

# Brookfield

Renewable

August 31, 2020

Sawmill Project – FERC No. 2422  
Cross Project – FERC No. 2326  
Upper Gorham Project – FERC No. 2311  
Shelburne Project – FERC No. 2300

Ms. Shannon Ames, Executive Director  
Low Impact Hydropower Institute  
329 Massachusetts Avenue, Suite 2  
Lexington, MA 02420

**Subject: Low Impact Hydropower Institute Application for the Sawmill, Cross, Upper Gorham and Shelburne Projects.**

Dear Ms. Ames:

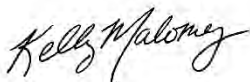
On behalf of the Licensee, Great Lakes Hydro America, LLC (GLHA), please find attached the revised Application for the Sawmill, Cross, Upper Gorham and Shelburne Projects on the Androscoggin River in New Hampshire. GLHA is requesting certification of the facilities for the Projects and submitted an Initial certification application to the Low Impact Hydropower Institute (LIHI) on April 20, 2020. LIHI completed the initial Intake Review on June 29, 2020.

The current application includes the following required submittals as revised in response to the LIHI Intake Review:

- Introduction
- LIHI Table B-1 Project Descriptions for each project
- List of hyperlinks to pertinent FERC and regulatory documents for the Projects
- Zones of Effect delineated into the Sawmill impoundment, Sawmill bypass reach, Sawmill tailrace; Cross impoundment, Cross bypass reach; Upper Gorham impoundment, Upper Gorham bypass reach, Upper Gorham tailrace; Shelburne impoundment, Shelburne bypass reach, Shelburne tailrace, and the Shelburne downstream regulated river reach of the Androscoggin River.
- Matrix of Alternative Standards for each Zone of Effect identified evaluating the LIHI certification standards for each requisite criterion including water quality, fish passage and recreation
- Sworn Statement and Waiver Form
- Facility Contacts Form including pertinent NGOs, as appropriate.

Please call me at (207) 755-5606 or email me at [Kelly.Maloney@brookfieldrenewable.com](mailto:Kelly.Maloney@brookfieldrenewable.com) if you have any questions or need additional information regarding this submittal.

Sincerely,



Kelly Maloney  
Manager, Compliance - Northeast

Cc: P. McDonough, N. Stevens, S. Michaud, S. Gregg, J. Seyfried, K. Murphy, A. Frechette

**LOW IMPACT HYDROPOWER INSTITUTE**  
**CERTIFICATION APPLICATION FOR THE**  
**SAWMILL PROJECT (FERC No. 2422)**  
**CROSS PROJECT (FERC No. 2326)**  
**UPPER GORHAM PROJECT (FERC No. 2311)**  
**SHELBURNE PROJECT (FERC No. 2300)**

**Brookfield**

04/17/2020

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**SHELBURNE PROJECT (FERC No. 2300)**

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**Low Impact Hydropower Institute**  
**Certification Application for the**  
**Sawmill Project (FERC No. 2422)**  
**Cross Project (FERC No. 2326)**  
**Upper Gorham Project (FERC No. 2311)**  
**Shelburne Project (FERC No. 2300)**

**1.0 PROJECT DESCRIPTIONS**

**1.1 PROJECT FACILITIES AND HISTORY**

The four Projects for which this application is submitted are licensed to Great Lakes Hydro America, LLC (GLHA NH) and are in northern New Hampshire, Coos County and along an 11-mile reach of the Androscoggin River that stretches from the City of Berlin, south to the Town of Shelburne (Figure 1-5).

**1.1.1 SAWMILL PROJECT**

The Sawmill Project dam extends approximately 720 feet, 332 feet west from the east riverbank, and approximately 388-feet-along an old island to the project powerhouse. The dam has four sections: (1) a wastegate section, (2) non-overflow sections (3) a flashboard section, and (4) an integral powerhouse. On the east riverbank is a 4-foot-wide concrete retaining wall which extends approximately 80 feet downstream to the leading edge of a mill building. The wall retains the riverbank and separates the bypass from the canal that supplies process water to a paper mill. The canal extends approximately 360 feet to a steel penstock that carries water to the mills. A concrete section of the dam with a crest elevation of 1,094 feet extends 169 feet west from the river bank (Section A). Adjacent to this section is the wastegate portion of the dam. The wastegate section extends 134 feet further west and consists of 5 wooden gates that are 22-feet-high (Section C). A 99.4-foot-long spillway section of the dam extends to the flashboard section of the dam (Section D). The steel flashboard section extends 145-feet-long and 11-foot-high in a southwesterly direction from the spillway section (Section E). This connects to a 36-foot-long spillway section (Section D1). A 137-foot-long hinged flashboard section connects then connects to the powerhouse (Section F). On the west riverbank, a 4-foot-wide retaining wall extends approximately 55 feet upstream from the edge of the powerhouse.

The powerhouse is a 115-foot by 65-foot by 27-foot brick and block structure built on steel framing, that is integral to the dam and the headworks. It contains four horizontal shaft synchronous generators that are connected to the turbines through speed increasers. All four generators are identical and have a nameplate rating of 888 kilovolt amps (kVA). The actual installed capability of the four generators is 3,174 kilowatts (kW) when accounting for the turbine ratings. There are four tube type, horizontal shaft turbines at the Sawmill Project, having a combined capacity of 2,750 cfs. Units 1 and 3 are Allis-Chalmers fixed blade propeller units having a capacity of 590 cfs and a rating of 1,083 horsepower (hp). Units 2 and 4 are adjustable blade propeller units with a hydraulic capacity of 652 cfs and a rating of 1,177 hp.



The Sawmill Project substation is approximately 25 feet to the west of the powerhouse in an enclosed area. The project transmission lines extend from the substation to the Burgess Mill with approximately 1,800 feet of transmission lines.



**PHOTO 1-1** VIEW OF THE SAWMILL PROJECT DAM, WASTEGATES, SPILLWAY, AND BYPASSED REACH.



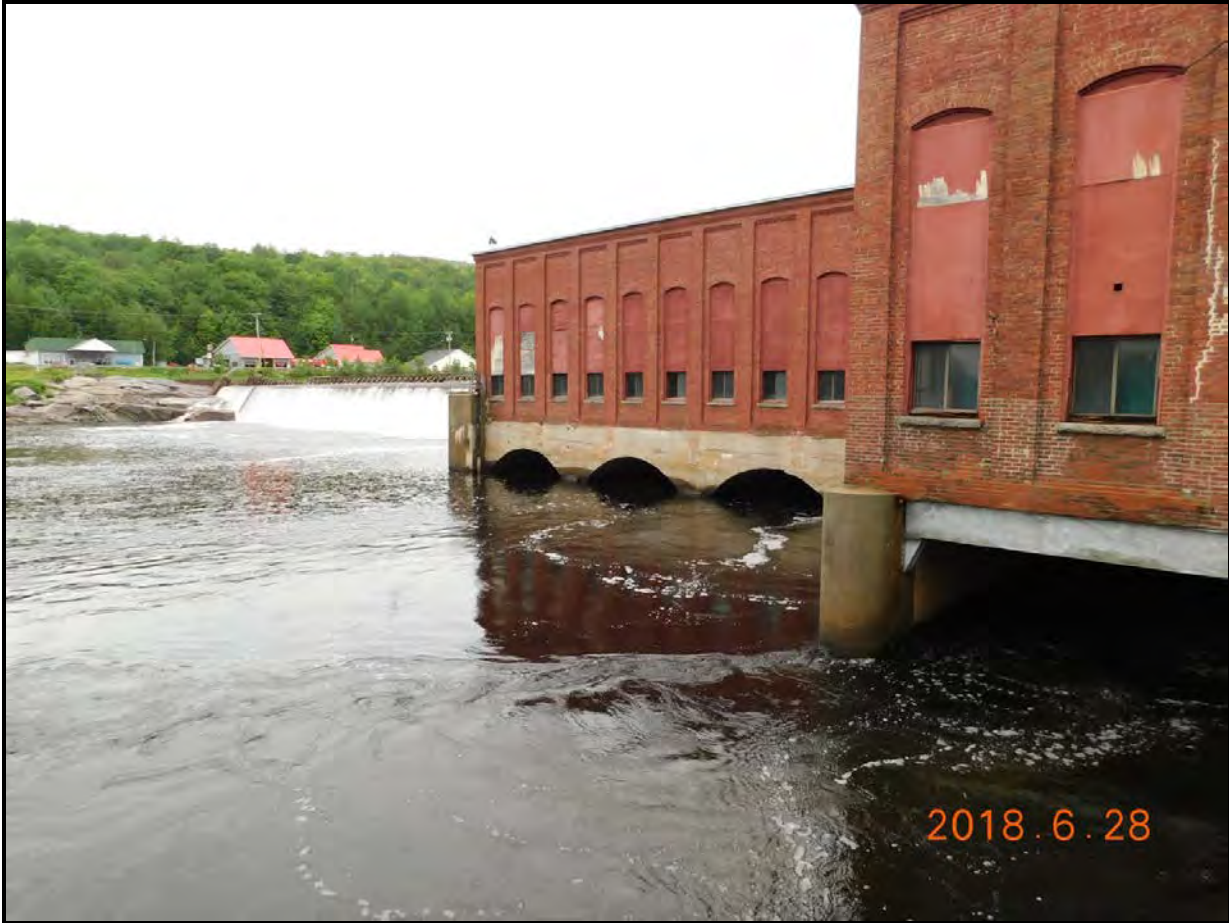
**PHOTO 1-2 VIEW OF THE SAWMILL PROJECT GATEHOUSE AND POWERHOUSE.**

**1.1.2 CROSS PROJECT**

The Cross Power Project dam consists of a 566-foot-long structure that crosses the river in a generally east-west direction. The western section of the dam consists of two concrete non-overflow sections separated by an outcropping ledge. On the eastern edge of the non-overflow section there is a stoplog opening used to pass accumulated debris from the bend of the dam. The concrete gravity section is located between the northeast side of the ledge and the spillway section. The spillway section extends approximately 276 feet across the river in an easterly direction. The spillway has a crest elevation of 918.2 feet to 921.7 feet topped with 42-inch-high flashboards<sup>1</sup>. A concrete retaining wall is located on the eastern end of the gatehouse and extends to the eastern embankment. The gatehouse is 19-feet-wide by 124-feet-long on east (river left) shore, with trashracks 21.6-feet-wide by 18.4-feet-high with 3-inch clear spacing per bay.

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<sup>1</sup> FERC approved the design for new self-failing flashboards on August 22, 2018. GLHA anticipates that the new flashboards will be installed and operational by 2020.



**PHOTO 1-3** VIEW OF THE CROSS POWER PROJECT SPILLWAY, POWERHOUSE, AND TAILRACE.





**PHOTO 1-4 VIEW OF THE CROSS POWER PROJECT GATEHOUSE.**

The powerhouse is located on the eastern bank of the Androscoggin River, approximately 44 feet downstream of the gatehouse. The powerhouse is a concrete substructure with brick superstructure that measures approximately 47-feet by 146-feet, with an addition on the downstream shore side that measures approximately 50-feet by 47-feet. The powerhouse contains five hydroelectric generating units, with a hydraulic capacity of 2,890 cfs. The current FERC license describes the Cross Power Project as having a 3,750 kVA 22,000/11,000V auto transformer and 20-foot transmission line located adjacent to the eastern side of the powerhouse.



**PHOTO 1-5 VIEW INSIDE THE CROSS POWER PROJECT POWERHOUSE.**

### **1.1.3 UPPER GORHAM DAM**

The Upper Gorham dam is a timber crib and earthen structure with an integral canal gatehouse that is situated in a generally east-west direction. The dam is approximately 775-feet-long, with (1) a west earthen dike, 133-feet-long, having a concrete core wall, with a crest elevation of 820.0 feet (U.S. Geological Survey [USGS]), (2) a 300-foot-long by 18-foot-high rock-filled timber-crib spillway section, with a crest elevation of 807.3 feet (USGS), topped with 5-foot-high flashboards, (3) a 122-foot -long power canal headgate section (topped with a gatehouse 113-feet-long by 16-feet-wide), with a sill elevation of 795.0 feet (USGS), having eight operable and two inoperable stoplog gates, each approximately 7.5-feet-wide, and (4) an east earthen dike, 220-feet-long, having a concrete core wall, with a crest elevation of 820.0 feet (USGS). The Upper Gorham Project has a 3,350-foot-long, 100-foot-wide, and 18-foot-deep power canal.



**PHOTO 1-6**      **VIEW OF UPPER GORHAM DAM AND MINIMUM FLOW STRUCTURE.**





**PHOTO 1-7 VIEW OF UPPER GORHAM PROJECT POWER CANAL AND ENTRANCE TO MINIMUM FLOW STRUCTURE.**

The brick and steel powerhouse are approximately 26-feet-high by 74-feet-wide by 127-feet-long, with four horizontal shaft Francis turbines, each with a rated capacity of 1,200 kW, a hydraulic capacity of 2,200 cfs, and a design head of 29 feet. The current FERC license describes the Upper Gorham Project as having a 22-kV, 50-foot-long primary transmission line.



**PHOTO 1-8 VIEW OF UPPER GORHAM PROJECT POWERHOUSE AND TAILWATER.**

#### **1.1.4 SHELBURNE DAM**

The project dam is 551-feet-long, consisting of retaining walls at the north shore, a 171-foot-long gated spillway section, a sluiceway and non-overflow structure extending to an island located midstream, an integral powerhouse extending to the south river bank, and 259 feet of dikes along the south shore of the impoundment. The permanent crest of the dam is a concrete structure approximately at El. 724 feet. A 3-foot-wide retaining wall runs along the north river bank perpendicular to the main spillway, extending approximately 70 feet. The main spillway extends south from the retaining wall for approximately 171 feet and is composed of an approximately 83-foot flashboard section and an 88-foot wastegate structure. The flashboards are approximately 9-feet-high. The wastegate structure houses three 25-foot-long waste gates. Adjacent to the wastegate structure is a 27-foot-wide sluiceway, controlled by a 19-foot-wide screw stem operated sluice gate. A 17-foot-long by 14-foot-wide building houses the gate controllers and is located on the island adjacent to the south sluiceway wall. Between the sluiceway and the north powerhouse wall is a 95-foot-long concrete retaining wall. The upstream face of the powerhouse is flush with the upstream face of the dam at the south end of the island. The powerhouse extends approximately 150 feet across the south channel of the river to the south riverbank. An emergency spillway channel was excavated along the south bank to protect the powerhouse from high flows.





**PHOTO 1-9** UPSTREAM VIEW OF SHELBURNE PROJECT ENTRANCE TO SLUICWAY, WASTEGATES, AND SPILLWAY.



**PHOTO 1-10 DOWNSTREAM VIEW OF SHELburne PROJECT SLUICEWAY, WASTEGATES, AND SPILLWAY**

**NOT NORMAL OPERATIONS, PHOTO SHOWS ALL GATES OPEN**

The powerhouse consists of brick and steel construction on top of nine concrete piers, each approximately 4-feet-wide. The powerhouse is approximately 112-feet-long by 48.6-feet-wide. The powerhouse is integral with the dam and spans the southern channel of the river from the island located mid-stream to the south bank. The powerhouse contains three turbines and three generators. Units 1 and 2 are vertical Francis turbines each with an 800 cfs hydraulic capacity. Unit 3 is a vertical Kaplan turbine with a hydraulic capacity of 1,800 cfs and rated for 1,800 kW. The existing FERC license describes a 22-kV 5.5-mile-long transmission line as a project facility; however, project boundary maps on file with FERC denote the majority of the transmission line to be a non-project feature. GLHA believes that the 5.5-mile line is not considered a primary line transmitting power from the Shelburne Project, because the line is also used by other generating facilities as well as an operational mill.





**PHOTO 1-11 VIEW OF SHELBURNE PROJECT POWERHOUSE AND HEADPOND.**

The Projects are operated as run of the river facilities with agency required minimum flows. There are no diadromous fish species in the upper Androscoggin River, therefore, fish passage facilities are not necessary nor have been requested or prescribed. Lands within the project boundaries are limited to those required for project operations and structures and project recreation facilities. The Projects have a FERC approved Recreation Plan in place. There are no documented endangered or threatened aquatic species in this reach of the Androscoggin River.



