

Ladd's Mill Facility

Application to the Low Impact Hydropower Institute

FERC Project No. 8242



Prepared by
Hobart Guion
Worcester Hydro Company, Inc.

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INTRODUCTION

This is an application to the Low Impact Hydropower Institute (LIHI) for certification of Ladd's Mill hydroelectric. This project started in 1905 when a crib dam was built to supply power for a sawmill owned by the Ladd family. In 1928 a concrete gravity dam was built to replace the crib dam washed out in the devastating floods of 1928. This new dam supplied hydroelectric power to the sawmill until 1957 when it was, once again, washed out. Abandoned until 1985, the site was resurrected thanks to the PURPA Act; Burlington, VT. Engineer, John Stewart, P.E., joined with landowners Wendell and Madeline Ladd to build the present structure, incorporating elements of the old concrete dam and mill into the works that define the site today. With lessons learned from the past, the project survived Hurricane Irene in 2011. The owner, Worcester Hydro Co. Inc., looks forward to producing renewable energy from a carbon-free source. Winning certification from LIHI and selling our RECs will immeasurably help that effort.

PART I. FACILITY DESCRIPTION

The Ladd's Mill Project (the "Project"), exempted from licensing by the Federal Energy Regulatory Commission ("FERC") as Project No. P-8242, is owned by Worcester Hydro Company, Inc. The Project is located on the North Branch of the Winooski River in the Town of Worcester, Washington County, Vermont. The Project is approximately five miles upstream from the Wrightsville Reservoir Dam and a total of ten miles upstream from the main trunk of the Winooski River proper. The Winooski River flows westward into Lake Champlain. Eventually, these waters drain into the St. Lawrence River, becoming the St. Lawrence Seaway, and into the Atlantic Ocean.

The major Project works consist of a dam and impoundment, an intake structure and a powerhouse. Specifically, the Project consists of: (1) a concrete gravity dam, 80 feet long with a height of 21 feet to the crest, with an elevation of 729.13 feet mean sea level (msl), with an additional 1 foot to the top of the flashboard elevation of 730.13 feet msl, creating a pond level 1-inch below that at 730.05 msl, (2) an impoundment approximately 1950 feet long, with a surface area of 4.57 acres and 16 acre-feet gross storage, (3) a concrete powerhouse with a turbine-generator capacity of 187 kW, (4) a 18.5-foot long forebay with a width of 9 feet and an average depth of 14.55 feet, (5) a 40 feet long by 25 feet wide tailrace, and (6) three 100 kVA transformers, which convert 480V three phase power up to 23.0 kV, which travels out on a 40 foot long transmission line to connect with the lines of Green Mountain Power.

The powerhouse, also concrete, is built into the eastern end of the dam. The plunge pool at the base of the dam is in constant communication with the minimum flow released from the weir, as well as the tailrace and downstream river flow.

The Ladd's Mill Project is located about five miles upstream from another hydroelectric project on the North Branch, on Wrightsville Reservoir in Putnamville, VT. Above the Project are only the headwaters of the North Branch, with sparse development, a very rural character, and ultimately, near the top of the Worcester Range mountains, simply wild country.

Table 1. Facility Description Information for the Ladd's Mill Facility (Table B-1.)

Information Type	Variable Description	Response (and reference to further details)
Name of the Facility	Facility name (use FERC project name if possible)	Ladd's Mill
Location	River name (USGS proper name)	North Branch of the Winooski River
	River basin name	Winooski River Basin
	Nearest town, county, and state	Worcester, Washington County, Vermont
	River mile of dam above next major river	Est. 10 miles above Winooski Est. 5 miles above Wrightsville Dam
	Geographic latitude	44° 22' 21"
	Geographic longitude	72° 32' 42"
Facility Owner	Application contact names (IMPORTANT: you must also complete the Facilities Contact Form):	Hobart Guion, Worcester Hydro Co. Inc.
	- Facility owner (individual and company names)	(same as above)
	- Operating affiliate (if different from owner)	(same as above)
	- Representative in LIHI certification	(same as above)
Regulatory Status	FERC Project Number (e.g., P-xxxxx), issuance and expiration dates	P-8242-001, issued 6/11/1985
	FERC license type or special classification (e.g., "qualified conduit")	Exemption
	Water Quality Certificate identifier and issuance date, plus source agency name	See Appendix A: Letter issued 1/25/85 from The Agency of Environmental Conservation Amended 1/8/86 Dept. of Water Resources and Environmental Engineering
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	FERC eLibrary documents are microfilm. See Appendix A for copies of key records.

