

REVIEW OF APPLICATION FOR RE-CERTIFICATION BY THE LOW IMPACT HYDROPOWER INSTITUTE OF THE GLENDALE HYDROELECTRIC PROJECT, LIHI #115

Prepared by Stephen Byrne

February 25, 2020

I. INTRODUCTION

This report summarizes the review findings of the application submitted by Hitchcock Hydro, LLC (Applicant) to the Low Impact Hydropower Institute (LIHI) for re-certification of the Glendale Hydroelectric Project FERC P-2801 (Project). The Project was first Low Impact Certified with LIHI # 115 on April 1, 2014. The Project is located on the Housatonic River at river mile 122 near Stockbridge, MA, off Route 183. The Project operates in a run-of-river mode.

On December 13, 2019 LIHI received a complete application for Low Impact Recertification of the Project. There have not been any material changes at the Project during the term of the previous Certification. However, there have been material changes in the LIHI Criteria and certification process since the Project was last certified, in that an updated Certification Handbook has been published by LIHI. This current review was made using the new 2nd Edition LIHI Certification Handbook (Revision 2.03, December 20, 2018).

II. PROJECT'S GEOGRAPHIC LOCATION

The Glendale Project is located beside Route 183 in the village of Glendale just west of the town of Stockbridge (Figures 1-2). The Project powerhouse was built in 1906. The Housatonic River has a total drainage area of 1,948 square mile, flowing from its headwaters near the city of Pittsfield, southward for approximately 150 miles through western Massachusetts and Connecticut before emptying into the Long Island Sound between Stratford and Milford Connecticut. (Figure 1).

The Project is located near the headwaters of the Housatonic River in Stockbridge, MA. The Housatonic River is 150 miles long and is located in western Massachusetts and western Connecticut. It is the seventh dam on the river upstream from its mouth at Long Island Sound. There are numerous dams downstream of the Project in CT and several upstream of the Project. Glendale is the only project on the river owned by the Applicant. Upstream dams are:

- Woods Pond Dam (no hydro) General Electric Co. 15.5 miles upstream Glendale
- Columbia Mill Dam (no hydro) Schweitzer-Mauduit Co. 13 miles upstream of Glendale
- Willow Mill (no hydro, formerly FERC No. P-2985) Onyx Paper Co. 6.5 miles upstream of Glendale

Downstream dams are:

- Rising Pond Dam (no hydro) Rising Paper Co. 3.5 miles downstream Glendale
- Falls Village Dam (FERC No. P-2576) First Light 33 miles downstream Glendale
- Bulls Bridge Dam (FERC No. P-2576) First Light 57 miles downstream Glendale
- Shepaug (FERC No. P-2576) First Light 80 miles downstream Glendale
- Stevenson (FERC No. P-2576) First Light 90 miles downstream Glendale
- Derby Dam (FERC No. P-6066) McCallum Enterprises 95 miles downstream Glendale