FIGURE 1-1. SAWMILL PROJECT FACILITIES

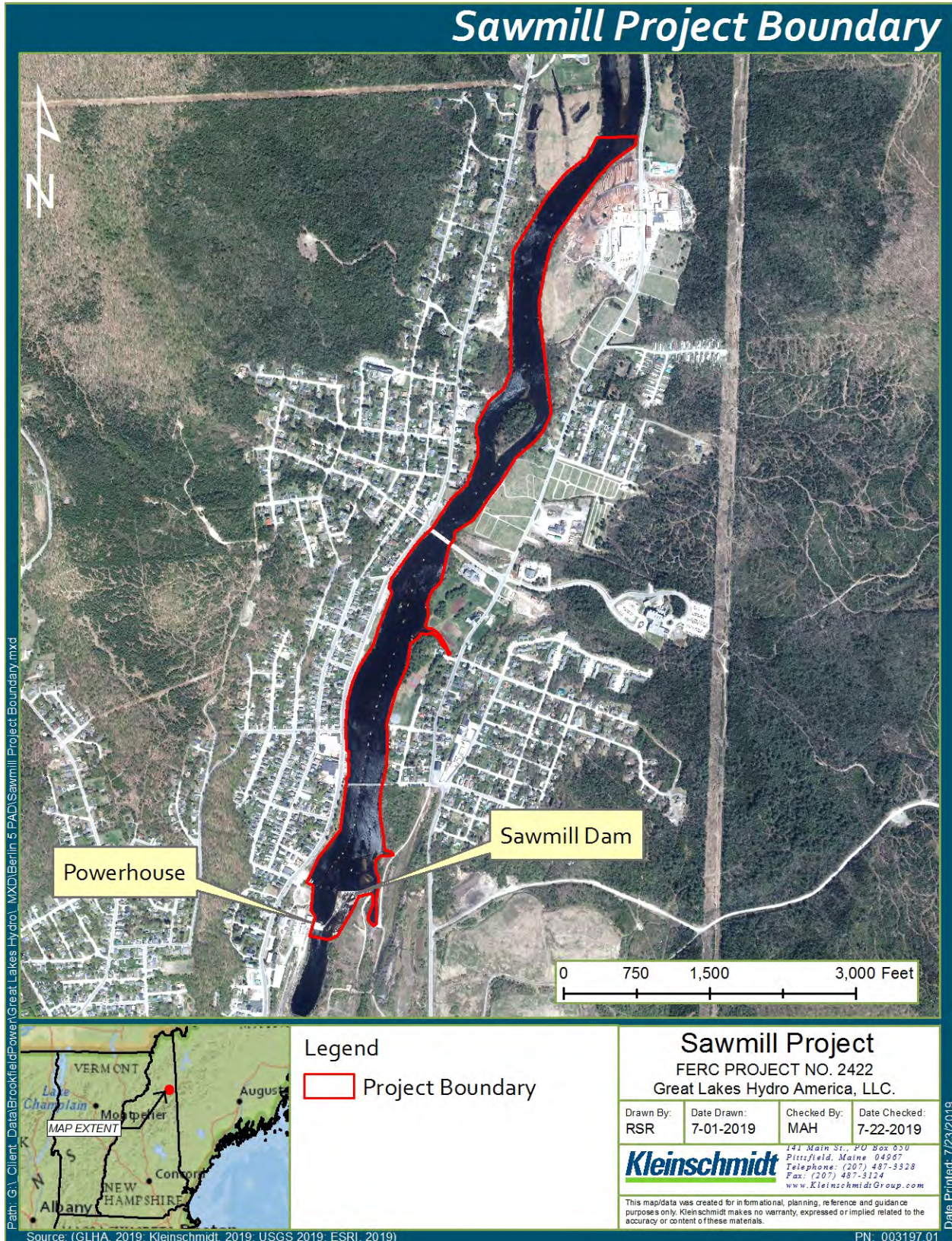




FIGURE 1-2. CROSS PROJECT FACILITIES

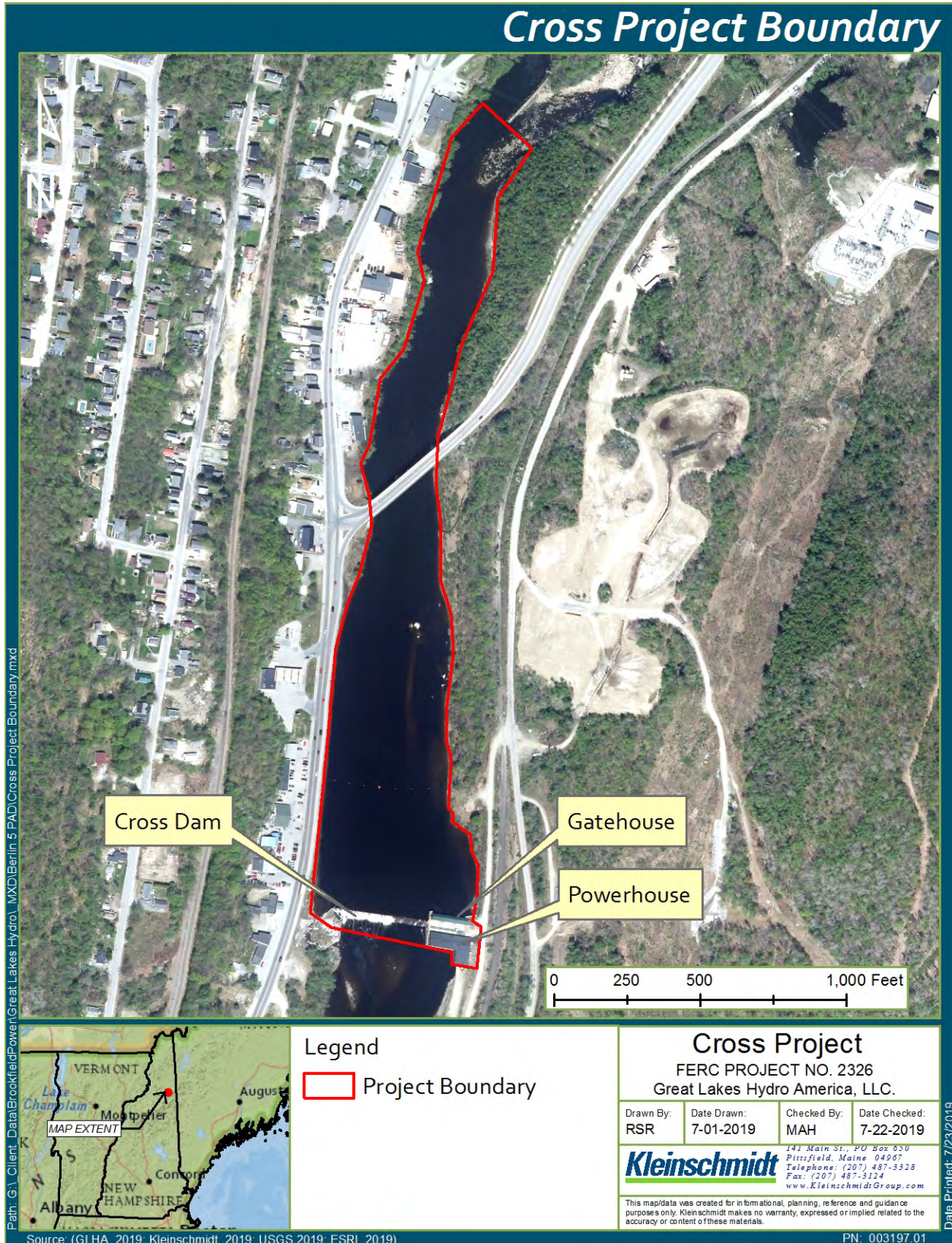




FIGURE 1-3. UPPER GORHAM PROJECT FACILITIES

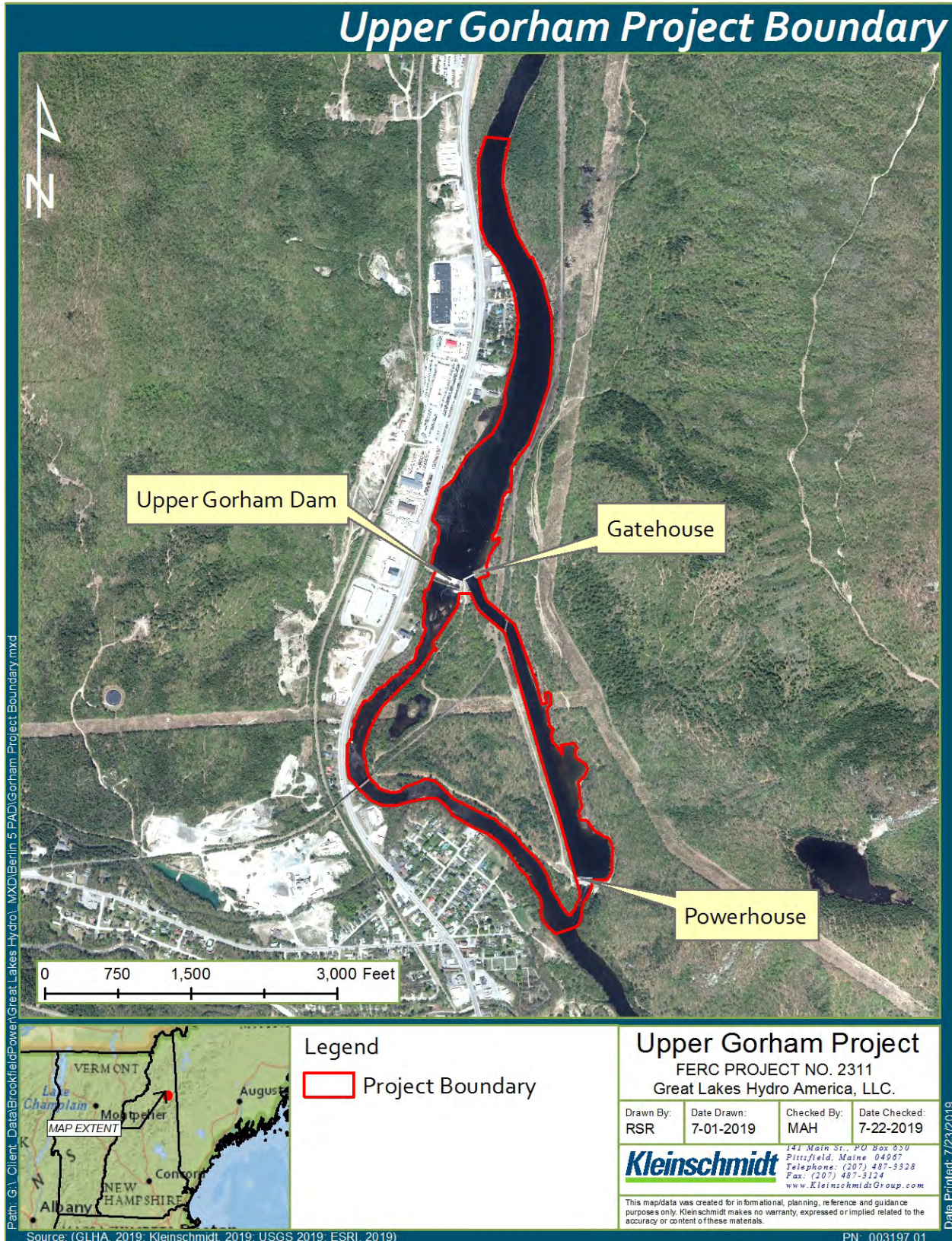
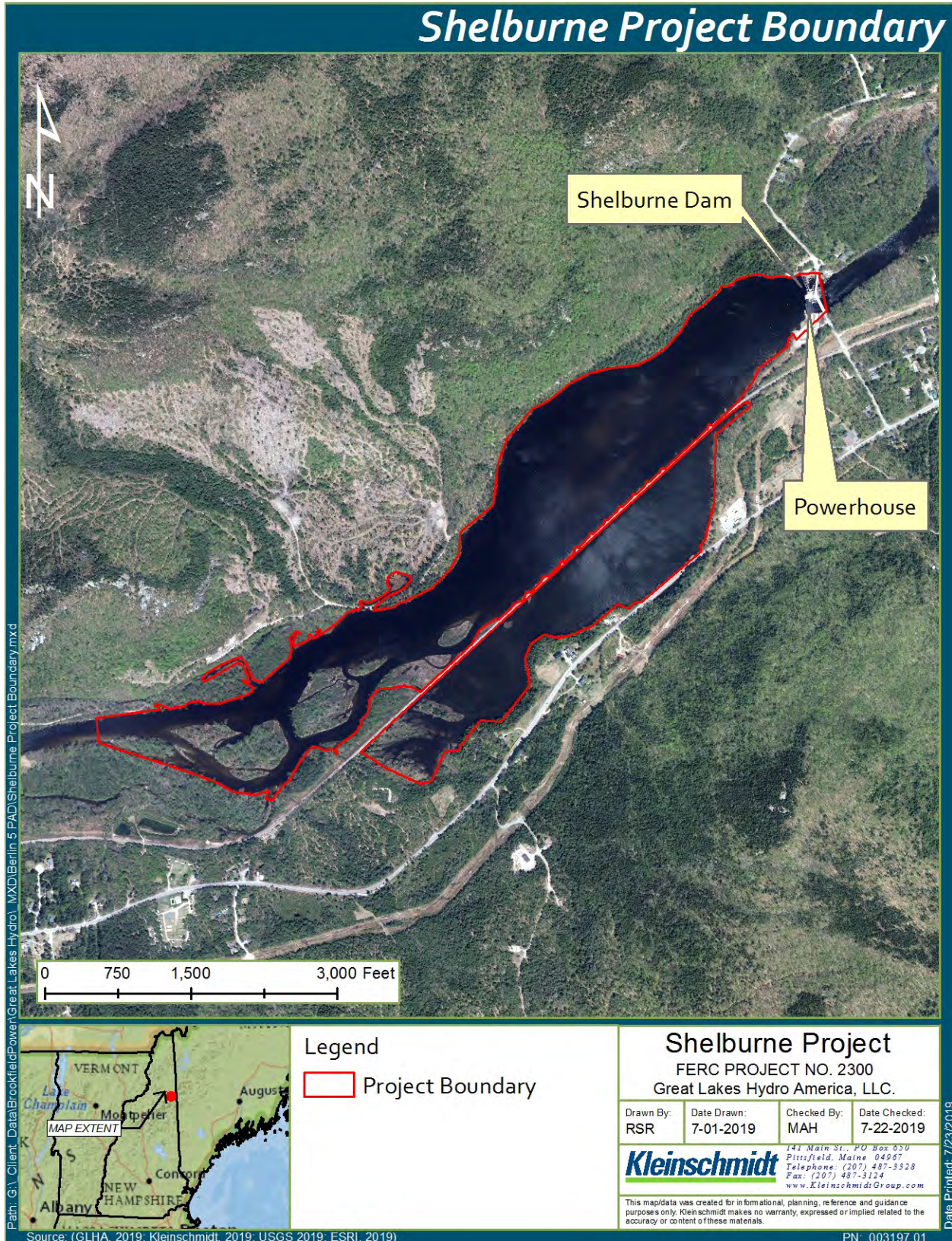




FIGURE 1-4. SHELburnE PROJECT FACILITIES



## **1.2 PROJECT OPERATIONS**

Inflow to the GLHA NH Projects is regulated by five large storage reservoirs at the headwaters of the Androscoggin River system: Lake Umbagog, Rangeley Lake, Mooselookmeguntic Lake, Richardson Lakes (Upper and Lower), and Aziscohos Lake (Figure 1-5). The Errol Hydroelectric Project (FERC No. 3133) impounds Lake Umbagog and serves as the release point for the upper storage reservoir system.

The Errol Project is operated in accordance with the terms of a 1909 agreement between Union Water Power Company (UWPC) and downstream paper and power companies (1909 Agreement). The 1909 Agreement requires Errol, in combination with the other upstream reservoirs, to target providing at least 1,550 cfs for downstream Berlin while storage is available. The 1909 Agreement was refreshed by the 1983 Androscoggin River Headwaters Agreement (Headwaters Agreement). The primary purpose of the Headwaters Agreement is to ensure that the 1909 Agreement is met and to require hydroelectric generators who benefit from the flow regulation to reimburse the water storage reservoir owner's annual operations and maintenance costs.

The available river flow for downstream energy production is determined through close coordination of the upstream storage reservoirs and GLHA dispatchers.

### **1.2.1 SAWMILL PROJECT**

The Sawmill Project operates as a run-of-river facility to maintain the headpond as close to the normal surface elevation of elevation 1094.5 feet as possible through operation of the units and wastegates. GLHA provides a minimum flow into the approximately 550-foot-long bypassed reach of 12 cfs or inflow, whichever is less, through a notch in the dam crest plus leakage (see Section 7.0).

### **1.2.2 CROSS PROJECT**

The Cross Power Project operates as a run-of-river facility to maintain the headpond near the normal surface elevation of 921.7 feet. When river flows exceed the station capacity, the excess flows are passed over the dam (see Section 7.0).

### **1.2.3 UPPER GORHAM PROJECT**

The Gorham Project operates as a run-of-river facility to maintain the normal headpond elevation of 812.3 feet. GLHA provides a minimum flow into the approximately 1-mile-long bypassed reach of 400 cfs from March 1 to June 15, and 200 cfs from June 16 to February 28, or inflow to the project reservoir, whichever is less, through a minimum flow structure on the right (west side) of the power canal (see Section 7.0).

### **1.2.4 SHELBURNE PROJECT**

The Shelburne Project operates as a run-of-river facility to maintain the normal headpond elevation of 734.2 feet through operation of the units or wastegates. GLHA operates the Shelburne Project to release a minimum flow equal to that of existing leakage flow, estimated at no more than 2 cfs or inflow to the project reservoir, whichever is less (see Section 7.0).



### 1.3 PROJECT LOCATION

The four Projects for which this application is submitted are licensed to Great Lakes Hydro America, LLC (GLHA NH) and are in northern New Hampshire, Coos County and along an 11-mile reach of the Androscoggin River that stretches from the City of Berlin, south to the Town of Shelburne (Figure 1-5).

The Sawmill Project is located at approximate river mile (RM) 138.2 on the Androscoggin River and is the most upstream Project of the four hydroelectric projects. It is approximately 0.4 miles upstream of GLHA's Riverside Project (FERC No. 2423).

The Cross Power Project is located at approximate RM 136.1 on the Androscoggin River, 2.1 miles downstream of Sawmill, and below the J. Brodie Smith Project (FERC No. 2287), licensed to Central Rivers Power (CRP).

The Upper Gorham Project is located within the town of Gorham, at approximate RM 132.6 on the Androscoggin River, 3.5 miles downstream of Cross and above CRP's Gorham Project (FERC No. 2288).

The Shelburne Project is located within the town of Shelburne, at approximate RM 128.4 on the Androscoggin River, 4.2 miles downstream of Upper Gorham and below CRP's Gorham Project. The Shelburne Project is the most downstream development of four hydroelectric projects within the 11-mile reach of the Androscoggin River near Berlin, New Hampshire.

The Androscoggin River begins in northwestern Maine at Umbagog Lake, journeys through New Hampshire, then re-enters Maine near Bethel, eventually joining the Kennebec at Merrymeeting Bay. The Androscoggin River has over a 1,200-foot drop from its headwaters to the sea, with an average descent of 8-feet per mile. The swift flowing, large volume river provides an excellent power source<sup>2</sup>.

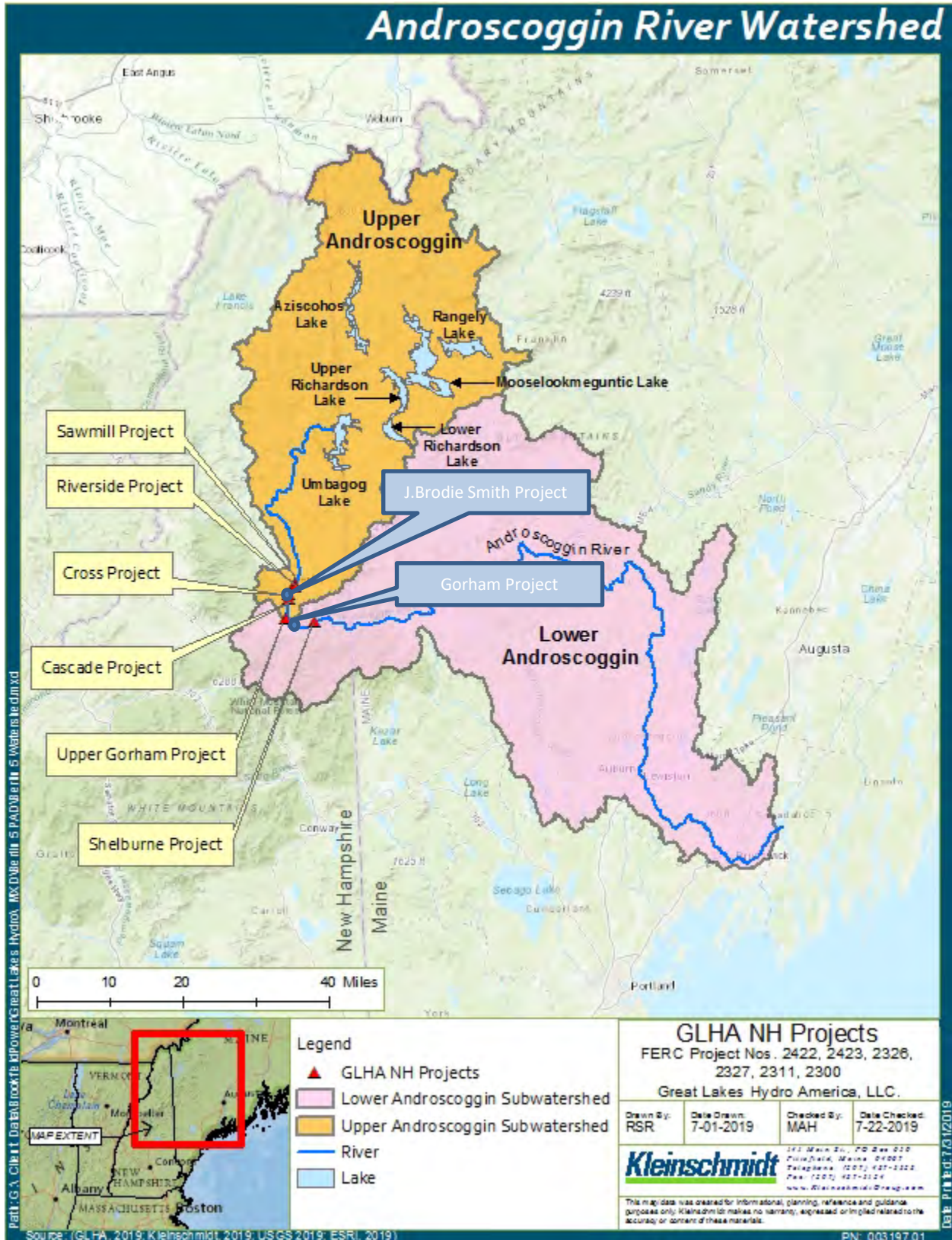
The watershed has a total drainage area of 3,450 square miles (720-square-miles in New Hampshire)<sup>3</sup>. The Androscoggin River watershed can be broken down into two sections, the upper and lower Androscoggin River Watersheds. The Projects start approximately 6.1 river miles upstream from the border of Maine and go up to approximately 18 river miles upstream from the border of Maine.

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<sup>2</sup> Maine Rivers. 2018. Androscoggin Watershed. [Online] <https://mainerivers.org/androscoggin.htm>. Accessed July 14, 2019.

<sup>3</sup> Maine Rivers. 2018. Androscoggin Watershed. [Online] <https://mainerivers.org/androscoggin.htm>. Accessed July 14, 2019.

FIGURE 1-5. OVERVIEW MAP OF THE WATERSHED



## **1.4 REGULATORY AND OTHER REQUIREMENTS**

### **1.4.1 FERC LICENSE AND WATER QUALITY CERTIFICATION REQUIREMENTS**

#### **1.4.1.1 SAWMILL PROJECT**

FERC issued a license for the Sawmill Project on August 1, 1994.

**Article 401** requires GLHA to operate the Project in run-of-river mode for the protection of fish and wildlife resources and water quality.

**Article 402** requires that GLHA to release from the Sawmill dam into the Androscoggin River a minimum flow of 12 cfs, or inflow to the project reservoir, whichever is less, for the protection and enhancement of fish and wildlife resources and water quality in the bypassed reach of the Androscoggin River.

**Article 403** requires that within six months from the effective date of the license, GLHA shall file with FERC for approval, a plan to monitor run-of-river operation and minimum flow of the Project, as stipulated by Articles 401 and 402, respectively, and to describe how flows will be maintained below the project when the impoundment is refilled after any maintenance and/or repairs.

**Article 404** gives FERC the authority to require GLHA to construct, operate, and maintain, or provide for the construction, operation, and maintain of, such fishways as may be prescribed by the Secretary of the Interior.

**Article 405** requires GLHA to file with FERC for approval, a plan to monitor dissolved oxygen (DO) levels and temperature of the Androscoggin River upstream and downstream of the Project.

**Article 406** requires GLHA to implement the provisions of the Programmatic Agreement.

**Article 407** requires GLHA to develop and file, for FERC approval, a recreation plan.

**Article 408** provides GLHA authority to grant permission for certain types of use and occupancy of the project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

With a couple of exceptions, the modifications to run-of-river and minimum flows that have occurred at the Sawmill Project have been permitted by the Project's FERC license, i.e., they were either operating emergencies beyond the control of GLHA, or they were planned in consultation with resource agencies (see Section 6.0). The following excursions from run of river and minimum flows were reported to the FERC within the last five years, none of which resulted in a determination of violation of FERC license:

- December 18, 2019
- August 31, 2019
- January 14, 2018
- March 9, 2018
- May 2, 2018
- May 8, 2015

### **1.4.1.2 CROSS PROJECT**

FERC issued a license for the Cross Project on August 1, 1994.

**Article 401** requires GLHA to operate the Project in run-of-river mode for the protection of fish and wildlife resources and water quality.

**Article 402** requires that within six months from the effective date of the license, GLHA shall file with FERC for approval, a plan to monitor run-of-river operation and minimum flow of the Project, as stipulated by Article 401, and to describe how flows will be maintained below the project when the impoundment is refilled after any maintenance and/or repairs.

**Article 403** provides FERC with the authority to require GLHA to construct, operate, and maintain, or provide for the construction, operation, and maintenance of, such fishways as may be prescribed by the Secretary of the Interior.

**Article 404** requires GLHA to file with FERC for approval, a plan to monitor DO levels and temperature of the Androscoggin River upstream and downstream of the Project.

**Article 405** requires GLHA to implement the provision of the Programmatic Agreement.

**Article 406** requires GLHA to develop and file, for FERC approval, a recreation plan.

**Article 408** provides GLHA with the authority to grant permission for certain types of use and occupancy of the project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

With a couple of exceptions, the modifications to run-of-river and minimum flows that have occurred at the Cross Project have been permitted by the Project's FERC license, i.e., they were either operating emergencies beyond the control of GLHA, or they were planned in consultation with resource agencies (see Section 6.0). The following excursions from run of river and minimum flows were reported to the FERC within the last five years, none of which resulted in a determination of violation of FERC license:

- October 24, 2019
- September 9, 2019
- March 13, 2018
- March 09, 2018
- September 28, 2017
- November 11, 2015
- September 25, 2015

### **1.4.1.3 UPPER GORHAM PROJECT**

FERC issued a license for the Upper Gorham Project on August 1, 1994.

**Article 401** requires GLHA to operate the Project in run-of-river mode for the protection of fish and wildlife resources and water quality.

**Article 402** requires GLHA to release from the Upper Gorham dam into the Androscoggin River a minimum flow of 400 cfs from March 1 to June 15, and 200 cfs from June 16 to February 28, or inflow to the project reservoir, whichever is less, for the protection and enhancement of fish and wildlife resources and water quality in the bypassed reach of the Androscoggin River.

**Article 403** requires that within six months from the effective date of the license, GLHA shall file with FERC for approval, a plan to monitor run-of-river operation and minimum flow of the Project, as stipulated by Articles 401 and 402, respectively, and to describe how flows will be maintained below the Project when the impoundment is refilled after any maintenance and/or repairs.

**Article 404** gives FERC the authority to require GLHA to construct, operate, and maintain, or provide for the construction, operation, and maintain of, such fishways as may be prescribed by the Secretary of the Interior.

**Article 405** requires GLHA to file with FERC for approval, a plan to monitor DO levels and temperature of the Androscoggin River upstream and downstream of the Project.

**Article 406** requires GLHA to file within six months, for FERC approval, functional design drawings of a trashrack and downstream fish bypass facility to reduce the entrainment of resident fish, together with a schedule to construct/install the facilities before operation of the Project.

**Article 407** requires GLHA to implement the provision of the Programmatic Agreement.

**Article 408** requires GLHA to develop and file, for FERC approval, a recreation plan.

**Article 409** requires GLHA to develop and file, for FERC approval, a plan for aesthetic enhancements.

**Article 410** requires GLHA to develop and file, within one year, for FERC approval, a shore land protection plan.

**Article 411** provides GLHA with the authority to grant permission for certain types of use and occupancy of the project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

With a couple of exceptions, the modifications to run-of-river and minimum flows that have occurred at the Upper Gorham Project have been permitted by the Project's FERC license, i.e., they were either operating emergencies beyond the control of GLHA, or they were planned in consultation with resource agencies (see Section 6.0). The following excursions from run of river and minimum flows were reported to the FERC within the last five years, none of which resulted in a determination of violation of FERC license:

- None

#### **1.4.1.4 SHELburnE PROJECT**

FERC issued a license for the Shelburne Project on August 1, 1994.

**Article 401** requires GLHA to operate the Project in run-of-river mode for the protection of fish and wildlife resources and water quality.

**Article 402** requires GLHA to release from the Shelburne dam into the Androscoggin River a minimum flow equal to that of the existing leakage flow, estimated at no more than 2 cfs, or inflow to the project reservoir, whichever is less, for the protection and enhancement of fish and wildlife resources and water quality in the bypassed reach of the Androscoggin River.

**Article 403** requires that within six months from the effective date of the license, GLHA shall file with FERC for approval, a plan to monitor run-of-river operation and minimum flow of the Project, as stipulated by Articles 401 and 402, respectively, and to describe how flows will be maintained below the Project when the impoundment is refilled after any maintenance and/or repairs.

**Article 404** requires GLHA to file with FERC for approval, a plan to monitor DO levels and temperature of the Androscoggin River upstream and downstream of the Project.

**Article 405** provides FERC the authority to require GLHA to construct, operate, and maintain, or provide for the construction, operation, and maintain of, such fishways as may be prescribed by the Secretary of the Interior.

**Article 406** requires GLHA to file with FERC for approval, a wetland monitoring and mitigation plan to replace any wetland habitat lost as a result of the increased reservoir water surface elevation increase and the project's operation.

**Article 407** requires GLHA to implement the provisions of the Programmatic Agreement.

**Article 408** requires GLHA to develop and file, for FERC approval, a recreation plan.

**Article 409** requires GLHA to develop and file, for FERC approval, a shore land protection plan.

**Article 410** provides GLHA authority to grant permission for certain types of use and occupancy of the project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior FERC approval.

With a couple of exceptions, the modifications to run-of-river and minimum flows that have occurred at the Shelburne Project have been permitted by the Project's FERC license, i.e., they were either operating emergencies beyond the control of GLHA, or they were planned in consultation with resource agencies (see Section 6.0). The following excursions from run of river and minimum flows were reported to the FERC within the last five years, none of which resulted in a determination of violation of FERC license:

- November 30, 2017
- May 06, 2016
- January 26, 2015

#### **1.4.1 LIHI CERTIFICATION REQUIREMENTS**

As this is an initial application for LIHI Certification, the Sawmill, Cross, Upper Gorham and Shelburne Projects are not currently subject to LIHI Certification Conditions.

