

REVIEW OF APPLICATION FOR RE-CERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE GREENVILLE HYDROELECTRIC FACILITY

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I. INTRODUCTION

This report summarizes the review findings of the application submitted by the Norwich Public Utilities (NPU or Applicant) to the Low Impact Hydropower Institute (LIHI) for re-certification of the Greenville Hydroelectric Project FERC P-2441 (Greenville or Project). The Project was initially certified by LIHI as a low impact hydropower facility in March 2013. LIHI Certificate No. 000106, which became effective on March 6, 2013 and will expire on May 31, 2018. This re-certification review was conducted in compliance with LIHI's Handbook, 2nd Edition, dated March 7, 2016 and updated July 20, 2016. The Applicant is concurrently filing for LIHI re-certification of a second facility located at the Occum Dam (FERC Project No. 11574), also located on the Shetucket River mainstem. Both Projects were evaluated concurrently by the same LIHI Reviewer.

The original 2013 Certification Report can be accessed via the link below. Details on the project and several figures incorporated into this Report were taken from the 2013 Report.

<https://lowimpacthydro.org/assets/files/Greenville%20Files/GreenvilleCertificationFinalReport23May2013.pdf>

One condition was incorporated into the 2013 LIHI certification:

“The City of Norwich shall continue to cooperate with CTDEEP and the USFWS on efforts to provide safe, timely, and effective American eel passage at Greenville Dam. The City shall implement reasonable improvements to passage facilities or operating protocols when requested by the resource agencies. Should the City disagree with an agency request, it shall so notify LIHI within 30 days of the request and provide an explanation for the disagreement. LIHI may suspend or revoke this certification should it determine that its passage criteria are not being met.”

The annual compliance statements did not specifically address this condition, however information that was received from the CT Department of Energy and Environmental Protection (CTDEEP), Fisheries Division, provided in the recertification application, demonstrated that agency recommendations have been implemented during the certification period. This is discussed under the two criteria for fish passage.

II. RECERTIFICATION PROCESS AND INITIAL ASSESSMENT

Under the 2016 LIHI Handbook, reviews are a two-phase process starting with a limited review of a completed LIHI application, focused on three questions:

- (1) Is there any missing information from the application?
- (2) Has there been a material change in the operation of the certified facility since the previous certificate term?
- (3) Has there been a change in LIHI criteria since the certificate was issued?

In accordance with the Recertification Standards, if the only issue is that there is some missing information, the applicant will have the opportunity to provide the missing information, and this may or may not trigger a Stage II review. These standards also state that "material changes" mean non-compliance and/or new or renewed issues of concern that are relevant to LIHI's criteria. If the answer to either question (2) or (3) is "Yes," the Application must proceed through a second phase, which consists of a more thorough review of the application using the LIHI criteria in effect at the time of the recertification application, and development of a complete Stage II Report. Because the new Handbook involves new criteria and a new process, the answer to question two for all projects scheduled to renew in 2017 is an automatic 'YES.' Therefore, all certificates applying for renewal in 2017 are required to proceed through both phases of the recertification process.

A review of the initial application, received on January 18, 2018, resulted in a Stage I or Intake Report, dated February 8, 2018. The response to the Stage I Report was provided in the form of a revised Application received on late February 28, 2018.

This Stage II assessment included review of the application package, public records in FERC's eLibrary since the most recent LIHI recertification in March 2013, public comments received and annual compliance statements received by LIHI during the past term of certification.

Outreach was made to the following stakeholders as part of this review. Only Melissa Grader responded to my inquiry. Her discussion is incorporated into the applicable criterion sections.

- CT Department of Energy and Environmental Protection (CTDEEP), Bureau of Water Protection and Land Reuse - Brian Golembiewski, Supervisor.
- US Fish and Wildlife Service (USFWS)- Melissa Grader, Fish and Wildlife Biologist
- River Alliance of CT - Margaret Minor, Executive Director

A support letter from CTDEEP, Inland Fisheries Division was included in the application.

III. PROJECT'S GEOGRAPHIC LOCATION

The Greenville Hydroelectric Project (Project) is located in New London County, Norwich, CT on the Shetucket River, about 1.3 miles upstream of the Thames River, and includes the Second Street and the Tenth Street developments. The dam is the most downstream dam on the Shetucket River. The reach below the dam is subject to tidal influence. At its mouth, the Shetucket River

combines with the Yantic River to form the Thames River 15 miles upstream of Long Island Sound in New London, Connecticut. The Thames River basin is the third largest major river basin in Connecticut. The Shetucket River, with a basin area of about 1,270 square miles, drains an estimated 93% of the Thames River watershed.

The Applicant's Occum Project is also located on the Shetucket mainstem about five miles upstream of Greenville Dam. Intermediate between the two projects is a third dam, Taftville Dam, an unlicensed hydroelectric facility owned and operated by FirstLight Power Resources, which also owns and operates another unlicensed facility, the Tunnel Hydroelectric Project at the mouth of the Quinebaug River. The Scotland Hydroelectric Project, also owned by FirstLight Power Resources is the most upstream dam on the river.