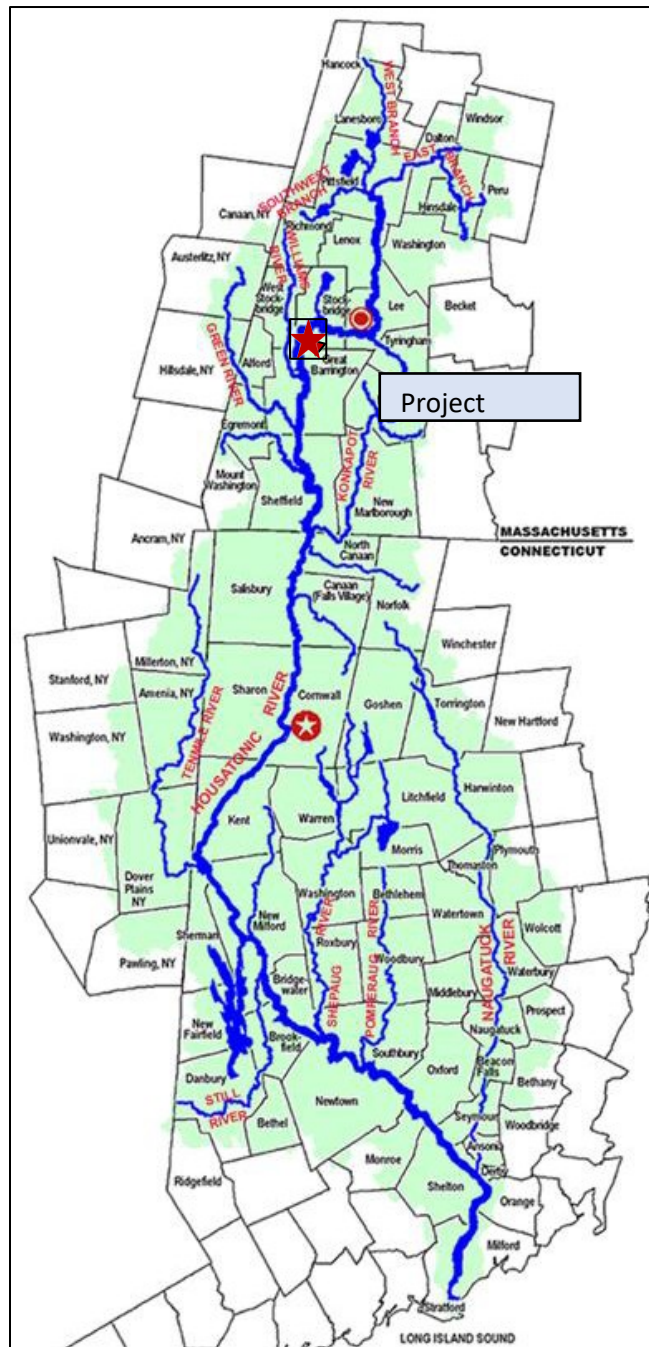


Figure 1 – Housatonic River Watershed

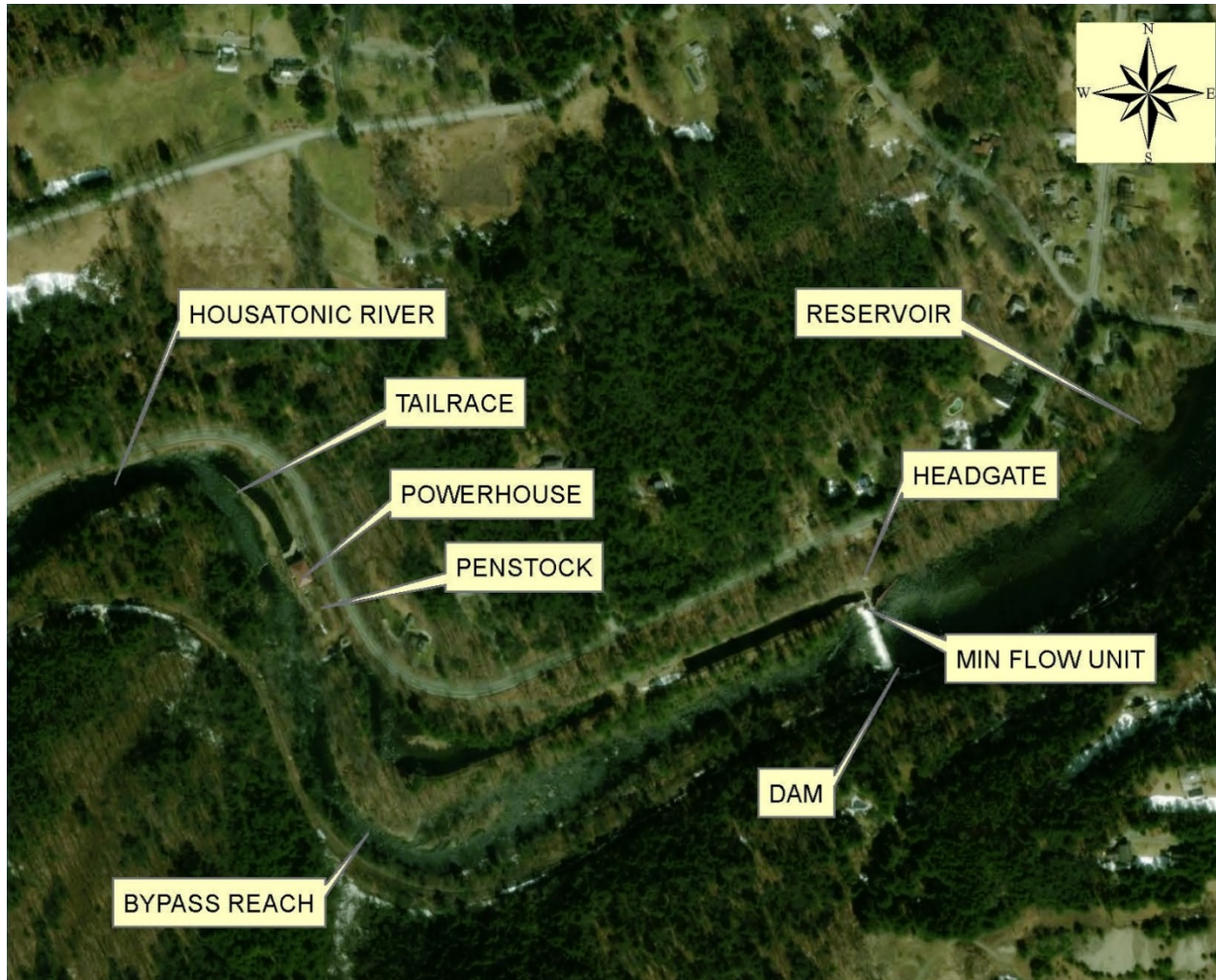


Figure 2 – Glendale Hydroelectric Project

III. PROJECT AND IMMEDIATE SITE CHARACTERISTICS

The Glendale dam is approximately 250 feet long and 30 feet high with a 182-ft long spillway with a crest elevation of 810.9 ft National Geodetic Vertical Datum (NGVD). The Project reservoir has a surface area of 23 acres and a normal water surface elevation of 810.9 ft NGVD. The Project intake structure, minimum flow powerhouse, and power canal are located at the north end of the dam. The intake structure consists of two manually operated 10-ft by 10-ft intake gates that convey water into the power canal. The power canal runs parallel to the bypassed reach and is approximately 1,500 ft long by 40 ft wide and has an average depth of 10 ft. The minimum flow powerhouse contains a 165-kW turbine-generator that discharges the required 90 cubic feet per second (cfs) minimum flow into the bypassed reach. The main powerhouse is located at the end of the power canal and contains four identical vertical semi-Kaplan turbine/generator units with a total installed capacity of 1,140 kW and a total hydraulic capacity of approximately 400 cfs. The minimum hydraulic capacity for each turbine is approximately 55 cfs. The Project

