LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

MIDDLE RAQUETTE RIVER HYDROELECTRIC PROJECT

(FERC NO. 2320)

Prepared for:

Brookfield Renewable

Prepared by:

August 2019

LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

MIDDLE RAQUETTE
HYDROELECTRIC PROJECT
(FERC PROJECT NO. 2320)

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LOW-IMPACT HYDROPOWER POWER INSTITUTE CERTIFICATION APPLICATION

MIDDLE RAQUETTE HYDROELECTRIC PROJECT (FERC NO. 2320)

1.0 FACILITY DESCRIPTION

The Middle Raquette River Hydroelectric Project (MRRP), Federal Energy Regulatory Commission (FERC) No. 2320, is owned and operated by Erie Boulevard Hydro, L.P. (Erie, or Brookfield) and is located along the Raquette River, beginning near Colton, New York. The four developments (Higley, Colton, Hannawa, and Sugar Island) are all located in an 9-mile reach of the river (RM 47 to RM 38) above its confluence with the St. Lawrence River. From its source in the Adirondack Mountains in New York, the Raquette River flows generally northwest and has a mainstem of 146 miles. The Raquette River drains an area that is approximately 1,253 square miles in size. The river is the source for numerous hydroelectric plants along its entire length.

1.1 PROJECT DESCRIPTION

The MRRP consists of the following four developments on the Raquette River: Higley, Colton, Hannawa, and Sugar Island. The four developments have a total installed capacity of 48,323 kW.

Higley - The Higley Development includes a 34-foot-high dam with 3-foot-high flashboards, two flood gates, a trashrack, two waste gates; a 742-acre reservoir; a concrete intake structure equipped with four steel headgates; four 8-foot diameter buried steel penstocks convey water to the turbines having a length of 202 feet, 212 feet, 221 feet, and 230 feet long; and a powerhouse containing four generating units with a total capacity of 6,300 kW.

Colton - The Colton Development includes a 33-foot-high dam with 2-foot-high flashboards, a log flume, a trash gate, and a gated spillway; a 152-acre-reservoir; an 11,990-foot-long steel pipeline; three penstocks; and a powerhouse containing three generating units with a total capacity of 30,101 kW.

Hannawa - The Hannawa Development has a 40-foot-high dam with 3.5-foot-high flashboards, a log chute, a Taintor gate, and a sluice gate; a 204-acre reservoir; a 2,700-foot-long canal; two penstocks; and a powerhouse containing two generating units with a total capacity of 7,200 kW.

Sugar Island -The Sugar Island Development has a 37-foot-high dam with two Taintor gates; a 29-acre reservoir; an intake structure with trash racks and a headgate; a 4,700-foot-long steel pipeline; two penstocks; and a powerhouse containing two generating units with a total capacity of 4,700 kW.

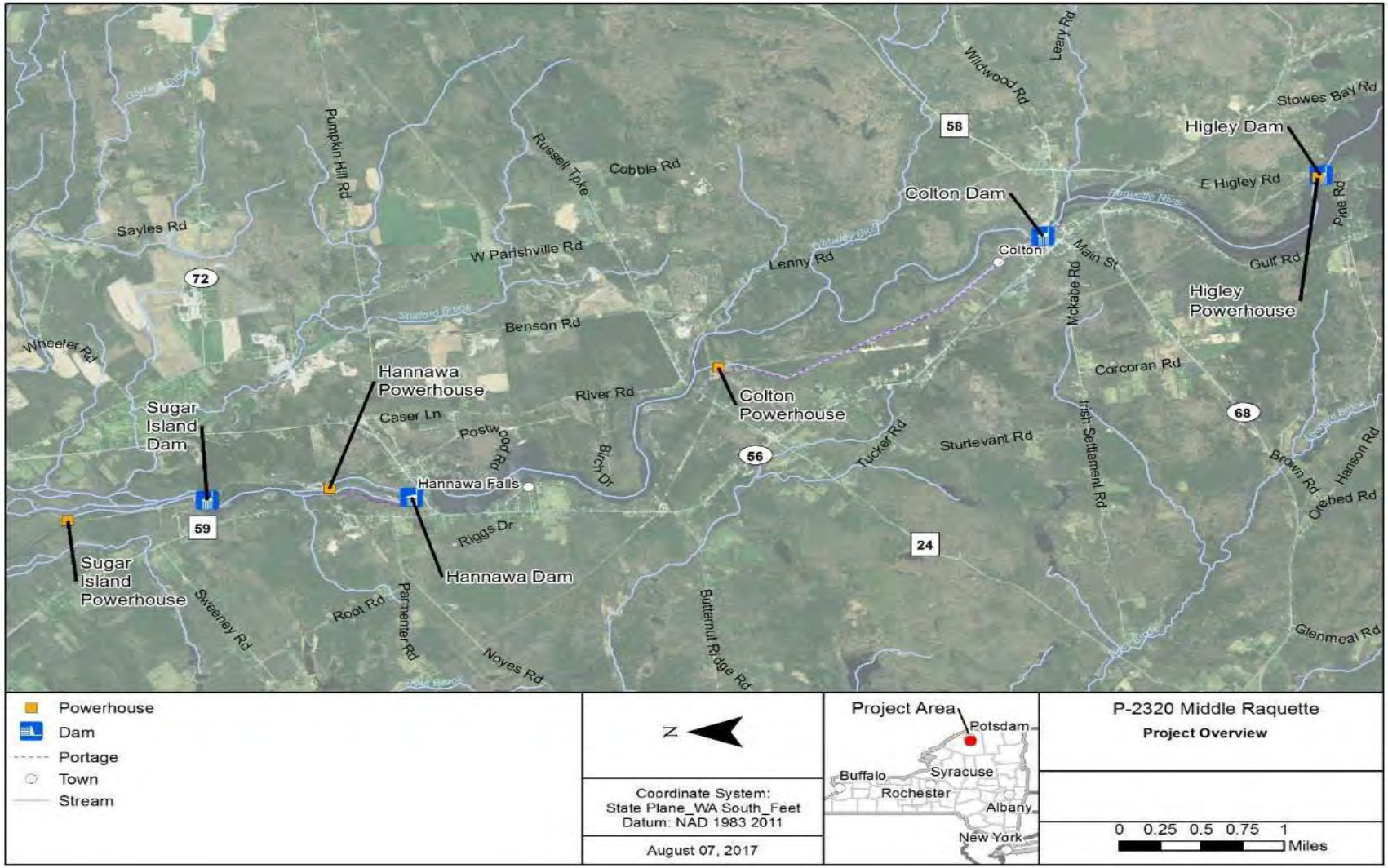


FIGURE 1 OVERVIEW OF MIDDLE RAQUETTE HYDROELECTRIC PROJECT LOCATIONS

1.2 PROJECT OPERATIONS

Operations are coordinated with Erie's other LIHI projects on the Raquette River. As described in the Raquette River Project Offer of Settlement (RRPSO), submitted to FERC on April 22, 1998 and the 2002 FERC license, the Project's most upstream development, Higley, operates as a re-regulating development to provide steadier flows for the downstream hydroelectric facilities.

Each of the developments below Higley are allowed to operate in a pulsing mode that limits the normal reservoir fluctuation at Colton and Hannawa to no more than 0.4 feet, and at Sugar Island to no more than 1.0 foot.

1.3 REGULATORY AND COMPLIANCE HISTORY

Since issuance of the 2014 LIHI Certification for the Middle Raquette River Project, Erie was required to meet two conditions: (1) *the facility owner shall develop a draft Deviation Reduction Plan (DRP) and submit it to LIHI no later than three months after LIHI certification of Project. The DRP should proactive operational control approaches for dam releases and pond level maintenance that will reduce the likelihood of operational deviations occurring in the future. The DRP needs to address the specific problems and potential recommendations identified in the reviewer's report. Options to be considered should include audible alarms in control centers and programmable logic controllers. The DRP shall describe options considered, those selected, and a schedule for implementation. LIHI staff will review and comment on the draft plan and be available to assist in the development of the DRP, if requested. The final DRP needs to be completed and agreed to by both [the licensee] and LIHI no later the six months after LIHI certification.; and (2) facility owner shall provide annual reports to LIHI documenting operational deviations from instream flow or pond levels that occurred throughout each year of certification. The report shall describe all deviations that have occurred, regardless of whether the deviations were planned or unintentional or whether they are eventually deemed as not violating the license by FERC. The report is due at the same time as the annual compliance statement and payment of the annual certification fee*.

- To mitigate the future reoccurrence, The System Operator at the North American System Control Center developed a procedure for 3-way communication. The 3- way communication helps to ensure there is clear direction of actions to be taken and who will take those actions. The measures taken by the NASCC have resulted in no license violations of the Middle Raquette license since 2014.
- Regarding the second condition, Brookfield filed its 2018 compliance report July 2, 2018.[1]

[1] 20190321-3130 (CEII eLibrary document)

1.4 MIDDLE RAQUETTE FACILITY DESCRIPTION INFORMATION (LIHI CERTIFICATE #14B)

TABLE 1. FACILITY DESCRIPTION INFORMATION FOR MIDDLE RAQUETTE HYDROELECTRIC PROJECT (LIHI #14b)

Information Type	*Variable Description*	*Response (and reference to further details)*
Name of the Facility	Facility name (use FERC project name if possible)	Middle Raquette Hydroelectric Project (FERC No. 2320) referred to as the "MRRP" throughout this application.
Location	River name (USGS proper name)	Raquette River
	River basin name	Raquette River Drainage Basin
	Nearest town, county, and state	Colton, New York; Hannawa Falls, NY; and Potsdam, NY
	River mile of dam above next major river	The MRRP is located at RM 47 to RM 38 on the Raquette River.
	Geographic latitude	Higley (44.53053 N) Colton (44.55520 N) Hannawa (44.61185 N) Sugar Island (44.7433 N)
	Geographic longitude	Higley (-74.93198 W) Colton (-74.93935 W) Hannawa (-74.97466 N) Sugar Island (-75.0053 N)
Facility Owner	Application contact names:	Danny Maguire, Compliance Manager (Atlantic Operations, NY), 184 Elm Street, Potsdam, NY 13676
	Facility owner (individual and company names)	Erie Boulevard Hydro, L.P, a subsidiary of Brookfield Renewable, 200 Donald Lynch Boulevard, Marlborough, MA 01752
	Operating affiliate (if different from owner)	N/A
	Representative in LIHI certification	Jot Splenda Louis Berger - WSP 1001 Wade Ave # 400, Raleigh, NC 27605
Regulatory Status	FERC Project Number, issuance and expiration dates	Project No. 2320 Issued: 2/01/2002 (31 years and 11 months) Expires: 12/31/2033

	FERC license type or special classification	Major
	Water Quality Certificate identifier and issuance date, plus source agency name	A Water Quality Certificate (WQ-6-4099-00007/0001) was issued by the New York Department of Environmental Conservation on October 13, 2006 (Appendix C).
	Hyperlinks to key electronic records on FERC e-library website (e.g., most recent Commission Orders, WQC, ESA documents, etc.)	2002 FERC License WQC
Power Plant Character-istics	Date of initial operation (past or future for operational applications)	The MRRP developments were constructed between in 1928. All four developments were updated (capacity) from 2006 through 2007.
	Total name-plate capacity (MW)	48.3 MW
	Average annual generation (GWh)	330.82 GWh
	Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit	Higley (4 units, 6,100 kW, min capacity 1,800 cfs, max capacity 2,045 cfs) Generators (4) – Potencia S.A (1,750 kVA, 0.9 PF) Colton (3 units, 30,101 kW, min capacity 1,241 cfs, max capacity 1,503 cfs) Generators (3) – Allis (11,900 kVA, 0.8 PF), Chalmers (12,500 kVA, 0.8 PF), GE (12,500 kVA, 0.8 PF) Hannawa (2 units, 7,200 kW, min capacity 450 cfs, max capacity 1,440 cfs) Generators (2) – GE (4,500 kVA, 0.8 PF) Sugar Island (2 units, 4,700 kW, min capacity 900 cfs, max capacity 1,190 cfs) Generators (2) – GE (3,000 kVA, 0.8 PF)
	Modes of operation (run-of-river, peaking, pulsing, seasonal storage, etc.)	Higley: Re-regulating Colton: Pulsing Hannawa Pulsing Sugar Island: Pulsing
	Dates and types of major equipment upgrades	On December 13, 2011, EBH notified FERC of its initial powerhouse rehabilitation construction for its Hannawa Falls development. No changes were made to the powerhouse's turbines or generators. The final construction report was submitted to FERC on

