), (to be codified at 18 C.F.R. §375.314). This order may be appealed to the Commission by any party within 30 days of its issuance pursuant to Rule 1902, 18 C.F.R. §385.1902 (1983). Filing an appeal and final Commission action on that appeal are prerequisites for filing an application for rehearing as provided in Section 313(a) of the Act. Filing an appeal does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically directed by the Commission.

2/ The Commission granted Briar-Hydro Associates' motion to intervene in the proceeding of Project No. 6689 on February 1, 1983.

3/ Application for license filed on June 28, 1982, by Briar Hydro Associates. A companion order will be issued concurrently for this project.

affect its power production. Subsequently, the two applicants executed an agreement, which stipulates that PHA would perform studies in cooperation with BHA to determine what effect, if any, PHA's Penacook Upper Falls Project would have on BHA's Rolfe Canal Project and to compensate BHA for any power production lost. As a result of this agreement BHA withdrew its protest to the issuance of a license for this project.

Project Description

The Penacook Upper Falls Project would consist of a new spillway built on the remains of an existing dam, making it a 21-foot-high, 187-foot-long structure, a small reservoir, a powerhouse containing one generating unit having an installed capacity of 2,800 kW, and appurtenant facilities. A more detailed project description is contained in ordering paragraph (B).

Safety and Adequacy

The dam was analyzed for stability and was found to be safe against sliding and overturning under normal and flood loading conditions. Staff inspected the project on March 30, 1983, and determined that the dam is a low hazard structure. The spillway capacity is considered adequate. The powerhouse would be safe if constructed in accordance with sound engineering practices.

It is concluded that the project under the conditions of this license will be safe and adequate.

Fish Passage Facilities

The U.S. Department of the Interior (Interior) commented that the proposed project is located in a section of the Contoocook River that is scheduled for restoration of anadromous fishes, primarily American shad. Interior stated that the river upstream of the project will also be used for rearing of juvenile Atlantic salmon, which will contribute to the overall run of salmon in the Merrimack River of which the Contoocook River is a tributary. A salmon run of undetermined size may in turn develop on the lower Contoocook River. Interior, therefore, recommended that both upstream and downstream fish passage facilities be installed at the project by 1988, which is the same timetable as that proposed for the downstream Penacook Lower Falls Project, FERC No. 3342. Interior also stated that provisions for downstream passage of salmon smolt may be required prior to 1988, since salmon fry stocking in the upper Contoocook River may commence in 1984.

The Applicant has proposed to construct upstream fish passage facilities when anadromous fishes appear below the Penacook Lower Falls Project, and to provide measures for downstream passage when outmigrating anadromous fishes are present at the project. Upstream and downstream fish passage facilities should be constructed at the

Penacook Upper Falls Project to provide for passage of American shad and Atlantic salmon. These facilities should be provided on the same schedule as at other projects recently licensed on the lower Contoocook River. Because of the uncertainty associated with the pending application for license for the Sewalls Falls Project, the Licensee is being required herein to provide fish facilities without regard to Sewalls Falls Dam. However, the Commission's authority is preserved to adjust the construction schedule of the fish passage facilities if construction of the Sewalls Falls Project is authorized. 4/

It is concluded that fish passage facilities at the project would protect and enhance the anadromous fishery resource planned for restoration in the Contoocook River and, therefore, Article 24 requires the Licensee to consult with FWS and FGD, and file for approval functional design drawings of fish passage facilities at the project. Article 24 also provides for a construction schedule for those facilities.

However, if salmon are introduced to the Contoocook River, provisions should be made for safe downstream passage of salmon smolt prior to 1988. Therefore, Article 25 requires the Licensee to consult with State and Federal fishery agencies, and to provide for downstream passage of salmon smolt should it be necessary before 1988.

Minimum Flow

Interior recommended that a continuous minimum flow of 338 cubic feet per second (cfs) be discharged from the project to protect resident and anadromous fishes. The Applicant did not object to Interior's recommended minimum flow. It is concluded that Interior's recommended flow would adequately protect fish and wildlife resources downstream of the proposed project. Therefore, Article 26 requires the Licensee to discharge a continuous minimum flow of 338 cfs or the inflow to the reservoir, whichever is less.

4/ The fish passage facilities for Penacook Lower Falls Project No. 3342 are to be provided within one year of the completion of fish passage facilities at the downstream Sewalls Falls Dam, the Garvin Falls Dam, the Hooksett Dam, the Amoskeag Dam, and the Pawtucket Dam. An application for license for the Sewalls Falls Dam Project No. 7216 is pending before the Commission. If a license is not issued for Project No. 7216, the requirements for Article 24 would be triggered by the next dam downstream of Sewalls Falls.

Recreation Access

Interior recommended that, because annual runs of shad and salmon will likely develop on the Contoocook River, the Applicant should be required to provide access for public utilization of fish and wildlife resources whenever possible. Article 13 of the license provides for public recreational access to the project to the extent that public safety is not jeopardized.

Other Environmental Impacts

Project construction would result in temporary increases in sedimentation and turbidity in the Contoocook River in the vicinity of the construction area, and would cause disturbance to the Village of Penacook due to increased noise, dust, and exhaust emissions. In-river construction and blasting may result in some mortality of resident fishes. The completed project and its operation would result in the inundation of about 2,600 feet of free-flowing riffle and cascade riverine habitat, the dewatering of about 2 acres of riverine habitat immediately downstream of the proposed dam, and the creation of an additional barrier to anadromous fish migration on the Contoocook River. 5/ Articles 24, 25, and 26 require that the project be equipped with fish passage facilities, and will provide a minimum instantaneous flow for the protection and enhancement of the aquatic resources. No Federally listed threatened or endangered species will be affected. The proposed project will have no effect on cultural resources, although Article 32 will ensure cultural resources protection should any be discovered in the future. On the basis of the record, and Staff's independent analysis, it is concluded that the issuance of a license for the project will not constitute a major Federal action significantly affecting the quality of the human environment.

Economic Feasibility

The project would operate run-of-river and generate an estimated 7,500,000 kWh annually. 6/ The project would be economically feasible based on the sale of power at avoided costs in the State of New Hampshire, adjusted for escalation.

5/ The New Hampshire Water Supply and Control Commission has issued a water quality certificate on May 6, 1983, for the project, in accordance with Section 401 of the Federal Water Pollution Control Act.

6/ The proposed project would utilize a renewable resource that will save the equivalent of approximately 12,300 barrels of oil or 3,420 tons of coal per year.

Other Aspects of Comprehensive Development

Briar-Hydro Associates has filed a license application to develop hydroelectric facilities on the Rolfe Canal Project, FERC No. 3240, immediately upstream of this project. Potential backwater during periods of high streamflows may affect the power production at the Rolfe Canal Project. Based on the Staff's analysis of the proposed developments and operating schemes, the backwater effect on the Rolfe Canal Project appears to be infrequent and minor in nature. BHA and PHA have executed an agreement concerning the operation of the two projects in which Penacook Hydro Associates would perform studies in cooperation with Briar-Hydro Associates to determine the extent that the backwater of Project No. 6689 would affect the power generation of the Rolfe Canal Project and the optimum design that would maximize power generation for both projects, and would compensate BHA for any lost generation. Article 31 which requires the Licensee to study and compensate BHA for any adverse effects on the generation of the upstream Rolfe Canal Project No. 3240 would assure maximum utilization of the water resources and energy output for both the Penacook Upper Falls and Rolfe Canal Projects.

The proposed Penacook Upper Falls Project would make good use of the flow and fall of the Contoocook River and would be best adapted to the comprehensive development of the Merrimack River Basin for beneficial purposes upon compliance with the terms and conditions of the license.

License Term

The proposed development of this project using existing facilities is similar to the relicensing of an existing licensed project at which a moderate amount of new development is proposed. Therefore, consistent with Commission policy, a 40-year license term is reasonable in this instance. 7/

It is ordered that:

(A) This license is issued to Penacook Hydro Associates (Licensee), of Concord, New Hampshire, under Part I of the Federal Power Act (Act), for a period of 40 years, effective the first day of the month in which this order is issued, for the construction, operation, and maintenance of the Penacook Upper Falls Project No. 6689, located in Merrimack County, New Hampshire, on the Contoocook River, and affecting the interests of interstate or foreign commerce. This license is subject to the terms and conditions of the Act, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the Act.

7/ Village of Lyndonville, 7 FERC ¶61,324 (1979).

(B) The Penacook Upper Falls Project No. 6689 consists of:

(1) All lands, to the extent of the Licensee's interests in those lands, constituting the project area and enclosed by the project boundary. The project area and boundary are shown and described by a certain exhibit that forms part of the application for license and that is designated and described as:

Exhibit A, Section 1 VIII, titled "Project Description."

Exhibit	FERC No. 6689-	Showing
G-1	4	Project Boundary Map
G-2	5	Area Plan
G-3	6	Site Plan

(2) Project works consisting of: (a) a timber stoplog dam with a concrete spillway 21 feet high and 187.0 feet long; (b) 16 gates in the spillway, 6 operable timbergates, 9.5 feet wide and 15.5 feet high, 8 fixed timber stoplog gates, and two operable (ice) gates, 12 feet wide and 3.5 feet high; (c) a reservoir with a surface area of 11.4 acres, a negligible storage capacity, and normal water surface elevation of 306 feet m.s.l.; (d) a powerhouse at the east side of the dam with one generating unit having an installed capacity of 2,800 kW; (e) a 35.0-foot-long, 4.16-kV generator lead; (f) a 4.16/34.5-kV 3.6 MVA three-phase transformer; (g) a 50-foot-long, 34.5-kV transmission line; (h) a tailrace, 47 feet wide and 350 feet long; and (i) appurtenant facilities.

The location, nature, and character of these project works are generally shown and described by the exhibit cited above and more specifically shown and described by certain other exhibits that also form a part of the application for license and that are designated and described as:

Exhibit	FERC No. 6689-	Showing
F-1	1	Powerhouse and Equipment
F-2	2	Powerhouse and Equipment
F-3	3	Spillway

(3) All of the structures, fixtures, equipment, or facilities used or useful in the operation or maintenance of the project and located within the project boundary, all portable property that may be employed in connection with the project, located within or outside the project boundary, as approved by the Commission, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

(C) Exhibits A, F and G designated in ordering paragraph (B) above, are approved and made a part of the license.

(D) This license is also subject to Articles 1 through 23 except Article 20 set forth in Form L-11 (revised October 1975), entitled "Terms and Conditions of License for Unconstructed Major Project Affecting the Interests of Interstate or Foreign Commerce," attached to and made a part of this license. The license is also subject to the following additional articles:

Article 24. Licensee shall, not later than 6 months after the commencement of construction of fish passage facilities at the Sewall Falls project (FERC No. 7216) and in no case later than July 1, 1988, file for Commission approval, functional design drawings of the proposed fish passage facilities at the Penacook Upper Falls Project, prepared in consultation with the U. S. Fish and Wildlife Service and the New Hampshire Fish and Game Department. Licensee shall provide upstream and downstream fish passage facilities at the Penacook Upper Falls Project within 1 year after completion of construction of fish passage facilities at the downstream Garvins Falls Dam, Hooksett Dam, Amoskeag Dam, and Pawtucket Dam; provided, however, that if the Sewalls Falls Project is authorized to be constructed, the Commission may adjust the construction schedule. Further, Licensee shall file with the Commission, within 6 months after completion of construction of the Penacook Upper Falls Project fish passage facilities, as-built drawings.

Article 25. Licensee shall continue to consult with the U. S. Fish and Wildlife Service and the New Hampshire Fish and Game Department regarding the introduction of Atlantic salmon to the Contoocook River, and shall cooperate with these agencies in providing safe downstream passage of salmon smolt at the project, if salmon migrations occur prior to completion of the fish passage facilities required by Article 24.

Article 26. Licensee shall discharge from the Penacook Upper Falls Project a continuous minimum flow of 338 cubic feet per second or the inflow to the reservoir, whichever is less, for the protection and enhancement of aquatic resources in the Contoocook River. These flows may be temporarily modified if required by operating emergencies beyond the control of the Licensee, and for short periods upon mutual agreement between the Licensee and the New Hampshire Fish and Game Department.

Article 27. The Licensee shall commence construction of project works within two years from the issuance date of the license and shall complete construction of the project within four years from the issuance date of the license.

Article 28. The Licensee shall provide to the Commission's Regional Engineer and the Director, Office of Hydropower Licensing, one copy each of the final contract drawings and specifications for pertinent features of the project, such as water retention structures, powerhouse, and water conveyance structures, at least 60 days prior to start of construction. The Director, Office of Hydropower Licensing may require changes in the plans and specifications to assure a safe and adequate project.

Article 29. The Licensee shall review and approve the design of contractor-designed cofferdams and deep excavations prior to the start of construction and shall ensure that construction of cofferdams and deep excavations are consistent with the approved design. At least 30 days prior to start of construction of the cofferdam, the Licensee shall provide to the Commission's Regional Engineer and Director, Office of Hydropower Licensing, one copy of the approved cofferdam construction drawings and specifications and a copy of the letter(s) of approval.

Article 30. The Licensee shall within 90 days of completion of construction file for approval by the Director, Office of Hydropower Licensing, revised Exhibits A, F, and G to describe and show the project as-built.

Article 31. The Licensee shall perform studies in cooperation with the Licensee for Project No. 3240 to determine the effect of project construction and operation on the proposed upstream Rolfe Canal Project, FERC No. 3240, if any, and shall compensate the Licensee of Project No. 3240 for losses, if any, incurred by reason of the construction or operation of the Penacook Upper Falls Project.

Article 32. The Licensee shall, prior to the commencement of any construction at the project, consult with the New Hampshire State Historic Preservation Officer (SHPO) about the need for any cultural resource survey and salvage work. The Licensee shall make available funds in a reasonable amount for any such work as required. If any previously unrecorded archeological or historical sites are discovered during the course of construction or development of any project works or other facilities at the project, construction activity in the vicinity shall be halted, a qualified archeologist shall be consulted to determine the significance of the sites, and the Licensee shall consult with the SHPO to develop a mitigation

plan for the protection of significant archeological or historic resources. If the Licensee and the SHPO cannot agree on the amount of money to be expended on archeological or historic work related to the project, the Commission reserves the right to require the Licensee to conduct, at its own expense, any such work found necessary.

Article 33. The Licensee shall continue to consult and cooperate with the U. S. Fish and Wildlife Service, the New Hampshire Water Supply and Pollution Control Board, and the New Hampshire Fish and Game Department for the protection and development of the environmental resources and values of the project area. The Commission reserves the right to require changes in the project works or operation that may be necessary to protect and enhance those resources and values.

Article 34. The Licensee shall pay the United States the following annual charge, effective the first day of the month in which this license is issued:

> For the purpose of reimbursing the United States for the cost of administration of Part I of the Act, a reasonable amount as determined in accordance with the provisions of the Commission's regulations in effect from time to time. The authorized installed capacity for that purpose is 3,750 horsepower.

Article 35. Pursuant to Section 10(d) of the Act, after the first 20 years of operation of the project under license, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. One half of the project surplus earnings, if any, accumulated after the first 20 years of operation under the license, in excess of the specified rate of return per annum on the net investment, shall be set aside in a project amortization reserve account at the end of each fiscal year. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year after the first 20 years of operation under the license, the amount of that deficiency shall be deducted from the amount of any surplus earnings subsequently accumulated, until absorbed. One-half of the remaining surplus earnings, if any, cumulatively computed, shall be set aside in the project amortization reserve account. The amounts established in the project amortization reserve account shall be maintained until further order of the Commission.

The annual specified reasonable rate of return shall be the sum of the annual weighted costs of long-term debt, preferred stock, and common equity, as defined below. The annual weighted cost for each component of the reasonable rate of return is the product of its capital ratio and cost rate. The annual capital ratio for each component of the rate of return shall be calculated based on an average of 13 monthly balances of amounts properly includable in the Licensee's long-term debt and proprietary capital

accounts as listed in the Commission's Uniform System of Accounts. The cost rates for long-term debt and preferred stock shall be their respective weighted average costs for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10 year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 36. (a) In accordance with the provisions of this article, the Licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain other types of use and occupancy, without prior Commission approval. The Licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the Licensee shall also have continuing responsibility to supervise and control the uses and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the Licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the Licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, cancelling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The types of use and occupancy of project lands and waters for which the Licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time where said facility is intended to serve single-family type dwellings; and (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the Licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The Licensee shall also ensure, to the satisfaction of the Commission's authorized representative, that the uses and occupancies for which it grants permission are maintained in good repair and comply with applicable State and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the Licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3)

determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the Licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the Licensee's costs of administering the permit program. The Commission reserves the right to require the Licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The Licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary State and Federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir. No later than January 31 of each year, the Licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The Licensee may convey fee titles to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary State and Federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary Federal and State water quality certificates or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary Federal and State approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed

is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal maximum surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 45 days before conveying any interest in project lands under this paragraph (d), the Licensee must file a letter to the Director, Office of Hydropower Licensing , stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G or K map may be used), the nature of the proposed use, the identity of any Federal or State agency official consulted, and any Federal or State approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the Licensee to file an application for prior approval, the Licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraphs (c) or (d) of this article:

(1) Before conveying the interest, the Licensee shall consult with Federal and State fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the Licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved Exhibit R or approved report on recreational resources of an Exhibit E; or, if the project does not have an approved Exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include covenants running with the land adequate to ensure that: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.

(4) The Commission reserves the right to require the Licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised Exhibit G or K drawings would be filed for approval for other purposes.

(E) The Licensee's failure to file a petition appealing this order to the Commission shall constitute acceptance of this license. In acknowledgment of acceptance of this order and its terms and conditions, it shall be signed by the Licensee and returned to the Commission within 60 days from the date this order is issued.

Quentin A. Edson
Director, Office of
Hydropower Licensing

Project No. 6689-000

IN TESTIMONY of its acknowledgment of acceptance of all of the terms and conditions of this order, Penacook Hydro Associates, this_____ day of _____, 19 ____, has caused its corporate name to be signed hereto by _____, its President, and its corporate seal to be affixed hereto and attested by _____, its Secretary, pursuant to a resolution of its Board of Directors duly adopted on the _____ day of _____, 19 ____, a certified copy of the record of which is attached hereto.