Figures 1 and 2 in Appendix A shows the location of the Greenville Project and other dams on the Shetucket River. Figures 3 through 5 show the key features of the Project, including the location of the fish passage facilities.

IV. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The Project, a run-of-river facility, consists of the 16-inch flashboard-equipped 399-foot-long timber crib Greenville Dam, that diverts water into a 3,200-foot-long, 70-foot-wide, and 13-foot-deep power canal with two power stations, the Tenth Street station located about a quarter of the way down the canal and the Greenville, or Second Street, station at the lower end of the canal. (See Figures 3 and 4 in Appendix A). The dam axis runs approximately east-west, with the Project facilities on the west bank. The dam, with a crest elevation of 21.0 feet NGVD, carries 1.3-foot-high flashboards. The dam creates a riverine impoundment with a gross storage capacity at normal pond level of 240-acre feet with a surface impoundment area of about 80 acres.

The canal gatehouse is separated from the dam by a masonry-lined earth fill embankment. The gatehouse has six timber gates, each approximately 11 feet wide by nine feet high. The canal runs parallel to the river. The canal incorporates a side spillway directly downstream of the gatehouse. The Tenth Street Station contains a single 1,400 KW horizontal Kaplan unit with a 1,200 cubic feet per second (cfs) maximum hydraulic capacity and a 340 cfs minimum hydraulic capacity. The Second Street Station contains twin 400 KW vertical Francis turbines with each unit having a maximum hydraulic capacity of 350 cfs and a minimum hydraulic capacity to of 100 cfs. The reported average annual production is 4,825 MWh (average from 1993 to 2017).

The Project also includes an upstream fish elevator system, an angled canal bar rack with associated downstream fish bypass, and an upstream eel passage ladder. The locations of the fish passage features are illustrated on Figure 5 in Appendix A, as are several photographs of the Project. Additional photographs including the fish passage facilities are contained in the original 2013 Certification Report.

V. ZONES OF EFFECT

Four Zones of Effect (ZOE) were designated by the applicant and were determined to be appropriate. These are identified on Figures 3 and 4 in Appendix A.

- ZOE #1 - Impoundment
- ZOE #2 – Bypass Reach
- ZOE #3 – Power Canal
- ZOE #4 – Regulated Reach

VI. REGULATORY AND COMPLIANCE STATUS

The Project is operating under its FERC license P-2441 issued March 31, 1993 and a Water Quality Certification (WQC) issued December 16, 1992. No changes to either have occurred since last certified by LIHI in 2013.

A review of FERC's eLibrary, data provided in the application and outreach to regulatory agencies indicated that there are no new or continuing environmental issues at Project. My review also confirmed that no material changes in the facility design or operation have occurred since previous LIHI review. Appropriate notifications had been made to the USFWS and CT DEEP, as required by the FERC license whenever impoundment drawdowns are required or run-of-river operation is temporarily interrupted. One such operational deviation occurred briefly when the dam repair work was conducted in August 2017. Required notifications were made.

VII. PUBLIC COMMENT RECEIVED OR SOLICITED BY LIHI

The deadline for submission of comments on the LIHI certification application was April 29, 2018. No comment letters were received.

VIII. SUMMARY OF COMPLIANCE WITH CRITERIA

The following table shows the Standards selected for each criterion for all four zones with two exceptions:

- ZOE #1 (Impoundment) – Standard 1 was selected for Upstream Fish Passage instead of Standard 2, upstream passage being not applicable to impoundment zones.
- ZOE # 4 (Regulated Reach)– Standard 1 was selected for Downstream Fish Passage instead of Standard 2, downstream passage being not applicable to downstream reach zones.

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

The Reviewer found that these standards are appropriate, and sufficient supporting data was provided which demonstrated compliance with the criteria and standard selected. Details of compliance with the criteria are presented in Section IX.

IX. 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.

Standards: All river reaches where stream flows are altered by the facility shall be defined. In all locations, appropriate flow management should apply an ecosystem-based approach that supports fish and wildlife resources by considering base flows, seasonal variability, high flow pulses, short-term rates of change, and year-to-year variability. Compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must also be demonstrated.

Assessment of Criterion Passage:

The Applicant has selected and demonstrated compliance with **Standard A-2, Agency Recommendation** to pass the Ecological Flow Regimes criterion. This standard requires:

“**STANDARD A-2. Agency Recommendation:** The flow regime at the Facility was developed in accord with a site--specific, science--based agency recommendation.”