**TABLE 1-1. FACILITY INFORMATION – SAWMILL PROJECT**

<i>Item</i>	<i>Information Requested</i>	<i>Response (include references to further details)</i>
<b>Name of the Facility</b>	Facility name (use FERC project name or other legal name)	Sawmill Project (FERC No. 2422)
<b>Location</b>	River name (USGS proper name)	Androscoggin River
	Watershed name (select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: <a href="https://water.usgs.gov/wsc/map_index.html">https://water.usgs.gov/wsc/map_index.html</a> )	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam	138.2
	Geographic latitude of dam	Latitude 44°28.366'N
	Geographic longitude of dam	Longitude 71°10.514' W
<b>Facility Owner</b>	Application contact names (Complete the Contact Form in <a href="#">Section B-4</a> also):	Kelly Maloney Manager, Compliance Northeast
	Facility owner company and authorized owner representative name. <b>For recertifications: If ownership has changed since last certification, provide the date of the change.</b>	Brookfield Renewable  Kelly Maloney
	FERC licensee company name (if different from owner)	Great Lakes Hydro America LLC
<b>Regulatory Status</b>	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	FERC P-2242, Issued Aug. 1, 1994 Expire July 31, 2024
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Hydroelectric Operating License, Federal Power Act
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	Issued December 18, 1991; State of New Hampshire, Dept. of Environmental Services Water Supply & Pollutions Control Division
	Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories	See hyperlink list below for relevant records including FERC License Orders; Section 401 Water Quality Certification; FERC and regulatory filings; and other key documents.
<b>Powerhouse</b>	Date of initial operation (past or future for pre-operational applications)	1903

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Total installed capacity (MW) <b>For recertifications: Indicate if installed capacity has changed since last certification</b>	Provide the total nameplate capacity for each development and for application as a whole  3.17 MW
	Average annual generation (MWh) and period of record used <b>For recertifications: Indicate if average annual generation has changed since last certification</b>	Provide average annual generation values for each development and for the application as a whole  15,899.13 MWh (2014-2018)
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) <b>For recertifications: Indicate if mode of operation has changed since last certification</b>	Run-of-river
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	4 horizontal shaft synchronous generators 4 tube-type, horizontal shaft turbines Units 1 and 3 are fixed blade propeller units Units 2 and 4 adjustable blade propeller units Units 1 and 3: max 590 cfs each; rating of 1,083 hp Units 2 and 4: max 652 cfs each; rating of 1,177 hp
	Trashrack clear spacing (inches), for each trashrack	14 feet wide by 19 feet 10 inches long per bay; 3-inch clear spacing
	Dates and types of major equipment upgrades	None
	Dates, purpose, and type of any recent operational changes	None
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	None
<b>Dam or Diversion</b>	Date of original construction and description and dates of subsequent dam or diversion structure modifications	1903, the dam was updated in 1965 - per Dam Safety and Surveillance monitoring plan and drawings
	Dam or diversion structure height including separately, the height of any flashboards, inflatable dams, etc.	Max: 15 feet
	Spillway elevation and hydraulic capacity	1087.0 feet to 1094.7 feet 24,000cfs



<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Tailwater elevation (provide normal range if available)	1077.3 feet
	Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse	None; powerhouse is integral
	Dates and types of major infrastructure changes	None
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
	Source water	Androscoggin River
	Receiving water and location of discharge	Androscoggin River
<b>Conduit</b>	Date of conduit construction and primary purpose of conduit	N/A
<b>Impoundment and Watershed</b>	Authorized maximum and minimum water surface elevations <b>For recertifications: Indicate if these values have changed since last certification</b>	Max 1094.5feet (USGS) Min 1094 feet (USGS)
	Normal operating elevations and normal fluctuation range <b>For recertifications: Indicate if these values have changed since last certification</b>	Within six inches of 1094.5 feet (USGS)
	Gross storage volume and surface area at full pool <b>For recertifications: Indicate if these values have changed since last certification</b>	620 acre-ft, 72.5 acres
	Usable storage volume and surface area <b>For recertifications: Indicate if these values have changed since last certification</b>	Negligible
	Describe requirements related to impoundment inflow, outflow, up/down ramping and refill rate restrictions.	Run of river operations which includes stable headpond (within approximately 6 inches of normal full pond)
	Upstream dams by name, ownership and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage.	<u>Androscoggin River</u> Errol Project (FERC #3133), Errol Hydroelectric LP & Great Lakes Hydro America LLC, River Mile 170.1; Pontook Project (FERC #2861), Pontook Operating LP, River Mile 152.4

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage	<p>Riverside Project (FERC #2423), Great Lakes Hydro America LLC, River Mile 138.8;</p> <p>J. Brodie Smith Project (FERC #2287), Central Rivers Power, River Mile 138.2;</p> <p>Cross Project (FERC #2326), Great Lakes Hydro America LLC, River Mile 136.9;</p> <p>Cascade Project (FERC #2327), Great Lakes Hydro America LLC, River Mile 136.3;</p> <p>Upper Gorham Project (FERC #2311), Great Lakes Hydro America LLC, River Mile 133.2;</p> <p>Gorham Project, Central Rivers Power, River Mile 130.4;</p> <p>Shelburne Project (FERC #2300), Great Lakes Hydro America LLC, River Mile 127.6</p> <p>Upper &amp; Middle Dam (FERC No.2333), Rumford Falls Power Company, River mile 90.9 and 90.7; Riley Project (FERC # 8277), Eagle Creek Renewable Energy LLC, River Mile 69.3;</p> <p>Jay (River Mile 66.6), Otis (River Mile 63.8), Livermore Falls (FERC # 2375) Eagle Creek Renewable Energy LLC, River Mile 61.2;</p> <p>Gulf Island Project (FERC #2283), Great Lakes Hydro America LLC, River Mile 35.0;</p> <p>Lewiston Falls Project (FERC # 2302), Great Lakes Hydro America LLC, River Mile 30.8</p> <p>Worumbo Project (FERC # 3428), Brown Bear II Hydro, Inc., River Mile 15.7;</p> <p>Pejepscot Project (FERC # 4784), Topsham Hydro Partners LP, River Mile 12.5;</p> <p>Brunswick Project (FERC # 2284), Great Lakes Hydro America LLC, River Mile 8.0</p>
	Operating agreements with upstream or downstream facilities that affect water availability and facility operation	1983 Androscoggin River Headwater Benefits Agreement
	Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control.	<p>Land: Undetermined; limited to lands encompassing project structures</p> <p>Water: 72.5 acres</p>
<b>Hydrologic Setting</b>	Average annual flow at the dam, and period of record used	1989-2018: 2,792cfs

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Average monthly flows and period of record used	January 2,562 February 2,679 March 3,020 April 4,597 May 4,026 June 2,911 July 2,270 August 2,018 September 1,895 October 2,382 November 2,632 December 2,532
	Location and name of closest stream gauging stations above and below the facility	Above - USGS 01053600 Androscoggin River at Cambridge NH Below - USGS 01054000 Androscoggin River near Gorham, NH
	Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration.	1,337.8 Square miles
<b>Designated Zones of Effect</b>	Number of zones of effect	3
	Upstream and downstream locations by river miles	Zone 1 Impoundment: RM 139.9 – 138.2 Zone 2 Bypass Reach: RM 138.4 – 138.1 Zone 3 Tailrace: RM 138.2 – 138
	Type of waterbody (river, impoundment, bypassed reach, etc.)	Zone 1 Impoundment Zone 2 Bypass Reach Zone 3 Tailrace
	Delimiting structures or features	Zone 1 Impoundment: Sawmill Dam and Powerhouse Zone 2 Bypass Reach: Sawmill Dam Spillway. Zone 3 Tailrace: Sawmill Powerhouse NOTE: The downstream Riverside Project impoundment backwaters to the immediate tailrace and bypass areas
	Designated uses by state water quality agency	Drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; navigation; and as a habitat for fish and other aquatic life.
<b>Pre-Operational Facilities</b>		
<b>Expected operational date</b>	Date generation is expected to begin	N/A

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Dam, diversion structure or conduit modification</b>	Description of modifications made to a pre-existing conduit, dam or diversion structure needed to accommodate facility generation. This includes installation of flashboards or raising the flashboard height. Date the modification is expected to be completed	N/A
<b>Change in water flow regime</b>	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

**TABLE 1-2. FACILITY INFORMATION – CROSS PROJECT**

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Name of the Facility</b>	Facility name (use FERC project name or other legal name)	Cross Project (FERC No. 2326)
<b>Location</b>	River name (USGS proper name)	Androscoggin River
	Watershed name (select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: <a href="https://water.usgs.gov/wsc/map_index.html">https://water.usgs.gov/wsc/map_index.html</a> )	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam	136.1
	Geographic latitude of dam	Latitude 44°27.397' N
	Geographic longitude of dam	Longitude 71°11.111' W
<b>Facility Owner</b>	Application contact names (Complete the Contact Form in <a href="#">Section B-4</a> also):	Kelly Maloney Manager, Compliance Northeast
	Facility owner company and authorized owner representative name. <b>For recertifications: If ownership has changed since last certification, provide the date of the change.</b>	Brookfield Renewable  Kelly Maloney
	FERC licensee company name (if different from owner)	Great Lakes Hydro America LLC

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Regulatory Status</b>	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	FERC P-2326, Issued Aug. 1, 1994 Expire July 31, 2024
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Hydroelectric Operating License, Federal Power Act
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	Issued December 13, 1991 by State of New Hampshire Dept. of Environmental Services Water Supply & Pollution Control Division
	Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories	See hyperlink list below for relevant records including FERC License Orders; Section 401 Water Quality Certification; FERC and regulatory filings; and other key documents.
<b>Powerhouse</b>	Date of initial operation (past or future for pre-operational applications)	1903
	Total installed capacity (MW) <b>For recertifications: Indicate if installed capacity has changed since last certification</b>	Provide the total nameplate capacity for each development and for application as a whole  3.22 MW
	Average annual generation (MWh) and period of record used <b>For recertifications: Indicate if average annual generation has changed since last certification</b>	Provide average annual generation values for each development and for the application as a whole  15,024.63 MWh (2014 – 2018)
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) <b>For recertifications: Indicate if mode of operation has changed since last certification</b>	Run-of-river
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	5 horizontal propeller turbines 5 horizontal generators Units 1,3,4: min 275cfs, max 550 cfs each, 950 hp Unit 2: min 275 cfs, max 600 cfs, 950 hp Unit 5: min 320 cfs, max 640 cfs, 1,160 hp Minimum flows are estimated
	Trashrack clear spacing (inches), for each trashrack	21.6 feet wide by 18.4 feet high with 3-inch clear spacing per bay
	Dates and types of major equipment upgrades	None

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Dates, purpose, and type of any recent operational changes	None
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	None
<b>Dam or Diversion</b>	Date of original construction and description and dates of subsequent dam or diversion structure modifications	1903
	Dam or diversion structure height including separately, the height of any flashboards, inflatable dams, etc.	Max: 20.2 feet
	Spillway elevation and hydraulic capacity	918.2 feet to 921.7 feet topped with 42-inch flashboards Run-of-river operations, all river flow can pass over the dam.
	Tailwater elevation (provide normal range if available)	901.7 feet
	Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse	None; powerhouse is integral
	Dates and types of major infrastructure changes	September/2019 A new FERC approved flashboard design was installed (see FERC and Regulatory Information)
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
	Source water	Androscoggin River
	Receiving water and location of discharge	Androscoggin River
<b>Conduit</b>	Date of conduit construction and primary purpose of conduit	N/A
<b>Impoundment and Watershed</b>	Authorized maximum and minimum water surface elevations <b>For recertifications: Indicate if these values have changed since last certification</b>	Max 921.7 feet (USGS) Min 921.2 feet (USGS)
	Normal operating elevations and normal fluctuation range <b>For recertifications: Indicate if these values have changed since last certification</b>	Within 6 inches of 921.7 feet (USGS)

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Gross storage volume and surface area at full pool <b>For recertifications: Indicate if these values have changed since last certification</b>	120 acre-ft, 22 acres
	Usable storage volume and surface area <b>For recertifications: Indicate if these values have changed since last certification</b>	Negligible
	Describe requirements related to impoundment inflow, outflow, up/down ramping and refill rate restrictions.	Run of river operations which includes stable headpond (within 1 foot of normal full pond)
	Upstream dams by name, ownership and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage.	<u>Androscoggin River</u> Errol Project (FERC #3133), Errol Hydroelectric LP & Great Lakes Hydro America LLC, River Mile 170.1; Pontook Project (FERC #2861), Pontook Operating LP, River Mile 152.4 Sawmill Project (FERC #2422), Great Lakes Hydro America LLC, River Mile 142.2; Riverside Project (FERC #2423), Great Lakes Hydro America LLC, River Mile 138.8; J. Brodie Smith Project (FERC #2287), Central Rivers Power, River Mile 138.2

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage	<p>Cross Project (FERC #2326), Great Lakes Hydro America LLC, River Mile 136.9; Cascade Project (FERC #2327), Great Lakes Hydro America LLC, River Mile 136.3;</p> <p>Upper Gorham Project (FERC #2311), Great Lakes Hydro America LLC, River Mile 133.2;</p> <p>Gorham Project, Central Rivers Power, River Mile 130.4;</p> <p>Shelburne Project (FERC #2300), Great Lakes Hydro America LLC, River Mile 127.6</p> <p>Upper &amp; Middle Dam (FERC No.2333), Rumford Falls Power Company, River mile 90.9 and 90.7; Riley Project (FERC # 8277), Eagle Creek Renewable Energy LLC, River Mile 69.3;</p> <p>Jay (River Mile 66.6), Otis (River Mile 63.8), Livermore Falls (FERC # 2375) Eagle Creek Renewable Energy LLC, River Mile 61.2;</p> <p>Gulf Island Project (FERC #2283), Great Lakes Hydro America LLC, River Mile 35.0; Lewiston Falls Project (FERC # 2302), Great Lakes Hydro America LLC, River Mile 30.8</p> <p>Worumbo Project (FERC # 3428), Brown Bear II Hydro, Inc., River Mile 15.7; Pejepsco Project (FERC # 4784), Topsham Hydro Partners LP, River Mile 12.5; Brunswick Project (FERC # 2284), Great Lakes Hydro America LLC, River Mile 8.0</p>
	Operating agreements with upstream or downstream facilities that affect water availability and facility operation	1983 Androscoggin River Headwater Benefits Agreement
	Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control.	Land: Undetermined; limited to lands encompassing project structures Water: 22 acres
<b>Hydrologic Setting</b>	Average annual flow at the dam, and period of record used	1989-2018: 2,792cfs



<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Average monthly flows and period of record used	January 2,562 February 2,679 March 3,020 April 4,597 May 4,026 June 2,911 July 2,270 August 2,018 September 1,895 October 2,382 November 2,632 December 2,532
	Location and name of closest stream gauging stations above and below the facility	Above - USGS 01053600 Androscoggin River at Cambridge NH Below - USGS 01054000 Androscoggin River near Gorham, NH
	Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration.	1,350 Square miles
<b>Designated Zones of Effect</b>	Number of zones of effect	2
	Upstream and downstream locations by river miles	Zone 1 Impoundment: RM 136.7 – 136.1 Zone 2 Bypass Reach: RM 136.1 – 136
	Type of waterbody (river, impoundment, bypassed reach, etc.)	Zone 1 Impoundment Zone 2 Bypass Reach
	Delimiting structures or features	Zone 1 Impoundment: Cross Dam and Powerhouse Zone 2 Bypass Reach: Cross Dam NOTE: The downstream Cascade Project impoundment backwaters to the immediate tailrace and bypass areas
	Designated uses by state water quality agency	Drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; navigation; and as a habitat for fish and other aquatic life.
<b>Pre-Operational Facilities</b>		
<b>Expected operational date</b>	Date generation is expected to begin	N/A

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Dam, diversion structure or conduit modification</b>	Description of modifications made to a pre-existing conduit, dam or diversion structure needed to accommodate facility generation. This includes installation of flashboards or raising the flashboard height. Date the modification is expected to be completed	N/A
<b>Change in water flow regime</b>	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

**TABLE 1-3. FACILITY INFORMATION – UPPER GORHAM PROJECT**

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Name of the Facility</b>	Facility name (use FERC project name or other legal name)	Upper Gorham Project (FERC No. 2311)
<b>Location</b>	River name (USGS proper name)	Androscoggin River
	Watershed name (select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: <a href="https://water.usgs.gov/wsc/map_index.html">https://water.usgs.gov/wsc/map_index.html</a> )	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam	132.6
	Geographic latitude of dam	Latitude 44°23.984' N
	Geographic longitude of dam	Longitude 71°11.390' W
<b>Facility Owner</b>	Application contact names (Complete the Contact Form in <a href="#">Section B-4</a> also):	Kelly Maloney Manager, Compliance Northeast
	Facility owner company and authorized owner representative name. <b>For recertifications: If ownership has changed since last certification, provide the date of the change.</b>	Brookfield Renewable  Kelly Maloney
	FERC licensee company name (if different from owner)	Great Lakes Hydro America LLC

<i>Item</i>	<i>Information Requested</i>	<i>Response (include references to further details)</i>
<b>Regulatory Status</b>	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	FERC P-2311, Issued Aug. 1, 1994 Expire July 31, 2024
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Hydroelectric Operating License, Federal Power Act
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	Issued October 26, 1993 by State of New Hampshire Dept. of Environmental Services
	Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories	See hyperlink list below for relevant records including FERC License Orders; Section 401 Water Quality Certification; FERC and regulatory filings; and other key documents.
<b>Powerhouse</b>	Date of initial operation (past or future for pre-operational applications)	1904
	Total installed capacity (MW) <b>For recertifications: Indicate if installed capacity has changed since last certification</b>	Provide the total nameplate capacity for each development and for application as a whole  4.8 MW
	Average annual generation (MWh) and period of record used <b>For recertifications: Indicate if average annual generation has changed since last certification</b>	Provide average annual generation values for each development and for the application as a whole  14,858.54 MWh (2014 – 2018)
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) <b>For recertifications: Indicate if mode of operation has changed since last certification</b>	Run-of-river
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	4 horizontal shaft Francis turbines, 4 generators 4 turbines: min capacity 475 cfs; max capacity of 550 cfs Each rated for 1,600 hp for an installed rating of 6,400 hp
	Trashrack clear spacing (inches), for each trashrack	3 1/8-inch clear spacing
	Dates and types of major equipment upgrades	2011 Runner upgrades completed to all 4 units (see FERC and Regulatory Information)

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Dates, purpose, and type of any recent operational changes	None
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	None
<b>Dam or Diversion</b>	Date of original construction and description and dates of subsequent dam or diversion structure modifications	1904
	Dam or diversion structure height including separately, the height of any flashboards, inflatable dams, etc.	Max: 31.2 feet
	Spillway elevation and hydraulic capacity	807.3 feet Run-of-river operation, all flow can pass over the dam
	Tailwater elevation (provide normal range if available)	901.7 feet
	Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse	None; powerhouse is integral
	Dates and types of major infrastructure changes	Summer 2018-2019 Upstream concrete repairs  (see FERC and Regulatory Information)
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
	Source water	Androscoggin River
	Receiving water and location of discharge	Androscoggin River
<b>Conduit</b>	Date of conduit construction and primary purpose of conduit	N/A
<b>Impoundment and Watershed</b>	Authorized maximum and minimum water surface elevations <b>For recertifications: Indicate if these values have changed since last certification</b>	Max 812.3 feet (USGS) Min 811.7 feet (USGS)
	Normal operating elevations and normal fluctuation range <b>For recertifications: Indicate if these values have changed since last certification</b>	Within 6 inches of 812.3 feet (USGS)

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Gross storage volume and surface area at full pool <b>For recertifications: Indicate if these values have changed since last certification</b>	370 acre-ft, 45 acres
	Usable storage volume and surface area <b>For recertifications: Indicate if these values have changed since last certification</b>	Negligible
	Describe requirements related to impoundment inflow, outflow, up/down ramping and refill rate restrictions.	Run of river operations which includes stable headpond (within 1 foot of normal full pond)
	Upstream dams by name, ownership and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage.	<u>Androscoggin River</u> Errol Project (FERC #3133), Errol Hydroelectric LP & Great Lakes Hydro America LLC, River Mile 170.1; Pontook Project (FERC #2861), Pontook Operating LP, River Mile 152.4 Sawmill Project (FERC #2422), Great Lakes Hydro America LLC, River Mile 142.2; Riverside Project (FERC #2423), Great Lakes Hydro America LLC, River Mile 138.8; J. Brodie Smith Project (FERC #2287), Central Rivers Power, River Mile 138.2

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage	<p>Cascade Project (FERC #2327), Great Lakes Hydro America LLC, River Mile 136.3;</p> <p>Upper Gorham Project (FERC #2311), Great Lakes Hydro America LLC, River Mile 133.2;</p> <p>Gorham Project, Central Rivers Power, River Mile 130.4;</p> <p>Shelburne Project (FERC #2300), Great Lakes Hydro America LLC, River Mile 127.6</p> <p>Upper &amp; Middle Dam (FERC No. 2333), Rumford Falls Power Company, River mile 90.9 and 90.7; Riley Project (FERC # 8277), Eagle Creek Renewable Energy LLC, River Mile 69.3;</p> <p>Jay (River Mile 66.6), Otis (River Mile 63.8), Livermore Falls (FERC # 2375) Eagle Creek Renewable Energy LLC, River Mile 61.2;</p> <p>Gulf Island Project (FERC #2283), Great Lakes Hydro America LLC, River Mile 35.0;</p> <p>Lewiston Falls Project (FERC # 2302), Great Lakes Hydro America LLC, River Mile 30.8</p> <p>Worumbo Project (FERC # 3428), Brown Bear II Hydro, Inc., River Mile 15.7;</p> <p>Pejepscot Project (FERC # 4784), Topsham Hydro Partners LP, River Mile 12.5;</p> <p>Brunswick Project (FERC # 2284), Great Lakes Hydro America LLC, River Mile 8.0</p>
	Operating agreements with upstream or downstream facilities that affect water availability and facility operation	1983 Androscoggin River Headwater Benefits Agreement
	Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control.	Land: Undetermined; limited to lands encompassing project structures Water: 45 acres
<b>Hydrologic Setting</b>	Average annual flow at the dam, and period of record used	1989-2018: 2,792cfs

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Average monthly flows and period of record used	January 2,562 February 2,679 March 3,020 April 4,597 May 4,026 June 2,911 July 2,270 August 2,018 September 1,895 October 2,382 November 2,632 December 2,532
	Location and name of closest stream gauging stations above and below the facility	Above – USGS 01054000 Androscoggin River near Gorham, NH Below - USGS 01054500 Androscoggin River at Rumford, Maine
	Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration.	1,372 Square miles
<b>Designated Zones of Effect</b>	Number of zones of effect	3
	Upstream and downstream locations by river miles	Zone 1 Impoundment: RM 135.5 – 132.6 Zone 2 Bypass Reach: RM 132.6–131.6 Zone 3 Tailrace: RM 131.6 – 131.4 Zone 4 Regulated River Reach RM 131.4 – 131.1
	Type of waterbody (river, impoundment, bypassed reach, etc.)	Zone 1 Impoundment Zone 2 Bypass Reach Zone 3 Tailrace Zone 4 Regulated River Reach
	Delimiting structures or features	Zone 1 Impoundment: Upper Gorham Dam and Powerhouse Zone 2 Bypass Reach: Upper Gorham Dam Zone 3 Tailrace: Gorham Powerhouse Zone 4 Regulated River Reach
	Designated uses by state water quality agency	Drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; navigation; and as a habitat for fish and other aquatic life.
<b>Pre-Operational Facilities</b>		
<b>Expected operational date</b>	Date generation is expected to begin	N/A

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Dam, diversion structure or conduit modification</b>	Description of modifications made to a pre-existing conduit, dam or diversion structure needed to accommodate facility generation. This includes installation of flashboards or raising the flashboard height. Date the modification is expected to be completed	N/A
<b>Change in water flow regime</b>	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

**TABLE 1-4. FACILITY INFORMATION – SHELBURNE PROJECT**

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Name of the Facility</b>	Facility name (use FERC project name or other legal name)	Shelburne Project (FERC No. 2300)
<b>Location</b>	River name (USGS proper name)	Androscoggin River
	Watershed name (select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: <a href="https://water.usgs.gov/wsc/map_index.html">https://water.usgs.gov/wsc/map_index.html</a> )	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam	128.4
	Geographic latitude of dam	Latitude 44°24.211' N
	Geographic longitude of dam	Longitude 71°6.906' W
<b>Facility Owner</b>	Application contact names (Complete the Contact Form in <a href="#">Section B-4</a> also):	Kelly Maloney Manager, Compliance Northeast
	Facility owner company and authorized owner representative name. <b>For recertifications: If ownership has changed since last certification, provide the date of the change.</b>	Brookfield Renewable  Kelly Maloney
	FERC licensee company name (if different from owner)	Great Lakes Hydro America LLC