By _____
President

Attest:

_____
Secretary

(Executed in quadruplicate)

Form L-11
(Revised October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION

TERMS AND CONDITIONS OF LICENSE FOR UNCONSTRUCTED MAJOR PROJECT AFFECTING THE INTERESTS OF INTERSTATE OR FOREIGN COMMERCE

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project works shall be constructed in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its

judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Upon the completion of the project, or at such other time as the Commission may direct, the Licensee shall submit to the Commission for approval revised exhibits insofar as necessary to show any divergence from or variations in the project area and project boundary as finally located or in the project works as actually constructed when compared with the area and boundary shown and the works described in the license or in the exhibits approved by the Commission, together with a statement in writing setting forth the reasons which in the opinion of the Licensee necessitated or justified variation in or divergence from the approved exhibits. Such revised exhibits shall, if and when approved by the Commission, be made a part of the license under the provisions of Article 2 hereof.

Article 4. The construction, operation, and maintenance of the project and any work incidental to additions or alterations shall be subject to the inspection and supervision of the Regional Engineer, Federal Power Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of the project and for any subsequent alterations to the project. Construction of the project works or any feature or alteration thereof shall not be initiated until the program of inspection for the project works or any such feature thereof has been approved by said representative. The Licensee shall also furnish to said representative such further information as he may require concerning the construction, operation, and maintenance of the project, and of any alteration thereof, and shall notify him of the date upon which work will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and

across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction, maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights of occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a non-power licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for

the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may be mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefited by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Commission may prescribe for the purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefiting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall consult with the appropriate State and Federal agencies and, within one year of the date of issuance of this license, shall submit for Commission approval a plan for clearing the reservoir area. Further, the Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. Upon approval of the clearing plan all clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the

Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 22. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 23. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
P.O. BOX 1518
CONCORD, NEW HAMPSHIRE 03301

Mr. Thomas A. Tarpey
New Hampshire Hydro Associates
99 North State Street
Concord, New Hampshire 03301

OCT 1 1982

Dear Mr. Tarpey:

We have reviewed the draft environmental report for the Penacook Upper Falls hydroelectric project, FERC No. 3343, located on the Contoocook River, in Merrimack County, New Hampshire as requested in your September 9, 1982 letter. Although there are some minor factual errors in the report, you have adequately addressed our concerns.

As you have ackowledged in the report, the Contoocook River is scheduled for restoration of anadromous fish. State and Federal fishery agencies are jointly working to restore runs of American shad to this river. There are also plans to use headwater portions of the river for instream rearing of Atlantic salmon. Natural reproduction by salmon is probably not possible. Whatever adult returns are realized as a result of stocking salmon fry in the headwaters will go toward augmenting the overall run in the Merrimack River basin. It is likely, however, that a small run of adult salmon will take place in the lower portion of the Contoocook River where your project is located.

In accordance with Section 18 of the Federal Power Act we will be prescribing to FERC that fish-passage facilities be provided at this project. Both upstream and downstream passage of shad and salmon will need to be considered in designing these facilities. Based on current estimates by State and Federal fishery agencies upstream passage will be required at this project by 1988 depending on the construction of similar facilities on the Merrimack River and at your Penacook Lower Falls project (FERC No. 3342). Downstream passage facilities may be required before 1988, however. Atlantic salmon fry stocking in the headwaters above your project may start as early as 1984. These fish would be expected to migrate downstream past your project in 1986.

We will keep you informed on the progress of restoration in the Merrimack River and on the fry stocking in the Contoocook drainage so that you can plan the construction of fish-passage facilities at this project. Prior to any construction of these facilities, however, we will need to review your conceptual plans and final design.

We are also concerned about instream flow releases at this project. Based on historical streamflow, we recommend that there be an instantaneous discharge from the project of at least 338 cfs or inflow to the project area, whichever is less to protect downstream aquatic habitat. There will be a

need for additional flows to operate the fish-passage facilities at this project. The magnitude of these additional flows will be identified when we review the conceptual plans for the fish-passage facilities.

You should also provide access for public utilization of fish and wildlife resources in the project area wherever possible. Access for fishing will be especially important during annual runs of shad and salmon.

The factual errors which were referred to earlier are contained in your discussion of Atlantic salmon and their expected use of the Contoocook River. Adult salmon do not feed once they enter fresh water, and therefore will not be expected to "feed in the pool after negotiating the fish ladder." As we indicated earlier, conditions in the Contoocook River drainage no longer permit natural reproduction by salmon. No spawning is anticipated, even in the tributaries.

We hope these comments will be helpful in the preparation of the final environmental report. Let us know if you have any questions.

Sincerely yours,

Gordon E. Beckett

Gordon E. Beckett
Supervisor

The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES
Robert R. Scott, Commissioner

October 2, 2017

Shannon Ames, Executive Director
Low Impact Hydropower Institute
34 Providence Street
Portland, Maine 04103

RE: Water Quality Status of the Contoocook River for Low Impact Hydropower Institute Recertification of the Penacook Upper Falls Hydroelectric Project (FERC License No. 6689) Contoocook River – Penacook, NH

Dear Ms. Ames:

Essex Hydro Associates (EHA), on behalf of Briar Hydro Associates, is applying for recertification from the Low Impact Hydropower Institute (LIHI) for the Penacook Upper Falls Hydroelectric Project (FERC License No. 6689) on the Contoocook River in Penacook, NH. We understand that for the applicant to receive LIHI recertification, you require a statement from the New Hampshire Department of Environmental Services (NHDES) stating that the project is complying with state water quality standards. On October 7, 2015, NHDES sent EHA a letter outlining what would be needed to determine if the Contoocook River in the vicinity of the Penacook Upper Falls Hydroelectric Project was or was not attaining water quality standards. The letter stated that "In order for NHDES to determine if the subject hydroelectric project is causing or contributing to water quality standard violations, additional monitoring and information is needed. In general, data / information is needed to address the following water quality concerns that are typically associated with hydropower projects:

1. Impact on ambient water quality criteria and thresholds;
2. Impact of pond fluctuations on aquatic habitat;
3. Maintenance of adequate minimum flows to protect downstream aquatic life; and
4. Adequate upstream and downstream fish passage."

The purpose of this letter is to provide you with our assessment of the data and information received from EHA in response to our letter of October 7, 2015 and our conclusions as to whether or not the Penacook Upper Falls Hydroelectric Project is complying with New Hampshire surface water quality standards in the Contoocook River.

Water quality data was collected for dissolved oxygen, water temperature, total phosphorus, and chlorophyll-a. Monitoring locations in the upstream impoundment (03-CTC) and in the downstream tailrace section of the river (02K-CTC) were monitored continuously for water temperature and dissolved oxygen using multi-parameter dataloggers for two periods of time (August 2015 and August 2016). NHDES specified that the multi-parameter continuous water quality data should be collected under critical low flow (< 3 x 7Q10) and higher water temperature conditions (>23° C). There is a USGS stream gage (# 01085500) on the Contoocook River in Hopkinton, NH approximately eight miles upstream from the Penacook Upper Falls Hydroelectric Project. NHDES uses this gage as a surrogate to estimate low flow conditions in the vicinity of the project. During the datalogger deployment in August of 2015 the flows at the gage were below the target conditions of 3 x 7Q10 (108 cfs) for approximately seven days at both stations. During the datalogger deployment in August of 2016 the flows at the gage were below the target conditions of 3 x 7Q10 (108 cfs) for approximately five days at both stations. The daily average water temperature in the Contoocook River was above the target of 23° C for the majority of days during the deployments in 2015 and 2016. EHA has stated that during the collection of the

continuous water quality data the Penacook Upper Falls Hydroelectric Project was operating under normal operating procedures. Between June and August 2015, EHA also collected ten weekly samples of total phosphorus and chlorophyll-a at stations 03-CTC (upstream) and 02K-CTC (downstream).

NHDES has assessed the water quality data collected in 2015 and 2016, and based on this assessment concludes that the water quality in the impoundment and downstream section of the Contoocook River, under the project operating conditions and flow conditions during which the data was collected, is meeting existing water quality criteria or thresholds for dissolved oxygen, total phosphorus and chlorophyll-a. At the time of the deployment and retrieval of the dataloggers a vertical profile of dissolved oxygen and water temperature was measured at the station in the impoundment (03-CTC) to determine if thermal stratification was present. The vertical profiles collected at 03-CTC indicate that the impoundment is not thermally stratified.

In the October 7, 2015 letter NHDES provided the assessment status for the parameters of concern for the reaches of the Contoocook River upstream and downstream of the Penacook Upper Falls Hydroelectric Project. Table 1 provides an update to the current assessment status of the river reaches in question for the parameters collected in 2015 and 2016. The assessments are based on the methodology described in the NHDES Consolidated Assessment and Listing Methodology (CALM)[1]. This information will be used in the next Section 305(b)/303(d) Water Quality Assessment report which is expected to be issued by NHDES in 2018. Please note that the assessment status listed in Table 1 could change if water quality criteria or thresholds change and/or if additional data indicate water quality violations. For example, data collected at lower flows and/or higher temperatures might result in a different assessment.

[1] NHDES. 2016. Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology. NH Department of Environmental Services, Watershed Management Bureau, Concord, NH

Table 1. Assessment Status for Water Quality Monitoring Parameters – Penacook Upper Falls Hydroelectric Project

Assessment Unit and Monitoring Station	Location	Parameter	Designated Use	Assessment Status based upon 2015 and 2016sampling
NHIMP700030507-06 03-CTC	Penacook Upper Falls Hydroelectric Project - Impoundment	Dissolved Oxygen (mg/L)	Aquatic Life	Fully Supporting
		Dissolved Oxygen (% Sat.)	Aquatic Life	Fully Supporting
		Chlorophyll-a	Primary Contact Recreation	Fully Supporting
			Aquatic Life	Potentially Supporting [A]
		Total Phosphorus	Aquatic Life	Indeterminate[A]
		Water Temperature	Aquatic Life	No numeric criteria[C]
NHRIV700030507-09 02K-CTC	Downstream of Penacook Upper Falls Hydroelectric Project– Tailrace	Dissolved Oxygen (mg/L)	Aquatic Life	Fully Supporting
		Dissolved Oxygen (% Sat.)	Aquatic Life	Fully Supporting
		Chlorophyll-a	Primary Contact Recreation	Fully Supporting
		Total Phosphorus	Aquatic Life	No numeric criteria[B]
		Water Temperature	Aquatic Life	No numeric criteria[C]

[A] NHDES does have numeric water quality thresholds for the aquatic life designated use for total phosphorus and chlorophyll-a in lakes/ponds and impoundments with characteristics similar to lakes/ponds but it can only be applied to waterbodies where the tropic class is known. For waterbodies where the trophic class is known the median total phosphorus and chlorophyll-a value is used to make the threshold comparison. The aquatic life designated use nutrient and chlorophyll-a thresholds are depicted below with the median values for each parameter for the data collected at station 03-CTC in assessment unit NH IMP700030507-06 and station 02K-CTC in assessment unit NHRIV700030507-09 during the summer of 2015.

	TP (ug/L)	Chl-a (ug/L)
Median 03-CTC (2015)	**19**	**2.25**
Median 02K-CTC (2015)	**19**	**2.19**
Oligotrophic	< 8	< 3.3
Mesotrophic	≤ 12	≤ 5
Eutrophic	≤ 28	≤ 11

[B] NHDES does not have numeric water quality criteria for nutrients in rivers or streams. The narrative criteria states that "Class B waters shall contain no phosphorus or nitrogen in such concentrations that would impair any existing or designated uses, unless naturally occurring.
[C] Although there is currently no numerical water quality criteria for water temperature, NHDES is in the process of collecting biological and water temperature data that will contribute to the development of a procedure for assessing rivers and stream based on water temperature and its corresponding impact to the biological integrity of the waterbody.

EHA has confirmed with NHDES that the minimum flow operations have not changed since the original LIHI certification in 2010. The FERC license for this project requires that the facility be operated as a run of river operation with a continuous minimum flow of 338 cfs or the inflow to the reservoir, whichever is less. EHA has provided NHDES with the 2010 - 2014 annual reports to FERC that certify compliance with the required minimum flows. In 2015 FERC notified the project that they no longer require annual certifications of minimum flow and only need to be notified if there is a deviation that occurs from the required minimum flow. No deviations occurred in 2015 or 2016.

Regarding the issue of fish passage circumstances have not changed since certification when EHA received confirmation of compliance from John Warner of the U.S. Fish and Wildlife Service (USFWS) and Carol Henderson of New Hampshire Fish and Game (NHFG) for downstream fish passage. Regarding upstream fish passage, NHDES has also received documentation from EHA that barring changes to river conditions or fish management plans, the schedule for design and installation of upstream fish passage infrastructure will be governed by the construction and successful function of upstream fish passage facilities located on the Merrimack River downstream of the confluence with the Contoocook River. NHFG and the USFWS have indicated their concurrence with the current status of upstream fish passage.

Eel passage at the Penacook Upper Falls Hydroelectric Project is contingent on downstream passage at the upstream Rolfe Canal Hydroelectric Project and upstream passage at the downstream Penacook Lower Falls Hydroelectric Project. In February of 2017 EHA staff met with USFWS and NHFG staff to discuss design of a permanent downstream eel passage measure, a sloping screen and eel traps at the Rolfe Canal Hydroelectric Project. EHA is continuing to coordinate with USFWS and NHFG to determine the best structure designs to address eel passage issues. .

In summary, based on the current operation of the facility, current water quality standards, water quality data collected in 2015-2016 and information provided to NHDES by EHA, the Contoocook River immediately upstream and downstream of the Penacook Upper Falls Hydroelectric Project is meeting water quality standards or thresholds for dissolved oxygen, total phosphorus and chlorophyll-a under the conditions during which the data was collected. As previously noted, the above water quality assessment could change in the future should a change in water quality criteria or thresholds and/or new data indicate water quality violations or the potential for water quality violations. It could also change if the NHDES, USFWS and/or NHFG conclude in the future that the project is not in compliance with upstream or downstream fish/eel passage requirements or minimum flow requirements.

Should you have any questions or require additional information please contact me at (603)271-2083 or ted.walsh@des.nh.gov.

Sincerely,

Ted Walsh, Surface Water Monitoring Coordinator
NHDES Watershed Management Bureau

Cc (via email): Dr. Michael J. Sale, Low Impact Hydropower Institute
Elise Anderson, Essex Hydro Associates, LLC
Andrew Locke, Essex Hydro Associates, LLC
Carol Henderson, NHFG
John Magee, NHFG
John Warner, USFS

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
P.O. BOX 1518
CONCORD, NEW HAMPSHIRE 03301

Mr. Kenneth F. Plumb, Secretary
Federal Energy Regulatory Commission
825 North Capitol Street, N.E.
Washington, D.C. 20426

MAY 14 1986

Dear Mr. Plumb:

We are submitting our comments regarding the document "A Comprehensive Plan for Provision of Anadromous Fish Passage Measures and Facilities at PSNH's Merrimack Pemigewasset River Hydroelectric Dams, FERC Projects #1893, 2456 and 2457," by Public Service of New Hampshire (PSNH) and the Policy and Technical Committees for Anadromous Fishery Management of the Merrimack River, dated April 14, 1986. As indicated in the letter dated April 17, 1986 (see enclosure) PSNH proposes modifying two of the project licenses to incorporate the provisions in the Plan.

GENERAL COMMENTS:

The Fish and Wildlife Service endorses the provisions, measures, and studies set forth in the Plan. The unanimous approval of the Plan by the Policy Committee and Public Service of New Hampshire on April 14, 1986 is the result of considerable coordination and negotiation between parties with an interest in the fishery and aquatic resources of the Merrimack and Pemigewasset Rivers.

This comprehensive plan ensures future passage of anadromous fish in the Merrimack and Pemigewasset Rivers. We commend Public Service of New Hampshire, the Policy and Technical Committees, and the participating state and federal fisheries resource agencies for their diligent efforts in developing the plan.

SPECIFIC COMMENTS:

Merrimack River Project #1893 (Amoskeag, Hooksett and Garvins Falls Dams)

Article 40 of the existing license requires the Licensee to submit to the Commission for approval, a report which includes functional design drawings for fish passage facilities and schedules for commencement and completion of construction of these facilities at each project. As part of the Plan, PSNH has proposed to provide upstream fish passage facilties at Amoskeag Dam to be operational for the 1988 spring runs. In addition, the Plan establishes a deferred schedule for construction of upstream fish passage facilities at Hooksett and Garvins Falls Dams. Implementation of the schedule for constructing facilities at the respective dams will be triggered by the passage of 15,000 American shad, first at Amoskeag Dam and second at Hooksett Dam.

The passage of American shad to trigger the construction of passage facilities is used in the Plan because shad restoration is expected to proceed faster than the restoration of Atlantic salmon in the Merrimack River Basin. Therefore, it is expected that passage facilities will be needed in the spring of the fifth year following the passage of 15,000 American shad at each of these dams (all available spawning and rearing habitat for shad will be utilized in the Amoskeag and Hooksett impoundments).

It is inherent in the Plan that functional design drawings and as-built plans for all upstream facilities will first be reviewed by the Fish and Wildlife Service. The schedule and methods for implementing downstream passage of smolts at these facilities is clear. However, the results of upstream and downstream passage studies to determine the effectiveness of passage could in fact alter the proposed schedules and methods for passage. Article 40 should be amended to ensure that the proposed studies are completed and that any mitigation measures are based on the results of the studies and are adequately implemented.

If for any reason the shad numbers are not achieved, but salmon restoration appears to be successful, discussions regarding a new schedule for construction of upstream fish passage facilities will be necessary.

Eastman Falls Dam-Project #2457

Article 38 of the existing license for the Eastman Falls Project provides a schedule for implementing fish passage facilities at the project. The Plan defers the need for upstream fish passage facilities at the project until the year 2010 or later. The FWS predicts, based on salmon population projections, that full restoration of naturally reproducing stocks of Atlantic salmon in the Merrimack and Pemigewasset Rivers is feasible as early as 2012 and is very likely to occur prior to the year 2020. At that time, the involvement of the Federal hatchery system will no longer be required in the stocking of Atlantic salmon fry and smolts. For planning purposes, it should be assumed that full fish passage facilities will probably be needed at Eastman Falls shortly after the year 2010.

Trapping facilities will be provided at the Eastman Falls Dam for the spring run of the second year following the annual passage or trapping of 50 multi-sea winter (non-grilse) Atlantic salmon at Amoskeag Dam. Transportation of Atlantic salmon from the Eastman Falls trap to upstream of the Eastman Falls Dam and/or Ayers Island Dam will be in accordance with Policy Committee annual instructions or until such time as full passage at both dams becomes available.

The interim trap-and-truck measures should augment the present restoration efforts. However, the FWS acceptance of these measures is predicated on the projection that upstream fish passage facilities will eventually be constructed at all dams on the Merrimack and Pemigewasset Rivers.

Article 38 should be amended to provide flexibility in the fish passage schedule for Eastman Falls, including a specific requirement to reassess the timing for construction of facilities by 2010.