Pursuant to requirements of the FERC license and WQC, the Project is operated in a run-of-river mode and provides a bypass flow release through various systems installed as part of the fish passage requirements. Condition 4 of the WQC requires that the Project be operated in a manner to promote fish passage movement through the Project area. License Article 403 and

Condition 5 of the WQC require the release of 250 cfs or inflow, whichever is less, into the bypass reach for the enhancement of water quality, protection of resident fish habitat and to provide passage for anadromous fish species in the bypass reach. License Article 402 and Condition 6 require that the Project be operated in a run-of-river mode to protect aquatic resources in the Shetucket River. Article 404 required the development of a stream gage plan to confirm compliance with these requirements which received FERC approval. The licensee is also required to obtain approval from the USFWS and CTDEEP for activities that may require temporary deviation from these requirements, and to report incidences of non-compliance to FERC within 30 days.

The Applicant operates this Project remotely at a control center that is manned full time, with hourly records manually kept of generation, flows, and headpond and tailwater levels. NPU certified that it operated Greenville in compliance with these requirements since LIHI certification in 2013, with one exception. One two-hour deviation from run-of-river operations occurred in August 2017 during dam repair activities. As required, the operational modification had been coordinated with both the USFWS and CTDEEP and FERC was notified of the deviation. A February 21, 2018 support letter from Steve Gephard of CTDEEP, Fisheries Division, included in the application, states that NPU is “*in complete compliance with its Section 401 Water Quality Certificate in respect to the Greenville Dam Hydroelectric Project.*”

This Project passes Criterion A – Ecological Flow Regimes- Go to B

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.

Standards: Compliance with the appropriate state/provincial or federal water quality standards must be demonstrated with all waterbodies where water quality is directly affected by the facility, including those affected areas outside the facility boundary. In all cases, if any waterbody directly affected by the facility has been defined as being water quality limited (for example, on a list of waters with quality that does not fully support designated uses), it must be demonstrated that that the facility has not contributed to that substandard water quality. Compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must also be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard B-2, Agency Recommendation** to pass the Water Quality criterion. This Standard requires:

“**STANDARD B-2. Agency Recommendation:** The facility is in compliance with all water quality conditions contained in a science-based agency recommendation providing reasonable assurance that water quality standards will be met for all waterbodies that are directly affected by the facility (for example, a recent Water Quality Certification issued

pursuant Section 401 of the Clean Water Act). Such recommendations, whether based on a generally applicable water quality standard or one that was developed on a site-specific basis, must include consideration of all water quality components necessary to preserve healthy fish and wildlife populations, human uses and recreation.”

The run-of-river and minimum flow requirements established by both the license and WQC were developed to provide for maintenance of compliance with water quality standards and fish protection, thus adherence to these are key to continued protection of water quality in this section of the Shetucket River. As noted above, the Project has met these flow requirements with one two-hour exception since 2013.

Table 1 of the 2012 Shetucket River Watershed Summary Report, indicates that the Greenville dam is the boundary between river Segment CT3800-00_01 and Segment CT3800-00_02. The 2012 report, which is incorporated into the 2016 State of Connecticut Integrated Water Quality Report, indicates that the upper sections have not been assessed for use support for Aquatic Life and for Recreation. The lower section is listed as impaired for recreational use (Table 2-3, page 64 and Table 3-4, page 216 of the 2016 report) and has not been assessed for Aquatic Life support. The impaired listing for recreation it noted to be related to bacteriological contamination and is likely attributable to storm water, illicit discharges or combined sewer overflows, and not the Project.

While the WQC is greater than 10 years old, I believe that the Project is nonetheless in compliance with this criterion because:

- the minimum flow established by the license and WQC were developed by the appropriate resource agencies and therefore, while not available at this time, must have been established using methods found acceptable during that time period;
- required minimum flows have been consistently met;
- I have assumed that the lack of response to my inquires to CTDEEP Bureau of Water Protection and Land Reuse, asking if any water quality concerns exist for the Project, suggests that there are no such issues;
- water quality standards were met for uses assessed by the CTDEEP and the impairment noted for the lower section is not caused by the Project; and
- a letter from Stephen Gephard from CTDEEP Fisheries Division included in the application stated that NPU is “*in complete compliance with its Section 401 Water Quality Certificate in respect to the Greenville Dam Hydroelectric Project.*”

This Project passes Criterion B – Water Quality- Go to C

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.

Standards: The applicant shall list all migratory fish species (for example, anadromous, catadromous, and potamodromous species) that occur now or have occurred historically at the

Facility. Maintenance of upstream passage sufficient to support sustainable populations of these migratory species must be demonstrated by compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016.

Assessment of Criterion Passage

The Applicant has selected **Standard C-1, Not Applicable/De Minimis Effect** as applicable to ZOE #1 (Impoundment) and **Standard C-2, Agency Recommendation** for the other three ZOEs. to pass the Upstream Fish Passage criterion. These standards require:

“STANDARD C-1. Not Applicable/De Minimis Effect: The facility does not create a barrier to upstream passage, or there are no migratory fish in the vicinity of the facility and the facility is not the cause of extirpation of such species if they had been present historically.”

“STANDARD C-2. Agency Recommendation: The facility is in compliance with science-based fish passage recommendations from appropriate resource agency(ies) which have been issued for the facility and which include provision for appropriate monitoring and effectiveness determinations.”

