

UPPER ANDROSCOGGIN LIHI MID-TERM REVIEWS

SAWMILL PROJECT (FERC No. 2422; LIHI No. 173)
CROSS POWER PROJECT (FERC No. 2326; LIHI No. 174)
UPPER GORHAM PROJECT (FERC No. 2311; LIHI No. 175)
SHELBURNE PROJECT (FERC No. 2300; LIHI No. 176)
CASCADE PROJECT (FERC No. 2327; LIHI No. 188)

Prepared for:

**Great Lakes Hydro
America, LLC**

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February 2026

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Review\20260203_Upper Andro LIHI Mid Term Review_Final.docx

ACRONYMS AND ABBREVIATIONS

A

ADCP	Acoustic Doppler Current Profiler
AMC	Appalachian Mountain Club
APE	area of potential effect

B

Brookfield	Brookfield Renewable Partners L.P.
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C

cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission

D

DLA	Draft License Application
DO	dissolved oxygen

E

EPRI	Electric Power Research Institute
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F

ft/s	feet per second
FERC	Federal Energy Regulatory Commission
FLA	Final License Application

G

GLHA	Great Lakes Hydro America, LLC
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H

hp	horsepower
HPMP	Historic Properties Management Plan

K

kW	kilowatt(s)
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L

Licensee	Great Lakes Hydro America, LLC
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LIHI Low Impact Hydropower Institute

M

mg/L milligrams per liter

MW megawatt(s)

MWh megawatt-hour(s)

N

N/A not applicable

NGVD 29 National Geodetic Vertical Datum of 1929

NHDES New Hampshire Department of Environmental Services

NHDHR New Hampshire Department of Historic Resources

NHFGD New Hampshire Fish and Game Department

NPS National Park Service

P

Projects Sawmill Project, Cross Power Project, Upper Gorham Project, Shelburne Project, and Cascade Project

R

RM River Mile

RMP Recreation Management Plan

RTE rare, threatened, and/or endangered

S

SWQPA State of New Hampshire Shoreland Water Quality Protection Act

T

TKN total Kjeldahl nitrogen

U

USFWS United States Fish and Wildlife Service

USGS United States Geological Survey

W

WQC Water Quality Certification

1.0 INTRODUCTION

On September 16, 2025, Great Lakes Hydro America, LLC (GLHA or Licensee), an affiliate of Brookfield Renewable Partners L.P. (Brookfield), received a letter from the Low Impact Hydropower Institute (LIHI) stating that the Mid-term Reviews of multiple projects owned by GLHA were required due to their receiving new Federal Energy Regulatory Commission (FERC or Commission) licenses (2025 FERC Licenses appear in Appendix A; previous LIHI applications appear in Appendix B). Mid-term reviews for the Sawmill Project (FERC No. 2422; LIHI No. 173), Cross Power Project (FERC No. 2326; LIHI No. 174), Upper Gorham Project (FERC No. 2311, LIHI No. 175), Shelburne Project (FERC No. 2300, LIHI No. 176), and Cascade Project (FERC No. 2327; LIHI No. 188) (collectively called Projects) are required. Each project is discussed below following the outline criteria provided by LIHI in the September 16, 2025, request letter and the LIHI Handbook 2nd Edition – Revision 2.06.

2.0 RELICENSING CONSULTATION

Active stakeholders through the FERC relicensing process for all Projects included the United States Fish and Wildlife Service (USFWS), National Park Service (NPS), New Hampshire Department of Environmental Services (NHDES), New Hampshire Coastal Program, New Hampshire Department of Historic Resources (NHDHR), New Hampshire Audubon, New Hampshire Fish and Game Department (NHFGD), Coos County, Town of Dummer, Town of Gorham, Town of Shelburne, City of Berlin, and Appalachian Mountain Club (AMC). Comments from these active stakeholders were received on the Draft License Application (DLA), which GLHA took into consideration for the development of the Final License Application (FLA). Additionally, NHDES and NHFGD were engaged with developing the relicensing studies, and NHDES provided comments on the draft Water Quality Study and the Bypass Reach Study. There are no federally recognized Native American Tribes in New Hampshire. As such, no Tribes were contacted during the relicensing effort, as GLHA was not aware of any Tribes that would be impacted by the Projects.

The Town of Gorham, Town of Shelburne, and City of Berlin submitted comments on FERC's draft Environmental Assessments (EAs); however, these comments were dismissed by FERC and were therefore not included in the final EAs or the resulting licenses. The comments focused on proposed modifications to recreation facilities located on non-project lands, the addition of flood-event procedures already addressed in the Emergency Action Plans (EAPs), and requests for further analyses that FERC concluded were unwarranted (see Appendix K of each project's respective final EA). There were no formal stakeholder recommendations for license conditions that were not included in the final FERC licenses or Water Quality Certification (WQC) for any of the Projects.

3.0 SAWMILL PROJECT (P-2422)

3.1 Project Details

The Sawmill Project (FERC No. 2422, LIHI No. 173) submitted an application to LIHI on August 31, 2020. On September 9, 2025, the Sawmill Project received a new FERC License (Accession No. 20250909-3059) which constitutes as a material change under Section 5.3.4 in the LIHI Handbook 2nd Edition – Revision 2.06. Additionally, on January 10, 2022¹ the Sawmill Project applied for a non-capacity amendment for the installation of a battery storage facility on the west bank of the Androscoggin River within the existing transmission facilities of the Sawmill Project. The battery storage project consists of eight battery enclosures, five transformers, five inverters, one auxiliary transformer, one switch gear and a single pole mounted disconnect switch. This non-capacity amendment was approved on March 7, 2022² and completed in December 2023. This battery storage facility does not change any Sawmill Project operations and or have impacts generating or water control capabilities of the dam or powerhouse.

No other material changes have occurred for this project. Any reference documents not linked in Table 3-1 appear in Appendix C.

3.2 Standards Matrix

Table 3-1 Sawmill Project Facility Matrix

Item	Information Requested	Response – if applicable, include references or links to further details
<i>Name of the Facility</i>	Facility name (use FERC project name or other legal name)	Sawmill Project (FERC No. 2422)
<i>Reason for applying for LIHI Certification</i>	<ol style="list-style-type: none">1. To participate in state RPS program (specify the state and the total MW/MWh associated with that participation (value and % of facility total MW/MWh)2. To participate in voluntary REC market (e.g., Green-e)	To participate in the voluntary REC market

¹ Accession No. 20220110-5213, supplemented by an additional filing on February 25, 2022, Accession No. 20220225-5094

² Accession No. 20220307-3006

Item	Information Requested	Response – if applicable, include references or links to further details
	3. To satisfy a direct energy buyer’s purchasing requirement 4. To satisfy the facility’s own corporate sustainability goals 5. For the facility’s corporate marketing purposes 6. Other (describe)	
	If applicable, the amount of annual generation (MWh and % of total generation) for which RECs are currently received or are expected to be received upon LIHI Certification	100%
Location	River name (United States Geological Survey [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: https://water.usgs.gov/wsc/map_index.html	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam above mouth	River Mile (RM) 138.2
	Geographic latitude and longitude of dam	Latitude 44°28.366’N Longitude 71°10.514’ W
Facility Owner	Application contact names	Kyle Murphy Senior Compliance Specialist – New England
	Facility owner company and authorized owner representative name. For recertifications: If ownership has changed since last certification, provide the effective date of the change.	Great Lakes Hydro America LLC Representative: Kyle Murphy <i>No change since last certification.</i>
	FERC licensee company name (if different from owner)	N/A

Item	Information Requested	Response – if applicable, include references or links to further details
Other Owners	If different from hydro facility owner, Provide the dam owner(s)/operator(s) entity names.	N/A
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates, or date of exemption	P-2422 Issuance on September 9, 2025 Expires September 1, 2065
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Major
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	WQC 2024-FERC-001; Standard NH 401 WQC Issued September 19, 2024 Issued by New Hampshire Department of Environmental Services
	Hyperlinks to key electronic records on FERC e-Library website or other publicly accessible data repositories ³ (or provide a separate list) If not electronically available, provide as appendices to the application	Order Issuing Sawmill License Sawmill 2024 Water Quality Certificate Final License Application Updated Sawmill Exhibit A Recreation Use and Facility Assessment Study Report and updated License Application exhibits Programmatic Agreement for the Sawmill Project Sawmill FERC Final Environmental Assessment

³ For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service or other agency, U.S. Army Corps of Engineers permits, and other regulatory documents, or permits or authorizations issued by a Tribal Nation, other third-party agreements including Memorandums of Agreement or Understanding about

Item	Information Requested	Response – if applicable, include references or links to further details
Powerhouse	Date of initial operation (past or future for pre-operational applications)	1903
	Total installed capacity (MW) For recertifications: Indicate if installed capacity has changed since last certification	3.17 MW <i>No change since last certification.</i>
	Average annual generation (MWh) and period of record used For recertifications: Indicate if average annual generation has changed since last certification	14,529 MWh (2016-2021) <i>Negligible change from 15,899.13 MWh (2014-2018) due to different years used. The Licensee estimates gross annual energy production of approximately 17,511 MWh when considering the value of the Sawmill Project.</i>
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) For recertifications: Indicate if mode of operation has changed since last certification	Run-of-river <i>No change since last certification.</i>
	Number, type, and size of turbine/generators, including maximum and minimum hydraulic capacity (in cubic feet per second [cfs]) and maximum and minimum output (in kW or MW) of each turbine and generator unit	4 horizontal shaft synchronous generators 4 tube-type, horizontal shaft turbines Units 1 and 3 are fixed blade propeller units <ul style="list-style-type: none"> • 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
	Trash rack clear spacing (inches) for each trash rack	14 feet wide by 19 feet 10 inches long per bay; 3-inch clear spacing
	Approach water velocity (feet per second [ft/s]) at each intake if known	2.5 ft/s at Unit 1 and 3 2.7 ft/s at Unit 2 and 4

water or land management, grants of right-of-way, water rights, and the like. If extensive, the list of hyperlinks can be provided separately in the application.

Item	Information Requested	Response – if applicable, include references or links to further details
	Dates and types of major equipment upgrades (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>
	Dates, purpose, and type of any recent operational changes (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments (or provide a separate list)	New FERC License - September 9, 2025 Article 401 and Condition E-7 require a new Operations Compliance Monitoring Plan. Article 405 requires implementation of the Programmatic Agreement and Historic Properties Management Plan.
Dam or Diversion	Date of original dam or diversion 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 length, height including separately the height of any flashboards, inflatable dams, etc. and describe seasonal operation of flashboards and the like	Approximately 168 feet long by 6 to 15 feet high, with a crest elevation of 1,094.1 feet National Geodetic Vertical Datum of 1929 (NGVD 29) ⁴ , topped with 0.6-foot-high timbers
	Spillway maximum hydraulic capacity	24,000 cfs
	Length and type of each penstock and water conveyance structure between the impoundment and powerhouse	None; powerhouse is integral

⁴ All elevations within this document are referenced to NGVD 29, unless otherwise noted.

Item	Information Requested	Response – if applicable, include references or links to further details
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
Conduit Facilities Only	Date of conduit construction and primary purpose of conduit	N/A
	Source water	N/A
	Receiving water and location of discharge	N/A
Impoundment and Watershed	Authorized maximum and minimum impoundment water surface elevations For recertifications: Indicate if these values have changed since last certification	Run-of-river project with a target elevation of 1,094.5 ft and an allowed fluctuation of 6 inches <i>No change since last certification.</i>
	Normal operating elevations and normal fluctuation range For recertifications: Indicate if these values have changed since last certification	Run-of-river project with a target elevation of 1094.5 feet. <i>No changes but the previously LIHI stated maximum of 1094.5 feet and a minimum of 1094 ft, but the Sawmill Project is a true run of river project and has no minimum or maximum water surface elevations.</i>
	Gross storage volume and surface area at full pool For recertifications: Indicate if these values have changed since last certification	Gross Storage: 620 acre-feet Surface Area: 72.5 acres <i>No change since last certification.</i>
	Usable storage volume and surface area For recertifications: Indicate if these values have changed since last certification	Run-of-river operation with no usable storage <i>No change since last certification.</i>

Item	Information Requested	Response – if applicable, include references or links to further details
	Describe requirements related to impoundment inflow and outflow, elevation restrictions (e.g., fluctuation limits, seasonality) up/down ramping and refill rate restrictions	The Sawmill Project operates as a run-of-river facility. The reservoir is managed as close to a constant elevation of 1,094.5-feet as possible, although some minor fluctuations (plus or minus 6 inches) may occur as a result of upstream releases. During refill, maintain minimum bypass flows, and release 90% inflow downstream, using the remaining 10% for refill.
	Upstream dams by name, ownership (including if owned by an affiliate of the applicant’s company) and river mile. If FERC licensed or exempt, please provide FERC project number of these dams. Indicate which upstream dams have downstream migratory fish passage	<p>Errol Project (FERC No. 3133), Brookfield White Pine Hydro LLC, RM 170.1;</p> <p>Pontook Project (FERC No. 2861), Pontook Operating LP, RM 152.4</p> <p>No fish passage at any of the upstream projects.</p>
	Downstream dams by name, ownership (including if owned by an affiliate of the applicant’s company), river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream migratory fish passage	<p>Riverside Project (FERC No. 2423), Great Lakes Hydro America LLC, RM 138.8;</p> <p>J. Brodie Smith Project (FERC No. 2287), Central Rivers Power, RM 138.2;</p> <p>Cross Power Project (FERC No. 2326), Great Lakes Hydro America LLC, RM 136.9;</p> <p>Cascade Project (FERC No. 2327), Great Lakes Hydro America LLC, RM 136.3;</p> <p>Upper Gorham Project (FERC No. 2311), Great Lakes Hydro America LLC, RM 133.2;</p>

Item	Information Requested	Response – if applicable, include references or links to further details
		<p>Gorham Project, Central Rivers Power, RM 130.4;</p> <p>Shelburne Project (FERC No. 2300), Great Lakes Hydro America LLC, RM 127.6</p> <p>Upper & Middle Dam (FERC No.2333), Rumford Falls Power Company, RM 90.9 and 90.7;</p> <p>Riley Project (FERC No. 8277), Eagle Creek Renewable Energy LLC, RM 69.3;</p> <p>Jay (RM 66.6), Otis (RM 63.8), Livermore Falls (FERC No. 2375) Eagle Creek Renewable Energy LLC, RM 61.2;</p> <p>Gulf Island Project (FERC No. 2283), Brookfield White Pine Hydro LLC, RM 35.0;</p> <p>Lewiston Falls Project (FERC No. 2302), Brookfield White Pine Hydro LLC, RM 30.8</p> <p>Worumbo Project (FERC No. 3428), Brown Bear II Hydro, Inc., RM 15.7;</p> <p>Pejepscot Project (FERC No. 4784), Topsham Hydro Partners LP, RM 12.5;</p> <p>Brunswick Project (FERC No. 2284), Brookfield White Pine Hydro LLC, RM 8.0</p> <p>Upstream migratory fish passage is provided at the Brunswick,</p>

Item	Information Requested	Response – if applicable, include references or links to further details																												
		Pejepscot, and Worumbo Project. Upstream American eel passage is being considered at the Lewiston Project.																												
	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. Indicate locations and acres of flowage rights versus fee-owned property	Land: Undetermined; limited to lands encompassing project structures Water: 72.5 acres																												
Hydrologic Setting	Average annual flow at the dam, and period of record used	1991-2020: 2,757 cfs																												
	Average monthly flows and period of record used	<table border="1" data-bbox="992 856 1373 1465"> <thead> <tr> <th data-bbox="1000 867 1179 932">Month</th> <th data-bbox="1179 867 1365 932">Mean flow (cfs)</th> </tr> </thead> <tbody> <tr><td data-bbox="1000 932 1179 972">January</td><td data-bbox="1179 932 1365 972">2,596</td></tr> <tr><td data-bbox="1000 972 1179 1012">February</td><td data-bbox="1179 972 1365 1012">2,722</td></tr> <tr><td data-bbox="1000 1012 1179 1052">March</td><td data-bbox="1179 1012 1365 1052">3,012</td></tr> <tr><td data-bbox="1000 1052 1179 1092">April</td><td data-bbox="1179 1052 1365 1092">4,670</td></tr> <tr><td data-bbox="1000 1092 1179 1131">May</td><td data-bbox="1179 1092 1365 1131">4,048</td></tr> <tr><td data-bbox="1000 1131 1179 1171">June</td><td data-bbox="1179 1131 1365 1171">2,814</td></tr> <tr><td data-bbox="1000 1171 1179 1211">July</td><td data-bbox="1179 1171 1365 1211">2,270</td></tr> <tr><td data-bbox="1000 1211 1179 1251">August</td><td data-bbox="1179 1211 1365 1251">1,924</td></tr> <tr><td data-bbox="1000 1251 1179 1291">September</td><td data-bbox="1179 1251 1365 1291">1,808</td></tr> <tr><td data-bbox="1000 1291 1179 1331">October</td><td data-bbox="1179 1291 1365 1331">2,251</td></tr> <tr><td data-bbox="1000 1331 1179 1371">November</td><td data-bbox="1179 1331 1365 1371">2,508</td></tr> <tr><td data-bbox="1000 1371 1179 1411">December</td><td data-bbox="1179 1371 1365 1411">2,485</td></tr> <tr><td data-bbox="1000 1411 1179 1451">Annual</td><td data-bbox="1179 1411 1365 1451">2,757</td></tr> </tbody> </table> <p data-bbox="992 1514 1453 1887">River flow data for the Sawmill Project was generated from USGS gage No. 01054000 (Androscoggin River near Gorham, New Hampshire) for the period January 1991 to December 2020 (USGS 2021); the USGS gage is approximately 3.5 river miles downstream of the Sawmill Project dam. Data from the USGS gage</p>	Month	Mean flow (cfs)	January	2,596	February	2,722	March	3,012	April	4,670	May	4,048	June	2,814	July	2,270	August	1,924	September	1,808	October	2,251	November	2,508	December	2,485	Annual	2,757
Month	Mean flow (cfs)																													
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Item	Information Requested	Response – if applicable, include references or links to further details
		were pro-rated by a factor of 0.983 to account for the difference in drainage area at the Sawmill Project.
	Locations, names, and hyperlinks to the closest stream gaging 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 from gage locations and provide the basis for proration calculation	1,337.8 square miles The drainage area was estimated using the USGS StreamStats Application.
	Other facility specific hydrologic information (e.g., average hydrograph)	N/A
Designated Zones of Effect	Numbers and names of each zone of effect and river mile of upstream and downstream limits of each zone of effect (e.g., “Zone 1: Impoundment RM 6.3 - 5.1”)	Zone 1 Impoundment: RM 139.9 – 138.2 Zone 2 Bypass Reach: RM 138.4 – 138.1 Zone 3 Tailrace: RM 138.2 – 138
Pre-Operational Facilities Only		
Expected Operational Date	Date generation is expected to begin	N/A
Dam, Diversion Structure or Conduit Modification	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
Change in Water Flow Regime	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

3.3 LIHI Criteria Analysis

The proposed 2025 LIHI standards for the Sawmill Project are summarized in Table 3-2. The Sawmill Project has no significant changes to operations or new license requirements that would substantially affect project resources; therefore, the proposed standards remain unchanged since the 2020 LIHI analysis. Analysis for each resource topic can be found in the sections below.

Table 3-2 Sawmill Project Proposed 2025 Criteria Summary Table

Criteria Standard		Zone 1	Zone 2	Zone 3
		Impoundment	Bypass Reach	Tailrace
A	Flow Regimes	1	2	1
B	Water Quality	3	3	3
C	Upstream Fish Passage	1	1	1
D	Downstream Fish Passage	1	1	1
E	Shorelines and Watershed	3	3	3
F	Threatened and Endangered Species	2	2	2
G	Cultural and Historic Resources	2	2	2
H	Recreational, Public, and Traditional Cultural Access	2	1	2

3.3.1 Flow Regimes

3.3.1.1 Changes in License, Regulatory Requirements, and Plans

No changes were made to the flow regime at the Sawmill Project following the new license. The Sawmill Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond level of 1,094.5 feet, and provides a minimum flow of 12 cubic feet per second (cfs) in the bypass reach. Per License Article 402 and Condition E-7 of the WQC, the Licensee must also develop an Operations Compliance Monitoring Plan.

3.3.1.2 Study Results

GLHA conducted a Bypass Reach Aquatic Habitat Study in November 2020 and documented that existing minimum flows in the bypass reach provide a diversity of quality aquatic habitats (GLHA 2021). Methodology included documenting the existing flows below the spillway using detailed aerial (i.e., drone) surveys to document habitat types,

substrates, and wetted channel conditions under the existing minimum flows that are released under current license conditions. The minimum flows at the Sawmill Project generally wet the channel from bank to bank and provide areas of deep, fast water, and substrates that promote benthic macroinvertebrate habitat. The river channels remain interconnected at the existing minimum flows, which allows volitional zone of passage movements for aquatic organisms. The Sawmill reach is backwatered and maintains adjacent deep aquatic habitats. Monitoring in 2020 also demonstrated that the existing minimum flow requirements maintain New Hampshire’s surface water quality standards (GLHA 2021).

3.3.1.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	A-1	A-1	No changes in operation. The Sawmill Project continues to operate as run-of-river and is in accordance with the new 401 WQC.
Bypass Reach	A-2	A-2	No changes in operation. The minimum bypass flow has not changed, minimum flows were documented to be sufficient in the Bypass Reach Flow Study 2021 (GLHA 2022), and flows are in accordance with the 2024 WQC.
Tailrace	A-1	A-1	No changes in operation. The Sawmill Project is operated as run-of-river and receives flows from generation or is backwatered during unit shutdown.

3.3.2 Water Quality

3.3.2.1 Changes in License, Regulatory Requirements, and Plans

There are no significant changes in water quality requirements under the new license, as the Sawmill Project continues to meet the Surface Water Quality Standards as described under Condition E-1 of the WQC. If the Surface Water Quality Standards are no longer being met, and NHDES determines that the Sawmill Project is contributing to the violation on the Water Quality Standards, the Licensee must provide a Water Quality Improvement Plan with 120 days of notice from the NHDES, per Condition E-10 of the WQC. The purpose of the plan would be to restore the surface waters to meet Surface Water Quality Standards, in accordance with Env-Wq 1703.01(b), for parameters that are influenced by the project.

3.3.2.2 Study Results

GLHA completed a comprehensive water quality study between June 30 and October 8, 2020, throughout an 11-mile reach of the Upper Androscoggin River containing eight hydroelectric projects. Continuous monitoring of the dissolved oxygen (DO) concentration, DO percent saturation, water temperature, and pH was completed at 24 sites distributed throughout the six GLHA hydroelectric project areas for 10 to 12 weeks. This study revealed that all Projects, including the Sawmill Project, are meeting Class B Water Quality Standards.