Ayers Island Dam-Project #2457

The license for the Ayers Island Project does not expire until 1993. There presently is no requirement in the license for fish passage or minimum stream flows, yet certain conditions regarding the Ayers Island Project were included in the Plan.

The Plan provides for trapping and trucking Atlantic salmon, downstream fish passage facilities and measures, studies to determine the effectiveness of downstream passage, and minimum flows below the Ayers Island dam. Although PSNH does not intend to amend their present license to incorporate the provisions stated in the Plan, they are committed to implementing the measures until 1993, at which time the measures will be formally incorporated during relicensing.

While the Plan provides for the interim trapping of salmon at Eastman Falls and trucking around Ayers Island Dam until 2010, projections are that full fish passage facilities will eventually be needed at Ayers Island. We will recommend that the issuance of any new license for Ayers Island after 1993 contain a provision for scheduling upstream fish passage facilities after the year 2010. This is consistent with the provisions for the Eastman Falls project.

Continued coordination will be needed in implementing and evaluating upstream and downstream fish passage measures and minimum flow releases at the Ayers Island project. All coordination with the Fish and Wildlife Service should occur with a representative from this office (New England Field Office, Ecological Services).

Recommendations: The following special license articles are suggested to ensure that fish passage and other mitigative measures are provided in the Merrimack and Pemigewasset Rivers.

Merrimack River Project No. 1893 (Amoskeag Hooksett and Garvins Falls Dams)

Article 40 should be amended to read as follows:

Article 40. The Licensee shall provide at the Amoskeag, Hooksett, and Garvins Falls Dams, the upstream and downstream fish passage and trapping facilities, and measures and studies stated in the document: "A Comprehensive Plan for Provision of Anadromous Fish Passage Measures and Facilities at PSNH's Merrimack-Pemigewasset River Hydroelectric Dams, FERC Projects No. 1893, 2456 and 2457." In addition, the Licensee shall, after consultation with the U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Forest Service, New Hampshire Department of Fish and Game, Massachusetts Division of Fisheries and Wildlife, and the Massachusetts Division of Marine Fisheries, submit for Commission approval (a) functional design drawings of fish passage and/or trapping facilities for each of the three project developments when necessary in accordance with the Plan; and (b) annual reports beginning in April 1987 describing (1) the yearly accomplishments and shortcomings in implementing the Plan, (2) the results of the studies or observations that were undertaken, and (3) the mitigation measures that were proposed and/or implemented based on the results of the studies or observations.

Eastman Falls Dam Project No. 2457

Article 38 should be superceded by the following:

Article 38: The Licensee shall provide at the Eastman Falls Dam the trapping facilities, measures, and studies stated in the document: "A Comprehensive Plan for Provision of Anadromous Fish Passage Measures and Facilities at PSNH's Merrimack-Pemigewasset River Hydroelectric Dams, FERC Project No. 1893, 2456, and 2457. In addition, the Licensee shall, after consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, U.S. Forest Service, New Hampshire Department of Fish and Game, Massachusetts Division of Fisheries and Wildlife, and the Massachusetts Division of Marine Fisheries, submit for Commission approval (a) functional design drawings of fish passage and/or trapping facilities when necessary in accordance with the Plan; (b) annual reports beginning in April 1987 describing (1) the yearly accomplishments and shortcomings in implementing the Plan, (2) the results of the studies or observations that were undertaken, and (3) the mitigation measures that were proposed and/or implemented based on the results of the studies or observations. In addition, the Licensee shall not later than the year 2010 submit for Commission approval, following consultation with the fisheries agencies, a schedule for upstream fish passage facilities based on the progress of the Atlantic salmon program.

If you have any questions regarding these comments, please contact Mr. Joseph McKeon of my staff at FTS 834-4411.

Sincerely yours,

Gordon E. Beckett

Gordon E. Beckett
Supervisor
New England Area

CC: L. Stolte, USFWS
R. Cronin, MDF&W
A. Crabtree, NHF&G
R. Fairbanks, MDFG
E. Niewald, USFS
R. Barbour, PSNH
R. Fairbanks, MDMF
R. Seamans, NMFS
RO/HR Reading File
ES: JMcKeon:jd:5-13-86:834-4411

A COMPREHENSIVE PLAN FOR PROVISION OF ANADROMOUS FISH PASSAGE MEASURES AND FACILITIES AT PSNH'S MERRIMACK - PEMIGEWASSET RIVER HYDROELECTRIC DAMS, FERC PROJECTS NO. 1893, 2456 AND 2457

By
Public Service of New Hampshire and
The Policy and Technical Committees
For Anadromous Fishery Management
Of The Merrimack River

PSNH will provide the following fish passage facilities, measures and studies.

UPSTREAM FISH PASSAGE

Amoskeag Dam

1988 - Provide Upstream Passage Facility (fish ladder); Operational for Spring Runs.

Provide for Transportation of Atlantic Salmon from Amoskeag Passage Facility to Garvins Falls Impoundment — Until Hooksett Dam and Garvins Falls Dam, Upstream Passage Facilities Are Operational.

- Provide 2 Barrier Dams; In Place for Spring Runs of Second Year Following:

  1. Observation of Stranding, Entrapment and/or Undue Delay of Upstream Migration of 200 or More Adult American Shad Below Spillway of Dam; Or

  2. Stranding, Entrapment and/or Undue Delay of Upstream Migration Below Spillway of Dam of 10% or More of Approximately 50 Adult Atlantic Salmon, Radio-Tagged and Released Above Pawtucket Dam in Lowell, Mass.

UPSTREAM FISH PASSAGE
Cont'd

- Provide For Performance of An Annual Radio Tracking Study of Approximately 50 Upstream Migrating, Adult Atlantic Salmon--Released in Merrimack River Between Pawtucket and Amoskeag Dams--for Three (3) Years Or Until Definitive Need for Amoskeag Barrier Dams Has Been Determined, Whichever Is Less. First Annual Tracking Study will Be Performed During First Year That 50 Or More Returning Salmon Are Made Available For This Purpose by the Policy Committee.

- Fishery Resource Agencies Will Provide PSNH With Necessary Salmon For Tracking Studies. Tracking Studies Will Be Cooperatively Developed by PSNH and Fishery Resource Agencies.

Hooksett Dam

Upstream passage facilities (fish ladder, etc.) will be provided for the spring runs of the 5th year following the annual passage of 15,000 American Shad at Amoskeag Dam but not prior to the completion of full fish passage facilities at Amoskeag Dam.

Garvins Falls Dam

Upstream passage facilities (fish ladder, etc.) will be provided for the spring runs of the 5th year following the annual passage of 15,000 American Shad at Hooksett Dam.

Eastman Falls and Ayers Island Dams

An Atlantic Salmon trapping facility will be provided at the Eastman Falls Dam for the spring run of the second year following the annual passage or trapping of 50 multi-sea winter Atlantic Salmon at Amoskeag Dam.

UPSTREAM FISH PASSAGE
Cont'd

PSNH will provide for the transportation of Atlantic Salmon from the Eastman Falls trap to upstream of the Eastman Falls Dam and/or Ayers Island Dam, in accordance with Policy Committee instructions or until such time as full fish passage at both dams becomes available.

Full upstream passage facilities (fish ladder, etc.) at the Eastman Falls Dam and a potential salmon trapping facility at the Ayers Island Dam will be deferred to the year 2010 or later. In the year 2010, the need for these facilities will be reevaluated by the fisheries resource agencies and PSNH.

DOWNSTREAM FISH PASSAGE

Ayers Island Dam

1988 - Provide Spillway Gate and Sluice for Regulated Overflow Spilling; Operational for Spring Salmon Out-Migration.

- Commence 2-3 Year Study to Determine Effectiveness of Spillway Gate and Sluice for Passing Salmon Smolt. Study Design Cooperatively Developed by PSNH and Fishery Resource Agencies. Fishery Resource Agencies Will Provide PSNH With Necessary Salmon for Study.

Eastman Falls Dam

1988 - Provide Gated Intake Structure (Gulper) for Existing Trash Sluice; Operational for Spring Salmon Out-Migration.

Automated Overflow Spillway Gate Within Waste Gate or Periodic Cracking of Waste Gate, etc., May Be Provided to Augment or Supplant Gulper Operation, If Need Demonstrated by Effectiveness Study, Below.

- Commence 2-3 Year Study to Determine Effectiveness of Gulper, etc., for Passing Salmon Smolt. Study Design Cooperatively Developed by PSNH and Fishery Resource Agencies. Fishery Resource Agencies Will Provide PSNH With Necessary Salmon for Study.

Garvins Falls Dam

1986 & 1987 - Provide Periodic Manipulation of Waste Gate to Pass Salmon Smolt and Clupeid Out-Migrants.

- Observations of Effectiveness of Overflow Spilling at Waste Gate for Passing Summer-Fall, Clupeid Out-Migrants -- Performed Cooperatively by PSNH and Fisheries Resource Agencies.

1986 & Etc. - Exit Channel Cleared and Plunge Pool Below Waste Gate Provided each Spring, As Soon As River Conditions Permit.

1987 - Automate Waste Gate for Regulated Overflow Spilling; Automation Completed for Summer-Fall, Clupeid Out-Migrations.

1988 - Garvins Falls Dam Included in 2-3 Year Study to Determining Effectiveness of Downstream Passage Facilities and Measures for Passing Salmon Smolt -- See Study for Ayers Island and Eastman Falls Dam, Above.

- Need for Observations and/or Studies of Effectiveness of Downstream Passage Facilities for Passing Clupeid Species Determined Partially by Results of 1986-1987 Observations at Garvins Falls and Hooksett Dams, and Evaluated Annually by Fisheries Resource Agencies and PSNH.

DOWNSTREAM FISH PASSAGE
Cont'd

Hooksett Dam

1986 - Provide Periodic Stoplog Adjustments in Trash Sluice to Pass Salmon Smolt and Clupeid Out-Migrants.

1986 & 1987 - Observations of Effectiveness of Overflow Spilling at Stoplog Bay/Waste Gate for Passing Summer-Fall, Clupeid Out-Migrants -- Performed Cooperatively by PSNH and Fisheries Resource Agencies.

1987 - Provide Automated Waste Gate in Trash Sluice for Regulated Overflow Spilling; Operational for Summer-Fall, Clupeid Out-Migrations. Provide Periodic Manipulation of Waste Gate to Pass Clupeid Out-Migrants.

1988 - Hooksett Dam Included in 2-3 Year Study to Determining Effectiveness of Downstream Passage Facilities and Measures for Passing Salmon Smolt -- See Study for Ayers Island and Eastman Falls Dam, Above.

- Need for Observations and/or Studies of Effectiveness of Downstream Passage Facilities for Passing Clupeid Species Determined Partially by Results of 1986-1987 Observations at Garvins Falls and Hooksett Dams, and Evaluated Annually by Fisheries Resource Agencies and PSNH.

Amoskeag Dam

1986 & 1987 - No Downstream Passage Requirements.

1988 - Provide Automated Overflow Spillway with Bypass Sluice; Operational for Spring Salmon Out-Migration.

- Amoskeag Dam Included in 2-3 Year Study to Determine Effectiveness of Downstream Passage Facilities and Measures for Passing Salmon Smolt — See Study for Ayers Island and Eastman Falls Dam, Above.

April 23, 1986

AYERS ISLAND MINIMUM FLOW

1986 – Minimum Flow at Ayers Island Dam Will Be Determined by Observations of Flows in Reach Between Ayers Island Dam and Smith River Confluence. Observations Will Be Performed Cooperatively by Fisheries Resource Agencies and PSNH During Summer-Fall of 1986.

1987 – Provide Ayers Island Dam Minimum Flow.

Appendix 5 Return to Table of Contents

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Upper Penacook Project — Project No. 6689-001

ORDER AMENDING LICENSE ARTICLE

(Issued September 25, 1986)

On August 5, 1986, Briar-Hydro Associates (licensee) filed an application for amendment of the license for the Upper Penacook Project, to amend article 24 to reflect an agreement between Public Service of New Hampshire (PSNH) and the state and federal fishery agencies regarding the construction of fish passage facilities at mainstem dams on the Merrimack River. 1/ The Upper Penacook Project is located on the lower Contoocook River, which is a tributary stream proposed for anadromous fish restoration and that enters the Merrimack River upstream of the fifth mainstem dam.

The revision of article 24 will provide for construction of fish passage facilities at the Upper Penacook Project on a schedule consistent with the agreement on mainstem fish passage, and based on the success of the anadromous fish restoration program on the Merrimack River.

The Director orders:

(A) Article 24 of the license is amended to read:

Article 24. The licensee, within 2 years after the annual passage of 15,000 adult American shad through the fish passage facilities at the Garvins Falls Project (FERC No. 1893), or through the fish

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1/ The agreement is entitled, A Comprehensive Plan for Provision of Anadromous Fish Passage Measures and Facilities at PSNH's Merrimack-Pemigewasset River Hydroelectric Dams, FERC Project Nos. 1893, 2456, and 2457, and was signed by PSNH, the New Hampshire Fish and Game Department, the Massachusetts Division of Fisheries and Wildlife, the Massachusetts Division of Marine Fisheries, the National Marine Fisheries Service, the U.S. Forest Service, and the U.S. Fish and Wildlife Service.

facilities of the proposed Sewalls Fall Project (FERC No. 7216) if constructed, but in no case later than July 1, 2004, shall file for Commission approval functional design drawings of fish passage facilities for the Upper Penacook Project, prepared after consultation with the New Hampshire Fish and Game Department and the U.S. Fish and Wildlife Service. The licensee shall provide upstream and downstream fish passage facilities at the Upper Penacook Project within 5 years after the annual passage of 15,000 adult American shad through the fish facilities at the Garvins Falls Dam, or Sewalls Falls Dam if constructed, consistent with the agreement entitled, A Comprehensive Plan for Provision of Anadromous Fish Passage Measures and Facilities at PSNH's Merrimack-Pemigewasset River Hydroelectric Dams, FERC Project Nos. 1893, 2456, and 2457. Further, the licensee shall file as-built drawings of the Upper Penacook Project fish passage facilities within 6 months after completion of construction.

(B) This order is issued under authority delegated to the Director and is final unless appealed to the Commission under Rule 1902 within 30 days from the date of this order.

Richard T. Hunt
Director, Office of
Hydropower Licensing

Bristol Comstock Tower
59 Ayers Island Road
Bristol, NH 03222

December 19, 2018

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Mr. Gregg Comstock
New Hampshire Department of Environmental Services
Watershed Management Bureau
29 Hazen Drive
Concord, NH 03302

RE: FERC Project No. 1893, Merrimack River Project
Annual status report regarding the design, construction, and anticipated completion date of fish passage facilities

Dear Ms. Bose and Mr. Comstock:

As outlined in section E-8 of the final New Hampshire Department of Environmental Services (NHDES) Water Quality Certification (WQC # 2003-006.1) dated May 10, 2005 and Federal Energy Regulatory Commission (FERC) License Article 401, Hull Street Energy Hydro NH AC, LLC ("HSE Hydro") is submitting the following fish passage facility annual status report for 2018.

Hooksett

The U.S. Department of the Interior, Fish and Wildlife Service fishway prescription requires the installation of upstream passage facilities for anadromous fish at the Hooksett Dam, to be operational within three years after passage of **either 9,500 or more shad or 22,500 or more river herring** in any given year at the Amoskeag development. The trigger number for river herring was reached during the 2016 migration season. As such, former owner, Eversource, initiated consultation with state and federal agencies to begin preliminary design work. HSE continues to consult with the agencies to determine the most feasible design in terms of size, location, target species, project operations, cost and constructability.

A meeting was held on January 4, 2018 to review the Hooksett ***Nature-like Fishway Cost Estimates Memo*** prepared by Gomez and Sullivan Engineers (GSE), the engineering design consultant. A copy of the January 4, 2018 meeting minutes is included as Attachment 1. GSE reviewed several pros and cons for each of three nature-like concepts,

one developed by GSE, one recommended by the USFWS and one recommended by NOAA Fisheries. The review included an assessment of issues related to fish passage efficiency, site access, and operations and maintenance. All parties agreed additional information to be collected in the field was necessary to further evaluate the G&S concept NOAA concept. Action items generated from the meeting included:

- Eversource and GSE to prepare a schedule for data collection. This schedule and associated data collection items will be submitted to the agencies for comments and additions. Once all groups agree upon data collection content and schedule, Eversource and GSE will proceed with collection of the data.
- Following data collection, all groups will review the concept designs and schedule a meeting or conference call to discuss further.

A draft Hooksett Upstream Fish Passage Data Collection Plan was sent to the agencies on February 26, 2018 for review and comment. Comments were received from agency engineers via a Technical Memorandum on March 5, 2018 and incorporated into the final data collection plan. The Plan and associated correspondence is included in Attachment 2.

An update on the data collection effort was sent to the agencies on September 27, 2018. The update included:

- A description of why the bathymetry data had not been collected in August as planned due to high river flows and limited availability of equipment.
- The sale of Eversource Hydro Generation to Hull Street Energy had been completed on August 26, 2018.
- Proposed dates to meet with the agency engineers to discuss the raw data collected to date and 2D modeling parameters.

HSE Hydro held an Upstream Fish Passage Engineering Meeting on November 1, 2018 to discuss where the development of the upstream fish passage design concepts stands. This included a discussion of data collection to date and GSE's inability to collect the bathymetry data upstream of the western spillway due to high river flows and limited availability of equipment. The basic 2D modeling parameters were discussed, including model extents and mesh size. A copy of the November 1, 2018 meeting minutes is included as Attachment 3.

HSE Hydro distributed the updated Hooksett Fish Passage Schedule(s) memo on December 5, 2018 and is currently scheduling a meeting with the agencies to review the updated project timeline(s) and 2-dimensional flow modeling of the conceptual designs. A copy of this correspondence and attachments is included with this filing as Attachment 4.

Garvins Falls

The U.S. Department of the Interior, Fish and Wildlife Service fishway prescription requires the installation of upstream passage facilities for anadromous fish at the Garvins Falls Dam, to be operational within three years after passage of: (1) **either 9,800 American shad or 23,200 river herring** at the Hooksett development; (2) if fish passage has been constructed at the Hooksett Development without a fish counting facility, passage of **either 19,300 American shad or 45,800 river herring** at the Amoskeag Development. No activity specific to fish passage design at Garvins Falls was necessary in 2018.

HSE Hydro looks forward to continuing productive consultation with the agencies to determine the most feasible design in terms of size, location, target species, project operations, cost and constructability of a fish passage facility at Hooksett.

If you have any questions, please call Mr. Curtis R. Mooney at (603) 744-8855 Ext. 2 or cmooney@centralriverspower.com.