		October 22, 2013.
	Dates, purpose, and type of any recent operational changes	No major operational changes have occurred at the Project.
	Plans, authorization, and regulatory activities for any facility upgrades	No major facility upgrades are planned in the near future.
Character-istics of Dam, Diversion, or Conduit	Date of construction	All four MRRP developments were built between 1911 to 1924.
	Dam height	Higley: 34-feet-high Colton: 27-feet-high Hannawa 40-feet-high Sugar Island: 37-feet-high
	Spillway length and elevation and	Higley (209-feet-long; crest elevation of 883.6 feet mean sea level (msl)) Colton (207.67-feet-long; crest elevation of 837.0 feet msl) Hannawa (215-feet-long; crest elevation of 552.0 feet msl) Sugar Island (192 feet-long; crest elevation of 470.0 feet msl)

Information Type	***Variable Description***	***Response (and reference to further details)***
	Tailwater elevation	Higley (847 feet msl) Colton (552.5 feet msl) Hannawa (522 feet msl) Sugar Island (406.7 feet msl)
	Length and type of all penstocks and water conveyance structures between reservoir and powerhouse	Higley: A 160-foot long by 50-foot wide flume formed by concrete retaining walls on each side; a 13-foot diameter, 225-foot long steel pipeline directly inflow to a new powerhouse. Four 8-foot diameter steel buried penstocks extend 200 to 230 feet from the intake to the new powerhouse. Colton: A steel pipeline, 9,890-feet long with a diameter of 13.5-feet transitioning to a 2,100-feet long steel pipeline with a diameter of 12-feet; three penstocks of lengths 160-feet, 140-feet, and 125-feet, and diameters of 7.5-feet, 7.5-feet, and 9-feet respectively. Hannawa: 2,700-foot long canal measuring 30-feet wide at the bottom, 120-feet wide at the top, with an average depth of 22-feet, equipped with trashracks that completely cover the canal entrance; two 10-foot

		diameter penstocks 190-feet long Sugar Island: A 4,700-foot long steel pipeline; Two 8-foot-diameter penstocks
	Dates and types of major, generation- related infrastructure improvements	On December 13, 2011, EBH notified FERC of its initial powerhouse rehabilitation construction for its Hannawa Falls development. No changes were made to the powerhouse's turbines or generators. The final construction report was submitted to FERC on October 22, 2013.
	Designated facility purposes	The purpose of this facility is to generate power to be supplied to the local grid.
	Water source	Raquette River
	Water discharge location or facility	Water utilized by each MRRP discharges directly into the waters of the Raquette River directly below each development powerhouse.
	Usable volume	Higley (4,400 acre-feet) Colton (620 acre-feet) Hannawa (690 acre-feet) Sugar Island (55 acre-feet)
Characte-ristics of Reservoir and Watershed	Surface area at full pool	Higley (742 acres; 880.6 feet msl) Colton (152 acres; 837.0 feet msl) Hannawa (552 acres; 552.0 feet msl) Sugar Island (29 acres; 470.0 feet msl)
	Maximum water surface elevation (ft. MSL)	See above.
	Normal maximum volume and water surface elevations for designated power pool, if available	Higley (4,400 acre-feet; 880.6 feet msl) Colton (620 acre-feet; 837.0 feet msl) Hannawa (690 acre-feet; 552.0 feet msl) Sugar Island (55 acre-feet; 470.0 feet msl)
	Upstream dam(s) by name, ownership, FERC number (if applicable), and river mile	Upstream Dam: South Colton Dam (Upper Raquette River Project) Owner: Erie FERC No.: 2060 River Mile (RM): 52 Status: In Service Downstream Dam: East and West Dams at Potsdam

		(Potsdam Hydroelectric Project) Owner: Village of Potsdam FERC No.: 2869 RM: 35 Status: In Service	
	Operating agreements with upstream or downstream reservoirs that affect water availability, if any, and facility operation	In accordance with FERC License Order, and the Settlement Agreement, the Higley development operates in a re-regulating mode to provide steadier infows for the downstream facilities. The remaining three developments all operate in a pulsing mode.	
	Area inside FERC project boundary, where appropriate	406.72 acres, approximately	
Hydrologic Setting	Average annual flow at the development dams (prorated for dam location)	Higley (1,932 cfs) Colton (1,936 cfs) Hannawa (1,960 cfs) Sugar Island (1,962 cfs)	
	Average monthly flows of Raquette River at South Colton, NY USGS Gage 04267500	Annual Monthly Mean for the period 1953 through 2018:	January – 1,730 cfs February – 1,690 cfs March – 2,110 cfs April – 3,210 cfs May – 3,260 cfs June – 1,860 cfs July – 1,350 cfs August – 1,140 cfs September – 1,110 cfs October – 1,410 cfs November – 1,580 cfs December – 1,710 cfs

	Location and name of relevant stream gauging stations above and below the facility	USGS Gage 04267500 is located at: Lat 44°30'35.4", long 74°53'01.0", St. Lawrence County, NY, Hydrologic Unit 04150305, near the route 56 bridge, approximately 3.5 miles upstream of the Higley Dam. USGS Gage 04268000 is located at: Lat 44°50'20", long 74°58'44", St. Lawrence County, NY, Hydrologic Unit 04150305, on right bank 250 ft upstream from bridge on Grant Road at Raymondville.
	Watershed area at the dam	Higley (979 square miles) Colton (981 square miles) Hannawa (993 square miles) Sugar Island (994 square miles)
	Number of zones of effect (Upstream to Downstream)	**Higley Development** Impoundment ZOE Bypass ZOE Downstream ZOE **Colton Development** Impoundment ZOE Bypass ZOE Downstream ZOE **Hannawa Development** Impoundment ZOE Bypass ZOE Downstream ZOE **Sugar Island Development** Impoundment ZOE Bypass ZOE Downstream ZOE
		See Appendix A for a depiction of Project ZOEs.

Designated Zones of Effect	Upstream and downstream locations by river miles	**Higley Development** Zone 1 Impoundment ZOE: RM 52 (South Colton Powerhouse) to RM 47 (Higley Dam) Zone 2 Bypass ZOE: RM 47 (Higley Dam) to RM 46.5 (Higley Powerhouse tailrace) Zone 3 Downstream ZOE: RM 46.5 (Higley Powerhouse tailrace) to RM 45 (Colton Dam) **Colton Development** Zone 1 Impoundment ZOE: RM 46.5 (Higley Powerhouse tailrace) to RM 45 (Colton Dam) Zone 2 Bypass ZOE: RM 45 (Colton Dam) to RM 42 (Colton powerhouse tailrace) Zone 3 Downstream ZOE: RM 42 (Colton Powerhouse tailrace) to RM 39 (Hannawa Dam) **Hannawa Development** Zone 1 Impoundment ZOE: RM 42 (Colton Powerhouse tailrace) to RM 39 (Hannawa Dam) Zone 2 Bypass ZOE: RM 39 (Hannawa Dam) to RM 38.5 (Hannawa powerhouse tailrace) Zone 3 Downstream ZOE: RM 38.5 (Hannawa powerhouse tailrace) to RM 38 (Sugar Island Dam) **Sugar Island Development** Zone 1 Impoundment ZOE: RM 38.5 (Hannawa powerhouse tailrace) to RM 38 (Sugar Island Dam) Zone 2 Bypass ZOE: RM 38 (Sugar Island Dam) to RM 37 (Sugar Island powerhouse tailrace) Zone 3 Downstream ZOE: RM 37 (Sugar Island Powerhouse tailrace) to RM 35 (East and West Dams at Potsdam)

	Type of waterbody (river, impoundment, by-passed reach, etc.)	According to the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory[2], the Impoundment ZOEs are classified as lake areas, the Bypass Reach ZOEs and downstream ZOEs are classified as a riverine areas.
	Delimiting structures	**Higley Development** Impoundment ZOE: RM 52 (South Colton Dam) to RM 47 (Higley Dam) Bypass ZOE and Downstream ZOE: RM 47 (Higley Dam) to RM 45 (Colton Dam) **Colton Development** Impoundment ZOE: RM 47 (Higley Dam) to RM 45 (Colton Dam) Bypass ZOE and Downstream ZOE: RM 45 (Colton Dam) to RM 39 (Hannawa Dam) **Hannawa Development** Impoundment ZOE: RM 45 (Colton Dam) to RM 39 (Hannawa Dam) Bypass ZOE and Downstream ZOE: RM 39 (Hannawa Dam) to RM 38 (Sugar Island Dam) **Sugar Island Development** Impoundment ZOE: RM 39 (Hannawa Dam) to RM 38 (Sugar Island Dam) Bypass ZOE and Downstream ZOE: RM 38 (Sugar Island Dam) to RM 35 (East and West Dam at Potsdam)
	Designated uses by state water quality agency	New York Department of Environmental Conservations designates waters in the Raquette River near the MRRP watershed as Class C fresh surface waters. Class C fresh surface waters of New York are

[2] https://www.fws.gov/wetlands/

		managed to achieve and maintain a level of quality that fully supports the following designated uses: aquatic biota, wildlife, aquatic habitat, swimming and other primary contact recreation, boating, fishing, and other recreational uses.[3]
Information Type	***Variable Description***	***Response (and reference to further details)***
Additional Contact Information	Names, addresses, phone numbers, and e-mail for local state and federal resource agencies	Please see section 4.0 for the Project Contacts Form
	Names, addresses, phone numbers, and e-mail for local non-governmental stakeholders	Please see section 4.0 for the Project Contacts Form
Photographs and Maps	Photographs of key features of the facility and each of the designated zones of effect	Please see Appendix A for photographs of key features of the facility and identification of each designated ZOE, and for project drawings.
	Maps, aerial photos, and/or plan view diagrams of facility area and river basin	Please see Appendix B for aerial photos of facility area and river basin.

2.0 STANDARDS MATRICES

2.1 Higley Development

IMPOUNDMENT ZOE

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			

[3] https://www.dec.ny.gov/chemical/23853.html

Bypass Reach ZOE

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			

Downstream ZOE

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			

2.2 Colton Development

Impoundment ZOE

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			

Bypass Reach ZOE

Criterion		Alternative Standards				
		1	2	3	4	Plus
A.	Ecological Flow Regimes		X			
B.	Water Quality		X			

Criterion		Alternative Standards				
		1	2	3	4	Plus
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			

Downstream ZOE

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			

2.3 Hannawa Development

Impoundment ZOE

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			

Bypass Reach ZOE

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**			

Downstream ZOE

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**			

2.4 Sugar Island Development

Impoundment ZOE

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**			

Bypass Reach ZOE

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**			

Downstream ZOE

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			

3.0 SUPPORTING INFORMATION

3.1 – Ecological Flow

Impoundment ZoEs – Colton Development, Hannawa Development, and Sugar Island Development

Criterion	Standard	
A	1	Not Applicable / De Minimis Effect: • Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility. • If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained. • In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located. • For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed – NOTE: this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.

- In accordance with Article 403 of the FERC License and section 4.0 of the 1998 Settlement Agreement, Brookfield Renewable (Brookfield) is required to limit fluctuations within the impoundments of the four developments of the Middle Raquette River Hydroelectric Project as defined in Table 2.

TABLE 2. MIDDLE RAQUETTE RIVER IMPOUNDMENT FLUCTUATIONS.