Two types of monitoring were conducted, Riverine and Impoundment monitoring. Riverine monitoring continuously measured DO concentration, water temperature, and pH at 15-minute intervals for 10 to 12 weeks. Impoundment monitoring started with vertical profile of DO and water temperature to determine the depth to install DO, temperature, and pH data sondes in the impoundments. None of the Projects were stratified and therefore all data loggers were installed at the 1-meter mark to monitor DO concentration, water temperature, and pH at 15-minute intervals. Additionally, water samples were collected for analysis of total Kjeldahl nitrogen (TKN), nitrite + nitrate nitrogen, total phosphorus, and chlorophyll-a at the impoundment sites once per week; a Secchi disk measurement was also collected. During each sampling event, the vertical profile measurements indicated that the deep spot in the impoundments was not thermally stratified.

Throughout the entire monitoring period, the DO concentration and daily average DO percent saturation were above the Class B water quality standards (5.0 milligrams per liter

[mg/L] and 75 percent saturation) at all 24 monitoring sites. The pH was within the limits of the Class B standard (6.5 to 8.0) throughout the entire monitoring period at 11 sites. At the other 13 sites, pH was in attainment with the standard between 94.0 percent and 99.6 percent of the time. The pH was below 6.5 during times of cooler water temperatures and higher flows following rain events. Minor variations in DO and pH were observed during short-term maintenance work; both parameters remained above the Class B standards. Normal operations did not have an adverse impact on water quality.

The median chlorophyll-a and total phosphorus concentrations were in attainment with the Class B standards for oligotrophic or mesotrophic waters. The low chlorophyll-a and nutrient concentrations and good water clarity indicate the Androscoggin River in the project area has low productivity and is not influenced by algal blooms. Diurnal variations in DO, water temperature, and pH throughout the project area were consistent with natural processes (e.g., sunlight, photosynthesis, respiration).

3.3.2.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	B-3	B-3	The Sawmill Project is still meeting NH State Surface Water Quality Standards, as shown in the site-specific water quality study, and a new WQC was issued in 2024.
Bypass Reach	B-3	B-3	
Tailrace	B-3	B-3	

3.3.3 Upstream Fish Passage

3.3.3.1 Changes in License, Regulatory Requirements, and Plans

There is no upstream fish passage at the Sawmill Project as there are no anadromous fish present at the project. Two major cascades in the lower Androscoggin River, Lewiston Falls and Rumford Falls, are natural barriers for anadromous fishes (Wippelhauser et al 2017). Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Sawmill Project.

3.3.3.2 Study Results

No fish passage studies were conducted.

3.3.3.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	C-1	C-1	No fish passage prescriptions or requirements.
Bypass Reach	C-1	C-1	
Tailrace	C-1	C-1	

3.3.4 Downstream Fish Passage

3.3.4.1 Changes in License, Regulatory Requirements, and Plans

There is no downstream fish passage at the Sawmill Project as there are no catadromous fish present at the project. Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Sawmill Project.

3.3.4.2 Study Results

GLHA evaluated entrainment risk, impingement risk, and the potential for turbine passage survival of juvenile and adult life stages of stocked trout, Fallfish (*Semotilus corporalis*), Smallmouth Bass (*Micropterus dolomieu*), White Sucker (*Catostomus commersonii*), and Longnose Dace (*Rhinichthys cataractae*) (four most common species known to occur in the GLHA project areas). This combination of species and life stages represented a range of game species, nongame species, and native species that may be affected by project operations. Entrainment and impingement risk for juveniles and adults of each target species was ranked as high, moderately high, moderate, moderately low, or low according to swim speed (i.e., ability to avoid or resist intake velocities that could result in involuntary entrainment or impingement), body size (likelihood of passing through trash racks), habitat preference or availability of habitat near the intake area, and the proclivity to move (i.e., migratory requirements).

Turbine passage survival estimates were made for those species and life stages that were found to be at risk (i.e., could physically fit through the trash racks and with swim speeds less than calculated approach velocities). Turbine passage survival estimates were derived from past studies described in the Electric Power Research Institute’s (EPRI) database for hydropower projects using sites similar to GLHA’s hydroelectric facilities. In addition, USFWS’ Turbine Blade Strike Analysis model (Towler and Pica 2020) was used to assess

turbine passage survival for those species or life stages classified as at risk (i.e., in instances where swim speeds were less than calculated approach velocities).

Researchers demonstrated that the risk of fish impingement and entrainment was low at the Riverside, Cross, Cascade, Gorham, and Shelburne projects and moderately low at the Sawmill Project.

This was a result of several factors including:

- The limited amount of aquatic habitat near the intake areas, which reduces the likelihood that fish will encounter the intake areas.
- The industrial nature and developmental history of the GLHA project areas, which has resulted in limited fisheries management in the 11-mile-long reach of the Androscoggin River between the Sawmill Project and the Shelburne Project.
- The presence of full depth, vertical bar racks, which exclude large fish from the turbines.
- The absence of migratory fish that require downstream passage and are therefore more at risk of entrainment as compared to resident fish species found at these projects; the natural range of migratory, anadromous fish does not extend to the Upper Androscoggin River.

Compared to the other projects analyzed on the Androscoggin River, the Sawmill Project had slightly higher risks for resident fish species due to approach velocities. Small (e.g., less than 5 inches long), resident fish that may encounter the intake area have the potential to become entrained because approach velocities are expected to be greater than 2.5 feet per second (ft/s) at full generation, which exceeds some swimming speeds of smaller fish. Survival estimates completed by GLHA as part of the 2021 desktop entrainment study estimated turbine passage survival to be above 95 percent for juvenile fish using the USFWS's turbine blade strike model (Towler and Pica 2020). Previous entrainment studies conducted at hydropower projects with horizontal Kaplan turbines, similar to those at the Sawmill Project (e.g., Townsend and Wilder hydroelectric projects) showed that survival estimates for juvenile fish passing through the turbines ranged from 96 to 100 percent (EPRI 1997). Additionally, other projects where entrainment survival has been studied have documented survival rates of at least 95 percent for juvenile life stages (i.e., less than 5 inches total length) (EPRI 1997).

3.3.4.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	D-1	D-1	No fish are present at the facility that require downstream passage to complete their life cycle.
Bypass Reach	D-1	D-1	
Tailrace	D-1	D-1	

3.3.5 Shorelines and Watershed

3.3.5.1 Changes in License, Regulatory Requirements, and Plans

The Sawmill Project Boundary only extends to the normal full pool elevation of 1,094.5 feet National Geodetic Vertical Datum of 1929 (NGVD 29),⁵ and as such there is limited shoreline under Sawmill Project control. No changes were made to the flow regime at the Sawmill Project following the new license that would impact the existing shoreline. The Sawmill Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond level of 1,094.5 feet, and provides a minimum flow of 12 cfs in the bypass reach.

The NHDES maintains regulatory jurisdiction over the Project's shorelines through implementation of the State of New Hampshire Shoreland Water Quality Protection Act (SWQPA). The SWQPA protects shorelands within a 250-foot buffer along public waters by regulating certain activities, such as lot subdivision, land development, and vegetation management, to protect shoreland resources. The SWQPA, supplemented by local zoning ordinances, are adequate to substantially protect shoreland resources along the river corridor. As the SWQPA supersedes the primary component of the original Shoreland Protection Plan (the New Hampshire Comprehensive Shoreland Protection Act), the SWQPA provides adequate protection of shorelands in the absence of a project-specific plan. As such, GLHA maintains compliance with the laws and applicable ordinances. No Shoreline Protection Plan was required for the Sawmill Project in the previous FERC License and is not required in the current FERC license.

3.3.5.2 Study Results

No shoreline or watershed studies were conducted during the relicensing.

⁵ All elevations within this document are referenced to NGVD 29, unless otherwise noted.

3.3.5.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	E-3	E-3	There have been no changes in operations or license requirements that would affect the standard rating for these criteria. The Sawmill Project is in compliance with the SWQPA.
Bypass Reach	E-3	E-3	
Tailrace	E-3	E-3	

3.3.6 Threatened and Endangered Species

3.3.6.1 Changes in License, Regulatory Requirements, and Plans

Article 404 of the new FERC license implements protections for the endangered bat species the northern long-eared bat (*Myotis septentrionalis*) and the proposed threatened tricolored bat (*Perimyotis subflavus*). The Licensee must avoid removing trees of any size on project land from April 15 through October 31, unless emergency tree removal for public safety is necessary. If emergency tree removal is required, the Licensee shall notify NHFGD and USFWS as soon as practicable following the tree removal.

3.3.6.2 Study Results

An extensive botanical survey was conducted at all the Projects in 2021 to document the botanical resources within Project Boundaries and note any rare, threatened, or endangered (RTE) species or associated habitats. In total, 18 habitat communities were identified, and a total of 167 plants species were documented within these communities. No federal or state threatened or endangered species were observed during the 2021 field surveys at the Sawmill Project, or any of the other Projects in the survey.

3.3.6.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	F-2	F-2	RTE bat species could be present in the area; however, the Licensee conducted consultation with appropriate resource agencies to identify potential impacts, and License Article 404 addresses protection measures. Daily operations of the Sawmill Project would have no impact on the RTE species.
Bypass Reach	F-2	F-2	
Tailrace	F-2	F-2	

3.3.7 Cultural and Historic Resources

3.3.7.1 Changes in License, Regulatory Requirements, and Plans

Article 405 of the new license requires the Licensee to implement a Programmatic Agreement between FERC and the New Hampshire State Historic Preservation Office (NH SHPO) for Managing Historic Properties. Pursuant to the Programmatic Agreement executed on December 12, 2024, the Licensee must develop a Historic Properties Management Plan (HPMP) within 1-year of license issuance. As such, the HPMP is currently under development with completion expected by September 2026. The HPMP will contain a (1) a description of each historic property; (2) a description of the potential effect on each historic property; (3) proposed measures for avoiding or mitigating adverse effects; and (4) documentation of the nature and extent of consultation; and (5) a schedule for implementing mitigation.

The previous license required the Licensee 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. At the Sawmill Project, GLHA was required to submit this report on the crib structure in the impoundment. The annual report was required to contain any alterations or future planned alterations to the structures.

3.3.7.2 Study Results

No cultural or archaeological studies were conducted at the Sawmill Project site during the relicensing.

3.3.7.3 LIHI Criteria and Zone of Impacts

There are no known archaeological sites, historic traditional cultural landscapes, traditional cultural properties, Tribal trust resources, or other historic properties or cultural or historic resources present on facility lands or waters within the Sawmill Project Boundary or area of potential effects (APE), as defined in the Final License Application.

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	G-2	G-2	A Programmatic Agreement was executed on December 12, 2024, and GLHA will develop an HPMP under consultation with the NH SHPO. Continued Sawmill Project operations are not expected to impact historic or cultural resources. Should any future site be identified, the HPMP will be in place to manage the properties and findings with appropriate resource agencies.
Bypass Reach	G-2	G-2	
Tailrace	G-2	G-2	

3.3.8 Recreational, Public, and Traditional Cultural Access

3.3.8.1 Changes in License, Regulatory Requirements, and Plans

Article 406 in the new license requires the Licensee to notify FERC if the non-project Horne Field (also known as Centennial Park) ceases operations. The Horne Field and the Berlin Riverwalk provides recreational access to the Sawmill Project lands, including the impoundment but is not located within the Sawmill Project Boundary. Horne Field is located on river left of the Sawmill Project impoundment approximately 1,800 feet upstream of the Sawmill dam. Should the Horne Field no longer be operational, FERC may require the Licensee to implement additional recreational measures in the public's interest.

3.3.8.2 Study Results

GLHA conducted a comprehensive Recreation Study in 2022 throughout the six Upper Androscoggin River Projects in the City of Berlin and the towns of Gorham and Shelburne, New Hampshire. The Recreation Use and Facility Assessment Study Report was filed with FERC on April 12, 2023 (GLHA 2023). The goal of the study was to evaluate the adequacy of existing recreational water access and facilities, determine if existing facilities were

meeting user needs, and to identify potential measures to enhance water access opportunities at the Upper Androscoggin River Projects. Components of the study included a facility inventory, spot counts, user surveys, and consultation with interested agencies and stakeholders.

Hand carry or motorized boat access to the Androscoggin River is available at 9 of the 14 recreation sites. Motorized boat access is available from Horne Field and Hogan Road; hand carry boat access is available from Rotary Park, Cascade Impoundment Access, Upper Gorham Impoundment Access, Reflection Pond, Shelburne Informal Access, Meadow Road Informal Access, and the Central Rivers Power (CRP) Gorham Project (P-2288). The majority of survey respondents (83 percent) were satisfied with the number and type of recreation facilities available at each site and 84 percent rated the condition of the sites as good or excellent. However, respondents often said there was not a lot to do at the sites. Respondents also recommend improving the water access at the Meadow Road Informal Access.

Based on the spot counts and surveys, 52 percent of respondents were either hiking or walking. Overall, 49 percent of survey respondents accessed the water for recreation on the survey day; 31 percent were fishing (bank, boat, or fly/wade), and 19 percent were boating (motorboat, canoe, kayak) or tubing. The primary activity of 25 percent of the survey respondents was water-based (kayaking, fishing, or swimming).

Overall, all sites were well under their parking capacity with a maximum number of six cars observed during the spot count circuits, and a maximum number of 17 people observed.

3.3.8.3 LIHI Criteria and Zone of Impacts

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

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	H-2	H-2	No change in project recreational opportunities or facilities, the public can access the impoundment via non-project Horne Field or the Berlin Riverwalk. Under Article 406, if public

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
			access is no longer available via Horne Field, the Licensee may be required to provide additional recreational opportunities.
Bypass Reach	H-1	H-1	No changes since the new license, and no safe access for the public.
Tailrace	H-2	H-2	No change in project recreational opportunities or facilities at the Tailrace zone.

3.4 Existing LIHI Conditions

Condition 1: The facility Owner shall provide updates to LIHI on the ongoing status of Sawmill Project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

Status: The Sawmill Project has been relicensed and is providing the updates in this Mid-term report, fulfilling this condition.

Condition 2: The facility Owner shall provide updates to LIHI on the ongoing status of the Proposed Recreation Plan including efforts with the City of Berlin’s Riverwalk project.

Status: In 2022, the City of Berlin constructed a walking path through the Rotary Park from near the Service Credit Union Heritage Park to the 11th Street Bridge. The Riverwalk is not a project recreation facility and is not within the Sawmill Project Boundary. GLHA does not have any observations or knowledge of enhancements made to the park since construction was completed and the park does not need to be included in a Recreation Management Plan, as it is not a Sawmill Project recreational facility.

3.5 Crosswalk Table

Table 3-3 Sawmill Project Crosswalk

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
Aquatics	Project Operation	Run of river operations	Run of river operations	Run of river operations	No change
	Minimum Flows	Minimum bypass flow of 12 cfs or inflow, whichever is less	Minimum bypass flow of 12 cfs or inflow, whichever is less	Minimum bypass flow of 12 cfs or inflow, whichever is less	No change
	Operations Compliance	None	Refers to Operation Compliance Monitoring Plan per WQC Condition E-7	Develop an Operations Compliance Monitoring Plan	New requirement to develop plan
Water Quality	Water Quality	None	Refers to Water Quality Improvement Plan per WQC Condition E-10	Maintain compliance with Surface Water Quality Standards, provide a Water Quality Improvement Plan if standards are no longer being met	Trigger for a Water Quality Improvement Plan if standards are no longer being met
Terrestrial	Wildlife Habitat & Wetlands	None	None	None	No change

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
Threatened & Endangered Species	Listed Bat Species	None	Avoiding any tree-cutting and trimming of trees greater than or equal to 3 inches in diameter at breast height from April 15 through October 31 to protect the northern long-eared and tri-colored bats unless the trees represent a public safety hazard.	None	New seasonal tree-cutting and trimming restrictions
Recreation	Public Access	Recreation Plan	Inform FERC if the non-project Horne Field, which provides recreational access to the Sawmill Project and associated waters, ceases operations, in which case FERC may implement additional recreational measures.	None	No formal Plan required

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
	Recreation Enhancements	Modify the recreation facilities at Horne Field (Centennial Park) to include development of an accessible parking space, path, landing area with bench, and signage. The facilities would continue to be maintained by the City of Berlin.	None	None	No change
Cultural	HPMP	None	Develop a HPMP	None	New requirement to develop HPMP

4.0 CROSS POWER PROJECT (P-2326)

4.1 Project Details

The Cross Power Project (FERC No. 2326; LIHI No. 174) submitted an application to LIHI on August 31, 2020. On September 9, 2025, the Cross Power Project received a new FERC License (Accession No. 20250909-3048) which constitutes as a material change under Section 5.3.4 in the LIHI Handbook 2nd Edition – Revision 2.06. No other material changes have occurred for this project. Any reference documents not linked in Table 4-1 appear in Appendix C.

4.2 Standards Matrix

Table 4-1 Cross Power Project Facility Matrix

Item	Information Requested	Response – if applicable, include references or links to further details
Name of the Facility	Facility name (use FERC project name or other legal name)	Cross Power Project (FERC No. 2326)
Reason for applying for LIHI Certification	<ol style="list-style-type: none"> 1. To participate in state RPS program (specify the state and the total MW/MWh associated with that participation (value and % of facility total MW/MWh) 2. To participate in voluntary REC market (e.g., Green-e) 3. To satisfy a direct energy buyer’s purchasing requirement 4. To satisfy the facility’s own corporate sustainability goals 5. For the facility’s corporate marketing purposes 6. Other (describe) 	To participate in voluntary REC market (e.g., Green-e)
	If applicable, the amount of annual generation (MWh and % of total generation) for which RECs are currently received or are expected to be received upon LIHI Certification	100%
Location	River name (USGS proper name)	Androscoggin River

Item	Information Requested	Response – if applicable, include references or links to further details
	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: https://water.usgs.gov/wsc/map_index.html	HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam above mouth	136.1
	Geographic latitude and longitude of dam	44°27.397' N, 71°11.111' W
Facility Owner	Application contact names	Kyle Murphy Senior Compliance Specialist – New England
	Facility owner company and authorized owner representative name. For recertifications: If ownership has changed since last certification, provide the effective date of the change.	Great Lakes Hydro America LLC Representative: Kyle Murphy <i>No change since last certification.</i>
	FERC licensee company name (if different from owner)	N/A
Other Owners	If different from hydro facility owner, Provide the dam owner(s)/operator(s) entity names.	N/A
Regulatory Status	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	FERC P-2326, Issued September 9, 2025, Expires September 1, 2065
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Major
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	WQC 2024-FERC-003; Standard NH 401 WQC Issued September 19, 2024 Issued by New Hampshire Department of Environmental Services

Item	Information Requested	Response – if applicable, include references or links to further details
	Hyperlinks to key electronic records on FERC e-Library website or other publicly accessible data repositories ⁶ (or provide a separate list) If not electronically available, provide as appendices to the application	Order Issuing Cross Power FERC License Cross Power 2024 Water Quality Certificate Final License Application Updated Cross Power Exhibit A Recreation Use and Facility Assessment Study Report and updated License Application exhibits Programmatic Agreement for the Cross Power Project Cross Power FERC Final Environmental Assessment
Powerhouse	Date of initial operation (past or future for pre-operational applications)	1903
	Total installed capacity (MW) For recertifications: Indicate if installed capacity has changed since last certification	3.22 MW <i>No change since last certification.</i>
	Average annual generation (MWh) and period of record used For recertifications: Indicate if average annual generation has changed since last certification	12,674.33 MWh (2016 to 2021) <i>Change from 15,024.63 MWh (2014 – 2018) in the last LIHI certification. The 2025 License states 13,175 MWh is expected for average annual generation.</i>

⁶ For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service or other agency, U.S. Army Corps of Engineers permits, and other regulatory documents, or permits or authorizations issued by a Tribal Nation, other 3rd-party agreements including Memorandums of Agreement or Understanding about water or land management, grants of right-of-way, water rights, and the like. If extensive, the list of hyperlinks can be provided separately in the application.

