Low Impact Hydropower Institute's (LIHI) Certification Review for Oswegatchie Hydroelectric Project

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1. BACKGROUND

The Oswegatchie Hydroelectric Project (Project) consists of six developments located on the Oswegatchie River in upstate NY, licensed with the Federal Energy Regulatory Commission (FERC) as Project No. 2713. From upstream to downstream these hydropower developments are Browns Falls (latitude 44.213°, longitude -75.037°), Flat Rock (latitude 44.221°, longitude -75.074°), South Edwards (latitude 44.266°, longitude -75.192°), Oswegatchie (latitude 44.270°, longitude -75.199°), Heuvelton (latitude 44.618°, longitude -75.404°), and Eel Weir (latitude 44.638°, longitude -75.491°). All of the developments are within St. Lawrence County.

The Project's developments were originally constructed over a period of years from 1913 to 1928 for the sole purpose of energy production. The Project's total installed capacity of 28.56 MW is estimated to produce an average annual generation (AAG) of 110,411 MWh which corresponds to an annual plant factor of 44.1%.

The Project is owned and operated by Erie Boulevard Hydropower, L.P. (EBH) [1], wholly owned as a subsidiary of Brookfield Renewable Energy Group (BREG). An Offer of Settlement (OOS) [2] was signed and filed with FERC on February 18, 2011. FERC's Final Environmental Assessment (FEA)[3] was issued on October 18, 2011. A Section 401 Water Quality Certificate (WQC) [4] was issued by the New York State Department of Environmental (NYSDEC) on October 24, 2012, and is still in effect.

The FERC issued the original license for the Project on January 10, 1983, which expired on December 31, 2012. On November 26, 2012, the FERC issued a new 40-year license to EBH[5], effective on January 1, 2013. The license expires on December 31, 2052.

EBH submitted an application for certification of the Project on March 29, 2019. On April 15, 2019, LIHI notified EBH that the intake review for the Project was complete. The intake review found that only a small amount of supplemental information was needed. EBH supplied a revised application dated April 23, 2019. On May 20, 2019, I committed to perform the certification review for the Project.

2. OSWEGATCHIE RIVER BASIN

The Oswegatchie River is a 137-mile-long river in northwestern New York, comprised of the main, west and middle branches, that drains 1,592 square miles (SQMI). It flows from the Adirondack Mountains north to the Saint Lawrence River.

The upper part of the watershed is a rugged mountainous area where numerous lakes and ponds flow into the river. The river valley is characterized by many narrow valleys with steep elevation drops before it reaches the level plains near the St. Lawrence River (See Figure 1).

[1] Daniel J. Maguire, P.E., EBH Compliance Manager, 184 Elm Street, Potsdam, NY 13676 - 315-267-1036 - Danny.Maguire@brookfieldrenewable.com
[2] OOS - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12567998
[3] FEA - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12794248
[4] WQC https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13100296
[5] FERC License - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13115600

The west branch of the river is located in Herkimer, Lewis, and St. Lawrence counties of New York. The middle branch of the river begins northeast of the hamlet of Stillwater, NY and flows into the west branch of the river in Harrisville, New York. The river continues downstream as the west branch of the river, until its confluence with the Oswegatchie River a short distance west of the village of Talcville, New York. The river continues downstream to its terminus with the St. Lawrence River near Ogdensburg, New York.

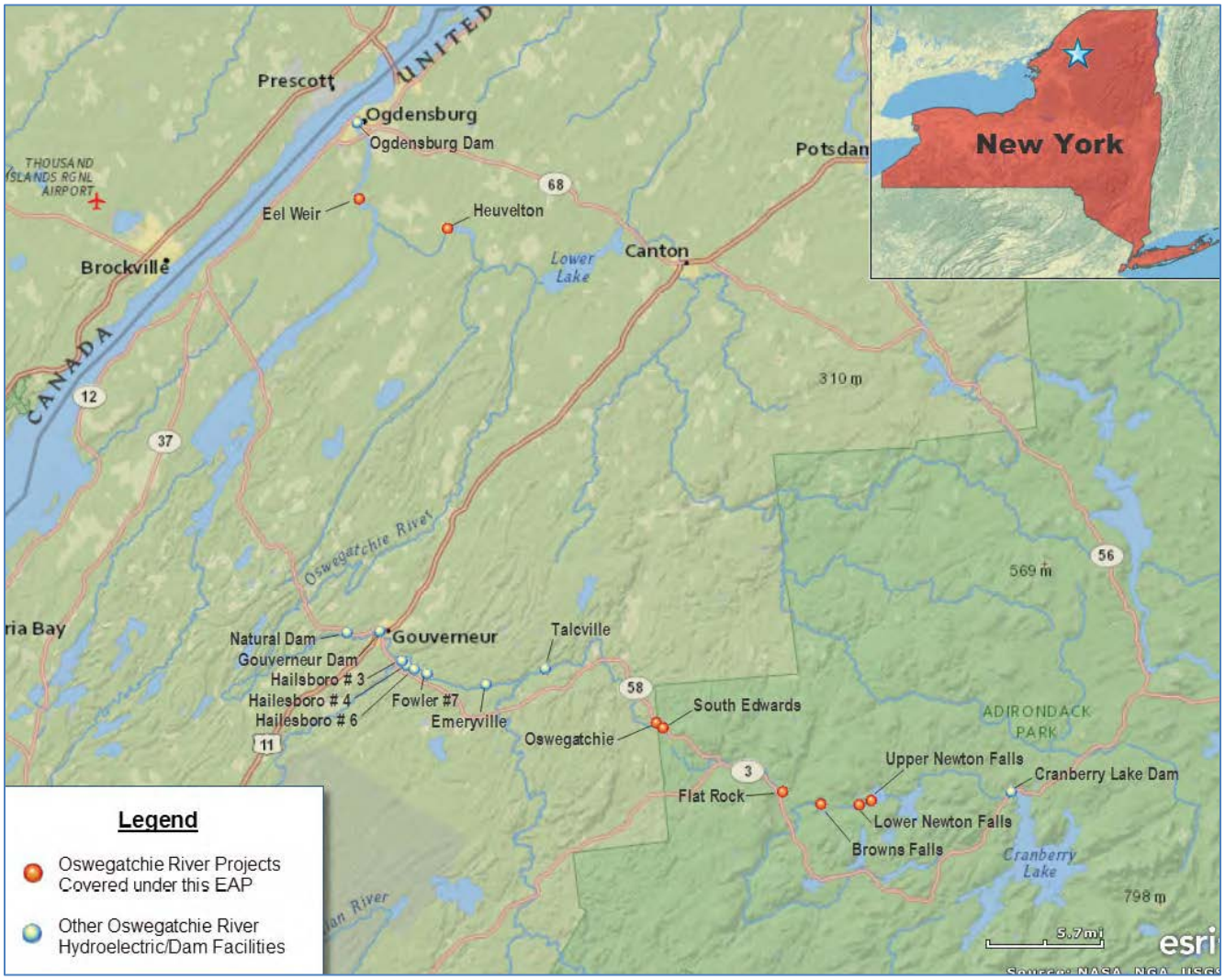


Figure 1 - Location Map

There are a number[6] of dams both upstream, downstream and intertwined between the Project's developments. A listing of the dams from upstream to downstream include:

- The Cranberry Lake Project at river mile (RM) 108.0, owned by Ampersand Cranberry Lake Hydro (ACLH) and licensed as FERC Project 9685. ACLH notifies EBH whenever outflows from Cranberry Lake change.
- The Upper Newton Falls Development, owned by EBH at RM 99.6 and licensed as part of FERC Project 7000. Downstream fish passage is provided below the dam.
- The Lower Newton Falls Development, owned by EBH at RM 99.1 and licensed as part of FERC Project 7000. Downstream fish passage is provided below the dam.
- *The Brown Falls Development, owned by EBH at RM 96.9, licensed with FERC as part of the Project.*
- *The Flat Rock Development, owned by EBH at RM 94.1, licensed with FERC as part of the Project.*
- *The South Edwards Development, owned by EBH at RM 87.1, licensed with FERC as part of the Project.*
- *The Oswegatchie Development, owned by EBH at RM 86.6, licensed with FERC as part of the Project.*
- The Talcville Project at RM 75.7, owned by EBH and licensed as FERC Project 4402.
- The Emeryville Project at RM 72.3, owned by Hampshire Paper Company and licensed as FERC Project 2850.
- The Fowler No. 7 Project at RM 69.0, owned by Hydro Development Group and licensed as FERC Project 6059.
- The Hailsboro No. 6 Project at RM 68.2, owned by Hydro Development Group and licensed as FERC Project 3181.
- The Hailsboro No. 4 Project at RM 67.1, owned by Hydro Development Group and licensed as FERC Project 5633.
- The Village of Gouverner Project at RM 64.4, owned by the Village of Gouverner and licensed as FERC Project 7155.
- The Natural Dam Project at RM 62.4, owned by Cell Tissue Corporation and licensed as FERC Project 2851.
- *The Heuvelton Development, owned by EBH at RM 12.0, licensed with FERC as part of the Project. Upstream fish passage is provided at the dam.*
- *The Eel Weir Development, owned by EBH at RM 5.1, licensed with FERC as part of the Project. Upstream fish passage is provided at the dam.*
- The Ogdensburg Project at RM 0.9, owned by Ampersand Ogdensburg Hydro and licensed as FERC Project 9821.

[6] The Project's developments in this list are italicized.

3. PROJECT DESCRIPTION

On November 26, 2012, the FERC issued a new 40-year license to EBH, effective on January 1, 2013. The license expires on December 31, 2052. The Project's total installed capacity of 28.56 MW is comprised as follows: Brown Falls Development – 15.0 MW, Flat Rock Development – 5.07 MW, South Edwards Development – 2.92 MW, Oswegatchie Development – 2.07 MW, Heuvelton Development – 1.04 MW and Eel Weir Development – 2.46 MW.

Actual annual generation is filed with FERC each year. The average annual generation (AAG) from 2013 to 2018 was reported as 110,411 MWh, comprised as follows: Brown Falls Development – 55,741 MWh (Power factor of 42.4%), Flat Rock Development – 16,095 MWh (Power factor of 36.2%), South Edwards Development – 17,249 MWh (Power factor of 67.4%), Oswegatchie Development – 8,080 MWh (Power factor of 44.6%), Heuvelton Development – 4,424 MWh (Power factor of 48.6%) and Eel Weir Development – 8,822 MWh (Power factor of 40.94%). This results in a total Project annual plant factor of 44.1%.