Development	**Permanent Crest of Dam (ft. USGS)**	**Height of Flashboards**	**Normal Impoundment Fluctuation**
Higley	880.6	3.0 foot trippable wooden flashboards	(see table 3)
Colton	835.0	2.0 foot pneumatic flashboards	0.4 feet
Hannawa	548.5	3.5 foot trippable wooden flashboards	0.4 feet
Sugar Island	470.0	none	1.0 feet

- Whenever an excursion occurs, Brookfield Renewable (Brookfield) notifies FERC, USFWS, and NYSDEC as soon as possible, but no later than 10 days after each such incident.
- Brookfield submitted its final streamflow and water level monitoring plan, pursuant to License Article 402 and section 10.5 of the Settlement Agreement, to FERC on September 6, 2002[4] with a supplemental filing on August 28, 2008[5]. FERC approved the streamflow and water level monitoring plan on October 30, 2008[6].
- Since license issuance, there have been three[7] impoundment drawdown events that FERC considered violations of the Middle Raquette Project License.
- The Middle Raquette River Hydroelectric Project has been certified for a third term of low impact certification, effective July 9, 2014, with the following two conditions: (1) *the facility owner shall develop a draft Deviation Reduction Plan (DRP) and submit it to LIHI no later than three months after LIHI certification of Project. The DRP should proactive operational control approaches for dam releases and pond level maintenance that will reduce the likelihood of operational deviations occurring in the future. The DRP needs to address the specific problems and potential recommendations identified in the reviewer's report. Options to be considered should include audible alarms in control centers and programmable logic controllers. The DRP shall describe options considered, those selected, and a schedule for implementation. LIHI staff will review and comment on the draft plan and be available to assist in the development of the DRP, if requested. The final DRP needs to be completed and agreed to by both [the licensee] and LIHI no later the six months after LIHI certification.; and (2) facility owner shall provide annual reports to LIHI documenting operational deviations from instream flow or pond levels that occurred throughout each year of certification. The report shall*

[4] 20020909-0257
[5] 20080904-0498
[6] 20081030-3021
[7] 20130801-3042, 20131112-3000, 20150114-3000

describe all deviations that have occurred, regardless of whether the deviations were planned or unintentional or whether they are eventually deemed as not violating the license by FERC. The report is due at the same time as the annual compliance statement and payment of the annual certification fee.

- An investigation of the 2014 Hannawa pond level excursion event revealed that the cause was a miscommunication between the System Operator at the National System Control Center (NSCC) and the Traveling Operator in the field. To mitigate the future reoccurrence the NSCC developed a procedure for 3-way communication. The 3- way communication helps to ensure there is clear direction of actions to be taken and who will take those actions. Additionally, the NSCC provides orientation training to new System Operators in which past deviations are reviewed (including the 2014 Hannawa pond elevation violation) as a means to emphasize the importance of operating within FERC license parameters. The measures taken by the NSCC have resulted in no license violations of the Middle Raquette license since 2014.
- Regarding the second condition, Brookfield filed its 2018 compliance report July 2, 2018.

Impoundment ZoE – Higley Development

Criterion	Standard	
A	2	Agency Recommendation: • 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 protective). • 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).

- In accordance with Article 403 of the FERC License and section 4.0 of the 1998 Settlement Agreement, Brookfield Renewable (Brookfield) is required to limit fluctuations within the impoundments of the Higley development of the Middle Raquette River Hydroelectric Project as defined in Table 3.

TABLE 3. HIGLEY DEVELOPMENT IMPOUNDMENT FLUCTUATIONS.

Time of Year	**Day of Week**	**Target Elevation (ft. USGS)**
Memorial Day Weekend through Labor Day Weekend	10:00 pm Friday through 6:00 am Monday	*By 10:00 pm on Friday* - impoundment to be at, or near, top of flashboards (elevation 883.6). *Over the course of the weekend* - utilize a 2.0 foot drawdown. *By 6:00 am Monday* - impoundment at, or near, 2.0 feet below top of flashboards (elevation 881.6)
Memorial Day Weekend through Labor Day Weekend	6:00 am Monday to rough 10:00 pm Friday	2.5 foot impoundment fluctuation utilized as needed to facilitate reregulation (elevation 883.6 to 881.1).
End of Labor Day Weekend to Start of Memorial Day Weekend	All days	2.5 foot impoundment fluctuation utilized as needed to facilitate reregulation (elevation 883.6 to 881.1).

- Whenever an excursion occurs, Brookfield Renewable (Brookfield) notifies FERC, USFWS, and NYSDEC as soon as possible, but no later than 10 days after each such incident.
- As mentioned previously, Brookfield submitted its final streamflow and water level monitoring plan, pursuant to License Article 402 and section 10.5 of the Settlement Agreement, to FERC on September 6, 2002[8] with a supplemental filing on August 28, 2008[9]. FERC approved the streamflow and water level monitoring plan on October 30, 2008[10].
- As mentioned previously, there have been a few pond level excursions since license issuance; however, since the measures taken by the NSCC have resulted in no license violations of the Middle Raquette license since 2014.

[8] 20020909-0257
[9] 20080904-0498
[10] 20081030-3021

Bypass ZoE – All Developments

Criterion	Standard	
A	2	Agency Recommendation: • 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 protective). • 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).

- In accordance with Article 402 of the FERC License and section 3.3.3 of the Settlement Agreement, Brookfield is not required to provide a minimum instream flow in the bypass reach at the Higley Development. The signators to the Settlement Agreement concluded that due to the shortness and backwatered nature of the bypass reach, an instream flow for aquatic purposes was not needed.
- However, in accordance with section 6.0 of the Settlement Agreement, Brookfield is required provide a 20 cfs release for the purpose of providing a route of downstream movement of fish at the Higley Development. The route of downstream movement is through the stoplog section of the dam located between the intake canal and spillway.
- Brookfield is required to maintain the instream flow regimes listed in table 4 in the bypasses reaches of the Colton, Hannawa, and Sugar Island Developments.

TABLE 4. REQUIRED MINIMUM INSTREAM FLOWS AT THE MIDDLE RAQUETTE RIVER PROJECT.

Flow Magnitude	Annual Start Date	Annual End Date
Colton Development		
110 cfs (100 - 120)	January 1	Start of Walleye Spawning Season[11]
240 cfs with spring spillage (216 - 264) 200 cfs without spring spillage (180 - 220)	Start of Walleye Spawning Season	End of Walleye Spawning Season[12]
200 cfs (180 - 220)	End of Walleye Spawning Season	June 30
125 cfs (113 - 138)	July 1	August 15
90 cfs (81 - 99)	August 16	September 15
125 cfs (113 - 138)	September 16	October 31
110 cfs (100 - 120)	November 1	December 31
Hannawa Development		
50 cfs (48 - 52)	January 1	Start of Walleye Spawning Season
90 cfs (87 - 93)	Start of Walleye Spawning Season	June 30
65 cfs (63 - 67)	July 1	October 31
50 cfs (48 - 52)	October 31	December 31
Sugar Island Development		
300 cfs (282 - 318)	January 1	Start of Walleye Spawning Season
400 cfs (376 - 424)	Start of Walleye Spawning Season	June 30
300 cfs (282 - 318)	July 1	December 31

- According to the Settlement Agreement, The nearly 3 mile long Colton bypass reach is the longest and one of the most complex bypass reaches on the Raquette River (and in New York). The management goal is to recreate a complete riverine ecosystem within the bypass reach. The instream flow schedule reflects this level of complexity through the variations over the course of the year, which are intended to follow natural hydrologic trends. The signators concluded that this flow schedule shall be provided to enhance and/or protect the recovery of a riverine ecosystem within the bypass reach,

[11] Walleye spawning season will start when water temperature at South Colton [Upper Raquette Project No. 2084] reaches 4 degrees Celsius (39.2 degrees F) for 4 consecutive days after March 15 of each year.

[12] Walleye spawning season will end 30 days after water temperature at South Colton has reached 10 degrees Celsius (50 degrees F) for 4 consecutive days.

forage fish and benthic invertebrate production, fish movement, wetland and riparian resources, aesthetics and safety, fish spawning and incubation, and water quality. The individual seasonal flows balance all of these concerns and address the varying habitats and recreational uses in the upper, middle, and lower sections of the reach.

- For the Hannawa Development, flow levels reflect variations over the course of the year and are intended to follow natural hydrologic trends. The signators concluded that this flow schedule shall be provided to enhance and/or protect forage fish and benthic invertebrate production, fish movement, wetland and riparian resources, aesthetics, and safety.
- For the Sugar Island Development, the bypass reach is characterized by numerous braided channels, bars, islands, and rock gardens. The primary objective is to recreate a complete riverine ecosystem within the bypass reach. Due to the numerous channels and the tendency for the water to spread out, the signators concluded that this bypass reach warrants an instream flow significantly greater than those provided on the remainder of the river. This flow schedule shall be provided to enhance and/or protect forage fish and benthic invertebrate production, fish movement, seasonal brook trout habitat, and to provide recreational opportunities.
- According to the Settlement Agreement, the flows are generally of sufficient volume to serve as attractant flows to help guide the fish to the release structure. Each site has been specifically examined by biologists and engineers to determine the most feasible fish movement route. Factors considered were proximity to the trashracks, use of existing facilities, adequate plunge pools and conveyance to downriver areas, and engineering cost and feasibility. The location has been chosen to maximize the attraction flow and the ability of the fish to locate the movement route while minimally disrupting project operations.
- As at the Higley Development, Brookfield is required to provide downstream fish passage flows at the Colton, Hannawa, and Sugar Island Developments as follows; (1) Colton – at least 20 cfs via a rehabilitated trash sluice structure; (2) Hannawa – 50 cfs via instream flow release structure; and (3) Sugar Island – 300 cfs via instream flow release structure.

Downstream ZoE – All Developments

Criterion	Standard	
A	1	<u>Not Applicable / De Minimis Effect</u>: • Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility. • If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained. • In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located. • For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed – NOTE: this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.

- In accordance with FERC License Order, and the Settlement Agreement, the Higley development operates in a re-regulating mode to provide steadier inflows for the downstream facilities. The remaining three developments all operate in a pulsing mode.

3.2 – Water Quality

All ZoEs – All Developments

Criterion	Standard	
B	2	Agency Recommendation: • If facility is located on a Water Quality Limited river reach, provide a link to the state's most recent impaired waters list and indicate the page(s) therein that apply to facility waters. If possible, 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 and any subsequent amendments, including the date(s) of issuance. If more than 10 years old, provide documentation that the certification terms and conditions remain valid and in effect for the facility (e.g., a letter from the agency). • Identify any other agency recommendations related to water quality and explain their scientific or technical basis. • Describe all compliance activities related to water quality and any agency recommendations for the facility, including on-going monitoring, and how those are integrated into facility operations

- The Middle Raquette River is not listed in the NYS's 2016 final Section 303(d) list of impaired waterbodies[13]. However, the Lower Raquette River and minor tributaries are listed as being impaired due to pathogens potentially from on-site water treatment systems.
- License Article 304 and Section B of the NYDEC 401 Water Quality Certification[14] requires Brookfield to adhere to several provision that protect water quality during project maintenance and construction activities.
- Prior to commencing activities which could adversely affect water quality, the certificate holder must receive Department approval of an Erosion and Sediment Control Plan. This plan must be submitted at least 60 days before the intended date for commencing work. Actions undertaken in response to an emergency and governed by the procedures contained in 6 NYCRR Section 621.12 are exempt from this condition.

[13] https://www.dec.ny.gov/docs/water_pdf/303dListfinal2016.pdf
[14] 20020926--0378

- During all periods of construction, the certificate holder will monitor the waters of the river at a point immediately upstream of project activities and at a point no more than 100 feet downstream from any discharge point or other potential source of turbidity. If at any time, turbidity measurements from the downstream locations exceed the measurements from the locations upstream of the work areas, certificate holder specifically agrees to immediately take all action necessary to identify the activities causing the turbidity and to correct the situation.
- A review of project filings on FERC's elibrary indicates that the licensee is in compliance with its water quality-related requirements. Furthermore, Brookfield notifies FERC of any planned drawdowns for construction and maintenance activities.

3.3 – Upstream Fish Passage

The fishery in the Middle Raquette reach is composed of a diverse group of game fish and panfish. NYSDEC manages the Raquette River in the section between Raymondville and South Colton as a mixed coolwater/warmwater fisheries resource. The more important game and panfish are walleye, smallmouth bass, northern pike, yellow perch, rock bass, pumpkinseed, and brown bullhead. White sucker and fallfish also have been found in all of the reservoirs. Surveys have shown that essentially the same assemblage of fish species exist in all Middle Raquette River Project reservoirs. During the Settlement discussions, FWS indicated that the only federally listed or proposed endangered or threatened species existing within all project boundaries is the transient bald eagle.