Item	Information Requested	Response – if applicable, include references or links to further details
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) For recertifications: Indicate if mode of operation has changed since last certification	Run-of-river <i>No change since last certification.</i>
	Number, type, and size of turbine/generators, including maximum and minimum hydraulic capacity (in cfs) and maximum and minimum output (in kW or MW) of each turbine and generator 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
	Trash rack clear spacing (inches) for each trash rack	21.6 feet wide by 18.4 feet high with 3-inch clear spacing per bay
	Approach water velocity (ft/s) at each intake if known	1.3 ft/s at Unit 1, 3, and 4 1.4 ft/s at Unit 2 1.5 ft/s at Unit 5
	Dates and types of major equipment upgrades <i>(or provide a separate list)</i> For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>
	Dates, purpose, and type of any recent operational changes <i>(or provide a separate list)</i> For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>

Item	Information Requested	Response – if applicable, include references or links to further details
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments (<i>or provide a separate list</i>)	<p>New FERC License - September 9, 2025</p> <p>Article 401 and Condition E-7 requires a new Operations Compliance Monitoring Plan</p> <p>Article 406 requires implementation of Programmatic Agreement and Historic Properties Management Plan</p> <p>Article 405 Requires a new Recreation Management Plan</p>
<i>Dam or Diversion</i>	Date of original dam or diversion construction and description and dates of subsequent dam or diversion structure modifications	1903
	Dam or diversion structure length, height including separately the height of any flashboards, inflatable dams, etc. and describe seasonal operation of flashboards and the like	<p>Concrete non-overflow sections 276-foot long spillway section 38-foot-long Stoplog section 124-foot-long gatehouse</p> <p>Spillway elevation of 918.2 feet topped with 42-inch flashboards, for a total elevation of 921.7.</p> <p>No seasonal flashboard removal, designed to trip during high flood events.</p>
	Spillway maximum hydraulic capacity	18,550 cfs at elevation 925.1 ft with flashboards removed top of the west abutments
	Length and type of each penstock and water conveyance structure between the impoundment and powerhouse	No penstock or conveyance structure.
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
<i>Conduit Facilities Only</i>	Date of conduit construction and primary purpose of conduit	N/A

Item	Information Requested	Response – if applicable, include references or links to further details
	Source water	N/A
	Receiving water and location of discharge	N/A
Impoundment and Watershed	Authorized maximum and minimum impoundment water surface elevations For recertifications: Indicate if these values have changed since last certification	Run-of-river project with a target elevation of 921.7 ft <i>No change in project operations, but a clarification. The Cross Power Project is a run-of river so there is no real minimum or maximum water surface elevation. As such, the section was edited from the last LIHI application.</i>
	Normal operating elevations and normal fluctuation range For recertifications: Indicate if these values have changed since last certification	Run of river project with a target elevation of 921.7 ft and an allowed fluctuation of 6 inches <i>No changes but the previously LIHI 918.2 feet to 921.7 feet topped with 42-inch flashboards, but the Cross Power Project is a run of true run of river project with no minimum or maximum water surface elevations.</i>
	Gross storage volume and surface area at full pool For recertifications: Indicate if these values have changed since last certification	Gross storage of 120 acre-ft; 22 acres surface area. <i>No change since last certification.</i>
	Usable storage volume and surface area For recertifications: Indicate if these values have changed since last certification	No usable storage. <i>No change since last certification.</i>
	Describe requirements related to impoundment inflow and outflow, elevation restrictions (e.g., fluctuation limits, seasonality) up/down ramping and refill rate restrictions	Run of river operations which includes stable headpond (within 6 inches of normal full pond)
	Upstream dams by name, ownership (including if owned by an affiliate of the applicant’s company) and river mile. If	Errol Project (FERC No. 3133), Brookfield White Pine Hydro LLC RM 170.1;

Item	Information Requested	Response – if applicable, include references or links to further details
	<p>FERC licensed or exempt, please provide FERC project number of these dams. Indicate which upstream dams have downstream migratory fish passage</p>	<p>Pontook Project (FERC No. 2861), Pontook Operating LP, RM 152.4</p> <p>Sawmill Project (FERC No. 2422), Great Lakes Hydro America LLC, RM 142.2;</p> <p>Riverside Project (FERC No. 2423), Great Lakes Hydro America LLC, RM 138.8;</p> <p>J. Brodie Smith Project (FERC No. 2287), Central Rivers Power, RM 138.2</p> <p>No fish passage at any of the upstream projects.</p>
	<p>Downstream dams by name, ownership (including if owned by an affiliate of the applicant’s company), river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream migratory fish passage</p>	<p>Cascade Project (FERC No. 2327), Great Lakes Hydro America LLC, RM 136.3;</p> <p>Upper Gorham Project (FERC No. 2311), Great Lakes Hydro America LLC, RM 133.2;</p> <p>Gorham Project, Central Rivers Power, RM 130.4;</p> <p>Shelburne Project (FERC No. 2300), Great Lakes Hydro America LLC, RM 127.6</p> <p>Upper & Middle Dam (FERC No.2333), Rumford Falls Power Company, RM 90.9 and 90.7;</p> <p>Riley Project (FERC No. 8277), Eagle Creek Renewable Energy LLC, RM 69.3;</p>

Item	Information Requested	Response – if applicable, include references or links to further details
		<p>Jay (RM 66.6), Otis (RM 63.8), Livermore Falls (FERC No. 2375) Eagle Creek Renewable Energy LLC, RM 61.2;</p> <p>Gulf Island Project (FERC No. 2283), Brookfield White Pine Hydro LLC RM 35.0;</p> <p>Lewiston Falls Project (FERC No. 2302), Brookfield White Pine Hydro LLC RM 30.8</p> <p>Worumbo Project (FERC No. 3428), Brown Bear II Hydro, Inc., RM 15.7;</p> <p>Pejepscot Project (FERC No. 4784), Topsham Hydro Partners LP, RM 12.5;</p> <p>Brunswick Project (FERC No. 2284), Brookfield White Pine Hydro LLC RM 8.0</p> <p>Upstream fish passage is provided at the Brunswick, Pejepscot, and Worumbo Project. Upstream American eel passage is being considered at the Lewiston Project.</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. Indicate locations and acres of flowage rights versus fee-owned property	<p>Land: Undetermined; limited to lands encompassing project structures</p> <p>Water: 22 acres</p>
Hydrologic Setting	Average annual flow at the dam, and period of record used	1991-2020: 2,801 cfs

Item	Information Requested	Response – if applicable, include references or links to further details																													
	Average monthly flows and period of record used	<table border="1"> <thead> <tr> <th data-bbox="984 279 1170 310">Month</th> <th data-bbox="1170 279 1445 310">Average Flow (cfs)</th> </tr> </thead> <tbody> <tr><td data-bbox="984 310 1170 352">January</td><td data-bbox="1170 310 1445 352">2,635</td></tr> <tr><td data-bbox="984 352 1170 394">February</td><td data-bbox="1170 352 1445 394">2,763</td></tr> <tr><td data-bbox="984 394 1170 436">March</td><td data-bbox="1170 394 1445 436">3,058</td></tr> <tr><td data-bbox="984 436 1170 478">April</td><td data-bbox="1170 436 1445 478">4,740</td></tr> <tr><td data-bbox="984 478 1170 520">May</td><td data-bbox="1170 478 1445 520">4,109</td></tr> <tr><td data-bbox="984 520 1170 562">June</td><td data-bbox="1170 520 1445 562">2,856</td></tr> <tr><td data-bbox="984 562 1170 604">July</td><td data-bbox="1170 562 1445 604">2,304</td></tr> <tr><td data-bbox="984 604 1170 646">August</td><td data-bbox="1170 604 1445 646">1,953</td></tr> <tr><td data-bbox="984 646 1170 688">September</td><td data-bbox="1170 646 1445 688">1,836</td></tr> <tr><td data-bbox="984 688 1170 730">October</td><td data-bbox="1170 688 1445 730">2,285</td></tr> <tr><td data-bbox="984 730 1170 772">November</td><td data-bbox="1170 730 1445 772">2,546</td></tr> <tr><td data-bbox="984 772 1170 814">December</td><td data-bbox="1170 772 1445 814">2,522</td></tr> <tr> <td data-bbox="984 814 1170 846">Annual</td> <td data-bbox="1170 814 1445 846">2,801</td> </tr> </tbody> </table> <p data-bbox="984 846 1445 961">Pro-rated river flows for the Cross Power Project (January 1991 to December 2020).</p>		Month	Average Flow (cfs)	January	2,635	February	2,763	March	3,058	April	4,740	May	4,109	June	2,856	July	2,304	August	1,953	September	1,836	October	2,285	November	2,546	December	2,522	Annual	2,801
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	Locations, names, and hyperlinks to the closest stream gaging stations above and below the facility	<p data-bbox="984 972 1445 1077">Above - USGS 01053600 Androscoggin River at Cambridge NH</p> <p data-bbox="984 1119 1445 1224">Below - USGS 01054000 Androscoggin River near Gorham, NH</p>																													
	Watershed area at the dam (in square miles). Identify if this value is prorated from gage locations and provide the basis for proration calculation	1,350 Square miles																													
	Other facility specific hydrologic information (e.g., average hydrograph)	N/A																													
Designated Zones of Effect	Numbers and names of each zone of effect and river mile of upstream and downstream limits of each zone of effect (e.g., "Zone 1: Impoundment RM 6.3 - 5.1")	<p data-bbox="984 1482 1445 1556">Zone 1 Impoundment: RM 136.7 – 136.1</p> <p data-bbox="984 1598 1445 1671">Zone 2 Bypass Reach: RM 136.1 – 136</p>																													
Pre-Operational Facilities Only																															
Expected Operational Date	Date generation is expected to begin	N/A																													

Item	Information Requested	Response – if applicable, include references or links to further details
<i>Dam, Diversion Structure or Conduit Modification</i>	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
<i>Change in Water Flow Regime</i>	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

4.3 LIHI Criteria Analysis

The proposed 2025 LIHI standards for the Cross Power Project are summarized in Table 4-2. The Cross Power Project has no significant changes to operations or new license requirements that would substantially affect project resources; therefore, the proposed standards remain unchanged since the 2020 LIHI analysis. Analysis for each resource topic can be found in the sections below.

Table 4-2 Cross Power Project Proposed 2025 Criteria Summary Tab

Criteria Standard		Zone 1	Zone 2
		Impoundment	Bypass Reach
A	Flow Regimes	1	2
B	Water Quality	3	3
C	Upstream Fish Passage	1	1
D	Downstream Fish Passage	1	1
E	Shorelines and Watershed	3	3
F	Threatened and Endangered Species	2	2
G	Cultural and Historic Resources	2	2
H	Recreational, Public, and Traditional Cultural Access	2	1

4.3.1 Flow Regimes

4.3.1.1 Changes in License, Regulatory Requirements, and Plans

No changes were made to the flow regime at the Cross Power Project following the new license. The Cross Power Project still operates as run-of-river and maintains the impoundment level within 0.5 foot of the normal full pond level of 921.7 feet. As stated in the 2025 license and 1993 Environmental Impact Statement (FERC 1993), there is no true bypass reach at the Cross Power Project. The powerhouse is essentially integral to the dam and therefore hydraulically connected to spillway flow, as well as being subject to the backwater of the downstream project. As such, there is no bypass reach minimum flow required in the WQC or FERC License. Per Article 402 and Condition E-7 of the WQC, the Licensee must develop an Operations Compliance Monitoring Plan.

4.3.1.2 Study Results

As the Cross Power Project has no true bypass reach and is run-of-river, no flow study was conducted.

4.3.1.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	A-1	A-1	No change in operations, in compliance with the 2025 WQC.
Bypass Reach	A-2	A-2	

4.3.2 Water Quality

4.3.2.1 Changes in License, Regulatory Requirements, and Plans

There are no significant changes in water quality requirements under the new license, as the Cross Power Project continues to meet the Surface Water Quality Standards as described under Condition E-1 of the WQC. If the Surface Water Quality Standards are no longer met, and NHDES determines that the Cross Power Project is contributing to the violation on the Water Quality Standards, the Licensee must provide a Water Quality Improvement Plan with 120 days of notice from the NHDES, per condition E-10 and E-11 of the WQC. The purpose of the plan would be to restore the surface waters to meet Surface Water Quality Standards, in accordance with Env-Wq 1703.01(b), for parameters that are influenced by the Cross Power Project.

4.3.2.2 Study Results

GLHA completed a comprehensive water quality study between June 30 and October 8, 2020, throughout an 11-mile reach of the Upper Androscoggin River containing eight hydroelectric projects. Continuous monitoring of the DO concentration, DO percent saturation, water temperature, and pH was completed at 24 sites distributed throughout the six GLHA hydroelectric project area for 10 to 12 weeks. This study revealed that all Projects, including the Cross Power Project, are meeting Class B Water Quality Standards.

Two types of monitoring were conducted, Riverine and Impoundment monitoring. Riverine monitoring continuously measured DO concentration, water temperature, and pH at 15-minute intervals for 10 to 12 weeks. Impoundment monitoring started with vertical profile of DO and water temperature to determine the depth to install DO, temperature, and pH data sondes in the impoundments. None of the Projects were stratified and therefore all data loggers were installed at the 1-meter mark to monitor DO concentration, water temperature, and pH with at 15-minute intervals. Additionally, water samples were collected for analysis of TKN, nitrite + nitrate nitrogen, total phosphorus, and chlorophyll-a at the impoundment sites once per week; a Secchi disk measurement was also collected. During each sampling event, the vertical profile measurements indicated that the deep spot in the impoundments was not thermally stratified.

Throughout the entire monitoring period, the DO concentration and daily average DO percent saturation were above the Class B water quality standards (5.0 mg/L and 75 percent saturation) at all 24 monitoring sites. pH was within the limits of the Class B standard (6.5 to 8.0) throughout the entire monitoring period at 11 sites. At the other 13 sites, pH was in attainment with the standard between 94.0 percent and 99.6 percent of the time. pH was below 6.5 during times of cooler water temperatures and higher flows following rain events. Minor variations in DO and pH were observed during short-term maintenance work; both parameters remained above the Class B standards. Normal operations did not have an adverse impact on water quality.

The median chlorophyll-a and total phosphorus concentrations were in attainment with the Class B standards for oligotrophic or mesotrophic waters. The low chlorophyll-a and nutrient concentrations and good water clarity indicate the Androscoggin River in the project area has low productivity and is not influenced by algal blooms. Diurnal variations in DO, water temperature, and pH throughout the project area were consistent with natural processes (e.g., sunlight, photosynthesis, respiration).

4.3.2.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	B-3	B-3	The Cross Power Project is still meeting NH State Surface Water Quality Standards, as shown in the site-specific water quality study, and a new WQC was issued in 2024.
Bypass Reach	B-3	B-3	

4.3.3 Upstream Fish Passage

4.3.3.1 Changes in License, Regulatory Requirements, and Plans

There is no upstream migratory fish passage at the Cross Power Project as there are no anadromous fish present at the project. Two major cascades in the lower Androscoggin River drainage, Lewiston Falls and Rumford Falls, are natural barriers for anadromous fishes (Wippelhauser et al 2017). Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Cross Power Project.

4.3.3.2 Study Results

No fish passage studies were conducted.

4.3.3.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	C-1	C-1	No fish passage prescriptions or requirements.
Bypass Reach	C-1	C-1	

4.3.4 Downstream Fish Passage

4.3.4.1 Changes in License, Regulatory Requirements, and Plans

There is no downstream fish passage at the Cross Power Project as there are no catadromous fish present at the project. Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Cross Power Project.

4.3.4.2 Study Results

GLHA evaluated entrainment risk, impingement risk, and the potential for turbine passage survival of juvenile and adult life stages of stocked trout, Fallfish, Smallmouth Bass, White Sucker, and Longnose Dace (four most common species known to occur in the GLHA project areas). This combination of species and life stages represented a range of game species, nongame species, and native species that may be affected by project operations. Entrainment and impingement risk for juveniles and adults of each target species was ranked as high, moderately high, moderate, moderately low, or low according to swim speed (i.e., ability to avoid or resist intake velocities that could result in involuntary entrainment or impingement), body size (likelihood of passing through trash racks), habitat preference or availability of habitat near the intake area, and the proclivity to move (i.e., migratory requirements).

Turbine passage survival estimates were made for those species and life stages that were found to be at risk (i.e., could physically fit through the trash racks and with swim speeds less than calculated approach velocities). Turbine passage survival estimates were derived from past studies described in the EPRI database for hydropower projects using sites similar to GLHA's hydroelectric facilities. In addition, the USFWS' Turbine Blade Strike Analysis model (Towler and Pica 2020) was used to assess turbine passage survival for those species or life stages classified as at risk (i.e., in instances where swim speeds were less than calculated approach velocities).

Researchers demonstrated that the risk of fish impingement and entrainment was low at the Cross Power Project.

This was a result of several factors including:

- The limited amount of aquatic habitat near the intake areas, which reduces the likelihood that fish will encounter the intake areas.
- The industrial nature and developmental history of the GLHA project areas, which has resulted in limited fisheries management in the 11-mile-long reach of the Androscoggin River between the Sawmill Project and the Shelburne Project.
- Low water velocities in front of the intake racks (e.g., less than 2 ft/s) and the ability of fish to swim away from the racks.
- The presence of full depth, vertical bar racks, which exclude large fish from the turbines.

- The absence of migratory fish that require downstream passage and are therefore more at risk of entrainment as compared to resident fish species found at these projects; the natural range of migratory, anadromous fish does not extend to the Upper Androscoggin River.

4.3.4.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	D-1	D-1	No fish present at the facility that require downstream passage to complete their life cycle.
Bypass Reach	D-1	D-1	

4.3.5 Shorelines and Watershed

4.3.5.1 Changes in License, Regulatory Requirements, and Plans

The Cross Power Project Boundary only extends to the normal full pool elevation of 921.7 feet; as such there is limited shoreline under project control. No changes were made to the flow regime at the Cross Power Project following the new license that would impact the existing shoreline. The Cross Power Project still operates as run-of-river and maintains the impoundment level within 0.5 foot of the normal full pond.

The NHDES maintains regulatory jurisdiction over the project shorelines through implementation of the SWQPA. The SWQPA protects shorelands within a 250-foot buffer along public waters by regulating certain activities, such as lot subdivision, land development, and vegetation management, to protect shoreland resources. The SWQPA, supplemented by local zoning ordinances, are adequate to substantially protect shoreland resources along the river corridor. As the SWQPA supersedes the primary component of the original Shoreland Protection Plan (the New Hampshire Comprehensive Shoreland Protection Act), the SWQPA provides adequate protection of shorelands in the absence of a project-specific plan. As such, GLHA maintains compliance with the laws and applicable ordinances. No Shoreline Protection Plan was required for the Cross Power Project in the previous FERC License and is not required in the current FERC license.

4.3.5.2 Study Results

No shoreline or watershed studies were conducted during the relicensing.

4.3.5.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	E-3	E-3	There have been no changes in operations or license requirements that would affect the standard rating for these criteria. The Cross Power Project is in compliance with the SWQPA.
Bypass Reach	E-3	E-3	

4.3.6 Threatened and Endangered Species

4.3.6.1 Changes in License, Regulatory Requirements, and Plans

Article 404 of the new FERC license implements protections for the endangered bat species the northern long-eared bats and proposed threatened species the tricolored bat. The Licensee must avoid removing trees of any size on project land from April 15 through October 31, unless emergency tree removal for public safety is necessary. If emergency tree removal is required, the Licensee shall notify the NHFGD and USFWS as soon as practicable following the tree removal.

4.3.6.2 Study Results

An extensive botanical survey was conducted at all the Projects in 2021 to document the botanical resources with Project Boundaries and note any RTE species or associated habitats. In total, 18 habitat communities were identified, and a total of 167 plants species were documented within these communities. No federal or state threatened or endangered species were observed during the 2021 field surveys at the Cross Power Project, or any of the other projects in the survey.

4.3.6.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	F-2	F-2	RTE bat species could be present in the area, the Licensee conducted consultation with appropriate resource agencies and Article 404 addresses protection measures. Daily operations of the Cross Power Project would have no impact on the RTE species.
Bypass Reach	F-2	F-2	

4.3.7 Cultural and Historic Resources

4.3.7.1 Changes in License, Regulatory Requirements, and Plans

Article 406 of the new license requires the Licensee to implement a Programmatic Agreement between FERC and the New Hampshire State Historic Preservation Office for Managing Historic Properties. Pursuant to the Programmatic Agreement executed on December 12, 2024, the Licensee must develop an HPMP with 1-year within license issuance, as such the HPMP is currently under development and should be complete by September 2026. The HPMP will contain a (1) a description of each historic property; (2) a description of the potential effect on each historic property; (3) proposed measures for avoiding or mitigating adverse effects; and (4) documentation of the nature and extent of consultation; and (5) a schedule for implementing mitigation.

The previous license required the Licensee 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. At the Cross Power Project, GLHA was required to submit this report on the dam, powerhouse, gatehouse, and gatehouse machinery. The annual report was required to contain any alterations or future planned alterations on the structures.

4.3.7.2 Study Results

No cultural or archaeological studies were conducted at the Cross Power Project during the relicensing.

4.3.7.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	G-2	G-2	A Programmatic Agreement was executed on December 12, 2024, and GLHA will develop an HPMP under consultation with the NH SHPO. Since there are no known historic, archeological, or Tribal sites, continued Cross Power Project operations are not expected to impact these resources. Should any future site be identified, the
Bypass Reach	G-2	G-2	

			HPMP is in place to manage the properties and findings with appropriate resource agencies.
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4.3.8 Recreational, Public, and Traditional Cultural Access

4.3.8.1 Changes in License, Regulatory Requirements, and Plans

During the relicensing, a Recreation Use and Facility Assessment (GLHA 2023) was conducted at the Cross Power Project, among other projects along the Androscoggin River. There are two non-project sites the GHHA owns and maintains in proximity to the Cross Power Project. The "Cross Informal Access" is located downstream of the project dam along Route 16, provides parking for 12 vehicles, scenic viewing of the Androscoggin River and the Cross Power Project, shoreline fishing access, safety signage, and informational signage regarding the hydroelectric project. There is also the "Cascade Impoundment Access", an informal access area approximately 800 feet downstream of the Cross dam on river right off Watson Street in Berlin, NH. This site is owned and operated by the city of Berlin on GLHA owned land outside of the Cross Power Project and Cascade Project boundaries. The site provides safety signage, scenic views of the Androscoggin River, a gravel hand carry boat access, and bank and boat fishing. However, there are no recreation areas that allow access to the Cross Power Project Impoundment.

Article 405 of the new license requires the Licensee to develop a RMP within 1 year of the license issuance to address the lack of Impoundment access and formalize recreational features. The RMP must contain (1) a description of project recreational facilities, (2) operation and maintenance schedule for these facilities, (3) a plan and schedule for the development of the new facilities proposed, and (4) provisions for informing boaters of potential hazards.

GLHA is proposing to develop a hand carry boat put-in to the impoundment on the eastern side (river left) of the Cross Power Project impoundment at the current location used to install and remove the boat barrier, approximately 450 feet upstream of the dam. The site can be accessed from Shelby Street in Berlin, NH, and by crossing the Rail Trail onto a dirt road that leads to the Cross Power Project gatehouse and powerhouse. GHHA will update the Cross Power Project Boundary to include the access and parking area. Additionally, GLHA proposes to improve the existing Cross Informal Access. Improvements would include improved fencing, gates, and safety signage.

Exact details of the proposed recreational facilities and improvements will be provided within the RMP, which will be developed by September 2026, pursuant to license Article 405. The RMP will be developed after consultation with the New Hampshire Department of Natural and Cultural Resources, the City of Berlin, and other interested stakeholders. Following approval and construction of the recreational features, the Licensee shall provide FERC a report documenting the completed facilities and revise Exhibit G drawings to reflect the changes.

4.3.8.2 Study Results

GLHA conducted a comprehensive Recreation Study in 2022 throughout the six Upper Androscoggin River Projects in the City of Berlin and the towns of Gorham and Shelburne, New Hampshire. The Recreation Use and Facility Assessment Study Report was filed with FERC on April 12, 2023 (GLHA 2023). The goal of the study was to evaluate the adequacy of existing recreational water access and facilities, determine if existing facilities were meeting user needs, and to identify potential measures to enhance water access opportunities at the Upper Androscoggin River Projects. Components of the study included a facility inventory, spot counts, user surveys, and consultation with interested agencies and stakeholders.

Hand carry or motorized boat access to the Androscoggin River is available at 9 of the 14 recreation sites. Motorized boat access is available from Horne Field and Hogan Road; hand carry boat access is available from Rotary Park, Cascade Impoundment Access, Upper Gorham Impoundment Access, Reflection Pond, Shelburne Informal Access, Meadow Road Informal Access, and the CRP Gorham Project. The majority of survey respondents (83 percent) were satisfied with the number and type of recreation facilities available at each site and 84 percent rated the condition of the sites as good or excellent. However, respondents often said there was not a lot to do at the sites. At the Cross Power Project, the study revealed that there was a lack of access to the Cross Power Project impoundment and public safety concerns at the Cross Informal Access, as discussed above in Section 4.3.8.1.