Fish species known to be present at the Project include: American shad, blueback herring, alewife, gizzard shad, hickory shad, striped bass, sea-run brown trout, sea lamprey, white perch, pickerel, smallmouth and largemouth bass, bluegills, rainbow smelt and American eel. Atlantic salmon was initially a target species for the fish passage restoration program, but have not been observed at the site, and the updated 2009 Plan to Restore Diadromous Fishes to the Shetucket River Watershed (2009 Plan) eliminated this species.

Standard C-1 is appropriate for the impoundment as no obstacles to upstream passage exist once fish have entered the impoundment.

Regarding the other three ZOEs, Article 405 of the license (and Conditions 1 and 3 of the WQC) required the installation of a fish elevator for upstream fish passage for anadromous species. Article 407 of the license required the testing of the passage facilities and Article 409 required the development of an Operation and Maintenance (O&M) plan. NPU has completed all the license requirements and has continued to operate the upstream passage system since 1995. In addition, though not required by the license order nor WQC, NPU has supported and assisted in providing upstream eel passage.

NPU allows resources agencies to maintain fish counting capability and assists with and permitted the installation of upstream eel passage systems. NPU voluntarily trucks live shad from the Project's fish elevator to upstream spawning habitat. NPU meets annually with representatives from the CTDEEP (typically Steve Gephard and Tim Wildman) to review expectations and potential concerns with the fish passage facilities. The last meeting with the CTDEEP occurred on February 9, 2018 with no changes in operation or other specific request being made. Previous testing of the facility and historic observations have satisfied the original concern with shad passage through the bypass reach, and this is no longer a concern for the passage system. In addition to the annual meetings, NPU maintains frequent interaction with the resource agencies during the migration season to promote successful fish passage and protection. The CTDEEP

incorporates data from the Greenville upstream passage in an annual report they prepare on passage counts throughout the State.

As reported by Steve Gephard of CTDEEP Fisheries Division in his February 21, 2018 letter of support contained in the application:

“The project's fishlift and eel pass have been routinely and effectively passing significant numbers of targeted upstream migrating diadromous fishes. The downstream bypass system is also effectively and safely passing targeted downstream migrating diadromous fishes. Both facilities do not appear to be causing any significant mortality of these species.”

Regarding compliance with the 2013 LIHI condition, Mr. Gephard noted the following in an email dated March 8, 2018 to LIHI: *“We have interacted with NPU at its Greenville and Occum projects and find it to be highly cooperative and responsive. I suspect that it is one of the most cooperative hydro operators in New England, in terms of compliance with fisheries and flow issues.”* While the email primarily applied to the Occum Project, this specific comment also applies at the Greenville Project. In an email dated March 14, 2018, Melissa Grader of USFWS noted that she agrees with the positions taken by CTDEEP on fishery issues.

This Project passes Criterion C – Upstream Fish Passage- Go to D

D. DOWNSTREAM FISH PASSAGE AND PROTECTION

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 are able to successfully complete their life cycles and to maintain healthy, sustainable fish and wildlife resources in the areas affected by the Facility.

Standards: The applicant shall list all fish species (for example, riverine, anadromous, catadromous, and potamodromous) that occur now or have occurred historically in the area affected by the Facility. To pass the downstream fish passage and protection criterion, compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard D-1, Not Applicable/De Minimis Effect** for ZOE #4 (Regulated Reach) and **STANDARD D-2. Agency Recommendation** for the other three ZOEs to pass the Downstream Fish Passage and Protection criterion. These standards require:

“STANDARD D-1. Not Applicable/De Minimis Effect: The facility does not create a barrier to downstream passage, or there are no migratory fish in the vicinity of the facility; if migratory fish had been present historically, the Facility is not responsible for extirpation of

such species; the Facility does not contribute adversely to the sustainability of riverine fish populations or to their access to habitat necessary for the completion of their life cycles.”

“STANDARD D-2. Agency Recommendation: The Facility is in compliance with a science-based resource agency downstream fish passage or fish protection recommendations, which may include provisions for ongoing monitoring and effectiveness determinations that have been issued for the Facility.”

Standard D-1 is appropriate for ZOE #4 as no obstacles to downstream passage exist once fish have entered the Regulated Reach.

The Project has installed and operated a downstream passage system since 1995. The system includes a close-spaced angled bar rack system within the canal leading to a bypass pipe system depositing fish into the bypass reach downstream of the dam. This passage system is also used to pass eels. License article 406 and WQC Condition 2 required the installation of downstream passage facilities for anadromous species. License Article 408 required testing of the installed facilities and Article 409 required the development of an O&M plan. Downstream passage of eels is done on a voluntary basis and is not required by either the license nor WQC.