All ZoEs – All Developments

Criterion	Standard	
C	1	<u>Not Applicable / De Minimis Effect</u>: • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. Typically, impoundment zones will qualify for this standard since once above a dam and in an impoundment, there is no facility barrier to further upstream movement. • 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

- FERC License Article 403 reserves the Commission's authority to require the Licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of, fishways as may be prescribed by the Secretary of the Interior under Section 18 of the Federal Power Act.

- FERC concluded in its final EA on the Raquette Projects that because there are no anadromous fish species in this reach of the Raquette River anadromous fish passage is not a concern. Provisions for upstream fish passage were not recommended at the time of the EA.

3.4 Downstream Fish Passage and Protection

Impoundment and Bypass ZoEs – All Developments

Criterion	Standard	
D	2	Agency Recommendation: • 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 protective). • 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

- Section 6.0 of the Settlement Agreement required Brookfield to provide the following downstream fish movement and protection measures at the four developments of the Middle Raquette River Hydroelectric Project (table 5).

TABLE 5. DOWNSTREAM FISH MOVEMENT AND PROTECTION MEASURES AT THE MIDDLE RAQUETTE RIVER PROJECT.

Development	**Protection Measure**	**Primary Route of Downstream Fish Movement**	**Conveyance and Collection System**
Higley	1-inch clear spacing physical barrier installed at the location of the existing trashrack structure.	20 cfs via stoplog section located between intake canal and spillway	(1) Roughness reduction of spillway face. (2) Measures to reduce dispersion of the release across spillway face. (3) Release structure empties into a pool of adequate dimensions. No additional modifications required.
Colton	1-inch clear spacing physical barrier installed	At least 20 cfs via rehabilitated trash sluice structure	At the time of rehabilitation of intake structure licensee shall retrofit trash sluice

Development	Protection Measure	Primary Route of Downstream Fish Movement	Conveyance and Collection System
	at the location of the existing trashrack structure.		return channel to accommodate fish safe conveyance and collection
Hannawa	1-inch clear spacing physical barrier installed at the location of the existing trashrack structure at the upstream end of the power canal	50 cfs via instream flow release structure	(1) Roughness reduction of spillway face (2) Measures to reduce dispersion of the release across spillway face. (3) Construct plunge pool
Sugar Island	None	300 cfs via instream flow release structure	Instream flow release structure empties into a pool of adequate dimensions. No additional modifications required.

- Due to the small size of the Sugar Island impoundment and the location of the instream flow release structure (downstream of the existing trashracks), the signators to the Settlement Agreement concluded that fish protection was not required at the Sugar Island Development. The goal is to facilitate movement of adult fish, via a tap off the pipeline, from the relatively small impoundment to the downstream reach which will be receiving the largest minimum flows of any bypass reach on the river.
- The flows are generally of sufficient volume to serve as attractant flows to help guide the fish to the release structure. Each site has been specifically examined by biologists and engineers to determine the most feasible fish movement route. Factors considered were proximity to the trashracks, use of existing facilities, adequate plunge pools and conveyance to downriver areas, and engineering cost and feasibility. The locations have been chosen to maximize the attraction flow and the ability of the fish to locate the movement route while minimally disrupting project operations.
- The 1-inch clear bar spacing physical barriers were installed on the trashracks by the end of 2011.

Downstream ZoEs – All Developments

Criterion	Standard	
D	1	Not Applicable/ De Minimis Effect: • Explain why the facility does not impose a barrier to upstream fish passage in the designated zone. Typically, impoundment zones will qualify for this standard since once above a dam and in an impoundment, there is no facility barrier to further upstream movement. • 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.

- There are no facilities in the downstream ZoE that act as a barrier to downstream fish passage. Once fish cross over the LRRP dams with use of the downstream passage facilities and through the bypass reaches, the fish do not have any further impediments to passage through the downstream ZOE.

3.5 – Shoreline and Watershed Protection

Impoundment ZoE – All Developments

Criterion	Standard	
E	2	Agency Recommendation: • Provide copies or links to any agency recommendations or management plans that are in effect related to protection, mitigation, or enhancement of shoreline surrounding the facility (e.g., Shoreline Management Plans). • Provide documentation that indicates the facility is in full compliance with any agency recommendations or management plans that are in effect.

- In accordance with Article 403 of the FERC License and section 4.0 of the 1998 Settlement Agreement, Brookfield Renewable (Brookfield) is required to limit fluctuations within the impoundments of the four developments of the Middle Raquette River Hydroelectric Project as defined in Table 1.

- Brookfield submitted its final streamflow and water level monitoring plan, pursuant to License Article 402 and section 10.5 of the Settlement Agreement, to FERC on September 6, 2002 with a supplemental filing on August 28, 2008. FERC approved the streamflow and water level monitoring plan on October 30, 2008.

Bypass and Downstream ZoEs – All Developments

Criterion	Standard	
E	1	Not Applicable/ De Minimis Effect: • 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 FERC project or facility boundary). • Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.

- Land around the Middle Raquette River Project is largely rural, forested and the area that is dependent on forestry, some agriculture, wood products, and tourism. Historically, the river has been developed for water power for sawmills, paper mills, tanneries, and other industry.
- Land cover units with nonsignificant ecological value identified within the vicinity of the Project can be found in Table 6 (based on National Land Cover Database 2011)[15].
- There are no requirements for a buffer zone, shoreline protection fund or shoreline management plan for the Middle Raquette River Project.

TABLE 6. PROJECT AREA LAND COVER AND CLASSIFIED BY THE NATIONAL LAND COVER DATABASE 2011.

Class/Value	***Classification Description***
11	**Open Water**- areas of open water, generally with less than 25% cover of vegetation or soil.
21	**Developed, Open Space**- areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20% of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes.
22	**Developed, Low Intensity**- areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20% to 49% percent of total cover. These areas

[15] https://www.mrlc.gov/viewer/

Class/Value	*Classification Description*
	most commonly include single-family housing units.
41	**Deciduous Forest**- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species shed foliage simultaneously in response to seasonal change.
42	**Evergreen Forest**- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75% of the tree species maintain their leaves all year. Canopy is never without green foliage.
43	**Mixed Forest**- areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75% of total tree cover.
81	**Pasture/Hay**-areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20% of total vegetation.
90	**Woody Wetlands**- areas where forest or shrubland vegetation accounts for greater than 20% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.
95	**Emergent Herbaceous Wetlands**- Areas where perennial herbaceous vegetation accounts for greater than 80% of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

3.6 – Threatened and Endangered Species Protection

All ZoEs –All Developments

Criterion	Standard	
F	2	<u>Finding of No Negative Effects:</u> • Identify all listed species in the facility area based on current data from the appropriate state and federal natural resource management agencies. • Provide documentation of a finding of no negative effect of the facility on any listed species in the area from an appropriate natural resource management agency.

- A U.S. Fish and Wildlife Information for Planning and Conservation (IPaC) Trust Resources Report was generated April 6, 2019 for the MRRP area (Appendix D). The IPaC Report identified one threatened species, the Northern Long-eared Bat (*Myotis septentrionalis*), and nine migratory birds protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.
- No critical habitat has been designated for the Northern Long-eared Bat.
- All of the following birds are listed as Birds of Conservation Concern: Bald Eagle (*Haliaeetus leucocephalus*); Black-billed Cuckoo (*Coccyzus* erythropthalmus); Bobolink (*Dolichonyx oryzivorus*); Cape May Warbler (*Setophaga* tigrina); Eastern Whip-poor-will (*Antrostomus vociferous*); Evening Grosbeak (*Coccothraustes vespertinus*); Golden-winged Warbler (*Vermivora chrysoptera*); Rusty Blackbird (*Euphagus carolinus*); and Wood Thrush (*Hylocichla mustelina*). The only year-round bird found in the LRRP area is the Bald Eagle. All the other eight species are found exclusively during breeding season.
- The Bald Eagle is a state-endangered species listed under the protection of the New York Endangered Species Law[16]. The Northern Long-eared Bat is listed as state-threatened.
- Signators to the Settlement Agreement agreed that the continued operation of the MRRP would not affect federal or state-listed threatened or endangered species.

3.7 – Cultural and Historic Resource Protection

All ZoEs – All Developments

Criterion	Standard	
G	2	Approved Plan: • Provide documentation of all approved state, federal, and recognized tribal plans for the protection, enhancement, and mitigation of impacts to cultural and historic resources affected by the facility. • Document that the facility is in compliance with all such plans

- Article 405 of the FERC License Order required the Licensee to implement the Programmatic Agreement. Brookfield submitted the final HPMP on April 15, 2003[17], and an Order Approving Historic Properties Management Plans was issued by FERC on September 28, 2004[18]. The purpose of the HPMP is to establish procedures and guidelines for the management of historic properties expected within the Middle Raquette River Project's Area of Potential Effect (APE). A summary of the guidelines established by the HPMP for each facility is presented below.

[16] https://www.dec.ny.gov/animals/7494.html
[17] 20030430-0218 (Privileged eLibrary document)
[18] 108 FERC ¶ 62,276

- Establishes a process for identifying the nature and significant of historic properties that may be affected by project maintenance and operation, proposed improvements to project facilities, and/or public access;
- Establishes a decision-making process for considering potential effects on historic properties;
- Defines goals for the preservation of historic properties;
- Establishes guidelines for routine maintenance and operation activities as they relate to historic properties; and
- Establishes procedures for consulting with the New York State Historic Preservation Office (SHPO), Indian Tribes, historic preservation experts, and the interested public concerning effects of the Projects on historic properties

- There is one identified archeological site within the Middle Raquette River Project's APE. The foundation of an early tanning factory is located just downstream of the Colton dam between the bypassed reach and the Stone Valley hiking trail. An interpretive sign provides information on the importance of the tannery, which operated from 1856 to 1898, to the local economy. The construction dates of the four developments of the Middle Raquette River Project range from Higley in 1911 to Sugar Island in 1924. NMPC conducted a survey of all hydroelectric development in New York State (Hay, 1991). Based on this survey, the SHPO provided an opinion that the Higley plant meets the criteria A and C for listing in the National Register (letter from Julia S. Stokes, Deputy Commission for Historic Preservation, NYSOPRHP, Albany, New York, to Jerry Sabattis, Relicensing Coordinator, NMPC, Syracuse, New York, dated May l, 1991). The SHPO states that in her opinion the Higley plant meets the National Register criteria because it is an intact representative example of a generating facility containing two original turbine generator units, which illustrates the operation of a small hydropower facility built during an important period in the development of electrical engineering in the region and the United States.
- The Licensee files annual Cultural Resources Management Reports with FERC. The most recent annual report was filed with FERC on February 1, 2019[19]

3.8 – Recreational Resources

All ZoEs – All Development

Criterion	Standard	

[19] 20190201-5043

H	2	Not Applicable / De Minimis Effect: • 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.

- Article 404 of the FERC License Order and Section 7.0 of the Settlement Agreement required the Licensee to develop and implement several recreational enhancement measures as well as a plan to implement and manage recreational resources in the project area.
- The licensee filed its final Recreation Plan on April 10, 2004[20], which FERC approved on November 17, 2004[21].
- Table 7 defines the existing recreational facilities at the time of approval, and the required new facilities.

Table 7. Recreational facilities at the Middle Raquette River Project.

