

REVIEW OF APPLICATION FOR LIHI RE-CERTIFICATION OF THE OAKDALE HYDROELECTRIC PROJECT

FERC Project No. 10689 (Conduit Exemption)
West Boylston, MA, Worcester County
LIHI #57



Source: MWRA 2023

January 25, 2024
Nuria Holmes, LIHI Reviewer

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FINAL REVIEW OF APPLICATION FOR LIHI RE-CERTIFICATION OF THE OAKDALE HYDROELECTRIC FACILITY

This report provides final review findings and recommendations related to the re-certification application submitted to the Low Impact Hydropower Institute (LIHI) by the Massachusetts Water Resources Authority (MWRA) for the Oakdale Hydroelectric Project (Project), LIHI #57. The final re-certification application package was filed on November 20, 2023, and is subject to review under the current 2nd edition LIHI Handbook (Revision 2.05, January 1, 2022).

I. INTRODUCTION

The 3.5-megawatt (MW) Project was constructed in 1929 as the outlet facility of the Quabbin Tunnel and was initially operated for the sole purpose of water transfer from the Ware River to the Wachusett Reservoir. The Project is located off-stream in West Boylston, Massachusetts. The Project is a conduit facility associated with the Cosgrove Aqueduct and generates power from potable water pumped from the Quabbin Reservoir into the Wachusett Reservoir. The water's purpose is distribution through MWRA's service territory. MWRA is a wholesale water supply department that provides drinking water to 50 communities throughout the Boston metropolitan area, equating to approximately 200 million gallons of water per day. The hydropower associated with the Project began operation in 1949.

II. PROJECT LOCATION

The Project receives water from the Quabbin Reservoir, located approximately 65 miles west of Boston, and delivers it to the Wachusett Reservoir, about 35 miles west of Boston. Both are man-made reservoirs, and were originally constructed, and still function today, as water supply reservoirs. The MWRA water conveyance system is comprised of over 100 miles of active tunnels and aqueducts which are part of the MWRA service area and distribution system. The Quabbin Aqueduct receives water from the Quabbin Reservoir and transmits it over 24 miles through the aqueduct's deep rock tunnel to its terminus at the Oakdale transfer station. The water supply system then discharges to a short outlet channel approximately 750 feet long that leads to the Quinepoxet River below the Quinepoxet River dam near its mouth, and into the Wachusett Reservoir (see cover page photo).

Although the Project is off-stream, it is located within the Nashua River Watershed. Other projects within this water conveyance system include the [Cosgrove Project \(LIHI #55\)](#), and the [Loring Road Project \(LIHI #56\)](#), which are both owned and operated by MWRA (Figure 1).