Power Plant Characteristics	Date of initial operation (past or future for operational applications)	August, 1986
	Total name-plate capacity (MW)	0.172 MW Ossberger Turbine (0.187 MW Siemens generator)
	Average annual generation (MWh)	440 MWh
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	One Ossberger 800 mm Cross-flow, 172kW Min. Flow: 22CFS Max. Flow: 141 CFS
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Run-of-river
	Dates and types of major equipment upgrades	Same equipment since 1985
	Dates, purpose, and type of any recent operational changes	August 2015: Re-model weir for our minimum release to conform to VT.'s Agency of Natural Resources "Best Practices"
	Plans, authorization, and regulatory activities for any facility upgrades	None
Characteristics of Dam, Diversion, or Conduit	Date of construction	Originally as saw mill in 1905. Re-furbished as electric generating facility in 1985
	Dam height	21 ft. plus 1 ft. flashboards
	Spillway elevation and hydraulic capacity	729.13 MSL, Hyd Cap. Est at 540 CFS
	Tailwater elevation	711.55 MSL
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	Forebay is 18.5 feet long with a width of 9 ft. and an average depth of 14.55 ft.
	Dates and types of major, generation-related infrastructure improvements	New stainless steel Trash Rack, 8/2013
	Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.)	Hydropower
	Water source	North Branch of the Winooski River
	Water discharge location or facility	North Branch of the Winooski River
Characteristics of Reservoir and Watershed	Gross volume and surface area at full pool	4.57 acre reservoir with a 16 acre-foot cap.
	Maximum water surface elevation (ft. MSL)	737 ft. MSL
	Maximum and minimum volume and water surface elevations for designated power pool, if available	Not available
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river	None

	mile	
	Downstream dam(s) by name, ownership, FERC number (if applicable), and river mile	N. Branch #3/Wrightsville, Washington Electric Co., FERC #5124. Est. 5 miles.
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation	None
	Area inside FERC project boundary, where appropriate	1.1 acres
Hydrologic Setting	Average annual flow at the dam	82 cfs
	Average monthly flows	JAN 47, FEB 41, MAR 107, APR 277, MAY 152, JUN 56, JUL 28, AUG 26, SEP 32, OCT 64, NOV 84, DEC 69
	Location and name of relevant stream gauging stations above and below the facility	Downstream gauge: Wrightsville USGS 04285500
	Watershed area at the dam	42.2 Sq. Miles
Designated Zones of Effect	Number of zones of effect	Two
	Upstream and downstream locations by river miles	Zone 1: RM zero to RM 0.29 Zone 2: RM 0.37 to RM zero
	Type of waterbody (river, impoundment, by-passed reach, etc.)	Zone 1: river Zone 2: impoundment
	Delimiting structures	Zone 1: Ladd's Mill dam down to rapids and entrance of third feeder stream Zone 2: Impoundment headwater down to Ladd's Mill dam
	Designated uses by state water quality agency	Class B waters
Additional Contact Information	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	See attached LIHI Facility Contact Form
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	See attached LIHI Facility Contact Form
Photographs and Maps	Photographs of key features of the facility and each of the designated zones of effect	See Appendix B
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	See Appendix C

PART II. STANDARDS SELECTION

The Ladd's Mill project site offers two designated zones of effect for this application. Zone one is defined as extending from the power plant intake, on the upstream of the dam, downstream 0.29 miles (1534 ft.), to the lip of a short stretch of shallow rapids and the entrance of a third small feeder stream from the east. See Figure 1.

Zone two is defined at the upstream start of the impoundment, 0.37 river miles (1954 ft.) upstream of the dam, down to the intake for the power plant. See Figure 2.