tailrace is an excavated earthen channel approximately 300 feet long, separated from the bypass channel by a concrete retaining wall and earthen dike. The Project is operated in an instantaneous run-of-river mode with no pondage or storage. The turbine flow is controlled by the Project's automatic programmable logic controller (PLC). A canoe portage route with a take-out/put-in and parking area exist along the north end of the dam. There are no diadromous fish species in the Project area and downstream fish passage is available via spillage or turbine passage. The Project trashracks have 1-inch clear bar spacing.

IV. ZONES OF EFFECT AND STANDARDS SELECTED

Three Zones of Effect (ZOE) were designated by the Applicant and were determined to be appropriate. Their locations are shown in Figures 3 through 5.

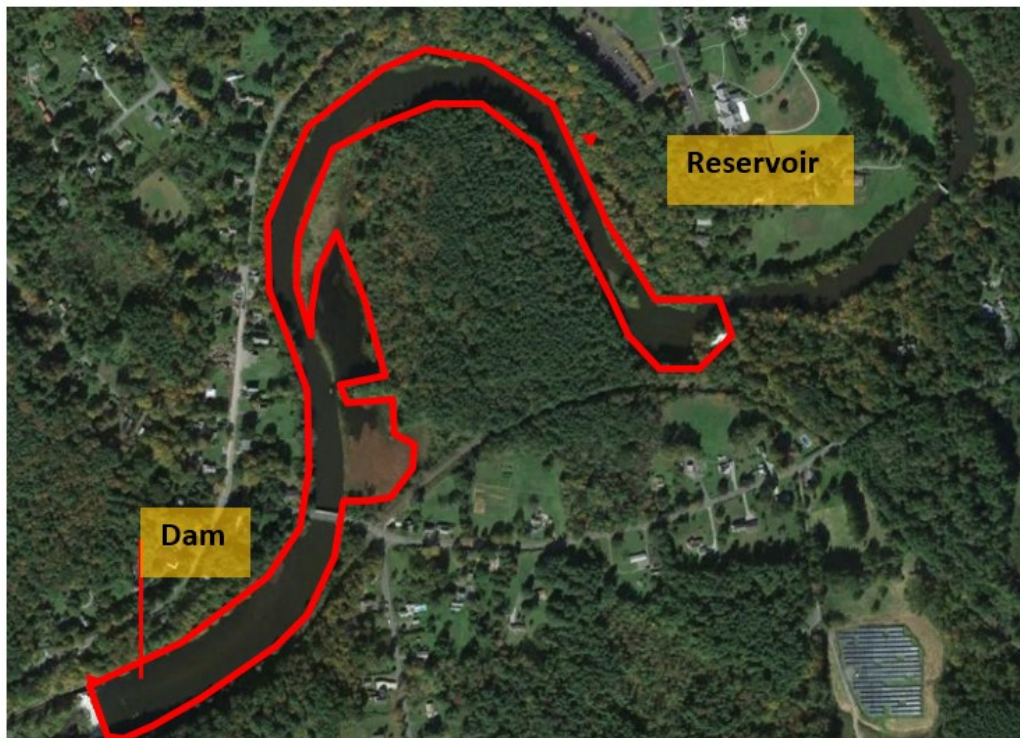


Figure 3 – Zone of Effect 1 is defined by the Applicant as extending from the upstream Butler Road bridge 1.25 miles downstream to the Glendale dam.



Figure 4 – Zone of Effect 2 is defined by the Applicant as extending from the downstream side of the Glendale dam 0.5 miles to the confluence of the bypass reach with the Project tailrace.



Figure 5 – Zone of Effect 3 is defined by the Applicant as extending from the main powerhouse outfall 0.06 river miles downstream to the confluence of the bypass reach with the Project tailrace.

The following tables show the Standards selected for each criterion for the three ZOE's. Where applicable, reviewer recommendations for alternate standards are shown in **red**.