<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
<b>Regulatory Status</b>	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	FERC P-2300, Issued Aug. 1, 1994 Expire July 31, 2024
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Hydroelectric Operating License, Federal Power Act
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	Issued December 13, 1991 by State of New Hampshire Dept. of Environmental Services Water Supply & Pollution Control Division
	Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories	See hyperlink list below for relevant records including FERC License Orders; Section 401 Water Quality Certification; FERC and regulatory filings; and other key documents.
<b>Powerhouse</b>	Date of initial operation (past or future for pre-operational applications)	1903
	Total installed capacity (MW) <b>For recertifications: Indicate if installed capacity has changed since last certification</b>	Provide the total nameplate capacity for each development and for application as a whole  3.72 MW
	Average annual generation (MWh) and period of record used <b>For recertifications: Indicate if average annual generation has changed since last certification</b>	Provide average annual generation values for each development and for the application as a whole  10,469.72 MWh (2014 – 2017)
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) <b>For recertifications: Indicate if mode of operation has changed since last certification</b>	Run-of-river
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	Units 1 and 2 are vertical Francis turbines; each have a min capacity of 450 cfs; and a max capacity of 800 cfs and 1,200 hp Unit 3 is a vertical Kaplan turbine with a min capacity of 770 cfs and a max capacity of 1,800 cfs and 2,500 hp
	Trashrack clear spacing (inches), for each trashrack	15 feet by 112 feet steel bars with 3-inch clear spacing
	Dates and types of major equipment upgrades	Fall/2019 Interior flood walled installed (see FERC and Regulatory Information)

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Dates, purpose, and type of any recent operational changes	None
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments	None
<b>Dam or Diversion</b>	Date of original construction and description and dates of subsequent dam or diversion structure modifications	1903
	Dam or diversion structure height including separately, the height of any flashboards, inflatable dams, etc.	17.4 feet
	Spillway elevation and hydraulic capacity	724.4 feet 25,000 cfs
	Tailwater elevation (provide normal range if available)	717.9 feet
	Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse	None; powerhouse is integral
	Dates and types of major infrastructure changes	2019 New winch for tripping dam 2019 Concrete spillway 2020 Remote PLC control for winch control (see FERC and Regulatory Information)
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power, Flood Control
	Source water	Androscoggin River
	Receiving water and location of discharge	Androscoggin River
<b>Conduit</b>	Date of conduit construction and primary purpose of conduit	N/A
<b>Impoundment and Watershed</b>	Authorized maximum and minimum water surface elevations <b>For recertifications: Indicate if these values have changed since last certification</b>	Max 734.2feet (USGS) Min 733.7 feet (USGS)
	Normal operating elevations and normal fluctuation range <b>For recertifications: Indicate if these values have changed since last certification</b>	Within 6 inches of 734.2 feet (USGS)

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Gross storage volume and surface area at full pool <b>For recertifications: Indicate if these values have changed since last certification</b>	Negligible, 250 acres
	Usable storage volume and surface area <b>For recertifications: Indicate if these values have changed since last certification</b>	Negligible
	Describe requirements related to impoundment inflow, outflow, up/down ramping and refill rate restrictions.	Run of river operations which includes stable headpond (within 1 foot of normal full pond)
	Upstream dams by name, ownership and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage.	<u>Androscoggin River</u> Errol Project (FERC #3133), Errol Hydroelectric LP & Great Lakes Hydro America LLC, River Mile 170.1; Pontook Project (FERC #2861), Pontook Operating LP, River Mile 152.4 Sawmill Project (FERC #2422), Great Lakes Hydro America LLC, River Mile 142.2; Riverside Project (FERC #2423), Great Lakes Hydro America LLC, River Mile 138.8; J. Brodie Smith Project (FERC #2287), Central Rivers Power, River Mile 138.2 Cascade Project (FERC #2327), Great Lakes Hydro America LLC, River Mile 136.3; Upper Gorham Project (FERC #2311), Great Lakes Hydro America LLC, River Mile 133.2; Gorham Project, Central Rivers Power, River Mile 130.4

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>																								
	Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage	Upper & Middle Dam (FERC No.2333), Rumford Falls Power Company, River mile 90.9 and 90.7; Riley Project (FERC # 8277), Eagle Creek Renewable Energy LLC, River Mile 69.3; Jay (River Mile 66.6), Otis (River Mile 63.8), Livermore Falls (FERC # 2375) Eagle Creek Renewable Energy LLC, River Mile 61.2; Gulf Island Project (FERC #2283), Great Lakes Hydro America LLC, River Mile 35.0; Lewiston Falls Project (FERC # 2302), Great Lakes Hydro America LLC, River Mile 30.8 Worumbo Project (FERC # 3428), Brown Bear II Hydro, Inc., River Mile 15.7; Pejepsco Project (FERC # 4784), Topsham Hydro Partners LP, River Mile 12.5; Brunswick Project (FERC # 2284), Great Lakes Hydro America LLC, River Mile 8.0																								
	Operating agreements with upstream or downstream facilities that affect water availability and facility operation	1983 Androscoggin River Headwater Benefits Agreement																								
	Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control.	Land: Undetermined; limited to lands encompassing project structures Water: 210 acres																								
<b>Hydrologic Setting</b>	Average annual flow at the dam, and period of record used	1989-2018: 2,792cfs																								
	Average monthly flows and period of record used	<table border="0"> <tr><td>January</td><td>2,562</td></tr> <tr><td>February</td><td>2,679</td></tr> <tr><td>March</td><td>3,020</td></tr> <tr><td>April</td><td>4,597</td></tr> <tr><td>May</td><td>4,026</td></tr> <tr><td>June</td><td>2,911</td></tr> <tr><td>July</td><td>2,270</td></tr> <tr><td>August</td><td>2,018</td></tr> <tr><td>September</td><td>1,895</td></tr> <tr><td>October</td><td>2,382</td></tr> <tr><td>November</td><td>2,632</td></tr> <tr><td>December</td><td>2,532</td></tr> </table>	January	2,562	February	2,679	March	3,020	April	4,597	May	4,026	June	2,911	July	2,270	August	2,018	September	1,895	October	2,382	November	2,632	December	2,532
	January	2,562																								
February	2,679																									
March	3,020																									
April	4,597																									
May	4,026																									
June	2,911																									
July	2,270																									
August	2,018																									
September	1,895																									
October	2,382																									
November	2,632																									
December	2,532																									
Location and name of closest stream gauging stations above and below the facility	Above – USGS 01054000 Androscoggin River near Gorham, NH Below - USGS 01054500 Androscoggin River at Rumford, Maine																									

<b>Item</b>	<b>Information Requested</b>	<b>Response (include references to further details)</b>
	Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration.	1,494 Square miles
<b>Designated Zones of Effect</b>	Number of zones of effect	4
	Upstream and downstream locations by river miles	Zone 1 Impoundment: RM 129.8 – 128.4 Zone 2 Bypass Reach: RM 128.4 – 128.3 Zone 3 Tailrace: RM 128.3- 128.1 Zone 4 Regulated Downstream River Reach: RM 128.1 – 126.5
	Type of waterbody (river, impoundment, bypassed reach, etc.)	Zone 1 Impoundment Zone 2 Bypass Reach Zone 3 Tailrace Zone 4 Regulated Downstream River Reach
	Delimiting structures or features	Zone 1 Impoundment: Shelburne Dam and Powerhouse Zone 2 Bypass Reach: Shelburne Dam Zone 3 Tailrace: Shelburne Powerhouse Zone 4 Downstream River Reach: Shelburne Dam and Powerhouse
	Designated uses by state water quality agency	Drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; navigation; and as a habitat for fish and other aquatic life.
<b>Pre-Operational Facilities</b>		
<b>Expected operational date</b>	Date generation is expected to begin	N/A
<b>Dam, diversion structure or conduit modification</b>	Description of modifications made to a pre-existing conduit, dam or diversion structure needed to accommodate facility generation. This includes installation of flashboards or raising the flashboard height. Date the modification is expected to be completed	N/A
<b>Change in water flow regime</b>	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

## **2.0 ZONES OF EFFECT**

### **2.1 SAWMILL PROJECT**

The Sawmill Project contains three Zones of Effect: Impoundment, Bypass Reach and Tailrace, as described in greater detail below. The river upstream of the impoundment is not influenced hydrologically by the Sawmill Project as the project boundary represents the upstream extent of the Project's backwater effect. The river downstream of the impoundment is the impoundment for the next downstream Project, Riverside.

#### **2.1.1 ZONE 1 – IMPOUNDMENT**

The Sawmill Project impoundment extends 1.67 miles upstream from Sawmill Dam and has a surface area of 72.5 acres at normal full pond elevation of 1094.5 ft. The Sawmill Project operates as a run-of-river facility to maintain the headpond as close to the normal surface elevation of elevation 1094.5 feet as possible through operation of the units and wastegates. The impoundment provides 620 acres of gross storage but, as a run of river facility, provides negligible net storage.



FIGURE 2-1 SAWMILL PROJECT – ZONE 1 - IMPOUNDMENT



**TABLE 2-1. SAWMILL PROJECT - ZONE 1 – IMPOUNDMENT MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Sawmill Project

Zone of Effect: 1 – Impoundment

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

The Sawmill Project operates as a run-of-river facility to maintain the headpond as close to the normal surface elevation of elevation 1094.5 feet as possible through operation of the units and wastegates. Lands adjacent to this Zone of Effect are generally unaffected by project operations. No threatened species are affected by routine project operations. Limited vegetation removal may occur within project lands for maintenance purposes and vegetation management of the dams. Recreation activities such as fishing, boating, canoeing and kayaking occur on the Sawmill impoundment. There is a public launch located on the headpond near the ball field; just upriver of the foot bridge, an overlook, and picnic area as part of the recreation plan.

**2.1.2 ZONE 2 – BYPASS REACH**

The Sawmill Project bypass reach extends directly below the spillway section of the dam to the convergence of water from the tailrace. At the lowermost extent, the bypass reach is separated from the powerhouse tailrace by an 80-foot-long section of retaining wall downstream from the powerhouse. GLHA provides a minimum flow into the approximately 550-foot-long bypassed reach of 12 cfs or inflow, whichever is less, through a notch in the dam crest plus leakage.



**FIGURE 2-2 SAWMILL PROJECT – ZONE 2 – BYPASS REACH**



**TABLE 2-2. SAWMILL PROJECT - ZONE 2 – BYPASS REACH MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Sawmill Project Zone of Effect: 2 – Bypass Reach

Criterion	Alternative Standards				
	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				

### 2.1.3 ZONE 3 - TAILRACE

The powerhouse tailrace extends approximately 80 feet to the confluence of the bypass reach, which converges at the upper extend of the downstream Riverside Project headpond.

**FIGURE 2-3 SAWMILL PROJECT – ZONE 3 - TAILRACE**



**TABLE 2-3. SAWMILL PROJECT - ZONE 3 – TAILRACE MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Sawmill Project

Zone of Effect: 3 – Tailrace

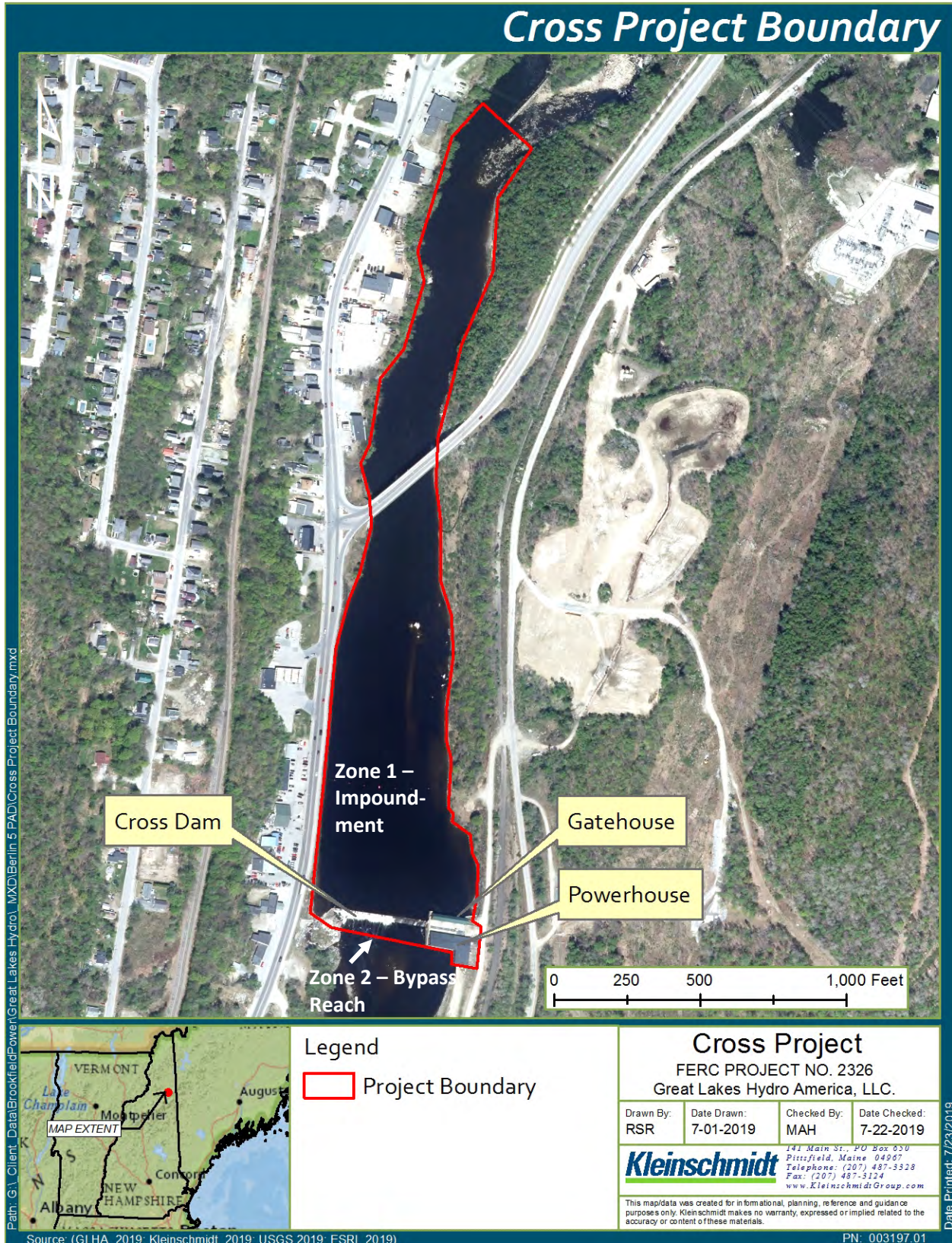
Criterion		Alternative Standards				
		1	2	3	4	Plus
<b>A</b>	<b>Ecological Flow Regimes</b>	X				
<b>B</b>	<b>Water Quality</b>		X			
<b>C</b>	<b>Upstream Fish Passage</b>	X				
<b>D</b>	<b>Downstream Fish Passage</b>	X				
<b>E</b>	<b>Watershed and Shoreline Protection</b>		X			
<b>F</b>	<b>Threatened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

## 2.2 CROSS PROJECT

The Cross Project has two Zones of Effect: Impoundment and Bypass Reach. The Androscoggin River upstream of the Cross Project is regulated by the upstream Riverside Project. The downstream Cascade Project backwaters immediately to the tailrace of the Cross Project. As such, the Impoundment Zone of Effect extends from the dam to the extent of hydrologic influence of the Cross Dam backwater, which terminates at the upstream limit of the project boundary. The bypass reach is a very short run of the river at the spillway discharging immediately into the Cascade Project impoundment.



FIGURE 2-4. CROSS PROJECT – ZONE 1 – IMPOUNDMENT AND ZONE 2 – BYPASS REACH



### 2.2.1 ZONE 1 – IMPOUNDMENT

The Cross Project impoundment extends 3,100 ft upstream from the dam and covers 22 acres at the normal full pond elevation of 921.7 ft. The Cross Project operates as a run-of-river facility to maintain the headpond near the normal surface elevation of 921.7 feet and has a gross storage of 120 acre-feet. The net storage is negligible.

**TABLE 2-4. CROSS PROJECT - ZONE 1 – IMPOUNDMENT MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Cross Project Zone of Effect: 1 – Impoundment

Criterion	Alternative Standards				
	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				

### 2.2.2 ZONE 2 – BYPASS REACH

The spillway of the Cross Dam is 276 ft discharging to a short (i.e. approximately 60-foot-long) reach of the Androscoggin River where it joins with the tailrace. The downstream Cascade Project and the discharges from the Cross powerhouse backwater to the toe of Cross Dam. Because the powerhouse is essentially integral to the dam, there is not a specific bypass reach minimum flow. However, when river flows exceed station capacity, the excess flows are passed over the spillway. Recreation activities such as fishing, and kayaking have been observed in the bypass reach although there are no recreation amenities within the bypass reach.

**TABLE 2-5. CROSS PROJECT - ZONE 2 – BYPASS REACH MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Cross Project Zone of Effect: 2 – Bypass Reach

Criterion	Alternative Standards				
	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			

<b>G</b>	<b>Cultural and Historic Resources Protection</b>	<b>X</b>				
<b>H</b>	<b>Recreational Resources</b>	<b>X</b>				

### **2.3 UPPER GORHAM PROJECT**

The Upper Gorham Project consists of four Zones of Effect: Impoundment, Bypass Reach, Tailrace, and Downstream Regulated Reach. The regulated river upstream of the Upper Gorham Project is controlled by flows released from the upstream Cascade Project. The Gorham Project backwaters to approximately 0.3 miles downstream of the Upper Gorham Project.

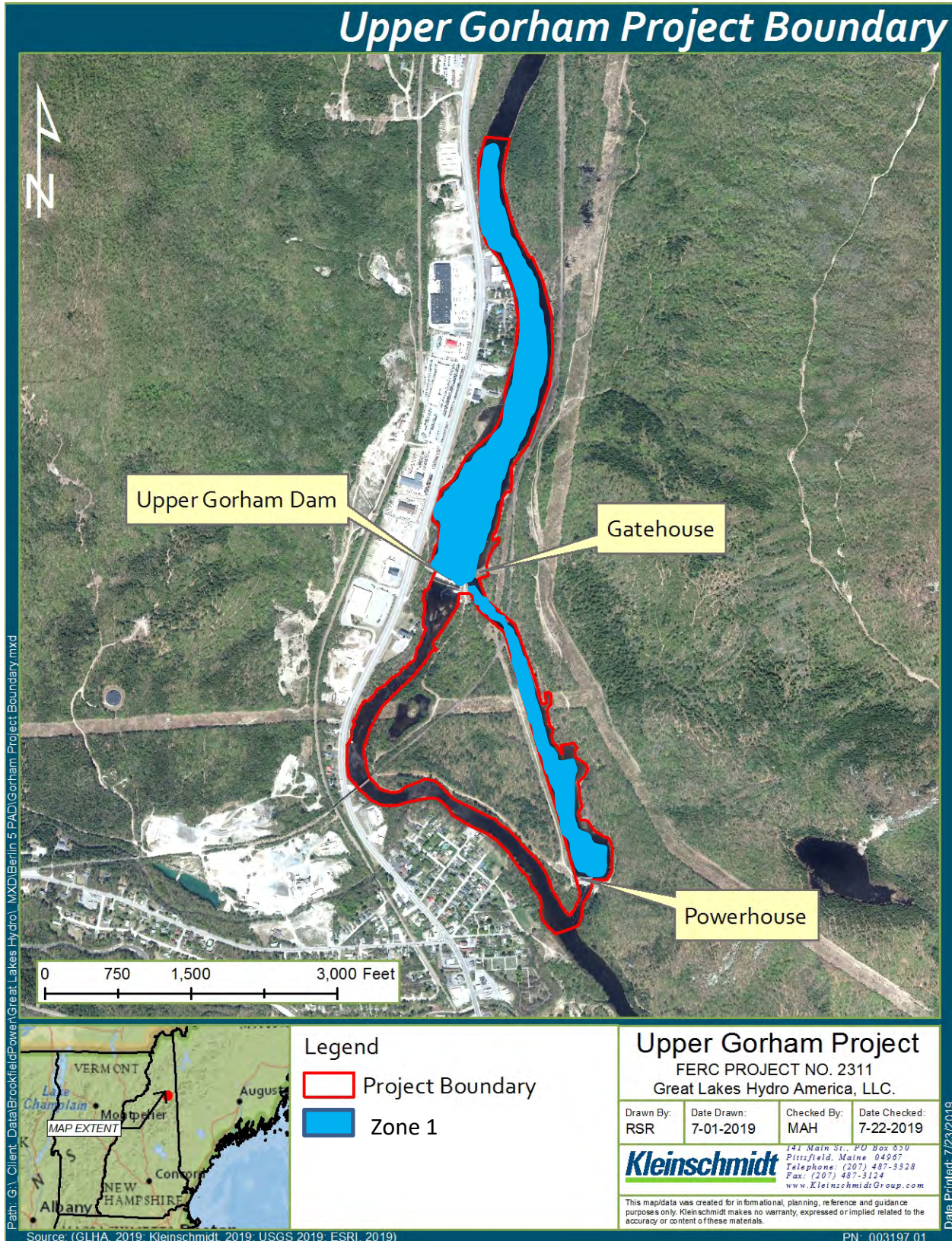
#### **2.3.1 ZONE 1 – IMPOUNDMENT**

The Upper Gorham Project impoundment is approximately 4,700 ft long from the dam to the upstream extent. The impoundment has 370 acre feet of storage at the normal full pond of 812.3 ft. The surface area at normal full pond is 45 acres. As a run of river facility, the Project has negligible net storage capacity.

Zone 1 also includes the 3,350 foot-long, 100 ft wide power canal, which is controlled by a gatehouse that has 7 operable stop log gates. The canal maintains an elevation of 811.8 ft, just 0.5 ft below the elevation of the headpond.



FIGURE 2-5. UPPER GORHAM PROJECT ZONE 1 - IMPOUNDMENT





**TABLE 2-6. UPPER GORHAM PROJECT - ZONE 1 – IMPOUNDMENT MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Upper Gorham Project

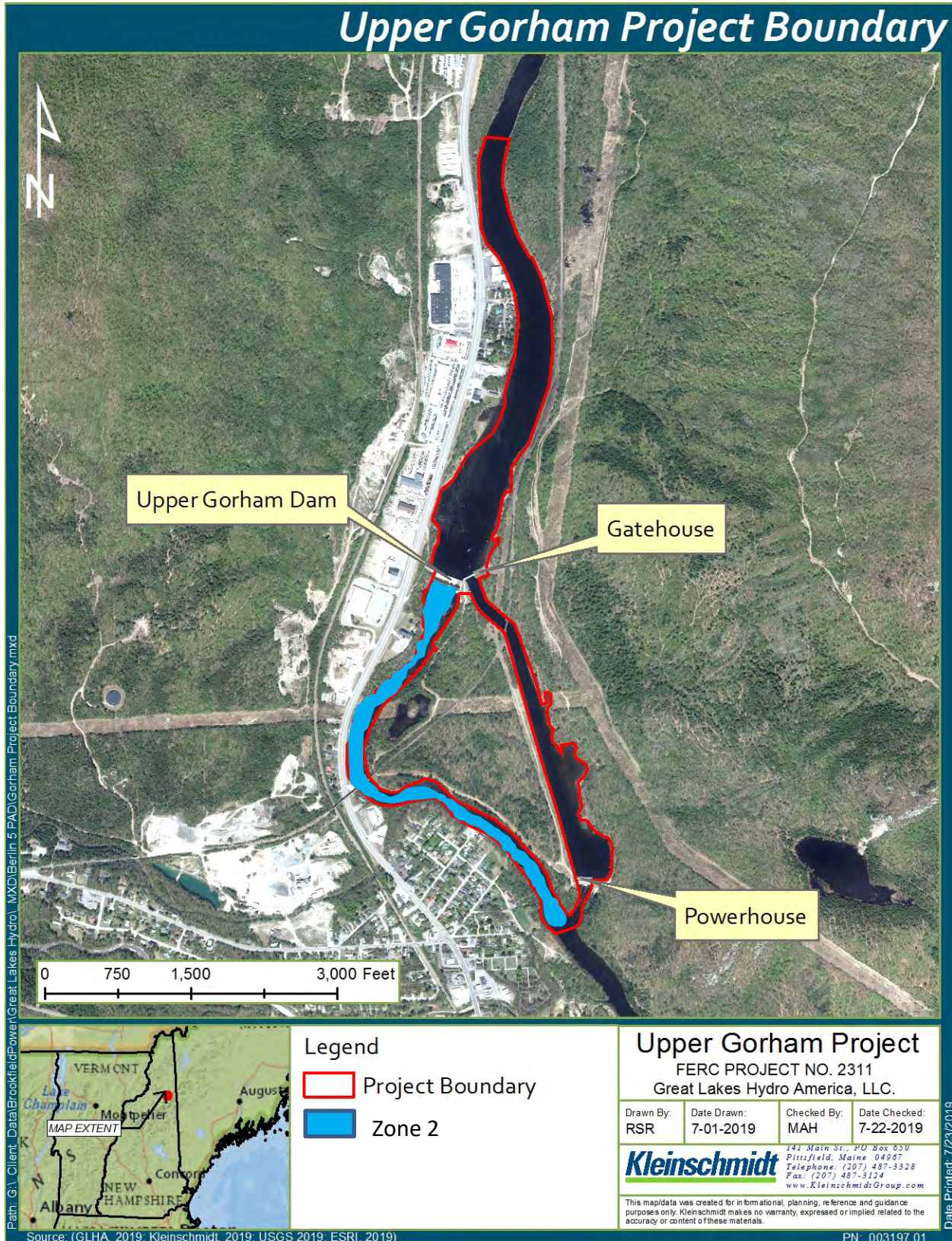
Zone of Effect: 1 – Impoundment

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

**2.3.2 ZONE 2 – BYPASS REACH**

The Upper Gorham bypass reach is approximately 1 mile long, extending from the Upper Gorham dam and following the natural river channel to the confluence with the Upper Gorham powerhouse. A seasonally variant minimum flow of 400 cfs from March 1 to June 15 and 200 cfs remainder of the year is provided into the bypass reach. No recreational amenities in the bypass reach, guided fishing trips do occur within the Upper Gorham bypass reach.

