REVIEW OF APPLICATION FOR LIHI CERTIFICATION
OF THE
QUINEBAUG-FIVE MILE POND HYDROELECTRIC PROJECT

FERC Project No. 5062
Quinebaug and Five Mile Rivers,
Brooklyn and Killingly, Connecticut

October 31, 2019
Maryalice Fischer, Certification Program Director

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FINAL REVIEW OF APPLICATION FOR LIHI CERTIFICATION OF THE QUINEBAUG-FIVE MILE POND HYDROELECTRIC PROJECT

This report provides final review findings and recommendations related to the certification application submitted to the Low Impact Hydropower Institute (LIHI) by Quinebaug Associates, LLC, a subsidiary of Gravity Renewables, Inc. (Applicant) for certification of the Quinebaug–Five Mile Pond Hydroelectric Project (Project). The final certification application was filed on June 21, 2019 and is subject to review under the current 2nd edition LIHI Handbook (Revision 2.03, December 20, 2018).

I. INTRODUCTION

The Quinebaug–Five Mile Pond Project is a 2.6 MW Project located at the confluence of the Five Mile River and Quinebaug River in the Towns of Brooklyn and Killingly in Windham County, Connecticut. It consists of two developments, Quinebaug and Five Mile Pond which are located in close proximity, but on different rivers, and authorized under the same Federal Energy Regulatory Commission (FERC) license No. 5062 dated March 19, 1987.[1] The current license will expire on February 28, 2027 and relicensing is scheduled to begin by late 2021 or early 2022.

The Project was built and started operation in 1990 by Diamond Power Corporation at dams originally constructed around 1855. The license was transferred in 1998 to Quinebaug Partnership (a.k.a. Quinebaug Associates, LLC); however, the formal FERC approval of the transfer did not occur until 2001.[2] The license had been amended in 1988 to reflect final as-built conditions, and in 1992 to slightly change the installed capacity[3] for purposes of calculating FERC annual fees. The license was amended again in 2006[4] to authorize replacement of the Five Mile Pond turbine and increase the installed capacity of that development from 260 kW to 350 kW. That replacement was completed in 2007. The current owner (Gravity Renewables) acquired the Project in 2017.

II. PROJECT LOCATION AND SITE CHARACTERISTICS

The Project is located in the northeastern region of the Connecticut approximately 50 miles east of Hartford and 25 miles west of Providence, Rhode Island (Figure 1).

[1] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13600778
[2] Various communications between FERC and the licensee between 1998 and 2001 clarified the name and corporate structure of the new licensee.
[3] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11114758
[4] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11114758

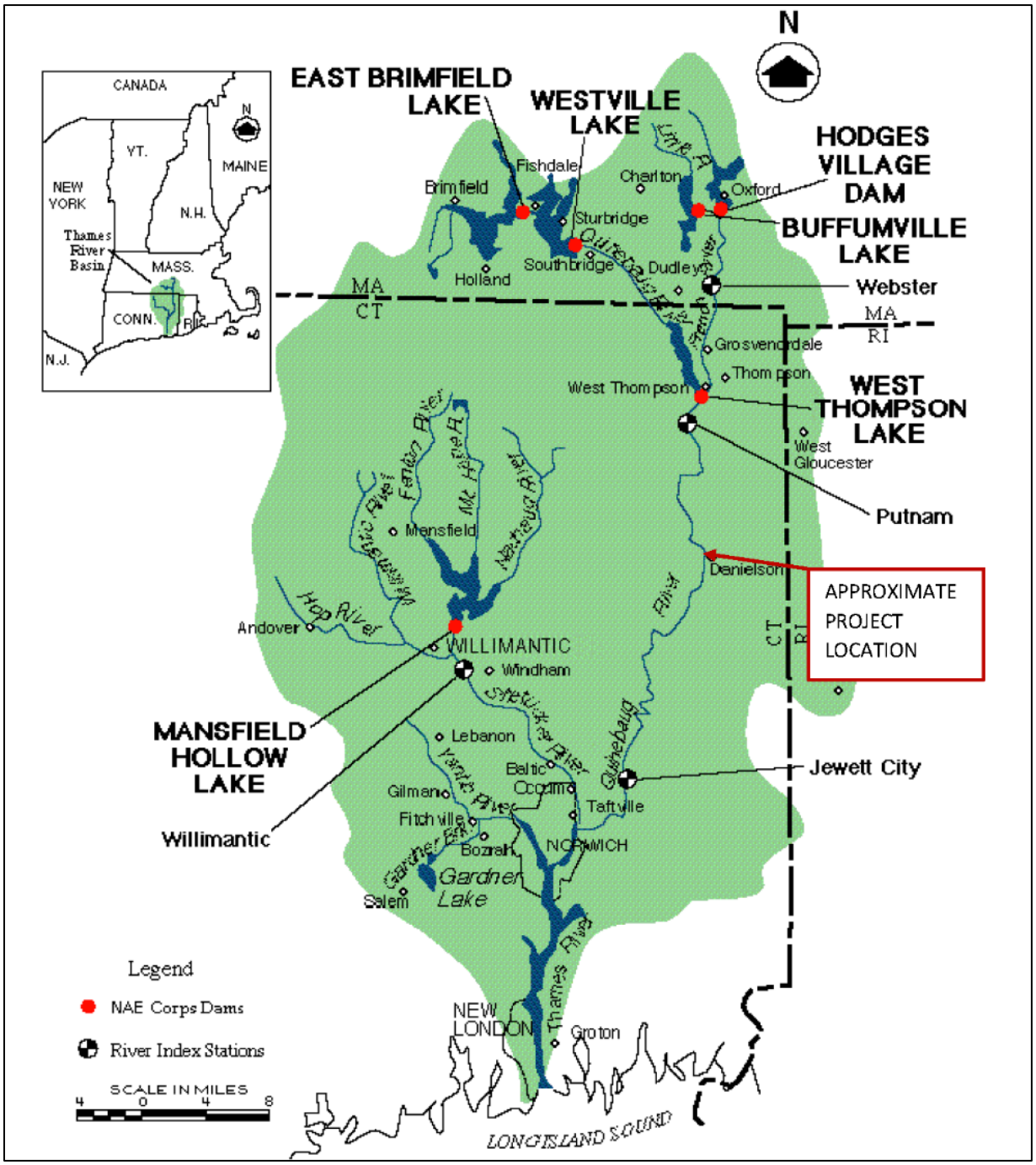

Figure 1. Project Location

The Quinebaug River watershed encompasses 456 square miles in south-central Massachusetts and eastern Connecticut with the watershed extending into Rhode Island. The river is 69 miles long and is part of the Thames River basin. It originates from East Brimfield Lake and other ponds northwest of Sturbridge, Massachusetts, flows generally southeast and south through Connecticut. The river joins Aspinook Pond which begins in Canterbury and ends in Jewett City.

The river then continues to the Shetucket River northeast of Norwich which flows into the Thames River and drains into Long Island Sound. The Quinebaug development is located at river mile (RM) 26.2.

The Five Mile River[5] watershed encompasses 76 square miles primarily in Connecticut, and flows through the towns of Thompson, Putnam and Killingly, CT. The river is 23.5 miles long with its source in Little Pond near the Massachusetts – Connecticut border. Five Mile River is a tributary of the Quinebaug River. The Five Mile Pond development is located at RM 0.2, just above the confluence with the Quinebaug River.