Sincerely,

Brent Sowle
Hydro Manager

Attachments

cc:

FWS/NEFO – Julianne Rosset (via email)
FWS/ – Mike Bailey (via email)
FWS-RO/ Fisheries Engineering – Bryan Sojkowski (via email)
NHFGD –Matt Carpenter (via email)
NOAA- Bjorn Lake (via email)

ORIGINAL

ESSEX HYDRO ASSOCIATES, L.L.C.
55 UNION STREET, 4th FLOOR
BOSTON, MASSACHUSETTS 02108-2400 USA
TELEPHONE: +617-367-0032
FAX: +617-367-3796
E-MAIL: essex@essexhydro.com

April 7, 2004

John P. Warner, Energy/Hydropower Coordinator
New England Field Office, U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Re: Penacook Lower Falls Hydroelectric, FERC Project No. 3342-NH
Penacook Upper Falls Hydroelectric, FERC Project No. 6689-NH
Rolfe Canal Hydroelectric, FERC Project No. 3240-NH

Dear Mr. Warner:

Essex Hydro Associates, LLC ("Essex") is a general partner of the entities holding the FERC licenses for the above referenced projects. License articles for those projects (articles 32, 24, and 30, respectively) require that the licensees shall, no later than July 1, 2004, "file for Commission approval functional design drawings of fish passage facilities... prepared after consultation with the New Hampshire Fish and Game Department ("NHF&GD") and the U. S. Fish and Wildlife Service ("USF&WS")."

As we have discussed the timetable for the Merrimack River fish restoration program has not proceeded as quickly as was envisioned at the time those articles were written. Essex understands that the three projects on the mainstem of the Merrimack River, immediately downstream of the above referenced projects, are now in the process of consultation and design regarding fish facilities as a part of their FERC relicensing process. As we have further discussed, consultation and design regarding fish facilities for the three Contoocook River projects would be more appropriately undertaken after the mainstem facilities have been better defined.

Therefore, if it meets with the approval of the NHF&GD and the USF&WS, the licensees for the above referenced projects are intending to file with the FERC, for each project, a request for an extension of time regarding the subject articles. Essex would request permission to file with the FERC, on or before January 31, 2006, a timetable for the required consultation and design process. If this is acceptable to the USF&WS, I would be grateful if you would signify this by signing and dating this letter in the appropriate spaces below and returning one copy to me by both facsimile and post. Thank you very much for your attention to this matter.

Sincerely,
Essex Hydro Associates, L.L.C.

Thomas A Tarpey
Executive Vice President

John Warner, U.S. Fish and Wildlife Service 5/17/04 Date

X:\WP_DOCS\EHALLC\REGULATO\2004\USF&WS\20040407v5.wpd

ORIGINAL

ESSEX HYDRO ASSOCIATES, L.L.C.
55 UNION STREET, 4th FLOOR
BOSTON, MASSACHUSETTS 02108-2400 USA
TELEPHONE: +617-367-0032
FAX: +617-367-3796
E-MAIL: essex@essexhydro.com

April 16, 2004

William Ingham, Fish and Wildlife Ecologist
New Hampshire Fish and Game Department
11 Hazen Drive
Concord, NH 03301 Facsimile: 603-271-1438

Re: Penacook Lower Falls Hydroelectric, FERC Project No. 3342-NH
Penacook Upper Falls Hydroelectric, FERC Project No. 6689-NH
Rolfe Canal Hydroelectric, FERC Project No. 3240-NH

Dear Mr. Ingham:

Essex Hydro Associates, LLC ("Essex") is a general partner of the entities holding the FERC licenses for the above referenced projects. License articles for those projects (articles 32, 24, and 30, respectively) require that the licensees shall, no later than July 1, 2004, "file for Commission approval functional design drawings of fish passage facilities... prepared after consultation with the New Hampshire Fish and Game Department ("NHF&GD") and the U. S. Fish and Wildlife Service ("USF&WS")."

As we have discussed the timetable for the Merrimack River fish restoration program has not proceeded as quickly as was envisioned at the time those articles were written. Essex understands that the three projects on the mainstem of the Merrimack River, immediately downstream of the above referenced projects, are now in the process of consultation and design regarding fish facilities as a part of their FERC relicensing process. As we have further discussed, consultation and design regarding fish facilities for the three Contoocook River projects would be more appropriately undertaken after the mainstem facilities have been better defined.

Therefore, if it meets with the approval of the NHF&GD and the USF&WS, the licensees for the above referenced projects are intending to file with the FERC, for each project, a request for an extension of time regarding the subject articles. Essex would request permission to file with the FERC, on or before January 31, 2006, a timetable for the required consultation and design process. If this is acceptable to the NHF&GD, I would be grateful if you would signify this by signing and dating this letter in the appropriate spaces below and returning one copy to me by both facsimile and post. Thank you very much for your attention to this matter.

Sincerely,
Essex Hydro Associates, L.L.C.

Thomas A Tarpey
Executive Vice President

William C. Ingham 5-14-04

William Ingham, Fish and Wildlife Ecologist Date
New Hampshire Fish and Game Department

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ORIGINAL

ESSEX HYDRO ASSOCIATES, L.L.C.
55 UNION STREET, 4th FLOOR
BOSTON, MASSACHUSETTS 02108-2400 USA

TELEPHONE: +617-367-0032
FAX: +617-367-3796
E-MAIL: essex@essexhydro.com

May 11, 2004

The Honorable Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.,
Room 1-A
Washington, DC 20426

016
015
036

Re: Penacook Lower Falls Hydroelectric, FERC Project No. 3342-NH
Penacook Upper Falls Hydroelectric, FERC Project No. 6689-NH
Rolfe Canal Hydroelectric, FERC Project No. 3240-NH

Dear Ms. Salas:

Essex Hydro Associates, LLC ("Essex") is a general partner of the partnerships holding the FERC licenses for the above referenced projects ("Contoocook River projects"). Essex seeks an extension of time in which to consult, develop and file functional design drawings of fish passage facilities and submits that good cause supports its request.

License articles for the Contoocook River projects (Articles 32 (P-3342), 24 (P-6689), and 30 (P-3240)) require that the Licensees shall, no later than July 1, 2004, "file for Commission approval functional design drawings of fish passage facilities... prepared after consultation with the New Hampshire Fish and Game Department ("NHF&GD") and the U. S. Fish and Wildlife Service ("USF&WS")."

The timetable for the Merrimack River fish restoration program, of which the above referenced projects are a part, has not proceeded as quickly as was envisioned at the time the subject licenses were issued. Essex understands the three projects on the mainstem of the Merrimack River, immediately downstream of the above referenced projects, are now in the process of consultation and design regarding fish facilities as a part of their FERC relicensing process. In light of the consultation and development activities at the downstream projects, consultation and design regarding fish facilities for the three Contoocook River projects would be more appropriately undertaken after the mainstem facilities have been better defined.

Therefore, the Licensees for the Contoocook River projects respectfully request the Commission grant an extension of time for compliance with License Articles 32 (P-3342), 24 (P-6689) and 30 (P-3240). The Licensees propose to file with the Commission, on or before January 31, 2006, a timetable for the required consultation and design process.

The Licensees have conferred with the relevant offices of the USF&WS and the NHF&GD. Correspondence with these agencies evidencing their consent to the granting of such an extension of time is attached.

Thank you very much for your attention to this matter. Please direct any questions with respect to this request to Thomas A. Tarpey at 617-367-0032.

Sincerely,
Essex Hydro Associates, L.L.C.

Thomas A Tarpey
Executive Vice President

Enc.: Essex Letter of April 07, 2004 to USF&WS
Essex Letter of April 16, 2004 to NHF&GD

cc: John Warner; USF&WS, Concord, NH
William Ingham; NHF&GD, Concord, NH

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20040706-3013 Issued by FERC OSEC 07/06/2004 in Docket#: P-3240-036

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Briar Hydro Associates

Project Nos. 3240-036, 3342-016, and 6689-015

ORDER GRANTING EXTENSION OF TIME
TO FILE FISH PASSAGE DESIGN DRAWINGS

(Issued July 6, 2004)

Briar Hydro Associates, licensee for the Rolfe Canal, Penacook Lower Falls, and Penacook Upper Falls Hydroelectric Projects, has requested an extension of time to file functional design drawings of the proposed fish passage facilities at each project, as required by the cited articles of its licenses.[1] The projects are located on the Contoocook River in Merrimack County, New Hampshire.

The licensee states that the timetable for the fish restoration program on the downstream Merrimack River has not proceeded as quickly as was expected when the licenses for these projects were issued. The licensee notes that consultation and design regarding fish facilities at projects on the Merrimack River are ongoing as part of the relicensing process for those projects. The licensee requests an extension of time, until January 31, 2006, to file a timetable for the consultation and design process for fish passage facilities at the three Contoocook River projects.

The reasons advanced by the licensee in support of the requested extension of time are reasonable and justify an extension. The licensee has contacted the U.S. Fish and Wildlife Service and the New Hampshire Fish and Game Department, with whom consultation on fish passage is required, regarding this request. The agencies concur with the request.

The Director orders:

(A) The licensee shall file, by January 31, 2006, a timetable for the consultation and design process for fish passage facilities required by article 30 of the license for

[1] 29 FERC ¶ 62,229 (1984), article 30; 21 FERC ¶ 62,282 (1982), article 32; and 29 FERC ¶ 62,230 (1984), article 24.

20040706-3013 Issued by FERC OSEC 07/06/2004 in Docket#: P-3240-036

Project No. 3240, article 32 of the license for Project No. 3342, and article 24 of the license for Project No. 6689.

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

Regina M. Saizan
Division of Hydropower
Administration and Compliance

ESSEX HYDRO ASSOCIATES, L.L.C.
55 UNION STREET, 4th FLOOR
BOSTON, MASSACHUSETTS 02108-2400 USA

TELEPHONE: +617-367-0032
FAX: +617-367-3796
E-MAIL: essex@essexhydro.com

February 25, 2005

John P. Warner, Energy/Hydropower Coordinator
New England Field Office, U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Via e-mail: "John_Warner@FWS.gov"

Re: Penacook Lower Falls Hydroelectric, FERC Project No. 3342-NH
Penacook Upper Falls Hydroelectric, FERC Project No. 6689-NH
Rolfe Canal Hydroelectric, FERC Project No. 3240-NH

Dear Mr. Warner:

Essex Hydro Associates, LLC ("Essex") is a general partner of Concord Hydro Associates, LLC ("CHA"), the FERC licensee, owner and operator of the three above captioned hydroelectric projects. All of these projects are located on the Contoocook River, in the vicinity of Penacook, New Hampshire.

Over the last several years, these Contoocook River plants have installed and operated numerous prototype systems designed to improve the passage of atlantic salmon smolts migrating downstream. To test the effectiveness of those systems, CHA has operated traps downstream of the bypass facilities for use in "Mark-Release-Recapture" studies.

These studies showed the installed facilities to be effective in passing the hatchery smolts employed in the testing. However, the trap and passage facility have now been run for five full migration seasons and the number of wild smolts captured has been extremely low relative to the predicted population of outmigrating wild smolts. See Table 1.

Assuming that wild smolts were opting to pass the hydro facility at which we were conducting our tests by moving through the facility's turbine, rather than using the bypass facilities being tested, CHA engaged Normandeau Associates, Inc. ("NAI") to conduct a survival test on salmon smolts moving through turbines of the type installed at each of CHA's Contoocook River plants. Attached for your review is the NAI letter report "Survival Estimates of Hatchery-reared Juvenile Atlantic salmon Passed Through A Kaplan Turbine at the Briar-Rolfe Canal Hydroelectric Project".

The Rolfe Canal Hydroelectric Project ("Rolfe") is the most upstream of CHA's Contoocook River hydroelectric projects. The Rolfe plant was chosen as the test site because, of the three Penacook plants, it presents the least favorable conditions for turbine passage. All three of the CHA Contoocook River plants have turbines which are essentially identical, mecahnically; all are three

meter diameter, five bladed, horizontal kaplan-type turbines. However, the Rolfe plant's turbine, at 150 RPM, has a higher operating speed than the turbines of either Penacook Upper Falls (138 RPM,) or Penacook Lower Falls (130.4 RPM).

The NAI test indicates that the survival rate for smolts transiting each of CHA's three Contoocook River turbines will be equal to or better than ninety-five percent. In light of this, CHA makes the following proposal regarding downstream fish passage at its three Contoocook River plants.

1. Rolfe Canal Hydro.
   a. Rolfe Canal passage - migrants moving downstream via the Rolfe Canal would pass the facility by transiting the turbine.
   b. Mainstem passage.
      i. When river discharge is less than or equal to turbine capacity - migrants moving downstream via the mainstem of the Contoocook would pass the York Dam via one of two bottom-opening slide gate located at the southerly end of the dam. This gate would release a constant fifty cubic feet per second, until river flow exceeds turbine hydraulic capacity.
      ii. When river discharge exceeds turbine hydraulic capacity (see Table 2) - the above mentioned gates will be opened as necessary, up to their full hydraulic capacity, to match river flow in excess of turbine hydraulic capacity.
      iii. When river discharge exceeds the combined hydraulic capacity of turbine and dam spill gates - additional river flow will pass via the crest of the York Dam.
2. Penacook Upper Falls Hydro.
   a. When river discharge is less than or equal to the combined hydraulic capacity of the turbine and the downstream migrant bypass slot - migrants would pass the Penacook Upper Falls Hydro facility via:
      i. A four foot deep slot located in the gate bay immediately to the left of the powerhouse intake. This slot would release a constant twenty cubic feet per second, until river flow exceeds turbine hydraulic capacity. This slot will be opened as necessary, up to its full hydraulic capacity, to match river flow in excess of turbine hydraulic capacity. Outfall from this slot will be channeled into a flume running down the left side of the powerhouse and be discharged into the tailrace.
      ii. The facility's turbine.
   b. When river discharge exceeds the combined hydraulic capacity of turbine and the downstream migrant bypass slot (see Table 2) - additional river flow will pass via one or more of the bottom opening slide gates comprising the facility's gated spillway.
3. Penacook Lower Falls Hydro.
   a. When river discharge is less than or equal to the combined hydraulic capacity of the turbine and the downstream migrant bypass gate - migrants would pass the Penacook Upper Falls Hydro facility via:
      i. A four foot high bottom opening slide gate located immediately to the right

of the powerhouse intake. This gate would release a constant twenty cubic feet per second, until river flow exceeds turbine hydraulic capacity. This slot will be opened as necessary, up to its full hydraulic capacity, to match river flow in excess of turbine hydraulic capacity. Outfall from this gate will be channeled into a flume running down the right side of the powerhouse and be discharged into the tailrace.

ii. The facility's turbine.

b. When river discharge exceeds the combined hydraulic capacity of turbine and the downstream migrant bypass slot (see Table 2) - additional river flow will pass via one or more of the bottom opening slide gates comprising the facility's gated spillway.

I would be grateful if you would review and comment on this proposed plan of operation for downstream migration facilities for CHA's three Contoocook River plants. I will contact you during the week of March 7th, to arrange a meeting for further discussion on this proposal. Thank you very much for your attention to this matter.

Sincerely,
Concord Hydro Associates, LLC, by
Essex Hydro Associates, L.L.C.. a
General Partner, by

-------- s ----------

Thomas A. Tarpey
Executive Vice President

Table 1 Penacook Upper Falls Hydroelectric Project Fishway Collection Information	
Test Year	Number of Wild Smolts Collected
2000	24
2001	17
2002	31
2003	29
2004	45

TABLE 2 Calculated Percent of Time when River Flow Exceeds Turbine Discharge April 1 thru June 30			
Rolfe Canal and Penacook Upper Falls Projects		Penacook Lower Falls Project	
1993	34.8	1993	26.3
1994	49.0	1994	49.5
1995	08.7	1995	00.3
1996	45.5	1996	57.3
1997	38.3	1997	49.1
1998	37.0	1998	45.3
1999	28.5	1999	35.0
2000	32.2	2000	43.4
2001	36.9	2001	38.9
2002	22.6	2002	31.5
2003	40.2	2003	53.2
2004	32.7	2004	43.7
Average	33.9	Average	39.5
Min	08.7	Min	00.3
Max	49.0	Max	57.3

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

FERC No. 3342, 6689 and 3240

June 21, 2005

Mr. Thomas A. Tarpey, Executive Vice President
Essex Hydro Associates, L.L.C.
55 Union Street, 5th Floor
Boston, MA 02108-2400

Dear Mr. Tarpey:

This is in response to your letter dated February 23, 2005, which submits a proposal for operation of downstream passage facilities at the Penacook Lower Falls, Penacook Upper Falls and Rolfe Canal Projects, located on the Contoocook River in Penacook and Boscawen, New Hampshire. Attached to the letter was a brief report on turbine survival tests of salmon smolts, conducted in 2004.

We have reviewed the proposal and turbine survival report and have the following comments, questions and recommendations. We have coordinated this response with other Service and state agency offices involved in anadromous fish restoration in the Merrimack River Basin.

Introductory Statements

The statement, in the third paragraph of the letter, that studies performed at the project have proven the downstream fish passage facilities to be effective for passing salmon smolts is incorrect. While studies of various bypasses and screen designs were conducted at all three projects, positive results were only attained at the Upper Penacook Falls Project, and acceptable passage effectiveness at this site only occurred when a combination of an arc-shaped bypass, flow inducer and floating guidance louver was in place. All studies at the Rolfe Canal and Lower Penacook Falls Projects demonstrated very poor passage efficiency under all tested scenarios.

Turbine Survival

The letter also references the turbine survival test results that indicate greater than 95% survival through the project turbines. While the study determined that direct mortality was less than 5%, some fish that survived initial passage received potentially serious injuries that could affect longer-term survival. Since all smolts passing this site need to pass though many miles of river and up to seven more hydro stations, cumulative injuries and reduced condition attributable to the injuries would likely reduce overall long-term survival. With injured fish factored in, we consider the long-term survival of smolts passing through each turbine to be closer to 90%.

Proposed Passage Plan

Based on turbine survival data, you propose the following:

Rolfe Canal – Operate the bottom-opening gate at York Dam to pass a minimum of 50 cfs at all times. Fish that do not pass at York Dam would enter the canal and pass through the Rolfe Canal station turbine.

We do not have any plans of York Dam or the bottom-opening gate. However, based on an approximated 10-foot head difference at York Dam and a submerged orifice type gate, a five-foot-wide gate would need to be open only six inches at the bottom to pass the required 50 cfs. A submerged opening would not be expected to provide an efficient passage by surface-oriented smolts, and effectiveness would be further aggravated by the small opening.

Upper Penacook – Operate a 4-foot-deep slot in the gate bay adjacent to the powerhouse intake. This slot would pass a minimum of 20 cfs. Passage through the turbine would be the secondary passage route.