FIGURE 2-6 UPPER GORHAM PROJECT – ZONE 2 – BYPASS REACH



**TABLE 2-7. UPPER GORHAM PROJECT - ZONE 2 – BYPASS REACH MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Upper Gorham Project Zone of Effect: 2 – Bypass Reach

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

**2.3.3 ZONE 3 - TAILRACE**

The Upper Gorham tailrace extends 370 ft from the Upper Gorham powerhouse to the confluence with the bypass reach.



**FIGURE 2-7 UPPER GORHAM – ZONE 3 - TAILRACE**



**TABLE 2-8. UPPER GORHAM PROJECT - ZONE 3 – TAILRACE MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Upper Gorham Project

Zone of Effect: 3 – Tailrace

Criterion		Alternative Standards				
		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				

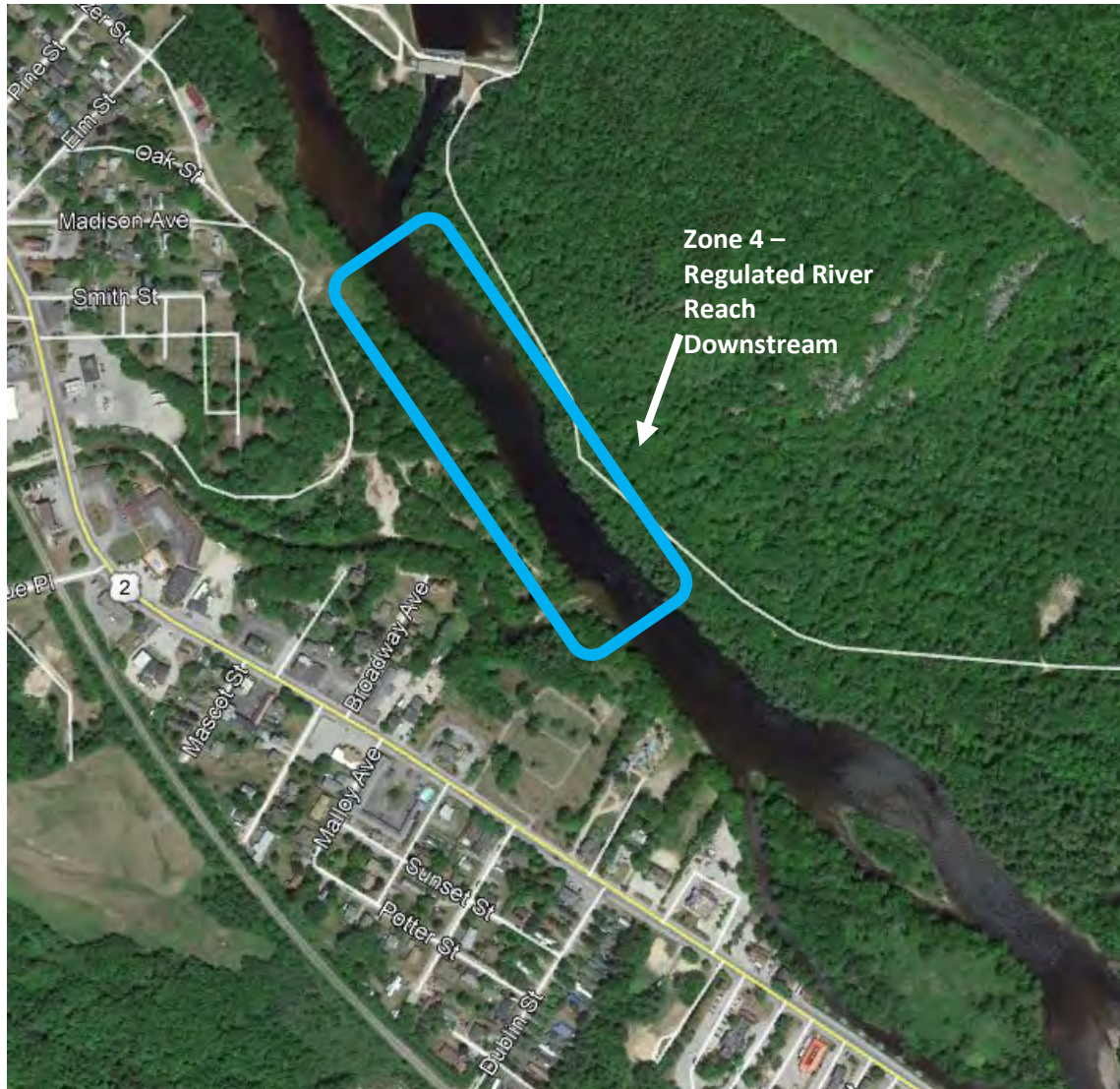
<b>H</b>	<b>Recreational Resources</b>	<b>X</b>				
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#### **2.3.4 ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**

This reach extends approximately 0.3 miles from the confluence of the Upper Gorham tailrace from the Upper Gorham powerhouse and the bypass reach downstream. The Androscoggin River at the point 0.3 miles downstream of the confluence is backwatered by the downstream Gorham Project.



**FIGURE 2-8 UPPER GORHAM – ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**



**TABLE 2-9. UPPER GORHAM PROJECT - ZONE 4 – TAILRACE MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Upper Gorham Project

Zone of Effect: 3 – Tailrace

Criterion	Alternative Standards				
	1	2	3	4	Plus
<b>A</b> Ecological Flow Regimes		X			
<b>B</b> Water Quality		X			
<b>C</b> Upstream Fish Passage	X				
<b>D</b> Downstream Fish Passage	X				
<b>E</b> Watershed and Shoreline Protection		X			
<b>F</b> Threatened and Endangered Species Protection		X			

<b>G</b>	<b>Cultural and Historic Resources Protection</b>	<b>X</b>				
<b>H</b>	<b>Recreational Resources</b>	<b>X</b>				

## **2.4 SHELBURNE PROJECT**

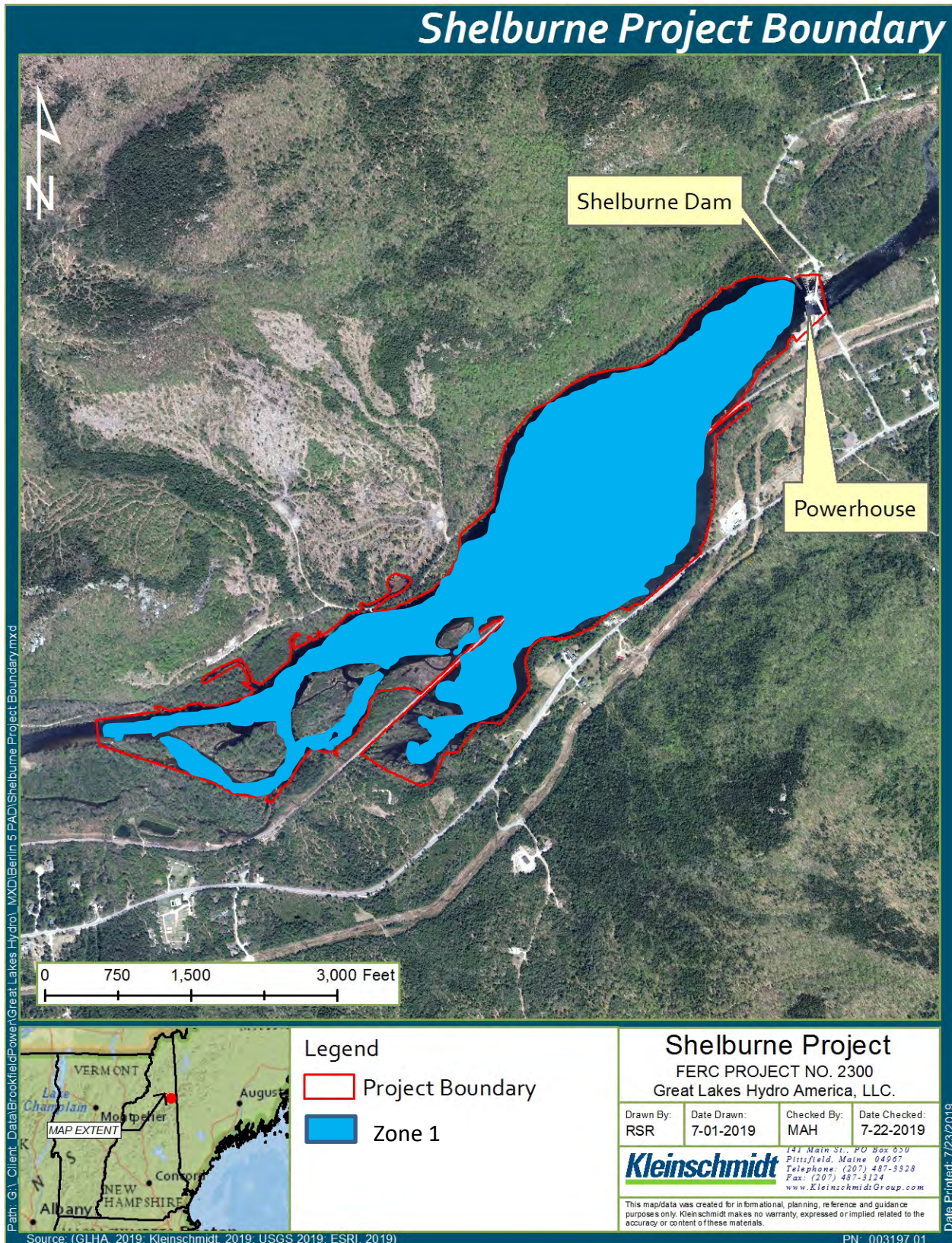
There are four Zones of Effect for the Shelburne Project: Impoundment, Bypass Reach, Tailrace, and Regulated River Reach Downstream. The Androscoggin River regulated reach upstream of the Project comes from the upstream Gorham Project. The impoundment hydrologic extent is contained within the upstream reach of the project boundary. The powerhouse is integral to the dam; however, a log sluice separates the short bypass reach from the tailrace. The tailrace and bypass reach converge to form the Regulated River Reach Downstream.

### **2.4.1 ZONE 1 – IMPOUNDMENT**

The Shelburne Project impoundment extends approximately 1.36 miles upstream from Shelburne Dam. The impoundment has a surface area of 250 acres at a normal full pond of 734.2 ft. The storage is negligible given the Project is run of river. Recreation activities such as boating, hiking, hunting, and fishing occur on the Shelburne impoundment in high concentrations.



FIGURE 2-9 SHELburnE PROJECT – ZONE 1 – IMPOUNDMENT



**TABLE 2-10. SHELBURNE PROJECT – ZONE 1 – IMPOUNDMENT MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Shelburne Project

Zone of Effect: 1 – Impoundment

Criterion		Alternative Standards				
		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			

**2.4.2 ZONE 2 – BYPASS REACH**

The Shelburne Dam spillway is 171 ft long and discharges to a short approximately 250 ft long bypass reach that converges with the tailrace at the end of the log sluice and abutment, which separates the two reaches. GLHA operates the Shelburne Project to release a minimum flow equal to that of existing leakage flow, estimated at no more than 2 cfs or inflow to the project reservoir, whichever is less. Fishing is common in the bypass area below the bridge.



**FIGURE 2-10 SHELBURNE PROJECT – ZONE 2 – BYPASS REACH**



**TABLE 2-11. SHELBURNE PROJECT - ZONE 2 – BYPASS REACH MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Shelburne Project Zone of Effect: 2 – Bypass Reach

Criterion	Alternative Standards				
	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			

### 2.4.3 ZONE 3 - TAILRACE

The Shelburne Project powerhouse discharges into a short reach approximately 130 ft in length and having an elevation of 717.9 ft prior to the confluence with the bypass reach flows. Guided fishing tours are launched below the bridge.

FIGURE 2-11 SHELburne PROJECT – ZONE 3 - TAILRACE



**TABLE 2-12. SHELBURNE PROJECT - ZONE 3 – TAILRACE MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Shelburne Project

Zone of Effect: 3 – Tailrace

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

**2.4.4 ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**

The Androscoggin River flows downstream from the Shelburne Project in the state of New Hampshire approximately 6.1 river miles to the border with the state of Maine.

**FIGURE 2-12 SHELburnE PROJECT – ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**



**TABLE 2-13. SHELburnE PROJECT - ZONE 4 – REGULATED RIVER REACH MATRIX OF ALTERNATIVE STANDARDS**

Facility Name: Shelburne Project Zone of Effect: 4 – Regulated River Reach

Criterion		Alternative Standards				
		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			



### 3.0 PROJECT LIHI CERTIFICATION CRITERION

The Projects are operated as a run of the river facilities with agency required minimum flows. There are no diadromous fish species in the upper Androscoggin River, therefore, fish passage facilities are not necessary nor have been requested or prescribed. Lands within the project boundary are limited to those required for project operations and project facilities. There are no documented endangered or threatened aquatic species in this reach of the Androscoggin River. The Canada Lynx and the Northern Long Eared Bat are identified as having the potential to be present or occupy habitats in the vicinity of the Projects, however, the Projects have no effect on the species as there are generally no tree-clearing activities or corridor maintenance activities. Cultural sites are present within and adjacent to the project boundary, but project operations have no effect on these resources. The projects have FERC approved recreation plans in place.

### 3.1 ECOLOGICAL FLOWS

The stated Low Impact Hydropower Institute goal for Criterion A – Ecological Flow Regimes is “The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.” A discussion of the applicable standards by Zone of Effect for each Project is provided in the Sections below.

#### 3.1.1 SAWMILL PROJECT

##### 3.1.1.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
A	<p><b>1</b></p> <p>The facility operates in a true run-of-river operational mode and there are no bypassed reaches or water diversions associated with the facility; or the facility is located within an existing water conduit that does not discharge into natural waterways</p>	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> <li>• For run-of-river facilities, provide details on operations and demonstrate that flows, water levels, and operation are monitored to ensure such an operational mode is maintained. If deviations from required flows have occurred, discuss them and the measures taken to minimize reoccurrence.</li> </ul>

The Project is operated in run-of-river mode with minimal impoundment fluctuations. The low headwater level limit is 1094 ft. Brookfield’s NSCC monitors operations including impoundment elevations and flows through both the Powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations. Any deviations from run-of-river operations or minimum flow requirements at the Project are reported to FERC as described above in Section 1.2.

For resident fish in the impoundment, the six-inch fluctuation target for run of river habitat enhances any bass spawning and nursery habitat that may be present in the impoundment and enhances aquatic invertebrate habitat.



**3.1.1.2 ZONE 2 – PROJECT BYPASS REACH**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

The bypass reach comprises a very short portion of the overall project and is bedrock ledge. This reach receives water during times of high flow in excess of the capacity of the powerhouse or when units are down. In addition, there is an agency recommended minimum flow of 12 cfs specific to the bypass reach. According to the November 1993 Final Environmental Impact Statement for the Upper Androscoggin River (FERC, 1993), the minimum flows were established by evaluating the Sawmill Project fishery resources and habitat in the bypassed reach via a fish survey and a minimum flow study, which evaluated the effects of alternative flows on fishery habitat. The conclusions were:

- Salmonids transiently reside in the bypassed reach as a result of downstream movement from upstream areas.
- No salmonid spawning habitat was observed.
- Salmonid habitat in the bypassed reach was not uniformly attractive or suitable.
- The 12 cfs minimum flow release would provide a zone of passage flow for downstream moving salmonids.

Given the overall lack of salmonid habitat in the immediate project area, New Hampshire Fish and Game and US Fish and Wildlife both concurred with the 12 cfs minimum flow.

**3.1.1.3 ZONE 3 – TAILRACE**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

This reach receives run of river flows from the powerhouse during times of generation. In addition, flows to the bypass reach will backwater to the tailrace during times of unit shut down. Brookfield’s NSCC monitors operations including impoundment elevations and flows through the powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations.

Any deviations from run-of-river operations or minimum flow requirements at the Development are reported to FERC as described above in Section 1.2.

### 3.1.2 CROSS PROJECT

#### 3.1.2.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
<b>A</b>	<b>1</b> The facility operates in a true run-of-river operational mode and there are no bypassed reaches or water diversions associated with the facility; or the facility is located within an existing water conduit that does not discharge into natural waterways	Not Applicable / De Minimis Effect: <ul style="list-style-type: none"> <li>• For run-of-river facilities, provide details on operations and demonstrate that flows, water levels, and operation are monitored to ensure such an operational mode is maintained. If deviations from required flows have occurred, discuss them and the measures taken to minimize reoccurrence.</li> </ul>

The Project is operated in run-of-river mode with minimal impoundment fluctuations. The low headwater level limit is 921.2 ft. Brookfield’s NSCC monitors operations including impoundment elevations and flows through both the Powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations. Any deviations from run-of-river operations or minimum flow requirements at the Project are reported to FERC as described above in Section 1.2.

For resident fish in the impoundment, the six-inch fluctuation target for run of river habitat enhances any bass spawning and nursery habitat that may be present in the impoundment and enhances aquatic invertebrate habitat.

**3.1.2.2 ZONE 2 – PROJECT BYPASS REACH**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

The bypass reach comprises a very short portion of the overall project and because the powerhouse is essentially integral to the dam and this reach of the river is subject to the backwater of the downstream Cascade Project, there is not a specific bypass reach minimum flow. Run of river operation ensures that inflows are passed downstream. However, when river flows exceed station capacity, the excess flows are passed over the spillway.

As stated by the FERC in the November 1993 EIS for the Upper Androscoggin River “Since the project discharges directly into the headpond of the Cascade Project and no bypassed reach exists, no bypass flows are necessary.” The New Hampshire Department of Fish and Game and USFWS “agree with James River’s operational proposal for Cross (letter from Donald A. Normandeau, Ph.D., Executive Director, NHFGD, Concord, NH June 5, 1992; letter from Jonathan P. Deason, Director, Office of Environmental Affairs, Office of the Secretary, US Department of the Interior, Washington, DC, July 13, 1992 letter).



### 3.1.3 UPPER GORHAM PROJECT

#### 3.1.3.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
A	<p><b>1</b> The facility operates in a true run-of-river operational mode and there are no bypassed reaches or water diversions associated with the facility; or the facility is located within an existing water conduit that does not discharge into natural waterways</p>	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> <li>• For run-of-river facilities, provide details on operations and demonstrate that flows, water levels, and operation are monitored to ensure such an operational mode is maintained. If deviations from required flows have occurred, discuss them and the measures taken to minimize reoccurrence.</li> </ul>

The Project is operated in run-of-river mode with minimal impoundment fluctuations. The low headwater level limit is 811.8 ft. Brookfield’s NSCC monitors operations including impoundment elevations and flows through both the Powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations. Any deviations from run-of-river operations or minimum flow requirements at the Project are reported to FERC as described above in Section 1.2.

For resident fish in the impoundment, the six-inch fluctuation target for run of river habitat enhances any bass spawning and nursery habitat that may be present in the impoundment and enhances aquatic invertebrate habitat.

**3.1.3.2 ZONE 2 – PROJECT BYPASS REACH**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

The bypass reach comprises a +-5,000-foot-long bypass reach. This reach receives water during times of high flow in excess of the capacity of the powerhouse or when units are down. In addition, there is an agency required minimum flow of 400 cubic feet per second (cfs) from March 1 to June 15, and 200 cfs from June 16 to February 28, or inflow to the project reservoir, whichever is less, for the protection and enhancement of fish and wildlife resources and water quality in the bypassed reach of the Androscoggin River.

**3.1.3.3 ZONE 3 – TAILRACE**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

This reach receives run of river flows from the powerhouse during times of generation. In addition, flows to the bypass reach will backwater to the tailrace during times of unit shut down. Brookfield’s NSCC monitors operations including impoundment elevations and flows through the powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations.

Any deviations from run-of-river operations or minimum flow requirements at the Development are reported to FERC as described above in Section 1.2.

**3.1.3.4 ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

This reach receives run of river flows from the powerhouse during times of generation and from the bypass reach during times of high water and/or unit shut down. Brookfield’s NSCC monitors operations including impoundment elevations and flows through the powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations.

Any deviations from run-of-river operations or minimum flow requirements at the Development are reported to FERC as described above in Section 1.2.



### 3.1.4 SHELBURNE PROJECT

#### 3.1.4.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
A	<p><b>1</b> The facility operates in a true run-of-river operational mode and there are no bypassed reaches or water diversions associated with the facility; or the facility is located within an existing water conduit that does not discharge into natural waterways</p>	<p>Not Applicable / De Minimis Effect:</p> <ul style="list-style-type: none"> <li>• For run-of-river facilities, provide details on operations and demonstrate that flows, water levels, and operation are monitored to ensure such an operational mode is maintained. If deviations from required flows have occurred, discuss them and the measures taken to minimize reoccurrence.</li> </ul>

The Project is operated in run-of-river mode with minimal impoundment fluctuations. The low headwater level limit is 733.7 ft. Brookfield’s NSCC monitors operations including impoundment elevations and flows through both the Powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations. Any deviations from run-of-river operations or minimum flow requirements at the Project are reported to FERC as described above in Section 1.2.

For resident fish in the impoundment, the six-inch fluctuation target for run of river habitat enhances any bass spawning and nursery habitat that may be present in the impoundment and enhances aquatic invertebrate habitat.

**3.1.4.2 ZONE 2 – PROJECT BYPASS REACH**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

The bypass reach comprises a very short portion of the overall project and is bedrock ledge. This reach receives water during times of high flow in excess of the capacity of the powerhouse or when units are down. In addition, there is an agency recommended minimum flow of 2 cfs specific to the bypass reach.

As stated by the FERC in the November 1993 EIS for the Upper Androscoggin River, “The Shelburne bypassed reach currently receives variable leakage flows and periodic spillage when river flows exceed the project’s hydraulic capacity of 3,105 cfs...” NHFGD stated that “the shore bypassed reach consists of bedrock and ledge and thus is not valuable as fish habitat...” (NHFGD, January 5, 1993). USFWS also concurred with the bypass flows “as long as flow is quantified and a means provided for its continued release” (USFWS, January 11, 1993).

**3.1.4.3 ZONE 3 – TAILRACE**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

This reach receives run of river flows from the powerhouse during times of generation. In addition, flows to the bypass reach will backwater to the tailrace during times of unit shut down. Brookfield’s NSCC monitors operations including impoundment elevations and flows through the powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations.

Any deviations from run-of-river operations or minimum flow requirements at the Development are reported to FERC as described above in Section 1.2.

**3.1.4.4 ZONE 4– REGULATED RIVER REACH DOWNSTREAM**

Criterion	Standard	Supporting Information
<b>A</b>	<p><b>2</b> The flow regime at the facility was developed in accordance with a, science-based agency recommendation</p>	<p>Agency Recommendation (see Appendix A for definitions):</p> <ul style="list-style-type: none"> <li>• 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).</li> <li>• 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.</li> <li>• Explain how the recommendation relates to agency management goals and objectives for fish and wildlife.</li> <li>• 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).</li> </ul>

This reach receives run of river flows from the powerhouse during times of generation. In addition, flows from the bypass reach during times of spill are provided to this reach. Brookfield’s NSCC monitors operations including impoundment elevations and flows through the powerhouse and as discharged through dam structures continuously to maintain compliance with requirements for run-of-river operations and minimum flows. As discussed in Section 3.1.1.1, maintenance of stable headpond elevations assures compliance with run-of-river obligations.