The downstream passage system was designed and tested in consultation with and approved by the resource agencies. The passage system satisfied the USFWS criteria for the protection and passage of the target species as indicated in the CTDEP's 1985 Preliminary Plan for the Restoration of Anadromous Fish to the Thames River Basin (1985 Plan) and conforms to the updated 2009 Plan to Restore Diadromous Fishes to the Shetucket River Watershed (2009 Plan). Testing of the system's effectiveness has been completed with resource agency suggested modifications incorporated. The system's approval, effectiveness and O&M plan were approved in a series of FERC orders. Additional testing and formal monitoring of the passage system is not required. NPU and CTDEEP staff routinely observe the canal rack and bypass system throughout the passage season to confirm fish passage for both anadromous and catadromous fish species is occurring without delays or mortalities. The CTDEEP incorporates data from the Greenville downstream passage facilities in an annual report they prepare on passage counts throughout the State.

As previously noted, in his February 21, 2018 support letter on the Greenville Project, Steve Gephard noted that *“The downstream bypass system is also effectively and safely passing targeted downstream migrating diadromous fishes.”* He also stated in his March 8, 2018 email to LIHI that NPU has been *“highly cooperative and responsive”* in terms of fish passage issues. As noted above, Melissa Grader of USFWS agrees with CTDEEP on fishery issues.

The Project Passes Criterion D – Downstream Fish Passage and Protection - Go to E

E. SHORELINE AND WATERSHED PROTECTION

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

Standards: To pass the watershed protection criterion for LIHI certification, the applicant shall demonstrate compliance with one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard E-1, Not Applicable/De Minimis Effect** to pass the Shoreline and Watershed Protection criterion for the Project. This standard requires:

“STANDARD E-1. Not Applicable/De Minimis Effect: There are no lands associated with the facility under ownership and control of the applicant that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and there has been no Shoreline Management Plan (SMP) or similar protection required at the facility; or the facility has no direct or indirect project-related land ownership, excluding lands used for power generation and transmission, flowage rights and required developed recreational amenities.”

The area around the Project is developed with industrial, commercial and urban residential land use abutting the river. Ground level vegetation at the immediate Project site is largely represented by native grasses and herbaceous growth. A minimal amount of exposed (bare) soil is present. There are no shoreline or watershed protection plans required for the Project in the license. The Project has been constructed for numerous years. Local groups (i.e. Shetucket.org and thamesriverbasinpartnership.org) are involved with the Shetucket River valley protection and have not identified a need in the Project area. Thus, the Project lands do not appear to have any significant ecological value.

The Project Passes Criterion E – Shoreline and Watershed Protection - Go to F

F. THREATENED AND ENDANGERED SPECIES PROTECTION

Goal: The Facility does not negatively impact listed species.

Standards: Facilities shall not have caused or contributed in a demonstrable way to the extirpation of a listed species. However, a facility that is making significant efforts to reintroduce an extirpated species may pass this criterion. To pass the Threatened and Endangered Species criterion compliance with at least one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard F-1, Not Applicable/De Minimis Effect** to pass the Threatened and Endangered Species Protection criterion for the Project. This standard requires:

“STANDARD F-1. Not Applicable/De Minimis Effect: There are no listed species present in the facility area or downstream reach, and the facility was not responsible for the extirpation of the listed species if they were previously there.”

Project lands are limited, consisting of 85.3 acres, of which 80 acres are the impoundment. The Applicant stated that there are no federal or state threatened and endangered species known to occur within the project site. The Environmental Assessment prepared during licensing in 1995 included assessment by both USFWS and CT Department of Environmental Protection (now CTDEEP) Natural Resource Center. They found that Project operation would not negatively affect any protected species. Additionally, the application notes that Project operations have been established for a number of years with no proposed changes. There are no proposed land disturbing or clearing activities planned for the site.

A 2016 range map for the federally protected Northern Long-eared Bat indicates this species range is statewide, however the project area does not have known Northern Long-eared Bat hibernacula. State records provided in the application indicate that the Project is within possible range of several state protected species, however no specific species data for the site was included. Consultation between LIHI staff and Dawn McKay of the Bureau of Natural Resources at CTDEEP, found that the only state-listed species in the vicinity of the project are blueback herring and bald eagle. As previously discussed under Criterion C-Upstream Fish Passage, a fish elevator has been operating since 1995 at the Project along with downstream passage measures. Both have been found to be effective in passing significant numbers of targeted upstream and downstream migrating diadromous fishes. No impacts are expected from normal Project operation to Bald Eagle that may visit the site.

The Project Passes Criterion F – Threatened and Endangered Species Protection - Go to G

G. CULTURAL AND HISTORIC RESOURCE PROTECTION

Goal: The Facility does not inappropriately 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.

Standards: To pass the Cultural and Historic Resource criterion compliance with one or more of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard G-2, Approved Plan** to pass the Cultural and Historic Protection criterion for the Project for all ZOE. This standard requires:

“STANDARD G-2. Approved Plan The facility is in compliance with approved state,

provincial, federal, and recognized tribal plans for protection, enhancement, or mitigation of impacts to cultural or historic resources affected by the facility.