Figure 1



Figure 2

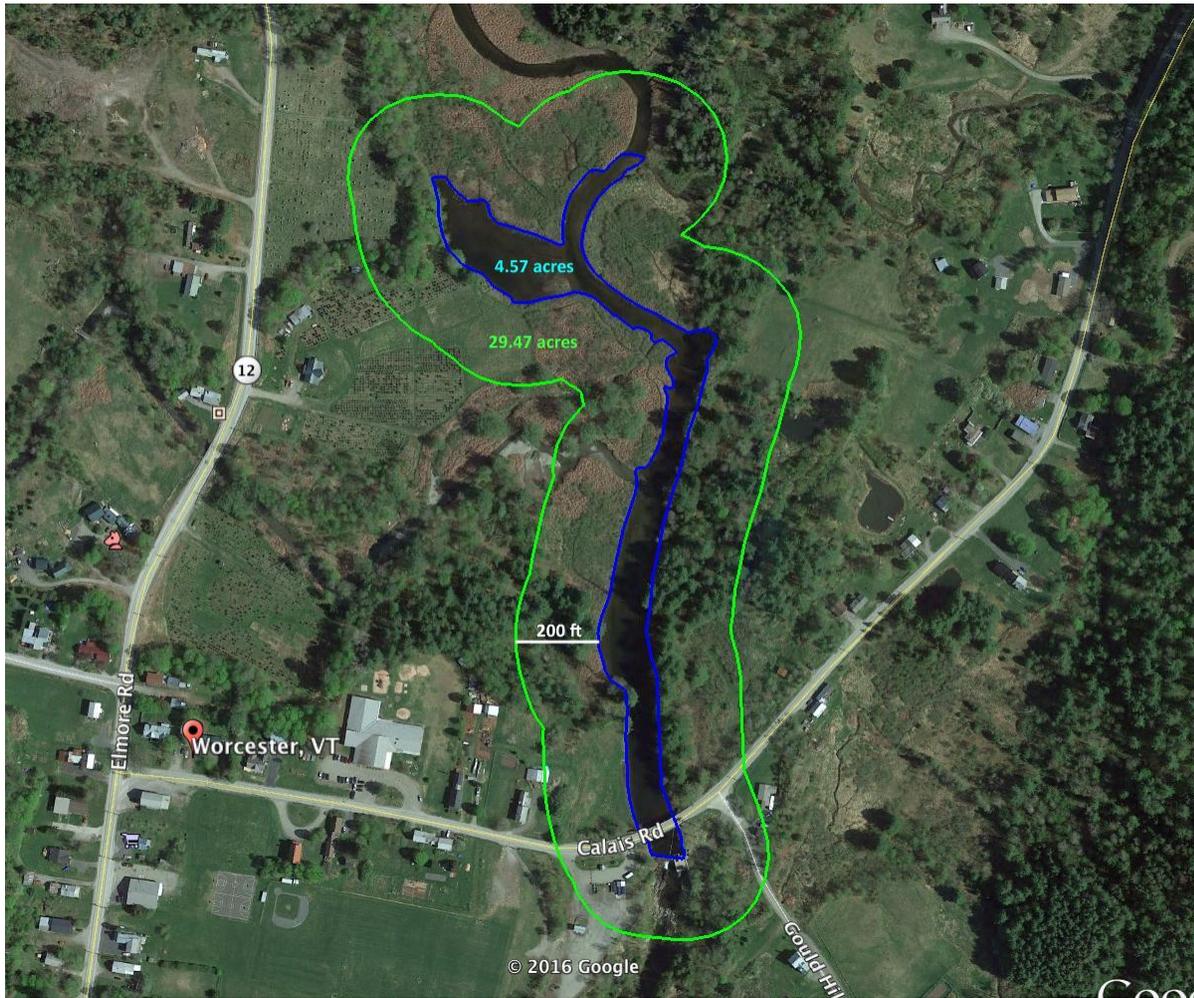


Table II-1. LIHI standards selected for Zone of Effect No. 1

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			X

Table II-2. LIHI standards selected for Zone of Effect No. 2

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			

PART III. Supporting Information

This section contains the information that explains and justifies the standards selected to pass the LIHI certification criteria (see Part II for selections).

III.A.1 Ecological Flow Standard for Zone 1.

Table III-1 Information Required to Support Ecological Flow Standards

Criterion	Standard	Instructions
A	2	<p><u>Agency Recommendation (see Appendix A for definitions):</u></p> <ul style="list-style-type: none"> Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

Source and Date: FERC Exemption 1985; US Dept. of the Interior, Office of Environmental Project Review, 1985; Vt. Dept. of Environmental Conservation, Letter in support of LIHI, 1/11/2016

Recommendation: Operate the facility in Run-of-River mode. Fish and Wildlife Resources concur with a release of a minimum of 10 CFS, or inflow to the project, whichever is less.

The 10 CFS minimum flow requirement assures both downstream fish passage and the continual oxygenation of the fish pool below the dam. The re-surfacing of the dam face down to the plunge pool, performed in 2014, and the modifications/re-siting to the weir releasing the minimum flow requirement, made in 2015, brought the site back into full compliance and meet the state's preferred operational goals.

III.A.2 Ecological Flow Standard for Zone 2.

Table III-2 Information Required to Support Ecological Flow Standards

Criterion	Standard	Instructions
A	2	<p><u>Agency Recommendation (see Appendix A for definitions):</u></p> <ul style="list-style-type: none"> • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Explain how the recommendation relates to agency management goals and objectives for fish and wildlife. • Explain how the recommendation provides fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream flow variations).

Source and Date: FERC Exemption 1985. US Dept. of the Interior, Office of Environmental Project Review, 1985.

Recommendation: The use of 12-inch wooden flashboards, designed to fail when overtopped with more than 2 feet of flooding, is allowed. Pond level is controlled by pressure sensitive transducers.

The raising of the pond due to the 12-inch flashboards has no appreciable negative effect upon the impoundment area. The failure of the wooden boards when overtopped by more than 2 feet of water ensures maximum hydraulic capacity at flooding events. A stable pond

elevation during regular run-of-the-river operations protects the aquatic habitat and its inhabitants.

