

**Review of Low Impact Hydropower Institute Application
for
Low Impact Hydropower Certification:
Jackson Mills Hydroelectric Project, Nashua New Hampshire**

Introduction and Overview

This report reviews the application submitted by Essex Hydro Associates to the Low Impact Hydropower Institute (LIHI) for Low Impact Hydropower Certification for the Jackson Mills Project (project or facility) in Nashua New Hampshire. The project, which is located on the Nashua River holds a FERC exemption which was issued in April 1984 (FERC No. 7590) for the operation and maintenance of the run-of-river 1 Mw Project.

Project and site characteristics

The Jackson Mills Project is located on the Nashua River approximately 700-feet downstream from the crossing of Route 3 (Main Street) in Nashua New Hampshire. The area in the vicinity of the project is urban in character and typical of an old New England manufacturing city.

The 180-foot long by 33-foot high dam is a gravity-type masonry structure with a concrete cap and a concrete extension and concrete-faced stone gravity-type abutments. Upstream and downstream fish passage is provided at the project by an Alaska steep-pass fishway and a stainless steel bypass pipe. The 40-acre impoundment has a normal maximum water surface of 116.6-feet NGVD. The Project operates in a run-of-river mode. The powerhouse which is located at the north dam abutment houses a 1 MW turbine generator.

The Nashua River has a total drainage area of 529 square miles, with 88 square miles being in New Hampshire, and 411 square miles in Massachusetts. The net drainage area available to the Jackson Mills Project is 410 square miles as 119 square miles are intercepted to supply water to the Massachusetts cities of Boston and Worcester.

The Nashua River is the heart of a living, working watershed, with a landscape ranging from wild to highly developed. Within its 529 square miles, nearly 240,000 people live and work amidst scenic lands and waters and abundant wildlife. The Nashua watershed is still largely rural at the edge of a great metropolitan area. It is endowed with a wonderful mixture of human and natural resources, from mill cities to rare species.

For thousands of years, the watershed has been used by humans. Today it retains much of its agrarian and early industrial past while actively participating in the high technology economy of the late twentieth century. The watershed's classic New England villages now shelter those who create our current age, while its waters, wetlands, and forests still shelter many of the species that have been here since the retreat of the glaciers.

Thirty years ago the rivers of this watershed were polluted by industrial and residential discharges. The Nashua's restoration has been a model of how communities can recover a natural resource.

Public comment. none

General conclusions. The project's design, location, topography, and geology have resulted in a project that appears to be consistent with LIHI criteria.

Recommendation. Based on my review of information submitted by the applicant, my review of additional documentation, and my consultations with resource agency staff, I believe the Jackson Mills Hydroelectric Project meets all of the criteria to be certified and I recommend certification.

Low Impact Certification Criteria

A. Flows:

Criteria

1) Is the facility in Compliance with Resource Agency Flow Recommendations issued after December 31, 1986 for both the reach below the tailrace and all bypassed reaches?

YES *go to B*

NO *fail*

NOT APPLICABLE *go to A2*

2) If there is no flow condition recommended, is the Facility in Compliance with a flow release schedule, that at a minimum meets Aquatic Base Flow standards or "good" habitat flow standards calculated using the Montana-Tennant method?

YES *go to B*

NO *If no, go to A3.*

3) If the Facility is unable to meet the flow standards in A.2., has the Applicant demonstrated, and obtained a letter from the relevant Resource Agency confirming that the flow conditions at the Facility are appropriately protective of fish, wildlife, and water quality?

NO *fail*

YES *go to B*

PASS

B. Water Quality:

1) Is the Facility either:

- a) In compliance with all conditions issued pursuant to a Clean Water Act Section 401 certification issued after December 31, 1986? Or**
- b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?**

YES go to B2

NO *fail*

2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?

YES go to B3

NO *pass*

3) If the answer to question B.2. is yes, has there been a determination that the Facility is not a cause of that violation?

YES *pass*

NO *fail*

PASS

C. Fish Passage and Protection:

1) Is the facility in compliance with Mandatory Fish Passage Prescriptions for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?