This slot width would only be about nine inches wide. The Service's design criteria calls for the minimum width of a bypass facility at a hydro facility to be three feet, or four times the width proposed here. All previous correspondence, as well as the approved bypass plans regarding downstream bypass facilities, identify a bypass flow of 40 cfs, which is consistent with our minimum design criteria of 2% of turbine capacity. The only bypass configurations that showed any reasonable effectiveness at this site was the configuration using an arc-shaped bypass entrance located at the dam crest gate bays.

Lower Penacook – Operate a four-foot-high bottom-opening slide gate located immediately adjacent to the powerhouse intake. This gate would release a minimum flow of 20 cfs. Passage through the turbine would be the secondary passage route. During high flows, excess spill would pass via additional bottom-opening slide gates.

As with Upper Penacook, the approved plans and all previous correspondence called for a minimum bypass flow of 40 cfs. Also, similar to Rolfe Canal, a bottom-opening gate passing such a small flow is unlikely to provide any meaningful passage.

Overall

We note that the proposal is not detailed, and included no design plans for which gates will be used as bypasses. As a result, the exact bypass configurations proposed are unclear. In addition, there is no information on the plunge pool configuration below any of the bypasses.

Salmon Fry Stocking in the Contoocook River

The numbers of salmon fry stocked into the Contoocook River has varied from year to year. In recent years, stocking upstream from the project (including the mainstem Contoocook, North Branch Contoocook and Beards Brook) have ranged from over 140,000 in 2000 to 9,000 in 2004. Most smolts move downstream as 2-year-olds with some migrating at one or three years old. As such, fish passing downstream in 2005 would have largely been from the 2003 fry stocking, with some possibly from 2002 and 2004. Stocking in those years have been 14,000, 93,000, and 9,000 fry respectively.

Passage measures in 2005

Given the need to determine 2005 passage measures prior to a complete review of the long-term passage plan for the projects, you contacted John Warner of this office regarding passage measures needed this year. You requested, and were granted permission to operate the Upper Penacook Falls fish bypass system without running the current inducer system, due to the limited number of salmon smolts that would move downstream in 2005 and your conclusion of over 95% turbine survival. We reserved a decision on long-term measures pending review of the proposal, the attached turbine survival results, and past study results.

Past Evaluations at Each Project

Evaluation of various structural downstream passage devices and non-structural behavioral measures have been ongoing at one or more of the three projects since 1991.

Rolfe Canal

Studies at Rolfe Canal included assessment of a simple 3-foot-wide, 2-foot-deep bypass adjacent to the project intake in 1992, a modified bypass with a surface screening structure and attraction and repulsion lights in 1993 and 1994, and a sound deterrent system in 1995 and 1996 designed to exclude smolts from the canal and encourage passage at York Dam.

Extremely poor passage results at Rolfe Canal led to the concept of excluding fish from the Rolfe Canal and passing them down the mainstem river or capturing fish at York Dam and transporting them downstream below the three projects. Passage effectiveness results for all studies, however, were very poor. It is notable, however, that the Rolfe Canal tests indicated that passage efficiency at the bypasses was inversely related to unit discharge.

Upper Penacook Falls

Poor passage results at Rolfe Canal led to a shift in focus to testing experimental technologies at the Upper Falls Project. Initial test results of an acoustic deterrent system in 1997 were poor, leading to a switch to look at current inducers that create an artificial flow field to guide fish to the fish bypass sluice. The fish bypass itself was moved to the center crest bay gate and designed with an arc-shaped entrance to promote an entrance flow field with more gradual flow acceleration. Results in 1997 were promising. In 1998, a slickbar oil boom was installed to help direct flow towards the bypass, and floating current transducer units were used in addition to a shore-mounted inducer. Overall passage with this configuration was 64%. This was the operation mode in 1999, but in 2000, a cabled louver was installed instead of the slickbar boom, and the bypass location was moved to the right crest bay gate. Passage results for specific test releases ranged from 3% to 86%. Better efficiencies were seen during test runs at lower turbine discharges.

The success of the current inducer in creating a flow field led to thoughts that such a system could be used to move smolts into a trap, where they could be transported around the three projects. If successful in its experimental deployment at Upper Falls, this system could be installed at Rolfe Canal to intercept emigrating smolts for transport below the three projects. A prototype floating auger–type trap was tested in 2001. The results of this test were poor, and focus was reverted back to the shore-mounted inducer and bypass system. The test in 2002 used a larger 16 hp motor on a single current inducer. Bypass efficiencies from different release groups ranged from 43% to 74%. It is uncertain if turbine discharge affected the test results as in past evaluations, as we do not have a results report from this study.

In addition to field testing in 2002, Essex had a Computational Flow Dynamics (CFD) model developed to evaluate the flow fields created by the current inducer and guide louver to assess how to improve that flow field. The results indicated that two inducers, one 10 hp shore-mounted inducer and one 16 hp floating inducer, were needed to create a continuous flow field to the fish bypass. A continuous field is considered necessary to achieve high bypass effectiveness.

Following the 2002 studies, you proposed to continue current inducer operations at Upper Falls, while you shifted to planning for a similar installation at Rolfe Canal. You also proposed to investigate the level of turbine mortality that may be expected to occur at the projects. In 2003, an acoustic Doppler flow profile was to be completed at the entrance to Rolfe Canal, a new current inducer system was to be installed in 2004, and by 2006, the plan and hope was that a complete, effective guidance and trapping system would be in place at Rolfe Canal/York Dam, to capture smolts and transfer them past the other two projects. If the Rolfe Canal trap proved to be very effective, it was possible that the Upper Falls current inducer system could be turned off.

We are unaware whether the Doppler survey or planning and designing a current inducer system for Rolfe Canal ever occurred. What was conduced in 2004 was the turbine survival test at Rolfe Canal discussed above.

Lower Penacook Falls

Lower Falls had largely been ignored in most studies of the projects. Initial bypass testing proved ineffective and efforts focused on technology development at the other sites that could be applied to Lower Falls and to trapping and transfer systems that would eliminate the need for site-specific measures at Lower Falls.

Passage Study Summation

Given that the three projects, in close proximity were operated by the same company, the Service and other resource agencies agreed that passage evaluations could focus on one site at a time to test new passage technologies. We also agreed to experimental measures including the lights, acoustic arrays and current inducers, modified bypasses and trap-and-trucking.

The concept for these evaluations was that information gathered and lessons learned at one site could then be applied to the other two sites, given somewhat similar project size, intake depths and turbine designs. As such, the tests of the current inducer, louver and modified bypass at Upper Falls show great promise as a solution to passage problems, especially at lower generation levels. Instead of following through on the results of so many years of study, Essex turned to turbine mortality testing. While we agreed this was acceptable, it was uncertain whether turbine passage alone would be an acceptable passage measure. Rather, it was conceivable that the data could have indicated that good survival coupled with moderate bypass effectiveness would be needed to provide acceptable passage.

Salmon Smolt Passage

Necessary Facilities for Salmon Smolt Passage

The proposed fish passage plan departs from the long-standing plan to move forward with modifications at Rolfe Canal and Lower Falls based on the Upper Falls results.

Essex's proposal would mean that the proven-effective current inducer and louver system would be abandoned and the simple bypasses that were proven to be ineffective would be operated instead. In fact, as described above, the proposed bypasses with only 20 cfs flow would be even less effective than the old bypasses that were previously proven ineffective. Salmon smolts, therefore, would largely pass through the turbine units. As indicated above, we would ascribe to a more conservative 90% turbine survival figure. If such a survival rate is applied to the three projects, overall survival past the three would be only 73%. That is a sizable percentage loss.

For successful salmon passage at the projects, we believe that the following improvements to passage would need to be implemented:

- The current inducer and louver system, with improvements indicated by the CFD modeling, would be installed and operated at Upper Falls.

- A current inducer system, such as a system at Upper Falls, would be implemented at the Rolfe Canal Project, as was previously proposed by Essex.
- Following installation and evaluation of the Rolfe Canal current inducer system, we would determine if a combination of trap-and-truck from Rolfe Canal and/or Upper Falls, and/or unit passage at the three projects would be acceptable long-term passage configurations, and whether or not current inducer and bypass operation at the Upper Falls facility could be suspended.

Interim Passage Operations Given Current Stocking Levels

We would not accept the proposed fish passage plan if salmon fry stocking in the Contoocook River had continued at the same levels that existed before and during much of the last 14 years of passage studies. However, a reduced number of salmon fry are now stocked in the Merrimack River Basin. Stocking into the Contoocook, therefore, has been severely reduced as indicated above.

Some fry stocking will continue and all fry and subsequent smolts are valuable to the restoration effort. However, moving forward with further studies and additional passage measures at Rolfe Canal solely for salmon smolts appears unwarranted at this time. In addition, the incremental difference between the proposed turbine passage plan and operation of only the Upper Falls current inducer system (the only bypass configuration proven to be somewhat effective) would be minimal given limited fry stocking.

We note that the bypass configuration at Upper Falls and the plunge pool configuration at all three sites are not defined, and need to be reviewed by the Service before we can agree with the proposed plan.

Please note that if salmon fry production increases or changes in stocking location result in more fry being stocked in the Contoocook River drainage, we will push for immediate action to implement the current inducer system at Upper Falls (as modified pursuant to the CFD results), and implementation of measures at Rolfe Canal as outlined above.

Therefore, for the time being, the proposed passage plan is acceptable, as long as the bypass flows are increased to the previously approved minimum flows at the Upper Penacook Project and safe plunge pools are established, and as long as Essex Hydro commits to implementing the modifications described above if Contoocook River stocking changes in the future.

River Herring and Shad Downstream Passage

We have raised the issue of shad and herring stocking into the Contoocook and the subsequent need for downstream passage measures for these fish a number of times in recent years. The shad and herring restoration program calls for establishment of both species in the Contoocook River. River herring have been stocked into the Contoocook River in past years. It is anticipated that herring or shad could be stocked into the Contoocook upstream from your projects as early as next year. At that time, passage measures to assure safe downstream migration of juvenile

clupeids will be needed as these juveniles exit the watershed in late summer or early fall of the same year that they were spawned.

When stocking does occur, the existing bypasses at Rolfe Canal and York Dam should be operated with safe plunge pools and the Upper Falls current inducer, louver and the arc-shaped bypass facility should be operated. We note that the freefall distance from the end of the bypass flume/pipe to tailwater cannot exceed six feet for juvenile clupeids.

While no formal evaluation of passage would be required the first year of such stocking, visual evaluation of fish congregating in the forebays and bypass entrances and observations of the project tailraces of all three projects for injured or dead juveniles should be undertaken. Decisions on the need for further evaluations or changes to these bypass measures would be based on these visual observations and the fishery agencies' long-term stocking plans.

Conclusion

As stated above, we can accept for the time being the proposed fish passage plan for salmon smolt passage (with clarifications on bypass and plunge pool configuration as well as minimum bypass flows), with the understanding from Essex that the passage measures described above will be required if fry stocking in the Contoocook drainage is increased. In addition, downstream passage measures will be needed for shad and/or herring when they are stocked into the river.

Thank you for this opportunity to comment. If you have any questions, please contact John Warner at 603-223-2541, extension 15.

Sincerely yours,

William J Neidermyer

William J. Neidermyer
Assistant Supervisor, Federal Activities
New England Field Office

cc: CNEFRO- Joe McKeon
NHFGD – Jon Greenwood
NHFGD- Bill Ingham
MDFW - Caleb Slater
MDMF - Kristen Ferry
Engineering FO – Dick Quinn
FERC- Div. Of Hydropower Administration and Compliance
Reading file

es: JWarner:06-21-05:603-223-2541

ESSEX HYDRO ASSOCIATES, L.L.C.
55 UNION STREET, 4TH FLOOR
BOSTON, MASSACHUSETTS 02108 USA
TELEPHONE: +617-367-0032
FAX: +617-367-3796
E-MAIL: essex@essexhydro.com

May 3, 2006

John P. Warner, Energy/Hydropower Coordinator
New England Field Office, U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 03301

Facsimile: 603-223-0104

Re: Rolfe Canal Hydroelectric, FERC Project No. 3240-NH
Penacook Upper Falls Hydroelectric, FERC Project No. 6689-NH
Penacook Lower Falls Hydroelectric, FERC Project No. 3342-NH

Dear Mr. Warner:

Essex Hydro Associates, LLC ("EHA") is a general partner of Concord Hydro Associates, LLC ("CHA"), the FERC licensee, owner and operator of the three above captioned hydroelectric projects (collectively referred to here as the "Contoocook River Projects"). All of these projects are located on the Contoocook River, in the vicinity of Penacook, New Hampshire.

By a letter dated February 25, 2005, addressed to you in your capacity as Energy/Hydropower Coordinator of the New England Field Office, U.S. Fish and Wildlife Service ("F&WS") (copy attached), EHA described its proposed methods for passing downstream migrants at the Contoocook River Projects. In a letter response dated June 21, 2005, the F&WS commented on and suggested changes to the proposed migration facilities.

Incorporating the changes suggested in the F&WS's letter, the subject downstream migration facilities have been fabricated and installed. The installed facilities and their operation are described below and in the attached drawings and photographs. Given water depths are measured from the invert of the structure being described to the minimum, regulated water surface elevation.

1. Rolfe Canal Facilities:
   a. Migrants moving downstream via the Rolfe Canal would pass the facility by transiting the turbine.
   b. Mainstem passage See Attachments 1 and 2.
      i. When river discharge is less than or equal to turbine capacity, migrants moving downstream via the mainstem of the Contoocook will pass the York Dam via a surface passage three (3) feet wide and four (4) feet deep, designed to pass fifty (50) fifty cubic feet per second.
      ii. When river discharge exceeds the combined hydraulic capacity of the project's turbine and the surface passage, the additional water will flow over the spillway crest. This will also increase passage flow slightly as pond elevation increases.

2. Penacook Upper Falls Facilities:
   a. When river discharge is less than or equal to the combined hydraulic capacity of the turbine and the downstream migrant passage, migrants will pass the Penacook Upper Falls Hydro facility via:

i. A surface passage twenty-six (26) inches wide and four (4) feet deep located in the gate bay immediately to the left of the powerhouse intake. This passage will release a constant forty (40) cubic feet per second. Outfall from this passage will be channeled into a flume running down the left side of the powerhouse and be discharged into the tailrace. Attachments 3, 4 and 5 are provided for general overview of the downstream passage. Attachment 3 shows the location of the trapping station which has been replaced by the flume passage as reflected in the pictures of attachments 4 and 5.

ii. The facility's turbine.

b. When river discharge exceeds the combined hydraulic capacity of turbine and the downstream migrant passage, additional river flow will pass via one or more of the bottom opening slide gates comprising the facility's gated spillway.

3. Penacook Lower Falls Facilities:

a. When river discharge is less than or equal to the combined hydraulic capacity of the turbine and the downstream migrant passage, migrants will pass the Penacook Lower Falls Hydro facility via:

i. Surface entrance passage located in the first full gate opening to the right of the turbine trash racks. This passage will release a constant forty (40) cubic feet per second. Outfall from this surface passage will discharge into a series of three plunge pools. Each step in this series of plunge pools represents a change in elevation of six (6) feet or less. The lower level of the last step in the series is a bypass channel leading to the facility's tailrace. See Attachments 6 – 9.

ii. The facility's turbine.

b. When river discharge exceeds the combined hydraulic capacity of turbine and the downstream migrant passage, additional river flow will pass via one or more of the bottom opening slide gates comprising the facility's gated spillway or over the spillway crest.

Please call me (617-367-0032) or Dave Sherman (603-753-6166) to arrange access for inspection of these installations. Once you have had an opportunity to review the facilities, please feel free to contact me to discuss their operation or to suggest further modifications.

Very truly yours,

ESSEX HYDRO ASSOCIATES, L.L.C.

Thomas A. Tarpey,
Vice President

cc: FERC, Division of Hydropower Admin. and Compliance
William Ingham, NH Department of Fish and Game

5940

ESSEX HYDRO ASSOCIATES, L.L.C.
55 UNION STREET, 4TH FLOOR
BOSTON, MASSACHUSETTS 02108 USA

TELEPHONE: +617-367-0032
FAX: +617-367-3796
E-MAIL: essex@essexhydro.com

October 6, 2006

Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Room 1A
Washington, DC 20426

RE: Rolfe Canal Project No. 3240
Penacook Lower Falls, Project No. 3342
Penacook Upper Falls, Project No. 6689
Order Granting Extension of Time to File Fish Passage Design Drawing
Issued July 6, 2004

Dear Secretary:

As originally filed with the FERC on May 19, 2006, enclosed please find an original and eight copies of a letter dated May 3, 2006 to John Warner, U.S. Fish and Wildlife Service ("USF&W") which states that the subject downstream migration facilities have been fabricated and installed.