Based on the spot counts and surveys, 52 percent of respondents were either hiking or walking. Overall, 49 percent of survey respondents accessed the water for recreation on the survey day; 31 percent were fishing (bank, boat, or fly/wade), and 19 percent were boating (motorboat, canoe, kayak) or tubing. The primary activity of 25 percent of the survey respondents was water-based (kayaking, fishing, or swimming). Overall, all sites

were well under their parking capacity with a maximum number of six cars observed during the spot count circuits, and a maximum number of 17 people observed.

4.3.8.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	H-2	H-2	The Cross Power Project is demonstrating continued compliance with FERC. The Licensee is currently developing an RMP and will provide improved access to the impoundment pursuant to Article 406 of the new 2025 license.
Bypass Reach	H-1	H-1	The Cross Power Project is demonstrating continued compliance with FERC. There is no true bypass reach in which recreation, public access, or traditional cultural access could safely occur.

4.4 Existing LIHI Conditions

Condition 1: The facility Owner shall provide updates to LIHI on the ongoing status of Cross Power Project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

Status: The Cross Power Project has been relicensed and is providing the updates in this Mid-term report, fulfilling this condition.

4.5 Crosswalk Table

Table 4-3 Cross Power Project Crosswalk

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
Aquatics	General Ops	Run of river operations	Run of river operations	Operate the project in a run-of-river mode by maintaining the impoundment within 6 inches of the headwater elevation of 921.7 feet NGVD 29	No changes
	Operations Compliance	Develop Operations Compliance Management Plan	Refers to Operation Compliance Monitoring Plan per WQC Condition E-9	Develop Operations Compliance Management Plan	No change, update existing plan
Water Quality	Water Quality Plan	None	Refers to Water Quality Improvement Plan per WQC Condition E-10	Maintain compliance with Surface Water Quality Standards, provide a Water Quality Improvement Plan if standards are no longer being met	Trigger for a Water Quality Improvement Plan if standards are no longer being met
Terrestrial	Wildlife Habitat & Wetlands	None	None	None	No change

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
Threatened & Endangered Species	Listed Bat Species	None	Avoiding any tree-cutting and trimming of trees greater than or equal to 3 inches in diameter at breast height from April 15 through October 31 to protect the northern long-eared and tri-colored bats unless the trees represent a public safety hazard	None	New seasonal tree-cutting and trimming restrictions
Recreation	Public access	Continue to provide public access to project reaches	Continue to provide public access to project reaches	None	No change
	Recreation Management Plan	Develop comprehensive Recreation Management Plan	Develop a site-specific Recreation Management Plan		Provide an updated Recreation Management Plan
	Recreation Enhancements	Improve signage and appearance of hydroelectric facilities	Provide access to the Cross Power Impoundment Improve safety signage and features at the Cross Informal Access location		New requirement to develop and maintain recreation sites at Cross Power Project

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
Cultural	HPMP	Implement provisions within the Programmatic Agreement	Develop HPMP	None	New requirement to develop HPMP

5.0 UPPER GORHAM PROJECT (P-2311)

5.1 Project Details

The Upper Gorham Project (FERC No. 2311, LIHI No. 175) submitted an application to LIHI on August 31, 2020. On September 9, 2025, the Upper Gorham Project received a new FERC License (Accession No. 20250909-3060) which constitutes as a material change under Section 5.3.4 in the LIHI Handbook 2nd Edition – Revision 2.06. No other material changes have occurred for this project. Any reference documents not linked in Table 5-1 appear in Appendix C.

5.2 Standards Matrix

Table 5-1 Upper Gorham Project Facility Matrix

Item	Information Requested	Response – if applicable, include references or links to further details
Name of the Facility	Facility name (use FERC project name or other legal name)	Upper Gorham Project (FERC No. 2311)
Reason for applying for LIHI Certification	<ol style="list-style-type: none"> 1. To participate in state RPS program (specify the state and the total MW/MWh associated with that participation (value and % of facility total MW/MWh) 2. To participate in voluntary REC market (e.g., Green-e) 3. To satisfy a direct energy buyer’s purchasing requirement 4. To satisfy the facility’s own corporate sustainability goals 5. For the facility’s corporate marketing purposes 6. Other (describe) 	To participate in voluntary REC market (e.g., Green-e)
	If applicable, the amount of annual generation (MWh and % of total generation) for which RECs are currently received or are expected to be received upon LIHI Certification	100%
Location	River name (USGS proper name)	Androscoggin River

Item	Information Requested	Response – if applicable, include references or links to further details
	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: https://water.usgs.gov/wsc/map_index.html	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam above mouth	132.6
	Geographic latitude and longitude of dam	Latitude 44°23.984' N Longitude 71°11.390' W
Facility Owner	Application contact names	Kyle Murphy Senior Compliance Specialist – New England
	Facility owner company and authorized owner representative name. For recertifications: If ownership has changed since last certification, provide the effective date of the change.	Great Lakes Hydro America LLC Representative: Kyle Murphy <i>No change since last certification.</i>
	FERC licensee company name (if different from owner)	Great Lakes Hydro America LLC
Other Owners	If different from hydro facility owner, Provide the dam owner(s)/operator(s) entity name.	N/A
Regulatory Status	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	FERC P-2311 Issued on September 9, 2025 Expires on September 1, 2065
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Major
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	WQC 2024-FERC-005; Standard NH 401 WQC Issued September 19, 2024 Issued by New Hampshire Department of Environmental Services

Item	Information Requested	Response – if applicable, include references or links to further details
	Hyperlinks to key electronic records on FERC e-Library website or other publicly accessible data repositories ⁷ (or provide a separate list) If not electronically available, provide as appendices to the application	Order Issuing Upper Gorham FERC License Upper Gorham 2024 Water Quality Certificate Final License Application Updated Upper Gorham Exhibit A Recreation Use and Facility Assessment Study Report and updated License Application exhibits State of NH Comprehensive Shoreland Protection Act Programmatic Agreement for the Upper Gorham Project Upper Gorham FERC Final Environmental Assessment
Powerhouse	Date of initial operation (past or future for pre-operational applications)	1904
	Total installed capacity (MW) For recertifications: Indicate if installed capacity has changed since last certification	4.8 MW

⁷ For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service or other agency, U.S. Army Corps of Engineers permits, and other regulatory documents, or permits or authorizations issued by a Tribal Nation, other 3rd-party agreements including Memorandums of Agreement or Understanding about water or land management, grants of right-of-way, water rights, and the like. If extensive, the list of hyperlinks can be provided separately in the application.

Item	Information Requested	Response – if applicable, include references or links to further details
	Average annual generation (MWh) and period of record used For recertifications: Indicate if average annual generation has changed since last certification	14,610.59 MWh (2016 – 2021) <i>Change from 14,858.54 MWh (2014 – 2018). The 2025 License states 27,421 MWh is expected for average annual generation.</i>
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) For recertifications: Indicate if mode of operation has changed since last certification	Run-of-river with minimum bypass reach flows: March 1 to June 15: 400 cfs* June 16 to February 28: 200 cfs* (*Or in flow, whichever is less) <i>No change, but added minimum bypass flows.</i>
	Number, type, and size of turbine/generators, including maximum and minimum hydraulic capacity (in cfs) and maximum and minimum output (in kW or MW) of each turbine and generator 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
	Trash rack clear spacing (inches) for each trash rack	3 1/8-inch clear spacing
	Approach water velocity (ft/s) at each intake if known	1.3 ft/s
	Dates and types of major equipment upgrades (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>
	Dates, purpose, and type of any recent operational changes (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>

Item	Information Requested	Response – if applicable, include references or links to further details
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments (or provide a separate list)	<p>New FERC License - September 9, 2025</p> <p>Article 401 and Condition E-9 requires a new Operations Compliance Monitoring Plan</p> <p>Article 405 requires implementation of a Programmatic Agreement and Historic Properties Management Plan</p>
Dam or Diversion	Date of original dam or diversion construction and description and dates of subsequent dam or diversion structure modifications	1904
	Dam or diversion structure length, height including separately the height of any flashboards, inflatable dams, etc. and describe seasonal operation of flashboards and the like	<p>Length: 775 ft Crest elevation: 807.3 ft NGVD 29 Flashboard: 5 -feet</p> <p>Flashboards pulled when flows exceed 8,300 cfs</p>
	Spillway maximum hydraulic capacity	44,740 cfs
	Length and type of each penstock and water conveyance structure between the impoundment and powerhouse	No penstock, powerhouse is integral.
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power
Conduit Facilities Only	Date of conduit construction and primary purpose of conduit	N/A
	Source water	N/A
	Receiving water and location of discharge	N/A

Item	Information Requested	Response – if applicable, include references or links to further details
Impoundment and Watershed	Authorized maximum and minimum impoundment water surface elevations For recertifications: Indicate if these values have changed since last certification	Run-of-river project with a target elevation of 812.3 ft <i>No changes but the previously LIHI stated: Max 812.3 feet, and Min 811.7 feet, but the project is run of river with a target elevation of 812.3 ft and has no true minimum or maximum water surface elevations.</i>
	Normal operating elevations and normal fluctuation range For recertifications: Indicate if these values have changed since last certification	Within 6 inches of target elevation 812.3 feet <i>No change since last certification.</i>
	Gross storage volume and surface area at full pool For recertifications: Indicate if these values have changed since last certification	Gross Storage of 370 acre-ft, Surface Area of 45 acres <i>No change since last certification.</i>
	Usable storage volume and surface area For recertifications: Indicate if these values have changed since last certification	Negligible <i>No change since last certification.</i>
	Describe requirements related to impoundment inflow and outflow, elevation restrictions (e.g., fluctuation limits, seasonality) up/down ramping and refill rate restrictions	Run of river operations which includes stable headpond (within 6 inches of normal full pond)
	Upstream dams by name, ownership (including if owned by an affiliate of the applicant's company) and river mile. If FERC licensed or exempt, please provide FERC project number of these dams. Indicate which upstream dams have downstream migratory fish passage	Errol Project (FERC No. 3133), Brookfield White Pine Hydro LLC RM 170.1; Pontook Project (FERC No. 2861), Pontook Operating LP, RM 152.4 Sawmill Project (FERC No. 2422), Great Lakes Hydro America LLC, RM 142.2;

Item	Information Requested	Response – if applicable, include references or links to further details
		<p>Riverside Project (FERC No. 2423), Great Lakes Hydro America LLC, RM 138.8;</p> <p>J. Brodie Smith Project (FERC No. 2287), Central Rivers Power, RM 138.2;</p> <p>Cascade Project (FERC No. 2327), Great Lakes Hydro America LLC, RM 136.3;</p> <p>Cross Power Project (FERC No. 2326), Great Lakes Hydro America LLC, RM 136.9</p> <p>No fish passage at any of the upstream projects.</p>
	<p>Downstream dams by name, ownership (including if owned by an affiliate of the applicant’s company), river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream migratory fish passage</p>	<p>Gorham Project, Central Rivers Power, RM 130.4;</p> <p>Shelburne Project (FERC No. 2300), Great Lakes Hydro America LLC, RM 127.6;</p> <p>Upper & Middle Dam (FERC No.2333), Rumford Falls Power Company, RM 90.9 and 90.7;</p> <p>Riley Project (FERC No. 8277), Eagle Creek Renewable Energy LLC, RM 69.3;</p> <p>Jay (RM 66.6), Otis (RM 63.8), Livermore Falls (FERC No. 2375) Eagle Creek Renewable Energy LLC, RM 61.2;</p> <p>Gulf Island Project (FERC No. 2283), Brookfield White Pine Hydro LLC RM 35.0;</p>

Item	Information Requested	Response – if applicable, include references or links to further details
		<p>Lewiston Falls Project (FERC No. 2302), Brookfield White Pine Hydro LLC RM 30.8;</p> <p>Worumbo Project (FERC No. 3428), Brown Bear II Hydro, Inc., RM 15.7;</p> <p>Pejepscot Project (FERC No. 4784), Topsham Hydro Partners LP, RM 12.5;</p> <p>Brunswick Project (FERC No. 2284), Brookfield White Pine Hydro LLC RM 8.0</p> <p>Upstream fish passage is provided at the Brunswick, Pejepscot, and Worumbo Project. Upstream American eel passage is being considered at the Lewiston Project.</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. Indicate locations and acres of flowage rights versus fee-owned property	<p>Land: Undetermined; limited to lands encompassing project structures</p> <p>Water: 45 acres</p>
Hydrologic Setting	Average annual flow at the dam, and period of record used	1991-2020: 2,828 cfs

Item	Information Requested	Response – if applicable, include references or links to further details																												
	Average monthly flows and period of record used	<table border="1" data-bbox="992 289 1373 863"> <thead> <tr> <th>Month</th> <th>Mean flow (cfs)</th> </tr> </thead> <tbody> <tr><td>January</td><td>2,663</td></tr> <tr><td>February</td><td>2,791</td></tr> <tr><td>March</td><td>3,089</td></tr> <tr><td>April</td><td>4,789</td></tr> <tr><td>May</td><td>4,151</td></tr> <tr><td>June</td><td>2,885</td></tr> <tr><td>July</td><td>2,328</td></tr> <tr><td>August</td><td>1,973</td></tr> <tr><td>September</td><td>1,855</td></tr> <tr><td>October</td><td>2,308</td></tr> <tr><td>November</td><td>2,573</td></tr> <tr><td>December</td><td>2,549</td></tr> <tr><td>Annual</td><td>2,828</td></tr> </tbody> </table> <p data-bbox="992 911 1435 1020">Pro-rated river flows by Month for the Upper Gorham Project (January 1991 to December 2020).</p>	Month	Mean flow (cfs)	January	2,663	February	2,791	March	3,089	April	4,789	May	4,151	June	2,885	July	2,328	August	1,973	September	1,855	October	2,308	November	2,573	December	2,549	Annual	2,828
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Annual	2,828																													
	Locations, names, and hyperlinks to the closest stream gaging stations above and below the facility	<p data-bbox="992 1066 1430 1171">Above – USGS 01054000 Androscoggin River near Gorham, NH</p> <p data-bbox="992 1182 1406 1287">Below - USGS 01054500 Androscoggin River at Rumford, Maine</p>																												
	Watershed area at the dam (in square miles). Identify if this value is prorated from gage locations and provide the basis for proration calculation	1,372 Square miles																												
	Other facility specific hydrologic information (e.g., average hydrograph)	N/A																												

Item	Information Requested	Response – if applicable, include references or links to further details
Designated Zones of Effect	Numbers and names of each zone of effect and river mile of upstream and downstream limits of each zone of effect (e.g., "Zone 1: Impoundment RM 6.3 - 5.1")	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
Pre-Operational Facilities Only		
Expected Operational Date	Date generation is expected to begin	N/A
Dam, Diversion Structure or Conduit Modification	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
Change in Water Flow Regime	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

5.3 LIHI Criteria Analysis

The proposed 2025 LIHI standards for the Upper Gorham Project are summarized in Table 5-2. The Upper Gorham Project has no significant changes to operations or new license requirements that would substantially affect project resources; therefore, the proposed standards remain unchanged since the 2020 LIHI analysis. Analysis for each resource topic can be found in the sections below.

Table 5-2 Upper Gorham Project Proposed 2025 Criteria Summary Tab

Criteria Standard		Zone 1	Zone 2	Zone 3	Zone 4
		Impoundment	Bypass Reach	Tailrace	Regulated River Reach Downstream
A	Flow Regimes	1	2	2	2
B	Water Quality	3	3	3	3
C	Upstream Fish Passage	1	1	1	1
D	Downstream Fish Passage	1	1	1	1
E	Shorelines and Watershed	3	3	3	3
F	Threatened and Endangered Species	2	2	2	2
G	Cultural and Historic Resources	2	2	2	2
H	Recreational, Public, and Traditional Cultural Access	2	1	2	1

5.3.1 Flow Regimes

5.3.1.1 Changes in License, Regulatory Requirements, and Plans

No changes were made to the flow regime at the Upper Gorham Project following the new license. The Upper Gorham Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond level of 812.3 feet, and has the same minimum bypass reach flows. Minimum bypass reach flows are provided through a structure on the right (west side) of the power canal, over the spillway or a combination of the two depending on conditions. Minimum bypass reach flows are no less than 200 cfs, or inflow to the Upper Gorham Project, whichever is less through the year, except from March 1 through June 15, when the minimum inflow increases to 400 cfs. Per Article 402 and Condition E-9 of the WQC, the Licensee must develop an Operations Compliance Monitoring Plan within 120 days of the new license.

5.3.1.2 Study Results

Results from an instream flow study conducted in 1988 during the last licensing of the Upper Gorham Project informed the minimum flows of 200 cfs and 400 cfs in the bypass reach (Normandeau 1988). The river presently supports Brown Trout (*Salmo trutta*), Rainbow Trout (*Oncorhynchus mykiss*), and other coolwater species such as Smallmouth Bass. The trout populations are supported by NH stocking programs upstream and downstream of the Project (NHFGD 2025). The minimum flows were established in

consultation with New Hampshire agencies and the USFWS to support natural reproduction, juvenile habitat, and adult habitat requirements for Rainbow Trout and Brown Trout. Minimum flows to the reach are maintained through a gate-controlled, underground sluiceway that siphons flow from the canal. Moose Brook, a perennial tributary, enters the bypass reach at approximately the mid-point.

GLHA conducted a Bypass Reach Aquatic Habitat Study in November 2020 to evaluate flows along the approximately 1-mile-long Upper Gorham reach (GLHA 2021). Methodology included documenting the existing flows below the spillway using detailed aerial (i.e., drone) surveys to document habitat types, substrates, and wetted channel conditions under the existing minimum flows that are released under current license conditions. Substrate in the Upper Gorham bypass reach is predominantly cobble and small boulder with occasional patches of gravel. Object cover is limited to scattered boulders, and deeper sections of riverine pools. Mesohabitats include a plunge pool at the toe of the spillway, riverine pools, and a repeating pattern of low-gradient riffles and runs, terminating in a riverine pool backwatered from the tailwater.

In November 2021, an Instream Flow Study was conducted to confirm that the 200 cfs and 400 cfs minimum flows were still appropriate (GLHA 2022). Stream gaging and habitat transect data was collected within the bypass reach with a Sontek M9 Acoustic Doppler Current Profiler (ADCP) mounted on a remotely operated drone boat. Additionally, Moose Brook was gaged to determine in supplemental flow into the bypass reach, which was about 27.4 cfs at the time. It was determined that the existing minimum flows (200 and 400 cfs) continue to provide high levels of habitat suitability for Brown and Rainbow Trout in the Gorham bypass reach.

5.3.1.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	A-1	A-1	No changes in operation. The Upper Gorham Project continues to operate as run-of-river and is in accordance with the new 401 WQC.
Bypass Reach	A-2	A-2	No changes in operation. The Upper Gorham Project continues to operate as run-of-river and is in accordance with

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
			the new 401 WQC. Flow regime was developed in accordance with science-based resources and agency recommendations, which was further confirmed with recent studies.
Tailrace	A-2	A-2	No changes in operation. The Upper Gorham Project continues to operate as run-of-river and is in accordance with the new 401 WQC.
Regulated River Reach Downstream	A-2	A-2	No changes in operation. The Upper Gorham Project continues to operate as run-of-river and is in accordance with the new 401 WQC.

5.3.2 Water Quality

5.3.2.1 Changes in License, Regulatory Requirements, and Plans

There are no significant changes in water quality requirements under the new license, as the Upper Gorham Project continues to meet the Surface Water Quality Standards as described under Condition E-1 of the WQC. If the Surface Water Quality Standards are no longer met, and NHDES determines that the Upper Gorham Project is contributing to the violation on the Water Quality Standards, the Licensee must provide a Water Quality Improvement Plan with 120 days of notice from the NHDES, per condition E-10 and E-11 of the WQC. The purpose of the plan would be to restore the surface waters to meet Surface Water Quality Standards, in accordance with Env-Wq 1703.01(b), for parameters that are influenced by the Upper Gorham Project.

5.3.2.2 Study Results

GLHA completed a comprehensive water quality study between June 30 and October 8, 2020, throughout an 11-mile reach of the Upper Androscoggin River containing eight hydroelectric projects. Continuous monitoring of the DO concentration, DO percent saturation, water temperature, and pH was completed at 24 sites distributed throughout the six GLHA hydroelectric project area for 10 to 12 weeks. This study revealed that all Projects, including the Upper Gorham Project, are meeting Class B Water Quality Standards.

Two types of monitoring were conducted, Riverine and Impoundment monitoring. Riverine monitoring continuously measured DO concentration, water temperature, and pH at 15-minute intervals for 10 to 12 weeks. Impoundment monitoring started with vertical profile of DO and water temperature to determine the depth to install DO, temperature, and pH data sondes in the impoundments. None of the Projects were stratified and therefore all data loggers were installed at the 1-meter mark to monitor DO concentration, water temperature, and pH with at 15-minute intervals. Additionally, water samples were collected for analysis of TKN, nitrite + nitrate nitrogen, total phosphorus, and chlorophyll-a at the impoundment sites once per week; a Secchi disk measurement was also collected. During each sampling event, the vertical profile measurements indicated that the deep spot in the impoundments was not thermally stratified.

Throughout the entire monitoring period, the DO concentration and daily average DO percent saturation were above the Class B water quality standards (5.0 mg/L and 75 percent saturation) at all 24 monitoring sites. pH was within the limits of the Class B standard (6.5 to 8.0) throughout the entire monitoring period at 11 sites. At the other 13 sites, pH was in attainment with the standard between 94.0 percent and 99.6 percent of the time. pH was below 6.5 during times of cooler water temperatures and higher flows following rain events. Minor variations in DO and pH were observed during short-term maintenance work; both parameters remained above the Class B standards. Normal operations did not have an adverse impact on water quality.

The median chlorophyll-a and total phosphorus concentrations were in attainment with the Class B standards for oligotrophic or mesotrophic waters. The low chlorophyll-a and nutrient concentrations and good water clarity indicate the Androscoggin River in the project area has low productivity and is not influenced by algal blooms. Diurnal variations in DO, water temperature, and pH throughout the project area were consistent with natural processes (e.g., sunlight, photosynthesis, respiration).

5.3.2.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	B-3	B-3	The Upper Gorham Project is still meeting NH State Surface Water Quality Standards, as shown in the site-specific
Bypass Reach	B-3	B-3	
Tailrace	B-3	B-3	

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Regulated River Reach Downstream	B-3	B-3	water quality study, and a new WQC was issued in 2024.

5.3.3 Upstream Fish Passage

5.3.3.1 Changes in License, Regulatory Requirements, and Plans

There is no upstream migratory fish passage at the Upper Gorham Project as there are no anadromous fish present at the project. Two major cascades in the lower Androscoggin River drainage (Lewiston Falls and Rumford Falls) are natural barriers for anadromous fishes (Wippelhauser et al 2017). Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Upper Gorham Project.