The four upstream developments, Browns Falls, Flat Rock, South Edwards and Oswegatchie are operated as peaking facilities, while the two downstream developments, Heuvelton and Eel Weir, operate more in a run-of-river (ROR) mode while still allowed to fluctuate their head ponds within a 0.5 foot band.

The NYSDEC has classified the portion of the Oswegatchie River from the Browns Falls impoundment through the downstream extent of the Oswegatchie Development as Class C waters with an accompanying standard (T) pertaining to trout waters in a portion of the Flat Rock impoundment. The Oswegatchie River at the Heuvelton and Eel Weir Developments is classified as Class B waters.

A. Browns Falls

The Brown Falls dam (See Figure 2) is located at RM 96.9 on the Oswegatchie River near the Towns of Fine and Clifton in St. Lawrence County, New York (Latitude 44.213° N, Longitude 75.037° W). The development was originally constructed in 1913 for the sole purpose of energy production and consists of:

- A 941-foot-long, 69-foot-high concrete gravity dam that includes a 192-foot-long ogee spillway section with a crest elevation of 1,347 feet above mean sea level (FTMSL) engineered for 2-foot-high seasonal flash boards. The hydraulic discharge capacity of the spillway is about 8,000 cubic feet per second (CFS) which corresponds to an impoundment elevation of 1,352 FTMSL (top on non-overflow structure);
- A 130-foot-long abutment section with a timber parapet wall and a 70-foot-long abutment section on the east side of the spillway;
- A 27.6-foot-long gate section on the west side of the spillway with a 6-foot-wide, 7-foot-high sluice gate opening and two 6-foot-high, 5.5-foot-wide sluice slide gates;
- A 62-foot-long intake section on the west side of the spillway and a 459-foot-long abutment section on the west side of the spillway;
- A 62-foot-long, 41.3-foot-high gated intake structure that includes a trashrack with 2.5-inch clear bar spacing and two 11-foot-wide, 15-foot-high head gates. EBH is required to install 1-inch spaced trashracks no later than December 31, 2023;
- A 12-foot-diameter, 6,000-foot-long steel pipeline;
- A 40-foot-diameter, 70-foot-high surge tank;
- Two 8-foot-diameter, 142-foot-long steel penstocks;

- A 74-foot-long, 53-foot-wide concrete-brick powerhouse containing two vertical Francis turbine-generating units;
- A 100-foot-long concrete-lined tailrace;
- A 123-foot-long, 6.6 kilovolt (kV) transmission line connecting the powerhouse to the regional grid.

There are no other major construction upgrades planned regarding the development.

The development's impoundment extends about 2.0 miles upstream. The normal operating range is from 1,349 FTMSL to 1,343 FTMSL. At a maximum operating headpond elevation of 1,349 FTMSL, the impoundment has a surface area of 168 acres, a gross storage capacity of 3,234 acre-feet (ACFT) and a usable volume of 882 ACFT.

Figure 2 - Browns Falls Dam, Impoundment and Bypass Reach

The development operates within a 4.0-foot drawdown limit measured from top of crest of spillway (1,347 FTMSL) or flashboards (1,349 FTMSL) from July 15 through March 14 and a 2.0-foot drawdown limit from March 15 through July 14. A year-round minimum flow of 30 CFS is released from a low-level outlet gate at the dam into the 7,500-foot-long bypassed reach.

Water is conveyed from the dam to the powerhouse through a 12-foot-diameter, 6,000-foot-long steel pipeline transitioning into two 8-foot-diameter, 142-foot-long steel penstocks.

The powerhouse contains two identical vertical Francis turbines. Each turbine has a design output capacity of 8.56 MW at a design head of 260 feet and a speed of 360 revolutions per minute (RPM).

Each turbine's maximum and minimum hydraulic capacities are 440 CFS and 187 CFS, respectively. Each generator is a direct-connected, General Electric, 3-phase, 60-cycle, alternating current, synchronous generators. A view of generator 2 is shown in Figure 3.

Figure 3 - View of Unit No. 2

Each generator has a maximum output of 9.375 MVA, operated at a power factor of 0.8, resulting in maximum power output of 7.5 MW. Therefore, the turbines are somewhat generator limited. There are currently no plans for turbine or generator upgrades in the near future.

Development inflows are estimated using U.S. Geological Survey (USGS) gage 04262000 Oswegatchie River near Oswegatchie, New York. This downstream gage has a drainage area of 259 SQMI. The drainage area at the Project dam is 178 SQMI. The applicant states the development's inflows are estimated by multiplying the USGS gage flow by (178/259) or 0.687. Based on this approach, the development's period of record (POR) average annual inflow from October 1, 1924 through May 22, 2019 is 375 CFS.

Based on a flow duration analysis using these POR daily flows, the total hydraulic powerhouse flow plus minimum flow (880+30) or 910 CFS is exceeded 5 percent of the time, indicating that spillway flow occurs only 5 percent of the time annually.

A frequency analysis using these POR daily flows indicates the 100-year daily flood flow is 2,844 CFS. The highest historical daily flow of 2,880 CFS occurred on April 15, 2014.

B. Flat Rock

The Flat Rock dam (Figure 4) is located at RM 95.5 on the Oswegatchie River near the Town of Fine in St. Lawrence County, New York (Latitude 44.221° N, Longitude 75.074° W). The development was originally constructed in 1924 for the sole purpose of energy production and consists of:

- A 658-foot-long, 70-foot-high concrete gravity dam that includes a 229-foot-long ogee spillway section with a crest elevation of 1,080 FTMSL and a 7-foot-wide, 4-foot-high sluice gate opening;
- A 120-foot-long earthen embankment section with a concrete core wall on the east side of the spillway;
- A 95-foot-long abutment section with a timber parapet wall on the east side of the spillway;
- A 66-foot-long intake section on the west side of the spillway;
- A 14-foot-long gate section on the west side of the spillway with a 6-foot-high, 5-foot-wide sluice slide gate;
- A 134-foot-long abutment section on the west side of the spillway;
- A 66-foot-long, 42-foot-high gated intake structure with two 16-foot-high, 14.25-foot-wide head gates;
- An 85-foot-long, 66-foot-wide concrete-brick powerhouse containing two vertical Francis turbine-generating units;
- A 25-foot-long concrete-walled tailrace;
- A 30-foot-long, 2.4 kV transmission line connecting the powerhouse to the regional grid.

In 1991, the dam underwent rehabilitation which included concrete surface repairs on the downstream face of the west non-overflow structure and the downstream wall of the powerhouse at the generator floor level. In 2001, the right dike was raised by installing a timber parapet. There are no other major construction upgrades planned regarding the development.

Figure 4 - Flat Rock Dam and Powerhouse

The development's impoundment extends about 1.4 miles upstream. The spillway is not engineered for flashboards. At a maximum operating headpond elevation of 1,080 FTMSL, the impoundment has a surface area of 159 acres, a gross storage capacity of 2,646 ACFT with a usable volume of 509 ACFT. The hydraulic discharge capacity of the spillway is about 12,000 CFS which corresponds to an impoundment elevation of 1,086 FTMSL (top of the left non-overflow structure).

The development's normal operating range is limited to a 4.0-foot drawdown band measured from top of crest of spillway from July 15 through March 14 and a 2.0-foot drawdown band from March 15 through July 14. A year-round base flow of 160 CFS is released from the powerhouse.

The development's powerhouse is integral with the dam; therefore, there is no bypassed reach. Water is conveyed from the dam to the powerhouse through an intake on the west side of the spillway to the powerhouse intakes. The intake for turbine 2 has 1-inch clear spaced trashracks. The turbine 1 intake has 2.5-inch clear spaced trashracks. EBH is required to install 1-inch spaced trashracks for the turbine 1 intake no later than December 31, 2023.

The powerhouse contains two vertical Francis turbines. Turbine 1 has a design output capacity of 2.09 MW at a design head of 57.5 feet and a speed of 180 RPM. Turbine 2 has a design output capacity of 2.98 MW at a design head of 58 feet and a speed of 180 RPM.

Figure 5 - Flat Rock Generator 2

Turbine 1's maximum and minimum hydraulic capacities are 478 CFS and 100 CFS. This turbine was redesigned to pass the 160 CFS downstream base flow. Turbine 2's maximum and minimum hydraulic capacities are 745 CFS and 180 CFS. Each generator is a direct-connected, General Electric, 3-phase, 60-cycle, alternating current, synchronous generators. A view of generator 2 is shown in Figure 5.

Each generator has a maximum output of 3.75 MVA, operated at a power factor of 0.8, resulting in maximum power output of 3.0 MW. There are currently no plans for turbine or generator upgrades in the near future.

Development inflows were estimated using U.S. Geological Survey (USGS) gage 04262000 Oswegatchie River near Oswegatchie, New York. This gage has a drainage area of 259 SQMI. The drainage area at the Project dam is 262 SQMI. The applicant states the development inflows are estimated by multiplying the USGS gage flow by (262/259) or 1.012. Based on this approach, the development's period of record (POR) average annual inflow from October 1, 1924 through May 22, 2019 is 553 CFS.

Based on a flow duration analysis using these POR daily flows, the total hydraulic powerhouse flow plus base flow (478+745) or 1,223 CFS is exceeded 9 percent of the time, indicating that spillway flow occurs only 9 percent of the time annually.

A frequency analysis using these POR daily flows indicates the 100-year daily flood flow is 4,186 CFS. The highest historical daily flow of 4,239 CFS occurred on April 15, 2014.

C. South Edwards

The South Edwards dam (See Figure 6) is located at RM 87.1 on the Oswegatchie River near the Towns of Edwards and Fine in St. Lawrence County, New York (Latitude 44.266° N, Longitude 75.192° W).