Any deviations from run-of-river operations or minimum flow requirements at the Development are reported to FERC as described above in Section 1.2.

**3.2 WATER QUALITY**

The stated Low Impact Hydropower Institute goal for Criterion B – Water Quality is “Water quality is protected in waterbodies directly affected by the facility, including downstream reaches, bypassed reaches, and impoundments above dams and diversions.” The applicable standard applies to all Zones of Effect and is discussed collectively for all reaches and all Projects.



Criterion	Standard	Supporting Information
<b>B</b>	<p><b>2</b></p> <p>The facility is in compliance with all water quality conditions contained in a recent Water Quality Certification or science-based resource agency recommendation providing reasonable assurance that water quality standards will be met for all waterbodies that are directly affected by the facility. Such recommendations, whether based on a generally applicable water quality standard or one that was developed on a site-specific basis, must include consideration of all water quality components necessary to preserve healthy fish and wildlife populations, human uses and recreation.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• If facility is located on a Water Quality Limited river reach, provide a link to the state’s most recent impaired waters list and indicate the page(s) therein that apply to facility waters. If possible, provide an agency letter stating that the facility is not a cause of such limitation.</li> <li>• Provide a copy of the most recent Water Quality Certificate and any subsequent amendments, including the date(s) of issuance. If more than 10 years old, provide documentation that the certification terms and conditions remain valid and in effect for the facility (e.g., a letter from the agency).</li> <li>• Identify any other agency recommendations related to water quality and explain their scientific or technical basis.</li> <li>• Describe all compliance activities related to water quality and any agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.</li> </ul>

The Androscoggin River in the GLHA NH Project Areas is classified by the state of New Hampshire as Class B. Class B waters are considered acceptable for fishing, swimming and other recreational purposes, and, after adequate treatment, for use as water supplies. Regulations for Class B waters include:

- no disposal of sewage or waste unless it has received adequate treatment to prevent the lowering of the physical, chemical, biological, or bacteriological characteristics;
- no disposal of sewage or waste that is harmful to aquatic life; and
- All surface waters shall be free from substances that: settle to form harmful benthic deposits; float as foam, debris, scum or other visible substances; produce odor, color, taste or turbidity that is not naturally occurring and would render the surface water unsuitable for its designated uses; result in the dominance of nuisance species; or interfere with recreational activities.

The Projects are operated as a run of river facilities with minimal fluctuation under a FERC and agency approved Operations Monitoring Plan. (See FERC and Regulatory Information) The projects meet all water quality standards for Class B waters pursuant to the Project’s Water Quality Certification.

### 3.3 UPSTREAM FISH PASSAGE

The stated Low Impact Hydropower Institute goal for Criterion C – Upstream Fish Passage is “The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the facility.”

The Projects do not have, and are not required to have, fish passage facilities, as anadromous fish are not present in the reaches occupied by the Projects. As such, all Zones of Effect meet Standard C-1 and are discussed collectively below.

Criterion	Standard	Supporting Information
C	<p><b>1</b></p> <p>The facility does not create a barrier to upstream passage, or there are no migratory fish in the vicinity of the facility and the facility is not the cause of extirpation of species that were present historically.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. Typically, impoundment zones will qualify for this standard since once above a dam and in an impoundment, there is no facility barrier to further upstream movement.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>

There is no upstream fish passage in this reach of the Androscoggin River occupied by the four Projects as migratory species such as alewife, blueback herring, striped bass, sea lamprey, and American shad are diadromous fish species are known not to be present in this river reach given the downstream Lewiston Falls in the state of Maine are impassable to these species and Rumford Falls in the state of Maine are impassable to Atlantic salmon. This is in accordance with the 2013 opinion of the National Marine Fisheries Service which states “The current GOM DPS includes all anadromous Atlantic salmon whose freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River, and wherever these fish occur in the estuarine and marine environment. The following impassable falls delimit the upstream extent of the freshwater range: Rumford Falls in the town of Rumford on the Androscoggin River. In the Androscoggin watershed, Rumford Falls was the upper extent of Atlantic salmon migration, while Lewiston Falls was believed to be the upper extent of alewife and shad migrations” (NMFS, 2009).

American eel, a catadromous fish species, are present in the lower Androscoggin River (i.e., downstream of Lewiston Falls) in relatively low numbers as compared to other watersheds in Maine (Yoder et al. 2006a). No American eels were collected in the upper Androscoggin River during fish sampling studies historically conducted in the Project areas (Yoder et al. 2006a).

The upper Androscoggin River in the Project area supports approximately 30 species of resident fish, a quarter of which are non-native (AMC 2003). The upper Androscoggin River throughout Maine and New Hampshire supports a well-known, popular coldwater trout and landlocked salmon fishery (JRNHE 1991). Angling for salmonids is bolstered by trout stocking and wild reproduction in the upper watershed and within tributaries. Cold water inflow from tributaries and regulated water releases from upper storage reservoirs (e.g., Umbagog and Aziscohos, and Richardson [Upper and Middle dams]) enhances coldwater fisheries habitat in the main stem of the Androscoggin River. Fish sampling studies conducted on the upper Androscoggin River in the vicinity of the Projects indicated that the overall catch was dominated by common fish species from the northeastern United States, including fallfish (30.6 percent), smallmouth bass (26.3 percent), white sucker (14.9 percent), and longnose dace (10.7 percent); common shiner (6.4 percent) and spottail shiner (4.2 percent) were also relatively abundant. Other species, such as rainbow trout, bullhead, and yellow perch were less common (i.e., less than or equal to 2 percent of the total catch). Smallmouth bass and white sucker were most common in riverine segments; smallmouth bass and fallfish were most common in the impounded segments (Yoder et al. 2006a). New Hampshire Fish and Game does not have a formal, published fisheries management plan for the upper Androscoggin River; however, they stock the river annually with brook trout, rainbow trout, and brown trout to support a put and take fishery approximately 10 miles upstream from the upstream-most Sawmill Project.

### **3.4 DOWNSTREAM FISH PASSAGE**

The stated Low Impact Hydropower Institute goal for Criterion D – Downstream Fish Passage is “The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, the facility minimizes loss of fish from reservoirs and upstream river reaches affected by facility operations. All migratory species can successfully complete their life cycles and to maintain healthy, sustainable fish and wildlife resources in the areas affected by the facility.” None of the Projects have fish passage facilities, and anadromous fish are not present in the reaches occupied by the Projects. As such, all Zones of Effect meet Standard D-1 and are discussed collectively.

Criterion	Standard	Supporting Information
D	<p><b>1</b></p> <p>The facility does not create a barrier to downstream passage, or there are no migratory fish in the vicinity of the facility; if migratory fish were present historically, the facility did not contribute to the extirpation of such species; the facility does not contribute adversely to the sustainability of riverine fish populations or to their access to habitat necessary for the completion of their life cycles.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• 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). Typically, tailwater/downstream zones will qualify for this standard since below a dam and powerhouse there is no facility barrier to further downstream movement. Bypassed reach zones must demonstrate that flows in the reach are adequate to support safe, effective and timely downstream migration.</li> <li>• 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.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>

There is no downstream fish passage in this reach of the upper Androscoggin River occupied by the Projects; diadromous fish species are not known to be present. This is in accordance with the 2013 opinion of the National Marine Fisheries Service statement above in criterion C.

There are no anadromous or catadromous fish species in this section of the Androscoggin River, as there are no upstream nor downstream fish passage facilities for migratory species upstream of the Lewiston Dam. Resident species discussed above may make their way into the various Project impoundments in times of spill. The Projects are operated with limited drawdowns which is protective of aquatic resources and agency recommended minimum bypass reach flows are in place to safeguard resident fish species. Maintenance work on the dams are planned in consultation with the local resource agencies. The Projects do not adversely impact the successful completion of resident fish lifecycles.

**3.5 SHORELINE AND WATERSHED PROTECTION**

The stated Low Impact Hydropower Institute goal for Criterion E – Shoreline and Watershed Protection is “The facility has demonstrated that sufficient action has been taken to protect, mitigate or enhance the condition of soils, vegetation and ecosystem functions on shoreline and watershed lands associated with the facility.” A discussion of the applicable standards by Zone of Effect for each Project is provided in the Sections below.



### 3.5.1 SAWMILL PROJECT

#### 3.5.1.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
E	<p><b>2</b></p> <p>The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands within the Project boundary are limited to those required for Project operations and Project recreation facilities. The Project’s run-of- river operation and license requirements for minimal impoundment fluctuation provide protection for the Project’s shoreline areas.

The Sawmill Project is the northernmost of the GHLA NH Projects and located on the northern edge of the City of Berlin. The east shoreline of the project impoundment is bordered sand and gravel terraces, most of which have been altered by industrial, commercial, and residential development, as well as railroad and bridge construction. The east shoreline of the impoundment is also characterized by low terraces and was altered by the railroad yard, railroad bed, mill yards, and commercial and residential development. Roads are on each side of the river, but the project facilities are not visible to the public except from Route 16.

#### 3.5.1.2 ZONE 2 – PROJECT BYPASS REACH

Criterion	Standard	Supporting Information
E	<p><b>1</b></p> <p>There are no lands associated with the facility where the facility owner has direct or indirect ownership or control over lands surrounding the facility and its riverine zones that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and the facility is not subject to any Shoreline Management Plan (SMP) or similar protection plan.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

The Sawmill bypass reach has a minimum flow requirement of 12 cfs, provided by a minimum flow notch in the boards and provides this flow during non-spill conditions. This flow was determined during the past relicensing to protect fishery resources by maintaining deep, pool habitat for transient fish species

**3.5.1.3 ZONE 3 – TAILRACE**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>E</b>	<b>2</b> The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands within the Project boundary along the tailrace of the Sawmill Project is limited to those required for Project operations. The Project’s run-of- river operation provides protection for the Project’s shoreline areas.

**3.5.2 CROSS PROJECT**

**3.5.2.1 ZONE 1 – PROJECT IMPOUNDMENT**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>E</b>	<b>2</b> The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands within the Project boundary are limited to those required for Project operations and Project recreation facilities. The Project’s run-of- river operation and license requirements for minimal impoundment fluctuation provide protection for the Project’s shoreline areas.

### 3.5.2.2 ZONE 2 – PROJECT BYPASS REACH

Criterion	Standard	Supporting Information
E	<p><b>1</b></p> <p>There are no lands associated with the facility where the facility owner has direct or indirect ownership or control over lands surrounding the facility and its riverine zones that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and the facility is not subject to any Shoreline Management Plan (SMP) or similar protection plan.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

The project lands within the bypass reach are minimal as the powerhouse is essentially integral to the dam, there is not a specific bypass reach minimum flow. Lands immediately adjacent to the Cross Dam are comprised of the dam and canal abutments.

### 3.5.3 UPPER GORHAM PROJECT

A Shoreline Protection Plan was developed for Upper Gorham Project, as required in Article 410 of the project license. The plan was filed on August 1, 1995 and supplemented by letter on May 12, 2000. The management plan adopted the provisions in the NH Comprehensive Shoreland Protection Act. The Act lists uses of the shoreland within a 250-foot buffer that are permitted, prohibited, or restricted. The Act established planting and vegetation removal standards within any existing woodland buffers.

#### 3.5.3.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
E	<p><b>2</b></p> <p>The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands within the Project boundary are limited to those required for Project operations and Project recreation facilities. The Project’s run-of- river operation and license requirements for minimal impoundment fluctuation provide protection for the Project’s shoreline areas. (see Exhibit G)

### 3.5.3.2 ZONE 2 – PROJECT BYPASS REACH

Criterion	Standard	Supporting Information
E	<p><b>1</b></p> <p>There are no lands associated with the facility where the facility owner has direct or indirect ownership or control over lands surrounding the facility and its riverine zones that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and the facility is not subject to any Shoreline Management Plan (SMP) or similar protection plan.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

The bypass reach comprises a +-5,000-foot-long bypass reach. This reach receives water during times of high flow in excess of the capacity of the powerhouse or when units are down. In addition, there is an agency required minimum flow of 400 cubic feet per second (cfs) from March 1 to June 15, and 200 cfs from June 16 to February 28, as measured immediately below the Gorham dam, or inflow to the project reservoir, whichever is less, for the protection and enhancement of fish and wildlife resources and water quality in the bypassed reach of the Androscoggin River

### 3.5.3.3 ZONE 3 – TAILRACE

Criterion	Standard	Supporting Information
E	<p><b>2</b></p> <p>The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands within the Project boundary along the tailrace of the Upper Gorham project are limited to those required for Project operations. The Project’s run-of- river operation provides protection for the Project’s shoreline areas. (See Exhibit G).



**3.5.3.4 ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>E</b>	<b>2</b> The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands along the reach of the Androscoggin River downstream of the Upper Gorham project are outside of the project boundary and not required for Project operations. The Project’s run-of- river operation provides protection for the Project’s shoreline areas. (See Exhibit G).

**3.5.4 SHELBURNE PROJECT**

A Shoreline Protection Plan was developed for the Shelburne Project, as required in Article 409 of the project license. The plan was filed on August 1, 1995 and supplemented by letter on May 12, 2000. The management plan adopted the provisions in the NH Comprehensive Shoreland Protection Act. The Act lists uses of the shoreland within a 250-foot buffer that are permitted, prohibited, or restricted. The Act established planting and vegetation removal standards within any existing woodland buffers.

**3.5.4.1 ZONE 1 – PROJECT IMPOUNDMENT**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>E</b>	<b>2</b> The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

The Shelburne Project Area includes the 250-acre impoundment, which extends approximately 2.0 miles upstream.

**3.5.4.2 ZONE 2 – PROJECT BYPASS REACH**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>E</b>	<b>1</b> There are no lands associated with the facility where the facility owner has direct or indirect ownership or control over lands surrounding the facility and its riverine zones that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and the facility is not subject to any Shoreline Management Plan (SMP) or similar protection plan.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

There is a small, 150-foot-long set of ledge falls in between the dam and powerhouse. The short, steep bypassed reach contains exposed bedrock ledge and pools that are backwatered from the tailwater.

**3.5.4.3 ZONE 3 – TAILRACE**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>E</b>	<b>2</b> The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands within the Project boundary along the tailrace of the Shelburne Project are limited to those required for Project operations. The Project’s run-of- river operation provides protection for the Project’s shoreline areas.

**3.5.4.4 ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**

Criterion	Standard	Supporting Information
E	<p><b>2</b></p> <p>The facility is in compliance with all government agency recommendations in a license or certificate, such as an approved SMP or equivalent for protection, mitigation or enhancement of shoreline surrounding the project.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans).</li> <li>• Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.</li> </ul>

Lands within the Project boundary along the regulated river reach downstream of the Shelburne Project are limited to those required for Project operations. The Project’s run-of- river operation provides protection for the Project’s shoreline areas.

**3.6 THREATENED AND ENDANGERED SPECIES**

The stated Low Impact Hydropower Institute goal for Criterion F – Threatened and Endangered Species Protection is “The facility does not negatively impact federal or state listed species”.

**3.6.1 FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES**

The USFWS has identified two mammals listed on the federally threatened species list that may occur in the Project Areas or may be affected by the Projects (USFWS 2019a,b,c). The July 1, 2019 USFWS Species Lists obtained using the Information for Planning and Consultation (IPaC) project planning tool identified the Canada lynx (*Lynx canadensis*) and the northern long-eared bat (USFWS 2019a,b,c).

There are no federally documented endangered or threatened aquatic species in this reach of the Androscoggin River including mussels (USFWS 2019a, b, c; NHB 2019a,b,c,d,e,and f). While Atlantic salmon has had a historic presence in the River, including project waters, there is no fish passage at the downstream Lewiston Falls Project, returns to the Androscoggin River have been low in recent decades, and there is no requirement for anadromous fish passage at the Lewiston Falls Project. As such, there is no expectation that Atlantic salmon would be in the Project Area.

Federally listed species, as they have the potential to occur within all reaches of the upper Androscoggin River for all Projects, are discussed collectively as such in this section.

Criterion	Standard	Supporting Information
F	<p><b>2</b> There are listed species in the area, but the facility has been found by an appropriate resource management agency to have no negative effect on them, or habitat for the species does not exist within the project’s affected area or is not impacted by facility operations.</p>	<p>Finding of No Negative Effects:</p> <ul style="list-style-type: none"> <li>• Identify all federal and state listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies.</li> <li>• Provide documentation that there is no demonstrable negative effect of the facility on any listed species in the area from an appropriate natural resource management agency or provide documentation that habitat for the species does not exist within the ZoE or is not impacted by facility operations.</li> </ul>

The Canada Lynx and the Northern Long Eared Bat are identified as having the potential to be present or occupy habitats in the vicinity of the Projects, however, the Projects have no effect on the species as there are generally no tree-clearing activities or corridor maintenance activities. Minor mowing and brush removal on the canals and dam abutments may occur but typically trees of a basal diameter of less than 4 inches would be expected to be removed and no significant tracts of forested lands occur within the project boundaries. Furthermore, northern New Hampshire is only considered supporting landscape for Canada lynx, so it is unlikely the species would use the Projects Areas for anything other than for transient purposes.

### 3.6.2 STATE LISTED THREATENED AND ENDANGERED SPECIES

Based on the available habitat and ranges of the state listed species using the New Hampshire Fish and Game species list and fact sheets within the New Hampshire Wildlife Action Plan, four state endangered bat species (the eastern small-footed bat, the little brown bat, the tri-colored bat, and the federally threatened northern long-eared bat) have been identified as having the potential to occur in or near the Project Areas (USFWS 2019a, b, c; NHB 2019a,b,c,d,e,and f).

A species review through the New Hampshire Natural Heritage Bureau (NHB) was requested for the Projects; the reports for the Sawmill and Cross Projects stated that there are no recorded occurrences for sensitive species near this project area. Reports for Upper Gorham and Shelburne show that the bald eagle and peregrine falcon and the sugar maple – silver maple – white ash floodplain forest natural community (NHB 2019a,b,c,d,e,and f) have the potential to occur within the project boundary for the Upper Gorham and/or Shelburne Projects.

Bald eagles and peregrine falcon have also been documented in the Project Areas. While eagles are no longer listed under the Endangered Species Act, eagles continue to be protected under the federal Bald Eagle and Golden Eagle Protection Act (“Eagle Act”) as well as other federal laws and are legally protected in New Hampshire as a species of special concern. Based on the New Hampshire Natural Heritage Bureau, there are five bald eagle nests documented on the upper Androscoggin River within or adjacent to the Project Areas. The peregrine falcon was first reported in 2015 near the Upper Gorham Project and in 2018, two nests were recorded, however no chicks fledged (NHB 2019f).

The NHB has identified an exemplary sugar maple-silver maple-white ash floodplain forest between Upper Gorham and Shelburne projects, one of only two documented floodplain forests of this type in the state. Portions of this natural community are described as having evident disturbance and patchy distribution of invasive species while records indicate that to the east “was a typical, non-disturbed patch of high terrace floodplain forest” (personal communication with Amy Lamb, New Hampshire Heritage Bureau, 2019). Rare plants that have the potential to occur in the vicinities of the Projects are listed in Table 3-1 (NH Natural Heritage Bureau 2018).

**TABLE 3-1 RARE PLANTS REPORTED IN GORHAM, NEW HAMPSHIRE**

COMMON NAME	SCIENTIFIC NAME	STATE LISTED
auricled twayblade	<i>Neottia auriculata</i>	E
dwarf blueberry	<i>Vaccinium cespitosum</i>	T
fragrant wood fern	<i>Dryopteris fragrans</i>	T
heart-leaved twayblade	<i>Neottia cordata</i>	T
Hornemann's willow-herb	<i>Epilobium hornemannii</i> ssp. <i>hornemannii</i>	T
mountain sweet-cicely	<i>Osmorhiza berteroi</i>	E
ovoid spikesedge	<i>Eleocharis ovata</i>	E
parasol sedge	<i>Carex umbellata</i>	E
pink shinleaf	<i>Pyrola asarifolia</i> ssp. <i>asarifolia</i>	E
purple virgin's-bower	<i>Clematis occidentalis</i> ssp. <i>occidentalis</i>	E
round-leaved orchid	<i>Amerorchis rotundifolia</i>	E
smooth cliff fern	<i>Woodsia glabella</i>	E

*E= State-listed Endangered*

*T=State-listed Threatened*

Based on the IPaC review and NHB reviews, no state-listed fish or mussel species were identified occurring in the Project Areas.

State-listed species, as some have the potential to occur within all reaches of the upper Androscoggin River for all Projects, are discussed collectively as such in this section.



Criterion	Standard	Supporting Information
<b>F</b>	<p><b>2</b>            There are listed species in the area, but the facility has been found by an appropriate resource management agency to have no negative effect on them, or habitat for the species does not exist within the project’s affected area or is not impacted by facility operations.</p>	<p>Finding of No Negative Effects:</p> <ul style="list-style-type: none"> <li>• Identify all federal and state listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies.</li> <li>• Provide documentation that there is no demonstrable negative effect of the facility on any listed species in the area from an appropriate natural resource management agency or provide documentation that habitat for the species does not exist within the ZoE or is not impacted by facility operations.</li> </ul>

Routine project operations are not anticipated to affect threatened or endangered bats. There may be periodic vegetation clearing for dam safety, access, and other purposes but these would be conducted in accordance with the Section 4(d) rule using the USFWS streamlined consultation process for NLEB. As such, no negative effects are anticipated by this periodic activity.

The Upper Gorham and Shelburne Projects are operated in run-of-river mode. Limited impoundment fluctuations would not be expected to produce long-term impacts to the rare floodplain. No state-listed botanical species are documented in the Project Areas and lands within the project boundaries for the Projects are limited and largely developed.

Migratory birds, including bald eagle and peregrine falcon are likely found in the area during spring and fall migrations. However, there are no known adverse effects as a result of project operations.

**3.7 CULTURAL AND HISTORIC RESOURCES**

The stated Low Impact Hydropower Institute goal for Criterion G – Cultural and Historic Resource Protection is “The facility does not unnecessarily impact cultural or historic resources that are associated with the facility’s lands and waters, including resources important to local indigenous populations, such as Native Americans.” This standard is discussed collectively for all Projects and Zones of Effect.

There are no known archeological sites within the project boundaries. In 1987, a preliminary archaeological assessment conducted in the Upper Gorham Project Area showed no archaeological resources. A 1987 survey at Cross Power showed no historical or archaeological resources in the Project Area (FERC 1994a). No features within the Project Areas are listed on the National Register of Historic Places, and the state of New Hampshire’s division of Historical Resources has not listed any of the sites in the State Register of Historic Places.

Criterion	Standard	Supporting Information
<b>G</b>	<b>1</b> There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not adversely affected those that are or were historically present.	Not Applicable / De Minimis Effect: <ul style="list-style-type: none"> <li>• Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility.</li> <li>• Document that the facility construction and operation have not in the past, nor currently adversely affect any cultural or historic resources that are present on facility lands.</li> </ul>

The GLHA NH Projects are required to submit an annual report for managing historic properties, as set forth in the 1993 Programmatic Agreement for Managing Historic Properties and the 1996 Programmatic Agreement Amendment. For GLHA, this agreement specifically applies to the following features:

- Sawmill: The crib structure in the impoundment
- Cross Power: the dam, powerhouse, gatehouse, and gatehouse machinery
- Cascade: the powerhouse and dam
- Upper Gorham: the dam, gatehouse, powerhouse, and machinery
- Shelburne: the powerhouse

This Agreement states that GLHA is required to submit an annual report regarding any alterations, or future planned alterations to the structures listed above.

### 3.8 RECREATIONAL RESOURCES

The stated Low Impact Hydropower Institute goal for Criterion H – Recreation Resources is “The facility accommodates recreation activities on lands and waters controlled by the facility and provides recreational access to its associated lands and waters without fee or charge.”

#### 3.8.1 SAWMILL PROJECT

There are no licensee-managed recreation facilities at the Sawmill Project. However, several recreation facilities are located at or near the Sawmill Project.