III.B.1 Water Quality Standard for Zone 1.

Table III-3 Information Required to Support Water Quality Standards

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
B	2	<p><u>Agency Recommendation:</u></p> <ul style="list-style-type: none"> • If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. • Provide a copy of the most recent Water Quality Certificate, including the date of issuance. • Identify any other agency recommendations related to water quality and explain their scientific or technical basis. • Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.

Source and Date: VT. Agency of Environmental Conservation, Water Quality Certification, 1985. VT. Agency of Environmental Conservation, Amended Water Quality Certification, 1986. Vt. Dept. of Environmental Conservation, Letter in support of LIHI, 1/11/2016

The Vermont Department of Environmental Conservation classifies the waters of the Winooski River Basin as Class B, suitable for bathing and recreation; irrigation and agricultural uses: good fish habitat: good aesthetic value: and acceptable for public water supply with filtration and disinfection.

The 2016 letter from the Department updates and confirms our Water Quality Certification. Additionally, I trust it shows the present owners as committed stewards of the river; once shown the error of the minimal release flow that we inherited from the previous owners, corrective action was taken, including moving the weir to a more preferable location for downstream fish passage.

III.B.2 Water Quality Standard for Zone 2.

Table III-4 Information Required to Support Water Quality Standards

Criterion	Standard	Instructions
B	2	<p><u>Agency Recommendation:</u></p> <ul style="list-style-type: none"> • If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation. • Provide a copy of the most recent Water Quality Certificate, including the date of issuance. • Identify any other agency recommendations related to water quality and explain their scientific or technical basis. • Describe all compliance activities related to the water quality related agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations.

Source and Date: Vt. Agency of Environmental Conservation, Water Quality Certification, 1985. Vt. Agency of Environmental Conservation, Amended Water Quality Certification, 1986. Vt. Dept. of Environmental Conservation, Letter in support of LIHI, 1/11/2016

Recommendation: “Historical data indicates that the stream has excellent water quality characteristics. The Department concludes that the project will not significantly degrade water quality if the proposed minimum flows are maintained”.

The 2016 letter from the VTDEC updates and confirms our Water Quality Certification.

III.C.1 Upstream Fish Passage Standard for Zone 1.

Table III-5 Information Required to Support Upstream Fish Passage Standards

Criterion	Standard	Instructions
C	2	<p><u>Agency Recommendation:</u></p> <ul style="list-style-type: none"> • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is or is not part of a Settlement Agreement. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Source and Date: VT. Agency of Environmental Conservation, Water Quality Certification, 1985. US Dept. of the Interior, Office of Environmental Project Review, 1985.

Recommendation: The fishery in the project area consists primarily of brook, rainbow and brown trout, all non-migratory. Any future plans by the VT Fish and Wildlife to restore landlocked salmon and steelhead trout (migratory species) to the North Branch will be achieved through a trap-and-truck operation, costs shared with the Exemptee.

In addition, the dam downstream at Wrightsville does not have any upstream fish passages, nor are they conducting a trap-and-truck operation. Migratory fish are no longer present within the Winooski River and its tributaries, and restoration is unlikely for the foreseeable future.

III.C.2 Upstream Fish Passage Standard for Zone 2.

Table III-6 Information Required to Support Upstream Fish Passage Standards

Criterion	Standard	Instructions
C	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

Source and Date: VT. Agency of Environmental Conservation, Water Quality Certification, 1985. US Dept. of the Interior, Office of Environmental Project Review, 1985.

There are no upstream fish passage barriers or migratory fish management issues in Zone 2 because it is an impoundment. Furthermore, there are presently no species of migratory fish.

Historical studies point to the loss of native salmon and steelhead fisheries in Vermont by the middle of the nineteenth century. Check out this article for reference:

<http://www.angelfire.com/home/lake/salmonsteel.html>

III.D.1 Downstream Fish Passage Standard for Zone 1.

“In all cases, 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.”

Anadromous fish are not purported to visit these waters. The North Branch of the Winooski River is known to contain such cold water species as: brook trout, rainbow trout, and brown trout. Historically, steelhead and/or landlocked salmon may have inhabited these tributaries of the Winooski River.

Table III-7 Information Required to Support Downstream Fish Passage Standards

Criterion	Standard	Instructions
D	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines). • For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles. • Document available fish distribution data and the lack of migratory fish species in the vicinity. • If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.

Source and Date: VT. Agency of Environmental Conservation, Water Quality Certification, 1985. US Dept. of the Interior, Office of Environmental Project Review, 1985.

There are no downstream fish passage barriers or migratory fish management issues in Zone 1 because waters leaving the Ladd's Mill facility are free flowing to the Wrightsville Reservoir located some 5 miles downstream. From Wrightsville, it is another 5 miles to reach the larger main trunk of the Winooski River itself. Furthermore, there are presently no species of migratory fish.