Figure 6 - South Edwards Dam and Penstock

The development was originally constructed in 1914 for the sole purpose of energy production and consists of:

- A 215-foot-long, 48-foot-high dam that includes an 88-foot-long gravity ogee spillway section with a crest elevation of 843.2 FTMSL, engineered for 2-foot-high seasonal flash boards;
- A 13.5-foot-long abutment section and a 17-foot-long abutment section with an 8-foot-wide, 6-foot-high log sluice gate on the east side of the spillway;
- A 46-foot-long intake section on the west side of the spillway;
- A 50-foot-long abutment section on the west side of the spillway;

- A 510-foot-long earthen embankment and a 240-foot-long earthen embankment located upstream on the west side of the dam, each with concrete core walls and 10-inch-high flashboards;
- A 46-foot-long, 33.5-foot-high gated intake structure and two 6-foot-wide, 11-foot-high head gates;
- A 10-foot-diameter, 1,106-foot-long fiberglass pipeline replaced the original steel pipeline in 1975;
- A 4-foot-diameter butterfly valve and a 4-foot-diameter, 30-foot-long pipe connected to the fiberglass pipeline containing a minimum flow submersible Flygt turbine-generating unit;
- A 10-foot-diameter, 51-foot-high riser and a 16-foot-diameter, 23-foot-high surge tank with a 4-foot-diameter, 63-foot-long overflow pipe connected to the fiberglass pipeline;
- A 78-foot-long, 45-foot-wide concrete powerhouse containing three horizontal Francis turbine-generating units;
- An 880-foot-long, 480 volt transmission line connecting the minimum flow turbine to the powerhouse and a 3,917-foot-long, 2.4 kV transmission line connecting the powerhouse to the regional grid.

The development's impoundment extends about 1.3 miles upstream. At a maximum operating headpond elevation of 845.2 FTMSL, the impoundment has a surface area of 79 acres, a gross storage capacity of 1,002 ACFT and a usable volume of 420 ACFT. The hydraulic discharge capacity of the spillway is about 5,100 CFS which corresponds to an impoundment elevation of 848.6 FTMSL (top of the dikes flashboards).

The development operates within a 6-foot drawdown limit measured from top of crest of spillway (843.2 FTMSL) or flashboards (845.2 FTMSL) from July 15 through March 14 and a 2-foot drawdown limit from March 15 through July 14. A year-round minimum flow of 60 CFS is released into the 1,500-foot-long bypass reach and a year-round base flow of the lesser of 160 CFS or inflow is provided downstream of the powerhouse.

Water is conveyed from the dam to the powerhouse via the gated intake structure. The intake currently has 2.5-inch clear spaced trashracks. EBH is required to install 1-inch spaced trashracks no later than December 31, 2023.

The powerhouse contains two horizontal double Francis turbines (Turbines 1 and 2), one horizontal Francis turbine (Turbine 3) and one submersible turbine-generator (Turbine 4).

Turbines 1 and 2 have a rated output of 1.29 MW at a design head of 83 feet and a speed of 514 RPM. Turbine 3 has a rated output of 0.708 MW at a design head of 80 feet and a speed of 450 RPM. Turbine 4, the minimum flow submersible turbine-generator, has a rated output of 0.256 MW at a design head of 53 feet and a speed of 725 RPM.

Turbine 1 and 2's maximum and minimum hydraulic capacities are 232 CFS and 80 CFS each. Turbine 3's maximum and minimum hydraulic capacity is 221 CFS and 70 CFS. Turbine 4's maximum and minimum hydraulic capacity is 60 CFS.

Each generator is a direct-connected, General Electric, 3-phase, 60-cycle, alternating current, synchronous generators. Generators 1 and 2 have a maximum output of 1.25 MVA, operated at a power factor of 0.8, resulting in maximum power output of 1.0 MW. Generator 3 has a maximum output of 0.85 MVA, operated at a power factor of 0.8, resulting in maximum power output of 0.68 MW. There are currently no plans for turbine or generator upgrades in the near future. A view of generators 1 and 2 is shown in Figure 7.

Figure 7 - South Edwards Generator 1 and 2

Development inflows were estimated using U.S. Geological Survey (USGS) gage 04262000 Oswegatchie River near Oswegatchie, New York. This downstream gage has a drainage area of 259 SQMI. The drainage area at the Project dam is 277 SQMI. The applicant states the development inflows are estimated by multiplying the USGS gage flow by (277/259) or 1.069. Based on this approach, the development's period of record (POR) average annual inflow from October 1, 1924 through May 22, 2019 is 584 CFS.

Based on a flow duration analysis using these POR daily flows, the total hydraulic powerhouse flow plus minimum flow (232+232+221+60) or 745 CFS is exceeded 24 percent of the time, indicating that spillway flow occurs 24 percent of the time annually.

A frequency analysis using these POR daily flows indicates the 100-year daily flood flow is 4,425 CFS. The highest historical daily flow of 4,481 CFS occurred on April 15, 2014.

D. Oswegatchie

The Oswegatchie dam is located at RM 86.6 (See Figure 8) on the Oswegatchie River near the Town of Edwards in St. Lawrence County, New York (Latitude 44.270° N, Longitude 75.199° W). The development was originally constructed in 1913 for the sole purpose of energy production. In 1992, the development suffered a failure of the water supply flume that took it off line for several years.

In 2002, the development was reconstructed, including new penstock headworks, penstocks and powerhouse and consists of:

- A 160-foot-long, 12-foot-high dam that includes an 80-foot-long concrete gravity spillway section with a crest elevation of 758.6 FTMSL, not engineered for seasonal flash boards and a 10-foot-wide, 2.6-foot-deep minimum flow notch with a crest elevation of 756 FTMSL;
- A 30-foot-long bedrock outcrop section on the west side of the spillway;

- A 50-foot-long, 23-foot-high gated intake structure with two 8-foot-high, 8-foot-wide head gates;
- A 6.5-foot-diameter, 75.5-foot-long steel penstock and a 6.5-foot-diameter, 65-foot-long steel penstock;
- A 30-foot-long, 26-foot-wide concrete masonry powerhouse containing two vertical Canadian Hydro turbine generating units;
- A 2,227-foot-long, 2.4 kV transmission line connecting the powerhouse to the regional grid.

Figure 8 - Oswegatchie Dam

The development's impoundment extends about 0.2 miles upstream. At a maximum operating headpond elevation of 758.6 FTMSL, the impoundment has a surface area of 6 acres, a gross storage capacity of 23 ACFT and a usable volume of 2.4 ACFT. The hydraulic discharge capacity of the spillway is about 4,600 CFS which corresponds to an impoundment elevation of 764.0 FTMSL (top of the penstock intake).

The development operates within a 0.4-foot drawdown limit measured from top of crest of spillway (758.6 FTMSL). A year-round minimum flow of 40 CFS is released into the 350-foot-long bypass reach and a year-round base flow of the lesser of 160 CFS or inflow is provided downstream of the powerhouse.

Water is conveyed from the dam to the powerhouse via the gated intake structure adjoined with two steel penstocks. Both penstocks have permanent 1-inch clear bar spacing. A view of the powerhouse and tailrace is shown in Figure 10.

The powerhouse contains two identical vertical-axial-flow turbines with a rated output of 955 MW at a design head of 34.7 feet and a speed of 450 RPM. Each turbine has a maximum and minimum hydraulic capacity of 370 CFS and 50 CFS.

Each generator is a self-contained, direct-connected, Potencia Industrial S.R. 3-phase, 60-cycle alternating current, synchronous unit and has a maximum output of 1.15 MVA, operated at a power factor of 0.9, resulting in maximum power output of 1.035 MW. A view of generators 1 and 2 is shown in Figure 9. There are currently no plans for turbine or generator upgrades in the near future.

Figure 9 - Oswegatchie Generators

Figure 10 - Oswegatchie Powerhouse and Tailrace

Development inflows were estimated using U.S. Geological Survey (USGS) gage 04262000 Oswegatchie River near Oswegatchie, New York. This downstream gage has a drainage area of 259 SQMI. The drainage area at the Project dam is 279 SQMI. The applicant states the development inflows are estimated by multiplying the USGS gage flow by (279/259) or 1.077. Based on this approach, the development's period of record (POR) average annual inflow from October 1, 1924 through May 22, 2019 is 589 CFS.

Based on a flow duration analysis using these POR daily flows, the total hydraulic powerhouse flow plus minimum flow (370+370+40) or 780 CFS is exceeded 22 percent of the time, indicating that spillway flow occurs about 22 percent of the time annually.

A frequency analysis using these POR daily flows indicates the 100-year daily flood flow is 4,457 CFS. The highest historical daily flow of 4,514 CFS occurred on April 15, 2014.

E. Heuvelton

The Heuvelton dam (See Figure 11) is located at RM 12.0 on the Oswegatchie River in the village of Heuvelton near Ogdensburg in St. Lawrence County, New York (Latitude 44.818° N, Longitude 75.404° W). The development was originally constructed in 1923 for the sole purpose of energy production and consists of:

- A 285-foot-long, 19-foot-high concrete gravity dam and spillway with a crest elevation of 276.5 FTMSL, topped with two 28-foot-long, 11.1-foot-high inflatable rubber bladder gates with a crest elevation of 286.7 FTMSL and four 28-foot-long, 11.1-foot-high tainter gates with a crest elevation of 286.7 FTMSL;
- A 70-foot-long, 21.25-foot-high gated intake structure with two 12.5-foot-high, 22-foot-wide head gates;
- A 67-foot-long, 37-foot-wide brick powerhouse containing two vertical Francis turbine-generating units;
- A 62-foot-long, 2.4 kV transmission line connecting the powerhouse to the regional grid.

Figure 11 - Heuvelton Dam and Powerhouse

Major development improvements have occurred. In 1993, a spillway rehabilitation included replacement of the needle beam deck, upper deck, four piers, gate chains and turnbuckles, counterweights, and the majority of trunnion pins and anchors. In addition, in 2018 EBH completed construction of a nature-like fishway around the powerhouse (See Figure 12).

Figure 12 - Heuvelton Nature-Like Fishway

The development's impoundment extends about 2.2 miles upstream. At a maximum operating headpond elevation of 286.7 FTMSL, the impoundment has a surface area of 239 acres, a gross storage capacity of 405 ACFT and a usable volume of 238 ACFT. The hydraulic discharge capacity of the spillway is about 23,000 CFS which corresponds to an impoundment elevation of 292.0 FTMSL (top of the right abutment).

The development operates in a 0.5-foot drawdown limit from the top of the tainter gate crest (286.7 FTMSL). The development's powerhouse is integral with the dam; therefore, there is no bypassed reach. A year-round base flow of 275 CFS or inflow, whichever is less, is provided downstream.

