



**REVIEW OF APPLICATION FOR LIHI CERTIFICATION
OF THE
HYDRAULIC RACE HYDROELECTRIC PROJECT**

**FERC Project No. 2424, Exempt
New York State (Erie) Barge Canal System
Lockport, NY**



**June 17, 2019
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FINAL REVIEW OF APPLICATION FOR LIHI CERTIFICATION OF THE HYDRAULIC RACE HYDROELECTRIC PROJECT

This report provides final review findings and recommendations related to the certification application submitted to the Low Impact Hydropower Institute (LIHI) by Erie Boulevard Hydropower LP, a subsidiary of Brookfield Renewable Energy Group (Applicant) for certification of the Hydraulic Race Hydroelectric Project (Project). The final certification application was filed on March 14, 2019 and is subject to review under the current 2nd edition LIHI Handbook (Revision 2.03, December 20, 2018).

I. INTRODUCTION

The Hydraulic Race Project is located on the New York State (Erie) Barge Canal System in the Town of Lockport, in Niagara County, New York. The Project was constructed in 1942 and was initially licensed but then issued a conduit exemption from Federal Energy Regulatory Commission (FERC) licensing on November 27, 1990 (Project No. 2424).¹ The exemption was transferred from the prior owner, Niagara Mohawk Power Corp., to Erie Boulevard Hydropower in 1999.

The Erie Canal is an artificial waterway that connects the Hudson River to Lake Erie and was first completed in 1825. The current Erie Canal was constructed from 1905 to 1918 and stretches approximately 351 miles from the Hudson River at Waterford, New York near Albany to the open waters of Lake Erie at Tonawanda near Buffalo. From tidewater level at Troy, the canal rises through a series of locks in the Mohawk Valley to an elevation of 420 feet above sea level to a summit level that stretches between New London and Whitesboro. Continuing westward, it descends to an elevation of 363 feet above sea level at the junction with the Oswego Canal, and finally rises to an elevation of 565.6 feet above sea-level at the Niagara River.²

The Project location in Lockport is about 30 miles from Lake Erie (Figure 1). The canal typically operates for navigation for much of the year and is then drained for maintenance and repair in winter, although there can still be some flow in the canal from road culvert runoff and some minor tributary inflows. Guard gates were built every five miles on the canal, allowing for quick drainage of sections of the canal in emergency situations or when repairs are needed in a certain sections.

II. PROJECT LOCATION, AND SITE CHARACTERISTICS

As a conduit facility, the Project draws water from the Erie Canal at Lock No. 35 and discharges it below Lock No. 34 (Figures 2 and 3). These locks have a combined lift of 49 feet.³ Water is conveyed to the Project by a 650-foot-long rock tunnel that bifurcates into a canal regulator

¹ <https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=3455674>

² <http://www.eriecanal.org/texts/Whitford/1921/chap24.html>

³ Ibid.

pipe which carries water for navigation in the canal, and a 410-foot-long concrete-lined tunnel that leads to a 100-foot-long steel penstock and to the powerhouse for hydroelectric generation (Figure 3).

The New York State Canal Corporation (NYSCC) owns the canal regulator pipe and surrounding infrastructure. The agency is responsible for the operation of Lock Nos. 34 and 35, and for maintaining canal operating water levels in the downstream section of the canal. Control of water releases and the resulting generation from the Project is achieved by the Erie Canal Lock Operator adjusting the discharge of water from the canal into the Project's tunnel. Generation is limited to the navigation season, typically from late April or early May to mid-November or early December.