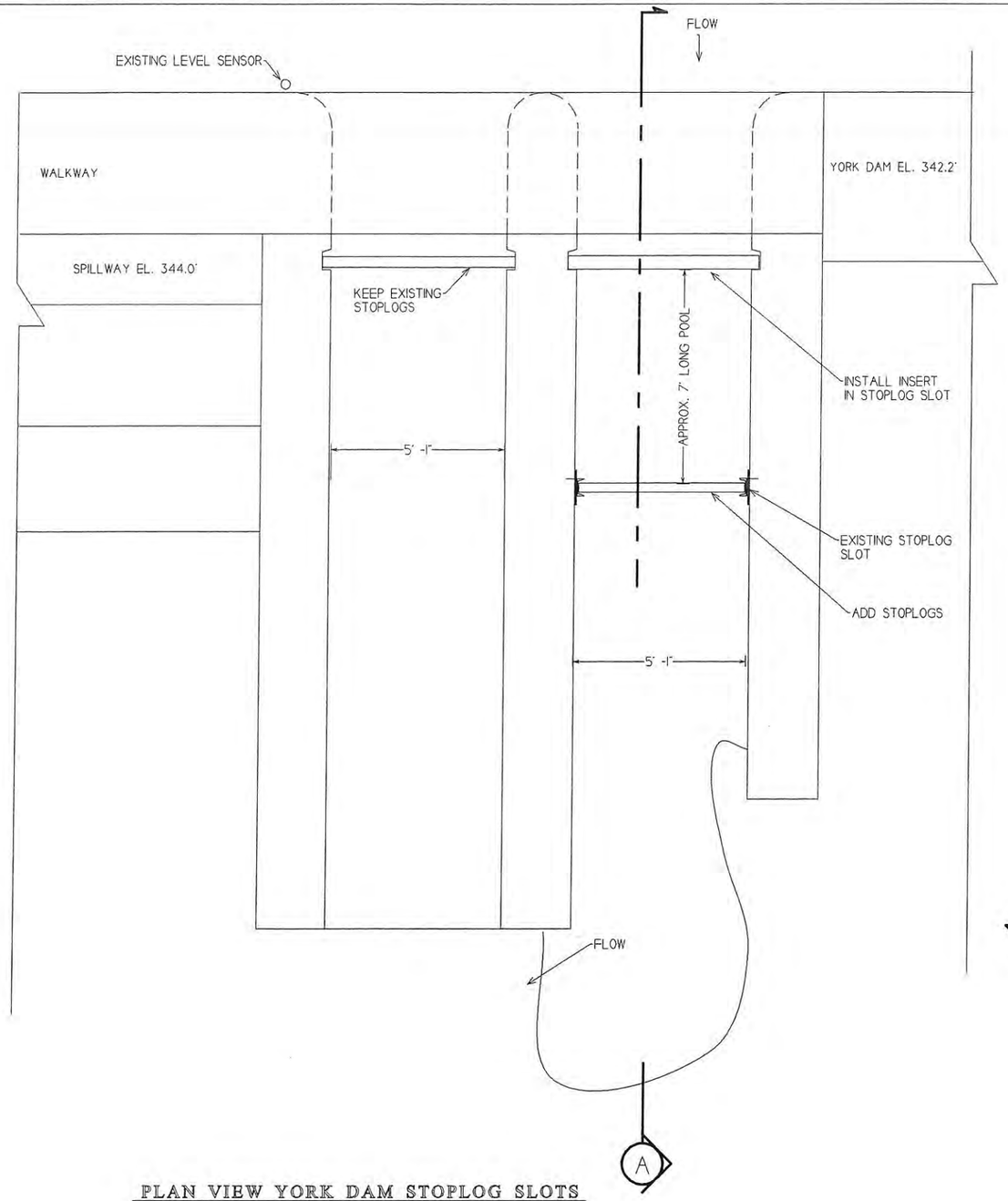
Very truly yours,

ESSEX HYDRO ASSOCIATES, L.L.C.

Thomas A. Tarpey

Thomas A. Tarpey
Executive Vice President

Enc.

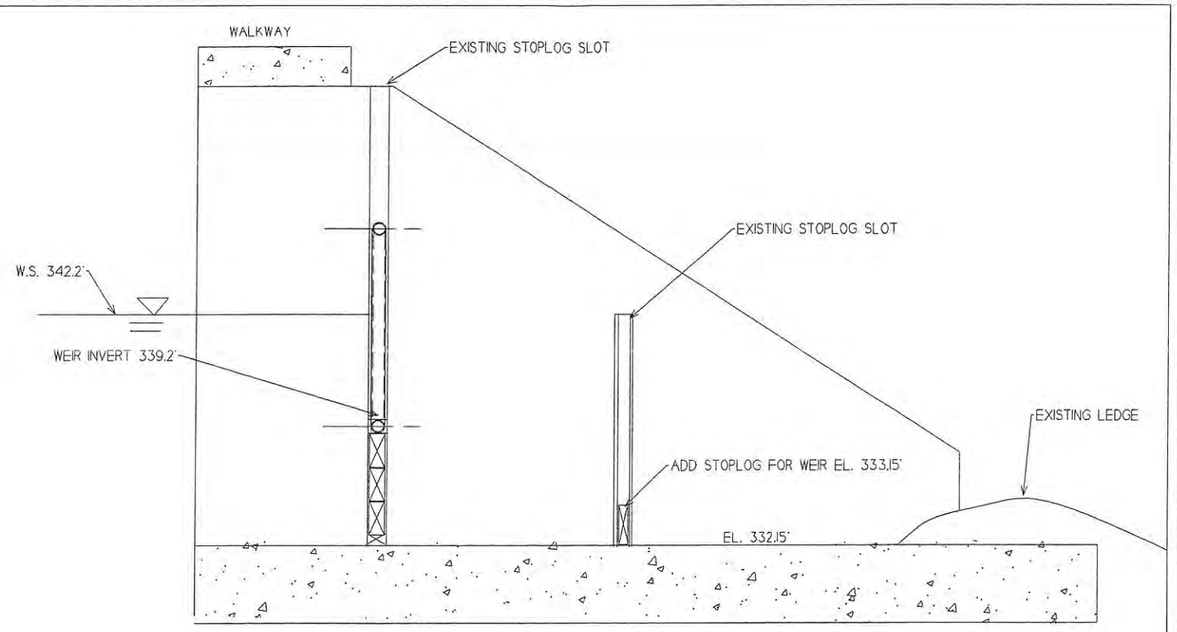


PLAN VIEW YORK DAM STOPLOG SLOTS

1/4" = 1'-0"

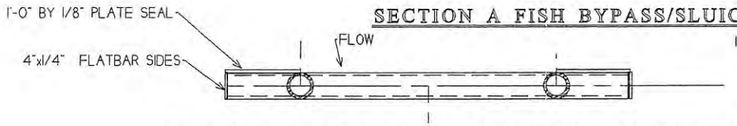
0 1 2 3 4

GRAPHIC SCALE IN FEET

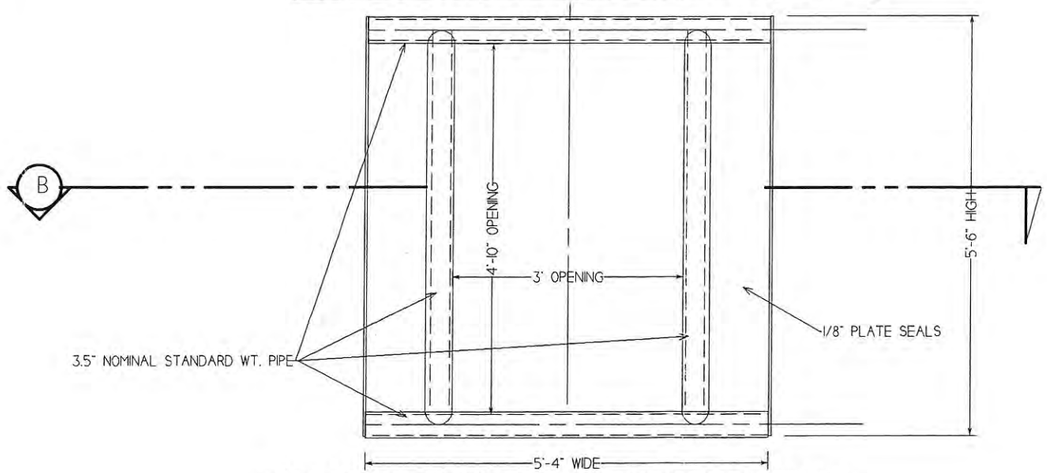


SECTION A FISH BYPASS/SLUICE AT YORK DAM

1/4" = 1'-0"



EXPANDED SECTION B THROUGH BYPASS INSERT



ELEVATION BYPASS INSERT LOOKING UPSTREAM
ONE REQUIRED 1/2" = 1'-0"

NOTES:
1. USE UNTREATED HEMLOCK WOOD FOR STOPLOGS.
2. TOTAL BYPASS FLOW 50 CFS.
3. WEIR INSERT TO BE MADE OF ALUMINUM OR STEEL

DRAFT PLOT DATE: MARCH 7, 2006

Date	Chkd.	Revision

Drawn by: _____ Date: _____
Designed by: _____ Date: _____
Checked by: _____ Date: _____
Scale: AS NOTED