ZOE #1 – Impoundment

Criterion		<i>Alternative Standards</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Plus</i>
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		X		
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			

ZOE #2 – Bypassed Reach

Criterion		<i>Alternative Standards</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Plus</i>
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		X		
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			

ZOE #3 – Tailrace

Criterion		<i>Alternative Standards</i>				
		<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>Plus</i>
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		X		
G	Cultural and Historic Resources Protection		X			
H	Recreational Resources		X			

V. REGULATORY AND COMPLIANCE STATUS

The Project was issued a new license (P-2801-MA) by the Federal Energy Regulatory Commission (FERC) on August 29, 2009 and Water Quality Certificate by the Massachusetts Department of Environmental Protection (MA DEP) on July 9, 2009. The Project license was transferred from Littleville Power Company to the current owner on May 19, 2017. Based on a review of the FERC elibrary during the current certification term, the Project appears to be in compliance with its FERC license and State issued Water Quality Certificate. Most documentation was related to dam safety or to installation of a new minimum flow turbine which was completed in 2014 (see original application review report). There were two reported minimum flow deviations described in Section VII.A below.

VI. PUBLIC COMMENT RECEIVED OR SOLICITED BY LIHI

The deadline for submission of comments on the LIHI certification application was February 14, 2020. No comments were submitted.

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 Passage: The Applicant has appropriately selected Standard A-1, Not Applicable/De Minimis Effect for the impoundment and tailrace ZOE's and Standard A-2 Agency Recommendation for the bypassed reach.

The Project operates in a run-of-river mode with no pondage or storage and the turbine flow is controlled by the Project's automatic PLC. Impoundment levels are therefore maintained at 810.9 ft during normal Project operations. The Project's Water Quality Certificate (WQC) condition number 18 requires that during refilling of the Project reservoir after a dam maintenance or emergency drawdown, the licensee must operate the Project such that 90% of inflow to the Project is released downstream of the Project and the impoundment is refilled on the remaining 10% of inflow.

The Project's FERC license and WQC also require a minimum flow of 90 cfs into the bypassed reach. The average annual flow at the dam is 517 cfs. This minimum flow is typically released through the Project's minimum flow powerhouse except when inflow to the Project is less than 90 cfs. When inflow is less than 90 cfs, flow is discharged through the minimum flow forebay gate. At 90 cfs, the minimum flow turbine is turned on and the forebay gate is closed. Between 91 cfs and 142 cfs the minimum flow turbine is operational but flows are insufficient to operate any turbines in the main powerhouse; as such, any flow between 90 and 142 cfs is discharged over the spillway. At 143 cfs, one of the main turbines is turned on and minimum flow unit operation ceases. Between 142 cfs and 458 cfs, all flow is used for generation either at the minimum flow turbine or main powerhouse. At 459 cfs and above, all units are operational and

excess flow is discharged over the spillway.

License Article 401(a) and WQC Condition 19 required that the licensee file a plan to monitor run-of-river and minimum flow releases to FERC and MA DEP. Per the FERC Order Modifying and Approving Run-of-River and Minimum Flow Monitoring and Compliance Plan, the licensee was further required to perform streamflow gaging measurements following installation of the minimum flow unit to determine the relationship between unit output in kilowatt hours and operating flow to confirm that unit operation meets the 90 cfs minimum flow. Minimum flow verification tests were performed on November 3, 2015 and the results showed that measured flow of 111 cfs and 103 cfs at a set 80% and 75% gate respectively for the minimum flow unit after maintaining headpond at spillway crest and eliminating all bypass flow other than the operating minimum flow unit. The licensee also verified that the bypass gate opened fully and automatically when the minimum flow unit was taken offline. FERC concluded on January 6, 2016 that the test results satisfied the minimum flow verification requirements. A review of the Project's filing record on eLibrary during the previous LIHI certification period indicates that only one deviation from the run-of-river operations occurred. FERC's review of the July 2018 deviation determined that it would not be considered a violation of the license. Following the July 2018 incident, modifications to the Project PLC were made to prevent similar deviations from occurring in the future.

Based on my review of the application, supporting documentation, and publicly available information, the Projects is operated in a manner that flows support habitat and other conditions suitable for healthy fish and wildlife resources. As such, the Project continues to satisfy 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 Passage: The Applicant appropriately selected Standard B-1, Not Applicable/De Minimis Effect for all ZOE's.

Project waters are designated as Class B water by MassDEP. Temperatures and DO concentrations during an August 2006 sampling event conducted for relicensing met the state standards for Class B waters with the warmwater fishery restrictions. The 2016 Massachusetts Integrated List of Waters Report¹ lists the Housatonic River segment ID No. MA21-19 as impaired due to: (1) zebra mussels, (2) excess algal growth, (3) Polychlorinated biphenyls in fish tissue, (4) total phosphorus, and (5) Polychlorinated biphenyls.