The Quinebaug River is dammed in its upper reaches at East Brimfield dam, Westville dam and West Thompson dam, all flood control projects, as well as numerous mill dams which powered mills along the river. Some of these locations currently provide hydroelectric power. The following dams are located upstream of the Quinebaug development.

- Rogers Dam – RM 30.9 (mill pond)
- Cargill Falls – RM 37.9 (hydro P-13080)
- Putnam– RM 38.4 (hydro P-5645), LIHI #3
- MSC– RM 38.6 (hydro P-5679)
- West Thompson Dam – RM 40.3 (flood control)

The following dams are located downstream of the Quinebaug development (RM 26.2).

- Aspinook Dam/Wyre Wind – RM: 7.5 (hydro, P-3472)[6]
- Tunnel Dam – RM 0.2 (hydro, non-jurisdictional)
- Greenville Dam – RM 1.3 (hydro, P-2441)[7]

The Five Mile Pond development is the first dam and the only hydropower facility on the Five Mile River. The following non-hydro dams are located upstream of the development.

- Old Daniels Dam – RM 8.1
- Ballouville Dam – RM 7.1
- Un-Named Dam – RM 5.6
- Un-Named Dam – RM 5.0

The Project boundary is approximately 130 acres. Of that, about 126 acres is land under water, about 2 acres has tree and brush cover and about 2 acres is urban/developed. The Project does not include any of the lands adjacent to the impoundments (Figure 2).

[5] There is another river named Five Mile River in western Connecticut that flows through New Canaan and West Norwalk.
[6] Owned by Gravity Renewables, Inc.
[7] In some reference documents the Greenville Project is listed as being located on the Thames River and in some, on the Shetucket River. This is likely due to the close proximity of the joining of the Quinebaug, Shetucket and Thames Rivers. LIHI certificate #106 for the Greenville Project lists that project as being located on the Shetucket River.

Figure 2. Project Boundary

Quinebaug Development

The Quinebaug development's (Figure 3) Rojak (a.k.a. Rajak) Dam is located on the Quinebaug River approximately 160 feet upstream of the confluence with the Five Mile River. The dam is a cut stone structure approximately 250 feet long, including a 130-foot-long spillway. The dam stands approximately 14 feet high and is built of rock. The dam contains four 6-foot-square waste gates, two of which have been plugged with concrete. The impoundment formed by the dam has a surface area of approximately 85 acres and a volume of 238 acre-feet at a water surface elevation of 188 feet above mean sea level (msl).

A new sluice gate and guides have been added to one of the two remaining sluiceways. A short penstock approximately 40 inches in diameter and 25 feet long is located immediately adjacent to the right side of the dam and conveys flow to the minimum flow turbine.

The concrete and steel canal headworks structure located near the dam's right abutment contains three gates. The headworks structure has been rehabilitated and new gates, guides and hoist have been added. The canal is approximately 900 feet long, averaging 30 feet in width and 9.5 feet in depth. The canal walls are primarily constructed of stone masonry with some sections having a gunite concrete coating.

The 70-kW minimum flow unit is a submersible axial flow propeller turbine/generator unit located approximately 38.5 feet downstream of the intake structure at the entrance to the original sluiceway. That unit's intake structure is of reinforced concrete construction and contains a slide gate with a hydraulic operator and steel trash racks. Power and control cables for the turbine/generator unit and intake gate are brought underground across the canal headworks structure to an adjacent equipment house on the right bank of the river. The minimum flow turbine discharges into the upper portion of the bypassed reach.

The lower powerhouse contains two Kaplan bulb units, 1.12 MW and 0.711 MW. The powerhouse has an integral intake structure of reinforced concrete construction that sits on bedrock. A steel draft tube gate with a hydraulic operator is provided for each unit. Steel intake gates are provided for both units and have steel trash racks with 3-inch clear spacing and an automatic raking system.

According to the application, average annual inflow at Quinebaug's Rojak dam is 830 cfs, with high spring flows averaging 1,584 cfs and low summer flows averaging 332 cfs. The mean low flow over 7 consecutive days with a 10-year recurrence (7Q10 flow) was calculated to be 7.7 cfs at the time of licensing.

The Quinebaug development is operated in instantaneous run-of-river mode with no pondage or storage. The plant is attended part time and has automatic operation for pond level maintenance to ensure compliance with minimum flow operation requirements. Turbine flow is controlled by an automatic programable logic controller (PLC). A minimum flow of 77 cubic feet per second (cfs) is released to the Quinebaug River through the minimum flow turbine or over the dam spillway. The approximate operating range of the two units in the lower powerhouse is 90 to 960 cfs.

Figure 3. Quinebaug Development Key Features

Five Mile Pond Development

The Five Mile Pond Development (Figure 4) consists of a dam, spillway, impoundment, intake structure, canal and powerhouse. The dam is approximately 135 feet long with a canal intake structure toward the right and spillway on river left (looking downstream). The dam is a stone masonry gravity structure with an overflow spillway section approximately 100 feet long. The maximum height of the dam is 16.5 feet. The impoundment created by the dam is approximately 65 acres with a storage capacity of 260 acre-feet at a water surface elevation of 220.75 feet msl.

The canal headgate structure contains five manually operated vertical steel gates. The canal width varies along its length but is approximately 30 feet wide, 12 feet deep and 280 feet long. The left side of the canal is formed by the natural elevation of the surrounding terrain and lined with concrete and stone. The right side of the canal is formed by a stone-lined earthen embankment.

A trash rack with 2-inch clear spacing and an automatic raking system is located at the terminus of the power canal. Immediately downstream of the trash rack, water is conveyed to the powerhouse. Immediately upstream of the powerhouse is a canal overflow spillway. The spillway is concrete lined and approximately 80 feet long. The powerhouse contains a single double regulated Kaplan turbine rated for 350 kW. As noted in Section 1, the turbine was replaced in 2007 but hydraulic capacity did not change.

The tailrace is minimal. Water from the draft tube enters a channel which discharges directly to the Five Mile River. An approximately 15-foot-long concrete wall angles flow from the draft tube back to the main river channel for separation from the main channel and gradual reintroduction of flows downstream.

Average annual inflow at the dam is 119 cfs, based on the FERC Environmental Assessment included in the 1987 license. High spring flows were about 238 cfs and low summer flows were about 58 cfs, and the 7Q10 flow was 1.5 cfs at the time of licensing. Older records provided in the application indicated a slightly higher average annual flow of 130 cfs and low summer flow of 60 cfs (based on records from USGS Gage No. 01126000 Five Mile River at Killingly, CT where data collection was discontinued in 1971).

The Five Mile Pond development is operated in instantaneous run-of-river mode with no pondage or storage. Turbine flow is controlled by an automatic PLC. A minimum flow of 15 cfs is released to the bypass reach through a notch in the flashboards. The approximate operating range of the two units in the lower powerhouse is 25-227 cfs.