YES go to C5

NOT APPLICABLE go to C2

NO fail

2) Are there historic records of anadromous and/or catadromous fish movement through the facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish run is extinct)?

YES *Go to C2a*

NO *Go to C3*

- a) **If the fish are extinct or extirpated the Facility area or downstream reach, has the Applicant demonstrated that the extinction or extirpation was not due in whole or part to the Facility?**

- b) **If a Resource Agency Recommended adoption of upstream and/or downstream fish passage measures at a specific future date, or when a triggering event occurs (such as completion of passage through a downstream obstruction or the completion of a specified process), has the Facility owner/operator made a legally enforceable commitment to provide such passage?**

YES *Go to C2b*

N/A *Go to C2b*

NO *fail*

3) If, since December 31, 1986:

- a) **Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C2a above), and**

- b) **The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,**

- c) **Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?**

NO *Go to C5*

N/A *Go to C4*

YES *fail*

5) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream or downstream passage of riverine fish?

YES *Go to C6*

NO *fail*

If NOT APPLICABLE *go to C6*

6) Is the facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?

YES *Pass, go to D*

NO *fail*

NOT APPLICABLE *Pass go to D*

PASS

D. Watershed Protection:

1) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the high water mark in an average water year around 50 - 100% of the impoundment, and for all of the undeveloped shoreline

YES *Pass, go to E and receive 3 extra years of certification*

NO *go to D2*

2) Has the facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1., and 2) has the agreement of appropriate stakeholders and state and federal resource agencies?

YES *Pass, go to E and receive 3 extra years of certification*

NO *go to D3*

3) Has the facility owner/operator established through a settlement agreement with appropriate stakeholders and that has state and federal resource agencies agreement an appropriate shoreland buffer or equivalent watershed land protection plan for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation)

YES *Pass, go to E*

NO *Go to D4*

4) Is the facility in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project.

YES *Pass, go to E*

NO *fail*

PASS

E. Threatened and Endangered Species Protection:

1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?

YES *Go to E2*

NO *Pass, go to F*

2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?

YES *Go to E3*

NOT APPLICABLE *Go to E3*

NO *fail*

3) If the Facility has received authority to Incidentally Take a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental take statement; (ii) Obtaining an incidental take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authority pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authority?

YES *Go to E4*

NOT APPLICABLE *Go to E5*

NO *fail*

4) If a biological opinion applicable to the Facility for the threatened or endangered species has been issued, can the Applicant demonstrate that:

a) The biological opinion was accompanied by a FERC license or exemption or a habitat conservation plan? Or

b) The biological opinion was issued pursuant to or consistent with a recovery plan for the endangered or threatened species? Or

c) There is no recovery plan for the threatened or endangered species under active development by the relevant Resource Agency? Or

d) The recovery plan under active development will have no material effect on the Facility's operations?

YES *Pass, go to F*

NO *fail*

5) If E2 and E3 are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?

YES *Pass, go to F*

NO *fail*

PASS

F. Cultural Resource Protection:

Criteria:

1) If FERC-regulated, is the Facility in compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?

YES *Pass, go to G*

NOT APPLICABLE *Go to F2*

NO *fail*

2) If not FERC-regulated, does the Facility owner/operator have in place (and is in Compliance with) a plan for the protection, mitigation or enhancement of impacts to Cultural Resources approved by the relevant state or federal agency or *Native American Tribe*, or a letter from a senior officer of the relevant agency or Tribe that no plan is needed because Cultural Resources are not negatively affected by the Facility?

YES *Pass, go to G*

NO *fail*

PASS

G. Recreation:

Criteria:

1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?

YES *Go to G3*

NOT APPLICABLE *Go to G2*

NO *fail*

2) If not FERC-regulated, does the Facility provide recreational access, accommodation (including recreational flow releases) and facilities, as Recommended by Resource Agencies or other agencies responsible for recreation?

YES *Go to G3*

NO *fail*

3) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?

YES *Pass, go to H*

NO *fail*

PASS

H. Facilities Recommended for Removal:

1) Is there a Resource Agency recommendation for removal of the dam associated with the Facility?

NO *Pass, Facility is Low Impact*

YES *fail*

PASS

FACILITY IS LOW IMPACT