III.D.2 Downstream Fish Passage Standard for Zone 2.

Table III-8 Information Required to Support Downstream Fish Passage Standards

Criterion	Standard	Instructions
D	2	<p><u>Agency Recommendation:</u></p> <ul style="list-style-type: none"> • Identify the proceeding and source, date, and specifics of the agency recommendation applied (NOTE: there may be more than one; identify and explain which is most environmentally stringent). • Explain the scientific or technical basis for the agency recommendation, including methods and data used. This is required regardless of whether the recommendation is part of a Settlement Agreement or not. • Describe any provisions for fish passage monitoring or effectiveness determinations that are part of the agency recommendation, and how these are being implemented.

Source and Date: VT. Agency of Environmental Conservation, Water Quality Certification, 1985. Vermont Agency of Environmental Conservation Letter addressing Weir, 11/5/1986. Vermont Dept. of Environmental Conservation Letter in support of LIHI, 1/11/2016.

The original weir was a four-foot section of the 12-inch flashboard height “removed”. The current owners of Worcester Hydro *inherited* this weir – but with two stoplogs in place limiting the flow below the 10 cfs requirement. Unaware of this discrepancy, this was the way the weir was left when, during a meeting with state ANR officials to speak of other matters, it was observed and corrective advice offered (remove the stoplogs). In addition, the officials offered their opinion on improvements to the weir design itself, in promotion of best practices; preferably a deeper channel and one closer to the intake of the facility.

Recommendation and Action: The Agency offered two different designs to choose from, in order to conform to best practices. Worcester Hydro chose the deeper-but-narrower design, installing a 24-inch wide by 18-inch deep channel to fulfill our minimum flow requirement and facilitate downstream fish passage.

III.E.1 Watershed and Shoreline Protection Standards for Zone 1.

Table III-9. Information Required to Support Shoreline and Watershed Protection Standards

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
<i>E</i>	<i>1</i>	<p><i>Not Applicable / De Minimis Effect:</i></p> <ul style="list-style-type: none"> • <i>If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary).</i> • <i>Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.</i>

The facility sits upon a 1.1 acre site, excluding the river, and is comprised of a mixed hardwood forest returning from cleared land. See *Figure 3*. The hand of man is subliminally evident as the remains of the original saw mill (mostly demolished concrete and various twisted metal pieces) can be found scattered about and poking through the underbrush. The Zones of Effect are mostly abutting private property and therefore are beyond the control of the project.

The first several hundred feet of Zone 1 are contained by alternating walls of ledge and stony bars of cobble-sized rocks. Erosion here is happening on geologic time. See the photos in Appendix B.

Shoreline Management Plans are not described in any of the permits, orders or certificates required for operation of the facility, nor is there any evidence of such within the files of Worcester Hydro.

Figure 3



III.E.2 Shoreline and Watershed Protection Standards for Zone 2.

Table III-10. Information Required to Support Shoreline and Watershed Protection Standards

Criterion	Standard	Instructions
<i>E</i>	<i>1</i>	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • <i>If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary).</i> • <i>Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.</i>

The impoundment is a) typically a slow current, and b) mostly abutting private property beyond the control of the project. It has one, relatively short, segment of shoreline that is high ledge but is otherwise mostly low angle, wide, expansive grass- or reed-covered shore.

No request for a Shoreline Management Plan is known to exist; none are on file.

III.F.1. Threatened and Endangered Species Standards for Zone 1.

“In all cases, the applicant shall identify all listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies.”