The run-of-river operation and continuous minimum flow releases minimize the potential for Project related water quality impacts and the noted impairments are not due to Project operations. As noted above, there has been only one deviation in the required run-of-river operation and minimum flow releases since the previous LIHI certification, and FERC determined that the deviation was not considered a violation of the Project license.

Based on my review of the application, supporting documentation, and publicly available information, I believe the Project continues to satisfy this 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 Passage: The Applicant appropriately selected Standard C-1, Not Applicable/De Minimis Effect for all ZOE's.

There are no known migratory fish species in the Project area. Additionally, the Glendale dam is the seventh dam on the Housatonic River upstream from the Long Island Sound. The Applicant stated in its application that at such time that resource agencies request passage of migratory fish species, Hitchcock Hydro will work cooperatively to install fish passage. Currently there are no upstream passage facilities at the next downstream dam.

Caleb Slater of Massachusetts Divisions of Fisheries and Wildlife (Division) informed the Applicant by an email dated October 24, 2019 (Appendix A) that while no eels were collected during the most recent Division fish survey of the Housatonic River, the new FERC license

¹ <https://www.mass.gov/doc/final-massachusetts-year-2016-integrated-list-of-waters/download>

issued for Housatonic River Project (P-2576), that includes the Stevenson Dam, the Shepaug Dam, the Bulls Ridge Dam, and the Falls Village Dam, requires eel passage facilities at the Stevenson, Shepaug and Bulls Bridge dams. Additionally, Mr. Slater stated that eels presumably can ascend the Great Falls at the Falls Village Dam and therefore, passage would only need to be provided at the downstream Risingdale dam before eel have access to the Glendale Dam.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Upstream Fish Passage criterion.

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.

Assessment of Criterion Passage: The Applicant appropriately selected Standard D-1, Not Applicable/De Minimis Effect for all ZOE's.

Fish species in the Project area generally are representative of a warmwater fishery and include rock bass, largemouth bass, smallmouth bass, bluegill, common carp, longnose dace, and common shiner. However, the Massachusetts Department of Fish and Wildlife stocks trout in the Housatonic River annually. There are no migratory fish species in the Housatonic River within Massachusetts. The Applicant notes in its application that nothing has materially changed at the Project since the 2009 FEFC relicensing. The existing trashracks have 1-inch clear bar spacing and an approach velocity of no more than 2 feet per second.

As mentioned previously, eel passage facilities have been required at the Housatonic River Projects and passage would need to be provided at the next downstream dam from the Glendale Project before eel have access to the Glendale Dam.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Downstream Fish Passage criterion.

E. SHORELINE AND WATERSHED PROTECTION

Goal: The Facility has demonstrated that enough 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.

Assessment of Criterion Passage: The Applicant appropriately selected Standard E-1, Not Applicable/De Minimis Effect in all ZOE's.

The Applicant owns approximately 12 acres of land within the Glendale Project boundary with the remaining 30 acres of the Project boundary belonging to the impoundment (23 acres), the bypassed reach (5 acres), and approximately 2 acres that lie within the 4 feet of elevation between the normal impoundment surface elevation and the extent of the Project's flow rights. There are no specific agency recommendations and the Project does not have, nor is it required to have, a watershed enhancement fund or specific watershed land protection plan. There are no lands of ecological significance. The application states that the shoreline varies from low wetland areas to relatively steep, sloped banks. The riparian area is vegetated and/or forested and is confined by a railroad, roads and residential development around the impoundment. The run-of-river operations also minimize shoreline impacts.

License Article 401(a) and WQC Condition 20 required that the license file an Invasive Species Control Plan. Invasive species, particularly aquatic invasive mussels such as zebra mussels impact aquatic ecosystems by attaching to, and in turn killing other mussels and clogging water intakes and preventing flow. Per the FERC Order Modifying and Approving the Invasive Species Control Plan, the licensee must prepare a report following each bi-annual year of monitoring that includes a description and maps of existing and new stands of invasive species; control and removal efforts, if any, implemented during the previous monitoring period or proposed for the next monitoring period; and any participation in region-wide invasive species control efforts. A review of the Project's filing record on eLibrary during the previous LIHI certification period indicates that three invasive species monitoring reports have been filed. The most recent report documented 23 invasive plant species and high densities of zebra mussels in the Project tailrace (up to 1,098 mussel/m²), canal (17.7 mussel/m²), the upper bypass reach (7 adults), and impoundment on the pier of the Glendale Middle Road bridge (15 adults). The licensee notes in the report that there is no evidence that Project related activities caused or contributed to zebra mussel establishment, nor is there any evidence that Project related activities cause or contribute to maintaining or expanding the population. Regarding zebra mussels the licensee recommends discontinuing monitoring for them as they are established in the watershed and at the Project and no effective control measures are currently available.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Shoreline and Watershed Protection criterion.

F. THREATENED AND ENDANGERED SPECIES PROTECTION

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 for all ZOE's. However, this review finds that Standard F-3, Recovery Planning and Action is the more appropriate standard.