Figure 1. Project Location



Figure 2. Locks 34 and 35 (new locks at left, five old locks at right used as a spillway)⁴

⁴ <http://www.tug44.org/erie.canal/lock-34-35/>

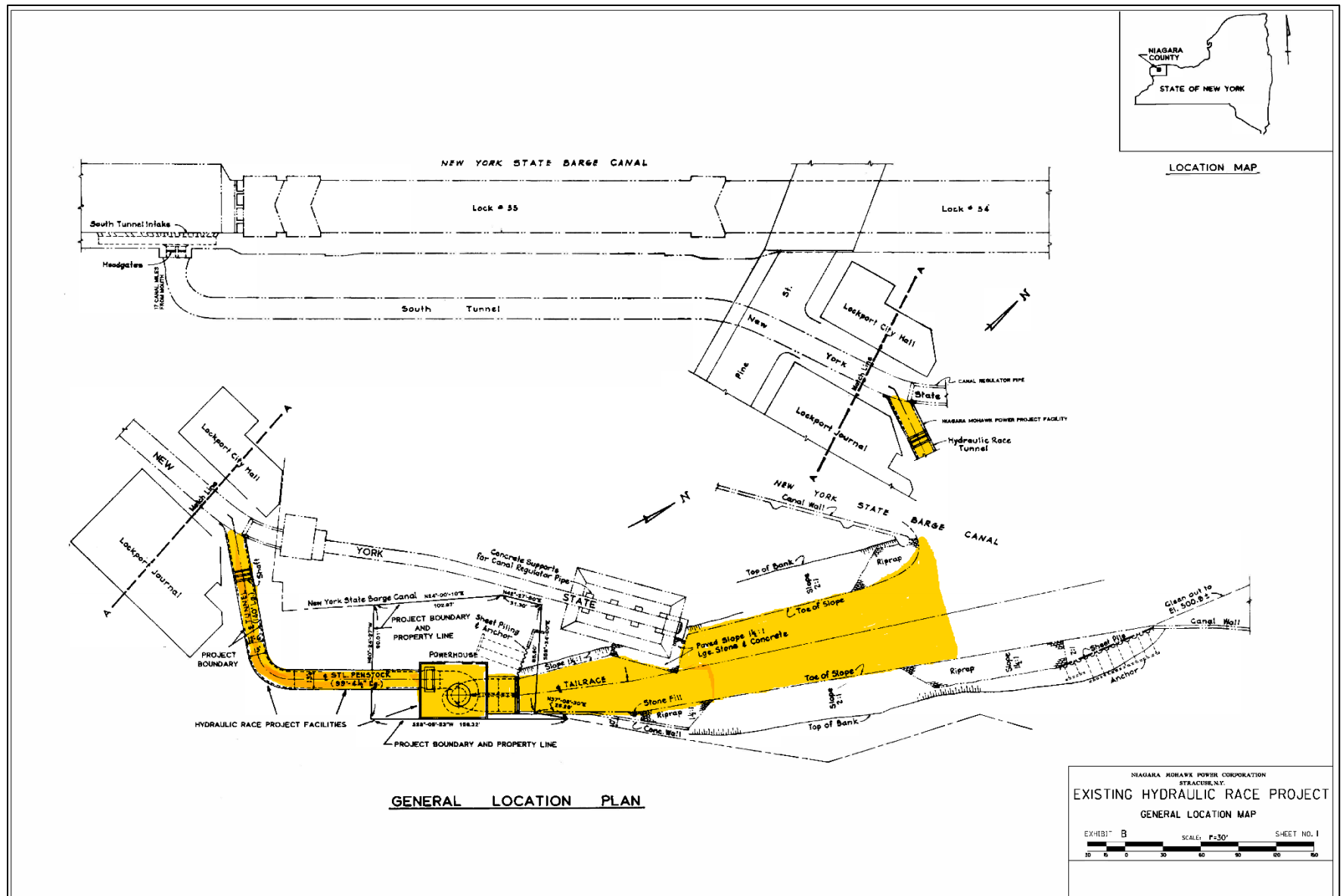


Figure 3. Project Layout and Zone of Effect (Project facilities highlighted)

In addition to the tunnel and penstock, the Project powerhouse contains a single vertical Kaplan turbine with a capacity 4.867 MW; however, capacity is limited to 3.4 MW due to the hydraulic limitations of the canal/conduit system. The Project's average annual generation is 10,800 MWh. In 2004, the turbine runners were replaced, there have been no other facility upgrades. The turbine intake is equipped with 5-inch clear spacing trash racks and the tailrace is 500 feet long. The Project is located in an urban environment and has a small footprint. The FERC boundary is 1.6 acres and encompasses a portion of the penstock, the powerhouse, and the tailrace.