On February 11, 1993, a Memorandum of Agreement (MOA) was executed between FERC, the licensee, the Connecticut State Historic Preservation Officer, and the Advisory Council on Historic Preservation. The MOA requires mitigative measures to protect the historical integrity of the Greenville dam, a component of the Greenville Industrial District which is eligible for inclusion in the National Register of Historic Places. Article 412 requires the licensee to implement the MOA, including documentation of the dam as related to fish passage alterations of the structure and development of a Cultural Resources Management Plan (CRMP). The CRMP addresses maintenance and repair activities to assure protection of historic resources over the long term. By order dated August 21, 1997, FERC approved the CRMP as well as the historic documentation of the dam, gatehouse and control gates, canal spillway deck bridge, and the canal.

Article 413 requires the licensee to consult with the State Historic Preservation Office and conduct a cultural resource survey prior to any ground disturbance at the project other than authorized in the license. NPU maintains consultation with the SHPO during periods of construction that may impact cultural resources in accordance with the CRMP and MOA. NPU has implemented a dam repair and maintenance program to maintain the structural integrity of the dam. The work is limited to the dam and does not result in an alteration of the project's configuration. The work replaces damaged or decayed dam members using similar materials (i.e. timber beams and planks) as the original dam construction details. In accordance with Condition 2 of the CRMP, such in-kind repairs do not require SHPO notification regarding the work. NPU reported that while pond lowering or ground disturbance is generally not required for the work, at times it may need to be lowered 8 to 12 inches for less than 2 weeks to permit access to the work area. Pond level lowering, if required, is reviewed with the appropriate agencies as required by the FERC license.

The Project Passes Criterion G - Cultural and Historic Resource Protection - Go to H

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.

Standards: To pass the recreation criterion, compliance with at least one of the alternative standards identified in the Low Impact Hydropower Certification Handbook issued March 7, 2016 must be demonstrated. In all cases, it must be demonstrated that flow-related recreational impacts are mitigated to a reasonable extent in all zones where there is flow-related recreation. Where there is recognized, flow-related recreational use, the facility shall provide the public with relevant and up-to-date information on reservoir levels and river flows, preferably real-time updates. It is understood that recreational activities must be consistent with the assurance of reasonable safety of employees and the public, and with critical infrastructure protection dictated by state or federal authorities.

Assessment of Criterion Passage

The Applicant has selected and demonstrated compliance with **Standard H-2, Agency**

Recommendation to pass the Recreational Resources criterion for the Project for all ZOE's. This standard requires:

“STANDARD H-2. Agency Recommendations: If there are comprehensive resource agency recommendations for recreational access or accommodation (including recreational flow releases) on record, or there is an enforceable recreation plan in place, the Facility demonstrates that it is in compliance with those.

License Article 410 required the installation of recreational enhancements to the Project as recommended by the resource agencies. These enhancements were developed and installed in consultation with resource agencies and are free to the public. Recreational access is provided to the impoundment and the section between the dam and Eighth Street. Downstream of Eighth Street the east riverbank is under private ownership and access along the west riverbank is not provided due to safety concerns. No FERC Environmental inspections of the Project have occurred during the past five years and the Applicant has reported that FERC has no plans for one to be scheduled in the near future.

FERC also required under Article 411 that the adequacy of recreational facilities be continually evaluated over the term of the license and reports are to be filed at intervals not greater than six years. These data are filed with the standard Form 80 reports. The most current recreational use and compliance report was submitted in 2015, simultaneously with the Form 80 report. All such reports issued indicate that current recreational facilities are satisfying the historic and current needs at the project.

The Project Passes Criterion H – Recreational Resource

X. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that this Project meets the requirements of a Low Impact facility and should be re-certified for a five-year period. While the previous LIHI certification included a condition that the Owner must continue to work cooperatively with the resource agencies regarding eel passage as such passage is not mandated by the FERC license or WQC, I do not believe such a condition is necessary. This is because of the obviously excellent working relationship NPU has with the CTDEEP, as presented under the fish passage criteria discussions.