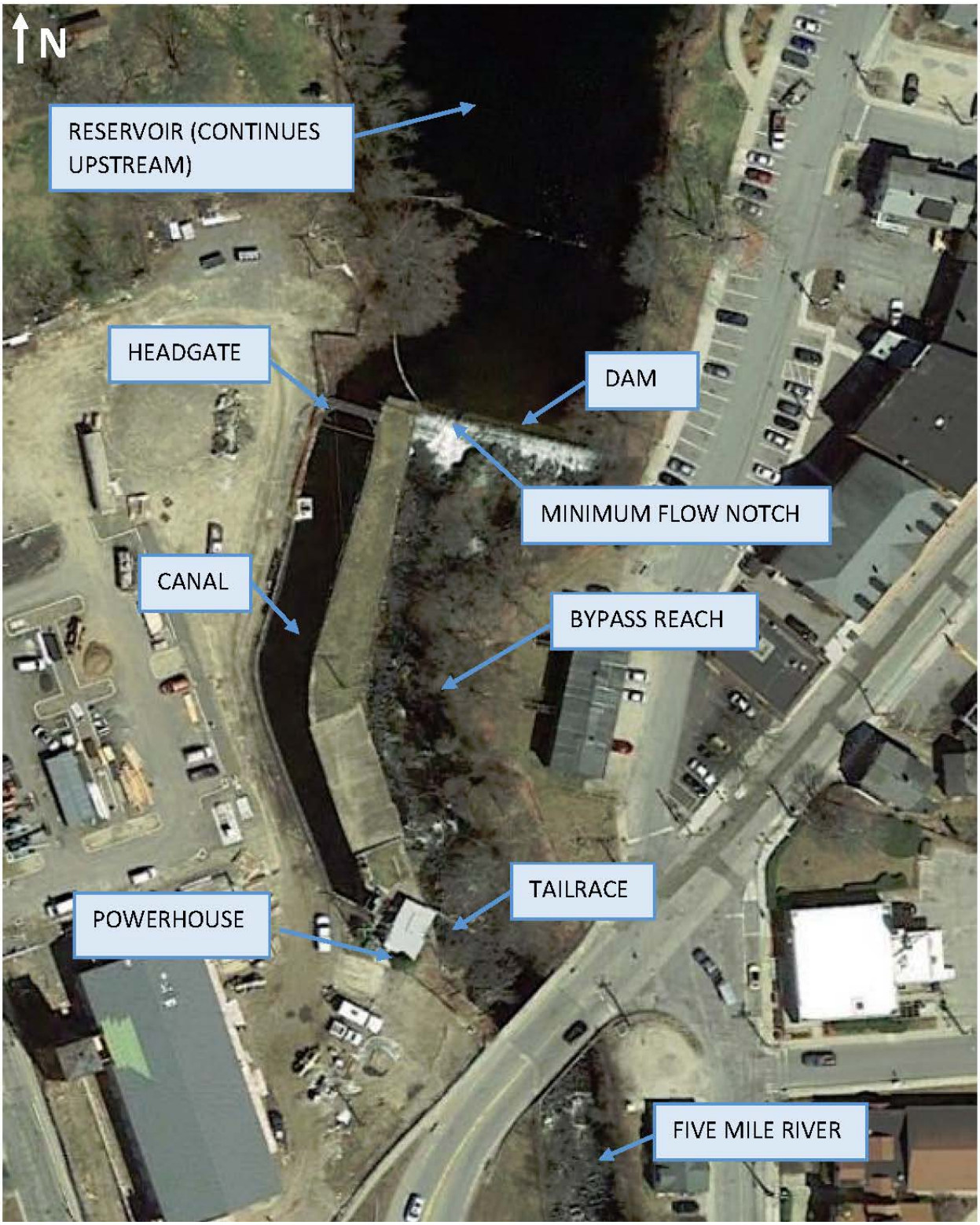

Figure 4. Five Mile Pond Development Features

III. REGULATORY AND COMPLIANCE STATUS

A review of the FERC elibrary was conducted from the 1987 license issuance to present. Most documents are dam safety related or routine filings, but a few key compliance documents related to the LIHI criteria were found and reviewed, including:

- March 27, 2018 owner filing of FERC Form 80 recreation usage reports[8]
- June 20, 2008 and July 24, 2007 FERC orders approving final Project as-builts[9]
- February 22, 2007 US Fish and Wildlife Service (FWS) comments on the owner's Flow Monitoring Plan for Five Mile Pond[10]
- January 10, 2007 owner filing of the Flow Monitoring Plan for Five Mile Pond[11]
- Various documents in 2006 related to turbine replacement at Five Mile Pond
- Various documents in 2005-2007 related to canal repairs at Quinebaug
- September 15, 2005 letter from the Connecticut Commission on Culture and Tourism (e.g., SHPO) confirming no negative effect on cultural or historic resources due to canal wall repairs[12]
- January 30, 2004 owner filing of FERC Form 80 recreation usage report[13]
- November 24, 2003 FERC environmental inspection report and August 29, 2003 FERC inspection follow up letter[14]
- March 17, 1998 owner filing of FERC Form 80 recreation usage report[15]
- June 28, 1994 FERC environmental inspection report[16]
- Various filings and FERC letters related to minimum flow and impoundment level deviations between 1996 and 2002

The Water Quality Certificate issued by the State of Connecticut on October 4, 1983 is not available electronically but was included as a supplement to the LIHI application. It requires that the Applicant provide anadromous fish passage when requested by CTDEEP and maintain the bypass minimum flows included in license Article 404. Table 1 summarizes FERC license requirements.

[8] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14851420 and https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14851437
[9] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11720204 and https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11404675
[10] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11276647
[11] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=11280708
[12] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10836443
[13] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10056271
[14] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10014072 and https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10355527
[15] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=8158020
[16] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10625206

Table 1. FERC License and Amendment Requirements

Article	Requirement
401	Prepare Construction Erosion Control and Sediment Plan for construction within 1 year of license issuance
402	Provide fish passage facilities at both developments within 6 months of construction of fish passage at the Aspinook (Wyre Wind) project
403	Operate in instantaneous run-of-river mode, and provide Flow Monitoring Plan for Five Mile Pond by February 1, 2007 (amendment)
404	Provide bypass reach minimum flows, and provide Flow Monitoring Plan for Five Mile Pond by February 1, 2007 (amendment)
405	Prepare Cultural Resources Management Plan for construction
406	Prepare Cultural Resources Management Plan for post-construction land-disturbing activities
407	Prepare Recreation Plan within 1 year of license issuance

V. PUBLIC COMMENTS RECEIVED OR SOLICITED BY LIHI

The application was publicly noticed on June 24, 2019 and notice of the application was forwarded to resource agency and stakeholder representatives listed in the application. No public comments were received by LIHI during the 60-day comment period which ended on August 23, 2019.

On June 24, 2019 the application reviewer emailed resource agency contacts to notify them of the application. Additional email inquiries were sent to Robert Hannon and Stephen Gephard of Connecticut Department of Energy and Environmental Protection (CTDEEP) on August 2, 2019 for input on water quality and fisheries, respectively. Communications are discussed in the applicable criteria sections below and email communications about fisheries is included in Appendix A.

VI. ZONES OF EFFECT

The Applicant delineated the Project into six Zones of Effect (ZoEs). The three Five Mile Pond ZoEs have been renumbered 4 – 6 for clarity in this report.:

- Zone 1: Quinebaug impoundment defined by an elevation contour of 188 feet msl around the impoundment.
- Zone 2: Quinebaug bypassed reach, approximately 1,090 feet from the dam to the tailrace confluence.
- Zone 3: Quinebaug tailrace area approximately 1,100 feet downstream to a set of rapids and a bend in the river.
- Zone 4: Five Mile Pond impoundment defined by an elevation contour of 220.8 feet msl around the impoundment.
- Zone 5: Five Mile Pond bypassed reach, approximately 315 feet from the dam to the tailrace confluence.