III. REGULATORY AND COMPLIANCE STATUS

A review of the FERC elibrary found no documents related to the LIHI Criteria since issuance of the FERC exemption in 1990. Available documents related to the ownership change, Project safety (emergency action plans and public safety), operations inspections and occasional repairs, and annual generation reporting.

V. PUBLIC COMMENTS RECEIVED BY LIHI

The application was publicly noticed on April 17, 2019. No public comments were received by LIHI during the 60-day comment period which ended on June 16, 2019.

Given the limited nature of the Project and availability of other public information, the reviewer only contacted the NY State Department of Environmental Conservation (NYSDEC), Bureau of Fisheries via email on April 29, 2019 to inquire about fisheries (see Section VI.C and D). No response was received from the agency.

VI. LIHI CRITERIA REVIEW AND RECOMMENDATIONS

The Applicant selected a single Zone of Effect (ZOE) defined as the 0.1-mile reach extending from the powerhouse discharge to the Erie Canal. Based on further discussion with the Applicant, this review extends the ZOE upstream to the point of bifurcation in the canal tunnel (highlighted areas in bottom panel of Figure 2), a total distance of about 1,064 feet.

The Applicant selected the standards shown in the table below. This review finds that the Project can meet Standard F-1 for Threatened and Endangered Species Protection rather than the Applicant-selected Standard F-3 which is discussed in Section VI.F below.

Table 1. LIHI Standards Selected for Zone of Effect No. 1

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

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 and has demonstrated compliance with Standard A-1, Not Applicable/De Minimis Effect, to pass the Ecological Flow Regimes criterion. This standard requires:

STANDARD A-1. Not Applicable/De Minimis Effect: The facility operates in a true run-of-river operational mode and there are no bypassed reaches or water diversions associated with the facility; or the facility is located within an existing water conduit that does not discharge into natural waterways.

Discussion: Flows into the Project are dictated by NYSCC and typically range from 600 to 800 cfs during the navigation season. Some residual water (about 20 cfs) that enters the NYSCC tunnel bypasses the Project and continues into the canal regulator pipe where it returns to the canal which takes the bulk of its navigation water from the Niagara River and its tributaries near the Project - Tonawanda Creek and Ellicott Creek.

The Project was not subject to an environmental assessment due to its exempt status. During the exemption application review process, state and federal agencies had the opportunity to object to an exemption or require base flows through the tailrace. According to the Applicant, a US Fish and Wildlife Service (FWS) comment letter dated September 24, 1990, did not include a recommendation for any base flows. This letter is not available electronically on the FERC elibrary.

Based on the information provided and because the Project is located in a conduit system with no flow-related effects on a natural river, this review concludes that 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 and has demonstrated compliance with Standard B-1, Not Applicable/De Minimis Effect to pass the Water Quality criterion. This standard requires:

STANDARD B-1. Not Applicable/De Minimis Effect: The facility does not alter the physical, chemical, or biotic water characteristics necessary to support fish and wildlife resources or human water uses (e.g., water supply or recreation).

Discussion: The State of New York did not issue a water quality certificate for the Project. The Erie Canal in the vicinity of the Hydraulic Race Project is classified by NYSDEC as Class C waters. The best usage of Class C waters is fishing, and they are also suitable for fish propagation and survival, as well as primary and secondary contact recreation, where such use is not limited by other factors.

The draft 2018 New York State Impaired Water Bodies list does not list the Erie Canal as impaired.⁵ However, the Niagara River is listed as impaired for dioxin, PCBs, Mirex (a now banned insecticide), polycyclic aromatic hydrocarbons (PAHs), and organic chlorinated pesticides. There are state-issued fish consumption advisories that recommend limits on fish consumption due to dioxin, PCBs, and Mirex in the Niagara River above Niagara Falls and for the Erie Canal between Lockport and the Niagara River.⁶

Based on the information provided and since the Project is a conduit facility and does not alter water quality in the Erie Canal, this review concludes that 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, sustainable fish and wildlife resources in areas affected by the facility.*

Assessment of Criterion: The Applicant selected and has demonstrated compliance with Standard C-1, Not Applicable/De Minimis Effect to pass the Upstream Fish Passage criterion.