The FERC license order and the WQC do not contain threatened and endangered species-related requirements. The application contained an official listing from FWS of threatened and endangered species that may occur in the Glendale Project area, and/or may be affected by the Project. The list only included the Northern long-eared bat and no critical habitat has been

designated for this species. FWS' rule 4(d) prohibits tree cutting within ¼ mile of hibernacula and prohibits cutting of known roost trees during summer months. The Applicant stated in its application that it does not have any activities planned that would include cutting trees or impacting potential northern long-eared bat habitat.

State-listed species occurring in the Project vicinity include, as noted in the FERC Environmental Assessment: four aquatic species—longnose sucker, bridled shiner, creeper mussel, and triangle floater mussel—as species of special concern that have been observed within the project area during the last 25 years.

The Applicant conducted a survey for freshwater mussels in the bypass reach in 2006 as part of relicensing and no live mussels and only a single creeper shell was found.

In response to the Applicant's request for updated species information, Massachusetts Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program responded by letter dated November 19, 2019 (Appendix A). The agency stated that the Project occurs within the actual habitat of the following four species: dwarf scouring-rush (species of concern), longnose sucker (species of concern), skillet clubtail (threatened), and creeper (species of concern), that are protected, including their habitat, pursuant to the Massachusetts Endangered Species Act. The agency concluded that four conditions must be met in order to avoid a prohibited take of state-listed species during ongoing Project operations and maintenance, including:

(1) Non-Emergency Drawdown and Refill:

a. Non-emergency Drawdown

- i. All non-emergency draw-downs shall occur from June 1 through October 1. During all such draw-downs, a Mussel Protection Plan approved by the Massachusetts Division of Fisheries and Wildlife in writing may be required.
- ii. The bypass reach shall retain sufficient flow and depth during all operations and non-emergency draw-downs and subsequent refill to ensure that oxygen levels are not significantly depleted, particularly during the months of July and August when the water is already carrying less oxygen and the air temperatures are high.

b. Refill after Non-emergency Drawdown - During the refilling of the impoundment after any non-emergency draw-down, the elevation of the impoundment shall be slowly raised such that the refill rate shall not exceed 0.334 ft/hr increase in water surface elevation, especially between the hours of 7 am and 4 pm.

(2) Vegetation Management (Native and Invasive): Any vegetation management in the impoundment or bypass reach may require a rare plant protection plan preceded by a rare plant survey as approved by the Massachusetts Division of Fisheries and Wildlife in writing.

(3) Wetlands Protection Act. Upon filing for any renewal, extension, amendment, or certification of compliance for the Order of Condition associated with this site pursuant to the MA Wetlands Protection Act, the Applicant shall similarly file with the Massachusetts Division of Fisheries and Wildlife pursuant to 310 CMR 10.58(4)(b) & 10.59.

(4) **Authorization Duration.** This authorization is valid for 5 years from the date of issuance. Work shall be completed by the expiration of this authorization. If needed, the Applicant shall submit a written request to the Massachusetts Division of Fisheries and Wildlife for an extension of time to complete the Work no later than 60 days prior to the expiration of this determination, and the Massachusetts Division of Fisheries and Wildlife will review the Project pursuant to the MESA and 310 CMR 10.58(4)(b) & 10.59 for any continuing impacts, as described herein, and any new impacts to any State-listed Species found subsequent to the issuance date of this Permit.

Based on my review of the application, supporting documentation, and publicly available information, I find that the Project continues to satisfy the Threatened and Endangered Species criterion. However, the new information filed by Massachusetts Division of Fisheries and Wildlife indicates that a condition should be included that requires the Applicant to comply with the four conditions listed above and in accordance with the Massachusetts Division of Fisheries and Wildlife's letter dated November 19, 2019.

G. CULTURAL AND HISTORIC RESOURCE 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.

Assessment of Criterion Passage: The Applicant appropriately selected Standard G-2, Agency Recommendation for all ZOE's.

The Glendale property is listed on the National Register of Historic Properties which includes 11 current or former structures. The Applicant has no plans for changes and or renovations of the powerhouse or other structures. Article 407 of the 2009 FERC license required that a Historic Properties Management Plan be developed and implemented for the Project. At that time the Massachusetts State Historic Preservation Officer (SHPO) reported that there is no adverse effect and "operation of the powerhouse for its historic purposes assists in maintaining the historic property".

The Applicant states that it is committed to completing the proper consultation with the State Historic Preservation Officer prior to completing any significant ground disturbing activities.

Based on my review of the application, supporting documentation, and publicly available information, both Project continues to satisfy the Cultural and Historic Resource 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.

Assessment of Criterion Passage: The Applicant appropriately selected Standard H-2, Agency Recommendation for all ZOE's.