##### 3.8.1.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
<b>H</b>	<b>2</b> The facility demonstrates compliance with resource agency recommendations for recreational access or accommodation (including recreational flow releases), or any enforceable recreation plan in place for the facility.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.</li> <li>• Document that the facility is in compliance with all such recommendations and plans.</li> </ul>

Service Credit Union Heritage Park, also known as Northern Forest Heritage Park (Heritage Park), is located immediately to the west of Sawmill dam and is managed by the Androscoggin Valley Chamber of Commerce, with support from public and private groups such as Service Credit Union, to sponsor recreational events throughout the year (Service Park Credit Union, Undated). The park was established in 1994 as part of a 12-acre land donation from James River, the previous licensee. Heritage Park hosts river tours, cultural events, concerts and holiday parties as well as special events such as logging competitions. In 1997 James River also donated the Company House to Heritage Park. (GLHA 2019).

Rotary Park, located adjacent to the Sawmill Project impoundment, provides access to the Sawmill impoundment via the shoreline and is operated and maintained by the City of Berlin. Rotary Park was part of the 12-acres of land donated by James Hydro as stated within the 1994 Recreation Plan (James River 1994).

Centennial Park, located on the Sawmill Project impoundment, provides access to the Sawmill impoundment via a single lane boat launch. This site has one ADA compliant parking space and a seasonally installed ADA compliant temporary restroom facility. The site is operated by the City of Berlin.

Improvements made in the mid-1990s, as outlined in the 1994 Recreation Plan, at Rotary Park are in the process of being removed and redesigned as part of the City of Berlin’s new Riverwalk (GLHA 2019).

Heritage Park, Centennial Park and Rotary Park are not currently part of the project boundary.

**3.8.1.2 ZONE 2 – BYPASS REACH**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>H</b>	<b>1</b> The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.	Not Applicable / De Minimis Effect: • Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.

There is no recreational or public access to the bypass reach. Lands surrounding the bypass reach are entirely for project purposes, being comprised of the dam.

**3.8.1.3 ZONE 3 – TAILRACE**

<b>Criterion</b>	<b>Standard</b>	<b>Supporting Information</b>
<b>H</b>	<b>1</b> The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.	Not Applicable / De Minimis Effect: • Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.

Access within this Zone of Effect is unavailable and there are no recreation facilities, formal or informal, providing opportunities to this reach.

### 3.8.2 CROSS PROJECT

There are no formal access points to the project and no recreational facilities are located either within or bordering the project boundary. The standard then, applies to all Zones of Effect for the Cross Project.

Criterion	Standard	Supporting Information
H	<b>1</b> The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.	Not Applicable / De Minimis Effect: <ul style="list-style-type: none"> <li>• Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.</li> </ul>

### 3.8.3 UPPER GORHAM PROJECT

Project lands at Upper Gorham contain a variety of recreation facilities; however, they are not provided by GLHA.

#### 3.8.3.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
H	<b>2</b> The facility demonstrates compliance with resource agency recommendations for recreational access or accommodation (including recreational flow releases), or any enforceable recreation plan in place for the facility.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.</li> <li>• Document that the facility is in compliance with all such recommendations and plans.</li> </ul>

GLHA has agreements providing snowmobile and hiking access trails over project lands and the public can access the impoundment via Route 16. The bridge across the river leading to the powerhouse is part of the Mahosuc Trail, maintained by the Appalachian Mountain Club and joins the Appalachian Trail on the north side of the river. The state of New Hampshire created parking areas and extended a snowmobile trail near the Project.

#### 3.8.3.2 ZONE 2 – BYPASS REACH

Criterion	Standard	Supporting Information
H	<b>2</b> The facility demonstrates compliance with resource agency recommendations for recreational access or	Agency Recommendation: <ul style="list-style-type: none"> <li>• Document any comprehensive resource agency recommendations and enforceable</li> </ul>

	accommodation (including recreational flow releases), or any enforceable recreation plan in place for the facility.	recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.
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In 2012, GLHA received permission from FERC to grant a recreational ROW to Coos Cycling Club for the development and maintenance of a non-motorized bicycle trail named Power Island on project lands that were not being used for project-specific purposes.

### 3.8.3.3 ZONE 3 – TAILRACE

Criterion	Standard	Supporting Information
H	<b>1</b> The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.	Not Applicable / De Minimis Effect: • Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.

Access within this Zone of Effect is unavailable and there are no recreation facilities, formal or informal, providing opportunities to this reach.

### 3.8.3.4 ZONE 4 – REGULATED RIVER REACH DOWNSTREAM

Criterion	Standard	Supporting Information
H	<b>1</b> The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.	Not Applicable / De Minimis Effect: • Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.

Access within this Zone of Effect is unavailable and there are no recreation facilities, formal or informal, providing opportunities to this reach.

### 3.8.4 SHELBURNE PROJECT

Project lands at the Shelburne offer recreation opportunities; however, there are no recreational facilities provided by GLHA within or adjacent to the project boundary at Shelburne.



### 3.8.4.1 ZONE 1 – PROJECT IMPOUNDMENT

Criterion	Standard	Supporting Information
H	<b>2</b> The facility demonstrates compliance with resource agency recommendations for recreational access or accommodation (including recreational flow releases), or any enforceable recreation plan in place for the facility.	Agency Recommendation: <ul style="list-style-type: none"> <li>• Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.</li> <li>• Document that the facility is in compliance with all such recommendations and plans.</li> </ul>

The Appalachian Trail crosses the Androscoggin River at the North Road Bridge adjacent to and downstream of the Shelburne dam and powerhouse. Parking at the trailhead is provided by the Appalachian Mountain Club. GLHA has developed an informal boat access that allows access to the river reach below the powerhouse for canoes and kayaks. This access is a non-project feature within the project boundary. While there are no formal access points onto the impoundment, the impoundment is used for boating and fishing. Leadmine State Forest borders much of the northern shore of the impoundment.

### 3.8.4.2 ZONE 2 – BYPASS REACH

Criterion	Standard	Supporting Information
H	<b>1</b> The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.	Not Applicable / De Minimis Effect: <ul style="list-style-type: none"> <li>• Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.</li> </ul>

Leadmine State Forest borders a small portion of the southern shore downstream. The town of Shelburne maintains a canoe launch downstream of the Project.

### 3.8.4.3 ZONE 3 – TAILRACE

Criterion	Standard	Supporting Information
H	<b>1</b> The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.	Not Applicable / De Minimis Effect: <ul style="list-style-type: none"> <li>• Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.</li> </ul>

Access within this Zone of Effect is unavailable and there are no recreation facilities, formal or informal, providing opportunities to this reach.

**3.8.4.4 ZONE 4 – REGULATED RIVER REACH DOWNSTREAM**

Criterion	Standard	Supporting Information
<b>H</b>	<p><b>2</b> The facility demonstrates compliance with resource agency recommendations for recreational access or accommodation (including recreational flow releases), or any enforceable recreation plan in place for the facility.</p>	<p>Agency Recommendation:</p> <ul style="list-style-type: none"> <li>• Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations.</li> <li>• Document that the facility is in compliance with all such recommendations and plans.</li> </ul>

GLHA has developed an informal boat access that allows access to the river reach below the powerhouse for canoes and kayaks. This access is a non-project feature within the project boundary that is maintained by the town of Shelburne.

**4.0 SWORN STATEMENT AND WAIVER FORM**

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 Great Lakes Hydro, the Undersigned attests that the material presented in the application is true and complete. America LLC

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: Great Lakes Hydro America LLC

Authorized Representative:

Name: Thomas Uncher

Title: Vice President, Operations

Authorized Signature: 

Date: 8/26/20

## 5.0 CONTACTS FORM

### 5.1 APPLICANT RELATED CONTACTS

<b>Project Owner:</b>	
Name and Title	Tom Uncher, Vice President
Company	Great Lakes Hydro America LLC
Phone	518-743-2018
Email Address	<a href="mailto:Thomas.Uncher@brookfieldrenewable.com">Thomas.Uncher@brookfieldrenewable.com</a>
Mailing Address	150 Main St. Lewiston Maine 04240
<b>Project Operator (if different from Owner):</b>	
Name and Title	Pat McDonough, Senior Operations Manager
Company	Brookfield White Pine Hydro, LLC
Phone	207-376-7063
Email Address	Patrick.McDonough@brookfieldrenewable.com
Mailing Address	259 Switzerland Rd, Lewiston, ME 04240
<b>Consulting Firm / Agent for LIHI Program (if different from above):</b>	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
<b>Compliance Contact (responsible for LIHI Program requirements):</b>	
Name and Title	Kelly Maloney, Manager, Compliance Northeast
Company	Brookfield Renewable
Phone	207-755-5606
Email Address	<a href="mailto:Kelly.Maloney@brookfieldrenewable.com">Kelly.Maloney@brookfieldrenewable.com</a>
Mailing Address	150 Main St. Lewiston, Maine 04240
<b>Party responsible for accounts payable:</b>	
Name and Title	Judith Charette Manager, Accounts Payable, Finance & Accounting
Company	Brookfield Renewable
Phone	819-561-8099
Email Address	<a href="mailto:Judith.Charette@brookfieldrenewable.com">Judith.Charette@brookfieldrenewable.com</a>
Mailing Address	41 Victoria, Gatineau, QC, Canada J8X2A1

**5.2 CURRENT AND RELEVANT STATE, FEDERAL, AND TRIBAL RESOURCE AGENCY CONTACTS WITH KNOWLEDGE OF THE FACILITY**

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources <u>X</u> , Recreation __):	
Agency Name	US Bureau of Indian Affairs
Name and Title	Harold Peterson, Natural Resources Officer
Phone	(615) 564-6838
Email address	Harold.Peterson@bia.gov
Mailing Address	545 Marriott Drive, Suite 700, Nashville, TN 37214

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality <u>X</u> , Fish/Wildlife Resources <u>X</u> , Watersheds <u>X</u> , T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	New Hampshire Department of Environmental Services
Name and Title	Gregg Comstock, Supervisor, Water Quality Planning Section
Phone	(603) 271-2983
Email address	gregg.comstock@des.nh.gov
Mailing Address	11 Hazen Dr, Concord, NH 03301

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds <u>X</u> , T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	US Forest Service
Name and Title	Mark Prout, Forest Fish Biologist
Phone	603-536-6224
Email address	mprout@fs.fed.us
Mailing Address	71 Mountain Drive, Campton, NH 03223

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds <u>X</u> , T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	New Hampshire Department of Fish and Game
Name and Title	Carol Henderson, Environmental Review Coordinator
Phone	603-271-3421
Email address	carol.henderson@wildlife.nh.gov
Mailing Address	11 Hazen Drive, Concord, NH 03301

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	New Hampshire Department of Fish and Game
Name and Title	Diane Timmins, Region 1 Fisheries Biologist
Phone	(603) 788-3164
Email address	diane.timmins@wildlife.nh.gov
Mailing Address	629B Main Street, Lancaster, NH 03584



<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	New Hampshire Department of Fish and Game
Name and Title	Will Staats, Region 1 Wildlife Biologist
Phone	(603) 788-3164
Email address	
Mailing Address	629B Main Street, Lancaster, NH 03584

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. <u>X</u> , Cultural/Historic Resources __, Recreation __):	
Agency Name	New Hampshire Department of Natural and Cultural Resources
Name and Title	Amy Lamb, Ecological Information Specialist, Natural Heritage Bureau
Phone	(603) 271-2834
Email address	Amy.Lamb@dred.nh
Mailing Address	172 Pembroke Rd, Concord, NH 03301

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	US Fish and Wildlife Service
Name and Title	Julianne Rosset
Phone	
Email address	julianne_rosset@fws.gov
Mailing Address	70 Commercial Street, Suite 300, Concord, NH 03304

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources <u>X</u> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	NOAA
Name and Title	Sean P McDermott, Fisheries Biologist
Phone	(978) 281-9113
Email address	<a href="mailto:sean.mcdermott@noaa.gov">sean.mcdermott@noaa.gov</a>
Mailing Address	55 Great Republic Drive Gloucester, MASSACHUSETTS 01930-2237

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources <u>X</u> , Recreation __):	
Agency Name	New Hampshire Department of Natural and Cultural Resources, Division of Historic Resources
Name and Title	Elizabeth Muzzey, Director and State Historic Preservation Officer
Phone	
Email address	elizabeth.muzzey@dcr.nh.gov
Mailing Address	19 Pillsbury Street, 2 <sup>nd</sup> Floor, Concord, NH 03301

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	U.S. National Park Service
Name and Title	Kevin Mendik, ESQ. NPS Hydro Program Coordinator
Phone	617-223-5299
Email address	<a href="mailto:kevin_mendik@NPS.gov">kevin_mendik@NPS.gov</a>
Mailing Address	15 State Street, 10th floor, Boston, Massachusetts 02109

### 5.3 CURRENT STAKEHOLDER CONTACTS THAT ARE ACTIVELY ENGAGED WITH THE FACILITY

<b>NGO Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	City of Berlin
Name and Title	James Wheeler, City Manager
Phone	(603) 752-7532
Email address	<a href="mailto:jwheeler@berlinnh.gov">jwheeler@berlinnh.gov</a>
Mailing Address	168 Main Street, Berlin, NH 3570

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	City of Shelburne
Name and Title	Town Clerk
Phone	603-466-2262
Email address	
Mailing Address	74 Village Road, Shelburne, NH 03581

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Town of Gorham
Name and Title	Mark Shea, City Manager
Phone	
Email address	
Mailing Address	20 Park Street, Gorham, NH 03581

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	American Rivers
Name and Title	Brian Graber, Director Northeast Field Office
Phone	530-478-0206
Email address	<a href="mailto:bgraber@americanrivers.org">bgraber@americanrivers.org</a>
Mailing Address	516 West Hampton Rd, Southampton, MA 01062

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Audubon Society of New Hampshire
Name and Title	Carol Foss, Senior Advisor for Science and Policy
Phone	(603) 224-9909, ext. 331
Email address	cfoss@nhaudubon.org
Mailing Address	84 Silk Farm Rd, Concord, NH 03301

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Appalachian Mountain Club
Name and Title	Mark Zakutansky
Phone	610-868-6915
Email address	mzakutansky@outdoors.org
Mailing Address	100 Illick's Mill Road, Bethlehem, PA 18017

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	New England FLOW
Name and Title	Thomas Christopher, Principal
Phone	
Email address	tom.christopher@comcast.net
Mailing Address	252 Fort Pond Inn Rd, Lancaster, MA 01523

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	American Canoe Association
Name and Title	Wade Blackwood, Executive Director
Phone	
Email address	
Mailing Address	1340 Central Blvd, Suite 210, Fredericksburg, VA 22401

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	American Whitewater
Name and Title	Kevin Colburn, National Stewardship Director
Phone	
Email address	kevin@americanwhitewater.org
Mailing Address	1035 Van Buren St, Missoula, MT 59802

<b>Agency Contact</b> (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Town of Dummer
Name and Title	Town Clerk
Phone	(603) 449-2006
Email address	
Mailing Address	75 Hill Rd, Dummer, NH 03588

## **6.0 FERC AND REGULATORY INFORMATION**

### **6.1 FERC LICENSE AND AMENDMENT ORDERS**

- Federal Energy Regulatory Commission (FERC). 1994. Order Issuing New License. James River-New Hampshire Electric, Inc. Sawmill Hydroelectric Project No. 2422-004. Issued August 1, 1994. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13711044>
- Federal Energy Regulatory Commission (FERC). 1994. Order Issuing New License. James River-New Hampshire Electric, Inc. Upper Gorham Hydroelectric Project No. 2311-001. Issued August 1, 1994. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13711045>
- Federal Energy Regulatory Commission (FERC). 1994. Order Issuing New License. James River-New Hampshire Electric, Inc. Cross Hydroelectric Project No. 2326-001. Issued August 1, 1994. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12148393>
- Federal Energy Regulatory Commission (FERC). 1994. Order Issuing New License. James River-New Hampshire Electric, Inc. Shelburne Hydroelectric Project No. 2300-001. Issued August 1, 1994. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13711041>

### **6.2 WATER QUALITY CERTIFICATION, AMENDMENTS, AND REPORTS**

- See Section 7.0 for Water Quality Certifications for the Cross, Sawmill, Upper Gorham and Shelburne Projects
- See Section 6.5.1 for water quality monitoring reports

### **6.3 SETTLEMENT AND OTHER AGREEMENTS**

- 1983 Androscoggin River Headwaters Agreement (attached in Section 7.0)

### **6.4 PERMITS**

- NPDES cooling water permits (attached in Section 7.0)

### **6.5 COMPLIANCE PLANS AND MONITORING REPORTS**

- Operations Monitoring Plans
- Water Quality Monitoring Plans
- James River. 1994. Sawmill, Cross, Upper Gorham, and Shelburne Dam Recreation Plan. Approved by FERC August 1, 1994. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10702395>

#### **6.5.1 ECOLOGICAL FLOWS AND WATER QUALITY**

- Federal Energy Regulatory Commission (FERC). 1993. Final Environmental Impact Statement. Relicensing Seven Existing Projects in the Upper Androscoggin River Basin (FERC 2422-004, 2287-003, 2326-002, 2327-002, 2322-001, 2288-004, 2300-002). <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=165045>



- Kleinschmidt Associates (Kleinschmidt). 1998. Water Quality Monitoring Report. Crown Vantage-New Hampshire Electric, Inc. Sawmill Project (FERC No. 2422), Cross Power Project (FERC No. 2326), Cascade Project (FERC No. 2327), Gorham Project (FERC No. 2311), and Shelburne Project (FERC No. 2300). June 1998. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=53664>
- New Hampshire Code of Administrative Rules (NHCAR). 2016. Chapter Env-Wq 1700 Surface Water Quality Standards. Available online: <https://www.des.nh.gov/organization/commissioner/legal/rules/documents/env-wq1700.pdf> [Accessed July 12, 2019].
- New Hampshire Department of Environmental Services (NHDES). 2005 Androscoggin River Water Quality Report. State of New Hampshire Volunteer River Assessment Program. February 2005. Available online: <https://www.des.nh.gov/organization/divisions/water/wmb/vrap/androscoggin/documents/report04.pdf> [Accessed July 1, 2019].
- New Hampshire Department of Environmental Services (NHDES). 2017. Chemical and Biological Parameter Explanations. Available online: <https://www.des.nh.gov/organization/divisions/water/wmb/vlap/documents/parameters.pdf> [Accessed July 16, 2019].
- New Hampshire Department of Environmental Services (NHDES). 2019a. 2018, Draft 303(d) List. Available online: <https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2018/index.htm> [Accessed July 14, 2019].
- New Hampshire Department of Environmental Services (NHDES). 2019b. Draft 2018 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology. Available online: <https://www.des.nh.gov/organization/divisions/water/wmb/swqa/2018/documents/r-wd-19-04.pdf> [Accessed July 13, 2019].
- New Hampshire Department of Environmental Services (NHDES). 2019c. Volunteer River Assessment Program Androscoggin River Report, Data, and Maps. Available online: <https://www.des.nh.gov/organization/divisions/water/wmb/vrap/androscoggin/index.htm> [Accessed July 1, 2019].
- New Hampshire Revised Statutes (NH Rev Stat). 2016. Title L- Water Management and Protection. Chapter 485-A-Water Pollution and Waste Disposal. Section 485-A:8 – Standards for Classification of Surface Waters of the State. Available online: <https://law.justia.com/codes/new-hampshire/2016/title-l/chapter-485-a/section-485-a-8/> [Accessed July 13, 2019].
- United States Environmental Protection Agency (USEPA). 2018. New Hampshire Final Individual NPDES Permits. Available online: <https://www.epa.gov/npdes-permits/new-hampshire-final-individual-npdes-permits> [Accessed July 14, 2019].
- United States Geological Survey (USGS). 2019a. StreamStats. Available online: <https://streamstats.usgs.gov/ss/> [Accessed July 11, 2019].
- United States Geological Survey (USGS). 2019b. USGS 01054000 Androscoggin River near Gorham, NH. Available online: [https://waterdata.usgs.gov/nwis/nwismap/?site\\_no=01054000&agency\\_cd=USGS](https://waterdata.usgs.gov/nwis/nwismap/?site_no=01054000&agency_cd=USGS) [Accessed July 11, 2019].

## 6.5.2 UPSTREAM AND DOWNSTREAM FISH PASSAGE

- Boucher, D.P. 1997. Fishery Progress Report No. 97-4, Androscoggin River Survey (New Hampshire to Rumford Falls). Maine Department of Inland Fisheries and Wildlife. Augusta, Maine. 7pp.

- Brautigam, F. and Pellerin, J. 2014. Upper Androscoggin River Fishery Management Plan. Maine Department of Inland Fisheries and Wildlife. Division of Fisheries and Hatcheries.
- National Marine Fisheries Service (NMFS) 2009  
[http://cybrary.fomb.org/ESA/20090000\\_NOOA\\_Bio\\_val\\_Atlantic\\_salmon\\_habitat\\_GOM\\_Distinct\\_Population\\_Segment.pdf](http://cybrary.fomb.org/ESA/20090000_NOOA_Bio_val_Atlantic_salmon_habitat_GOM_Distinct_Population_Segment.pdf)
- Yoder, C., Kulik, B., Audet, J., Bagley, J. 2006a. The Spatial and Relative Abundance Characteristics of the Fish Assemblages in Three Maine Rivers. 269 pp.
- Yoder, C., Kulik, B., Audet, J., and Apell, B. 2006b. 2005 Maine Rivers Fish Assemblage Assessment. 124 pp.

### 6.5.3 SHORELINE AND WATERSHED PROTECTION

N/A

### 6.5.4 THREATENED AND ENDANGERED SPECIES

- New Hampshire Fish and Game (NHFG). 2015a. New Hampshire Wildlife Action Plan Appendix A Mammals: Tricolored Bat.  
[file:///J:/1203/103/Docs/PAD/J.%20Brodie%20Smith/Section%205.7%20ORTE/References/NHFG\\_2015\\_mammals-tricoloredbat.pdf](file:///J:/1203/103/Docs/PAD/J.%20Brodie%20Smith/Section%205.7%20ORTE/References/NHFG_2015_mammals-tricoloredbat.pdf). Accessed July 1, 2019.
- New Hampshire Fish and Game (NHFG). 2015b. New Hampshire Wildlife Action Plan Appendix A Mammals: Eastern Small-Footed Bat.  
[file:///J:/1203/103/Docs/PAD/J.%20Brodie%20Smith/Section%205.7%20ORTE/References/NHGF\\_2015\\_mammals-easternsmallfootedbat.pdf](file:///J:/1203/103/Docs/PAD/J.%20Brodie%20Smith/Section%205.7%20ORTE/References/NHGF_2015_mammals-easternsmallfootedbat.pdf). Accessed March 7, 2019.
- New Hampshire Fish and Game (NHFG). 2015c. New Hampshire Wildlife Action Plan Appendix A Mammals: Canada lynx.  
[file:///J:/1203/103/Docs/PAD/J.%20Brodie%20Smith/Section%205.7%20ORTE/References/NHFG\\_2015\\_mammals-canadalynx.pdf](file:///J:/1203/103/Docs/PAD/J.%20Brodie%20Smith/Section%205.7%20ORTE/References/NHFG_2015_mammals-canadalynx.pdf). Accessed July 1, 2019.
- New Hampshire Fish and Game Department (NHFGD). 2017. Endangered and Threatened Wildlife of New Hampshire. <https://www.wildlife.state.nh.us/nongame/documents/endangered-threatened-wildlife-nh.pdf>. Accessed July 1, 2019.
- New Hampshire Fish and Game (NHFG). 2018a. Endangered and Threatened Wildlife of NH. <https://www.wildlife.state.nh.us/nongame/endangered-list.html>. Accessed July 1, 2019.
- New Hampshire Fish and Game (NHFG). 2018b. Bald eagle (*Haliaeetus leucocephalus*). <https://www.wildlife.state.nh.us/wildlife/profiles/bald-eagle.html>. Accessed June 15, 2018.
- New Hampshire Natural Heritage Bureau (NHB). 2018. Rare Plants, Rare Animals, and Exemplary Natural Communities in New Hampshire Towns. <https://www.nhdfi.org/DRED/media/Documents/Natural%20Heritage/TownLists.pdf>. Accessed June 15, 2018.
- New Hampshire Natural Heritage Bureau (NHB). 2019a. Sawmill Hydroelectric Project. NHB19-2055. June 28, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*.
- New Hampshire Natural Heritage Bureau (NHB). 2019b. Riverside Hydroelectric Project. NHB19-2056. June 28, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*

- New Hampshire Natural Heritage Bureau (NHB). 2019c. Cross Hydroelectric Project. NHB19-2057. June 28, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*
- New Hampshire Natural Heritage Bureau (NHB). 2019d. Cascade Hydroelectric Project. NHB19-2068. July 1, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*
- New Hampshire Natural Heritage Bureau (NHB). 2019e. Gorham Hydroelectric Project. NHB19-2069. July 1, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*
- New Hampshire Natural Heritage Bureau (NHB). 2019f. Shelburne Hydroelectric Project. NHB19-2070. July 1, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*
- U.S. Fish and Wildlife Service (USFWS). 2016. Species Profile: Northern Long-Eared Bat (*Myotis septentrionalis*). Available online at <https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0JE> Accessed July 1, 2019.
- U.S. Department of Interior: U.S. Fish and Wildlife Service (USFWS). 2019a. List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your project. Sawmill Hydroelectric Project (P-2422). July 1, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*
- U.S. Department of Interior: U.S. Fish and Wildlife Service (USFWS). 2019b. List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your project. Cross (P-2426), Cascade (P-2327), and Gorham (P-2311). July 1, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*
- U.S. Department of Interior: U.S. Fish and Wildlife Service (USFWS). 2019c. List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your project. Shelburne Hydroelectric Project (P-2300). July 1, 2019. *Confidential – Sent Under Separate Cover – See Section 7.0 Supporting Documentation*

### 6.5.5 CULTURAL AND HISTORIC RESOURCES

Documents provided for this application regarding cultural and historic resources are confidential and are filed under separate cover.