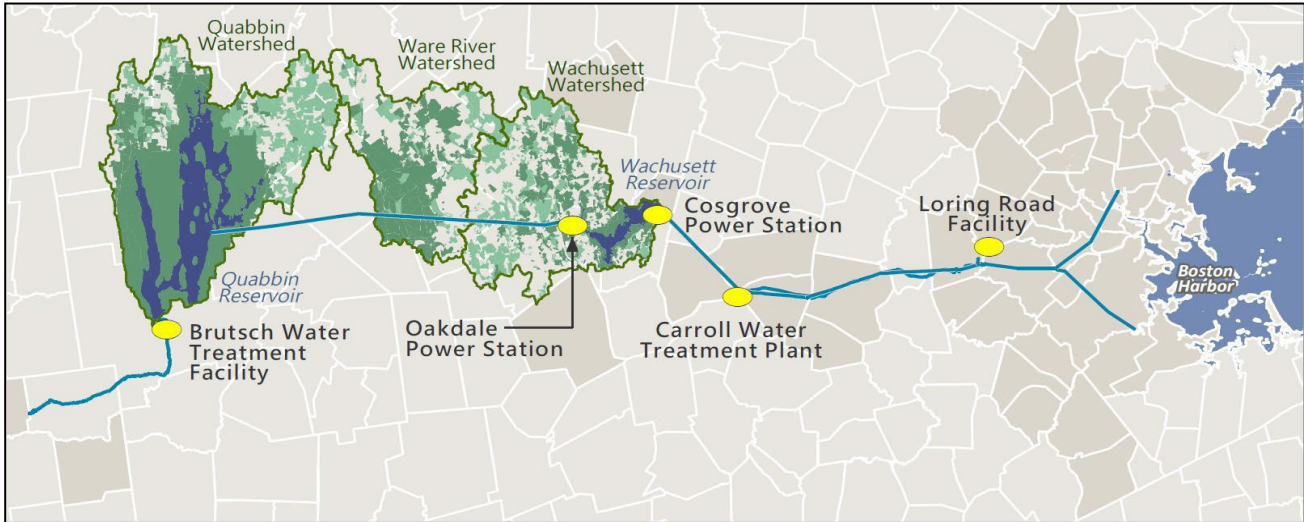


Figure 1: MWRA's Water Conveyance System



III. EXISTING FACILITIES

The Project's facilities include one Francis runner turbine-generator rated at 3.5 MW, put into operation in 1949; and appurtenant facilities. The Project generates approximately 10,418 MWh. The amount of generation has not changed since the last certification period in 2015.

IV. EXISTING OPERATIONS

As noted above, the Project is off-stream on a water transfer aqueduct and does not discharge into any rivers. Water within MWRA's system is treated as drinking water and held against rigorous drinking water standards.

V. REGULATORY AND COMPLIANCE STATUS

This review included a docket search of the FERC eLibrary. Records for the Project date back to 1988, however, there are no compliance issues noted in the eLibrary. MWRA submitted an exemption application on November 4, 1988. The Project was issued a conduit exemption on January 19, 1990. A conduit exemption exempts from the Project from Part I of the Federal Power Act.

The Massachusetts Division of Fish and Wildlife (MDFW) and the Massachusetts Historical Commission (MHC) engaged in the conduit exemption process and provided comments described in applicable sections below.

VI. PUBLIC COMMENTS RECEIVED OR SOLICITED BY LIHI

The application was publicly noticed on November 20, 2023, with a 60-day comment period, 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 January 20, 2024.

VII. ZONES OF EFFECT

The Applicant delineated the Project as a single Zone of Effect (ZoE 1), the area within and immediately surrounding the intake facility, encompassing the intake and discharge lines.

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				

VIII. 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) and has demonstrated compliance with this Standard.

Discussion: As noted in the application, the Project is a conduit facility located between two man-made public water supply reservoirs associated with MWRA’s drinking water conveyance system. Consistent with Standard A-1, the Project has no bypassed reaches, minimum flow requirements, or flow release schedules associated with its operations or FERC exemption order.

Water is transferred from one reservoir to the other via Shaft 1 at the outlet of the

Quabbin Aqueduct at the Wachusett Reservoir. The facility discharge briefly joins the Quinepoxet River just before its confluence with the Wachusett Reservoir. There are bypass lines so that if the generator is down for maintenance, drinking water continues to flow into the Wachusett Reservoir. At the time of FERC exemption, the MDFW did not require flow recommendations. The power generation of the Project is based on the amount of flow that passes through the two reservoirs, and it mostly generates power between June and September when water demand is high. Between October and February, when water demand is low and less water passes through the two reservoirs, generation is lower. Based on this information, the Project satisfies Criterion A.

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) and has demonstrated compliance with this Standard.

Discussion: The Project has no water quality certification and is not located on a Water Quality Limited riverine reach. The water is entirely contained within MWRA's closed water conveyance system. As noted in the LIHI application, the water within the facility does not affect water quality below, around, or above the facility. The water contained within the facility is of the highest water quality as its primary purpose is drinking water. Monthly water quality test results are available on MWRA's public website. MWRA routinely evaluates the water quality for micro-bacteria, turbidity, corrosiveness, disinfectants, chemicals, and minerals. Based on this information, the Project satisfies Criterion B.

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 populations in areas affected by the facility.*

Assessment of Criterion: The applicant selected Standard C-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this Standard.

Discussion: The Project is a closed, off-stream system unconnected to a natural river with no possibility that fish could enter the water supply system to move upstream through the Project. There are no migratory fish present.

At the time of the FERC exemption proceedings, MDFW had one primary concern regarding mortality of lake trout that could enter the turbine from the tailrace. MWRA installed tailrace racks in 1996 to prevent fish from entering the turbine from the Wachusett Reservoir.

The power generation equipment is located inside buildings, and therefore there is no interaction between fish migrating upstream and the hydropower facility. Water passing through the turbine is drinking water only, and is also enclosed within the closed system, therefore there is no possible water for fish to migrate upstream via the Project. Based on this information, the Project satisfies Criterion C.