Development	**Existing Facilities**	**New Facilities**
Higley	Boat launch with parking area Picnic facilities	Canoe Portage Implementation Date: 2006
Colton	Stone Valley Hiking Trail System (cooperative) Car-top boat launch with parking area	Canoe Portage Car-top boat launch with overnight parking Whitewater Access Implementation Date: 2004
Hannawa	None	Canoe Portage Red Sandstone Trail – Southern Terminus Scenic overlook and picnic facilities Whitewater access Roadside parking Implementation Date: 2004
Sugar Island	None	Canoe Portage Day-use area Red Sandstone Trail – Northern Terminus

[20] 20030414-0143
[21] 20041117-3026

Development	Existing Facilities	New Facilities
		Whitewater access Implementation Date: 2004

- Article 404 requires consultation with the NYSDEC for the placement of directional signage and with the members of the Raquette River Advisory Committee while preparing the plan. The licensee sent draft copies of the plan to those agencies as well as the U.S. Fish and Wildlife Service (USFWS). The NYSDEC and the USFWS both commented that the content of the draft plan adequately addresses the Raquette River Settlement Agreement. The Laurentian Chapter of the Adirondack Mountain Club (ADKLC), North Country Raquette River Advocates (NCRRA), Adirondack Mountain Club (ADK), and the Jordan Club all responded with numerous comments and the licensee incorporated most of the comments into the final plan.
- Whitewater activities of the Middle Raquette River Project are managed by a Whitewater Subcommittee of the Raquette River Advisory Committee. At a minimum, the Whitewater Subcommittee consists of Brookfield, NYSDEC, Adirondack Mountain Club, a representative of local boater interests and a representative of local government. Any member of the Raquette River Advisory Committee may elect to participate on the WS each year or only during specific years.
- The Whitewater Subcommittee is charged with the responsibility of developing a whitewater release schedule and meets at least once by February 1st of the year to determine how to schedule and allocate the whitewater budget among the Colton, Hannawa, and Sugar Island Developments.
- The whitewater season runs from July 1 through September 30 of the year. The approximate peak whitewater flows are: 1250-cfs at Colton, 800-cfs at Hannawa and 1,500-cfs at Sugar Island. Ramping flows are an hourly doubling of the instream flows.
- The licensee is in compliance with access, accommodations and facility conditions of the FERC license and the Offer of Settlement. The most recent FERC environmental and public use inspection reports note that the licensee appears to be in compliance with its requirements with regard to recreation resources.

4.0 CONTACTS FORMS

Project Owner:	
Name and Title	Erie Boulevard Hydropower, L.P.
Company	Brookfield Renewable
Phone	315-267-1036
Email Address	Danny.Maguire@brookfieldrenewable.com
Mailing Address	184 Elm Street, Potsdam, NY 13676
Consulting Firm / Agent for LIHI Program (if different from above):	
Name and Title	Jot Splenda
Company	Louis Berger/WSP
Phone	(919) 866-4417
Email Address	jsplenda@louisberger.com
Mailing Address	1001 Wade Ave; Suite 400; Raleigh, NC 27615
Compliance Contact (responsible for LIHI Program requirements):	
Name and Title	Daniel J. Maguire, P.E., Compliance Manager
Company	Brookfield Renewable
Phone	315-267-1036
Email Address	Danny.Maguire@brookfieldrenewable.com
Mailing Address	184 Elm Street, Potsdam, NY 13676
Party responsible for accounts payable:	
Name and Title	Judith Charette
Company	Brookfield Renewable
Phone	819-561-8099
Email Address	Judith.Charette@brookfieldrenewable.com
Mailing Address	41 Rue Victoria, Gatineau, QC J8X 2A1

Agency Contact (Check area of responsibility: Flows_X_, Water Quality _X_, Fish/Wildlife Resources _X_, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation _X_):	
Agency Name	New York State Department of Environmental Conservation
Name and Title	Jessica Hart, Environmental Analyst
Phone	315-785-2246
Email address	Jessica.hart@dec.ny.gov
Mailing Address	317 Washington Street, Watertown, NY 13601

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. _X_, Cultural/Historic Resources __, Recreation __):	
Agency Name	New York State Department of Environmental Conservation
Name and Title	Nicholas Conrad, Information Resources Coordinator
Phone	518-402-8935
Email address	Nick.Conrad@dec.ny.gov
Mailing Address	625 Broadway, Albany, NY 12233-4757

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. _X_, Cultural/Historic Resources __, Recreation __):	
Agency Name	U.S. Fish and Wildlife Service
Name and Title	Robyn Niver, Endangered Species Biologist
Phone	607-753-9334
Email address	Robyn_Niver@fws.gov
Mailing Address	3817 Luker Road, Cortland, NY 13045

Agency Contact (Check area of responsibility: Flows_X_, Water Quality _X_, Fish/Wildlife Resources _X_, Watersheds __, T/E Spp. _X_, Cultural/Historic Resources __, Recreation __)	
Agency Name	U.S. Fish and Wildlife Service
Name and Title	Steve Patch
Phone	607-753-9334
Email address	Stephen_Patch@fws.gov
Mailing Address	3817 Luker Road, Cortland, NY 13045

Agency Contact (Check area of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources _X_, Recreation __):	
Agency Name	New York State Division for Historic Preservation
Name and Title	Michael Lynch, Division Director
Phone	518-237-8643
Email address	Michael.Lynch@parks.ny.gov
Mailing Address	Peebles Island State Park, P.O. Box 189, Waterford, NY 12188-0189

5.0 SWORN STATEMENT

B.3 Sworn Statement and Waiver Form

All applications for LIHI Certification must include the following sworn statement before they can be reviewed by LIHI:

SWORN STATEMENT

As an Authorized Representative of Erie Boulevard Hydro, L.P. *, the Undersigned attests that the material presented in the application is true and complete.*

The Undersigned acknowledges that the primary goal of the Law 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 thot if LIHI Certification of the applying facility is granted, the LIHI Certification Mark License Agreement must be executed prior to marketing the electricity product as LIHI Certified®.

The Undersigned 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, fram any consequences of disclosing or publishing any submitted certification application materials to the public, or on any other oction pursuant to the Low Impact Hydropower Institute's certification program.

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

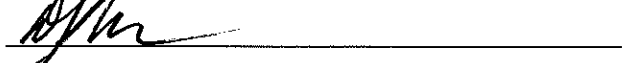
The Undersigned acknowledges that LIHI may suspend or revoke the LIHI Certification should the impacts of the focility, once operational, fail to comply with the LIHI program requirements.

Company Name: Erie Boulevard Hydro, L.P, a subsidiary of Brookfield Renewable Energy Group

Authorized Representative:

Name: Daniel Maguire P.E.

Title: Compliance Manager

Authorized Signature: 