Article 406 of the 2009 FERC license order required a recreation plan for the Project. Recreational facilities at the Project include a canoe portage that extends from the north impoundment shore near the canal gatehouse along the north shore of the canal, across the canal bridge and down the south canal dike to the bypass reach. The access at the bypassed reach serves as both a put-in site for canoeists and an access point for bank fishing. The dam access road from Glendale Road (Route 183) is used to access a parking area adjacent to the canal. The parking area serves those using the canoe portage as well as those using the bypassed reach access for bank fishing. The last FERC form 80 was filed in 2015 and reported little to no observed recreational activity. The Housatonic Valley Association published a river paddling guide² which describes the impoundment area as flatwater and the reach downstream of the dam as very technical with Class III rapids.

Based on my review of the application, supporting documentation, and publicly available information, the Project continues to satisfy the Recreational Resources criterion.

VIII. GENERAL CONCLUSIONS AND REVIEWER RECOMMENDATION

Based on my review, I believe that the Project meets the requirements of Low Impact Certification and recommend it be re-certified for a five (5)-year term with the condition noted below.

Condition 1: The Facility Owner shall comply with the four conditions listed in the Massachusetts Division of Fisheries and Wildlife's letter dated November 19, 2019 submitted as part of the LIHI application. The Owner shall summarize any activities related to those conditions in annual compliance submittals.

² <https://housatonicheritage.org/wp-content/uploads/2015/08/BerkshirePaddleGuide.pdf>

APPENDIX A – AGENCY CORRESPONDENCE

From: [Celeste Fay](#)
To: mfischer@lowimpacthydro.org; [Jonathan Miller](#)
Subject: Fwd: Glendale Hydropower Project LIHI Re-Certification
Date: Friday, December 13, 2019 7:22:18 AM

Good morning Maryalice and Jonathan,
See below for response from Caleb Slater regarding Glendale LIHI.

Thank you,
Celeste

Begin forwarded message:

From: "Slater, Caleb (FWE)" <caleb.slater@state.ma.us>
Date: October 24, 2019 at 9:15:54 AM EDT
To: Celeste Fay <celeste@gravityrenewables.com>
Subject: RE: Glendale Hydropower Project LIHI Re-Certification

Celeste,

The following was submitted to LIHI in 2014 and is still the case today:

Fish Passage

Review of the project's FERC license indicates that passage for anadromous and/or catadromous (American eel) fish is not currently required. However, the potential of fish passage needs at some future date was raised during FERC relicensing and the project's new FERC license requires the owner to build upstream and downstream anadromous and/or catadromous fish passage when notified to do so by the Division and/or the USFWS.

Due to the recent dramatic decline of American eel stocks, the Division and other fishery agencies are engaged in efforts to facilitate upstream eel passage and to implement downstream eel passage measures at hydropower facilities in areas where American eels exist. However, no American eel were collected during the most recent Division fish survey of the Housatonic River. This is not surprising, given that the State of Connecticut found limited numbers of eel upstream of the Stevenson Dam and no eel above the Shepaug Dam (both associated with the Housatonic River Project, FERC No. 2576). However, the new license issued for this Project requires eel passage facilities at the Stevenson, Shepaug and Bulls Bridge dams. Eel presumably can ascend the Great Falls at the Falls Village Dam. Therefore, passage would only need to be provided at the downstream Risingdale dam before eel have access to the Glendale Dam.

Caleb

Caleb Slater, PhD
Anadromous Fish Project Leader

Massachusetts Division of Fisheries and Wildlife
1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6331 | e: Caleb.Slater@state.ma.us
mass.gov/masswildlife | facebook.com/masswildlife

From: Celeste Fay [<mailto:celeste@gravityrenewables.com>]
Sent: Wednesday, October 23, 2019 4:10 PM
To: Slater, Caleb (FWE)
Cc: Jon Petrillo; Jonathan Miller
Subject: Glendale Hydropower Project LIHI Re-Certification

Hi Caleb,

We are going through the LIHI recertification process for the Glendale hydroelectric project located on the Housatonic River in western MA.

LIHI has requested we reach out to you and confirm that the project does not currently need upstream and downstream fish passage for migratory fish per the FERC license.

Feel free to let me know if there are any questions and I hope you are well.

Best regards,
Celeste

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 Celeste Fay | *Regulatory Manager / Project Engineer*
Gravity Renewables Inc.

Office Location: 4145 Church Street, Thorndike, MA 01079
Mailing Address: 5 Dartmouth Drive, Suite 104, Auburn, New Hampshire 03032
Mobile: [413.262.9466](tel:413.262.9466) | Fax: [720.420.9956](tel:720.420.9956)
www.gravityrenewables.com

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DIVISION OF FISHERIES & WILDLIFE

1 Rabbit Hill Road, Westborough, MA 01581
p: (508) 389-6300 | f: (508) 389-7890
MASS.GOV/MASSWILDLIFE

November 19, 2019

Stockbridge Conservation Commission
Town Hall
West Main Street
Stockbridge, MA 01262

Celeste Fay
Gravity Renewables, Inc.
1401 Walnut Street, Suite 420
Boulder, CO 80302