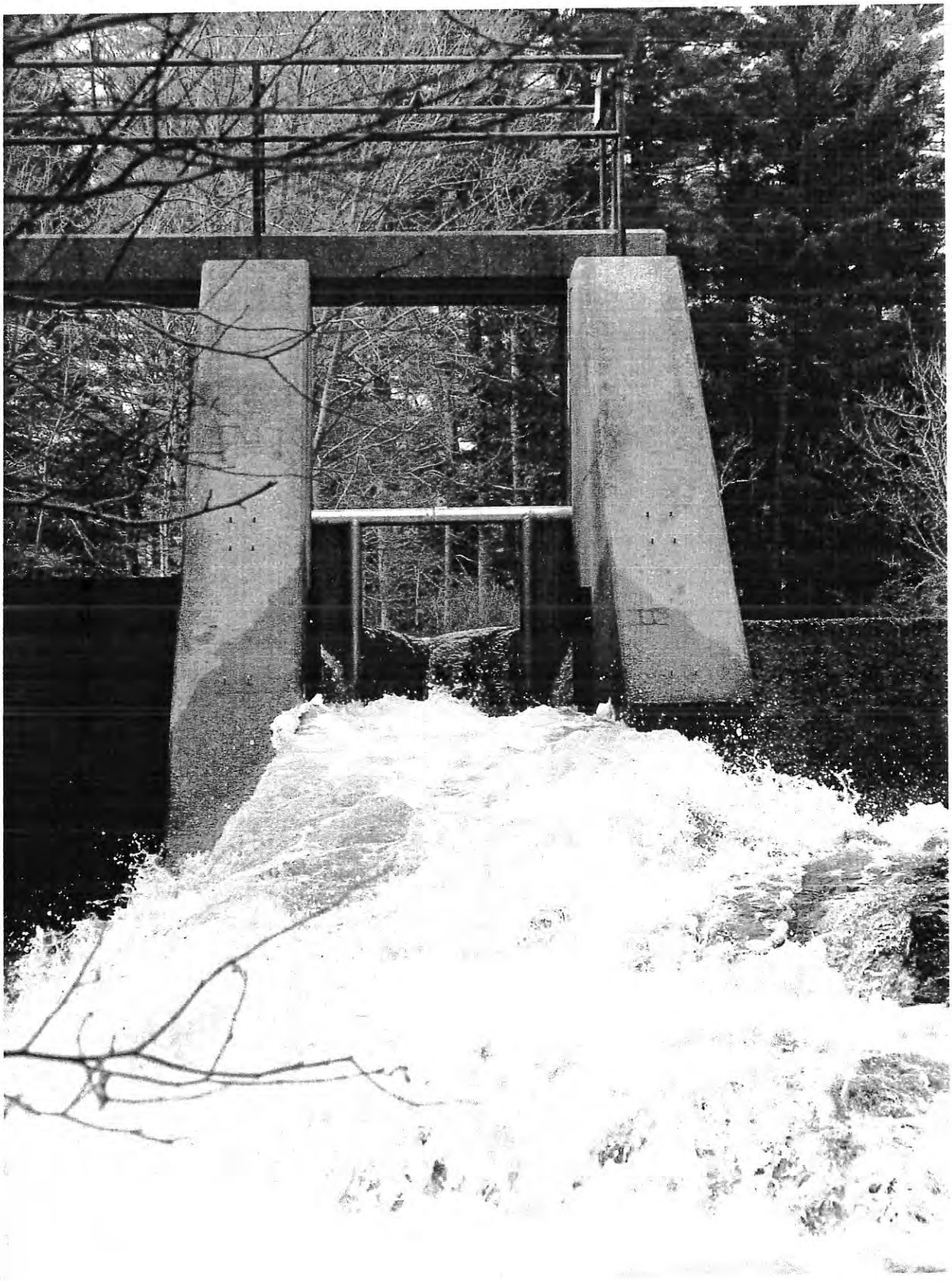
ROLFE CANAL HYDROELECTRIC
ESSEX HYDRO ASSOCIATES, L.L.C.
FERC NO. 3240-NH

PLAN AND SECTION OF YORK DAM
DOWNSTREAM FISH BYPASS

LAKESIDE ENGINEERING, INC.
MIRROR LAKE, NH

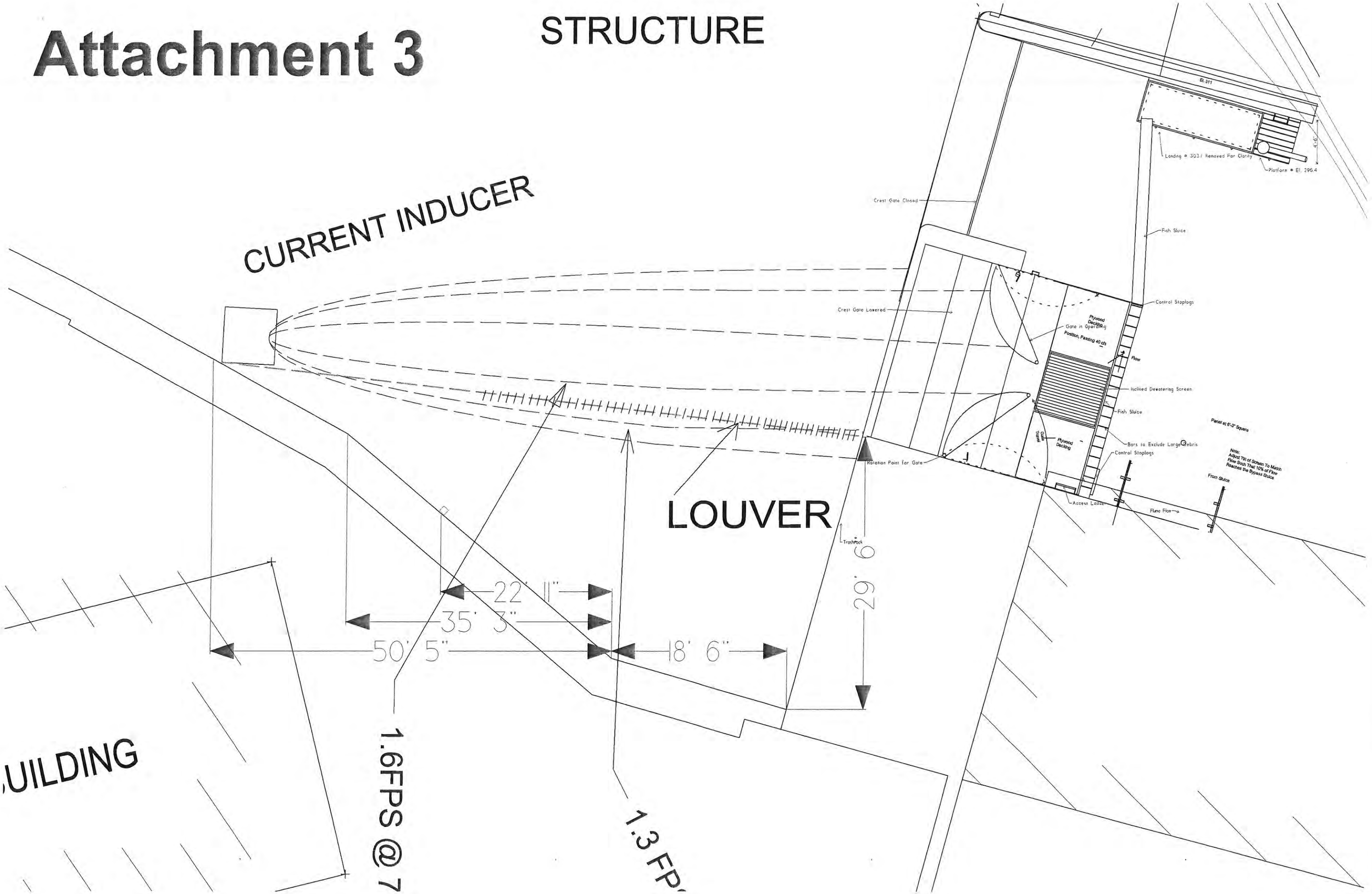
SHEET NO.
1 OF 1
000-000-000

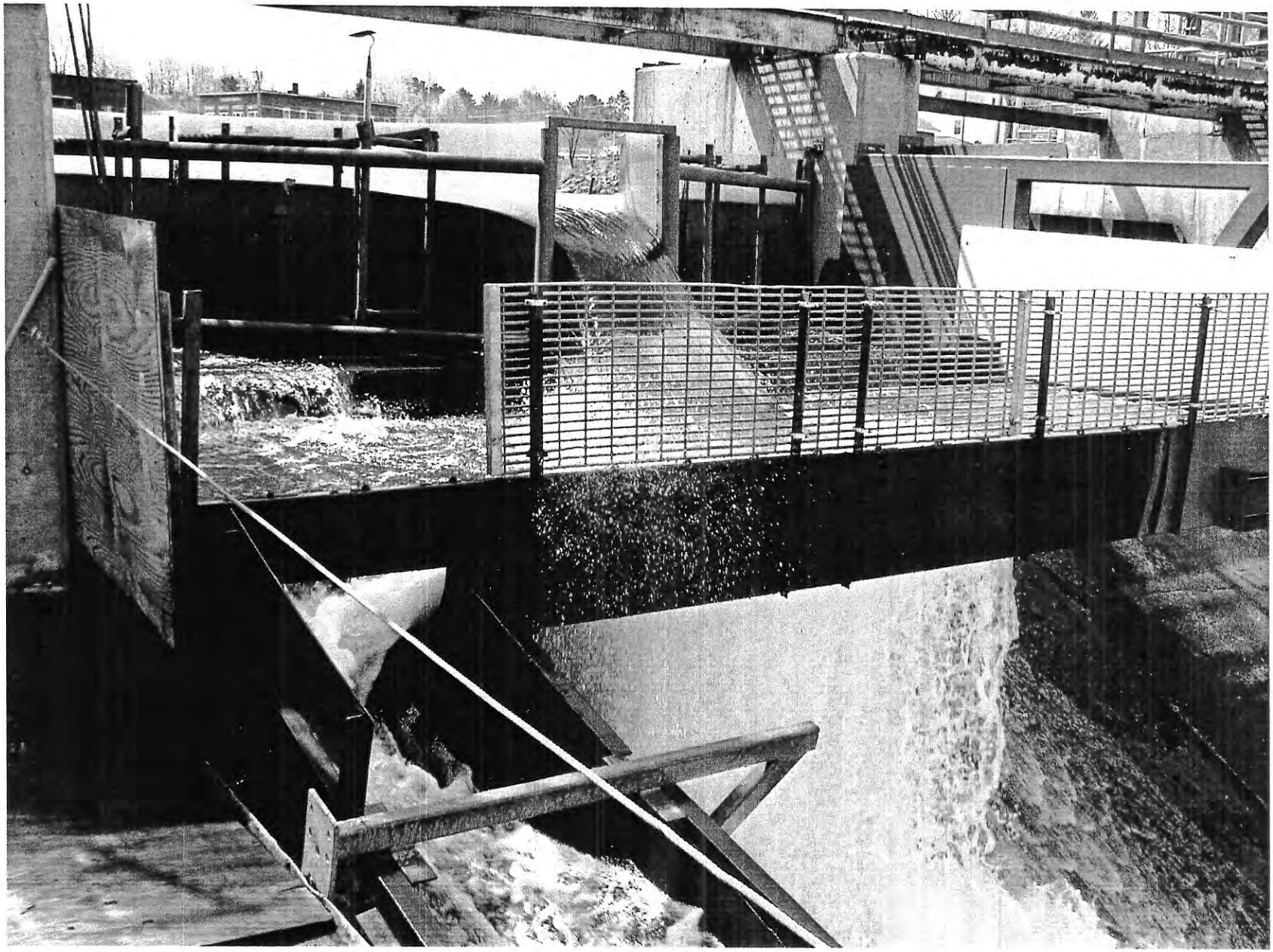
Attachment 1



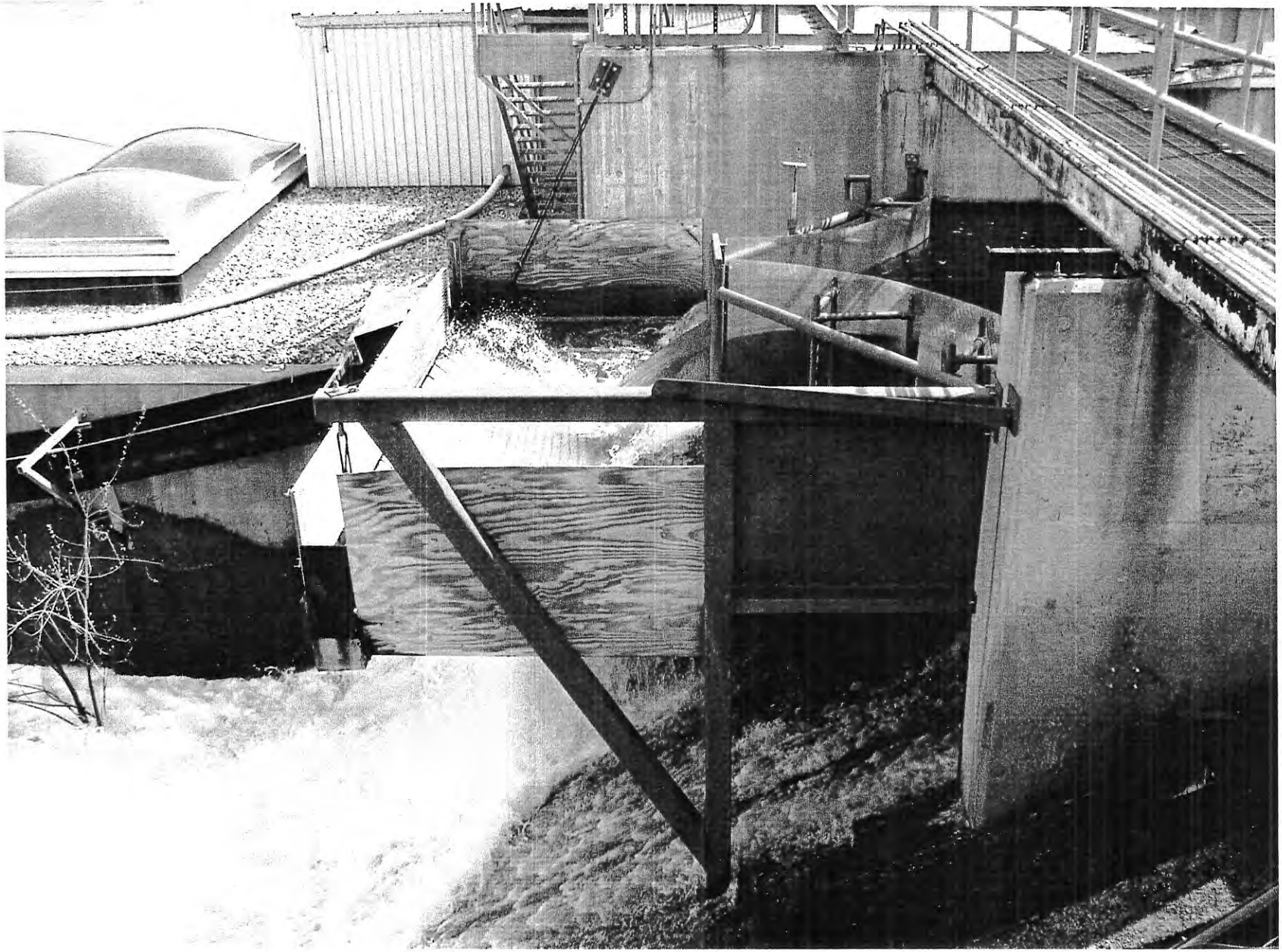
ATTACHMENT 2

Attachment 3

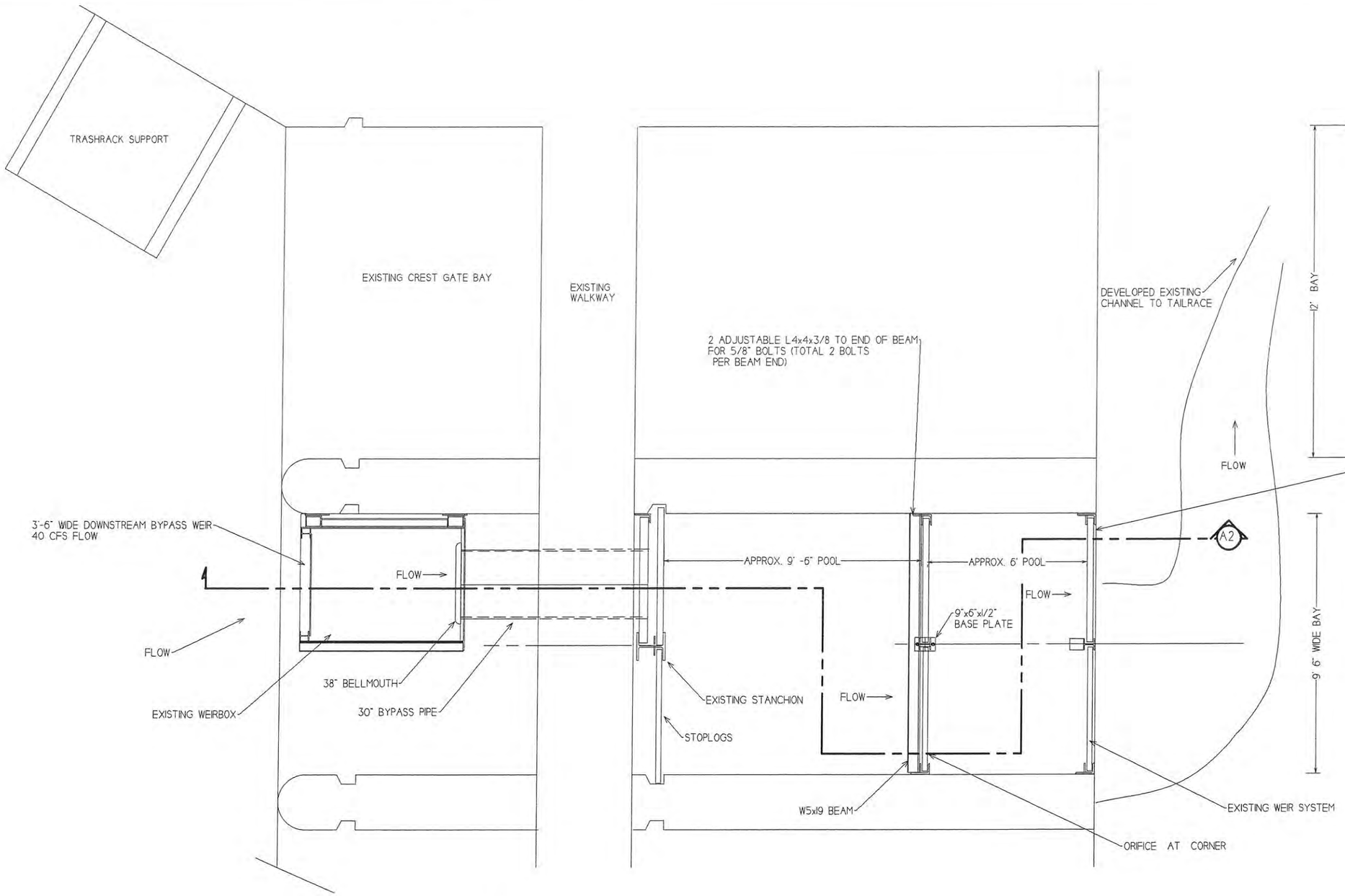




ATTACHMENT 4



ATTACHMENT 5



PLAN VIEW LOWER PENACOOK FISH BYPASS

1/4" = 1'-0"

0 1 2 3 4

GRAPHIC SCALE IN FEET

NOTES:
1. FLOW THROUGH DOWNSTREAM FISH BYPASS TO BE 40 CFS.

Attachment -6

DRAFT PLOT DATE: MARCH 7 2006

Date	Chkd.	Revision

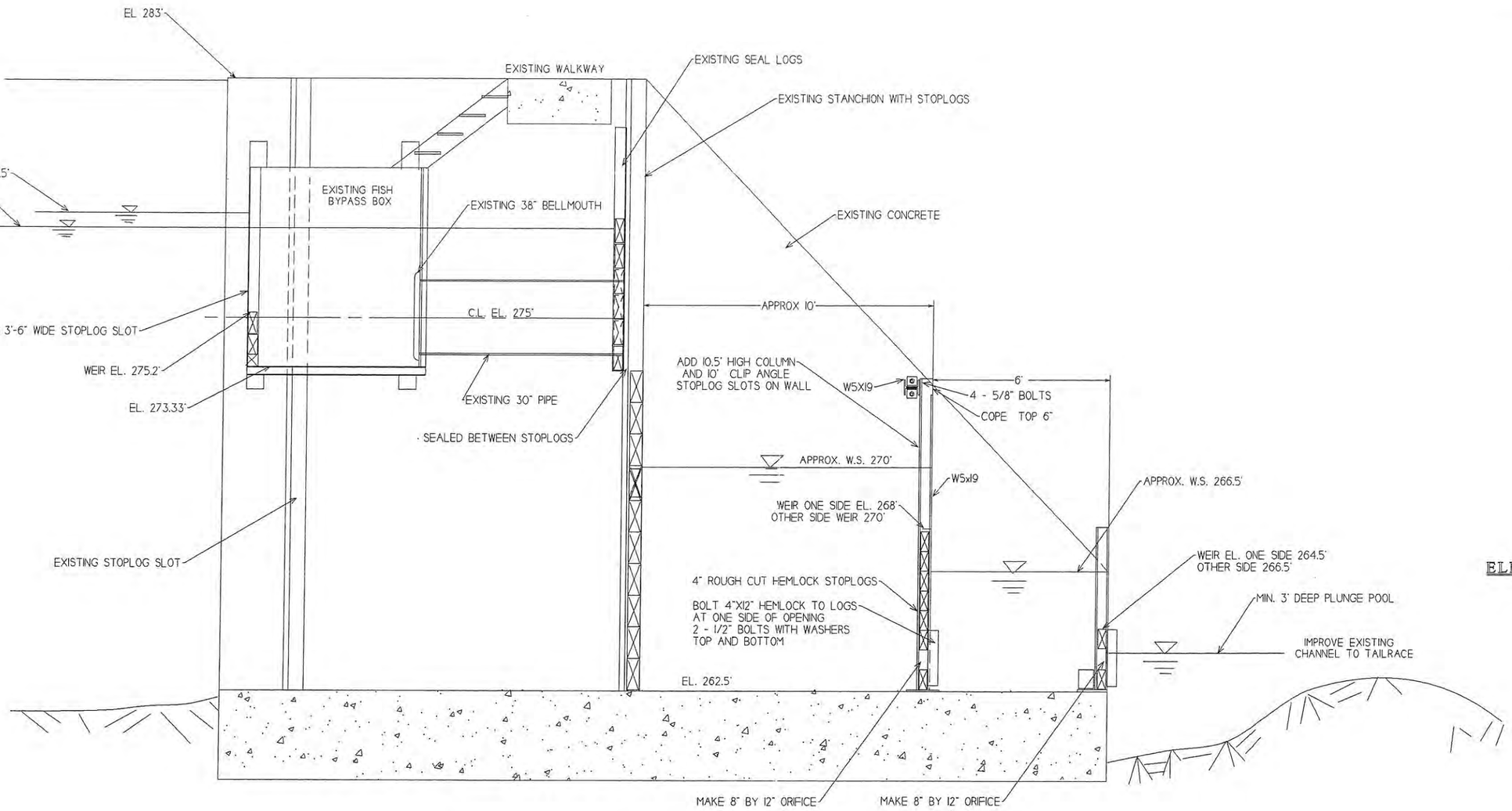
Drawn by: _____ Date: _____
Designed by: _____ Date: _____
Checked by: _____ Date: _____
Scale: AS NOTED

PENACOOK LOWER FALLS
ESSEX HYDRO ASSOCIATES, L.L.C.
FERC NO. 3342-NH

DOWNSTREAM FISH BYPASS
PLAN VIEW

LAKESIDE ENGINEERING, INC.
MIRROR LAKE, NH

SHEET NO.
1 OF 2
000-000-000

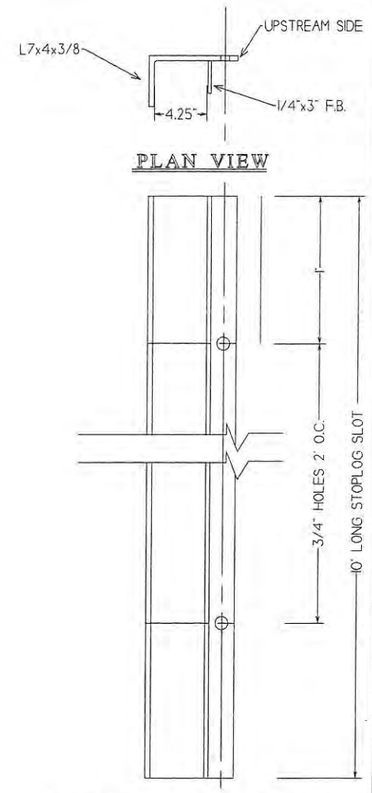


SECTION A-2 LOWER PENACOOK FISH BYPASS

1/4" = 1'-0"

0 1 2 3 4

GRAPHIC SCALE IN FEET



ELEVATION STOPLOG CLIPS
2 REQUIRED

1" = 1'-0"

NOTES:
1. USE UNTREATED WOOD.
2. ALL ANCHOR BOLTS TO BE 5/8" SS ADHESIVE ANCHORS
3. STEEL TO BE A36 OR HIGHER GRADE

Attachment - 7

DRAFT PLOT DATE: MARCH 7 , 2006

Date	Chkd.	Revision

Drawn by: _____ Date: _____
Designed by: _____ Date: _____
Checked by: _____ Date: _____
Scale: AS NOTED

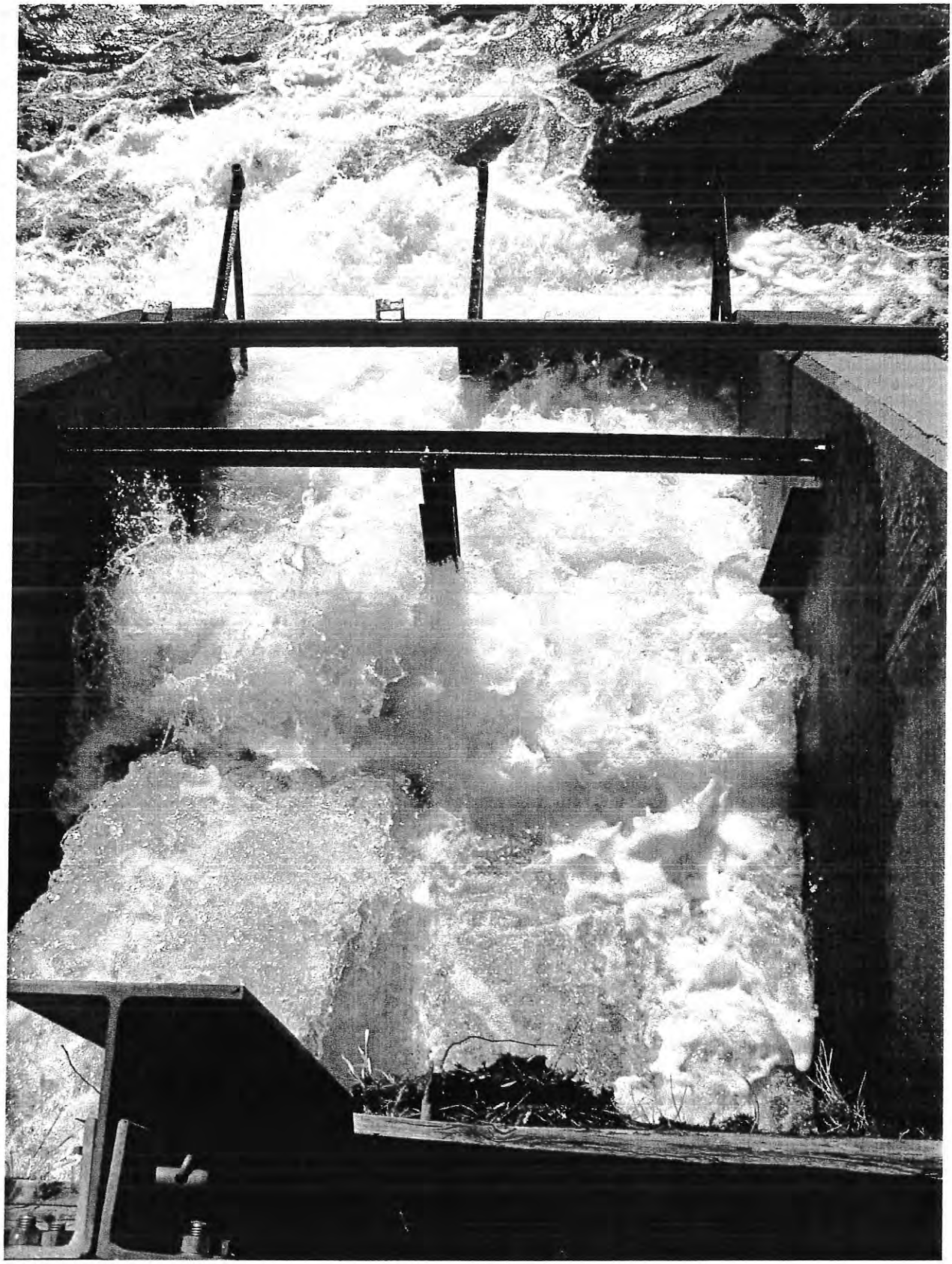
PENACOOK LOWER FALLS
ESSEX HYDRO ASSOCIATES, L.L.C.
FERC NO. 3342-NH

DOWNSTREAM FISH BYPASS
SECTION A-2

LAKESIDE ENGINEERING, INC.
MIRROR LAKE, NH

SHEET NO.
2 OF 2
000-000-000

ATTACHMENT 8



ATTACHMENT 9

ESSEX HYDRO

Dave Sherman <dsherman@essexhydro.com>

Downstream Fish Passage at Briar Hydro (Contoocook River)

Elise Anderson <eanderson@essexhydro.com> Tue, Apr 25, 2017 at 12:44 PM
To: "Warner, John" <john_warner@fws.gov>, "Rosset, Julianne" <julianne_rosset@fws.gov>
Cc: Dave Sherman <dsherman@essexhydro.com>

Hi John,

We wanted to get confirmation from you on something you mentioned to us when we met in person. We understood that you will not require downstream fish passage for smolts and herring at the Penacook Lower, Upper and Rolfe Canal projects (Briar Hydro). I think this was due to USFWS's suspension of fish stocking efforts in this waterway. Could you confirm via email to us that we are no longer required to operate downstream fish passage at these projects?