5.3.3.2 Study Results

No fish passage studies were conducted.

5.3.3.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	C-1	C-1	No fish passage prescriptions or requirements.
Bypass Reach	C-1	C-1	
Tailrace	C-1	C-1	
Regulated River Reach Downstream	C-1	C-1	

5.3.4 Downstream Fish Passage

5.3.4.1 Changes in License, Regulatory Requirements, and Plans

There is no downstream migratory fish passage at the Upper Gorham Project as there are no catadromous fish present at the project. Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Upper Gorham Project.

5.3.4.2 Study Results

GLHA evaluated entrainment risk, impingement risk, and the potential for turbine passage survival of juvenile and adult life stages of stocked trout, Fallfish, Smallmouth Bass, White Sucker, and Longnose Dace (four most common species known to occur in the GLHA project areas). This combination of species and life stages represented a range of game species, nongame species, and native species that may be affected by project operations. Entrainment and impingement risk for juveniles and adults of each target species was ranked as high, moderately high, moderate, moderately low, or low according to swim speed (i.e., ability to avoid or resist intake velocities that could result in involuntary entrainment or impingement), body size (likelihood of passing through trash racks), habitat preference or availability of habitat near the intake area, and the proclivity to move (i.e., migratory requirements).

Turbine passage survival estimates were made for those species and life stages that were found to be at risk (i.e., could physically fit through the trash racks and with swim speeds less than calculated approach velocities). Turbine passage survival estimates were derived from past studies described in the EPRI database for hydropower projects using sites similar to GLHA's hydroelectric facilities. In addition, the USFWS' Turbine Blade Strike Analysis model (Towler and Pica 2020) was used to assess turbine passage survival for those species or life stages classified as at risk (i.e., in instances where swim speeds were less than calculated approach velocities).

Researchers demonstrated that the risk of fish impingement and entrainment was low at the Upper Gorham Project.

This was a result of several factors including:

- The limited amount of aquatic habitat near the intake areas, which reduces the likelihood that fish will encounter the intake areas.
- The industrial nature and developmental history of the GLHA project areas, which has resulted in limited fisheries management in the 11-mile-long reach of the Androscoggin River between the Sawmill Project and the Shelburne Project.
- Low water velocities in front of the intake racks (e.g., less than 2 ft/s) and the ability of fish to swim away from the racks.
- The presence of full depth, vertical bar racks, which exclude large fish from the turbines.

- The absence of migratory fish that require downstream passage and are therefore more at risk of entrainment as compared to resident fish species found at these projects; the natural range of migratory, anadromous fish does not extend to the Upper Androscoggin River.

5.3.4.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	D-1	D-1	No fish present at the facility that require downstream passage to complete their life cycle.
Bypass Reach	D-1	D-1	
Tailrace	D-1	D-1	
Regulated River Reach Downstream	D-1	D-1	

5.3.5 Shorelines and Watershed

5.3.5.1 Changes in License, Regulatory Requirements, and Plans

The Upper Gorham Project Boundary includes a 0.8-mile-long impoundment (45 acres), a 5,000-foot-long riverine bypass reach between the dam and the powerhouse, a lined power canal, and a tailwater area. The Upper Gorham Project Boundary only extends to the normal full pool elevation of 812.3 feet NGVD 29; as such there is limited shoreline under project control within the impoundment. The impoundment is bordered by industrial and urban development on the west and forested lands to the east. No changes were made to the flow regime at the Upper Gorham Project following the new license that would impact the existing shoreline. The Upper Gorham Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond, and maintains the minimum bypass reach flows.

The NHDES maintains regulatory jurisdiction over the project shorelines through implementation of the SWQPA. The SWQPA protects shorelands within a 250-foot buffer along public waters by regulating certain activities, such as lot subdivision, land development, and vegetation management, to protect shoreland resources. The SWQPA, supplemented by local zoning ordinances, are adequate to substantially protect shoreland resources along the river corridor. As the SWQPA supersedes the primary component of the original Shoreland Protection Plan (the New Hampshire Comprehensive Shoreland

Protection Act), the SWQPA provides adequate protection of shorelands in the absence of a project-specific plan.

The prior license required a Shoreline Protection Plan for the Upper Gorham Project to protect the aesthetics of and public access to the project’s shorelands. On July 5, 2000, FERC approved the Licensee’s proposal to adopt the State of New Hampshire Comprehensive Shoreland Protection Act (now supersede by the SWQPA) as the Shoreline Protection Plan for the Upper Gorham Project. As such, GLHA maintains compliance with the laws and applicable ordinances, and the new FERC license does not require a Shoreline Protection Plan for the Upper Gorham Project.

5.3.5.2 Study Results

No shoreline or watershed studies were conducted during the relicensing.

5.3.5.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	E-3	E-3	There have been no changes in operations or license requirements that would affect the standard rating for these criteria. The Upper Gorham Project is in compliance with the SWQPA.
Bypass Reach	E-3	E-3	
Tailrace	E-3	E-3	
Regulated River Reach Downstream	E-3	E-3	

5.3.6 Threatened and Endangered Species

5.3.6.1 Changes in License, Regulatory Requirements, and Plans

Article 404 of the new FERC license implements protections for the endangered bat species the northern long-eared bats and proposed threatened species the tricolored bat. The Licensee must avoid removing trees of any size on project land from April 15 through October 31, unless emergency tree removal for public safety is necessary. If emergency tree removal is required, the Licensee shall notify the NHFGD and USFWS as soon as practicable following the tree removal.

5.3.6.2 Study Results

An extensive botanical survey was conducted at all the Projects in 2021 to document the botanical resources with Project Boundaries and note any RTE species or associated

habitats. In total, 18 habitat communities were identified, and a total of 167 plants species were documented within these communities. No federal or state threatened or endangered species were observed during the 2021 field surveys at the Upper Gorham Project, or any of the other projects in the survey.

5.3.6.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	F-2	F-2	RTE bat species could be present in the area, the Licensee conducted consultation with appropriate resource agencies and Article 404 addresses protection measures. Daily operations of the Upper Gorham Project would have no impact on the RTE species.
Bypass Reach	F-2	F-2	
Tailrace	F-2	F-2	
Regulated River Reach Downstream	F-2	F-2	

5.3.7 Cultural and Historic Resources

5.3.7.1 Changes in License, Regulatory Requirements, and Plans

Article 405 of the new license requires the Licensee to implement a Programmatic Agreement between FERC and the New Hampshire State Historic Preservation Office for Managing Historic Properties. Pursuant to the Programmatic Agreement executed on December 12, 2024, the Licensee must develop an HPMP with 1-year within license issuance, as such the HPMP is currently under development and should be complete by September 2026. The HPMP will contain a (1) a description of each historic property; (2) a description of the potential effect on each historic property; (3) proposed measures for avoiding or mitigating adverse effects; and (4) documentation of the nature and extent of consultation; and (5) a schedule for implementing mitigation.

The previous license required the Licensee 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. At the Upper Gorham Project, GLHA was required to submit this report on the dam, gatehouse, powerhouse, and machinery. The annual report was required to contain any alterations or future planned alterations on the structures.

5.3.7.2 Study Results

No cultural or archaeological studies were conducted at the Upper Gorham Project during the relicensing.

5.3.7.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	G-2	G-2	A Programmatic Agreement was executed on December 12, 2024, and GLHA will develop an HPMP under consultation with the NH SHPO. Since there are no known historic, archeological, or Tribal sites, continued Upper Gorham Project operations are not expected to impact these resources. Should any future site be identified, the HPMP is in place to manage the properties and findings with appropriate resource agencies.
Bypass Reach	G-2	G-2	
Tailrace	G-2	G-2	
Regulated River Reach Downstream	G-2	G-2	

5.3.8 Recreational, Public, and Traditional Cultural Access

5.3.8.1 Changes in License, Regulatory Requirements, and Plans

Article 406 in the new license requires the Licensee to notify FERC if the non-project facilities (i.e., picnic area and put-in) provided by the Trinity Assembly of God or parking area that provide recreational access to the project, including the impoundment, cease operations. Should these facilities no longer be operational, FERC may require the Licensee to implement additional recreational measures in the public's interest.

5.3.8.2 Study Results

GLHA conducted a comprehensive Recreation Study in 2022 throughout the six Upper Androscoggin River Projects in the City of Berlin and the towns of Gorham and Shelburne, New Hampshire. The Recreation Use and Facility Assessment Study Report was filed with FERC on April 12, 2023 (GLHA 2023). The goal of the study was to evaluate the adequacy of existing recreational water access and facilities, determine if existing facilities were meeting user needs, and to identify potential measures to enhance water access opportunities at the Upper Androscoggin River Projects. Components of the study

included a facility inventory, spot counts, user surveys, and consultation with interested agencies and stakeholders.

Hand carry or motorized boat access to the Androscoggin River is available at 9 of the 14 recreation sites. Motorized boat access is available from Horne Field and Hogan Road; hand carry boat access is available from Rotary Park, Cascade Impoundment Access, Upper Gorham Impoundment Access, Reflection Pond, Shelburne Informal Access, Meadow Road Informal Access, and the CRP Gorham Project. The majority of survey respondents (83 percent) were satisfied with the number and type of recreation facilities available at each site and 84 percent rated the condition of the sites as good or excellent. However, respondents often said there was not a lot to do at the sites. Respondents also recommend improving the water access at the Meadow Road Informal Access.

Based on the spot counts and surveys, 52 percent of respondents were either hiking or walking. Overall, 49 percent of survey respondents accessed the water for recreation on the survey day; 31 percent were fishing (bank, boat, or fly/wade), and 19 percent were boating (motorboat, canoe, kayak) or tubing. The primary activity of 25 percent of the survey respondents was water-based (kayaking, fishing, or swimming).

Overall, all sites were well under their parking capacity with a maximum number of six cars observed during the spot count circuits, and a maximum number of 17 people observed.

5.3.8.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	H-2	H-2	Article 406 in the new license requires the Licensee to notify FERC if the non-project facilities are no longer operational and FERC may require GLHA to implement additional recreational measures.
Bypass Reach	H-1	H-1	The Upper Gorham Project is still in compliance with the FERC license and there are no proposed changes. There is no safe access for recreation, public access, or traditional cultural access.

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Tailrace	H-2	H-2	Article 406 in the new license requires the Licensee to notify FERC if the non-project facilities are no longer operational and FERC may require GLHA to implement additional recreational measures.
Regulated River Reach Downstream	H-1	H-1	The Upper Gorham Project is still in compliance with the FERC license and there are no proposed changes. There is no safe access for recreation, public access, or traditional cultural access.

5.4 Existing LIHI Conditions

Condition 1: The facility Owner shall provide updates to LIHI on the ongoing status of Upper Gorham Project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

Status: The Upper Gorham Project has been relicensed and is providing updates in this Mid-term report, fulfilling this condition.

5.5 Crosswalk Table

Table 5-3 Upper Gorham Project Crosswalk

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
Aquatics	General Ops	Run of river operations	Run of river operations	Operate the project in a run-of-river mode by maintaining the impoundment within 6 inches of the headwater elevation of 921.7 feet NGVD 29	No changes
	Minimum Flows	Minimum bypass flow of 400 cfs or inflow, whichever is less, from March 1 to June 15; minimum bypass flow of 200 cfs or inflow, whichever is less, for the rest of the year	Refers to minimum bypass reach flows per WQC condition E-7	Minimum bypass flow of 400 cfs or inflow, whichever is less, from March 1 to June 15; minimum bypass flow of 200 cfs or inflow, whichever is less, for the rest of the year	No change
	Operations Compliance	Develop Operations Compliance Management Plan	Refers to Operation Compliance Monitoring Plan per WQC Condition E-9	Develop Operations Compliance Management Plan	No change, update existing plan

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
Water Quality	Water Quality Plan	None	Refers to Water Quality Improvement Plan per WQC Condition E-10	Maintain compliance with Surface Water Quality Standards, provide a Water Quality Improvement Plan if standards are no longer being met	Trigger for a Water Quality Improvement Plan if standards are no longer being met
Terrestrial	Wildlife Habitat & Wetlands	None	None	None	No change
Threatened & Endangered Species	Listed Bat Species	None	Avoiding any tree-cutting and trimming of trees greater than or equal to 3 inches in diameter at breast height from April 15 through October 31 to protect the northern long-eared and tri-colored bats unless the trees represent a public safety hazard	None	New seasonal tree-cutting and trimming restrictions
Recreation	Public access	Continue to provide public access to project reaches	Continue to provide public access to project reaches	None	No change

Resource Area	Topic	Previous License Requirement	FERC License Requirement	401 WQC Requirement	Change from Existing License
	Recreation Management Plan	Develop comprehensive Recreation Management Plan	None – Notify FERC is access no longer available through the non-project facilities.		None
	Recreation Enhancements	None	None		None
Cultural	HPMP	Implement provisions within the Programmatic Agreement	Develop HPMP	None	New requirement to develop HPMP

6.0 SHELburnE PROJECT (P-2300)

6.1 Project Details

The Shelburne Project (FERC No. 2300, LIHI No. 176) submitted an application to LIHI on August 31, 2020. On September 9, 2025, the Shelburne Project received a new FERC License (Accession No. 20250909-3037) which constitutes as a material change under Section 5.3.4 in the LIHI Handbook 2nd Edition – Revision 2.06. No other material changes have occurred for this project. Any reference documents not linked in Table 6-1 appear in Appendix C.

6.2 Standards Matrix

Table 6-1 Shelburne Project Facility Matrix

Item	Information Requested	Response – if applicable, include references or links to further details
<i>Name of the Facility</i>	Facility name (use FERC project name or other legal name)	Shelburne Project (FERC No. 2300)
<i>Reason for applying for LIHI Certification</i>	<ol style="list-style-type: none"> 1. To participate in state RPS program (specify the state and the total MW/MWh associated with that participation (value and % of facility total MW/MWh) 2. To participate in voluntary REC market (e.g., Green-e) 3. To satisfy a direct energy buyer’s purchasing requirement 4. To satisfy the facility’s own corporate sustainability goals 5. For the facility’s corporate marketing purposes 6. Other (describe) 	To participate in the voluntary REC market.
	If applicable, the amount of annual generation (MWh and % of total generation) for which RECs are currently received or are expected to be received upon LIHI Certification	100%
<i>Location</i>	River name (USGS proper name)	Androscoggin River

Item	Information Requested	Response – if applicable, include references or links to further details
	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: https://water.usgs.gov/wsc/map_index.html	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Shelburne and Gorham, Coos County, NH
	River mile of dam above mouth	RM 128.4
	Geographic latitude and longitude of dam	Latitude 44°24.211' N Longitude 71°6.906' W
Facility Owner	Application contact names	Kyle Murphy Senior Compliance Specialist – New England
	Facility owner company and authorized owner representative name. For recertifications: If ownership has changed since last certification, provide the effective date of the change.	Great Lakes Hydro America LLC Representative: Kyle Murphy <i>No change since last certification.</i>
	FERC licensee company name (if different from owner)	N/A
Other Owners	If different from hydro facility owner, Provide the dam owner(s)/operator(s) entity names.	N/A
Regulatory Status	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	P-2300 Issuance on September 9, 2025 Expires September 1, 2065
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Major
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	WQC 2024-FERC-006; Standard NH 401 WQC Issued September 19, 2024. Issued by the New Hampshire Department of Environmental Services

Item	Information Requested	Response – if applicable, include references or links to further details
	Hyperlinks to key electronic records on FERC e-Library website or other publicly accessible data repositories ⁸ (or provide a separate list) If not electronically available, provide as appendices to the application	Order Issuing Shelburne FERC License Shelburne 2024 Water Quality Certificate Final License Application Updated Shelburne Exhibit A Recreation Use and Facility Assessment Study Report and updated License Application exhibits State of NH Comprehensive Shoreland Protection Act Programmatic Agreement for the Shelburne Project Shelburne FERC Final Environmental Assessment
Powerhouse	Date of initial operation (past or future for pre-operational applications)	1903
	Total installed capacity (MW) For recertifications: Indicate if installed capacity has changed since last certification	3.72 MW <i>No change since last certification.</i>
	Average annual generation (MWh) and period of record used	10,914 MWh (2016 to 2021)* *Excluded 2018 due to no generation all year following a

⁸ For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service or other agency, U.S. Army Corps of Engineers permits, and other regulatory documents, or permits or authorizations issued by a Tribal Nation, other 3rd-party agreements including Memorandums of Agreement or Understanding about water or land management, grants of right-of-way, water rights, and the like. If extensive, the list of hyperlinks can be provided separately in the application.

Item	Information Requested	Response – if applicable, include references or links to further details
	For recertifications: Indicate if average annual generation has changed since last certification	flood event (Accession No. 20180525-5056). <i>Change from 10,469.72 MWh (2014 – 2017). The 2025 License states 16,962 MWh is expected for average annual generation. Note: License also states “19,962 MWh” which is a typo, 16,962 MWh is the correct number.</i>
	<u>Mode of operation</u> (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) For recertifications: Indicate if mode of operation has changed since last certification	Run-of-river with minimum bypass reach flows: 2 cfs, or inflow, whichever is less <i>No change, but added minimum bypass flows.</i>
	Number, type, and size of turbine/generators, including maximum and minimum hydraulic capacity (in cfs) and maximum and minimum output (in kW or MW) of each turbine and generator 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
	Trash rack clear spacing (inches) for each trash rack	15 feet by 112 feet steel bars with 3-inch clear spacing
	Approach water velocity (ft/s) at each intake if known	1.3 ft/s at Unit 1 and 2 1.7 ft/s at Unit 3
	Dates and types of major equipment upgrades (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>
	Dates, purpose, and type of any recent operational changes (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>

Item	Information Requested	Response – if applicable, include references or links to further details
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments (<i>or provide a separate list</i>)	<p>New FERC License - September 9, 2025</p> <p>Article 401 and Condition E-9 requires a new Operations Compliance Monitoring Plan</p> <p>Article 405 requires a new Recreation Management Plan</p> <p>Article 406 requires implementation of the 11/27/2024 Programmatic Agreement and a new Historic Properties Management Plan</p>
<i>Dam or Diversion</i>	Date of original dam or diversion construction and description and dates of subsequent dam or diversion structure modifications	1903
	Dam or diversion structure length, height including separately the height of any flashboards, inflatable dams, etc. and describe seasonal operation of flashboards and the like	<p>Length: 551 feet long (includes 19-foot sluiceway, 171-foot spillway, and 259 feet of dikes)</p> <p>Height: 17.4 feet</p> <p>Spillway: Total Length: 171 feet total: One 83-foot-long concrete spillway section with 9.6-foot-high flashboards; and One 88-foot-long gate section containing three 25-foot-wide crest gates</p>
	Spillway maximum hydraulic capacity	25,000 cfs
	Length and type of each penstock and water conveyance structure between the impoundment and powerhouse	No penstock, powerhouse is integral.
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Power, Flood Control
<i>Conduit Facilities Only</i>	Date of conduit construction and primary purpose of conduit	N/A
	Source water	Androscoggin River

Item	Information Requested	Response – if applicable, include references or links to further details
	Receiving water and location of discharge	Androscoggin River
Impoundment and Watershed	Authorized maximum and minimum impoundment water surface elevations For recertifications: Indicate if these values have changed since last certification	Run-of-river project with a target elevation of 734.2 ft <i>No changes but the previous LIHI stated: 734.2 feet (USGS) Min 733.7 feet (USGS), but the project is run of river with a target elevation of 734.2 ft and has no true minimum or maximum water surface elevations.</i>
	Normal operating elevations and normal fluctuation range For recertifications: Indicate if these values have changed since last certification	Normal headpond elevation is 734.2 ft <i>No change since last certification.</i>
	Gross storage volume and surface area at full pool For recertifications: Indicate if these values have changed since last certification	Run-of-river operation with no usable storage. Surface area: 210 acres <i>No change since last certification.</i>
	Usable storage volume and surface area For recertifications: Indicate if these values have changed since last certification	Negligible <i>No change since last certification.</i>
	Describe requirements related to impoundment inflow and outflow, elevation restrictions (e.g., fluctuation limits, seasonality) up/down ramping and refill rate restrictions	The Shelburne Project operates as a run-of-river facility. The reservoir is managed as close to a constant elevation of 734.2-feet as possible, although some minor fluctuations (plus or minus 6 inches) may occur as a result of upstream releases. Per the WQC, when drawing the water level in the impoundment down for scheduled maintenance or repairs, GLHA shall lower the impoundment water level no more

Item	Information Requested	Response – if applicable, include references or links to further details
		<p>than six inches per 24-hour period. When refilling the impoundment, GLHA shall maintain bypass reach flows specified in Condition E-7.b [of WQC]. to the extent practicable release 90 percent of the inflow to the Shelburne Project downstream to the Androscoggin River and utilize the remaining 10 percent of inflow to refill the impoundment.</p>
	<p>Upstream dams by name, ownership (including if owned by an affiliate of the applicant’s company) and river mile. If FERC licensed or exempt, please provide FERC project number of these dams. Indicate which upstream dams have downstream migratory fish passage</p>	<p>Errol Project (FERC No. 3133), Brookfield White Pine Hydro LLC RM 170.1;</p> <p>Pontook Project (FERC No. 2861), Pontook Operating LP, RM 152.4</p> <p>Sawmill Project (FERC No. 2422), Great Lakes Hydro America LLC, RM 142.2;</p> <p>Riverside Project (FERC No. 2423), Great Lakes Hydro America LLC, RM 138.8;</p> <p>J. Brodie Smith Project (FERC No. 2287), Central Rivers Power, RM 138.2;</p> <p>Cascade Project (FERC No. 2327), Great Lakes Hydro America LLC, RM 136.3;</p> <p>Cross Power Project (FERC No. 2326), Great Lakes Hydro America LLC, RM 136.9</p> <p>Upper Gorham Project (FERC No. 2311), Great Lakes Hydro America LLC, RM 133.2;</p>

Item	Information Requested	Response – if applicable, include references or links to further details
		<p>Gorham Project, Central Rivers Power, RM 130.4</p> <p>No fish passage at any of the upstream projects.</p>
	<p>Downstream dams by name, ownership (including if owned by an affiliate of the applicant’s company), river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream migratory fish passage</p>	<p>Upper & Middle Dam (FERC No.2333), Rumford Falls Power Company, RM 90.9 and 90.7;</p> <p>Riley Project (FERC No. 8277), Eagle Creek Renewable Energy LLC, RM 69.3;</p> <p>Jay (RM 66.6), Otis (RM 63.8), Livermore Falls (FERC No. 2375) Eagle Creek Renewable Energy LLC, RM 61.2;</p> <p>Gulf Island Project (FERC No. 2283), Brookfield White Pine Hydro LLC RM 35.0;</p> <p>Lewiston Falls Project (FERC No. 2302), Brookfield White Pine Hydro LLC RM 30.8;</p> <p>Worumbo Project (FERC No. 3428), Brown Bear II Hydro, Inc., RM 15.7;</p> <p>Pejepscot Project (FERC No. 4784), Topsham Hydro Partners LP, RM 12.5;</p> <p>Brunswick Project (FERC No. 2284), Brookfield White Pine Hydro LLC RM 8.0</p> <p>Upstream fish passage is provided at the Brunswick, Pejepscot, and Worumbo Project. Upstream</p>