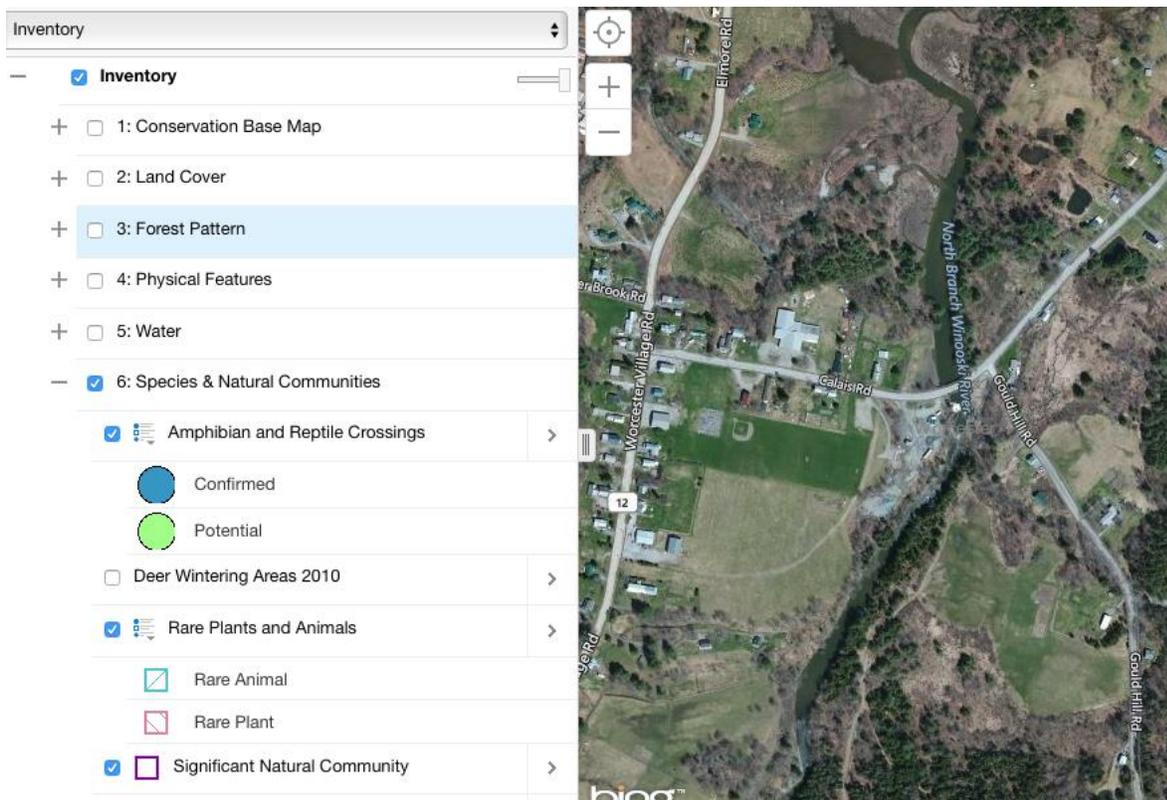
Table III-11. Information Required to Support Threatened and Endangered Species Standards

<i>Criterion</i>	<i>Standard</i>	<i>Instructions</i>
F	1	<p><i>Not Applicable / De Minimis Effect:</i></p> <ul style="list-style-type: none"> • Document that there are no listed species in the facility area or affected riverine zones downstream of the facility. • If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species. • If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.

Source: The Vermont ANR “Biofinder” GIS mapping site, with the added layer of “rare animals and rare plants”. No green or red shaded areas, within the Ladd’s Mill site, indicates an absence of endangered or rare species.

See Figure 4, below, for the current status of rare plant and animals within the site (none). Otherwise the present owners of the site have been happy to find deer, weasel and otter sign, and been extremely pleased to observe families of mergansers and minks, watch the diving flight of kingfishers soaring over the crest of the dam, help a snapping turtle downstream, become entranced with watching a teeny turtle *scale* the dam while heading upstream, and to have been startled by the warning slap of a beaver’s tail.

Figure 4



III.F.2. Threatened and Endangered Species Standards for Zone 2.

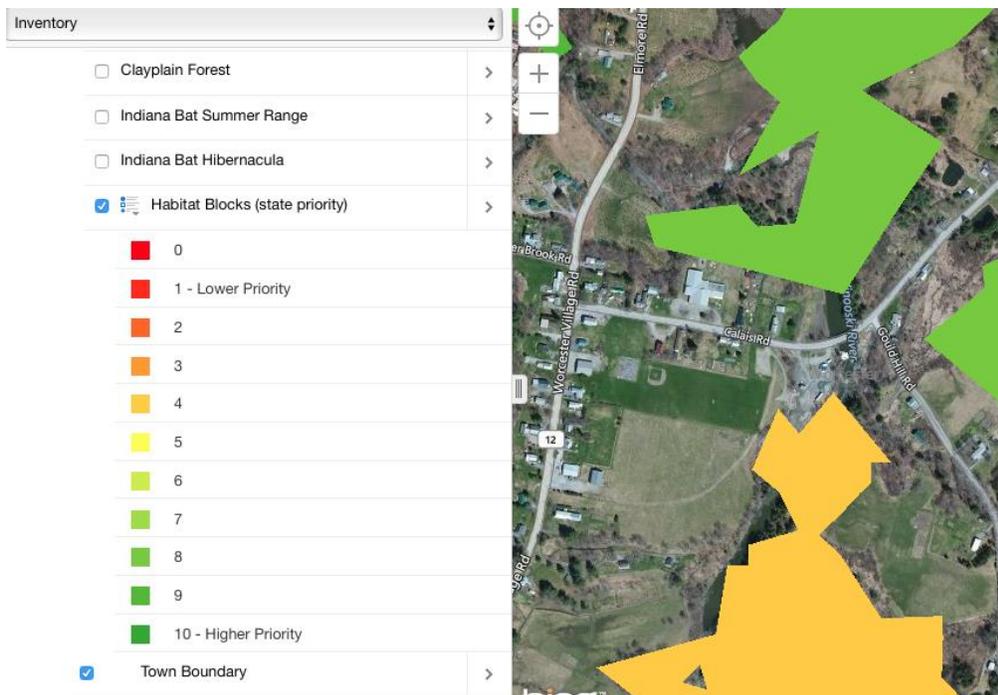
Table III-12. Information Required to Support Threatened and Endangered Species Standards

Criterion	Standard	Instructions
F	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • Document that there are no listed species in the facility area or affected riverine zones downstream of the facility. • If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species. • If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.