Water is conveyed from the dam to the powerhouse via the gated intake structure. The intake currently has 1.0-inch clear spaced trashracks.

The powerhouse contains two identical vertical Francis turbines. Each turbine has a rated output of 0.544 MW at a design head of 14.5 feet and a speed of 100 RPM. Each turbine's maximum and minimum hydraulic capacity is 496 CFS and 200 CFS.

Each generator is a direct-connected, Westinghouse, 3-phase, 60-cycle, alternating current, and synchronous unit with a maximum output of 0.65 MVA, operated at a power factor of 0.8, resulting in

maximum power output of 0.52 MW. There are currently no plans for turbine or generator upgrades in the near future. A view of generator 2 is shown in Figure 13.

Development inflows were estimated using U.S. Geological Survey (USGS) gage 04263000 Oswegatchie River near Heuvelton, New York. This gage has a drainage area of 986 SQMI. The drainage area at the Project dam is 995 SQMI. The applicant states the development inflows are estimated by multiplying the USGS gage flow by (995/986) or 1.009. Based on this approach, the development's period of record (POR) average annual inflow from June 23, 1916 through May 22, 2019 is 1,798 CFS.

Figure 13 - Heuvelton Generator 2

Based on a flow duration analysis using these POR daily flows, the total hydraulic powerhouse flow (496+496) or 992 CFS is exceeded 57 percent of the time, indicating that spillway flow occurs 57 percent of the time annually.

A frequency analysis using these POR daily flows indicates the 100-year daily flood flow is 15,930 CFS. The highest historical daily flow of 19,375 CFS occurred on April 6, 1960.

F. Eel Weir

The Eel Weir dam (See Figure 14) is located at RM 5.1 on the Oswegatchie River near the Town of Ogdensburg in St. Lawrence County, New York (Latitude 44.638° N, Longitude 75.491° W).

Figure 14 - Eel Weir Dam and Powerhouse

The development was originally constructed in 1928 for the sole purpose of energy production and consists of:

- A 1,122-foot-long, 26-foot-high dam that includes a 774-foot-long Ambursen spillway section with a crest elevation of 272.0 FTMSL, a 3-foot-high, 6-foot-wide log sluice gate opening and two 16.17-foot-high, 13.5-foot-wide sluice slide gates;
- A 110-foot-long earthen embankment section on the west side of the spillway;
- A 120.5-foot-long abutment section on the east side of the spillway;
- A 117-foot-long, 21.75-foot-high gated intake structure with two 15.5-foot-high, 12.25-foot-wide head gates, and two 12-foot-high, 10.25-foot-wide head gates;
- A 117-foot-long, 55-foot-wide brick-and-tile powerhouse containing three turbine-generator units;
- A 127-foot-long, 2.4 kV transmission line connecting the powerhouse to the regional grid.

In 2015, EBH constructed a nature-like fishway around left side of the spillway (See Figure 15).

Figure 15 - Eel Weir Nature-Like Fishway

The development's impoundment extends about 1.5 miles upstream. At a maximum operating headpond elevation of 272.0 FTMSL, the impoundment has a surface area of 96 acres, a gross storage capacity of 136 ACFT and a usable volume of 96 ACFT. The hydraulic discharge capacity of the spillway is about 70,000 CFS which corresponds to an impoundment elevation of 280.0 FTMSL (top of the non-overflow dam section).

The development operates within a 0.5-foot drawdown limit from top of crest of spillway (272.0 FTMSL). The Eel Weir powerhouse is integral within the dam; therefore, there is no bypassed reach at this development. A year-round base flow of the lesser of 325 CFS or inflow is provided downstream of the powerhouse. Water is conveyed from the dam to the powerhouse via the gated intake structure. The intake currently has 1.0-inch clear spaced trashracks.

The powerhouse contains a vertical Francis turbine (Turbine 1) and two vertical propeller turbines (Turbines 2 and 3). Turbine 1 has a rated capacity of 0.45 MW at design head of 12.5 feet and a speed of 100 RPM. Turbines 2 and 3 have a rated capacity of 1.0 MW Design capacity of at design head of 12.5 feet and a speed of 100 RPM. Turbine 1 has a maximum and minimum hydraulic capacity are 510 CFS and 220 CFS. Turbine 2 and 3 have maximum and minimum hydraulic capacities of 1,165 CFS and 790 CFS each.

Each generator is a direct-connected, General Electric, 3-phase, 60-cycle, alternating current, synchronous generator. A view of generator 1 is in Figure 16.

Figure 16 - Eel Weir Generator 1

Generator 1 has a maximum output of 0.625 MVA, operated at a power factor of 0.8, resulting in a maximum power output of 0.5 MW. Generators 2 and 3 have a maximum output of 1.375 MVA, operated at a power factor of 0.8, resulting in maximum power output of 1.1 MW. There are currently no plans for turbine or generator upgrades in the near future.

Development inflows were estimated using U.S. Geological Survey (USGS) gage 04263000 Oswegatchie River near Heuvelton, New York. This gage has a drainage area of 986 SQMI. The drainage area at the Project dam is 1,590 SQMI. The applicant states the development inflows are estimated by multiplying the USGS gage flow by (1,590/986) or 1.613. Based on this approach, the development's period of record (POR) average annual inflow from June 23, 1916 through May 22, 2019 is 1,798 CFS.

Based on a flow duration analysis using these POR daily flows, the total hydraulic powerhouse flow (510+1,165+1,165) or 2,840 CFS is exceeded 33 percent of the time, indicating that spillway flow occurs 33 percent of the time annually.

A frequency analysis using these POR daily flows indicates the 100-year daily flood flow is 25,457 CFS. The highest historical daily flow of 30,960 CFS occurred on April 6, 1960.

4. REGULATORY SUMMARY

The FERC issued the original license for the Project to Niagara Mohawk Power Corporation (NMPC) on January 10, 1983, effective January 1, 1983. This license expired on December 31, 2012. The FERC license was transferred to EBH on July 29, 1999. EBH received a new 40-year FERC license No. 2713 for the Project, issued on November 26, 2012[7], effective on January 1, 2013, expiring on December 31, 2052.

A. Summary of Project Licensing and Agency Consultation Process

The following important correspondence occurred leading up to the FERC relicensing for the Project:

- On February 18, 2011, EBH submitted to FERC a copy of the Offer of Settlement (OOS) signed by EBH, NYSDEC, the U.S. Fish and Wildlife Service (USFWS), the National Park Service (NPS), the Adirondack Mountain Club (ADK), Adirondack Park Agency (APA), Trout Unlimited (TU), and St. Lawrence County.[8]
- On April 21, 2011, FERC filed a notice of application accepted for filing, soliciting motions to intervene regarding EBH's filed an application to relicense the existing Project.[9]
- On May 16, 2011, EBH submitted to FERC proof of filing the application for a Water Quality Certification (WQC) with the NYSDEC for the Project.[10]
- On June 16, 2011, the U.S. Department of the Interior (USDOI) submitted comments, recommendations and preliminary prescriptions for the Project.[11]
- On June 20, 2011, the NYSDEC submitted comments, recommendations and preliminary prescriptions for the Project.[12]
- On June 21, 2011, the USFWS submitted comments, recommendations and preliminary prescriptions for the Project.[13]
- On October 18, 2011, FERC issued a draft Programmatic Agreement (PA) requesting the Advisory Council on Historic Preservation (ACHP) to review and comment by November 17, 2011.[14]
- On October 18, 2011, FERC issued its FEA.[15]
- On October 28, 2011, SHPO responded that it has no additional comments or recommendations regarding the PA.[16]
- On November 4, 2011, the USFWS submitted comments on the FEA.[17]
- On November 17, 2011, EBH submitted comments on the FEA.[18]
- On November 17, 2011, the NYSDEC submitted comments on the FEA. [19]
- On March 1, 2012, FERC issued the final PA.[20]
- On May 8, 2012, the NYSDEC issued the initial WQC.[21]

7 New License - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13115600
8 OOS - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12567998
9 EBH License Application https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12631524
10 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12661599
11 USDOI - https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12682495
12 NYSDEC - https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12684937
13 USFWS - https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12685577
14 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12794247
15FEA - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12794248
16 SHPO - https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12805041
17 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12810823
18 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12820541
19 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12820441
20 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12906599
21 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12987872

- On June 27, 2012, EBH submitted a status update regarding WQC.[22]
- On October 24, 2012, the NYSDEC issued the modified WQC for the Project.[23]

B. Compliance Issues

My review of the FERC docket found the following compliance correspondence relating to the LIHI criteria:

- The final Stream Flow and Water Level Monitoring Plan (SFWLMP) was filed with FERC on September 25, 2013.[24]
- On October 21, 2013, FERC informed EBH that the impoundment deviation that occurred at the Oswegatchie development on May 1, 2013, would not be considered a violation of the license.[25]
- On June 4, 2014 FERC issued an Order Modifying and Approving the SFWLMP.[26]
- On September 11, 2014, FERC informed EBH that the impoundment levels for the Oswegatchie River Hydroelectric Project as a result of flooding and a subsequent complaint were not a deviation nor in violation of the license.[27]
- On May 12, 2015, FERC issued an Order Modifying and Approving the Fish Passage Plan at Eel Weir.[28]
- On May 14, 2015, FERC informed EBH that the base flow deviations at the Heuvelton and Eel Weir developments that occurred on September 15, 2014 would not be considered a violation of the license.[29]
- On October 5, 2015, FERC informed EBH that the impoundment level deviation at the Oswegatchie development that occurred on April 27, 2015 would not be considered a violation of the license.[30]
- On November 13, 2015, EBH submitted the Exhibit F drawings for new 1-inch trash racks installed on Flat Rock Unit No. 2. On November 20, 2015, FERC issued an Order Approving the As-Builts.[31]
- On January 22, 2016, FERC informed EBH that the base flow deviation at the Eel Weir Development on August 29, 2015 would not be considered a violation of the license.[32]
- On February 16, 2016, FERC issued an Order Modifying and Approving the Fish Passage Design Plan at Heuvelton.[33]
- On April 11, 2016, FERC informed EBH the impoundment deviation at the Heuvelton Development that occurred on January 5, 2016, would not be considered a violation of the license.[34]
- On November 10, 2016, FERC informed EBH that the base flow deviation at the South Edwards Development on September 19, 2016 would not be considered a violation of the license.[35]
- On May 2, 2017, FERC issued an Order Approving the Amended Historical Properties Management Plan.[36]