⁵ https://www.dec.ny.gov/docs/water_pdf/303dlistdraft18.pdf

⁶ https://www.health.ny.gov/environmental/outdoors/fish/health_advisories/regional/western.htm#table

This standard requires:

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 species that were present historically.

Discussion: The Erie Canal is a man-made canal with barge lock activities and yearly drawdowns. There are no migratory species present but a warmwater fishery is known to exist in the Project vicinity, despite there being no natural habitat at the Project. Species such as largemouth bass, brown bullhead, and northern pike are, or may be present. Article 2 of the FERC exemption requires compliance with mandatory prescriptions made by state or federal agencies. During the exemption proceedings for the Project, no jurisdictional agency prescribed upstream fish passage facilities for the Project. In addition, normal lock operations utilize higher flows than those provided to the Project and lock operations are likely to facilitate upstream passage of these species when the Project is operating during the navigation season.

Therefore, based on the information provided, this review concludes that 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. All migratory species can successfully complete their life cycles and to maintain healthy, sustainable fish and wildlife resources in the areas affected by the Facility.*

Assessment of Criterion: The Applicant selected and has demonstrated compliance with Standard D-1, Not Applicable/De Minimis Effect to pass the Downstream Fish Passage and Protection criterion for the Project. This standard requires:

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 were present historically, the facility did not contribute to the 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.

Discussion: The Project intake has a trash rack with 5-inch clear spacing and approach velocities high enough (6.4 cfs at best efficiency) that fish could theoretically be drawn into the intake and turbine. Given the large rack spacing, impingement is not expected to be a concern. It is unclear if there would be a significant entrainment impact, although NYSDEC did not respond to my inquiry as to whether there might be a concern, thus implying that no concern exists.

The Erie Canal is not a managed fishery (although there is a privately-operated annual fishing derby in the canal) and there is no natural habitat for fish despite the presence of some warmwater species. Presumably the Project does not impact the sustainability of species that are present given that the canal is dewatered in the winter and there is no year-round natural habitat. Article 2 of the exemption requires compliance with mandatory prescriptions made by state or federal agencies. During the exemption proceedings for the Project, no jurisdictional agency prescribed downstream fish passage facilities, but FWS reserved its right to prescribe such facilities to protect fish and wildlife in the future. As noted above, lock operations are likely to facilitate downstream passage of these species and flows in the canal exceed those diverted to the Project such that fish would be unlikely to enter the Project tunnel and penstock.

Therefore, based on the information provided, this review concludes that 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 and has 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 where the facility owner has direct or indirect ownership or control over lands surrounding the facility and its riverine zones that have significant ecological value for protecting water quality, aesthetics, or low-impact recreation, and the facility is not subject to any Shoreline Management Plan (SMP) or similar protection plan.

Discussion: There is no Shoreline Management Plan required for the Project. The Erie Canal and the tailrace area are man-made structures blasted through rock, and they do not have riverine zones associated with them, nor any lands of significant ecological value. The Project's footprint is small, and the tailrace includes a 100-ft-long concrete wall along the shore that would not be subject to erosion.

Therefore, based on the information provided, this review concludes that 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 and has demonstrated compliance with Standard F-3, Recovery Planning and Action to pass the Threatened and Endangered Species criterion for the Project. This standard requires:

STANDARD F-3. Recovery Planning and Action. The facility is in compliance with relevant conditions in a species recovery plan, with relevant conditions in an incidental take permit or statement, biological opinion, habitat conservation plan, or similar government document and the incidental take document and/or biological opinion issued relevant to the facility was designed to be a long-term solution for protection of the listed species.

However, this review finds that the Project also demonstrates compliance with Standard F-1, Not Applicable/De Minimis Effect and this standard is more appropriate. It 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 listed species that historically were present.