Date: 5/28/2019

APPENDIX A

PROJECT ZOEs, PHOTOS, & DRAWINGS

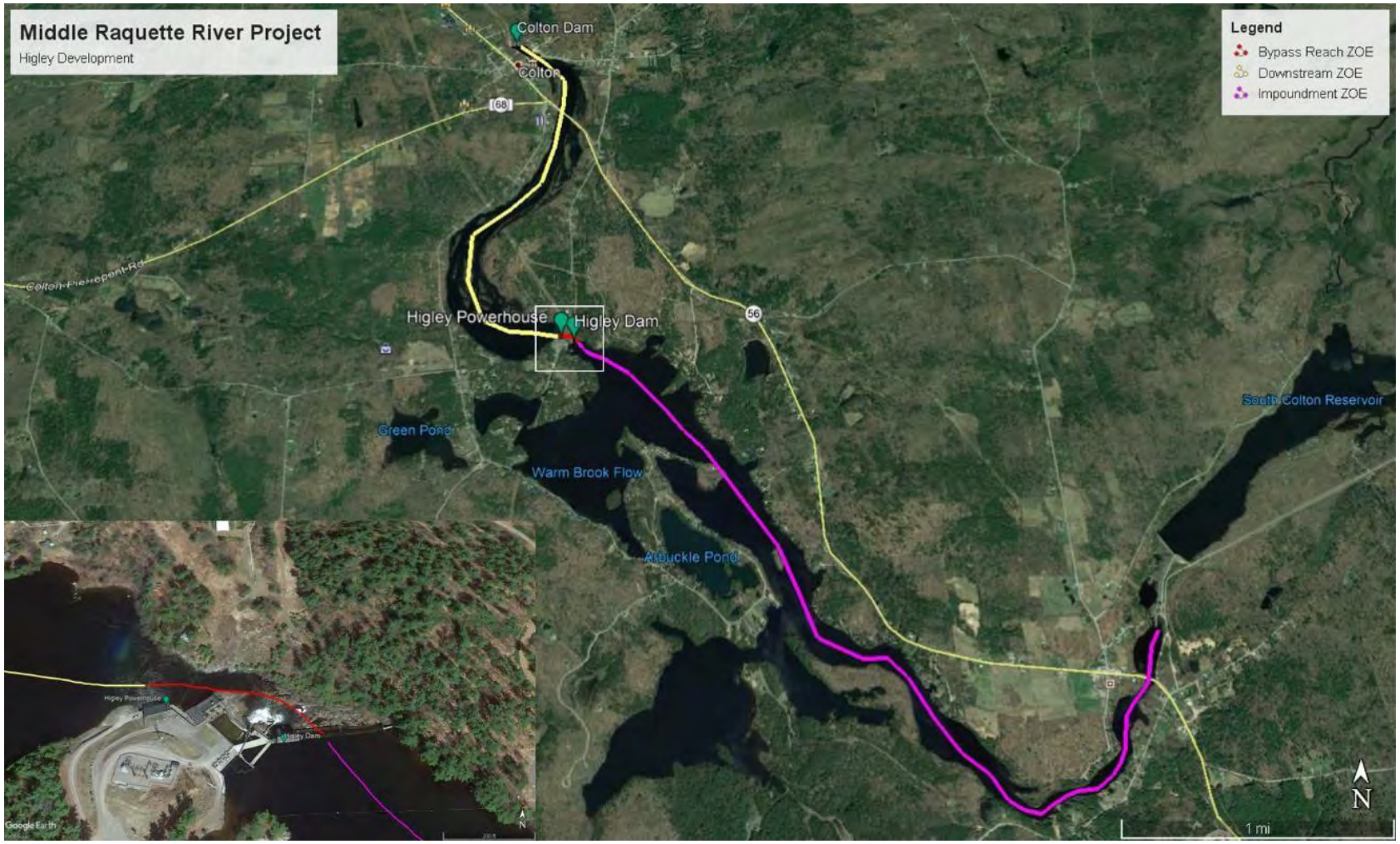


Figure 2. Overview Map of the Higley Development with Zones of Effects

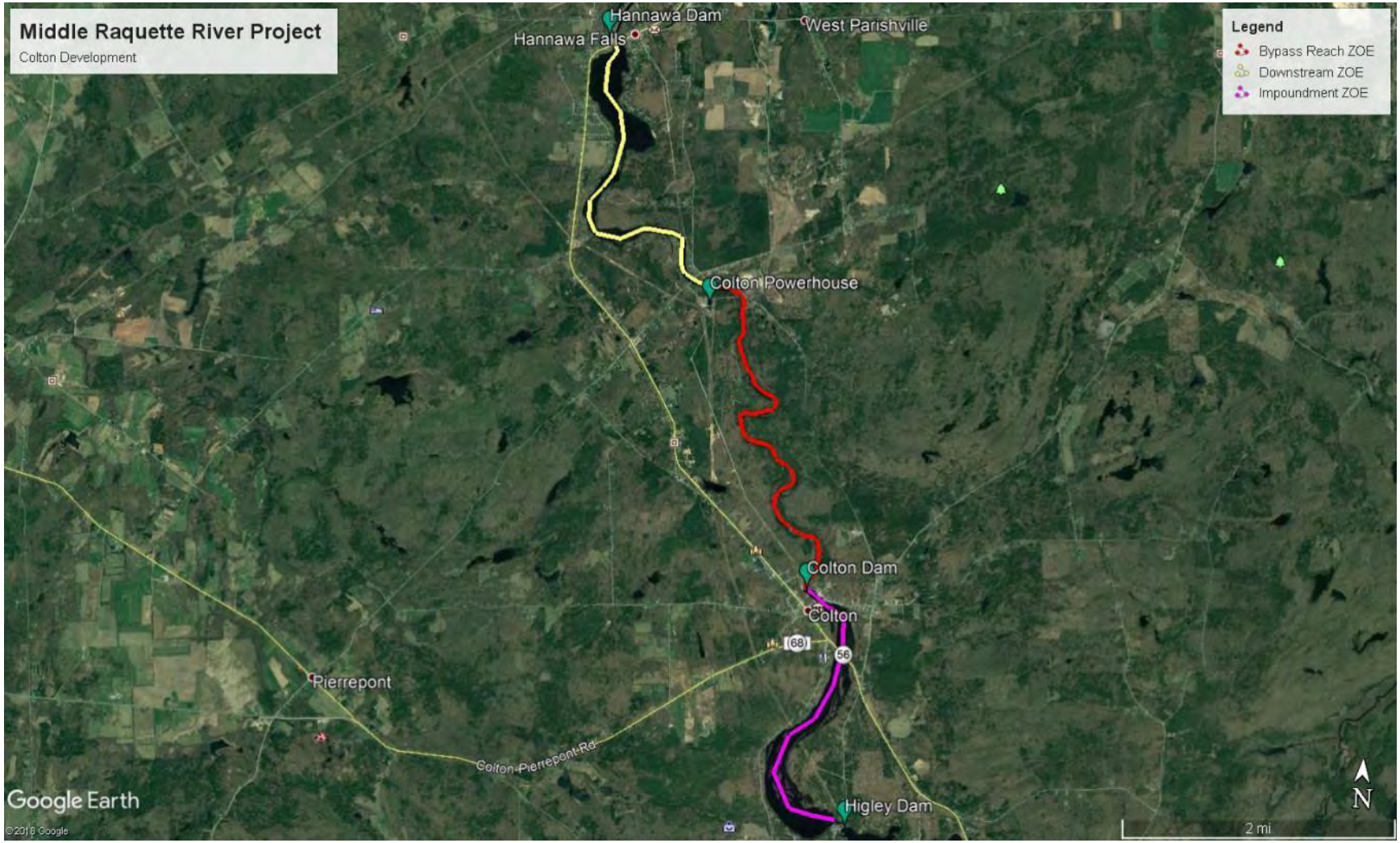


Figure 3. Overview Map of the Colton Development with Zones of Effects

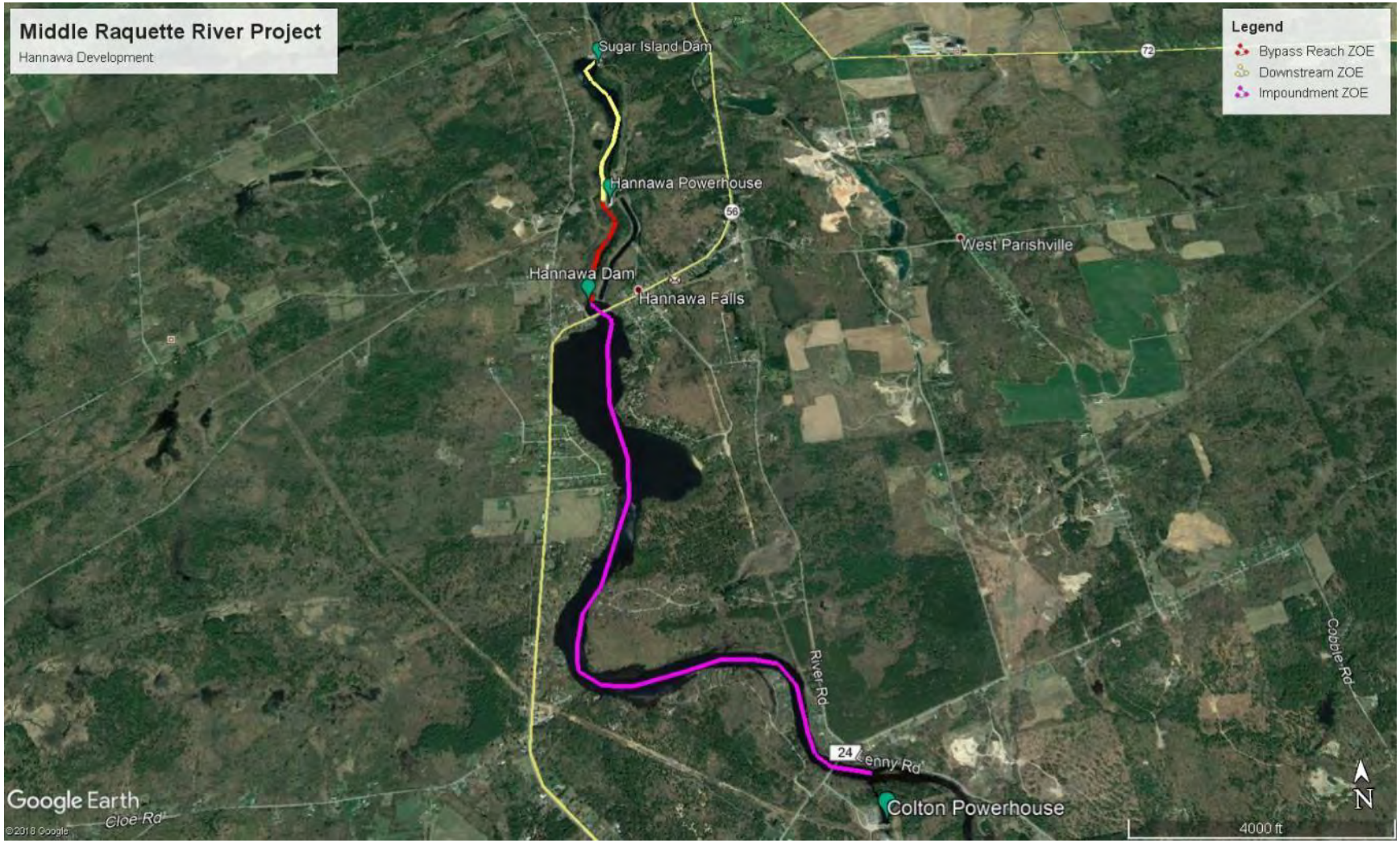


Figure 4. Overview Map of the Hannawa Development with Zones of Effects

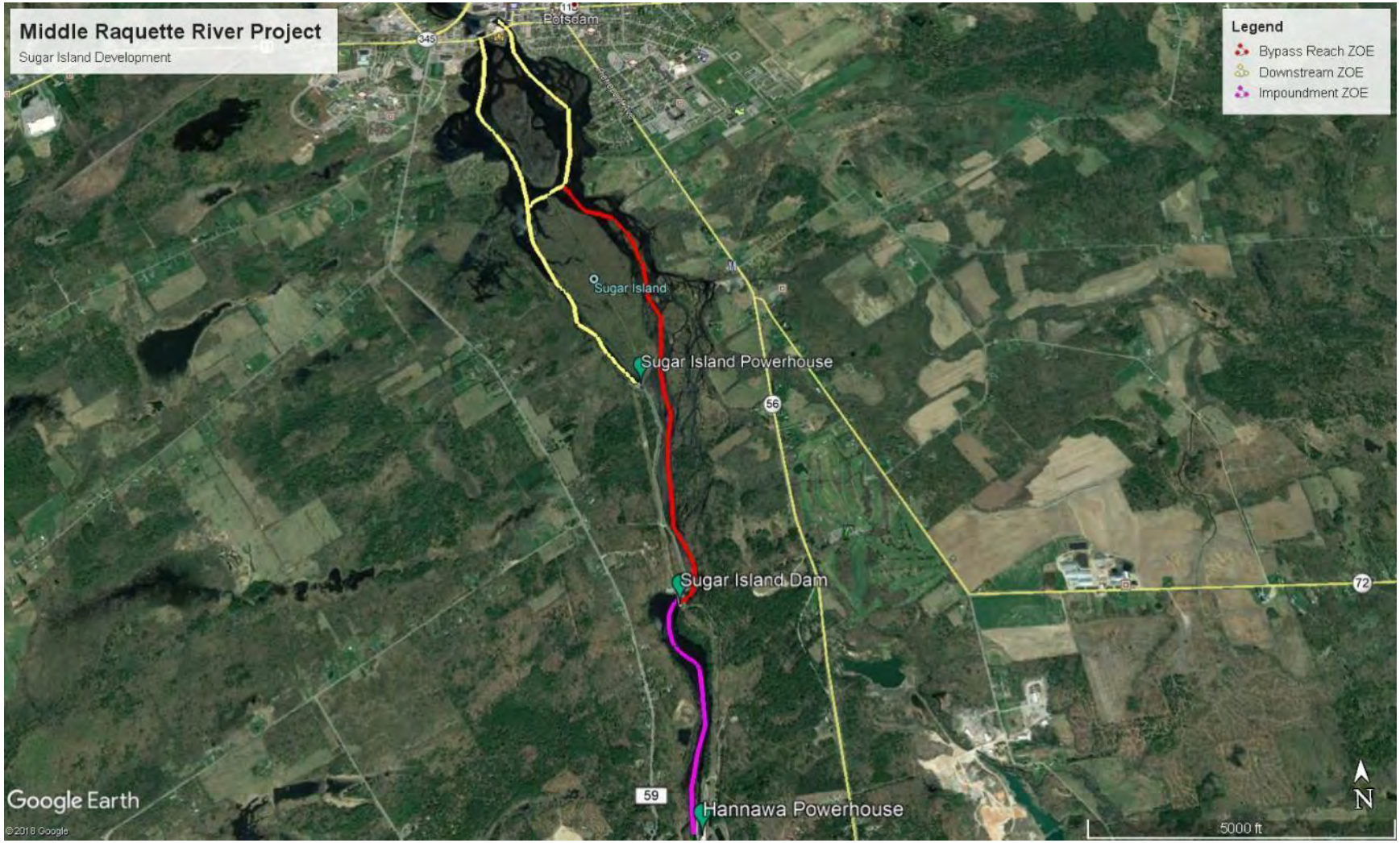


Figure 5. Overview Map of the Sugar Island Development with Zones of Effects

Colton Dam

Colton Dam and Intake

Colton Bypass Pipeline

Colton Generators

Hannawa Dam

Hannawa Powerhouse and Penstocks

Hannawa Power Canal

Hannawa Powerhouse

Higley Dam

Higley Powerhouse

Higley Intake

Higley Generators

Sugar Island Dam and Penstock

Sugar Island Powerhouse

Sugar Island Gates and Intake

Sugar Island Generator

APPENDIX B

AERIAL PHOTOS OF FACILITY AREA AND RIVER BASIN

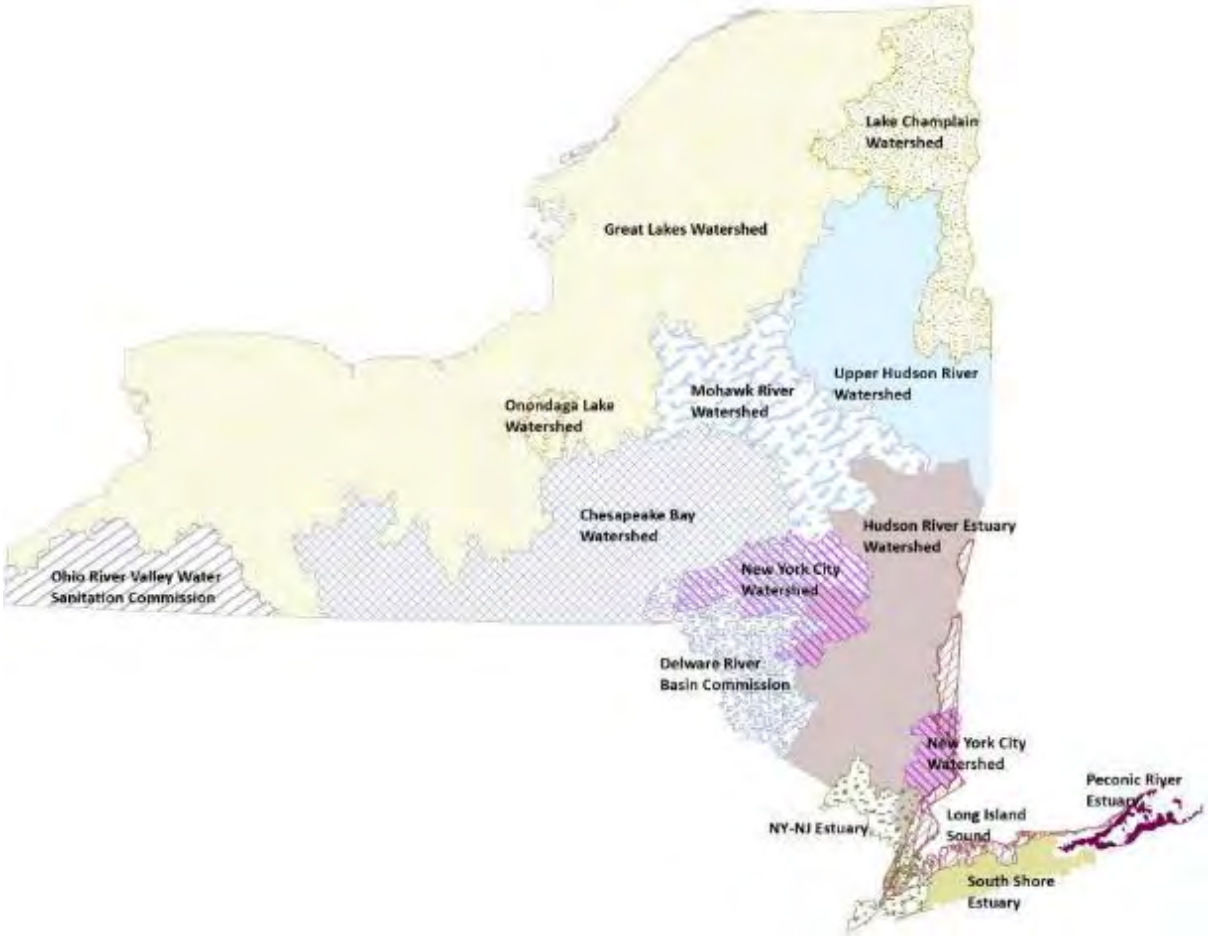


FIGURE 6: New York State Drainage Basins

APPENDIX C
WATER QUALITY CERTIFICATE

ORIGINAL

New York State Department of Environmental Conservation
Division of Environmental Permits, 4th Floor
625 Broadway, Albany, New York 12233-1750
Phone: (518) 402-9167 • **FAX:** (518) 402-9168
Website: www.dec.state.ny.us