Item	Information Requested	Response – if applicable, include references or links to further details																												
		American eel passage is being considered at the Lewiston Project.																												
	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. Indicate locations and acres of flowage rights versus fee-owned property	Land: Undetermined; limited to lands encompassing project structures Water: 210 acres																												
Hydrologic Setting	Average annual flow at the dam, and period of record used	1991 – 2020: 3,025 cfs																												
	Average monthly flows and period of record used	<table border="1" data-bbox="992 783 1373 1434"> <thead> <tr> <th data-bbox="1000 783 1179 863">Month</th> <th data-bbox="1179 783 1365 863">Mean flow (cfs)</th> </tr> </thead> <tbody> <tr><td data-bbox="1000 863 1179 905">January</td><td data-bbox="1179 863 1365 905">2,849</td></tr> <tr><td data-bbox="1000 905 1179 947">February</td><td data-bbox="1179 905 1365 947">2,987</td></tr> <tr><td data-bbox="1000 947 1179 989">March</td><td data-bbox="1179 947 1365 989">3,305</td></tr> <tr><td data-bbox="1000 989 1179 1031">April</td><td data-bbox="1179 989 1365 1031">5,124</td></tr> <tr><td data-bbox="1000 1031 1179 1073">May</td><td data-bbox="1179 1031 1365 1073">4,441</td></tr> <tr><td data-bbox="1000 1073 1179 1115">June</td><td data-bbox="1179 1073 1365 1115">3,087</td></tr> <tr><td data-bbox="1000 1115 1179 1157">July</td><td data-bbox="1179 1115 1365 1157">2,491</td></tr> <tr><td data-bbox="1000 1157 1179 1199">August</td><td data-bbox="1179 1157 1365 1199">2,111</td></tr> <tr><td data-bbox="1000 1199 1179 1241">September</td><td data-bbox="1179 1199 1365 1241">1,984</td></tr> <tr><td data-bbox="1000 1241 1179 1283">October</td><td data-bbox="1179 1241 1365 1283">2,470</td></tr> <tr><td data-bbox="1000 1283 1179 1325">November</td><td data-bbox="1179 1283 1365 1325">2,752</td></tr> <tr><td data-bbox="1000 1325 1179 1367">December</td><td data-bbox="1179 1325 1365 1367">2,727</td></tr> <tr><td data-bbox="1000 1367 1179 1434">Annual</td><td data-bbox="1179 1367 1365 1434">3,025</td></tr> </tbody> </table> <p data-bbox="992 1482 1442 1858">River flow data for the Shelburne Project was generated from USGS gage No. 01054000 (Androscoggin River near Gorham, New Hampshire) for the period January 1991 to December 2020; the USGS gage is approximately 7.0 river miles upstream of the Shelburne Project dam (USGS 2021). Data from the USGS gage</p>	Month	Mean flow (cfs)	January	2,849	February	2,987	March	3,305	April	5,124	May	4,441	June	3,087	July	2,491	August	2,111	September	1,984	October	2,470	November	2,752	December	2,727	Annual	3,025
Month	Mean flow (cfs)																													
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December	2,727																													
Annual	3,025																													

Item	Information Requested	Response – if applicable, include references or links to further details
		were pro-rated by a factor of 1.0786 to account for the difference in drainage area at the Shelburne Project.
	Locations, names, and hyperlinks to the closest stream gaging 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 from gage locations and provide the basis for proration calculation	1,494 Square miles The drainage area was estimated using the USGS StreamStats Application.
	Other facility specific hydrologic information (e.g., average hydrograph)	N/A
Designated Zones of Effect	Numbers and names of each zone of effect and river mile of upstream and downstream limits of each zone of effect (e.g., “Zone 1: Impoundment RM 6.3 - 5.1”)	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
Pre-Operational Facilities Only		
Expected Operational Date	Date generation is expected to begin	N/A – Existing facility
Dam, Diversion Structure or Conduit Modification	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

Item	Information Requested	Response – if applicable, include references or links to further details
<i>Change in Water Flow Regime</i>	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

6.3 LIHI Criteria Analysis

The proposed 2025 LIHI standards for the Shelburne Project are summarized in Table 6-2. The Shelburne Project has no significant changes to operations or new license requirements that would substantially affect project resources; therefore, the proposed standards remain unchanged since the 2020 LIHI analysis with one exception. The Tailrace zone of effect for Recreational, Public, and Traditional Cultural Access was updated to better reflect the conditions at the site that was present during both the 2020 and 2025 LIHI analysis. Further information can be found under Section 6.3.8. Analysis for each resource topic can be found in the sections below.

Table 6-2 Shelburne Project Proposed 2025 Criteria Summary Tab

Criteria Standard		Zone 1	Zone 2	Zone 3	Zone 4
		Impoundment	Bypass Reach	Tailrace	Regulated River Reach Downstream
A	Flow Regimes	1	2	2	2
B	Water Quality	3	3	3	3
C	Upstream Fish Passage	1	1	1	1
D	Downstream Fish Passage	1	1	1	1
E	Shorelines and Watershed	3	3	3	3
F	Threatened and Endangered Species	2	2	2	2
G	Cultural and Historic Resources	2	2	2	2
H	Recreational, Public, and Traditional Cultural Access	2	1	1*	2

* Indicates changes from the 2020 LIHI Analysis.

6.3.1 Flow Regimes

6.3.1.1 Changes in License, Regulatory Requirements, and Plans

No changes were made to the flow regime at the Shelburne Project following the new license. The Shelburne Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond level of 734.2 feet, and provides a minimum flow of 2 cfs in the bypass reach. Per License Article 401 and Condition E-9 of the WQC, the Licensee must develop an Operations Compliance Monitoring Plan.

6.3.1.2 Study Results

GLHA conducted a Bypass Reach Aquatic Habitat Study in November 2020 and documented that existing minimum flows in the bypass reach provides a diversity of quality aquatic habitats (GLHA 2021). Methodology included documenting the existing flows below the spillway using detailed aerial (i.e., drone) surveys to document habitat types, substrates, and wetted channel conditions under the existing minimum flows that are released under current license conditions. The minimum flows at the Shelburne Project generally wet the channel from bank to bank and provide areas of deep, fast water, and substrates that promote benthic macroinvertebrate habitat. The river channels remain interconnected at the existing minimum flows, which allows volitional zone of passage movements for aquatic organisms. The Shelburne reach is backwatered and maintains adjacent deep aquatic habitats. Monitoring in 2020 also demonstrated that the existing minimum flow requirements maintain New Hampshire’s surface water quality standards (GLHA 2021).

6.3.1.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	A-1	A-1	No changes in operation. The Shelburne Project continues to operate as run-of-river and is in accordance with the new 401 WQC.
Bypass Reach	A-2	A-2	No changes in operation. The minimum bypass flow has not changed, minimum flows were documented to be sufficient in the 2021 Bypass Reach Aquatic Habitat Flow Study, and flows are in accordance with the 2024 WQC.

Tailrace	A-2	A-2	No changes in operation. The Shelburne Project is operated as run-of-river and receives flows from generation or is backwatered during unit shutdown.
Regulated River Reach Downstream	A-2	A-2	No changes in operation. The Shelburne Project continues to operate as run-of-river and is in accordance with the new 401 WQC.

6.3.2 Water Quality

6.3.2.1 Changes in License, Regulatory Requirements, and Plans

There are no significant changes in water quality requirements under the new license, as the Shelburne Project continues to meet the Surface Water Quality Standards as described under Condition E-1 of the WQC. If the Surface Water Quality Standards are no longer being met, and NHDES determines that the Shelburne Project is contributing to the violation of NH Water Quality Standards, the Licensee must provide a Water Quality Improvement Plan within 120 days of notice from the NHDES, per Condition E-10 of the WQC. The purpose of the plan would be to restore the surface waters to meet Surface Water Quality Standards, in accordance with Env-Wq 1703.01(b), for parameters that are influenced by the Shelburne Project.

6.3.2.2 Study Results

GLHA completed a comprehensive water quality study between June 30 and October 8, 2020, throughout an 11-mile reach of the Upper Androscoggin River containing eight hydroelectric projects. Continuous monitoring of the DO concentration, DO percent saturation, water temperature, and pH was completed at 24 sites distributed throughout the six GLHA hydroelectric project areas for 10 to 12 weeks. This study revealed that all Projects, including the Shelburne Project, are meeting Class B Water Quality Standards.

Two types of monitoring were conducted, Riverine and Impoundment monitoring. Riverine monitoring continuously measured DO concentration, water temperature, and pH at 15-minute intervals for 10 to 12 weeks. Impoundment monitoring started with a vertical profile of DO and water temperature to determine the depth to install DO, temperature, and pH data sondes in the impoundments. None of the Projects were stratified and therefore all data loggers were installed at the 1-meter mark to monitor DO

concentration, water temperature, and pH at 15-minute intervals. Additionally, water samples were collected for analysis of TKN, nitrite + nitrate nitrogen, total phosphorus, and chlorophyll-a at the impoundment sites once per week; a Secchi disk measurement was also collected. During each sampling event, the vertical profile measurements indicated that the deep spot in the impoundments was not thermally stratified.

Throughout the entire monitoring period, the DO concentration and daily average DO percent saturation were above the Class B water quality standards (5.0 mg/L and 75 percent saturation) at all 24 monitoring sites. pH was within the limits of the Class B standard (6.5 to 8.0) throughout the entire monitoring period at 11 sites. At the other 13 sites, pH was in attainment with the standard between 94.0 percent and 99.6 percent of the time. pH was below 6.5 during times of cooler water temperatures and higher flows following rain events. Minor variations in DO and pH were observed during short-term maintenance work; both parameters remained above the Class B standards. Normal operations did not have an adverse impact on water quality.

The median chlorophyll-a and total phosphorus concentrations were in attainment with the Class B standards for oligotrophic or mesotrophic waters. The low chlorophyll-a and nutrient concentrations and good water clarity indicate the Androscoggin River in the project area has low productivity and is not influenced by algal blooms. Diurnal variations in DO, water temperature, and pH throughout the project area were consistent with natural processes (e.g., sunlight, photosynthesis, respiration).

6.3.2.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	B-3	B-3	The Shelburne Project is still meeting NH State Surface Water Quality Standards, as shown in the site-specific water quality study, and a new WQC was issued in 2024.
Bypass Reach	B-3	B-3	
Tailrace	B-3	B-3	
Regulated River Reach Downstream	B-3	B-3	

6.3.3 Upstream Fish Passage

6.3.3.1 Changes in License, Regulatory Requirements, and Plans

There is no upstream fish passage at the Shelburne Project as there are no anadromous fish present at the project. Two major cascades in the lower Androscoggin River drainage (Lewiston Falls and Rumford Falls) are natural barriers for anadromous fishes (Wippelhauser et al 2017). Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Shelburne Project.

6.3.3.2 Study Results

No fish passage studies were conducted.

6.3.3.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	C-1	C-1	There are no fish passage prescriptions or requirements.
Bypass Reach	C-1	C-1	
Tailrace	C-1	C-1	
Regulated River Reach Downstream	C-1	C-1	

6.3.4 Downstream Fish Passage

6.3.4.1 Changes in License, Regulatory Requirements, and Plans

There is no downstream fish passage at the Shelburne Project as there are no catadromous fish present at the project. Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Shelburne Project.

6.3.4.2 Study Results

GLHA evaluated entrainment risk, impingement risk, and the potential for turbine passage survival of juvenile and adult life stages of stocked trout, Fallfish, Smallmouth Bass, White Sucker, and Longnose Dace (four most common species known to occur in the GLHA project areas). This combination of species and life stages represented a range of game species, nongame species, and native species that may be affected by project operations. Entrainment and impingement risk for juveniles and adults of each target species was

ranked as high, moderately high, moderate, moderately low, or low according to swim speed (i.e., ability to avoid or resist intake velocities that could result in involuntary entrainment or impingement), body size (likelihood of passing through trash racks), habitat preference or availability of habitat near the intake area, and the proclivity to move (i.e., migratory requirements).

Turbine passage survival estimates were made for those species and life stages that were found to be at risk (i.e., could physically fit through the trash racks and with swim speeds less than calculated approach velocities). Turbine passage survival estimates were derived from past studies described in the EPRI database for hydropower projects using sites similar to GLHA’s hydroelectric facilities. In addition, the USFWS’ Turbine Blade Strike Analysis model (Towler and Pica 2020) was used to assess turbine passage survival for those species or life stages classified as at risk (i.e., in instances where swim speeds were less than calculated approach velocities).

Researchers demonstrated that the risk of fish impingement and entrainment was low at the Shelburne Project.

This was a result of several factors including:

- The limited amount of aquatic habitat near the intake areas, which reduces the likelihood that fish will encounter the intake areas.
- The industrial nature and developmental history of the GLHA project areas, which has resulted in limited fisheries management in the 11-mile-long reach of the Androscoggin River between the Sawmill Project and the Shelburne Project.
- Low water velocities in front of the intake racks (e.g., less than 2 ft/s) and the ability of fish to swim away from the racks.
- The presence of full depth, vertical bar racks, which exclude large fish from the turbines.
- The absence of migratory fish that require downstream passage and are therefore more at risk of entrainment as compared to resident fish species found at these projects; the natural range of migratory, anadromous fish does not extend to the Upper Androscoggin River.

6.3.4.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
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Impoundment	D-1	D-1	No fish are present at the facility that require downstream passage to complete their life cycle.
Bypass Reach	D-1	D-1	
Tailrace	D-1	D-1	
Regulated River Reach Downstream	D-1	D-1	

6.3.5 Shorelines and Watershed

6.3.5.1 Changes in License, Regulatory Requirements, and Plans

The Shelburne Project Boundary only extends to the normal full pool elevation of 734.2 feet; as such there is limited shoreline under Shelburne Project control. No changes were made to the flow regime at the Shelburne Project following the new license that would impact the existing shoreline. The Shelburne Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond level of 734.2 feet, and provides a minimum flow of 2 cfs in the bypass reach.

The NHDES maintains regulatory jurisdiction over the project shorelines through implementation of the SWQPA. The SWQPA protects shorelands within a 250-foot buffer along public waters by regulating certain activities, such as lot subdivision, land development, and vegetation management, to protect shoreland resources. The SWQPA, supplemented by local zoning ordinances, are adequate to substantially protect shoreland resources along the river corridor. As the SWQPA supersedes the primary component of the original Shoreland Protection Plan (the New Hampshire Comprehensive Shoreland Protection Act), the SWQPA provides adequate protection of shorelands in the absence of a project-specific plan.

The prior license required a Shoreline Protection Plan for the Shelburne Project to protect the aesthetics of and public access to the project’s shorelands. On July 5, 2000, FERC approved the Licensee’s proposal to adopt the State of New Hampshire Comprehensive Shoreland Protection Act (now supersede by the SWQPA) as the Shoreline Protection Plan for the Shelburne Project. As such, GLHA maintains compliance with the laws and applicable ordinances, and the new FERC license does not require a Shoreline Protection Plan for the Shelburne Project.

6.3.5.2 Study Results

No shoreline or watershed studies were conducted during the relicensing.

6.3.5.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	E-3	E-3	There have been no changes in operations or license requirements that would affect the standard rating for these criteria. The Shelburne Project is in compliance with the SWQPA.
Bypass Reach	E-3	E-3	
Tailrace	E-3	E-3	
Regulated River Reach Downstream	E-3	E-3	

6.3.6 Threatened and Endangered Species

6.3.6.1 Changes in License, Regulatory Requirements, and Plans

Article 404 of the new FERC license implements protections for the endangered northern long-eared bat and proposed threatened species, the tricolored bat. The Licensee must avoid removing trees of any size on project land from April 15 through October 31, unless emergency tree removal for public safety is necessary. If emergency tree removal is required, the Licensee shall notify the NHFGD and USFWS as soon as practicable following the tree removal.

6.3.6.2 Study Results

An extensive botanical survey was conducted at all the Projects in 2021 to document the botanical resources within Project Boundaries and note any RTE species or associated habitats. In total, 18 habitat communities were identified, and a total of 167 plants species were documented within these communities. No federal or state threatened or endangered species were observed during the 2021 field surveys at the Shelburne Project, or any of the other projects in the survey.

6.3.6.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	F-2	F-2	RTE bat species could be present in the area; however, the Licensee conducted consultation with appropriate resource agencies to identify potential impacts, and License Article 404 addresses protection measures. Daily operations of
Bypass Reach	F-2	F-2	
Tailrace	F-2	F-2	
Regulated River Reach Downstream	F-2	F-2	

			the Shelburne Project would have no impact on the RTE species.
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6.3.7 Cultural and Historic Resources

6.3.7.1 Changes in License, Regulatory Requirements, and Plans

Article 406 of the new license requires the Licensee to implement a Programmatic Agreement between FERC and the New Hampshire State Historic Preservation Office for Managing Historic Properties. Pursuant to the Programmatic Agreement executed on December 12, 2024, the Licensee must develop an HPMP with 1-year of license issuance. As such, the HPMP is currently under development with completion expected by September 2026. The HPMP will contain a (1) a description of each historic property; (2) a description of the potential effect on each historic property; (3) proposed measures for avoiding or mitigating adverse effects; (4) documentation of the nature and extent of consultation; and (5) a schedule for implementing mitigation.

The previous license required the Licensee 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. At the Shelburne Project, the annual report is required to contain descriptions of any alterations or future planned alterations to the powerhouse.

6.3.7.2 Study Results

No cultural or archaeological studies were conducted at the Shelburne Project during the relicensing.

6.3.7.3 LIHI Criteria and Zone of Impacts

There are no known archaeological sites, historic traditional cultural landscapes, traditional cultural properties, Tribal trust resources, or other historic properties or cultural or historic resources present on facility lands or waters within the Shelburne Project Boundary or APE, as defined in the Final License Application.

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	G-2	G-2	A Programmatic Agreement was executed on December 12, 2024, and GLHA will develop an HPMP under
Bypass Reach	G-2	G-2	
Tailrace	G-2	G-2	

Regulated River Reach Downstream	G-2	G-2	consultation with the NH SHPO. Since there are no known historic, archeological, or Tribal sites, continued Shelburne Project operations are not expected to impact these resources. Should any future site be identified, the HPMP will be in place to manage the properties and findings with appropriate resource agencies.
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6.3.8 Recreational, Public, and Traditional Cultural Access

6.3.8.1 Changes in License, Regulatory Requirements, and Plans

Article 405 of the new FERC license requires the Licensee to develop an RMP that includes a plan and schedule to: (a) construct an approximately 4-foot-wide, 450-foot-long portage connecting the hand-carry take-out on the impoundment and the downstream put-in; (b) improve the downstream put-in by adding gravel or wood crib steps; (c) install a wooden canoe rest at the halfway point between the take-out and put-in; (d) develop a gravel parking area for 4-5 vehicles adjacent to the take-out location and existing access gate off North Road; and (e) install signage describing the rules governing the accessibility and use of the recreation facility that comply with FERC’s recreational signage requirements at 18 C.F.R § 8.2. The RMP will also include a description of the above facilities, as well as a description of the operation and maintenance schedule for the Shelburne Project recreation facilities. The RMP will be developed following consultation with the town of Shelburne and include documentation of such consultation with the RMP.

6.3.8.2 Study Results

GLHA conducted a comprehensive Recreation Study in 2022 throughout the six Upper Androscoggin River Projects in the City of Berlin and the towns of Gorham and Shelburne, New Hampshire. The Recreation Use and Facility Assessment Study Report was filed with FERC on April 12, 2023 (GLHA 2023). The goal of the study was to evaluate the adequacy of existing recreational water access and facilities, determine if existing facilities were meeting user needs, and to identify potential measures to enhance water access opportunities at the Upper Androscoggin River Projects. Components of the study included a facility inventory, spot counts, user surveys, and consultation with interested agencies and stakeholders.

Hand carry or motorized boat access to the Androscoggin River is available at 9 of the 14 recreation sites. Motorized boat access is available from Horne Field and Hogan Road; hand carry boat access is available from Rotary Park, Cascade Impoundment Access, Upper Gorham Impoundment Access, Reflection Pond, Shelburne Informal Access, Meadow Road Informal Access, and the CRP Gorham Project. The majority of survey respondents (83 percent) were satisfied with the number and type of recreation facilities available at each site and 84 percent rated the condition of the sites as good or excellent. However, respondents often said there was not a lot to do at the sites. Respondents also recommend improving the water access at the Meadow Road Informal Access.

Based on the spot counts and surveys, 52 percent of respondents were either hiking or walking. Overall, 49 percent of survey respondents accessed the water for recreation on the survey day; 31 percent were fishing (bank, boat, or fly/wade), and 19 percent were boating (motorboat, canoe, kayak) or tubing. The primary activity of 25 percent of the survey respondents was water-based (kayaking, fishing, or swimming).

Overall, all sites were well under their parking capacity with a maximum number of six cars observed during the spot count circuits, and a maximum number of 17 people observed.

6.3.8.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	H-2	H-2	The standard for this zone should remain H-2 due to the informal access that was existing at the time of the 2020 LIHI application, and the 2025 license requirements for development of formal portage facilities and a trail from the impoundment to the put-in downstream.
Bypass Reach	H-1	H-1	There has been no change to the recreation facilities in this zone, and no new requirements as a result of the new operating license. This standard has remained unchanged.
Tailrace	H-2	H-1	This standard was documented as H-1 in the 2020 LIHI application, but as H-2 in the 2020 LIHI review, without denoting

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
			an editorial change. It is believed that this standard should be H-1 since there is no access within this zone and there are no recreation facilities, formal or informal, providing opportunities to this reach.
Regulated River Reach Downstream	H-2	H-2	At the time of the previous LIHI application, this zone included informal canoe access that was maintained by the town of Shelburne. The new license requires development of more formal recreation facilities in this zone, as described above, and therefore should remain H-2.

6.4 Existing LIHI Conditions

Condition 1: The facility Owner shall provide updates to LIHI on the ongoing status of Shelburne Project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

Status: The Shelburne Project has been relicensed and is providing the updates in this Mid-term report, fulfilling this condition.