Source: The Vermont ANR “Biofinder” GIS mapping site, with the added layer of “rare animals and rare plants”. No green or red shaded areas, within the Ladd’s Mill site, indicates an absence of endangered or rare species.

While the site isn’t home to rare plant or animals, it is a beautiful, rural place that is frequented by, or home to, numerous species, many of which we have spent time blissfully observing. To accent the habitat that Ladd’s Mill resides in, please refer to Figure 4, which displays the state’s prioritized “habitat blocks”. The landscape, upstream of our dam, is largely forested, while the downstream is (aging) agricultural.

Figure 4



III.G.1 Cultural and Historic Resources Standards for Zone 1.**Table III-13. Information Required to Support Cultural and Historic Resources Standards**

Criterion	Standard	Instructions
G	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility. • Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are present on facility lands.

Source and Date: Vt. Agency of Development and Community Affairs, 8/5/1982

To see current documents pertaining to the Worcester, VT. area, please follow the link here:

http://orc.vermont.gov/Documents/Worcester_HistoricSurvey_SurveyForm_0000004.pdf

The second document, within this link, is a map showing the area around Ladd's Mill. Specifically, historic sites #7 and #8 are those that are nearest to the facility, and yet, they are well outside the perimeter of the site and it's zones-of-effect. No other cultural or historic sites are identified.

III.G.2 Cultural and Historic Resources Standards for Zone 2.**Table B-14. Information Required to Support Cultural and Historic Resources Standards**

Criterion	Standard	Instructions
G	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> • Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility. • Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are present on facility lands.

Sources: See the above.

III.H.1 Recreational Resources Standards for Zone 1.**Table B-15. Information Required to Support Recreational Resources Standards**

Criterion	Standard	Instructions
H	2	<u>Agency Recommendation:</u>

		<ul style="list-style-type: none"> • Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.
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Source and Date: US Dept. of the Interior, Office of Environmental Project Review, 1985

Item 5 of the above-referenced letter states the following: *“The Exemptee shall allow public access to the project area for utilization of public resources, subject to reasonable safety and liability limitations”.*

While insurance/safety protocol requires that the physical structures of Ladd’s Mill bear “danger” and “no trespassing” signs, fishermen and canoeists have been free to park at our site and access the river. After the effects of Hurricane Irene in 2011, to mitigate the danger of getting to the river south of the facility, we reached out to the good folks at *Vermont River Conservancy* who, in the spring of 2014, were able to construct an amazing stone stairway to reach the shore. To see the website of VRC and check out a photo of the stairway, please check out this link:

<http://www.vermontriverconservancy.org/ladds-mill-access>

III.H.2 Recreational Resources Standards for Zone 2.

Table B-16. Information Required to Support Recreational Resources Standards

Criterion	Standard	Instructions
H	2	<u>Agency Recommendation:</u> <ul style="list-style-type: none"> • Document any comprehensive resource agency recommendations and enforceable recreation plan that is in place for recreational access or accommodations. • Document that the facility is in compliance with all such recommendations and plans.

Source and Date: US Dept. of the Interior, Office of Environmental Project Review, 1985

Item 5 of the above-referenced letter states the following: *“The Exemptee shall allow public access to the project area for utilization of public resources, subject to reasonable safety and liability limitations”.*

Although there isn’t an amazing stone structure to lead people to the impoundment area, the area is open to fishermen and others via age-old dirt footpaths. This area is often visited by folks trapping crayfish.

PART IV. SWORN STATEMENT AND WAIVER

As an Authorized Representative of Worcester Hydro Co. Inc. the Undersigned attests that the material presented in the application is true and complete.

The Undersigned acknowledges that the primary goal of the Low Impact Hydropower Institute's Certification Program is public benefit, and that the LIHI Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions.

The undersigned further acknowledges that if certification of the applying facility is issued, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified.

The undersigned Applicant further agrees to hold the Low Impact Hydropower Institute, the Governing Board and its agents harmless for any decision rendered on this or other applications, from any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other action pursuant to the Low Impact Hydropower Institute's Certification Program.

PLEASE INSERT ONLY FOR PRE-OPERATIONAL CERTIFICATIONS (See Section 4.5.3):

For applications for pre-operational certification of a "new" facility the applicant must also acknowledge that the Institute may suspend or revoke the certification should the impacts of the project, once operational, fail to comply with the certification criteria.