- Zone 6: Five Mile Pond tailrace area downstream to the confluence with the Quinebaug River, approximately 1,100 feet.

The Applicant selected the standards shown in the tables below. Where the reviewer's selection differed from that of the applicant's, the table is marked with **red X**. An explanation of the revised selection is provided in the criterion sections below.

Zone of Effect # 1: Quinebaug Impoundment

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

Zone of Effect # 2: Quinebaug Bypass Reach

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

Zone of Effect # 3: Quinebaug Downstream Reach

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

Zone of Effect # 4 (identified as #1 in the application): Five Mile Pond Impoundment

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

Zone of Effect # 5 (identified as #2 in the application): Five Mile Pond Bypass Reach

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

Zone of Effect # 6 (identified as #3 in the application): Five Mile Pond Downstream Reach

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

VII. DETAILED CRITERIA REVIEW

A: Ecological Flow Regimes

Goal: *The flow regimes in riverine reaches that are affected by the facility support habitat and other conditions suitable for healthy fish and wildlife resources.*

Assessment of Criterion: The Applicant selected Standard A-1, Not Applicable/De Minimis Effect for the two impoundments and downstream reaches, and Standard A-2, Agency Recommendation for the two bypassed reaches. Impoundments can typically qualify for A-1 since this criterion is focused primarily on riverine reaches, and with no impoundment storage, Standard A-1 is appropriate. For the downstream reaches, this review finds that Standard A-2 is more appropriate given the bypassed reaches and minimum flows that reenter the rivers at the tailrace confluences.

Discussion: The Quinebaug development is operated in instantaneous run-of-river mode with no pondage or storage. The facility has automatic controls for impoundment level maintenance to ensure compliance with run-of-river and minimum flow requirements. Turbine flow is controlled by an automatic programable logic controller (PLC).

At Quinebaug, a minimum flow of 77 cubic feet per second (cfs), or inflow if less, is released to the bypassed reach through the minimum flow turbine or directly over the dam spillway. As part of initial licensing FWS recommended a continuous minimum flow at the dam of 77 cfs to maintain suitable aquatic habitat for resident and migratory fish in the bypassed reach. Connecticut Department of Environmental Protection initially recommended a minimum flow of 23 to 77 cfs before including a final requirement of 77 cfs under Condition 3 of the Section 401 Water Quality Certification (WQC, included as an application supplement), which is also the licensed value.

When flows are less than 77 cfs or the minimum flow turbine is not operational, the bypass flow is provided over the dam spillway crest. At 77 cfs, the minimum flow turbine is operational and bypass flows are met through discharge from the minimum flow turbine and via the spillway up to 167 cfs of inflow. In the event that the minimum flow turbine is not available, the pond level is set at 188.32 ft msl based on weir equation calculations in order to meet the 77 cfs minimum flow requirement with flow over the project spillway. At 167 cfs, the main turbines are turned on and the bypass minimum flow is discharged via the minimum flow turbine or over the spillway. The maximum turbine capacity is 960 cfs. At a flow of 1,037 cfs, all three turbines are fully operational, and the bypass flow is being met via the minimum flow unit. Flows exceeding 1,037 are discharged over the spillway.

The Five Mile Pond development is also operated in an instantaneous run-of-river mode with a PLC controller to maintain the impoundment at 220.8 ft msl during normal project operations. A minimum flow of 15 cfs, or inflow if less, is released into the bypassed reach through a permanent notch in the spillway flashboards sized through weir equation calculations. At licensing, FWS recommended a minimum flow of 15.4 cfs into the bypassed reach. The state initially recommended 12 to 15.4 cfs and later 15 cfs under Condition 3 of the WQC, which is also the licensed value.

Up to the minimum flow requirement of the turbine (25 cfs) plus the minimum flow (15 cfs), all flow is discharged into the bypassed reach. Flows above 40 cfs are directed to the turbine automatically by PLC adjustment of the wicket gates and turbine blade settings until the inflow reaches 242 cfs at which time the maximum flow for the turbine (227 cfs) is reached. Flows in excess of 242 cfs are discharged over the spillway.

The 2006 FERC license amendment for the Five Mile Pond turbine replacement required development of a Compliance Plan for Minimum Flows that was prepared and approved by the resource agencies. Agencies did not propose changes in the minimum flow at that time. The spillway notch is inspected regularly to remove debris and other potential blockages and ensure appropriate through flows are provided. Run-of-river operations are achieved through impoundment level maintenance that links the transducer recorded impoundment levels with the generating unit's PLC to adjust gate settings appropriately. In addition, a data recorder is linked to a water level transducer located in the impoundment to monitor compliance with run-of-river operations. Data recorder charts are changed weekly and retained for a period of 3 years.

Due to the age of the license and WQC, the scientific basis for the minimum flow releases cannot be verified. However, the formal agency recommendations at that time supported the flows that are in place. A review of the FERC elibrary also showed numerous flow and impoundment level deviations up until 2002, under prior ownership of the Project. There have been no reported deviations since that time, and with automatic controls on impoundments and flows, those issues appear to have been resolved.

Based on the application, supporting documentation, and FERC elibrary documents, this review finds that the Project satisfies the ecological flow regimes criterion.

B: Water Quality

Goal: *Water Quality is protected in waterbodies directly affected by the facility, including downstream reaches, bypassed reaches, and impoundments above dams and diversions*.

Assessment of Criterion: The Applicant selected Standard B-1, Not Applicable/De Minimis Effect in all ZoEs to pass the water quality criterion.

Discussion: A Water Quality Certificate (WQC) was issued by Connecticut Department of Environmental Protection (now Department of Energy and Environmental Protection, or CTDEEP) on October 4, 1983 with conditions related to minimum flows as discussed above, and related to providing effective anadromous fish passage upon request by the Department. Fish passage is discussed in Sections VII.C and D below.

The freshwater ecosystem of the Thames River Basin is strongly influenced by nutrient loading from urban and agricultural areas even though the majority of the basin is forested.[17] CTDEEP classifies the Quinebaug River in the project area as "Class B". Class B waters are designated to be used for fish and wildlife habitat, agricultural and industrial supply and other uses such as navigation. Class B waters must have a minimum dissolved oxygen (DO) standard of 5 milligrams per liter (mg/l) at all times and cannot have temperature changes from natural conditions that would impair existing or designated uses, and in no case exceed 85^0 F, nor raise the temperature of surface water more than 4^0 F.

The 2016 Integrated Water Quality Report developed by the State of Connecticut[18] shows the Quinebaug development located within the section of the Quinebaug River defined as CT3700-00_03. This stretch of river is approximately 6.3 miles long and extends from the confluence of Mill Brook, near Yaworski Landfill to the upstream confluence with the Moosup River. The reach has not been assessed for aquatic life but is fully supporting for recreation activities. The Quinebaug River in the Project area is not listed as impaired, although some upstream and downstream locations were assessed as non-supporting for aquatic life and/or recreation due to e coli. Potential sources of impairments include stormwater runoff, industrial and municipal discharges, salt storage, remediation sites, and groundwater impacts. Hydropower operations were not listed as a potential source of the upstream and downstream impairments.