22 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13015978
23 WQC - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13100296
24 SFWLMP -https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13356139
25 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13375437
26 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13563986
27 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13633067
28 FPP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13873616
29 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13875613
30 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14004055
31 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14050661
32 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14125433
33 FPDP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14147024
34 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14238576
35 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14396247
36 HPMP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14580083

- On July 21, 2017, FERC issued the Order Amending the Fish Passage Design Plan at Heuvelton.[37]
- A final Common Loon Nesting Platform Installation and Monitoring Plan report was submitted to FERC on October 19, 2017.[38]
- On February 27, 2018, FERC granted and amended the Project's Recreation Management Plan.[39]
- On April 11, 2018, FERC informed EBH that the December 4, 2017 Oswegatchie impoundment level deviation would not be considered a violation of the license.[40]
- On October 11, 2018, FERC stated that the Eel Weir Final Fishway Effectiveness Report satisfied the effectiveness requirements.[41]
- On November 20, 2018, FERC informed EBH that the July 22, 2018, Eel Weir base flow deviation would not be considered a violation of the license.[42]
- On December 5, 2018 EBH submitted the Final Trout Stocking and Monitoring Report.[43]
- On March 28, 2019, FERC informed EBH that the impoundment level deviation at the Heuvelton development that occurred on December 7, 2018, would not be considered a violation of license.[44]

5. ZONES OF EFFECT (ZOEs)

The Project has a total of fifteen ZOEs defined from upstream to downstream. ZOEs 1 through 5 are shown in Figure 17, ZOEs 6 through 11 in Figure 18, ZOEs 12 and 13 in Figure 19 and ZOEs 14 and 15 in Figure 20.

The Browns Falls development has three zones defined as:

- ZOE 1 - From the head of the Browns Falls impoundment, downstream approximately 2.0 miles to the Browns Falls dam,
- ZOE 2 - From the Browns Falls dam, downstream along the bypassed reach approximately 1.4 miles, and,
- ZOE 3 - From the Browns Falls powerhouse, downstream approximately 0.1 miles to the Flat Rock Dam.

The Flat Rock development has two zones:

- ZOE 4 - From the head of the Flat Rock impoundment, downstream approximately 1.3 miles to the Flat Rock dam, and,
- ZOE 5 - From the Flat Rock dam, downstream approximately 2.6 miles.

The South Edwards development has three zones:

- ZOE 6 - From the head of the South Edwards impoundment, downstream approximately 1.3 miles to the South Edwards Dam,
- ZOE 7 - From the South Edwards dam, downstream along the bypassed reach approximately 0.3 miles, and,

37 Amended FPDP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14641982
38 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14714557
39 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14830258
40 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14883755
41 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15066238
42 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=15100293
43 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15113243
44 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=15197538

- ZOE 8 - From the South Edwards powerhouse approximately 0.01 miles to the Oswegatchie impoundment.

The Oswegatchie development has three zones:

- ZOE 9 - From the head of the Oswegatchie impoundment, downstream approximately 2.0 miles to the Oswegatchie dam, and
- ZOE 10 - From the Oswegatchie dam, downstream along the bypassed reach approximately 0.1 miles, and,
- ZOE 11 - From the Oswegatchie powerhouse, downstream approximately 0.43 miles.

The Heuvelton development has two zones:

- ZOE 12 - From the head of the Heuvelton impoundment, downstream approximately 2.2 miles to the Heuvelton dam, and,
- ZOE 13 - From the Heuvelton dam, downstream approximately 0.4 miles.

The Eel Weir development has two zones:

- ZOE 14 - From the head of the Eel Weir impoundment, downstream approximately 1.5 miles to the Eel Weir dam, and,
- ZOE 15 - From the Eel Weir dam, downstream approximately 1.3 miles.

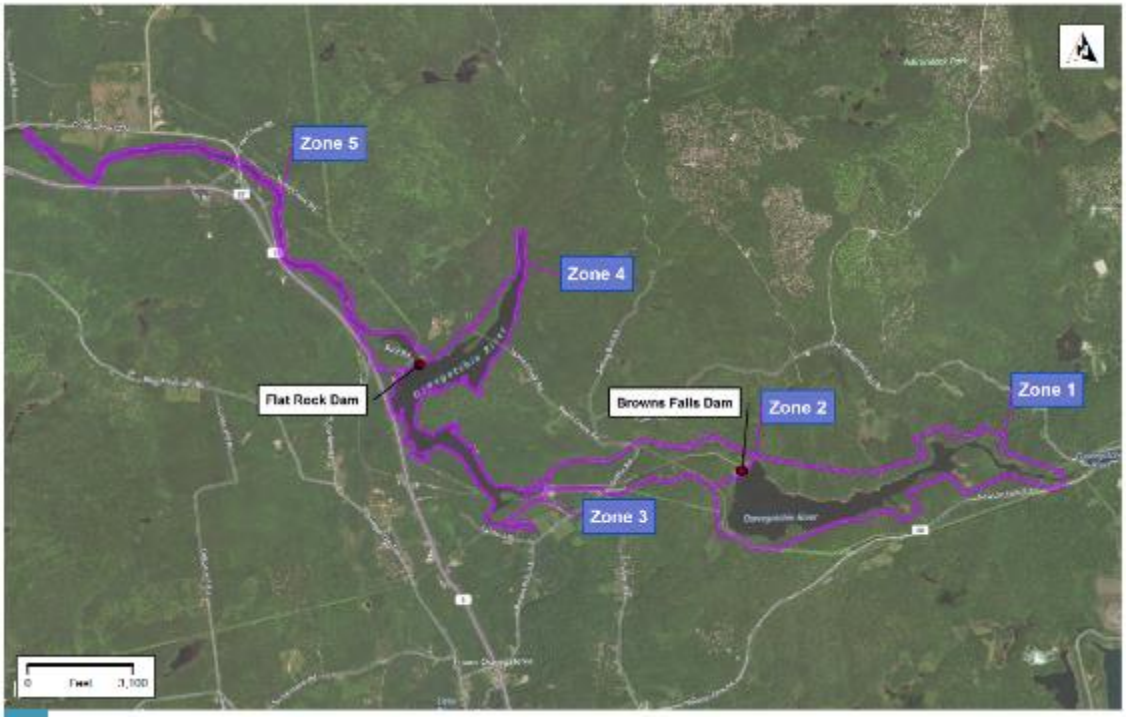


Figure 17 - ZOEs 1 to 5

Figure 18 - ZOEs 6 to 11

Figure 19 - ZOEs 12 to 13

Figure 20 - ZOEs 14 to 15

The alternative standards selected to satisfy the LIHI certification criteria in each of these ZOEs are identified in the following tables.

Table 1 - Brown Falls Development - ZOE 1 Alternative Standards						
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			

Table 2 - Brown Falls Development - ZOE 2 Alternative Standards						
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			

Table 3 - Brown Falls Development - ZOE 2 Alternative Standards						
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			

Table 4 – Flat Rock Development - ZOE 4 Alternative Standards						
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			

Table 5 – Flat Rock Development - ZOE 5 Alternative Standards						
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			

Table 6 – South Edwards Development - ZOE 6 Alternative Standards						
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			

Table 7 – South Edwards Development - ZOE 7 Alternative Standards						
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			

Table 8 – South Edwards Development - ZOE 8 Alternative Standards						
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			

Table 9 - Oswegatchie Development - ZOE 9 Alternative Standards						
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			

Table 10 - Oswegatchie Development - ZOE 10 Alternative Standards						
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			

Table 11 - Oswegatchie Development - ZOE 11 Alternative Standards						
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			

Table 12 - Heuvelton Development - ZOE 12 Alternative Standards						
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			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			

Table 13 - Heuvelton Development - ZOE 13 Alternative Standards						
Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
C	Upstream Fish Passage		X			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			

Table 14 – Eel Weir Development - ZOE 14 Alternative Standards						
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			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			

Table 15 – Eel Weir Development - ZOE 15 Alternative Standards						
Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes		X			
B	Water Quality		X			
C	Upstream Fish Passage		X			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			

6. LIHI CERTIFICATION PROCESS

EBH submitted an application for certification of the Project on March 29, 2019. On April 15, 2019, LIHI notified EBH that the intake review for the Project was complete. The intake review found that some information was missing and the application needed modification. EBH supplied a revised application dated April 23, 2019. On April 26, 2019, I committed to perform the certification review for the Project.

A. Comment Letters

On May 20, 2019, LIHI filed notice on their email list that the public comment period for the application has been opened. The notice states, *"LIHI is seeking comment on this application. Comments that are directly tied to specific LIHI criteria (flows, water quality, fish passage, etc.) will be most helpful, but all comments will be considered. Comments may be submitted to the Institute by e-mail at comments@lowimpacthydro.org with "Oswegatchie Project Comments" in the subject line, or by mail addressed to the Low Impact Hydropower Institute, 329 Massachusetts Avenue, Suite 6, Lexington, MA 02420. Comments must be received at the Institute on or before 5 pm Eastern time on July 19, 2019 to be considered. All comments will be posted to the web site and the applicant will have an opportunity to*

respond. Any response will also be posted. The project description and complete application can be found HERE [45]*."* No comments were received.

B. Agency Correspondence

On May 20, 2019, LIHI[46] emailed contacts[47] listed in the Project application as knowledgeable about the Project stating, *"You may have already received this notice if you are on the Low Impact Hydropower Institute (www.lowimpacthydro.org) email list. However, you were also identified as an agency contact on the LIHI certification application recently submitted by Erie Boulevard Hydropower LP (a subsidiary of Brookfield Renewable Energy Group) for the Oswegatchie River Hydroelectric Projects located in St. Lawrence County, New York. The application reviewer, Gary Franc (copied here), may be in contact with you if he has questions about these projects or wishes to clarify any aspects of the LIHI applications. You may also provide comments directly to LIHI as indicated below.*

More information about the projects and their application can be found in the link below. If you would like to receive additional notices about these projects or other hydroelectric projects in your region applying for LIHI certification, please sign up for our mailing list at https://lowimpacthydro.org/join-our-list/ ."