- August 8 1996 FERC Order amending programmatic agreement & granting extension of time re James River-NH Elec Inc et al under P-2300 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10754391>
- January 8, 1998 Crown Vantage-NH Elec, Inc submits annual report required by provision of Programmatic Agreement for managing Historic Properties etc re Sawmill Proj-2422 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=108979>
- April 23, 1999 Crown Vantage-New Hampshire Electric, Inc submits Annual Report of Programmatic Agreement for Managing Historic Properties for 1998 re Sawmill Proj-2422, et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=8360923>
- May 18, 2000 Crown Vantage-New Hampshire Electric, Inc submits 1999 annual report required by provisions of the Programmatic Agreement for Managing Historic Properties re the Sawmill Proj-2422. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=8052945>
- December 17, 2002 Great Lakes Hydro America, LLC submits its annual report required by provision of the Programmatic Agreement for Managing Historic Properties etc under P-2422 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10597541>

- February 10, 2003 Letter order informing Great Lakes Hydro America LLC that the January filing meets the requirements of the PA for 2000, 2001 and 2002 under P-2300 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10556258>
- December 31, 2003 Great Lakes Hydro America, LLC submits its Annual Report required by provision of the Programmatic Agreement for Managing Historic Properties likely to be affected etc re the Sawmill Project et al under P-2422 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10038100>
- January 21, 2004 Letter order accepting Great Lakes America, LLC's 2003 Annual Report, Programmatic Agreement for managing historic properties as fulfilling the annual reporting requirements for the Shelburne Hydroelectric Proj-2300 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10054333>
- December 29, 2004 Great Lakes Hydro America, LLC submits this Annual Report required by provision of the Programmatic Agreement for the managing Historic Properties for the Sawmill Project et al under P-2422 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10354148>
- August 8, 2005 Letter order accepting Great Lakes Hydro America, LLC's 12/30/04 filing its 2004 Annual Historic Resources Management Plan Report for the Sawmill Hydroelectric Project et al under P-2422 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10732203>
- December 31, 2005 Great Lakes Hydro America LLC submits its 2005 Report required by the provision of the Programmatic Agreement for the Managing Historic Properties likely to be affected by operation of the Sawmill Project et al under P-2422 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10919812>
- April 27 2006 Letter order accepting Great Lakes Hydro American, LLC's 2005 Annual Report- Programmatic Agreement as fulfilling the annual filing requirements for the Shelburne Project under P-2300 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11019615>
- December 14, 2006 Great Lakes Hydro America, LLC submits its 2006 Report required by the provision of the Programmatic Agreement for the Managing Historic Properties likely to be affected by operation of the Sawmill Project et al under P-2422 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11212197>
- February 8, 2007 Letter informing Brookfield Power that their Annual Report summarizing the activities conducted in 2006 and proposed for 2007 etc for the New Hampshire Shelburne Project et al under P-2300 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11258308>
- December 26, 2007 Great Lakes Hydro America, LLC submits its annual report required by provision of the Programmatic Agreement for Managing Historic Properties re Shelburne Project under P-2300. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11546217>
- March 13, 2008 Letter order accepting Great Lakes Hydro America, LLC's 12/26/07 filing of the annual report summarizing the activities conducted in 2007 and proposed for 2008 re historic resources for the Shelburne Proj-2300 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11625059>
- December 31 2008 Great Lakes Hydro America LLC submits the Programmatic Agreement for managing historic Properties for the Shelburne Project et al under P-2300 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11901185>
- February 20, 2009. Letter order accepting Great Lakes Hydro America, LLC's 12/31/08 filing of their annual report of cultural resources monitoring at the Shelburne Project et al under P-2300 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11949779>

- December 4, 2009. Great Lakes Hydro America LLC Annual Cultural Resources Report per Programmatic Agreement under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12212728>
- December 4, 2009. Report / Form of Great Lakes Hydro America LLC under P-2311 et., al. Annual Cultural Resources Report per the Programmatic Agreement.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12212725>
- December 11, 2009 Letter order accepting Great Lakes Hydro America, LLC's 12/4/09 filing regarding Cultural Resource activities pursuant to the Programmatic Agreement & informing them of the next due date of 1/1/11 re the Shelburne Project under P-2300 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12220299>
- December 15, 2010 Great Lakes Hydro American LLC submits 2010 Report per the Programmatic Agreement for Managing Historic Properties under P-2300 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12522831>
- December 27, 2011 Annual Report - Programmatic Agreement for Managing Historic Properties dated 12/27/2011 P-2300, et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12849733>
- December 18, 2014 Report of Brookfield Renewable Energy Group's Annual Cultural Resource filing for the NH projects under P-2300, et. al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13714403>
- December 1, 2015 Report of Brookfield Renewable Energy Group under P-2300, et. al.. Annual Cultural Resource filing. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14059939>
- December 21, 2016 Brookfield Renewable Energy Group 2016 Annual Cultural Report under P-2300, et. al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14447020>
- December 19, 2017 Annual Report of Brookfield Renewable Energy Group under P-2300, et. al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14779554>
- January 2, 2020 Brookfield Renewable Energy Group Annual Cultural Resource Report under P-2300, et. al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15434812>

#### **6.5.6 RECREATIONAL RESOURCES**

- March 24, 2003 Great Lakes Hydro America, LLC's 2002 FERC Form 80, Licensed Hydropower Development Recreation Report for the Ragged Lake Development of the Storage Project et al under P-2634 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10476490>
- March 14, 2003 Great Lakes Hydro America LLC's FERC Form 80 Licensed Hydropower Development Recreation Report for the year ending 2002 re Cross Power Project under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10480806>
- March 14, 2003 Great Lakes Hydro America LLC's FERC Form 80 Licensed Hydropower Development Recreation Report for the year ending 2002 re Sawmill Project under P-2422.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10480799>
- June 24, 2003 Letter to Great Lakes Hydro America LLC acknowledging receipt of the its FERC Form 80 filing & advises that they are exempt from further filing FERC Form 80 until further order of FERC re Riverside Project et al under P-2423 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10428540>
- Great Lakes Hydro America LLC (GLHA). 2015a. Licensed Hydropower Development Recreation Report, Sawmill Project, 2014. Filed April 1, 2015.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13824310>



- Great Lakes Hydro America LLC (GLHA). 2015b. Licensed Hydropower Development Recreation Report, Gorham Project, 2014.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13823112>
- Great Lakes Hydro America LLC (GLHA). 2015c. Licensed Hydropower Development Recreation Report, Shelburne Project, 2014.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13823118>
- April 3, 2015. 2015 FERC Form 80 Recreation Report Monitoring - Filing of Methodology under P-4026 et.al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13828535>
- February 23, 1997. Order approving recreational plan re James River New-Hampshire Elec Inc, Cross Power Proj-2326. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10772489>

## 6.6 LICENSE AND CERTIFICATION COMPLIANCE

- October 30, 2003 Environmental Inspection Report by New York Regional Office for Great Lakes Hydro America LLC's Cross Project conducted on 7/29/03 under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=9917784>
- June 19, 2006 Special Environmental Inspection Report by New York Regional Office for Great Lakes Hydro America, LLC's Cross Project for the inspection conducted on 5/17/06 under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11074231>
- May 19, 2016 Letter informing Great Lakes Hydro America, LLC that the May 2 and 3, 2016 deviations from the run-of-river operations will not be considered violations of Article 401 of the license for the Shelburne Project under P-2300.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14251984>
- April 6, 2015 Letter informing Great Lakes Hydro America, LLC that their 1/23/15 Deviation of Run-of-River Operations- Article 401 will not be considered a violation re the Shelburne Project under P-2300. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13828981>
- January 9, 2020 Letter informing Great Lakes Hydro America, LLC that the run-of-river deviation that occurred on 10/16/2019 will not be considered a violation of Article 401 for the Cross Power Hydroelectric Project under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15438421>
- November 25, 2019 Letter informing Great Lakes Hydro America, LLC that the run-of-river deviation that occurred on 09/09/2019 will not be considered a violation for Article 401 for the Cross Power Project under P-2326. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15411416>
- May 29, 2018 Letter informing Great Lakes Hydro America, LLC that the Run-of-River Deviation that occurred on 3/13/18 will not be considered a violation of license re the Cross Power Hydroelectric Project et al under P-2326 et al.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14930851>
- May 22, 2018 Letter informing Great Lakes Hydro America LLC that the 3/10-3/12/2018 Run - of - River Deviation will not be considered a violation of Article 401 re the Sawmill and Cross Power Hydroelectric projects under P-2422 and P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14923830>
- November 14, 2017 Letter informing Great Lakes Hydro America, LLC that the deviation from the run-of-river requirement that occurred on 9/28/17 will not be considered a violation of the license for the Cross Power Hydroelectric Project under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14756412>

- November 19, 2015 Letter informing Great Lakes Hydro America, LLC that the 10/1/15 and 11/13/15 filings of the run-of-river operation deviations will not be considered violations of Articles 401 of the Cross Power Project under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14049214>
- December 11, 2014 Letter informing Great Lakes Hydro America, LLC that the weather conditions and equipment failures will not be a violations of Article 401 of their licenses for the Cross Power et al under P-2326 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13708193>
- June 11, 2012 Letter to Great Lakes Hydro America LLC acknowledging 3/2/12 filing of their project deviated from run-of-river operation on 2/22/12 as required by Article 401 of the license for the Cross Power Hydro Station Project under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13007152>
- April 30, 2012 Letter order accepting Great Lakes Hydro America LLC's 3/27/12 filing of additional information re the two deviation incidents that occurred on 1/15/12 and 2/1/12 for the Cross Power Hydro Project under P-2326.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12972502>
- November 27, 2019 Letter informing Great Lakes Hydro America, LLC that the run-of-river deviation that occurred on 08/31/2019 will not be considered a violation of Article 401 for the Sawmill Hydroelectric Project under P-2422.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15413909>
- August 22, 2018 Letter informing Great Lakes Hydro America, LLC that the deviation that occurred on May 2, 2018 will not be considered a violation of Article 401 re the Sawmill Hydroelectric Project under P-2422. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15002065>
- April 2, 2018 Letter informing Great Lakes Hydro America, LLC that the run-of-river deviation that occurred on 01/14/18 will not be considered a violation of the license for the Sawmill Hydroelectric Project under P-2422. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14859664>
- June 11, 2015 Letter informing Great Lakes Hydro America, LLC that the deviation from the run-of-river operation and pond elevation requirements on 5/8/15 we will not consider a violation of Article 401 and 403 of the Sawmill Project under P-2422.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13901517>
- December 11, 2014 Letter informing Great Lakes Hydro America, LLC that the weather conditions and equipment failures will not be a violations of Article 401 of their licenses for the Cross Power et al under P-2326 et al. <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13708193>
- February 19, 2013 Letter informing Great Lakes Hydro America, LLC that the temporary deviation that occurred on 4/6/12 at the Sawmill Hydroelectric Project will not be considered a violation of license Article 40 under P-2422.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13183663>
- March 8, 2011 Letter informing Great Lakes Hydro America, LLC that the 1/26/11 incident resulting in a deviation from the minimum flow requirement will not be considered a violation of Article 401 re Sawmill Project under P-2422.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12585823>
- September 16, 2014 Letter informing Brookfield Renewable Energy Group that their Deviation from Run-of-River Operation that occurred on 8/2/14 will not be considered a violation of License Article 401 re Great Lakes Hydro America, LLC's Gorham Project under P-2311.  
<https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13636867>

## 7.0 SUPPORTING DOCUMENTATION

### Androscoggin River Headwater Benefits Agreement

#### ANDROSCOGGIN RIVER HEADWATER BENEFITS AGREEMENT

This Agreement made as of the 1st day of June, 1983 by and among Androscoggin Reservoir Company ("ARCO") with a business address at 150 Main Street, Lewiston, Maine 04240, Union Water Power Company ("Union") with a business address at 150 Main Street, Lewiston, Maine 04240, International Paper Company ("IP") with a business address at International Paper Plaza, 77 West 45th Street, New York, New York 10036, Rumford Falls Power Company ("Rumford") with a business address at c/o Boise Cascade Corporation, Paper Group, Rumford Mill, Rumford, Maine 04276, James River Corporation. ("James River") with a business address at 650 Main Street, Berlin, New Hampshire 03570, and Public Service Company of New Hampshire ("Public Service") with a business address at 1000 Elm Street, Manchester, New Hampshire 03105:

#### W I T N E S S E T H T H A T

WHEREAS, Union owns dams, reservoirs, works and other structures to wit: On Rapid River at the outlet of Lower Richardson Lake in Township "C", Oxford County, Maine and known as Middle Dam; at the outlet of Mooselookmeguntic Lake in Richmondsontown, T-4, R-1, Oxford County, Maine and known as Upper Dam; on Rangeley River at the outlet of Rangeley Lake, Rangeley, Franklin County, Maine and known as Rangeley Dam; and on the Androscoggin River, three (3) miles south of the outlet of Umbagog Lake, Errol, Coos County, New Hampshire and known as

Sawmill Water Quality Certification



ROBERT W. WARREN  
COMMISSIONER

EDWARD J. SCHMIDT, P.E., Ph.D.  
DIRECTOR

RUSSELL A. NYLANDER, P.E.  
CHIEF ENGINEER

State of New Hampshire  
DEPARTMENT OF ENVIRONMENTAL SERVICES  
WATER SUPPLY & POLLUTION CONTROL DIVISION

6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095

603-771-3504

TELEFAX 603-771-3503  
Rapp Service for Draft/Specs/Inquiries

December 18, 1991

CONTROL:

TOM F. EMMONS, Chief  
MICHAEL C. LITTLE, Asst. Dir.  
E. B. BASTELINK, Ph.D.  
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JOHN F. HALLGREN  
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DORIS HEBBY  
WILBERT LARCE  
DONALD A. WARRINGTON, P.E.  
WALTER J. PATRICK  
JAMES W. COO  
JOHN C. SMITH

John Slagle  
Kleinschmidt Associates  
75 Main St., PO Box 576  
Pittsfield, ME 04967

Re: Water Quality Certificate (pursuant to Section 401 of the Clean Water Act): FERC Project #2422. James River-Sawmill Hydroelectric Project, Berlin, NH.

Dear Mr. Slagle:

The Division has determined that under the conditions outlined in this certificate, FERC Project #2422 will comply with the applicable provisions of Section 301, 302, 303, 306, and 307 of the Clean Water Act as amended.

The following condition is placed on this section 401 Water Quality Certificate:

- 1) If it is determined through James River-NH Electric Inc. sampling at the Shelburne project (FERC # 2300) that there is a Class B dissolved oxygen violation, the following water quality monitoring program will be initiated immediately by James River-NH Electric Inc. at the Sawmill Project to determine if the Sawmill facility is the cause of the violation. If it is determined by DES that the Sawmill project is not causing the violation at Shelburne, sampling will be discontinued.
  - (a) Dissolved oxygen and water temperature must be monitored at three stations in the Androscoggin River; upstream of the Sawmill impoundment, at three depths in the Sawmill impoundment (surface, bottom, and mid-depth), and downstream of the dam, as specified by DES-WSPCD.
  - (b) Monitoring must occur between 6 am and 8 am.
  - (c) Equipment calibration and quality control measures must be followed to assure accurate reporting.
  - (d) Monitoring events will be conducted under as close to limiting water quality conditions as possible (i.e. if possible, water temperatures of 20°C or greater and river flows below 2000 cfs).
  - (e) Water quality monitoring and QA/QC results must be reported on an annual basis and a yearly summary report must be submitted to DES-WSPCD.



Cross Power Water Quality Certification



ROBERT W. WARNEY  
COMMISSIONER

EDWARD J. SCHMIDT, P.E., Ph.D.  
DIRECTOR

RUSSELL A. NYLANDER, P.E.  
CHIEF ENGINEER

State of New Hampshire  
DEPARTMENT OF ENVIRONMENTAL SERVICES  
WATER SUPPLY & POLLUTION CONTROL DIVISION

6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095

603-271-3504

TTY/TDD 285-4813  
Relay Service for Deaf/Spaced Impaired

December 13, 1991

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DEBBY CALDWELL  
JAMES MAROTTA

John Slagle  
Kleinschmidt Associates  
75 Main St., PO Box 576  
Pittsfield, ME 04967

Re: Water Quality Certificate (pursuant to Section 401 of the Clean Water Act): FERC Project #2326. James River-Cross Power Hydroelectric Project, Berlin, NH.

Dear Mr. Slagle:

The Division has determined that under the conditions outlined in this certificate, FERC Project #2326 will comply with the applicable provisions of Section 301, 302, 303, 306, and 307 of the Clean Water Act as amended.

The following condition is placed on this section 401 Water Quality Certificate:

- 1) If it is determined through James River-NH Electric Inc. sampling at the Shelburne project (FERC # 2300) that there is a Class B dissolved oxygen violation, the following water quality monitoring program will be initiated immediately by James River-NH Electric Inc. at the Cross Project to determine if the Cross facility is the cause of the violation. If it is determined by DES that the Cross project is not causing the violation at Shelburne, sampling will be discontinued.
  - (a) Dissolved oxygen and water temperature must be monitored at three stations in the Androscoggin River; upstream of the Cross impoundment, at three depths in the Cross impoundment (surface, bottom, and mid-depth), and downstream of the dam, as specified by DES-WSPCD.
  - (b) Monitoring must occur between 6 am and 8 am.
  - (c) Equipment calibration and quality control measures must be followed to assure accurate reporting.
  - (d) Monitoring events will be conducted under as close to limiting water quality conditions as possible (ie. If possible, water temperatures of 20°C or greater and river flows below 2000 cfs).
  - (e) Water quality monitoring and QA/QC results must be reported on an annual basis and a yearly summary report must be submitted to DES-WSPCD.





Upper Gorham Water Quality Certification



State of New Hampshire  
DEPARTMENT OF ENVIRONMENTAL SERVICES

6 Hazen Drive, P.O. Box 95, Concord, NH 03302-0095  
603 271-3501 FAX 603-271-2867  
TDD New Kelly NH 1-800-735-2864

October 26, 1993



Mr. Jon Christensen  
Kleinschmidt Associates  
PO Box 650  
Pittsfield, ME 04967

FILED  
NOV 8 AM 9:30  
FEDERAL REGISTER  
DEPARTMENT OF ENVIRONMENTAL SERVICES  
CONCORD, NH

Re: Section 401 Water Quality Certificate - FERC Project #2311, James River-Gorham Hydroelectric Project, Gorham, NH.

Dear Mr. Christensen:

The Division has determined that FERC Project #2311 as proposed and amended on October 19, 1993 to limit bypass flows to minimums of 400 cfs between March 1 and June 1 and 75 cfs for the remainder of the year will comply with the applicable provisions of Section 301, 302, 303, 306, and 307 of the Clean Water Act as amended, and hereby issues a Section 401 Water Quality Certificate, subject to the following conditions:

- 1) If it is determined through James River-NH Electric Inc. sampling at the Shelburne project (FERC #2300) that there is a Class B dissolved oxygen violation, the following water quality monitoring program will be initiated immediately by James River-NH Electric Inc. at the Gorham Project to determine if the Gorham facility is the cause of the violation. The frequency of sampling will be determined by DES. If it is determined by DES that the Gorham project is not causing the violation at the Shelburne project, sampling will be discontinued. The monitoring program shall include:
  - (a) Dissolved oxygen and water temperature must be monitored at three stations in the Androscoggin River: 1) upstream of the Gorham impoundment, 2) at three depths in the impoundment (surface, bottom, and mid-depth), and 3) downstream of the tailrace. Station locations will be specified by DES-WSPCD.
  - (b) Monitoring must occur between 0500 and 0800 daily.
  - (c) Equipment calibration and quality control measures must be followed to assure accurate reporting.
  - (d) Monitoring events will be conducted under as close to the following conditions as possible, water temperature 20 C or greater and river flows less than 2000 cfs. Sampling water temperatures and river flows must be documented.

FERC DOCKETED

NOV 8 1993

AIR RESOURCES DIV  
60 N. Main Street  
Cutter Box 2037  
Concord, NH 03302-0203  
Tel. 603-271-1139  
Fax 603-271-1131

WASTE MANAGEMENT DIV  
6 Hazen Drive  
Concord, NH 03302  
Tel. 603-271-2864  
Fax 603-271-2866

WATER RESOURCES DIV  
60 N. Main Street  
PO Box 2100  
Concord, NH 03302-0200  
Tel. 603-271-3501  
Fax 603-271-3502

WATER SUPPLY & POLLUTION CONTROL DIV  
PO Box 95  
Concord, NH 03302-0095  
Tel. 603-271-2863  
Fax 603-271-2100

*Christensen*

Shelburne Water Quality Certification



ROBERT W. VARNEY  
COMMISSIONER

EDWARD J. SCHMIDT, P.E., P.D.  
DIRECTOR

RUSSELL A. NYLANDER, P.E.  
CHIEF ENGINEER

DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT  
WATER SUPPLY & POLLUTION CONTROL DIVISION  
6 Hazen Drive, P.O. Box 85, Concord, NH 03302-0085  
603-271-3504  
TTW/TDD 225-4083  
Relay Service for Deaf/Speech Impaired

December 13, 1991

FRANK R. BROWN, JR.  
MICHAEL G. LITTLE, Vice-Chairman  
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WAYNE L. BERNHARDT  
JEFFREY DOLAN  
JAMES BURTON

John Slagle  
Kleinschmidt Associates  
75 Main St., PO Box 576  
Pittsfield, ME 04967

Re: Water Quality Certificate (pursuant to Section 401 of the Clean Water Act); FERC Project #2300, James River Corporation-Shelburne Hydroelectric Project, Shelburne, NH.

Dear Mr. Slagle:

The Division has determined that under the conditions outlined in this certificate, FERC Project #2300 will comply with the applicable provisions of Section 301, 302, 303, 306, and 307 of the Clean Water Act as amended.

The following condition is placed on this section 401 Water Quality Certificate:

- 1) The following water quality monitoring program must be enacted no later than the first summer following FERC licensing.
  - (a) Bathymetrically survey the Shelburne impoundment to determine the deepest location, and any other deep spots that should be monitored.
  - (b) Sample at least four discrete locations during the first, second and third years of the new license as follows:
    - (i) Riffles just upstream of the impoundment.
    - (ii) Profile of the deepest location in the impoundment at 1 meter intervals.
    - (iii) Profile just above the dam in the area of the powerhouse intake.
    - (iv) Tailwater.
    - (v) Additional deep spots in the impoundment (if necessary).
  - (c) Sample data will be obtained in situ using a portable dissolved oxygen and temperature meter such as a YSI meter. Additional sampling locations may be added if needed, at the discretion of the sampler. Equipment calibration and quality control measures must be followed and documented to assure accurate reporting.
  - (d) Collect samples twice per day (between 6 am - 8 am, between 1 pm - 2 pm) for 3 consecutive days during the following periods: late June - early July, late July - early August, late August - early September, at as near worst case conditions (warm water >20°C, low flow <2100 cfs, non-storm event) as possible.
  - (e) Record river flow, weather conditions and other pertinent data.

⊗

NHB THREATENED AND ENDANGERED SPECIES INFORMATION

Provided under separate cover as "Confidential".

USFWS THREATENED AND ENDANGERED SPECIES LIST AND IPAC REPORT

Provided under separate cover as "Confidential".