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. Migratory species can successfully complete their life cycles and to maintain healthy populations in the areas affected by the Facility.*

Assessment of Criterion: The applicant selected Standard D-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this Standard.

Discussion: As outlined above, the Project is entirely closed. The water intake for the Project has a 2" x 2" gauge 8 stainless steel mesh rack to prevent fish from the Quabbin Reservoir from entering the turbine. These racks are inspected twice annually either manually or via remote inspection. There is no discharge from the facility that could impact downstream passage. Multiple fish species exist in the Wachusett Reservoir; however, they are not impacted by the Project's operations. No comments were received from the agencies during the comment window. No impacts are anticipated on the fish species due to the Project's operations. Based on this information, the Project satisfies Criterion D.

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) and has demonstrated compliance with this Standard.

Discussion: The hydropower facility is located entirely within the water supply facility, and therefore, there are no impacts to shoreline or the watershed. MWRA is the owner of over 30% of the watershed and maintains a buffer around the water supply reservoirs in order to protect the public water supply. Additionally, MWRA maintains a partnership with the Department of Conservation and Recreation Division of Water Supply Protection, which is responsible for managing the activities within the watershed funded by MWRA. For water quality purposes and shoreline protection, MWRA has a narrow operational band for raising/lowering the reservoir elevations. Based on this information, the Project satisfies Criterion E.

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) and has demonstrated compliance with this Standard.

Discussion: The USFWS Information for Planning and Consultation (IPaC) database was accessed to determine federally-listed species that could occur in the vicinity of the Project. An updated IPaC report was generated on January 23, 2024. As noted in the LIHI application, the Wachusett Reservoir is designated by the Massachusetts Endangered Species Act (MESA) as Estimated Habitat of Rare Wildlife and Priority Habitat of Rare Species, primarily due to the presence of the Common Loon.

Additionally, the USFWS lists the candidate monarch butterfly and endangered Northern long-eared bat as two species that may be present in the vicinity of the Project. However, since the facility is contained entirely within a closed system, there are no anticipated or known impacts from the facility's operations on any federal or state listed species.

Landscape maintenance does not require any tree-cutting that may impact bat or bird species habitat or nesting. As noted in the LIHI application, several bird species are present in the Project footprint, however, there are no known impacts to birds from operation of the facility. Based on this information, the Project satisfies Criterion F.

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.*

Assessment of Criterion: The applicant selected Standard G-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this Standard.

Discussion: The Project is located within MWRA's Quabbin Aqueduct Shaft 1/Oakdale Power Station Building. This building sits at the terminus of the Quabbin Aqueduct. The Quabbin Aqueduct Shaft 1 Building (WBY.907) as well as the adjacent Quabbin Aqueduct Outlet Service Building (WBY.168) and Quinapoxet River Dam located near the Project outlet (WBY.905) are all Massachusetts Historical Commission inventoried properties and considered eligible for listing on the National Register of Historic Places (MHC). The MHC and MWRA have a Programmatic Memorandum of Agreement (MOA) to ensure that projects undertaken do not have impacts to the eligible properties. The Project itself is not listed on the National Register of Historic Places. At the time of the FERC exemption proceedings, MHC stated that there were no known or recorded historic structures or archaeological sites at the site or affected by this facility. The FERC exemption order has no conditions specific to cultural or historic resources. Based on this information, the Project satisfies Criterion G.

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 selected Standard H-1 (Not Applicable/De Minimis Effect) and has demonstrated compliance with this Standard.

Discussion: The Project's FERC exemption has no recreation compliance requirements associated with its operation. The facility is secure and locked and not accessible to the public due to its significance as a public drinking water system. A separate Wachusett Reservoir Public Access Plan provides passive recreation in a different part of the watershed, but it is unassociated with the Project. Based on this information, the Project satisfies Criterion H.

IX. Re-CERTIFICATION RECOMMENDATION

This review included evaluation of the LIHI application and supplemental additional information provided by the Applicant, a review of the FERC eLibrary, and other publicly available information. Based on the evaluation, I recommend that the Project be re-certified as Very Low Impact (VLI) for a term of fifteen (15) years since the Project meets the Not Applicable/De Minimis Effect standards in all LIHI Criteria. No conditions are recommended for the Certification.