Erin M. Crotty
Commissioner

September 19, 2002

Mr Jerry Sabattis
Hydro Licensing Coordinator
Reliant Energy
225 Greenfield Parkway, Suite 201
Liverpool, NY 13088

Re: Hoosic River Section 401 State Water Quality Certification, FERC Project # 2616, DECID# 4-3842-00109/00001

Dear Mr Sabattis:

Please find enclosed the Hoosic River Section 401 State Water Quality Certification, DEC Permit # 4-3842-00109/00001 issued to Erie Boulevard Power L.L.C. for the construction and operation of the Hoosic River Hydropower Project in Rensselaer County.

This permit contains significant conditions. If these conditions are unacceptable, you have the right to request a adjudicatory hearing within 30 days of this letter.

If you have any questions, or need further information please don't hesitate to contact me.

Sincerely,

Kent P. Sanders
Environmental Analyst

cc: List Attached

DEC 86-20-8(10/90)-25c R3

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DEC PERMIT NUMBER
4-3842-00109/00001

FACILITY/PROGRAM NUMBER(s)

EFFECTIVE DATE
September 19, 2002

EXPIRATION DATE
Coincident with the expiration date of the license issued by the Federal Energy Regulatory Commission (FERC) for FERC Project P-2616

PERMIT
Under the Environmental Conservation Law (ECL)

TYPE OF PERMIT (Check All Applicable Boxes)
X New ☐ Renewal ☐ Modification X Permit to Construct X Permit to Operate

☐ Article 15, Title 5: Protection of Water	☐ Article 17, Titles 7, 8: SPDES	☐ Article 27, Title 9; 6NYCRR 373: Hazardous Waste Management
☐ Article 15, Title 15: Water Supply	☐ Article 19: Air Pollution Control	☐ Article 34: Coastal Erosion Management
☐ Article 15, Title 15: Water Transport	☐ Article 23, Title 27: Mined Land Reclamation	☐ Article 36: Floodplain Management
☐ Article 15, Title 15: Long Island Wells	☐ Article 24: Freshwater Wetlands	☐ Articles 1, 3, 17, 19, 27, 37; 6NYCRR 380: Radiation Control
☐ Article 15, Title 27: Wild, Scenic & Recreational Rivers	☐ Article 25: Tidal Wetlands	☐ Other _____
X 6NYCRR 608: Water Quality Certification	☐ Article 27, Title 7; 6NYCRR 360: Solid Waste Management	

PERMIT ISSUED T
Erie Boulevard Power L. L. C

TELEPHONE NUMBER
(315) 413-2700

ADDRESS OF PERMITTEE
225 Greenfield Parkway, Suite 201, Liverpool, New York 13088

CONTACT PERSON FOR PERMITTED WORK
Sam Hirshey, Manager - Hydro Licencing & Regulatory Compliance

TELEPHONE NUMBER
(315) 413-2790

NAME AND ADDRESS OF PROJECT/FACILITY
Hoosic River Hydropower Project, Schaghticoke and Johnsonville Impoundments FERC Project # P-2616

LOCATION OF PROJECT/FACILITY
Hoosic River at Schaghticoke and Johnsonville, Rensselaer County.

COUNTY	TOWN	WATERCOURSE/WETLAND NO.	NYTM COORDINATES
Rensselaer	Schaghticoke	Hoosic River	E 621. N 4750.00 E 621.736 N: 4753.023

DESCRIPTION OF AUTHORIZED ACTIVITY

Operation and Maintenance of the Hoosic River Hydropower Project at Schaghticoke and Johnsonville on the Hoosic River in accordance with the applicable provisions of the June, 2002 Hoosic River Offer of Settlement and the attached conditions.

By acceptance of this permit, the permittee agrees that the permit is contingent upon strict compliance with the ECL, all applicable regulations, the General Conditions specified (**See Page 2**) and any Special Conditions included as part of this permit.

PERMIT ADMINISTRATOR	ADDRESS	
William R. Adriance	NYSDEC Div. of Envir. Permits, 4th Floor, 625 Broadway, Albany, NY 12233-1750	
AUTHORIZED SIGNATURE: William R. Adriance	Date: 9/19/02	Page 1 of 5

NOTIFICATION OF OTHER PERMITTEE OBLIGATIONS

Item A: Permittee Accepts Legal Responsibility and Agrees to Indemnification

The permittee expressly agrees to indemnify and hold harmless the Department of Environmental Conservation of the State of New York, its representatives, employees, and agents ("DEC") for all claims, suits, actions, and damages, to the extent attributable to the permittee's acts or omissions in connection with the permittee's undertaking of activities in connection with, or operation and maintenance of, the facility or facilities authorized by the permit whether in compliance or not in compliance with the terms and conditions of the permit. This indemnification does not extend to any claims, suits, actions, or damages to the extent attributable to DEC's own negligent or intentional acts or omissions, or to any claims, suits, or actions naming the DEC and arising under article 78 of the New York Civil Practice Laws and Rules or any citizen suit or civil rights provision under federal or state laws.

Item B: Permittee's Contractors to Comply with Permit

The permittee is responsible for informing its independent contractors, employees, agents and assigns of their responsibility to comply with this permit, including all special conditions while acting as the permittee's agent with respect to the permitted activities, and such persons shall be subject to the same sanctions for violations of the Environmental Conservation Law as those prescribed for the permittee.

Item C: Permittee Responsible for Obtaining Other Required Permits

The permittee is responsible for obtaining any other permits, approvals, lands, easements and rights-of-way that may be required to carry out the activities that are authorized by this permit.

Item D: No Right to Trespass or Interfere with Riparian Rights

This permit does not convey to the permittee any right to trespass upon the lands or interfere with the riparian rights of others in order to perform the permitted work nor does it authorize the impairment of any rights, title, or interest in real or personal property held or vested in a person not a party to the permit.

GENERAL CONDITIONS

General Condition 1: Facility Inspection by the Department

The permitted site or facility, including relevant records, is subject to inspection at reasonable hours and intervals by an authorized representative of the Department of Environmental Conservation (the Department) to determine whether the permittee is complying with this permit and the ECL. Such representative may order the work suspended pursuant to ECL 71-0301 and SAPA 401(3).

The permittee shall provide a person to accompany the Department's representative during an inspection to the permit area when requested by the Department.

A copy of this permit, including all referenced maps, drawings and special conditions, must be available for inspection by the Department at all times at the project site or facility. Failure to produce a copy of the permit upon request by a Department representative is a violation of this permit.

General Condition 2: Relationship of this Permit to Other Department Orders and Determinations

Unless expressly provided for by the Department, issuance of this permit does not modify, supersede or rescind any order or determination previously issued by the Department or any of the terms, conditions or requirements contained in such order or determination.

General Condition 3: Applications for Permit Renewals or Modifications

The permittee must submit a separate written application to the Department for renewal, modification or transfer of this permit. Such application must include any forms or supplemental information the Department requires. Any renewal, modification or transfer granted by the Department must be in writing.

The permittee must submit a renewal application at least:

a) 180 days before expiration of permits for State Pollutant Discharge Elimination System (SPDES), Hazardous Waste Management Facilities (HWMF), major Air Pollution Control (APC) and Solid Waste Management Facilities (SWMF); and

b) 30 days before expiration of all other permit types.

Submission of applications for permit renewal or modification are to be submitted to:

NYSDEC Chief Permit Administrator,
625 Broadway, Albany NY 12233-1750, Telephone (518) 402-9167

General Condition 4: Permit Modifications, Suspensions and Revocations by the Department

The Department reserves the right to modify, suspend or revoke this permit in accordance with 6 NYCRR Part 621. The grounds for modification, suspension or revocation include:

a) materially false or inaccurate statements in the permit application or supporting papers;

b) failure by the permittee to comply with any terms or conditions of the permit;

c) exceeding the scope of the project as described in the permit application;

d) newly discovered material information or a material change in environmental conditions, relevant technology or applicable law or regulations since the issuance of the existing permit;

e) noncompliance with previously issued permit conditions, orders of the commissioner, any provisions of the Environmental Conservation Law or regulations of the Department related to the permitted activity.

Water Quality Certification

Certification

1. The New York State Department of Environmental Conservation (Department) hereby certifies:

- the Department has reviewed the certificate holders' Application for Federal Hydroelectric License (hereafter referred to as "the Application") and all other available pertinent information, including studies submitted in support of the application and the Offer of Settlement filed with the Federal Energy Regulatory Commission (FERC) in August 2002.
- the Project will comply with Sections 301, 302, 303, 306, and 307 of the Federal Water Pollution Control Act as amended and as implemented by the limitations, standards and criteria of the state statutory and regulatory requirements set forth in 6NYCRR Section 608.9(a); and
- the Project will comply with applicable New York State effluent limitations, water quality standards and thermal discharge criteria set forth in 6NYCRR Parts 700-706.

This Water Quality Certification is issued solely for the purposes of Section 401 of the Federal Water Pollution Control Act (33 USC 1341).

CONTACTS: Except as otherwise specified, all contact with the Department concerning this certificate shall be addressed to:

New York State Department of Environmental Conservation
Chief Permit Administrator
625 Broadway
Albany, NY 12233-1750

Written submissions to the Department must include five (5) complete copies of the submission. One (1) copy must be sent to the Region 4 Permit Administrator, NYSDEC, 1150 Westcott Rd, Schenectady, NY 12306-2014.

SPECIAL CONDITIONS

A. ADMINISTRATION

1. This certificate includes and incorporates the Hoosic River "Offer of Settlement" (Settlement) dated June, 2002.

2. Inspections: The Project, including relevant records, is subject to inspection at reasonable hours and intervals, upon reasonable notice to the certificate holder, by an authorized representative of the Department to determine whether the applicant is complying with this certification. A copy of this certification, including the Hoosic River **Offer of Settlement** dated June, 2002 and the FERC license, including all maps, drawings, and special conditions, must be available for inspection by the Department during such inspections at the Project.

3. Emergencies: With the exception of emergency provisions described in the Settlement, the following procedures shall apply to activities conducted at the Project in response to an emergency.

   Prior to commencement of emergency activities, the NYS DEC must be notified and must determine whether to grant emergency authorization. If circumstances require that emergency activities be taken immediately such that prior notice to the DEC is not possible, then the DEC must be notified by the certificate holder within 24 hours of commencement of the emergency activities and be provided sufficient information to make a determination whether to grant emergency authorization. In either case, notification must be by certified mail, telegram, or other written form of communication, including fax and electronic mail. This notification must be followed within 3 weeks by submission of the following information:

SPECIAL CONDITIONS
(continued)

1) a description of the action;
2) location map and plan of the proposed action;
3) reasons why the situation is an emergency

All notifications, requests for emergency authorizations and information submitted to support such requests shall be sent to the Chief Permit Administrator at the address listed above.