**THE GREENVILLE PROJECT MEETS
THE LIHI CRITERIA FOR
CERTIFICATION AS A
LOW IMPACT FACILITY**

APPENDIX A
Figures and Photographs

Figure 1 – General Location of the Greenville Project

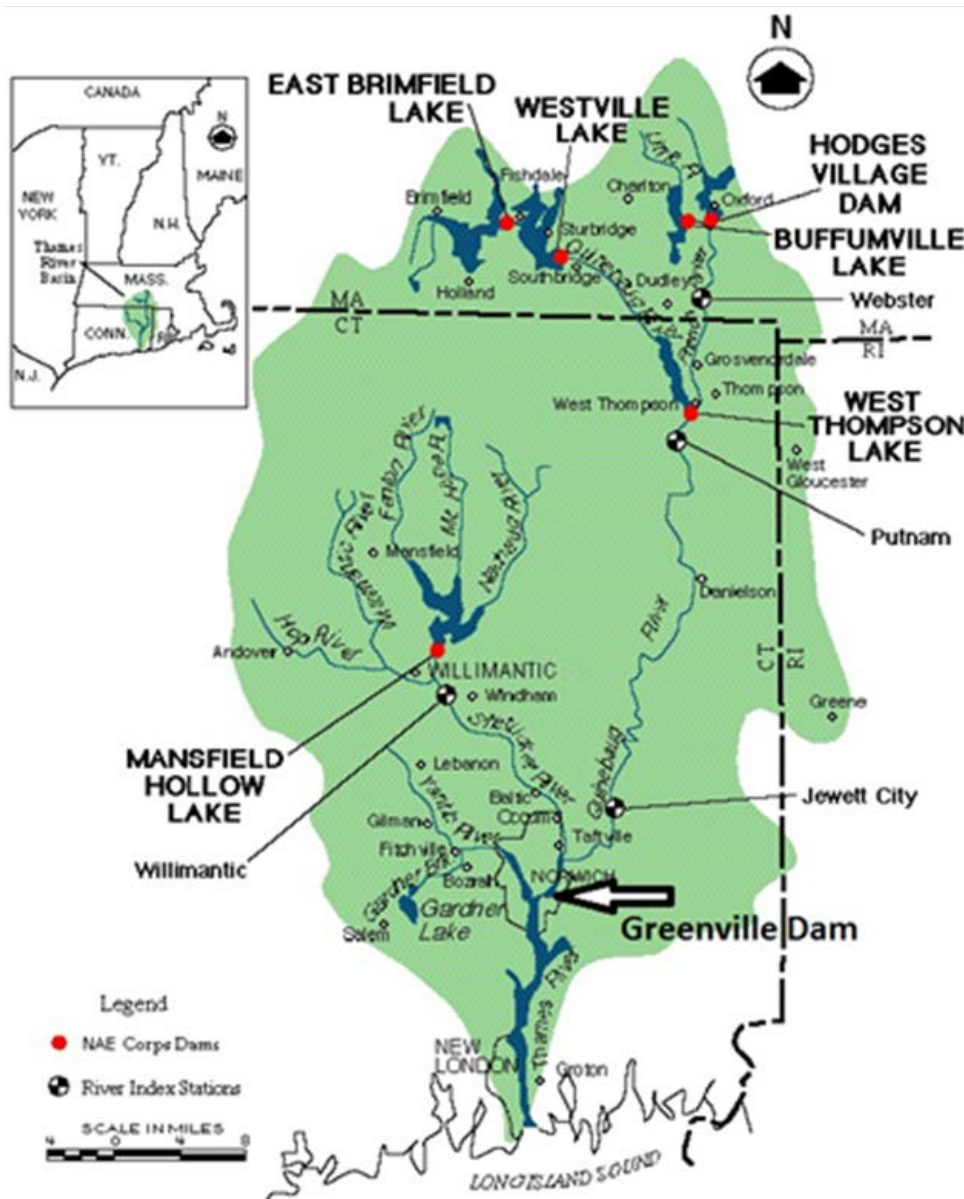


Figure 2 – Greenville Project and Nearby Dams on the Shetucket River

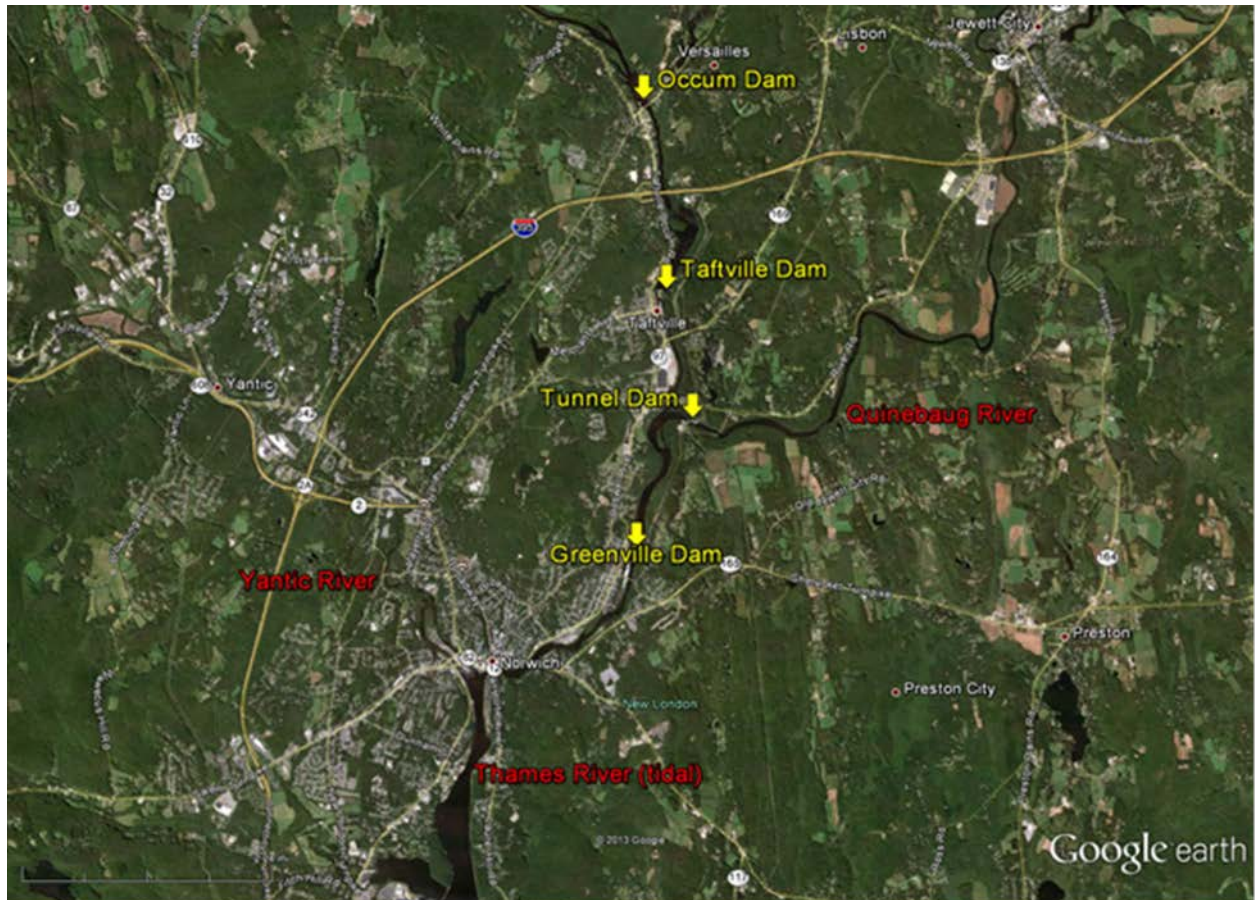