The Five Mile River is not listed in the report and thus not classified as impaired. Note: there is another Five Mile River in southwest Connecticut (identified as CT7401) which is included in the report; this is not the river of interest.

[17] https://pubs.water.usgs.gov/ofr20051208
[18] http://www.ct.gov/deep/lib/deep/water/water_quality_management/305b/2016_iwqr_final.pdf

The application included DO data from a USGS gage[19] located about 20 miles downstream of the Quinebaug development and just downstream of Aspinook dam (Wyre Wynd) which showed average historical DO levels from 1967 – 2017 of 10.5 mg/L and no recorded instances where the State water quality standard of 5 mg/L was violated. Additional data from the USGS gage indicates an average water temperature of 13.6° Celsius (C), with a historic maximum of 30°C recorded in 1977. The gage data is not in the immediate Project vicinity so is of limited use in this review.

The Applicant met with Mr. Robert Hannon of the Water Quality division of CTDEEP on September 5, 2019 to seek concurrence on water quality at the Project, no official concurrence was provided. In the reviewer's follow up telephone inquiry with Mr. Hannon on October 31, 2019 after two email inquiries went unanswered, he reported that the State has no concerns with Project operations related to water quality and he does not believe that the Project adversely impacts water quality. He noted that the Project will begin FERC relicensing in the near future (by February 2022 at the latest), and that a new WQC will be issued at the appropriate time during the relicensing process.

Therefore, based on the application, supporting documentation, agency consultation, and FERC elibrary documents, this review finds that the Project satisfies the water quality criterion.

C: Upstream Fish Passage

Goal: *The facility allows for the safe, timely, and effective upstream passage of migratory fish. This criterion is intended to ensure that migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the facility.*

Assessment of Criterion: The Applicant selected Standard C-1, Not Applicable/De Minimis Effect in all ZoEs to pass the upstream fish passage criterion.

Discussion: The Quinebaug (Rojak) dam is the third upstream dam on the Quinebaug River. Approximately 25 miles downstream, the Quinebaug River and Shetucket River join to form the Thames River which ultimately discharges into the Atlantic Ocean. There are two dams located downstream of the Project on the Quinebaug River and one dam located on the Shetucket River (Figure 5, below).

Migratory fish species in the Thames, Shetucket and Quinebaug rivers include American shad, blueback herring and alewife as well as American eel that are subject to an ongoing restoration effort at the downstream dams. Diadromous fish species were once common to the basin. Spawning runs of these species were extirpated in the mid-to late-1800s due to the construction of dams. There remains suitable spawning and nursery habitat for alewife and

[19] USGS Gage No. 01127000 Quinebaug River at Jewett City, CT

blueback herring (collectively referred to as river herring), American shad, sea lamprey, American eel, and sea-run trout above the dams.[20]

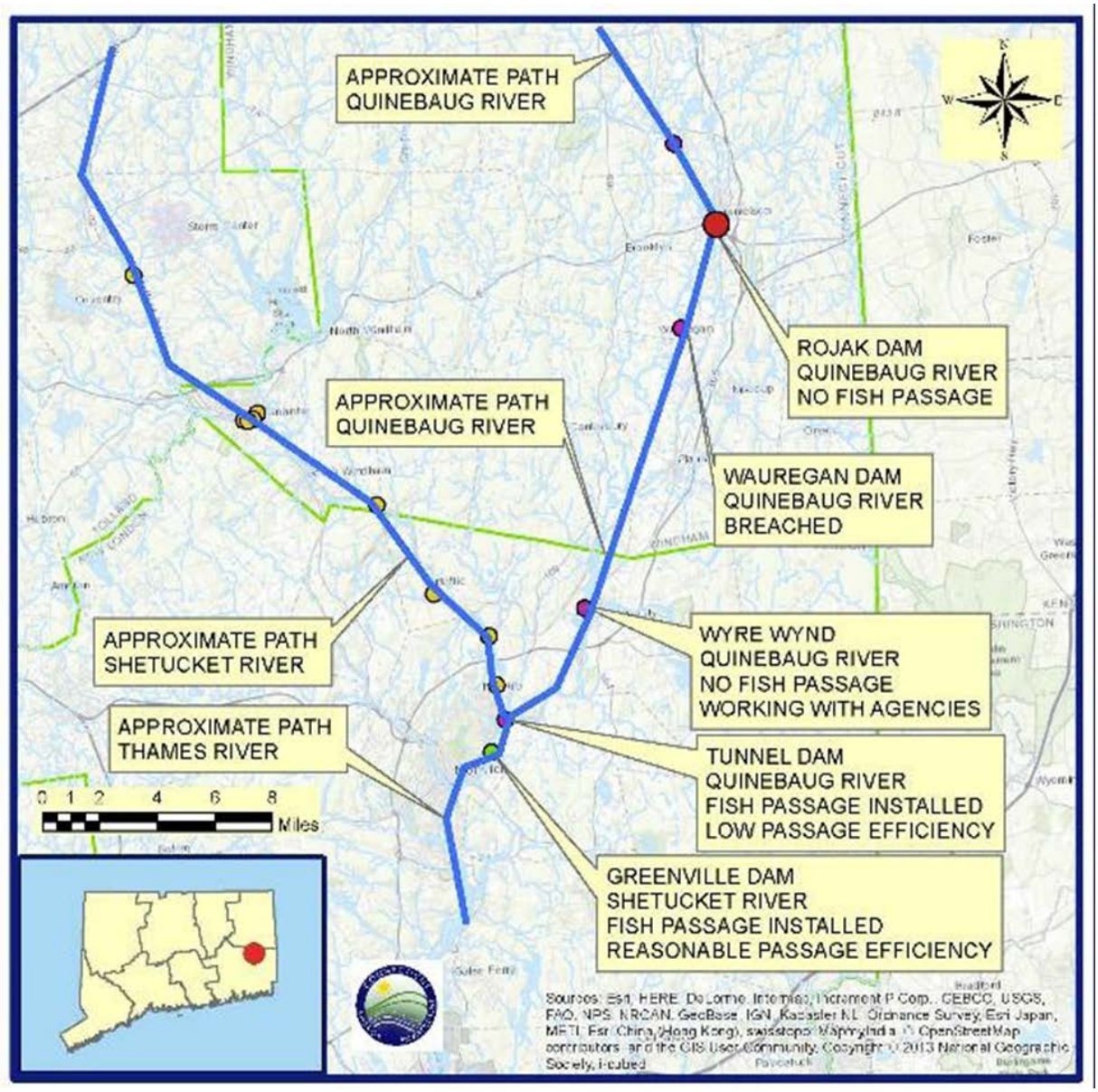

Figure 5. Dams and Fish Passage on the Quinebaug River

The Wyre Wynd Hydroelectric Project (Aspinook dam, FERC P-3472) creates the current barrier to upstream migrating species at Quinebaug. The Wyre Wynd Project is currently engaged in the FERC relicensing process (license expires April 30, 2022) and Gravity Renewables, the owner of that Project as well as this Project, is working with resource agencies to address fish passage restoration goals at that Project. Upon completion of fish passage measures there, Quinebaug