Thank you-

Elise Anderson

Environmental and Regulatory Analyst

Essex Hydro

55 Union Street, 4th Floor

Boston, MA 02108

Tel: (617) 367-0032

Fax: (617) 367-3796

Warner, John <john_warner@fws.gov> Thu, Apr 27, 2017 at 7:28 AM
To: Elise Anderson <eanderson@essexhydro.com>
Cc: "Rosset, Julianne" <julianne_rosset@fws.gov>, Dave Sherman <dsherman@essexhydro.com>

Elise - That is not 100% correct. It is correct that you no longer need to operate the DS passage devices for Atlantic salmon smolts in the spring. Regarding river herring (or shad for that matter) , stocking of the Contoocook can occur under current management plans and if so, operation of DS bypasses would be needed. I am copying Matt Carpenter who may be able to shed light on that program and prospects for ensuing years - JW

[Quoted text hidden]

--

John P. Warner
Assistant Supervisor, Migratory Fish/Hydropower
New England Field Office, U.S. Fish and Wildlife Service
70 Commercial Street, Suite 300
Concord, NH 0330-5087
phone: 603-223-2541, Ext. 6420
fax: 603-223-0104

Elise Anderson <eanderson@essexhydro.com> Thu, Apr 27, 2017 at 3:23 PM
To: "Warner, John" <john_warner@fws.gov>, "Carpenter, Matthew" <matthew.carpenter@wildlife.nh.gov>
Cc: "Rosset, Julianne" <julianne_rosset@fws.gov>, Dave Sherman <dsherman@essexhydro.com>

Thanks John.

I didn't see Ma copied, so I added him. Ma can you tell us the status of river herring management on the Contoocook and prospects for future years?

Thank you-

Elise Anderson

[Quoted text hidden]

Carpenter , Matthew <Matthew.Carpenter@wildlife.nh.gov> Fri, Apr 28, 2017 at 2:24 PM
To: Elise Anderson <eanderson@essexhydro.com>, "Warner, John" <john_warner@fws.gov>
Cc: "Rosset, Julianne" <julianne_rosset@fws.gov>, Dave Sherman <dsherman@essexhydro.com>

Hi Elise,

We do plan to stock river herring in the Contoocook River when fish are available. I will be able to let you know if we were able to stock adult river herring in the Contoocook River by early June. If we do stock adult river herring this spring, then downstream passage will need to be provided star ng in late summer.

Thanks,

Ma

[Quoted text hidden]

Elise Anderson <eanderson@essexhydro.com> Mon, Jul 24, 2017 at 10:15 AM
To: Dave Sherman <dsherman@essexhydro.com>

Just fyi, I wanted it documented we did not need downstream passage for herring this year for LIHI, FERC, etc.

From: Carpenter, Matthew [mailto:Matthew.Carpenter@wildlife.nh.gov]
Sent: Friday, July 21, 2017 11:28 AM
To: Elise Anderson
Subject: RE: Downstream Fish Passage at Briar Hydro (Contoocook River)

Hi Elise,

No, we did not get to it this year. The high flows limited our access to fish this spring.

Thanks,

List of resident fish species requested from New Hampshire Fish and Game on October 2, 2019. When the list is provided, it will be forwarded to LIHI.

New Hampshire Natural Heritage Bureau

DNCR - Division of Forests & Lands
172 Pembroke Road, Concord, NH 03301
Phone: (603) 271-2214 Fax: (603) 271-6488

To: Sheila Burge
Briar Hydro Associates
55 Union St.
Boston, MA 02108

From: NH Natural Heritage Bureau
Date: 2019-10-01
Re: Review by NH Natural Heritage Bureau of request dated 2019-09-24

NHB File ID: 3295 **Town:** Concord, NH
Project type: Landowner Request **Location:** MAP P1 Block 7 Lot 6

We have searched our database for records of rare species and exemplary natural communities on the property(s) identified in your request. Our database includes known records for species officially listed as Threatened or Endangered by either the state of New Hampshire or the federal government, as well as species and natural communities judged by experts to be at risk in New Hampshire but not yet formally listed.

NHB records on the property(s): **None**

NHB records within one mile of the property(s):

	Last Reported	Listing Status		Conservation Rank	
Invertebrate Species (For more information, contact Kim Tuttle, NH F&G at 271-6544)		**Federal**	**NH**	**Global**	**State**
Pygmy Snaketail *(Ophiogomphus howei)*	2011	--	--	G3	S2
Natural Community		**Federal**	**NH**	**Global**	**State**
Silver maple - false nettle - sensitive fern floodplain forest	2005	--	--		S2
Vertebrate species (For more information, contact Kim Tuttle, NH F&G at 271-6544)		**Federal**	**NH**	**Global**	**State**
Fowler's Toad *(Bufo fowleri)*	2012	--	SC	G5	S3
Northern Leopard Frog *(Rana pipiens)*	2011	--	SC	G5	S3
Bald Eagle *(Haliaeetus leucocephalus)*	2018	--	T	G5	S2
Vesper Sparrow *(Pooecetes gramineus)*	2018	--	SC	G5	S2B
Spotted Turtle *(Clemmys guttata)*	2013	--	T	G5	S2

NOTE: This review *cannot* be used to satisfy a permit or other regulatory requirement to check for rare species or habitats that could be affected by a proposed project, since it provides detailed information only for records actually on the property.

New Hampshire Natural Heritage Bureau

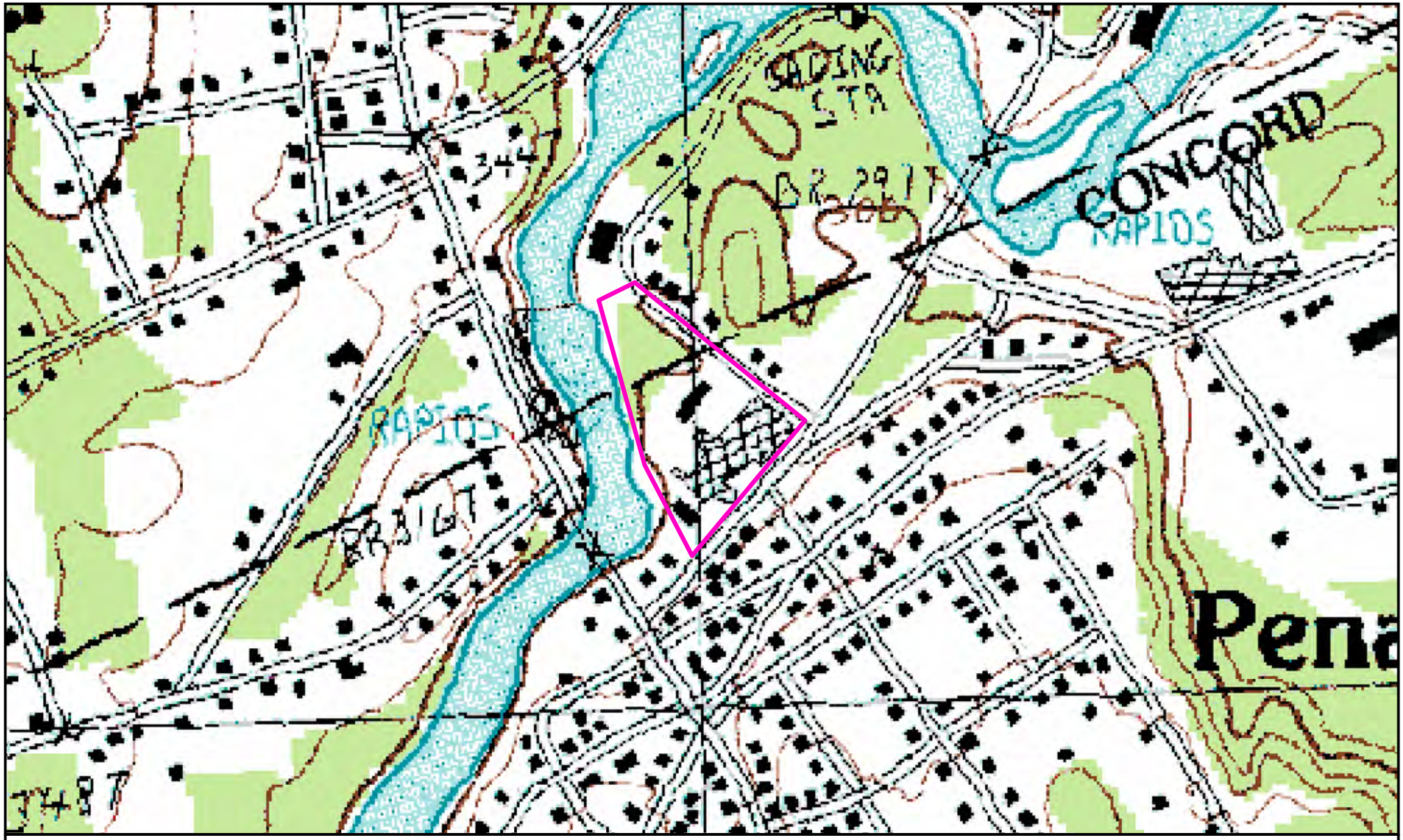
DNCR - Division of Forests & Lands
172 Pembroke Road, Concord, NH 03301
Phone: (603) 271-2214 Fax: (603) 271-6488

Wood Turtle *(Glyptemys insculpta)*	2013	--	SC	G4	S3

Listing codes: T = Threatened, E = Endangered SC = Special Concern
Rank prefix: G = Global, S = State, T = Global or state rank for a sub-species or variety (taxon)
Rank suffix: 1-5 = Most (1) to least (5) imperiled. "--", U, NR = Not ranked, B = Breeding population, N = Non-breeding. H = Historical, X = Extirpated.

A negative result (no record in our database) does not mean that no rare species are present. Our data can only tell you of known occurrences, based on information gathered by qualified biologists and reported to our office. However, many areas have never been surveyed, or have only been surveyed for certain species. An on-site survey would provide better information on what species and communities are indeed present.

NOTE: This review *cannot* be used to satisfy a permit or other regulatory requirement to check for rare species or habitats that could be affected by a proposed project, since it provides detailed information only for records actually on the property.



Natural Heritage Bureau Landowner Report

Project ID Number: 3295

NOTE: Any rare species and/or exemplary natural communities in this area are not shown unless they occur, at least in part, within the property bounds.

	# of Records
Property Bounds	
Plant Occurence:	*0*
Animal Occurence:	*0*
Natural Community:	*0*
Ecological System:	*0*

0 0.1 0.2 Mile

N W E S

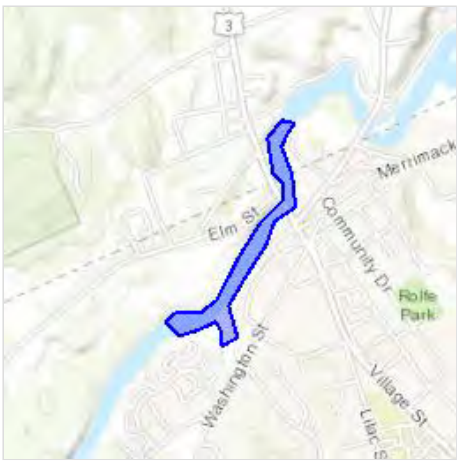
NEW HAMPSHIRE FORESTS & LANDS

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Location

Merrimack County, New Hampshire



Local office

New England Ecological Services Field Office

(603) 223-2541
(603) 223-0104

70 Commercial Street, Suite 300
Concord, NH 03301-5094

http://www.fws.gov/newengland

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle Haliaeetus leucocephalus — Breeds Dec 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1626

Black-billed Cuckoo Coccyzus erythropthalmus — Breeds May 15 to Oct 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9399

Bobolink Dolichonyx oryzivorus — Breeds May 20 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Canada Warbler Cardellina canadensis — Breeds May 20 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Cape May Warbler Setophaga tigrina — Breeds Jun 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Evening Grosbeak Coccothraustes vespertinus — Breeds May 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Olive-sided Flycatcher Contopus cooperi — Breeds May 20 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3914

Prairie Warbler Dendroica discolor — Breeds May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Rusty Blackbird Euphagus carolinus — Breeds May 10 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

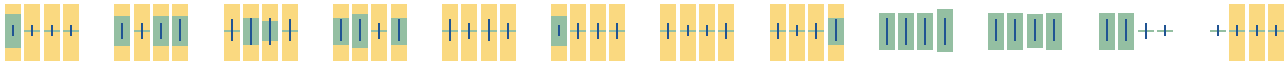
No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

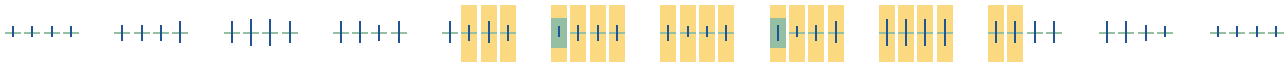
■ probability of presence ■ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

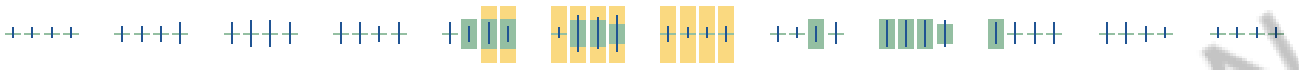
Bald Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



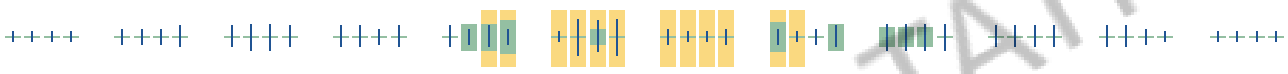
Black-billed Cuckoo
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Bobolink
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

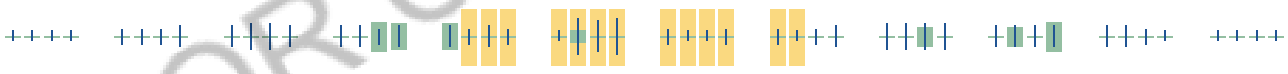


Canada Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

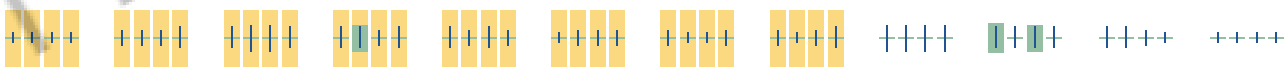


Cape May Warbler
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

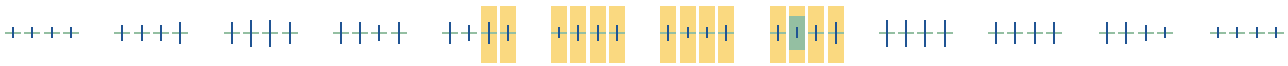
Evening Grosbeak
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



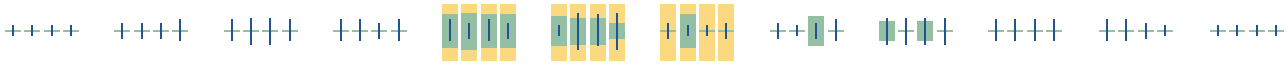
Golden Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)



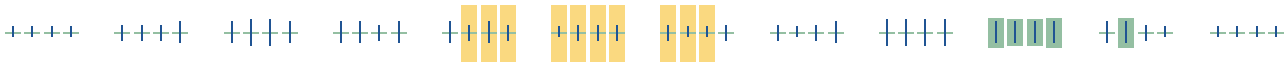
Olive-sided Flycatcher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



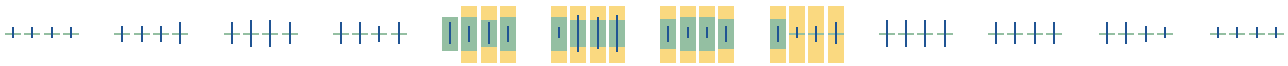
Prairie Warbler
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Rusty Blackbird
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Wood Thrush
BCC Rangewide (CON)
(This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER FORESTED/SHRUB WETLAND

PFO1C

LAKE

L1UBHh

RIVERINE

R3UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs øf

government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NEW HAMPSHIRE DEPARTMENT of RESOURCES and ECONOMIC DEVELOPMENT

GEORGE GILMAN
COMMISSIONER

TELEPHONE 603 271-2411

September 29, 1982

Mr. Thomas A. Tarpey
New Hampshire Hydro Associates
99 North State Street
Concord, N.H. 03301

Dear Mr. Tarpey:

The New Hampshire Department of Resources and Economic Development has no objection to the granting of a License for a Major Project (Less than five Megawatts) for the Penacook Upper Falls Hydroelectric Project (FREC # 3343) located on the Contoocook River in Penacook, a village in the town of Boscawan and the City of Concord, New Hampshire.

Based upon the environmental information provided in the license application dated September 9, 1982 and September 21, 1982 from New Hampshire Hydro Associates, it has been determined that the report has adequately addressed those areas of interest to this Department, as follows:

The proposed project will have no effect upon state park, state forest, or other properties that are the responsibility of the Department of Resources and Economic Development.

The proposed project will have no effect upon state or local parks or outdoor recreation projects or sites funded in part by the federal Land and Water Conservation Fund program.

The Contoocook River has been identified as a potential Recreational River in the June 1977 report Wild, Scenic and Recreational Rivers for New Hampshire prepared by the N.H. Office of State Planning.

The Historic Preservation Office has determined that the project will have no effect upon known architectural, historical, archeological or other cultural resources. Should such resources be discovered as a result of project planning or implementation, appropriate measures should be undertaken according to 36 CFR 800 and other appropriate federal laws and regulations that apply to historic and cultural resources.

Your incorporation of these comments into the license application will be appreciated.

Sincerely,

George Gilman, Commissioner
N.H. State Historic Preservation Officer

GG:gh

cc: Recreation Services (Quinn)
Division of Forest & Lands (Heath)
Historic Preservation Office (Hume)

P.O. BOX 856 . . . CONCORD, N.H. 03301

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