6.5 Crosswalk Table

Table 6-3 Shelburne Project Crosswalk

Resource Area	Topic	Previous License Requirement	New FERC License Requirement	401 WQC Requirement	Change from Existing License
Aquatics	Project Operation	Run of river operations	Run of river operations	Run of river operations	No change
	Minimum Flows	Minimum bypass flow of 2 cfs or inflow, whichever is less	Minimum bypass flow of 2 cfs or inflow, whichever is less	Minimum bypass flow of 2 cfs or inflow, whichever is less	No change
	Operations Compliance	Minimum Flow and Run-of-River Monitoring Plan	Refers to Operation Compliance Monitoring Plan per WQC Condition E-7	Develop an Operations Compliance Monitoring Plan	New requirement to develop OCMP that captures all operational requirements and describes how the Licensee maintains compliance with requirements throughout the term of the new license
Water Quality	Water Quality	Water Quality Monitoring Plan and Report	Refers to Water Quality Improvement Plan per WQC Condition E-10 (conditional requirement – only required if DES determines standards	Maintain compliance with Surface Water Quality Standards, provide a Water Quality Improvement Plan if standards are no longer being met	Trigger for a Water Quality Improvement Plan if standards are no longer being met

Resource Area	Topic	Previous License Requirement	New FERC License Requirement	401 WQC Requirement	Change from Existing License
			are no longer being met)		
Terrestrial	Wildlife Habitat & Wetlands	Wetland Monitoring and Mitigation Plan (only required if raising the reservoir surface elevation)	None	None	No proposal to raise the water surface elevation of the reservoir, so although there is no longer the requirement for the plan, there is also no longer a need for the plan
Threatened & Endangered Species	Listed Bat Species	None	Avoiding any tree-cutting and trimming of trees greater than or equal to 3 inches in diameter at breast height from April 15 through October 31 to protect the northern long-eared and tri-colored bats, unless the trees present a public safety hazard.	None	New seasonal tree-cutting and trimming restrictions
Recreation	Public Access	Recreation Plan	Recreation Management Plan that includes provisions for a portage trail,	None	The Recreation Management Plan under the new FERC license requires improvements to
	Recreation Enhancements	Add informational signage at existing public access sites; a means for directing		None	

Resource Area	Topic	Previous License Requirement	New FERC License Requirement	401 WQC Requirement	Change from Existing License
		the public from Rt. 2 to Shelburne Project recreation sites; a system for monitoring recreational use; a discussion of who would maintain the public use areas; provisions for ADA accessibility. Plan developed in consultation with NHFGD, NPS, and the town of Shelburne.	improvements to the downstream put-in, a canoe rest installed at halfway point on portage trail, development of gravel parking area adjacent to take-out location, signage.		recreation access and facilities
Cultural	HPMP	None	Develop a HPMP	None	New requirement to develop HPMP pursuant to the executed Programmatic Agreement

7.0 CASCADE PROJECT (P-2327)

7.1 Project Details

The Cascade Project (FERC No. 2327; LIHI No. 188) submitted an application to LIHI on August 31, 2020. On September 10, 2025, the Cascade Project received a new FERC License (Accession No. 20250910-3014), which constitutes as a material change under Section 5.3.4 in the LIHI Handbook 2nd Edition – Revision 2.06. No other material changes have occurred for this project. Any reference documents not linked in Table 7-1 appear in Appendix C.

7.2 Standards Matrix

Table 7-1 Cascade Project Facility Matrix

Item	Information Requested	Response – if applicable, include references or links to further details
Name of the Facility	Facility name (use FERC project name or other legal name)	Cascade Project (FERC No. 2327)
Reason for applying for LIHI Certification	<ol style="list-style-type: none"> 1. To participate in state RPS program (specify the state and the total MW/MWh associated with that participation (value and % of facility total MW/MWh) 2. To participate in voluntary REC market (e.g., Green-e) 3. To satisfy a direct energy buyer’s purchasing requirement 4. To satisfy the facility’s own corporate sustainability goals 5. For the facility’s corporate marketing purposes 6. Other (describe) 	To participate in the voluntary REC market.
	If applicable, the amount of annual generation (MWh and % of total generation) for which RECs are currently received or are expected to be received upon LIHI Certification	100%
Location	River name (USGS proper name)	Androscoggin River

Item	Information Requested	Response – if applicable, include references or links to further details
	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: https://water.usgs.gov/wsc/map_index.html	Androscoggin HUC: 01030003
	Nearest town(s), county(ies), and state(s) to dam	Berlin and Gorham, Coos County, New Hampshire
	River mile of dam above mouth	RM 135.6
	Geographic latitude and longitude of dam	Latitude 44.448852 N Longitude -71.187116 W
Facility Owner	Application contact names	Kyle Murphy Senior Compliance Specialist – New England
	Facility owner company and authorized owner representative name. For recertifications: If ownership has changed since last certification, provide the effective date of the change.	Great Lakes Hydro America LLC Representative: Kyle Murphy <i>No change since last certification.</i>
	FERC licensee company name (if different from owner)	N/A
Other Owners	If different from hydro facility owner, Provide the dam owner(s)/operator(s) entity names.	N/A
Regulatory Status	FERC Project Number (e.g., P-xxxx), issuance and expiration dates, or date of exemption	FERC No. 2327, license issued 9/10/2025, license expires 8/31/2065
	FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional")	Major
	Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments.	WQC 2024-FERC-004; Standard NH 401 WQC Issued September 19, 2024 Issued by New Hampshire Department of Environmental Services

Item	Information Requested	Response – if applicable, include references or links to further details
	Hyperlinks to key electronic records on FERC e-Library website or other publicly accessible data repositories ⁹ (or provide a separate list) If not electronically available, provide as appendices to the application	Order Issuing Cascade FERC License Cascade 2024 Water Quality Certificate Final License Application Updated Cascade Exhibit A Recreation Use and Facility Assessment Study Report and updated License Application exhibits State of NH Comprehensive Shoreland Protection Act Programmatic Agreement for the Cascade Project Cascade FERC Final Environmental Assessment
Powerhouse	Date of initial operation (past or future for pre-operational applications)	1903
	Total installed capacity (MW) For recertifications: Indicate if installed capacity has changed since last certification	7.92 MW <i>No change since last certification.</i>

⁹ For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service or other agency, U.S. Army Corps of Engineers permits, and other regulatory documents, or permits or authorizations issued by a Tribal Nation, other 3rd-party agreements including Memorandums of Agreement or Understanding about water or land management, grants of right-of-way, water rights, and the like. If extensive, the list of hyperlinks can be provided separately in the application.

Item	Information Requested	Response – if applicable, include references or links to further details
	Average annual generation (MWh) and period of record used For recertifications: Indicate if average annual generation has changed since last certification	49,897 MWh <i>Change from prior application value of 39,190.5 MWh (2014 – 2018) due to the use of different years for the calculation.</i>
	Mode of operation (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.) For recertifications: Indicate if mode of operation has changed since last certification	Run-of-River <i>No change since last certification.</i>
	Number, type, and size of turbine/generators, including maximum and minimum hydraulic capacity (in cfs) and maximum and minimum output (in kW or MW) of each turbine and generator unit	3 vertical Francis turbines Units 1 and 2: 950 cfs; 3,400 hp; 2.5 MW each Unit 3: 1,050 cfs; 4,420 hp; 2.92 MW
	Trash rack clear spacing (inches) for each trash rack	2.5-inch clear spacing
	Approach water velocity (ft/s) at each intake if known	1.3 ft/s
	Dates and types of major equipment upgrades (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>
	Dates, purpose, and type of any recent operational changes (or provide a separate list) For recertifications: Indicate only those since last certification	None <i>No change since last certification.</i>
	Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments (or provide a separate list)	Article 401 and Condition E-9 requires a new Operations Compliance Monitoring Plan; Article 405 requires implementation of the 11/27/2024 Programmatic Agreement and a new Historic Properties Management Plan

Item	Information Requested	Response – if applicable, include references or links to further details
Dam or Diversion	Date of original dam or diversion construction and description and dates of subsequent dam or diversion structure modifications	1903; The Cascade dam and powerhouse was originally constructed in 1903 by the Berlin Mills Company as a hydromechanical project for paper making activities. The existing dam is in the same configuration as it had in 1903. The forebay originally ended at six penstocks that led to a grinder room where the flow from Cascade Falls was converted to hydromechanical power for use by the Berlin Mills Company. It was converted to a hydroelectric generating project between 1913 and 1918, as the hydromechanical units were replaced one by one with hydroelectric turbine/generators. The first hydroelectric energy was produced in 1914. The three hydroelectric units used the same flow as the six hydromechanical units, so the three easterly penstocks were phased out of service.
	Dam or diversion structure length, height including separately the height of any flashboards, inflatable dams, etc. and describe seasonal operation of flashboards and the like	Total length: 583 feet (dam + forebay); Maximum height: 53 feet; flashboards are 3-feet-high
	Spillway maximum hydraulic capacity	35,400 cfs with the impoundment at the top-of-dam elevation of 908.5 ft
	Length and type of each penstock and water conveyance structure between the impoundment and powerhouse	No penstocks; powerhouse is integral
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Hydroelectric power

Item	Information Requested	Response – if applicable, include references or links to further details
Conduit Facilities Only	Date of conduit construction and primary purpose of conduit	N/A
	Source water	N/A
	Receiving water and location of discharge	N/A
Impoundment and Watershed	Authorized maximum and minimum impoundment water surface elevations For recertifications: Indicate if these values have changed since last certification	901.4 feet No change since last certification
	Normal operating elevations and normal fluctuation range For recertifications: Indicate if these values have changed since last certification	Run of river project with a target elevation of 901.4 feet <i>No change since last certification.</i>
	Gross storage volume and surface area at full pool For recertifications: Indicate if these values have changed since last certification	Gross storage: 200 acre-ft Surface area: 28 acres <i>No change since last certification.</i>
	Usable storage volume and surface area For recertifications: Indicate if these values have changed since last certification	Run-of-river operation with no usable storage <i>No change since last certification.</i>
	Describe requirements related to impoundment inflow and outflow, elevation restrictions (e.g., fluctuation limits, seasonality) up/down ramping and refill rate restrictions	The Cascade Project operates as a run-of-river facility. The reservoir is managed as close to a constant elevation of 901.4-feet as possible, although some minor fluctuations (plus or minus 6 inches) may occur as a result of upstream releases. During refill, maintain minimum bypass flows, and release 90% inflow downstream, using the remaining 10% for refill.

Item	Information Requested	Response – if applicable, include references or links to further details
	<p>Upstream dams by name, ownership (including if owned by an affiliate of the applicant’s company) and river mile. If FERC licensed or exempt, please provide FERC project number of these dams. Indicate which upstream dams have downstream migratory fish passage</p>	<p>Errol Project (FERC No. 3133), Brookfield White Pine Hydro LLC RM 170.1;</p> <p>Pontook Project (FERC No. 2861), Pontook Operating LP, RM 152.4</p> <p>Sawmill Project (FERC No. 2422), Great Lakes Hydro America LLC, RM 142.2;</p> <p>Riverside Project (FERC No. 2423), Great Lakes Hydro America LLC, RM 138.8;</p> <p>J. Brodie Smith Project (FERC No. 2287), Central Rivers Power, RM 138.2;</p> <p>Cross Power Project (FERC No. 2326), Great Lakes Hydro America LLC, RM 136.9;</p> <p>No fish passage at any of the upstream projects.</p>
	<p>Downstream dams by name, ownership (including if owned by an affiliate of the applicant’s company), river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream migratory fish passage</p>	<p>Upper Gorham Project (FERC No. 2311), Great Lakes Hydro America LLC, RM 133.2;</p> <p>Gorham Project, Central Rivers Power, RM 130.4;</p> <p>Shelburne Project (FERC No. 2300), Great Lakes Hydro America LLC, RM 127.6</p> <p>Upper & Middle Dam (FERC No.2333), Rumford Falls Power Company, RM 90.9 and 90.7;</p>

Item	Information Requested	Response – if applicable, include references or links to further details
		<p>Riley Project (FERC No. 8277), Eagle Creek Renewable Energy LLC, RM 69.3;</p> <p>Jay (RM 66.6), Otis (RM 63.8), Livermore Falls (FERC No. 2375) Eagle Creek Renewable Energy LLC, RM 61.2;</p> <p>Gulf Island Project (FERC No. 2283), Brookfield White Pine Hydro LLC RM 35.0;</p> <p>Lewiston Falls Project (FERC No. 2302), Brookfield White Pine Hyrdo LCC RM 30.8</p> <p>Worumbo Project (FERC No. 3428), Brown Bear II Hydro, Inc., RM 15.7;</p> <p>Pejepscot Project (FERC No. 4784), Topsham Hydro Partners LP, RM 12.5;</p> <p>Brunswick Project (FERC No. 2284), Brookfield White Pine Hydro LLC RM 8.0</p> <p>Upstream fish passage is provided at the Brunswick, Pejepscot, and Worumbo Project. Upstream American eel passage is being considered at the Lewiston Project.</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. Indicate locations and acres of flowage rights versus fee-owned property	<p>Land: Undetermined; limited to lands encompassing project structures</p> <p>Water: approximately 28 acres</p>

Item	Information Requested	Response – if applicable, include references or links to further details																												
Hydrologic Setting	Average annual flow at the dam, and period of record used	1991-2020: 2,801 cfs																												
	Average monthly flows and period of record used	<table border="1" data-bbox="1024 348 1406 961"> <thead> <tr> <th data-bbox="1024 348 1203 428">Month</th> <th data-bbox="1203 348 1406 428">Mean flow (cfs)</th> </tr> </thead> <tbody> <tr><td data-bbox="1024 428 1203 470">January</td><td data-bbox="1203 428 1406 470">2,637</td></tr> <tr><td data-bbox="1024 470 1203 512">February</td><td data-bbox="1203 470 1406 512">2,765</td></tr> <tr><td data-bbox="1024 512 1203 554">March</td><td data-bbox="1203 512 1406 554">3,060</td></tr> <tr><td data-bbox="1024 554 1203 596">April</td><td data-bbox="1203 554 1406 596">4,744</td></tr> <tr><td data-bbox="1024 596 1203 638">May</td><td data-bbox="1203 596 1406 638">4,111</td></tr> <tr><td data-bbox="1024 638 1203 680">June</td><td data-bbox="1203 638 1406 680">2,858</td></tr> <tr><td data-bbox="1024 680 1203 722">July</td><td data-bbox="1203 680 1406 722">2,306</td></tr> <tr><td data-bbox="1024 722 1203 764">August</td><td data-bbox="1203 722 1406 764">1,954</td></tr> <tr><td data-bbox="1024 764 1203 806">September</td><td data-bbox="1203 764 1406 806">1,837</td></tr> <tr><td data-bbox="1024 806 1203 848">October</td><td data-bbox="1203 806 1406 848">2,286</td></tr> <tr><td data-bbox="1024 848 1203 890">November</td><td data-bbox="1203 848 1406 890">2,548</td></tr> <tr><td data-bbox="1024 890 1203 932">December</td><td data-bbox="1203 890 1406 932">2,524</td></tr> <tr><td data-bbox="1024 932 1203 961">Annual</td><td data-bbox="1203 932 1406 961">2,801</td></tr> </tbody> </table> <p data-bbox="987 1010 1442 1545">River flow data for the Cascade Project was generated from USGS gage No. 01054000 (Androscoggin River near Gorham, New Hampshire) for the period January 1991 to December 2020 (USGS 2021); the USGS gage is approximately 1.0 river miles downstream of the Cascade Project dam. Data from the USGS gage were pro-rated by a factor of 0.9985 to account for the difference in drainage area at the Cascade Project.</p>	Month	Mean flow (cfs)	January	2,637	February	2,765	March	3,060	April	4,744	May	4,111	June	2,858	July	2,306	August	1,954	September	1,837	October	2,286	November	2,548	December	2,524	Annual	2,801
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December	2,524																													
Annual	2,801																													
Locations, names, and hyperlinks to the closest stream gaging stations above and below the facility	<p data-bbox="987 1556 1430 1661">Above - USGS 01053600 Androscoggin River at Cambridge NH</p> <p data-bbox="987 1709 1430 1814">Below - USGS 01054000 Androscoggin River near Gorham, NH</p>																													

Item	Information Requested	Response – if applicable, include references or links to further details
	Watershed area at the dam (in square miles). Identify if this value is prorated from gage locations and provide the basis for proration calculation	1,359 Square miles
	Other facility specific hydrologic information (e.g., average hydrograph)	N/A
Designated Zones of Effect	Numbers and names of each zone of effect and river mile of upstream and downstream limits of each zone of effect (e.g., "Zone 1: Impoundment RM 6.3 - 5.1")	Zone 1: Impoundment: RM 136.2 – 135.6 Zone 2: Bypass Reach: RM 135.6 – 135.5 Zone 3: Tailrace and Downstream Regulated River Reach 135.5 – 133.5
Pre-Operational Facilities Only		
Expected Operational Date	Date generation is expected to begin	N/A – Existing project
Dam, Diversion Structure or Conduit Modification	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
Change in Water Flow Regime	Description of any change in impoundment levels, water flows or operations required for new generation	N/A

7.3 LIHI Criteria Analysis

The proposed 2025 LIHI standards for the Cascade Project are summarized in Table 7-2. The Cascade Project has no significant changes to operations or new license requirements that would substantially affect project resources; therefore, the proposed standards remain mostly unchanged since the 2020 LIHI analysis with a few exceptions. Under Shorelines and Watershed, Cultural and historic Resources, and the Impoundment zone of effect for Recreational, Public, and Traditional Cultural Access changes to the standards

were recommended to better align with the handbook criteria. Analysis for each resource topic can be found in the sections below.

Table 7-2 Cascade Project Proposed 2025 Criteria Summary Tab

Criteria Standard		Zone 1	Zone 2	Zone 3
		Impoundment	Bypass Reach	Tailrace
A	Flow Regimes	1	2	2
B	Water Quality	3	3	3
C	Upstream Fish Passage	1	1	1
D	Downstream Fish Passage	1	1	1
E	Shorelines and Watershed	3*	3*	3*
F	Threatened and Endangered Species	2	2	2
G	Cultural and Historic Resources	2*	2*	2*
H	Recreational, Public, and Traditional Cultural Access	2*	1	1

* Indicates changes from the 2020 LIHI Analysis

7.3.1 Flow Regimes

7.3.1.1 Changes in License, Regulatory Requirements, and Plans

No changes were made to the flow regime at the Cascade Project following the new license. The Cascade Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond level of 901.4 feet, and provides a minimum flow of 6 cfs in the bypass reach. Per Article 401 and Condition E-9 of the WQC, the Licensee must also develop an Operations Compliance Monitoring Plan.

7.3.1.2 Study Results

GLHA conducted a Bypass Reach Aquatic Habitat Study in November 2020 and documented that existing minimum flows in the bypass reach provides a diversity of quality aquatic habitats (GLHA 2021). Methodology included documenting the existing flows below the spillway using detailed aerial (i.e., drone) surveys to document habitat types, substrates, and wetted channel conditions under the existing minimum flows that are released under current license conditions. The minimum flows at the Cascade Project generally wet the channel from bank to bank and provide areas of deep, fast water, and substrates that promote benthic macroinvertebrate habitat. The river channels remain

interconnected at the existing minimum flows, which allows volitional zone of passage movements for aquatic organisms. The Cascade reach is backwatered and maintains adjacent deep aquatic habitats. Monitoring in 2020 also demonstrated that the existing minimum flow requirements maintain New Hampshire’s surface water quality standards (GLHA 2021).

7.3.1.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	A-1	A-1	No changes in operation. The Cascade Project continues to operate as run-of-river and is in accordance with the new 401 WQC.
Bypass Reach	A-2	A-2	No changes in operation. The minimum bypass flow has not changed, minimum flows were documented to be sufficient in the Bypass Reach Flow Study 2021, and flows are in accordance with the 2024 WQC.
Tailrace and Downstream Regulated River Reach	A-2	A-2	No changes in operation. The Cascade Project is operated as run-of-river and receives flows from generation or is backwatered during unit shutdown.

7.3.2 Water Quality

7.3.2.1 Changes in License, Regulatory Requirements, and Plans

No changes were made to the flow regime at the Cascade Project following the new license. The Cascade Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond level of 901.4 feet, and has the same minimum bypass reach flows. Minimum bypass reach flows are provided through a structure on the right (west side) of the power canal. Minimum bypass reach flows are no less than 6 cfs, or inflow to the Cascade Project, whichever is less throughout the year, provided through a rectangular notch in the flashboards in the river right area of the spillway as well as through a pipe located in the forebay wall. Per Article 401 and Condition E-9 of the WQC, the Licensee must develop an Operations Compliance Monitoring Plan within 120 days of the new license.

7.3.2.2 Study Results

GLHA completed a comprehensive water quality study between June 30 and October 8, 2020, throughout an 11-mile reach of the Upper Androscoggin River containing eight hydroelectric projects. Continuous monitoring of the DO concentration, DO percent saturation, water temperature, and pH was completed at 24 sites distributed throughout the six GLHA hydroelectric project areas for 10 to 12 weeks. This study revealed that all Projects, including the Cascade Project, are meeting Class B Water Quality Standards.

Two types of monitoring were conducted, Riverine and Impoundment monitoring. Riverine monitoring continuously measured DO concentration, water temperature, and pH at 15-minute intervals for 10 to 12 weeks. Impoundment monitoring started with a vertical profile of DO and water temperature to determine the depth to install DO, temperature, and pH data sondes in the impoundments. None of the Projects were stratified and therefore all data loggers were installed at the 1-meter mark to monitor DO concentration, water temperature, and pH at 15-minute intervals. Additionally, water samples were collected for analysis of TKN, nitrite + nitrate nitrogen, total phosphorus, and chlorophyll-a at the impoundment sites once per week; a Secchi disk measurement was also collected. During each sampling event, the vertical profile measurements indicated that the deep spot in the impoundments was not thermally stratified.

Throughout the entire monitoring period, the DO concentration and daily average DO percent saturation were above the Class B water quality standards (5.0 mg/L and 75 percent saturation) at all 24 monitoring sites. pH was within the limits of the Class B

standard (6.5 to 8.0) throughout the entire monitoring period at 11 sites. At the other 13 sites, pH was in attainment with the standard between 94.0 percent and 99.6 percent of the time. pH was below 6.5 during times of cooler water temperatures and higher flows following rain events. Minor variations in DO and pH were observed during short-term maintenance work; both parameters remained above the Class B standards. Normal operations did not have an adverse impact on water quality.

The median chlorophyll-a and total phosphorus concentrations were in attainment with the Class B standards for oligotrophic or mesotrophic waters. The low chlorophyll-a and nutrient concentrations and good water clarity indicate the Androscoggin River in the project area has low productivity and is not influenced by algal blooms. Diurnal variations in DO, water temperature, and pH throughout the project area were consistent with natural processes (e.g., sunlight, photosynthesis, respiration).