Figure 3 – Upper Power Canal and Tenth Street Station

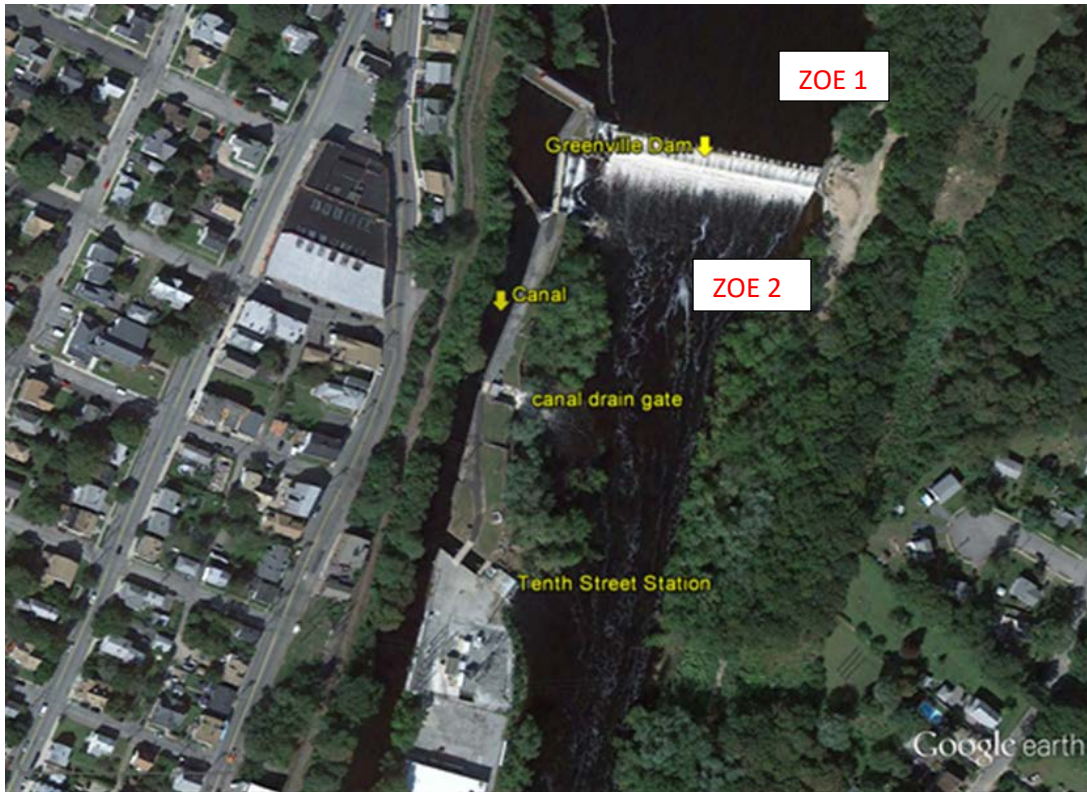


Figure 4 – Lower Power Canal and Second Street or Greenville Station



Figure 5 – Location of Fish Passage Features



Photograph 1 - Greenville Timber Crib Dam



Photograph 2 – Power Canal Gatehouse



Photograph 3 - Tenth Street Station (intake side).



Photograph 4 – Second Street Station