On June 5, 2019, I called Daniel Daoust at EBH concerning a new procedure to be instituted at the Eel Weir development to help eliminate future base flow deviation occurrences as well as to discuss the required effectiveness testing of the nature-like fishway at Heuvelton. Daniel stated both issues have been extended by about a year due to ongoing discussion with resource agencies.

Given that the application provided all supporting documentation and no other apparent issues were uncovered in my review I did not have to reach out to any environmental agencies.

7. CERTIFICATION REVIEW

This section contains my certification review of the Project with regard to the LIHI Certification criteria. As part of my review, I conducted a FERC e-library search to verify claims in the certification application. My review concentrated on the period from December 30, 2010, the start of FERC relicensing, through May of 2019, for FERC docket number P-2713.

A. LIHI Criterion-Flows

The goal of this criterion is to support habitat and other conditions that are suitable for healthy fish and wildlife resources in riverine reaches that are affected by the facility's operation and water release policy.

In November of 2010, an Impoundment Fluctuation Study (IFS)[48] was conducted on the Project's impoundments.

45 Project Application on LIHI website - https://lowimpacthydro.org/oswegatchie-river-project-complete-application-received/
46 Maryalice Fischer – LIHI Certification Program Director - mfischer@lowimpacthydro.org - 603-664-5097 office - 603-931-9119 cell
47 Jessica Hart – Jessica.Hart@dec.ny.gov; Nicholas Conrad - Nick.Conrad@dec.ny ; Robyn Niver - Robyn_Niver@fws.gov ; Steve Patch - Stephen_Patch@fws.gov ; Michael Lynch - Michael.Lynch@parks.ny.gov .
48 IFS - https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12523208

All agency recommendations were incorporated into the OOS, WQC and current FERC license. License Article 401 required a Stream Flow and Water Level Monitoring Plan (SFWLMP) be developed for all Project developments to ensure compliance with impoundment fluctuations. The final SFWLMP was filed with FERC on September 25, 2013.[49] On June 4, 2014 FERC issued an Order Modifying and Approving the SFWLMP.[50]

The Applicant states that the Project is in compliance with resource agency conditions issued regarding flow conditions and impoundment fluctuations and that all of the license and settlement requirements pertaining to flow conditions and impoundment levels have been implemented.

EBH maintains records of these conditions. In the event of a deviation from established minimum flows or impoundment levels, EBH files documentation with FERC detailing the reasons for the deviation.

A.1 Brown Falls

The application states that the development satisfies the LIHI flows criterion in ZOE 1 and ZOE 3 by meeting alternative standard A-1[51] and in ZOE 2 by meeting alternative standard A-2.[52] ZOE 1 is the impoundment, ZOE 2 is the bypassed reach, and ZOE 3 is the reach downstream of the powerhouse.

Browns Falls operates in tandem with Flat Rock as a peaking facility to increase generation during periods of high electricity demand. The impoundment fluctuates on a daily cycle, typically drawing down when the demand for electricity increases and refilling when demand decreases.

The development operates with a maximum impoundment fluctuation of four feet from July 15 through March 14, and two feet from March 15 through July 14. Fluctuations greater than 3 feet occur infrequently. Erie maintains two-foot year-round flashboards designed to fail when overtopped in excess of 2 feet of flow.

According to the FEA, limiting water level fluctuations in the Browns Falls impoundment reduces the occurrence of unplanned drawdowns and protects littoral habitat. The seasonal impoundment limitations ensure that habitat conditions are enhanced for fish spawning season. The FEA stated that based on data collected for the IFS, the reservoir fluctuation limits prevent 23 acres of littoral habitat from being dewatered.

EBH releases a minimum bypass flow of 30 CFS year-round into the 7,500-foot-long bypass reach through an orifice opening created by raising one of the two dam gates. EBH conducted a Delphi study of the Browns Falls bypassed reach and evaluated habitat conditions in relation to management goals for flows of 15, 23, 30, and 45 CFS. The study indicated providing a year-round flow of 30 CFS would enhance over-wintering habitat for trout from October 1 through March 31.

A downstream base flow was not recommended given that the development flows directly into the Flat Rock impoundment. Additionally, the FERC license does not contain conditions to manage fish and wildlife within the 1,000-foot-long tailrace.

49 SFWLMP -https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13356139
50 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13563986
51 NA.
52 Agency recommendation.

The OOS required that a Trout Stocking and Monitoring Plan (TSMP) be developed in consultation with the NYSDEC, the USFWS, and TU. EBH stocked trout and performed seasonal continuous water temperature monitoring in the Browns Falls bypassed reach on an annual basis from 2013 through 2017.

In addition to stocking the bypassed reach with trout and monitoring water temperatures, EBH performed sampling events in 2014, 2016, and 2018 to evaluate the stocking success. On December 5, 2018 EBH submitted the Final Trout Stocking and Monitoring Report.[53] Results indicate that trout abundance in the bypassed reach has been low with and without stocking, and few were collected during summer sampling events. Those that were collected were mostly found in thermal refuges in the reach since summer water temperatures were at or near the maximum threshold for the species. However, sufficient trout habitat and macroinvertebrate prey were found to exist in the reach. Other species collected were primarily smallmouth bass and cutlips minnows.

A.2 Flat Rock

The application states that the development satisfies the LIHI flows criterion in ZOE 4 by meeting alternative standard A-1 and in ZOE 5 by meeting alternative standard A-2. ZOE 4 is the impoundment and ZOE 5 is the reach downstream of the powerhouse.

The Flat Rock development operates with a maximum fluctuation of four feet from July 15 through March 14, and two feet from March 15 through July 14. Flat Rock operates in tandem with Brown Falls as a peaking facility to increase generation during periods of high electricity demand. The impoundment fluctuates on a daily cycle, typically drawing down when the demand for electricity increases and refilling when demand decreases.

According to the FEA, reduced water level fluctuations in the Flat Rock impoundment reduces the occurrence of unplanned drawdowns and protects littoral habitat. The seasonal impoundment limitations ensure that habitat conditions are enhanced for fish spawning season. The FEA stated that based on data collected for the IFS, the reservoir fluctuation limits prevent 21 acres of littoral habitat from being dewatered.

The Flat Rock powerhouse is integral with the dam; therefore, there is no bypassed reach at this development. The OOS and WQC require EBH to release a minimum base flow of 160 CFS year-round from the Flat Rock powerhouse. According to the FEA, the minimum base flows were consistent with the previous license. Since the existing aquatic communities persisted during the prior license term, the base flows were understood to adequately support and maintain existing aquatic communities.

A.3 South Edwards

The application states that the development satisfies the LIHI flows criterion in ZOE 6 by meeting alternative standard A-1 and in ZOE 7 and ZOE 8 by meeting alternative standard A-2. ZOE 6 is the impoundment, ZOE 7 is the bypassed reach, and ZOE 8 is the reach downstream of the powerhouse.

The South Edwards development operates with a maximum fluctuation of six feet from July 15 through March 14, and two feet from March 15 through July 14. EBH maintains two-foot year-round flashboards

53 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15113243

designed to fail when overtopped in excess of 2 feet of flow. Fluctuations greater than 3 feet occur infrequently.

According to the FEA, reduced water level fluctuations in the impoundment reduces the occurrence of unplanned drawdowns and protects littoral habitat. The seasonal impoundment limitations ensure that habitat conditions are enhanced for the fish spawning season. The FEA stated that based on data collected for the IFS, the reservoir fluctuation limits prevent 6 acres of littoral habitat from being dewatered.

EBH releases a minimum flow of 60 CFS year-round a minimum flow unit into the 1,500-foot-long bypass reach and provides a base flow of 160 CFS through the development's tailrace. The minimum and base flows are consistent with the previous license. Since the existing aquatic communities persisted during the prior license term, the minimum flow was understood to adequately support and maintain existing aquatic communities.

A.4 Oswegatchie

The application states that the development satisfies the LIHI flows criterion in ZOE 9 by meeting alternative standard A-1 and in ZOE 10 and ZOE 11 by meeting alternative standard A-2. ZOE 9 is the Project impoundment, ZOE 10 is the bypassed reach, and ZOE 11 is the tailrace downstream of the powerhouse.

The Oswegatchie development operates with a maximum fluctuation of 0.4 feet. According to the FEA, limited water level fluctuations in the Oswegatchie impoundment maintain littoral habitat and associated fish.

EBH releases a minimum flow of 40 CFS year-round into the 350-foot-long bypass reach through a minimum flow notch in the spillway and provides a base flow of 160 CFS through the development's tailrace. The minimum and base flows are consistent with the previous license. Since the existing aquatic communities persisted during the prior license term, the minimum flow was understood to adequately support and maintain existing aquatic communities.

A.5 Heuvelton

The application states that the development satisfies the LIHI flows criterion in ZOE 12 by meeting alternative standard A-1 and in ZOE 13 by meeting alternative standard A-2. ZOE 12 is the impoundment and ZOE 13 is the tailrace downstream of the powerhouse.

The Heuvelton development operates in ROR mode with a maximum fluctuation of 0.5 feet. According to the FEA, limited water level fluctuations in the Heuvelton impoundment maintain littoral habitat and associated fish.

The powerhouse is integral with the dam and releases water directly into the Oswegatchie River; there is no bypassed reach at this development. EBH releases a minimum base flow of 275 CFS year-round from the powerhouse. According to the FEA, the proposed base flows were consistent with the previous license. Since the existing aquatic communities persisted during the prior license term, the base flows were understood to adequately support and maintain existing aquatic communities.

A.6 Eel Weir

The application states that the development satisfies the LIHI flows criterion in ZOE 14 by meeting alternative standard A-1 and in ZOE 15 by meeting alternative standard A-2. ZOE 14 is the Project impoundment and ZOE 15 is the tailrace downstream of the powerhouse.

The Eel Weir development operates in ROR mode with a maximum fluctuation of 0.5 feet. According the FEA, limited water level fluctuations in the Eel Weir impoundment maintain littoral habitat and associated fish.

The powerhouse is integral with the dam and releases water directly into the Oswegatchie River; there is no bypassed reach at this development. EBH releases a minimum base flow of 325 CFS year-round from the powerhouse. According to the FEA, the proposed base flow is consistent with the previous license. Since the existing aquatic communities persisted during the prior license term, the base flows were understood to adequately support and maintain existing aquatic communities.