7.3.2.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	B-3	B-3	The Cascade Project is still meeting NH State Surface Water Quality Standards, as shown in the site-specific water quality study, and a new WQC was issued in 2024.
Bypass Reach	B-3	B-3	
Tailrace and Downstream Regulated River Reach	B-3	B-3	

7.3.3 Upstream Fish Passage

7.3.3.1 Changes in License, Regulatory Requirements, and Plans

There is no upstream fish passage at the Cascade Project as there are no anadromous fish present at the project. Two major cascades in the lower Androscoggin River drainage, Lewiston Falls and Rumford Falls, are natural barriers for anadromous fishes (Wippelhauser et al 2017). Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Cascade Project.

7.3.3.2 Study Results

No fish passage studies were conducted.

7.3.3.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	C-1	C-1	There are no fish passage facilities or requirements at the Cascade Project.
Bypass Reach	C-1	C-1	
Tailrace and Downstream Regulated River Reach	C-1	C-1	

7.3.4 Downstream Fish Passage

7.3.4.1 Changes in License, Regulatory Requirements, and Plans

There is no downstream fish passage at the Cascade Project as there are no catadromous fish present at the project. Article 403 of the license reserves the Commission’s authority to require fishways that may be prescribed by Secretary of the Interior pursuant to section 18 of the Federal Power Act for the Cascade Project.

7.3.4.2 Study Results

GLHA evaluated entrainment risk, impingement risk, and the potential for turbine passage survival of juvenile and adult life stages of stocked trout, Fallfish, Smallmouth Bass, White Sucker, and Longnose Dace (four most common species known to occur in the GLHA project areas). This combination of species and life stages represented a range of game species, nongame species, and native species that may be affected by project operations. Entrainment and impingement risk for juveniles and adults of each target species was ranked as high, moderately high, moderate, moderately low, or low according to swim speed (i.e., ability to avoid or resist intake velocities that could result in involuntary entrainment or impingement), body size (likelihood of passing through trash racks), habitat preference or availability of habitat near the intake area, and the proclivity to move (i.e., migratory requirements).

Turbine passage survival estimates were made for those species and life stages that were found to be at risk (i.e., could physically fit through the trash racks and with swim speeds less than calculated approach velocities). Turbine passage survival estimates were derived from past studies described in the EPRI database for hydropower projects using sites similar to GLHA’s hydroelectric facilities. In addition, the USFWS’ Turbine Blade Strike

Analysis model (Towler and Pica 2020) was used to assess turbine passage survival for those species or life stages classified as at risk (i.e., in instances where swim speeds were less than calculated approach velocities).

Researchers demonstrated that the risk of fish impingement and entrainment was low at the Cascade Project.

This was a result of several factors including:

- The limited amount of aquatic habitat near the intake areas, which reduces the likelihood that fish will encounter the intake areas.
- The industrial nature and developmental history of the GLHA project areas, which has resulted in limited fisheries management in the 11-mile-long reach of the Androscoggin River between the Sawmill Project and the Shelburne Project.
- Low water velocities in front of the intake racks (e.g., less than 2 ft/s) and the ability of fish to swim away from the racks.
- The presence of full depth, vertical bar racks, which exclude large fish from the turbines.
- The absence of migratory fish that require downstream passage and are therefore more at risk of entrainment as compared to resident fish species found at these projects; the natural range of migratory, anadromous fish does not extend to the Upper Androscoggin River.

7.3.4.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	D-1	D-1	There are no fish present at the facility that require downstream passage to complete their life cycle.
Bypass Reach	D-1	D-1	
Tailrace and Downstream Regulated River Reach	D-1	D-1	

7.3.5 Shorelines and Watershed

7.3.5.1 Changes in License, Regulatory Requirements, and Plans

Aquatic habitat within the Cascade Project Boundary includes a 28-acre lacustrine impoundment and a small, 350-foot-long bypass reach between the dam and powerhouse. Water depth in the Cascade impoundment ranges up to approximately 15 feet with an average depth of 7 feet; the width of the impoundment ranges from 200 to 850 feet. The impoundment is bordered by industrial and urban development, forested lands, and wetland habitat. The 350-foot-long, high-gradient reach between the dam and powerhouse consists of a small pool-riffle-pool series and is backwatered by discharge from the tailwater. The eastern side of the channel is a vertical ledge outcrop with areas of boulder, cobble, and rubble, which restricts public access due to the hazardous terrain. The western side of the reach is bordered by the dam superstructure. Substrates in the 350-foot-long reach are rock, ledge, cobble, and sand. There is limited or no gravel in the reach to support trout spawning.

No changes were made to the flow regime at the Cascade Project following the new license that would impact the existing shoreline. The Cascade Project still operates as run-of-river, maintains the impoundment level within 0.5 foot of the normal full pond, and maintains the minimum bypass reach flows. The Cascade Project's run-of-river operation and license requirements for minimal impoundment fluctuation provide protection for the Cascade Project's shoreline areas including wetlands within the impoundment.

The NHDES maintains regulatory jurisdiction over the project shorelines through implementation of the SWQPA. The SWQPA protects shorelands within a 250-foot buffer along public waters by regulating certain activities, such as lot subdivision, land development, and vegetation management, to protect shoreland resources. The SWQPA, supplemented by local zoning ordinances, are adequate to substantially protect shoreland resources along the river corridor. As the SWQPA supersedes the primary component of the original Shoreland Protection Plan (the New Hampshire Comprehensive Shoreland Protection Act), the SWQPA provides adequate protection of shorelands in the absence of a project-specific plan.

The prior license required a Shoreline Protection Plan for the Cascade Project to protect the aesthetics of and public access to the project's shorelands. On July 5, 2000, FERC approved the Licensee's proposal to adopt the State of New Hampshire Comprehensive Shoreland Protection Act (now supersede by the SWQPA) as the Shoreline Protection Plan

for the Cascade Project. As such, GLHA maintains compliance with the laws and applicable ordinances, and the new FERC license does not require a Shoreline Protection Plan for the Cascade Project.

7.3.5.2 Study Results

No shoreline or watershed studies were conducted during the relicensing.

7.3.5.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	E-2	E-3	Since the Cascade Project is in compliance with the SWQPA and no longer has a specific Shoreline Protection Plan, GLHA believes these criteria should be updated to E-3. There have been no changes in operations or license requirements that would impact the shoreline since the relicensing.
Bypass Reach	E-2	E-3	
Tailrace and Downstream Regulated River Reach	E-2	E-3	

7.3.6 Threatened and Endangered Species

7.3.6.1 Changes in License, Regulatory Requirements, and Plans

Article 404 of the new FERC license implements protections for the endangered northern long-eared bat and proposed threatened species the tricolored bat. The Licensee must avoid removing trees of any size on project land from April 15 through October 31, unless emergency tree removal for public safety is necessary. If emergency tree removal is required, the Licensee shall notify the NHFGD and USFWS as soon as practicable following the tree removal.

7.3.6.2 Study Results

An extensive botanical survey was conducted at all the Projects in 2021 to document the botanical resources with Project Boundaries and note any RTE species or associated habitats. In total, 18 habitat communities were identified, and a total of 167 plants species were documented within these communities. No federal or state threatened or endangered species were observed during the 2021 field surveys at the Cascade Project, or any of the other projects in the survey.

7.3.6.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	F-2	F-2	RTE bat species could be present in the area; however, the Licensee conducted consultation with appropriate resource agencies to identify potential impacts, and License Article 404 addresses protection measures. Daily operations of the Cascade Project would have no impact on the RTE species.
Bypass Reach	F-2	F-2	
Tailrace and Downstream Regulated River Reach	F-2	F-2	

7.3.7 Cultural and Historic Resources

7.3.7.1 Changes in License, Regulatory Requirements, and Plans

Article 405 of the new license requires the Licensee to implement a Programmatic Agreement between FERC and the New Hampshire State Historic Preservation Office for Managing Historic Properties. Pursuant to the Programmatic Agreement executed on December 12, 2024, the Licensee must develop an HPMP within 1-year of license issuance. As such, the HPMP is currently under development with completion expected by September 2026. The HPMP will contain a (1) a description of each historic property; (2) a description of the potential effect on each historic property; (3) proposed measures for avoiding or mitigating adverse effects; and (4) documentation of the nature and extent of consultation; and (5) a schedule for implementing mitigation.

The previous license required the Licensee 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. At the Cascade Project, the annual report is required to contain descriptions of any alterations or future planned alterations to the powerhouse and dam.

7.3.7.2 Study Results

No cultural or archaeological studies were conducted at the Cascade Project during the relicensing.

7.3.7.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	G-1	G-2	A Programmatic Agreement was executed on December 12, 2024, and GLHA will develop an HPMP under consultation with the NH SHPO. Since there are no known historic, archeological, or Tribal sites, continued Cascade Project operations are not expected to impact these resources. Should any future site be identified, the HPMP will be in place to manage the properties and findings with appropriate resource agencies. Since there is a Programmatic Agreement and HPMP being developed, GLHA believes this standard should be updated from G-1 to G-2.
Bypass Reach	G-1	G-2	
Tailrace and Downstream Regulated River Reach	G-1	G-2	

7.3.8 Recreational, Public, and Traditional Cultural Access

7.3.8.1 Changes in License, Regulatory Requirements, and Plans

Article 406 in the new license requires the Licensee to notify FERC if the non-project facilities (i.e., the Cascade impoundment access area and parking) that provide recreational access to the project, including the impoundment, cease operations. Should these facilities no longer be operational, FERC may require the Licensee to implement additional recreational measures in the public’s interest.

7.3.8.2 Study Results

GLHA conducted a comprehensive Recreation Study in 2022 throughout the six Upper Androscoggin River Projects in the City of Berlin and the towns of Gorham and Shelburne, New Hampshire. The Recreation Use and Facility Assessment Study Report was filed with FERC on April 12, 2023 (GLHA 2023). The goal of the study was to evaluate the adequacy of existing recreational water access and facilities, determine if existing facilities were meeting user needs, and to identify potential measures to enhance water access opportunities at the Upper Androscoggin River Projects. Components of the study

included a facility inventory, spot counts, user surveys, and consultation with interested agencies and stakeholders.

Hand carry or motorized boat access to the Androscoggin River is available at 9 of the 14 recreation sites. Motorized boat access is available from Horne Field and Hogan Road; hand carry boat access is available from Rotary Park, Cascade Impoundment Access, Upper Gorham Impoundment Access, Reflection Pond, Shelburne Informal Access, Meadow Road Informal Access, and the CRP Gorham Project. The majority of survey respondents (83 percent) were satisfied with the number and type of recreation facilities available at each site and 84 percent rated the condition of the sites as good or excellent. However, respondents often said there was not a lot to do at the sites. Respondents also recommend improving the water access at the Meadow Road Informal Access.

Based on the spot counts and surveys, 52 percent of respondents were either hiking or walking. Overall, 49 percent of survey respondents accessed the water for recreation on the survey day; 31 percent were fishing (bank, boat, or fly/wade), and 19 percent were boating (motorboat, canoe, kayak) or tubing. The primary activity of 25 percent of the survey respondents was water-based (kayaking, fishing, or swimming).

Overall, all sites were well under their parking capacity with a maximum number of six cars observed during the spot count circuits, and a maximum number of 17 people observed.

7.3.8.3 LIHI Criteria and Zone of Impacts

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
Impoundment	H-1	H-2	There have been no changes to recreational facilities or requirements at the Cascade Project since the prior LIHI certification. The public can access the impoundment via the non-project impoundment access area. Under Article 406, if public access is no longer available via the established impoundment access area, the Licensee may be required to provide additional recreational opportunities. Since the Cascade Project does occupy lands or waters that the public can safely access,

Zone	2020 LIHI Standard	2025 LIHI Recommended Standard	Rationale
			and recommendations are set in place within the 2025 FERC License, GLHA believes this standard should be updated from H-1 to H-2.
Bypass Reach	H-1	H-1	No changes since the new license, and no safe access for the public.
Tailrace and Downstream Regulated River Reach	H-1	H-1	No changes since the new license, and no safe access for the public.

7.4 Existing LIHI Conditions

Condition 1: The facility Owner shall provide updates to LIHI on the ongoing status of Cascade Project relicensing, including studies, FERC filings, resource agency consultation, prescriptions and recommendations, and agency comments on study results. LIHI reserves the right to modify the Certificate or conditions based on the outcome of the relicensing.

Status: The Cascade Project has been relicensed and is providing updates in this Mid-term report, fulfilling this condition.

7.5 Crosswalk Table

Table 7-3 Cascade Project Crosswalk

Resource Area	Topic	Previous License Requirement	New FERC License Requirement	401 WQC Requirement	Change from Existing License
Aquatics	Project Operation	Run of river operations	Run of river operations	Run of river operations	No change
	Minimum Flows	Minimum bypass flow of 6 cfs or inflow, whichever is less	Minimum bypass flow of 6 cfs or inflow, whichever is less	Minimum bypass flow of 6 cfs or inflow, whichever is less	No change
	Operations Compliance	Minimum Flow and Run-of-River Monitoring Plan	Refers to Operation Compliance Monitoring Plan per WQC Condition E-7	Develop an Operations Compliance Monitoring Plan	New requirement to develop OCMP that captures all operational requirements and describes how the Licensee maintains compliance with requirements throughout the term of the new license

Resource Area	Topic	Previous License Requirement	New FERC License Requirement	401 WQC Requirement	Change from Existing License
Water Quality	Water Quality	Water Quality Monitoring Plan and Report	Water Quality Improvement Plan per WQC Condition E-10 (conditional requirement – only required if DES determines standards are no longer being met)	Maintain compliance with Surface Water Quality Standards, provide a Water Quality Improvement Plan if standards are no longer being met	Trigger for a Water Quality Improvement Plan if standards are no longer being met
Terrestrial	Wildlife Habitat & Wetlands	None	None	None	No change
Threatened & Endangered Species	Listed Bat Species	None	Avoiding any tree-cutting and trimming of trees greater than or equal to 3 inches in diameter at breast height from April 15 through October 31 to protect the northern long-eared and tri-colored bats, unless the trees present a public safety hazard.	None	New seasonal tree-cutting and trimming restrictions
Recreation	Public Access	None	None	None	No enhancements or Plan required. If the existing public access area ceases
	Recreation Enhancements	None	None	None	

Resource Area	Topic	Previous License Requirement	New FERC License Requirement	401 WQC Requirement	Change from Existing License
					operation, Licensee must notify FERC.
Cultural	HPMP	Programmatic Agreement	Implement Programmatic Agreement and develop an HPMP	None	New requirement to develop HPMP pursuant to the executed Programmatic Agreement

8.0 CONTACT TABLES

8.1 Applicant-related Contacts

Facility Owner:	
Name and Title	Nathan Stevens, Vice President
Company	Great Lakes Hydro America LLC
Phone	207-660-2223
Email Address	Nathan.Stevens@brookfieldrenewable.com
Mailing Address	150 Main Street Lewiston, ME 04240
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	Karen Bishop, Licensing Coordinator
Company	Kleinschmidt Associates
Phone	860-581-5877
Email Address	Karen.Bishop@kleinschmidtgroup.com
Mailing Address	35 Pratt Street, Suite 201, Essex CT, 06426
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Kyle Murphy, Senior Compliance Specialist – New England
Company	Great Lakes Hydro America
Phone	207-458-5861
Email Address	Kyle.Murphy@brookfieldrenewable.com
Mailing Address	150 Main Street Lewiston, ME 04240
Party responsible for accounts payable:	
Name and Title	Judith Charette Senior Manager, Accounts Payable, Finance & Accounting
Company	Brookfield Renewable
Phone	819-561-8099
Email Address	Judith.Charette@brookfieldrenewable.com
Mailing Address	41 Victoria, Gatineau, QC, Canada J8X2A1

8.2 Federal, State, and Local Resource Agency Contacts with Knowledge of the Facility

- Include federal and state fish and wildlife agencies and federal agencies owning project lands or having oversight of the project; state agencies responsible for environmental protection, water quality certification, natural heritage, and historic preservation; and local and regional agencies with project oversight or interest.
- If applicable, also include at least one contact for each agency involved in each active project working group and identify the working group name.

Contact Name and Agency	Title	Email	Phone	Resource Area(s) of Interest, from the list below
John Spain, FERC	Regional Engineer, D2SI NY Region	john.spain@FERC.gov	212-273-5954	A, B, C, D, E, F
Harold Peterson, U.S. Bureau of Indian Affairs	Natural Resources Officer	Harold.Peterson@bia.gov		G
Mel Cote, U.S. EPA	Surface Water Branch Chief	cote.mel@epa.gov		B
Dave Simmons, USFWS	Hydropower Program Coordinator	david_simmons@fws.gov		C, D, F
Tom Chapman, USFWS	Supervisor, New England Field Office	Tom.chapman@fws.gov		C, D, F

Contact Name and Agency	Title	Email	Phone	Resource Area(s) of Interest, from the list below
Benjamin German, NOAA	Marine Resources Management Specialist and Hydropower Coordinator	benjamin.german@noaa.gov	978-281-9353	C, D
Mark Prout, U.S. Forest Service	Forest Fish Biologist	mprout@fs.fed.us		C, D, E
Catherine Brown, U.S. National Park Service	Hydro Program Coordinator	catherine.brown@nps.gov		H
Steve Couture, New Hampshire Coastal Zone Management	Coastal Program Administrator	steven.couture@des.nh.gov		A, E
Rene Pelletier, NHDES	Director, Water Division	Rene.pelletier@des.nh.gov	603-271-0677	A, B, C, D, E
Diane Timmins, NH Department of Fish and Game	Fisheries Biologist, Region 1	Dianne.Timmins@Wildlife.nh.gov		A, B, C, D, E

Contact Name and Agency	Title	Email	Phone	Resource Area(s) of Interest, from the list below
Nadine Miller, New Hampshire Department of Natural and Cultural Resources	Deputy State Historic Preservation Officer	Nadine.Miller@dcr.nh.gov	603-271-6628	G
Benjamin Wilson, New Hampshire Department of Natural and Cultural Resources	Director and State Historic Preservation Officer	benjamin.h.wilson@dncr.nh.gov	603-271-8850	G
Sabrina Stanwood, New Hampshire Department of Natural and Cultural Resources	Administrator, Natural Heritage Bureau	Sabrina.stanwood@dncr.nh.gov	603-892-8824	G

Resource Areas (LIHI Criteria):

- | | |
|--|---|
| A. Flow regimes | E. Shorelines and watershed |
| B. Water quality | F. Threatened and endangered species |
| C. Upstream fish passage | G. Cultural and historic resources |
| D. Downstream fish passage and protection | H. Recreation |

8.3 Tribal Government and Tribal Agency Contacts

- Include federally recognized Tribes, state-recognized Tribes, and non-recognized Tribal entities.
- If applicable, also include at least one contact for each Tribe involved in each active project working group and identify the working group name.

Contact Name and Tribal Affiliation	Title	Email	Phone	Resource Area(s) of Interest, from the list below
Rhonda Besaw Abenaki Nation of New Hampshire	Speaker	AbenakiNationofNH@gmail.com	603-837-3381	All resources may be of interest
Arthur Hanchett Koasek Abenaki Nation	Chief	chiefarthanchett@gmail.com	Not listed	All resources may be of interest
Paul Pouliot Pennacook New Hampshire Tribe	Council Chief and Speaker	cowasuck@cowasuck.org	603-776-1090	All resources may be of interest

Resource Areas (LIHI Criteria):

- | | |
|--|---|
| A. Flow regimes | E. Shorelines and watershed |
| B. Water quality | F. Threatened and endangered species |
| C. Upstream fish passage | G. Cultural and historic resources |
| D. Downstream fish passage and protection | H. Recreation |

8.4 Currently Engaged External Interested Party Contacts

Contact Name and Organization	Title	Email	Phone	Resource Area(s) of Interest, from the list below
Brian Graber, American Rivers	Director Northeast Field Office			B, C, D
Carol Foss, Audubon Society of New Hampshire	Senior Advisor for Science and Policy			E, F
Brian Graber, American Rivers	Director	bgraber@americanrivers.org		B, C, D
Kevin Richard Colburn, American Whitewater	National Stewardship Director	kevin@americanwhitewater.org		A, B, H

Resource Areas (LIHI Criteria):

- | | |
|--|---|
| A. Flow regimes | E. Shorelines and watershed |
| B. Water quality | F. Threatened and endangered species |
| C. Upstream fish passage | G. Cultural and historic resources |
| D. Downstream fish passage and protection | H. Recreation |

9.0 ATTESTATION AND WAIVER FORM

B.3 Attestation and Waiver Form

ATTESTATION

As an Authorized Representative of Great Lakes Hydro America, LLC (GLHA or Licensee), an affiliate of Brookfield Renewable Partners L.P. (Brookfield) the Undersigned attests that the material presented in the application is true and complete.

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

The Undersigned further acknowledges that if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to the final certification decision and prior to marketing the electricity product as LIHI Certified® (which includes selling RECs in a market that requires LIHI Certification).

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.

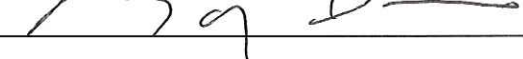
FOR PRE-OPERATIONAL CERTIFICATIONS:

The Undersigned acknowledges that LIHI may suspend or revoke the LIHI Certification should the impacts of the facility, once operational, fail to comply with the LIHI program requirements.

Authorized Representative:

Name: Randal Dorman

Title: Senior Compliance Manager Northeast/Rest of Country (LA, NC, TN)

Authorized Signature: 

Date: Click or tap to enter a date.

2.4.24

10.0 REFERENCES

- Electric Power Research Institute (EPRI). 1997. Turbine Entrainment and Survival Database-Field Tests. Prepared by Alden Research Laboratory, Inc. EPRI Report No. 108630.
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- Towler, B. and Pica, J. 2020. A Desktop Tool for Estimating Mortality of Fish Entrained at Hydroelectric Turbines. Available online: <https://www.fws.gov/northeast/fisheries/fishpassageengineering.html>.
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- Wippelhauser, G. S., J. Sulikowski, G. B. Zydlewski, M. A. Altenritter, M. Kieffer, and M. T. Kinnison. 2017. Movements of Atlantic Sturgeon of the Gulf of Maine Inside and Outside of the Geographically Defined Distinct Population Segment, Marine and Coastal Fisheries, 9:1, 93-107, DOI: 10.1080/19425120.2016.1271845

APPENDIX A

2025 FERC LICENSES

Attached Separately

APPENDIX B

PREVIOUS LIHI APPLICATIONS AND REVIEWS

Attached Separately

APPENDIX C

REFERENCE DOCUMENTS

Attached Separately