4. Modifications and Revocations: The DEC reserves the right to modify suspend or revoke this certificate when:

1) the scope of the certified activity is exceeded or a violation of any condition of this certificate or provision of the ECL and pertinent regulation is found;
2) the certificate was obtained by misrepresentation or failure to disclose relevant facts;
3) new material information is discovered;
4) environmental conditions, relevant technology, or applicable law or regulation have materially changed since the certificate was issued.

B. OPERATING CONDITIONS

5. Instream Flows: The certificate holder shall maintain instream flows in accordance with the Settlement, in particular, Section 3.2.

6. Flow Monitoring: The certificate holder shall develop a stream flow and water level monitoring plan consistent with the Settlement in particular Section 3.3.

7. Impoundment Fluctuations: The Schaghticoke and Johnsonville reservoirs (Project reservoirs) shall be operated in accordance with the Settlement (see subsection 3.1). Alternate impoundment operating plans must be reviewed and approved by NYS DEC prior to being implemented. Emergencies shall be dealt with in accordance with special conditions #3 of this certificate.

8. Fish Protection, Passage and Movement: Fish protection passage and movement provisions shall be provided in accordance with the Settlement (see Section 3.4).

C. Project MAINTENANCE AND CONSTRUCTION
Note: All matters pertaining to "Project Maintenance and Construction" shall be addressed to:

Chief Permit Administrator
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233

9. Maintenance Dredging: The certificate holder shall install and maintain appropriate turbidity control structures while conducting any maintenance dredging activities in the intake/forebay area of the Project.

10. Sediment Analysis and Disposal: The certificate holder must sample any sediments to be disturbed or removed from the Project waters and test them for contaminants. Sampling and testing shall be accomplished according to a protocol submitted to and approved by the Department prior to sampling.

Prior to dredging or other excavation, the certificate holder must secure Department approval for all disposal or interim holding locations for any sediments to be removed from the Project waters.

11. Erosion and Sediment Control: The certificate holder shall ensure that the following erosion and sediment/contaminant control measures, at a minimum, are adhered to during routine maintenance and construction (including maintenance dredging) that may result in sediments/contaminants entering the Project reservoirs or the Hoosic River.

SPECIAL CONDITIONS
(continued)

1. Isolate in-stream work from the flow of water and prevent discolored (turbid) discharges and sediments caused by excavation. dewatering and construction activities from entering the waters of the Hoosic River.

2. Prohibit heavy construction equipment from operating below the mean high water level of Project reservoirs and the Hoosic River until the work area is protected by a watertight structure and dewatered

3. Minimize soil disturbance, grade so as to prevent or minimize erosion and provide temporary and/or permanent stabilization of all disturbed areas and stockpiles to minimize the potential for erosion and subsequent sedimentation within Project reservoirs or the Hoosic River.

4. Protect all waters from contamination by deleterious materials such as wet concrete, gasoline solvents, epoxy resins or other materials used in construction, maintenance and operation of the Project.

5. Install and maintain erosion control structures on the down slopes of all disturbed areas to prevent eroded material from entering Project reservoirs or the Hoosic River. Erosion control structures must be installed before commencing any activities involving soil disturbance and all erosion control structures must be maintained in a fully functional condition.

6. Ensure complete removal of all dredged/excavated material and construction debris from the bed and banks of Project reservoirs and the Hoosic River in the vicinity of the Project.

7. Ensure that all temporary fill and other materials placed in the waters of the river are completely removed, immediately upon completion of construction, unless otherwise directed by the Department.

12. Placement of cofferdams, construction of temporary access roads or ramps, or other temporary structures which encroach upon the bed or banks of the Hoosic River or Project Reservoirs: The design of all such structures must be approved by the Department prior to installation.

13. River Flow: During any period of maintenance and/or construction activity, the certificate holder shall continuously maintain adequate flows immediately downstream of work sites consistent with the provisions of this certificate.

14. Construction Drawdowns: Whenever construction and/or maintenance activities require that the water level of Project reservoirs be lowered, it shall not be drawn down more than 1 foot per hour. During refill, the water level of the impoundment shall not be allowed to rise more than 1 foot per hour.

15. Turbidity Monitoring: During maintenance or construction-related activities in or near the Hoosic River or Project reservoirs, the certificate holder will monitor the turbidity of Project waters at a point immediately upstream of the work area and at a point no more than 100 feet downstream from the work area. The certificate holder specifically agrees that if, at any time, turbidity measurements from the downstream locations exceed the measurements from the upstream locations, all related construction on the Project will cease until the source of the turbidity is discovered and the situation is corrected.

16. Notifications: The Chief Permit Administrator must be notified in writing at least two weeks prior to commencing any Project maintenance or construction work performed under the authority of this certificate.

D. PUBLIC ACCESS AND RECREATION

16. Public access and recreational opportunities shall be provided in conformance with the Settlement.

cc: List Attached

Betty Lou Bailey, Chairman
Adirondack Mountain Club
Canoe Route Subcommittee
4029 Georgetown Square
Schenectady, New York 12303-5300

Neil F. Woodworth, Counsel & Deputy Ex. Director
Adirondack Mountain Club
301 Hamilton St
Albany, New York 12210-1707

Andrew Fahlund, Director of Hydropower Dev.
American Rivers
1025 Vermont Ave NW
Washington, DC 20005-3516

John T. Gangemi, Conservation Director
American Whitewater
482 Electric Ave
Bigfork, Mt. 59911-3641

Town Clerk
Town of Cambridge
Cobble Road
Cambridge, NY 12816

Jacob S. Niziol, Coordinator
Reliant Energy
225 Greenfield Parkway, Suite 201
Liverpool, NY 13088-6656

James A. Bessha
Fourth Branch Assoc (Mechanicville)
455 New Karner Road
Albany, NY 12205-3821

Office of the Mayor
Village of Hoosick Falls
PO Box 247
Hoosick Falls, NY 12090-0247

Jerry L. Sabattis, Hydro Licensing Coordinator
Reliant Energy
225 Greenfield Parkway, Suite 201
Liverpool, NY 13088-6656

Mitchell F. Hertz, Esquire
Kirkland & Ellis
655 15th St NW, Suite 1200
Washington, DC 20005-55701

Samuel S. Hirschey P.E., Manager
Reliant Energy
Erie Boulevard Hydropower, L.P.
225 Greenfield Parkway, Suite 201
Liverpool, NY 13088-6656

W, Thaddeus Miller
Reliant Energy.
7 E. Redwood St., Floor 10
Baltimore, Md 21202-1115

Frances E. Francis, Esquire
Spiegel & Diarmid
1350 New York Ave NW, Suite 1100
Washington, DC 20005-4710

Town Clerk
Town of Hoosick
56 Church Street
Hoosick Falls, NY 12090-1644

Office of the Mayor
Town of Mechanicville
36 North Main Street
Mechanicville, NY 12118-1985

David J. Miller
National Audubon Society
700 Broadway
New York, NY 10003-9536

Richard Roos-Collins, Director of Litigation
Natural Heritage Institute
2140 Shattuck Ave, Floor 5
Berkeley, Ca 94704-1210

Janet Hand Deixler, Commissioner
New York Public Service Commission
3 Empire State Plaza
Albany, New York 12223-1000

Bruce .R. Carpenter, Executive Director
Rivers United
PO Box 1460
Rome, NY 13442-1460

Director
New York Sea Grant Institute
SUNY
Dutchess Hall
Stony Brook, NY 11794-0001

Carol A. Howland
New York State Electric & Gas Corp.
PO Box 5224
Binghamton, NY 13902-5224

John J. Gosek, Mayor
City of Oswego
Office of the Mayor, City Hall
11 West Oneida Street
Oswego, NY 13126

Town Clerk
Town of Pittstown
R.D. #1
Valley Falls, NY 12185

John D. Draghi
Law Offices of Huber Lawrence & Abell
605 3rd Ave, Floor 27
New York, NY 10158-2799

Paul V. Nolan
5515 17th Street
Arlington, Va 22205-2722

Raymond W. Coonrad
Rensselaer County Conservation Alliance
3119 6th Avenue
Troy, NY 12180-1202

Leon F. Szeptycki, Environmental Counsel
Trout Unlimited
1500 Wilson Blvd., Suite 310
Arlington, Va 22209-2404

Office of the Mayor
City of Troy
1 Monument Square
Troy, New York 12180-0824

Leonard P. Corin, Field Supervisor
U.S. Fish & Wildlife Service
3817 Luker Road
Cortland, NY 13045-9385

Kevin Mendick
U.S. National Park Service
North Atlantic Region
15 State Street
Boston, Ma 02109-3502

Anthony R. Conte
US Dept. of the Interior
Suite 300
70 Commercial Street
Concord, NH 03301-5031

Thomas Matias
Trout Unlimited
37 Douglas Road
Delmar, NY 12054-3125

Lydia T. Grimm
US Dept. of the Interior
Office of the Solicitor
1849 C Street NW, MS 6456
Washington, DC 20240-0001

Office of the Mayor
Village of Valley Falls
PO Box 157
Valley Falls, NY 12185-0157

Bill Jolly
Washington State Parks &
Recreation Commission
PO Box 42668
Olympia, Wa 98504-2668

Judith M. Stolfo
US Dept. of the Interior
1 Gateway Center, Suite 612
Newton, Ma 02458-2881

F. Michael Tucker
Mercer Companies Inc
Three E-Comm 2
Albany, NY 12207-2981

William J. Madden Jr., Esquire
Winston & Strawn
1400 L Street NW
Washington, DC 20005-3509

County Clerk
County of Washington
Washington County Office Building
Upper Broadway
Fort Edward, NY 12828

John Costello
Office of Hydropower Licensing
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Deborah Osborne
Office of Dispute Resolution
Federal Energy Regulatory commission
888 First Street, NE
Washington, DC 20426

Thomas DeWitt
Office of Hydropower Licensing
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Honorable Magalie R. Salas
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

From: Hogan, Chris M (DEC) <chris.hogan@dec.ny.gov>
Sent: Wednesday, August 14, 2019 2:01 PM
To: Zehr, Jason <Jason.Zehr@brookfieldrenewable.com>
Cc: VanMaaren, Chris C (DEC) <chris.vanmaaren@dec.ny.gov>
Subject: Brookfield WQCs

Jason – Chris VanMaaren forwarded me your email requesting that the NYSDEC confirm that the Section 401 Water Quality Certificates (WQC) for the Brookfield Renewable facilities listed below are still in effect.

Lower Raquette River (P-2330) – WQC effective date of October 2006
Middle Raquette River (P-2320) – WQC effective date of October 2006
School Street (P-2539) – WQC effective date of October 2006
Hoosic River (P-2616) – WQC effective date of September 2002

This email serves to confirm that the WQCs for the above reference facilities were issued to expire concurrent with the FERC license. As such, all of the NYSDEC WQCs are valid and in full effect for these facilities.

If you need anything further from the NYSDEC please contact me.

Christopher M. Hogan
Chief, Major Project Management Unit
Department of Environmental Conservation
Division of Environmental Permits
625 Broadway, 4th Floor
Albany, NY 12233-1750
(518) 402-9151
chris.hogan@dec.ny.gov

APPENDIX D
THREATENED AND ENDANGERED SPECIES IPaC REPORT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

St. Lawrence County, New York

Local office

New York Ecological Services Field Office

(607) 753-9334
(607) 753-9699

3817 Luker Road
Cortland, NY 13045-9385

http://www.fws.gov/northeast/nyfo/es/section7.htm

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Northern Long-eared Bat Myotis septentrionalis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9045	Threatened

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)

Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Dec 1 to Aug 31
Black-billed Cuckoo *Coccyzus erythropthalmus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 20 to Jul 31
Cape May Warbler *Setophaga tigrina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Jul 31
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Evening Grosbeak *Coccothraustes vespertinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Golden-winged Warbler *Vermivora chrysoptera* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8745	Breeds May 1 to Jul 20

Rusty Blackbird Euphagus carolinus — Breeds May 10 to Jul 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wood Thrush Hylocichla mustelina — Breeds May 10 to Aug 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is

not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

WETLAND INFORMATION IS NOT AVAILABLE AT THIS TIME

This can happen when the National Wetlands Inventory (NWI) map service is unavailable, or for very large projects that intersect many wetland areas. Try again, or visit the NWI map to view wetlands at this location.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.