[20] http://thamesriverbasinpartnership.org/wp-content/uploads/2019/02/ShetucketRiverPlanConnecticutDEPDecember2009.pdf

will form the upstream barrier to fish passage. This possibility was recognized during initial conditioning of the Quinebaug Project as noted in the 1983 WQC which specifies: *"recognition and acceptance of a responsibility to provide effective anadromous fish passage facilities on the Quinebaug and Fivemile [sic] Rivers upon request by the Department."*

FERC License Article 402 states, in part: *"The licensee, no later than 6 months after the start of construction of fish passage facilities at the Aspinook Pond Dam, shall file for Commission approval, functional design drawings for upstream and downstream passage facilities at Five Mile Pond and Rojak Dam, prepared after consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the Connecticut Department of Environmental Protection…."*

Upstream passage facilities are in place at dams farther downstream of Wyre Wynd, the most downstream at the Greenville Project on the Shetucket River (Thames River confluence, FERC #2441, LIHI #106), and the FERC non-jurisdictional Tunnel Project at the mouth of the Quinebaug River (Figure 5). Greenville has an eel ladder and uses a fish elevator for anadromous fish that are trucked upstream, both of which appear to be effective (see Greenville 2018 recertification review report[21]). The Tunnel Project also has a fish lift. The Wyre Wynd Preliminary Application Document[22] reports that effectiveness of fish passage above Greenville appears to be low based on fish count data from CTDEEP.

There are no formal upstream eel passage facilities installed at Quinebaug; however, eels have been documented upstream. American eels have the capacity to surmount obstacles through crawling up wet surfaces and they may pass up and over the wetted face of the spillway, over the canal embankment and/or over the left abutment of the dam to enter into the Project headwaters and continue their movement to the upper reaches of the watershed. Eels can also apparently pass upstream of the Five Mile Pond dam since they have been documented upstream in the Five Mile River and very small numbers of eels have been reported in both rivers upstream of the Project. The most recent CT DEEP Fish Community Data - Inland Waters data[23] shows less than a dozen eels upstream of Quinebaug as recently as 2010 and none reported upstream of Five Mile Pond since 1994.

Subsequent to the issuance of the Quinebaug FERC license and WQC, the CT DEEP developed a *Plan to Restore Diadromous Fishes to the Shetucket River Watershed* [24], which includes targets for passage and restoration at Quinebaug of multiple species including American shad, alewife, blueback herring, sea-run trout, sea lamprey, and American eel to the Quinebaug River up to the natural falls (Cargill Falls) in Putnam. (and beyond for eels). The plan also indicates that a cascade located at the mouth of the Five Mile River (downstream of the Five Mile Pond dam) forms a natural historic barrier to anadromous species but a need for American eel passage in the future was identified.

[21] https://lowimpacthydro.org/wp-content/uploads/2013/05/Greenville-Recertification-Report_2018_06_07.pdf
[22] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14575737
[23] http://www.cteco.uconn.edu/projects/fish/viewer/index.html
[24] Op. cit. footnote 20.

The reviewer contacted Mr. Stephen Gephard, Supervising Fisheries Biologist at CTDEEP (Appendix A) who stated via email on August 6, 2019 that he believed LIHI Certification would be premature for the Project since the developments do not currently have upstream fish passage facilities. LIHI policy is to evaluate Projects on their existing requirements and available information.

Given that there are currently downstream barriers to upstream fish passage, and based on the application, supporting documentation, and FERC elibrary documents, this review finds that the Project satisfies the upstream passage criterion. However, upstream passage at the Wyre Wynd Project is likely to be constructed once that Project's new license is issued. The existing Quinebaug – Five Mile Pond license includes a time trigger for installation of upstream passage pending installation at Wyre Wind, so this review recommends a condition to notify LIHI once that trigger has been met and upstream passage plans at Quinebaug – Five Mile Pond need to be developed.

D: Downstream Fish Passage

Goal: *The facility allows for the safe, timely, and effective downstream passage of migratory fish. For riverine (resident) fish, the facility minimizes loss of fish from reservoirs and upstream river reaches affected by Facility operations. All migratory species can successfully complete their life cycles and to maintain healthy, sustainable fish and wildlife resources in the areas affected by the Facility.*

Assessment of Criterion: The Applicant selected Standard D-1, Not Applicable/De Minimis Effect in all ZoEs to pass the downstream fish passage and protection criterion.

Discussion: The Quinebaug River supports a mixed coldwater and warmwater fishery and the Five Mile River supports a coldwater fishery. The fish community in in the vicinity of Project has been surveyed several times between 1994 and 2014 by CT DEEP. CT DEEP Fish Community Data - Inland Waters data[25] reports fish species present in the Quinebaug and Five Mile rivers upstream and downstream of the Project dams including American eel, and numerous resident species as shown in Tables 2 and 3 included in the application. American eel is the only diadromous species present at this time.

[25] Op. cit. footnote 21.

Table 2. Fish Species at Quinebaug Development[26]

SPECIES	UPSTREAM	DOWNSTREAM
Black Crappie		X
Green Sunfish		X
Banded Killifish	X	
Longnose Dace	X	X
Brook Trout - Wild		X
White Catfish		X
White Perch		X
Rainbow Trout - Wild		X
Yellow Bullhead	X	X
Brown Bullhead	X	
Chain Pickerel	X	
Common Shiner	X	
American Eel	X	X
Bluegill Sunfish	X	X
Blacknose Dace	X	X
Common Carp	X	X
Fallfish	X	X
Golden Shiner	X	X
Spottail Shiner	X	
Rock Bass	X	
Largemouth Bass	X	X
Pumpkinseed	X	X
Redbreast Sunfish	X	X
Smallmouth Bass	X	X
Tessellated Darter	X	X
White Sucker	X	X
Yellow Perch	X	X

[26] Upstream data from Quinebaug River in Killingly (Station ID 14412) collected in 2008 and Quinebaug River in Putnam (Station ID 16990) collected in 1994. Downstream data from Quinebaug River in Killingly (Station ID 16304) collected in 2008, 2009, 2010, 2012 and 2014.

Table 3. Fish Species at Five Mile Pond Development[27, 28]

SPECIES	UPSTREAM	DOWNSTREAM
Black Crappie		X
Green Sunfish		X
Longnose Dace	X	X
Brook Trout - Wild	X	X
White Catfish		X
White Perch		X
Rainbow Trout - Wild		X
Yellow Bullhead	X	X

Trash rack spacing at the Quinebaug development is 3 inches and the approach velocity is estimated to be about 1.4 ft/second. At Five Mile Pond, trash rack spacing is 2 inches and approach velocity is estimated to be about 1.5 ft/second. In both cases, the water velocity is less than the standard agency guidance of 2 ft/second or less to protect fish against entrainment and impingement. Due to these low velocities, larger fish could avoid being impinged on the trash racks, but some smaller fish could possibly pass and become entrained through the turbines.

Existing downstream passage is also available through the minimum flow provided by a notch in the spillway flashboards into the bypassed reach at Five Mile Pond. Minimum flow at Quinebaug is provided via the minimum flow turbine. If the unit is not operating due to inflows lower than its minimum hydraulic capacity, or if the unit is out of service, flow is provided over the spillway.