RE: Applicant: Hitchcock Hydro, LLC, a subsidiary of Gravity Renewables, Inc.
 Project Location: 33 Glendale Road (Glendale Dam)
 Project Description: Operation of existing Glendale Dam for hydroelectric purposes
 NHESP File No.: **00-8101**
 FERC License No.: P-2801
 MA DEP 401 WQC: No. BRP WW11 (July 9, 2009)

Dear Commissioners and Applicant:

The Natural Heritage & Endangered Species Program of the Massachusetts Division of Fisheries & Wildlife (the "Division") received the MESA Project Review Checklist, plans and other required materials for review pursuant to the Massachusetts Endangered Species Act (MESA) (MGL c.131A) and its implementing regulations (321 CMR 10.00).

The MESA is administered by the Division, and prohibits the Take of state-listed species. The Take of state-listed species is defined as "in reference to animals...harm...kill...disrupt the nesting, breeding, feeding or migratory activity...and in reference to plants...collect, pick, kill, transplant, cut or process...Disruption of nesting, breeding, feeding, or migratory activity may result from, but is not limited to, the modification, degradation, or destruction of Habitat" of state-listed species (321 CMR 10.02).

The Division has determined that this Project, as currently proposed, will occur **within** the actual habitat of the following state-listed species.

Scientific Name	Common Name	State Status	Taxonomic Group
<i>Equisetum scirpoides</i>	Dwarf Scouring-rush	Special Concern	Plant
<i>Catostomus catostomus</i>	Longnose Sucker	Special Concern	Fish
<i>Gomphus ventricosus</i>	Skillet Clubtail	Threatened	Damselfly
<i>Strophitus undulatus</i>	Creeper	Special Concern	Freshwater Mussel

MASSWILDLIFE

These species and their habitats are protected pursuant to the MESA. Fact sheets for these species can be found on our website, www.mass.gov/nhesp.

Based on the information provided and the information contained in our database, the Division finds that a portion of this project, as currently proposed, **must be conditioned** in order to avoid a prohibited Take of state-listed species (321 CMR 10.18(2)(a)). To avoid a prohibited Take of state-listed species, the following conditions must be met:

1. Non-Emergency Drawdown and Refill:

a. Non-emergency Drawdown

- i. All non-emergency draw-downs shall occur June 1 through October 1. During all such draw-downs, a Mussel Protection Plan approved by the Division in writing may be required.
- ii. The bypass reach shall retain sufficient flow and depth during all operations and non-emergency draw-downs and subsequent refill to ensure that oxygen levels are not significantly depleted, particularly during the months of July and August when the water is already carrying less oxygen and the air temperatures are high.

b. Refill after Non-emergency Drawdown - During the refilling of the impoundment after any non-emergency draw-down, the elevation of the impoundment shall be slowly raised such that the refill rate shall not exceed 0.334 ft/hr increase in water surface elevation, especially between the hours of 7 am and 4 pm.

- 2. **Vegetation Management (Native and Invasive):** Any vegetation management in the impoundment or bypass reach may require a rare plant protection plan preceded by a rare plant survey as approved by the Division in writing.
- 3. **Wetlands Protection Act.** Upon filing for any renewal, extension, amendment, or certification of compliance for the Order of Condition associated with this site pursuant to the MA Wetlands Protection Act, the Applicant shall similarly file with the Division pursuant to 310 CMR 10.58(4)(b) & 10.59.
- 4. **Authorization Duration.** This authorization is valid for 5 years from the date of issuance. Work shall be completed by the expiration of this authorization. If needed, the Applicant shall submit a written request to the Division for an extension of time to complete the Work no later than 60 days prior to the expiration of this determination, and the Division will review the Project pursuant to the MESA and 310 CMR 10.58(4)(b) & 10.59 for any continuing impacts, as described herein, and any new impacts to any State-listed Species found subsequent to the issuance date of this Permit.

We note that all work is subject to the anti-segmentation provisions (321 CMR 10.16) of the MESA. This determination is a final decision of the Division of Fisheries and Wildlife pursuant to 321 CMR 10.18. Any changes to the proposed project or any additional work beyond that shown on the site plans may require an additional filing with the Division pursuant to the MESA. This project may be subject to further review if no physical work is commenced within five years from the date of issuance of this determination, or if there is a change to the project.

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Please note that this determination addresses only the matter of state-listed species and their habitats. If you have any questions regarding this letter please contact, Misty-Anne R. Marold, Senior Endangered Species Review Biologist, at (508)-389-6356.

Sincerely,

A handwritten signature in black ink, reading "Everose Schlüter". The signature is fluid and cursive, with the first name "Everose" and last name "Schlüter" clearly distinguishable.

Everose Schlüter, Ph.D.
Assistant Director

cc: David Foulis, MA DEP Western Regional Office
David Cameron, MA DEP Western Regional Office
Mark Boumansour, Hitchcock Hydro, LLC

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