Company Name: Worcester Hydro Co. Inc.

Authorize Representative Name: Hobart Guion Title: President

State of Vermont

County of Washington

On this, the ____ day of _____, 2016, before me a notary public, the undersigned officer, personally appeared _____, known to me (or satisfactorily proven) to be the person whose name is subscribed to the within instrument, and acknowledged that he executed the same for the purposes therein contained. In witness hereof, I hereunto set my hand and official seal.

Notary Public _____

PART V. CONTACTS**1. Facility Contacts**

Project Owner:	
Name and Title	Hobart Guion, President,
Company	Worcester Hydro Co. Inc.
Phone	802-223-1808
Email Address	hgguion@gmail.com
Mailing Address	345 Kelton Rd. East Montpelier, VT. 05651
Project Operator (if different from Owner):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	
Company	
Phone	
Email Address	
Mailing Address	
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Same as Above
Company	
Phone	
Email Address	
Mailing Address	
Party responsible for accounts payable:	
Name and Title	Same As Above
Company	
Phone	
Email Address	
Mailing Address	

2. Current state, federal, provincial, and tribal resource agency contacts.

Agency Contact (Check area of responsibility: Flows <input checked="" type="checkbox"/> , Water Quality <input checked="" type="checkbox"/> , Fish/Wildlife Resources <input type="checkbox"/> , Watersheds <input checked="" type="checkbox"/> , T/E Spp. <input type="checkbox"/> , Cultural/Historic Resources <input type="checkbox"/> , Recreation <input 454="" 484="" 935="" 952"="" data-label="Page-Footer" type="checkbox/>)</td> </tr> <tr> <td>Agency Name</td> <td>Vermont Department of Environmental Conservation</td> </tr> <tr> <td>Name and Title</td> <td>Jeff Crocker, River Ecologist</td> </tr> <tr> <td>Phone</td> <td>802-490-6151</td> </tr> <tr> <td>Email address</td> <td>Jeff.Crocker@vermont.gov</td> </tr> <tr> <td>Mailing Address</td> <td>1 National Life Drive, Main 2, Montpelier, VT. 05620-3522</td> </tr> </table> </div> <div data-bbox="/> 22	
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Agency Contact (Check area of responsibility: Flows __, Water Quality <input checked="" type="checkbox"/> , Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Vermont Agency of Natural Resources, Fish and Wildlife Division
Name and Title	Tim Appleton, <i>Fish and Wildlife Specialist</i>
Phone	802-476-0198
Email address	tim.appleton@vermont.gov
Mailing Address	5 Perry ST., Suite 40, Barre, VT. 05641

Agency Contact (Check area of responsibility: Flows <input checked="" type="checkbox"/> , Water Quality __, Fish/Wildlife Resources <input checked="" type="checkbox"/> , Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	US Fish and Wildlife Service
Name and Title	Wendi Weber, <i>Regional Director</i>
Phone	413-253-8300
Email address	Wendi_Weber@fws.gov
Mailing Address	300 Westgate Center Drive, Hadley, MA 01035

Agency Contact (Check area of responsibility: Flows <input checked="" type="checkbox"/> , Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __):	
Agency Name	Federal Energy Regulatory Commission
Name and Title	John Spain, <i>Regional Engineer</i>
Phone	212-273-5900
Email address	John.Spain@ferc.gov
Mailing Address	19 West 34 th St., Suite 40, New York, NY 10001

Agency Contact (Check area of responsibility: Flows __, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources <input checked="" type="checkbox"/> , Recreation __):	
Agency Name	Vermont State Historic Preservation Office
Name and Title	Laura Trieschmann, <i>Officer</i>
Phone	802-828-3222
Email address	http://accd.vermont.gov/contact
Mailing Address	1 National Life Drive, Deane Davis Bldg., 6 th Floor, Montpelier, VT. 05620-0501

Appendix A. Referenced Material

- 1) FERC Exemption 1985
- 2) US Dept. of the Interior, Office of Environmental Project Review, 1985
- 3) Vt. Agency of Environmental Conservation, Water Quality Certification, 1985.
- 4) Vt. Agency of Environmental Conservation, Amended Water Quality Certification, 1986.
- 5) Vt. Agency of Environmental Conservation Letter addressing Weir, 11/5/1986.
- 6) Vt. Agency of Natural Resources Letter in support of LIHI, 1/11/2016.
- 7) Vt. Agency of Development and Community Affairs, 8/5/1982
- 8) Sworn Statement and Waiver

Appendix B.

Forebay, Top of Powerhouse and crest of Dam



Reconfigured Downstream Weir



Retaining Wall (Re-facing partly completed summer of 2016)



Transition Piece and Ossberger Tubine



Appendix C.

Map of Project and Site



Ladd's Mill Watershed.