With regard to wild trout in the Five Mile River, the Inland Waters data shows four fish sampling sites upstream of Five Mile Pond, three in the Town of Killingly and one in Putnam. At the site closest to the Project (Station ID 16664), one wild brown trout was captured in 1994 and farther upstream one wild brook trout was captured in 2014 (Station ID 18709). There is no additional data on wild trout reported for that river. No wild trout are reported on the Quinebaug River upstream of the Quinebaug development.

Mr. Stephen Gephard, Supervising Fisheries Biologist at CTDEEP reported (Appendix A) that he did not know of additional or more recent fish data for the Five Mile River. He also stated that wild brown trout is a resource the agency views as at risk with the 2-inch trash rack spacing at Five Mile Pond, and that the agency would likely require some protection during Project relicensing since smaller trash rack spacing would be needed for diadromous species anyway. He further stated that the current CTDEEP requirement for instantaneous run-of-river operations provides great benefit to resident species which, other than wild brown trout, generally have robust populations that are resilient against turbine induced mortality.

[27] Upstream data from “Fivemile” River in Killingly (Station ID 16664) collected in 1994. Downstream data from Quinebaug River in Killingly (Station ID 16304) collected in 2008, 2009, 2010, 2012 and 2014.
[28] One wild brown trout, not a brook trout was collected at the upstream site in 1994.

The Project operates in instantaneous run-of-river mode. Given the extremely low numbers of wild brown trout and lack of a state management priority for the species, American eel is the primary species of interest. Eel are present in only very small numbers as noted in Section C above, pending installation of upstream passage facilities at Wyre Wynd.

LIHI policy is to evaluate Projects not currently in relicensing on their existing requirements and available information. Given the downstream barrier to upstream fish passage for American eel that would later want to move downstream past this Project, the Project currently meets the LIHI criterion via Standard D-1 in all ZoEs.

Based on the application, supporting documentation, and FERC elibrary documents, this review finds that this Project satisfies the downstream passage and protection criterion. Downstream passage at the Wyre Wynd Project is likely to be constructed once that Project's new license is issued. The existing Quinebaug – Five Mile Pond license includes a time trigger for installation of downstream passage pending installation at Wyre Wynd, so this review recommends a condition to notify LIHI once that trigger has been met and downstream passage plans at Quinebaug – Five Mile Pond are developed.

E: Shoreline and Watershed Protection

Goal: *The facility has demonstrated that sufficient action has been taken to protect, mitigate or enhance the condition of soils, vegetation and ecosystem functions on shoreline and watershed lands associated with the facility.*

Assessment of Criterion: The Applicant selected Standard E-1, Not Applicable/De Minimis Effect in all ZoEs to pass the shoreline and watershed protection criterion.

Discussion: The Quinebaug and Five Mile Pond developments are licensed under a single FERC license with a combined project boundary. The Project boundary is approximately 130 acres. Of that, about 126 acres is land under water, about 2 acres has tree and brush cover, and about 2 acres is urban/developed (see Figure 2 above). The Project does not include any of the lands adjacent to the impoundments. There are no specific agency recommendations for shoreline protection or watershed protection nor any mention of these protections in the WQC or FERC license. The Project does not have, nor is it required to have, a watershed enhancement fund or specific watershed land protection plan.

There are apparently no lands of significant ecological value associated with the Project. The Project's footprint is small and run-of-river operations serve to minimize impoundment fluctuations and disturbances to the natural hydrograph mitigating any Project-related impacts to shoreline and watershed resources. Article 401 of the license required the Applicant to file an erosion plan in 1987 to control erosion and minimize sediment from project construction and operation. The plan is not available on the FERC elibrary, but the most recent FERC

Environmental Inspection in 2003[29] indicates the plan was filed and approved by FERC, and the inspection did not note any erosion or other shoreline concerns.

Based on the application, supporting documentation, and FERC elibrary documents, this review finds that the Project satisfies the shoreland and watershed protection criterion.

F: Threatened and Endangered Species

Goal: *The facility does not negatively impact federal or state listed species.*

Assessment of Criterion Passage: The Applicant selected Standard F-1, Not Applicable/De Minimis Effect in all ZoEs to pass the threatened and endangered species criterion.

Discussion: The only federally listed species with potential to occur in the Project vicinity is the threatened Northern long-eared bat (*Myotis septentrionalis*). General habitat characteristics for this species includes mines and caves (over-wintering) and forested habitats (summer). There are no mines or caves within any of the Project ZoEs nor in eastern Connecticut.[30] The Applicant reports that they conduct regular vegetation removal; however, this does not typically include removal of trees. Normal maintenance consists of mowing lawns and cutting back brush and other low growing vegetation primarily on the banks of the power canal at Quinebaug. At Five Mile Pond, immediate surrounding land use is dominated by dense residential and urban development. Periodic vegetation management is conducted on the abutment of the dam as part of dam safety maintenance and limited to shrubby and herbaceous cover. There are no critical habitats for bats located within the Project area and it is extremely unlikely that the species is present within the Project's small footprint and urban location.

The Applicant reviewed the Connecticut State Natural Diversity Database[31] as part of the LIHI application. The online maps show no occurrences of state-listed species or significant natural communities in the Project vicinity.

Therefore, based on the information provided, this review finds that the Project satisfies the threatened and endangered species protection criterion.

G: Cultural and Historic Resources Protection

Goal: *The Facility does not unnecessarily impact cultural or historic resources that are associated with the facility's lands and waters, including resources important to local indigenous populations, such as Native Americans.*

[29] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10014072
[30] https://www.ct.gov/deep/lib/deep/endangered_species/images/nleb_approved2_16.pdf
[31] https://www.ct.gov/deep/cwp/view.asp?a=2702&q=323464&deepNav_GID=1628

Assessment of Criterion: The Applicant selected Standard G-1, Not Applicable/De Minimis Effect in all ZoEs to pass the cultural and historic resources protection criterion. However, the reviewer finds that Standard G-2, Approved Plan is more appropriate for all ZoEs, as discussed below.

Discussion: FERC license article 405 required preparation of a Cultural Resources Management Plan (CRMP) as recommended by the State Historic Preservation Office (SHPO) prior to initiation of land-disturbing activities when the Project was constructed. A cultural resource assessment of the property was conducted during licensing in 1985 and 1986, and mitigation efforts were completed to minimize adverse impacts to identified historic structures and historic archaeological remains that are located within the Quinebaug Mill - Quebec Square Historic District which is listed on the National Register of Historic Places.[32] The CRMP was submitted to FERC on May 16, 1988 and approved on September 26, 1988. Neither document is available on the FERC elibrary in electronic format.

The license includes the following standard text: *"…If the applicant discovers any previously unidentified archaeological or historic sites during the course of constructing or developing the project works or other facilities at the project, the applicant should halt construction and development activities in the vicinity of the sites, and should consult a qualified cultural resources specialist and the SHPO about eligibility of the sites for listing in the National Register of Historic Places and about any measures needed to avoid the sites or to mitigate effects on the sites."*

The 2003 FERC Environmental Inspection Report also stated: *"There are no known prehistoric archaeological sites within the boundaries of the Five Mile Pond or Quinebaug Developments. There has been extensive industrial development in the area in addition to construction and development of the hydroelectric generating facilities. The possibility of uncovering previously unknown archaeological sites in the area is remote. There are no structures within the project area that are listed on or eligible for inclusion on the National Register of Historic Places. The licensee must consult with the Connecticut State Historic Preservation Officer prior to any land-disturbing activities. The licensee appears to be in compliance with its requirements with regards to cultural resources."*

Therefore, based on the information provided and given that the Applicant stated in the application that they are committed to completing the proper SHPO consultation prior to completion of any significant ground disturbing activities, this review finds that the Project satisfies the cultural and historic resources protection criterion.