Discussion: According to the Applicant, the FWS letter from 1990 stated that no federally listed or proposed species were known to exist in the area at that time. Therefore, no Biological Assessment or further consultation with FWS was needed for the protection of threatened or endangered species. Since that time and based on information received from the FWS New York Field Office on February 1, 2019, the northern long-eared bat (*Myotis septentrionalis*) was subsequently listed and may potentially occur within the Project vicinity. There are no critical habitats located within the Project area and it is extremely unlikely that the species is present within the Project's small footprint and urban location.

The Applicant consulted with NYSDEC's Natural Heritage Program for a list of threatened and endangered species that may occur in the vicinity of the Project. Pursuant to a letter dated February 7, 2019, NYSDEC indicated that two special status freshwater mussel species, pink heelsplitter (*Potamilus alatus*) and fragile papershell (*Leptodea fragilis*), have been documented within 0.5 miles upstream of the Project. As noted above for fish, there is no natural aquatic habitat for these species in the manmade canal. Neither species is listed as threatened or endangered by the state.

Based on the information provided and given that the Project is located in an urban area with no potential impacts to bats, this review concludes that the Project satisfies Criterion F under Standard F-1.

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 and has demonstrated compliance with Standard G-1, Not Applicable/De Minimis Effect to pass the Cultural and Historic Protection criterion for the Project. This standard requires:

STANDARD G-1. Not Applicable/De Minimis Effect: There are no cultural or historic resources present on facility lands that can be potentially threatened by construction or operations of the facility, or facility operations have not adversely affected those that are or were historically present.

Discussion: The Erie Canal is designated as a National Historical Landmark.⁷ The entire New York State Barge Canal system is listed on the National Register of Historic Places.⁸ However, there are no cultural or historic resources associated with the Project because Project facilities are not considered part of the historic canal system.

The Applicant follows its corporate “*Compendium of Compatible Operation and Maintenance Activities (Categorical Exclusions for Historic Hydro Facilities) Pursuant to a Cultural Resources Management Plan*” for operations and Projects in New York. Any activities beyond those listed in the Compendium are or would be submitted to the New York State Historic Preservation Office for review prior to commencing them.

Based on the information provided, this review concludes that 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 and has demonstrated compliance with Standard H-1, Not Applicable/De Minimis Effect to pass the Recreational Resources criterion for the Project. This standard requires:

STANDARD H-1. Not Applicable/De Minimis Effect: The facility does not occupy lands or waters to which the public can be granted safe access and does not otherwise impact recreational opportunities in the vicinity of the facility.

⁷ <https://eriecanalway.org/resources/NHL>

⁸ <http://www.canals.ny.gov/national-historic-places.pdf>

Discussion: There are no recreational resources associated with the Project. New York State law prohibits swimming, diving or fishing in any canal lock chambers, from the lock walls or from any other canal structure. It is illegal to jump into the water from any of the canal's bridges, locks, guard gates or mooring walls. Hunting on, at, or near canal locks or any other canal structure is prohibited.⁹ This law is necessary for public safety, as the Erie Canal can be dangerous for recreationists.

Near the powerhouse/tailrace access road are guardrails and handrails posted with "Danger Fast Rising Water" signs. The area is fenced and posted with "Danger High Voltage" and "Danger Private Property No Trespassing" signs. However, there are local public recreation opportunities including boat sightseeing tours and guided cycling and walking tours along the canal in Lockport.

Based on the information provided, and since the Project cannot provide safe access to Project facilities, this review concludes that the Project satisfies Criterion H.

VII. CERTIFICATION RECOMMENDATION

This review included evaluation of the application and supplemental additional information provided, a review of the FERC elibrary, and other publicly available information. Based on the evaluation, I recommend that the Project be certified as Very Low Impact (VLI) for a term of ten (10) years since the Project meets the Not Applicable/De Minimis Effect standards in all LIHI Criteria. No conditions are recommended for the Certification.

⁹ <http://www.canals.ny.gov/about/rulesregs/canalregs.pdf>