H: Recreational Resources

Goal: *The facility accommodates recreation activities on lands and waters controlled by the facility and provides recreational access to its associated lands and waters without fee or charge.*

[32] Op. cit., footnote 1, FERC license.

Assessment of Criterion Passage: The Applicant selected Standard H-1, Not Applicable/De Minimis Effect in all ZoEs to pass the recreational resources criterion. The reviewer finds that Standard H-1 is appropriate for all ZoEs except the Quinebaug impoundment (ZoE #1) where Standard H-2, Agency Recommendation is more appropriate as discussed below.

Discussion: FERC license article 407 required the licensee to consult with FWS, National Park Service, and CTDEEP to determine measures to provide public access and enhance recreational opportunities. A Public Access and Recreational Access Plan was submitted to FERC on March 18, 1988 (not available electronically) and was approved with modifications on February 21, 1992.[33] Measures proposed in the plan included warning signs upstream of the dams, improvements to an existing informal canoe portage around the east (river left) end of Quinebaug dam, and unrestricted public access to Project lands and waters, where safe to provide. Boat barriers upstream of the dams were also installed.

The proposed improved canoe portage route was to be located on land owned by Connecticut Department of Transportation (DOT). As part of FERC's plan approval, the then licensee was required to consult with the DOT to obtain permission to make the proposed improvements to that route, and to file a schedule for implementation with FERC. Ultimately, the proposal was abandoned, and the existing informal portage trail was rerouted as a result of a 1994 FERC inspection[34] which determined that the proximity to the dam of the proposed take-out and put-in locations and the steepness of the embankment at the take-out created public safety concerns. At that time, the boat barrier was moved upstream from the dam and the informal take-out point relocated upstream to the Route 6 bridge, with approval from FERC. Boaters portage along the existing road and a walkway on river left to put in below the dam, so that other route improvements were deemed unnecessary.

Thus, there are no "formal" recreation facilities at the Project. Informal access for fishing is provided, primarily at the confluence of the Quinebaug and Five Mile Rivers and in the impoundments. According to the latest FERC Form 80 submissions filed in 2018 for the 2015 year[35], public use of these areas has historically been very limited.

Based on the application, supporting documentation, and FERC elibrary documents, this review finds that the Project satisfies the recreational resources criterion.

VIII. CERTIFICATION RECOMMENDATION

This review included evaluation of the application and additional information provided, a review of the FERC elibrary, and a review of other publicly available information. Based on this

[33] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3457858
[34] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10625206
[35] https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14851420 and https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14851437

evaluation, I recommend that the Project be certified for a five (5)-year term with the following condition:

> **Condition 1:** The Facility Owner shall notify LIHI of installation of upstream and/or downstream passage facilities at the Wyre Wynd (Aspinook Pond Dam) Project and provide a schedule for installation of passage facilities at the Quinebaug-Five Mile Pond Project in accordance with the existing FERC license article 402.

APPENDIX A

From: Gephard, Steve
To: "mfischer@lowimpacthydro.org"
Subject: RE: Quinebaug River and Five Mile River Hydro Project - Fisheries
Date: Tuesday, August 6, 2019 11:46:47 AM

Maryalice,

The species that are listed are not species we typically require rigorous proof of protection. The species generally have robust populations that are resilient against turbine induced mortality. The exception is wild brown trout on the Fivemile. That is a resource we view as at risk with 2" intake gaps and we would require some protection during relicensing. We would likely seek smaller gaps for diadromous species anyway. We also have a policy in CT that ALL new licenses have a provision for instantaneous run-of-river. This will be of great benefit to these resident species.

Steve

From: mfischer@lowimpacthydro.org [mailto:mfischer@lowimpacthydro.org]
Sent: Tuesday, August 06, 2019 11:38 AM
To: Gephard, Steve <Steve.Gephard@ct.gov>
Subject: RE: Quinebaug River and Five Mile River Hydro Project - Fisheries

Thank you Steve,
I am aware of that plan and understand your agency's position. Note that the Quinebaug/Five Mile project's current FERC license has a trigger for fish passage based on Wyre Wynd. FERC License Article 402 states, in part: *"The licensee, no later than 6 months after the start of construction of fish passage facilities at the Aspinook Pond Dam (Wyre Wynd), shall file for Commission approval, functional design drawings for upstream and downstream passage facilities at Five Mile Pond and Rojak Dam, prepared after consultation with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the Connecticut Department of Environmental Protection...."* So, regardless of relicensing for Quinebaug/Five Mile they are currently required to install passage once Wyre Wynd does.

I wonder if you can answer my other question about the resident species listed in my email below, and whether any Quinebaug entrainment/impingement would negatively affect populations of resident fish?

Best regards,
Maryalice

From: Gephard, Steve <Steve.Gephard@ct.gov>
Sent: Tuesday, August 6, 2019 11:14 AM
To: 'mfischer@lowimpacthydro.org' <mfischer@lowimpacthydro.org>
Subject: RE: Quinebaug River and Five Mile River Hydro Project - Fisheries

Hi Maryalice,

I don't know of any updated fish data for the Fivemile River.

Our agency would not support LIHI certification of these two projects at this time.

We have produced a Diadromous Fish Management Plan for the Shetucket River Watershed (including the Quinebaug River) and I have attached it. It has been filed with FERC and repeatedly used to support decisions. The plan calls for the restoration of American shad, alewife, blueback herring, sea-run trout, sea lamprey, and American eel to the Quinebaug River up to the natural falls (Cargill Falls) in Putnam. (and beyond for eels) In order for us to consider any hydropower as 'green', it must protect existing fisheries resources and support this restoration plan. These two projects do not yet do so.

Rajak (Quinebaug) was licensed prior to the adoption of the plan and when there was no fish passage at downstream dams. Now, there is fish passage at Greeneville (Shetucket 1) and Tunnel (Quinebaug 1). Wyre Wynd (Quinebaug 2) is undergoing relicensing now. We will be requiring Gravity Renewables, the licensee, to install full upstream and downstream fish passage including specific facilities for American eel through our 401 WQC. The USFWS and NOAA will be requiring the same through their prescriptive authorities. Rajak (Quinebaug 3) is next in line. We will be requiring the same things for it when it comes up for re-licensing. Given that there is nothing in place now, we would not support LIHI certification but once it is re-licensed and found to be in compliance with all of our anticipated license conditions, then LIHI certification may be warranted. The application is premature in my eyes. I would say the same thing about Wyre Wynd.

Five Mile is different in that most fish species never got past the barrier waterfall at the mouth of the river and our Plan does not call for American shad and the other anadromous species two be in that river. However, eels can get over those falls and our 401 will require the project to provide safe, timely, and effective upstream and downstream passage of eels upon relicensing. Therefore, we feel that the application for this project for LIHI certification is also premature.

Please do not hesitate to contact me if you wish to discuss this further.

Steve

Stephen Gephard
Supervising Fisheries Biologist
Diadromous Fisheries *and* Habitat Conservation and Enhancement programs
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