A.7 Summary

A review of the FERC docket indicates that nine minimum flow and/or impoundment fluctuation deviations have occurred since issuance of the new license on January 1, 2013. This list includes:

- On October 21, 2013, FERC informed EBH that the impoundment deviation that occurred at the Oswegatchie development on May 1, 2013, would not be considered a violation of the license.[54]
- On September 11, 2014, FERC informed EBH the impoundment levels for the Oswegatchie River Hydroelectric Project were not deviations nor in violation of the license. On July 10, 2014, the FERC had received a letter from the New York State Senator Patty Ritchie (Senator) of a concern associated with possible reservoir operations outside of the license requirements at the Heuvelton and Eel Weir developments, stating that a constituent had contacted the Senator to express his concern about the water levels. The constituent stated the past spring water levels were high enough to overflow the river banks, which resulted in the flooding of his property. The Senator asked the FERC to review the matter, and inquired as to how future flooding incidents could be controlled in the Oswegatchie River. The FERC concluded that flooding was a result of high flows along the Oswegatchie River and high releases from Black Lake, due to adverse weather conditions such as heavy precipitation and snowmelt.[55]
- On May 14, 2015, FERC informed EBH that the base flow deviations at the Heuvelton and Eel Weir developments that occurred on September 15, 2014 would not be considered a violation of the license. FERC found that a failure on the conductor line at the National Grid McIntyre-Heuvelton #23 transmission line caused the power plants to trip offline, resulting in the base flow deviations and that no resource agencies comments were forthcoming after being notified.[56]
- On October 5, 2015, FERC informed EBH that the impoundment level deviation at the Oswegatchie development that occurred on April 27, 2015 would not be considered a violation of the license. FERC concluded the deviation was due to an equipment malfunction. [57]

54 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13375437
55 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13633067
56 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=13875613
57 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14004055

- On January 22, 2016, FERC informed EBH that the base flow deviation at the Eel Weir Development on August 29, 2015 would not be considered a violation of the license. FERC concluded the deviation was due to an equipment malfunction.[58]
- On April 11, 2016, FERC informed EBH the impoundment deviation at the Heuvelton Development that occurred on January 5, 2016, would not be considered a violation of the license. FERC concluded the deviation was due to a frozen gate caused by unexpected lower temperatures and ice conditions.[59]
- On November 10, 2016, FERC informed EBH that the base flow deviation at the South Edwards Development on September 19, 2016 would not be considered a violation of the license. FERC concluded the deviation was the result of an unanticipated unit trip that revealed a wiring problem that prevented the correct sequence of valve openings and closures. The wiring issue led EBH to unintentionally release more water than necessary downstream, which lowered the water level in the impoundment. In an effort to prevent a deviation from the water level impoundment requirement, EBH had deviated from the base flow requirement. EBH corrected the wiring problem and ran multiple tests to ensure that this does not happen again.[60]
- On April 11, 2018, FERC informed EBH that the December 4, 2017 Oswegatchie impoundment level deviation would not be considered a violation of the license. FERC concluded the deviation was due to operator error. The deviation occurred because an operator inadvertently left one unit in local control mode after cleaning the trashrack. Although the incident was not consider a violation, it was made part of the compliance history for the Project.[61]
- On November 20, 2018, FERC informed EBH that the July 22, 2018, Eel Weir base flow deviation would not be considered a violation of the license.[62] FERC concluded the deviation in the minimum flow release was a result of low inflows and a decreasing headpond elevation, causing the operating unit to go offline. The event was of short duration, no impacts to aquatic resources were observed and EBH took appropriate measures to restore flows and corrected the cause in a timely manner. EBH proposed to establish a new operating procedure within 45 days to use during periods of reduced inflows to assist in preventing or mitigating similar events in the future which involves the use of upstream gage data for anticipating inflows. Discussions with resource agency pertaining to this procedure are still ongoing.
- On March 28, 2019, FERC informed EBH that the impoundment level deviation at the Heuvelton development that occurred on December 7, 2018, would not be considered a violation of the license. FERC concluded that the impoundment level deviation was due to operator error because the system operator failed to notify local staff of the lowering impoundment level at the Heuvelton development. Although the incident was not consider a violation, it was made part of the compliance history for the Project. [63]

The main causes of deviations have been associated with loss of power, equipment malfunction or operator error at associated Project developments. The equipment malfunctions have been corrected and are unlikely to be repeated.

Loss of power deviations could be reduced by the installation, or modifications to existing automatic backup reserve generators, of sufficient capacity to keep the programmable logic controller (PLC) operating.

58 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14125433
59 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14238576
60 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14396247
61 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14883755
62 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=15100293
63 https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=15197538

Operator error could be reduced by providing annual reviews for appropriate personnel (i.e. traveling operators) that reinforce each development's environmental flow requirements.

It is my view that since issuance of the new FERC license, the Project has adequately complied with Standard A-2, resource agency conditions and recommendations issued regarding flow conditions and impoundment fluctuations in applicable ZOEs and Standard A-1 in the impoundments. Based on the information provided, it is my recommendation that the Project conditionally satisfies the flows criterion. However, reducing future environmental flow and pond level fluctuations would help to ensure that appropriate flows are maintained.

B. LIHI Criterion-Water Quality

The goal of this criterion is to ensure water quality is protected in water bodies directly affected by facility operations, including downstream reaches, bypassed reaches, and impoundments above dams and diversions.

The Applicant states the Project is in compliance with resource agency conditions pursuant to the WQC[64], issued on October 24, 2012. The Applicant contacted the NYSDEC on January 3, 2019, regarding the current WQC status for the Project. The NYSDEC response letter, dated January 14, 2019[65], indicated the current WQC is still valid for the Project (Appendix A, page A-2). The WQC is conditioned on compliance with the terms of the OOS. Ongoing water quality monitoring at the Project facilities are not required as part of the WQC or FERC license.

Water quality monitoring was conducted in the impoundments, tailraces and bypassed reaches in 2007, 2008 and 2009. Results indicated that dissolved oxygen (DO) met or exceeded state standards, and both DO and temperature were similar among the different reaches and Project operations do not have an appreciable effect on those parameters. Results for pH showed that some samples were lower than state standards, but likely attributable to regionally low buffering capacity of the water and not to Project operations (FEA pp. 35-36).

All of the license and settlement requirements pertaining to water quality have been implemented. EBH maintains records of these conditions. In the event of a deviation from established water quality requirements, EBH files documentation with FERC detailing the reasons for the deviation.

The November 2016 Section 303(d) list for New York State indicates no impaired waters in the Project area.[66] The NYSDEC river classification codes can be found by clicking on this link: https://govt.westlaw.com/nycrr/Browse/Home/NewYork/NewYorkCodesRulesandRegulations?guid=I06849fe0b5a111dda0a4e17826ebc834&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)

64 WQC - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13100296
65 The letter from the NYSDEC was dated 2018 in error.
66 303(d) - https://www.dec.ny.gov/docs/water_pdf/303dListfinal2016.pdf

B.1 Brown Falls

The Applicant states that the development satisfies the LIHI water quality criterion in ZOEs 1, 2 and 3 by meeting alternative standard B-2[67]. In the vicinity of the development, the Oswegatchie River is designated as Class C.[68]

B.2 Flat Rock

The Applicant states that the development satisfies the LIHI water quality criterion in ZOEs 4 and 5 by meeting alternative standard B-2. In the vicinity of the development, the Oswegatchie River is designated as Class C. An accompanying standard (T) pertaining to trout water was included in a section for the Flat Rock impoundment. This standard indicated that this section of the river may support a trout population.

B.3 South Edwards

The Applicant states that the development satisfies the LIHI water quality criterion in ZOEs 6, 7 and 8 by meeting alternative standard B-2. In the vicinity of the development, the Oswegatchie River is designated as Class C.

B.4 Oswegatchie

The Applicant states that the development satisfies the LIHI water quality criterion in ZOEs 9, 10 and 11 by meeting alternative standard B-2. In the vicinity of the development, the Oswegatchie River is designated as Class C.

B.5 Heuvelton

The Applicant states that the development satisfies the LIHI water quality criterion in ZOEs 12 and 13 by meeting alternative standard B-2. In the vicinity of the development, the Oswegatchie River is designated as Class B.[69]

B.6 Eel Weir

The Applicant states that the development satisfies the LIHI water quality criterion in ZOEs 14 and 15 by meeting alternative standard B-2. In the vicinity of the development, the Oswegatchie River is designated as Class B.

B.7 Summary

My review found no license deviations nor any issues pertaining to the Project's water quality compliance. The WQC is less than 10 years old, there are no impaired waters in the Project reaches, and water quality sampling confirmed a lack of Project effects on water quality. Based on the information provided, it is my recommendation that the Project meets the water quality criterion.

67 Agency recommendation.

C. LIHI Criterion-Upstream Fish Passage

The goal of this criterion is to ensure safe, timely and effective upstream passage of migratory fish so that the migratory species can successfully complete their life cycles and maintain healthy, sustainable fish and wildlife resources in areas affected by the Project's facilities.

EBH conducted a Fish Passage and Protection Study (FPPS)[70] in November of 2010. Historically, lake sturgeon and American eel moved upstream on the Oswegatchie River to Natural Dam, located at RM 62.4. The natural waterfall drop prevented further upstream passage.

Four of the Project's developments are upstream of this waterfall, namely, Browns Falls, Flat Rock, South Edwards and Oswegatchie. The Heuvelton and Eel Weir developments are downstream of this waterfall. Both developments have installed nature-like fishways to allow for the reintroduction of lake sturgeon and American eel upstream to Natural Dam, opening up about 50 miles of additional habitat.

C.1 Brown Falls

The Applicant states that the development satisfies the LIHI upstream fish passage criterion in ZOEs 1, 2 and 3 by meeting alternative standard C-1.[71]

During FERC relicensing, neither the U.S. Department of Commerce (USDOC) nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe upstream fish passage measures in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

C.2 Flat Rock

The Applicant states that the development satisfies the LIHI upstream fish passage criterion in ZOEs 4 and 5 by meeting alternative standard C-1.

During FERC relicensing, neither the USDOC nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe upstream fish passage measures in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike.

68 The best usage of Class C water is fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.
69 The best usage of Class B water is primary and secondary contact recreation and fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival.
70 FPPS - https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12523212
71 Not applicable.

Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

C.3 South Edwards

The Applicant states that the development satisfies the LIHI upstream fish passage criterion in ZOEs 6, 7 and 8 by meeting alternative standard C-1.

During FERC relicensing, neither the USDOC nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe upstream fish passage measures in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

C.4 Oswegatchie

The Applicant states that the development satisfies the LIHI upstream fish passage criterion in ZOEs 9, 10 and 11 by meeting alternative standard C-1.

During FERC relicensing, neither the USDOC nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe upstream fish passage measures in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

C.5 Heuvelton

The Applicant states that the development satisfies the LIHI upstream fish passage criterion in ZOEs 12 by meeting alternative standard C-1 and in ZOE 13 by meeting alternative standard C-2.[72] The Applicant is additionally requesting a C-PLUS[73] standard at this development.

The FPPS found this area of the Oswegatchie River supports several resident percid and centrarchid species such as smallmouth bass, largemouth bass, walleye, pike, and yellow perch. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. In addition, lake sturgeon, have been documented in the vicinity of the development.

72 Agency recommendation.
73 Bonus activities.

On December 22, 2015, EBH filed its Fish Passage Design Plan (FPDP) pursuant to license Article 401(a) with FERC. On February 2, 2016, EBH submitted the final fishway design plans to FERC. On February 16, 2016, FERC issued an Order Modifying and Approving the FPDP.[74]

On May 12, 2017, EBH filed an amendment to its FPDP. This amendment requested design changes and an extension of the completion date until December 2018. FERC issued the Order Amending the FPDP[75] on July 21, 2017.

EBH completed construction of an upstream fishway at the development in 2018 to facilitate the movement of lake sturgeon, American eel, and other fish species (See Figure 21).

Figure 21 - Completed Heuvelton Fishway

EBH incorporated a nature-like design concept for upstream passage which consists of an excavated bypass channel with reinforced concrete walls beginning on the left side of the powerhouse tailrace, running overland around the left side of the powerhouse and reentering the Oswegatchie River upstream of the powerhouse.

The channel consists of a series of gapped boulder weirs and pools with a minimum depth of two-feet, and a thalweg depth of three-feet at each weir separated by pools up to six-feet deep. Under normal operations, the fishway will have approximately 45 CFS of flow. The upstream passage structure is operated from March 15 through November 30 each year.

An effectiveness testing plan must be developed in concert with the resource agencies. On June 5, 2019, I had discussions with EBH about the required effectiveness testing of the nature-like fishway at Heuvelton.

74 FPDP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14147024
75 Amended FPDP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14641982

EBH stated the testing plan has been extended by about a year due to ongoing discussion with resource agencies. EBH stated that LIHI would be keep abreast on the status of the testing.

C.6 Eel Weir

The Applicant states that the development satisfies the LIHI upstream fish passage criterion in ZOEs 14 by meeting alternative standard C-1 and in ZOE 15 by meeting alternative standard C-2. The Applicant is additionally requesting a C-PLUS standard at this development.

The FPPS found this area of the Oswegatchie River supports several percid and centrarchid species such as smallmouth bass, largemouth bass, walleye, pike, and yellow perch. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. In addition, lake sturgeon, have been documented in the vicinity of the development.

On April 8, 2015, EBH filed its Fish Passage Plan (FPP) with FERC. On May 12, 2015, FERC issued an Order Modifying and Approving the FPP.[76]

EBH completed construction of an upstream fishway at the development in 2016 (see Figure 15 above) to facilitate the movement of lake sturgeon, American eel, and other fish species (Figure 15). EBH incorporated a nature-like design concept for upstream passage which consists of an excavated bypass channel downstream of the spillway consisting of a series of gapped boulders and pools with a minimum depth of two-feet. Under normal operations, the fishway will have approximately 45 CFS of flow. The upstream passage structure is operated from March 15 through November 30 each year.

The May 12, 2015 FERC Order also required effectiveness testing of the completed fishway. On July 26, 2018, EBH filed with FERC the Eel Weir Final Fishway Effectiveness Report (EWFER).[77] On October 11, 2018, FERC stated that the EWFER satisfied the effectiveness requirements.[78] The determination of effectiveness was to be based on whether fish were captured by electrofishing or observed on video which would indicate use of the fishway. Video results in fall 2017 recorded about 600 fish, and in spring 2018, about 2,300 fish in the fishway. The report was shared with FWS and NYSDEC and no comments were received.

C.7 Summary

On April 3, 2019, The National Hydropower Association (NHA) announced the winners of the 2019 Outstanding Stewards of America's Waters Awards, which recognizes projects that have provided extraordinary recreational, historical, environmental or educational value. BREG, which owns EBH, was selected for an award for the construction of the Eel Weir and Heuvelton nature-like fishways.

These structures are the first nature-like fishways in New York, providing an innovative and natural means for upstream and downstream migration of lake sturgeon, American eel, and other riverine species. Designed to emulate natural riffle and pool river channels, the Fishways are a unique, effective, and a natural means of allowing fish to pass unharmed through the developments.

76 FPP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13873616
77 EWFER - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14984964
78 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15066238

My review found no license deviations nor any issues pertaining to upstream fish passage. Given EBH efforts in installing the innovative nature-like fishways and opening up 50 miles of additional fish habitat, it is my recommendation that the Project meets the applicable standards in each ZOE and The Project satisfies the upstream fish passage criterion. Pending agency acceptance of the Heuvelton nature-like fishway effectiveness study, the Project should be awarded with a three-year certification extension for the PLUS standard for the nature-like fishways at both Heuvelton and Eel Weir.

D. LIHI Criterion-Downstream Fish Passage

To goal of this criterion is to ensure safe, timely and effective downstream passage of migratory fish and for riverine fish such that the facility minimizes loss of fish from reservoirs and upstream river reaches affected by facility operations.

Fish passage monitoring and effectiveness testing is not required in the license for any of the Project's developments.

D.1 Brown Falls

The Applicant states that the development satisfies the LIHI downstream fish passage criterion in ZOEs 1 and ZOE 2 by meeting alternative standard D-2[79] and in ZOE 3 by meeting alternative standard D-1.[80]

During FERC relicensing, neither the USDOC nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe downstream fish passage devices in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

EBH releases a minimum flow of 30 CFS year-round through an orifice opening created by raising one of the two dam gates. To exclude adult fish from being entrained through the turbines, 1-inch trashracks (or seasonal overlays) are to be installed at Browns Falls by December 31, 2023. As of the date of this report, the trashracks have not been installed.

EBH conducted a Browns Falls Delphi Study (BFDS)[81] of the bypassed reach and evaluated habitat conditions in relation to management goals for bypass flows of 15, 23, 30, and 45 CFS. The BFDS indicated that providing a year-round flow of 30 CFS in the bypassed reach would enhance over-wintering habitat for trout from October 1 through March 31.

79 Agency recommendation.
80 Not applicable.
81 BFDS - https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=12523205

D.2 Flat Rock

The Applicant states that the development satisfies the LIHI downstream fish passage criterion in ZOEs 4 by meeting alternative standard D-2 and in ZOE 5 by meeting alternative standard D-1.

During FERC relicensing, neither the USDOC nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe downstream fish passage devices in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

EBH releases a minimum base flow of 160 CFS year-round from the development's tailrace. According to the FEA, little evidence exists to suggest fish entrainment is having an adverse effect on the fish community. However, 1-inch trashracks were requested to be installed by December 31, 2023 to reduce project related entrainment and likely increase the abundance or stability of the fish communities.

On November 13, 2015, EBH submitted the Exhibit F drawings for new 1-inch trash racks installed on Unit No. 2. On November 20, 2015, FERC issued an Order Approving the As-Builts.[82] The remaining portion of the trashracks are planned to be installed by December 31, 2019.

D.3 South Edwards

The Applicant states that the development satisfies the LIHI downstream fish passage criterion in ZOEs 6 and ZOE 7 by meeting alternative standard D-2 and ZOE 8 by meeting alternative standard D-1.

During FERC relicensing, neither the USDOC nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe downstream fish passage devices in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

EBH releases a minimum bypass flow of 60 CFS year-round through a minimum flow unit. According to the FEA, little evidence exists to suggest fish entrainment is having an adverse effect on the fish community. However, 1-inch trashracks were requested to be installed for all turbines by December 31, 2023 to reduce project related entrainment and likely increase the abundance or stability of the fish communities. As of the date of this report, the trashracks have not been installed.

82 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14050661

D.4 Oswegatchie

The Applicant states that the development satisfies the LIHI downstream fish passage criterion in ZOEs 9 and ZOE 10 by meeting alternative standard D-2 and ZOE 11 by meeting alternative standard D-1.

During FERC relicensing, neither the USDOC nor the USDOI prescribed anadromous or catadromous fish passage facilities at the development. The USDOI did, however, request reservation of its authority to prescribe downstream fish passage devices in the future.

The FPPS found this area of the Oswegatchie River supports several resident species such as pumpkinseed, yellow perch, bluntnose minnow, golden shiner, smallmouth bass, largemouth bass, walleye, and pike. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. Currently, there are no known data indicating that migratory fish species occur in the vicinity of the development.

EBH releases a minimum bypass flow of 40 CFS year-round through a minimum flow notch. This notch allows for fish to pass downstream. Erie maintains 1-inch trashracks over the intake to limit fish entrainment. EBH also provides a 160 CFS minimum base flow through the powerhouse. To exclude adult fish from being entrained through the turbines, EBH installed trashracks with 1-inch clear bar spacing.

D.5 Heuvelton

The Applicant states that the development satisfies the LIHI downstream fish passage criterion in ZOEs 12 by meeting alternative standard D-2 and in ZOE 13 by meeting alternative standard D-1. The Applicant is additionally requesting a D-PLUS standard at this development.

The FPPS found this area of the Oswegatchie River supports several percid and centrarchid species such as smallmouth bass, largemouth bass, walleye, pike, and yellow perch. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. In addition, lake sturgeon, have been documented in the vicinity of the development.

EBH releases a minimum base flow of 275 CFS year-round from the Project's powerhouse. To exclude adult fish from being entrained through the turbines, EBH installed trashracks with 1-inch clear bar spacing in December of 2017.

On December 22, 2015, EBH filed its Fish Passage Design Plan (FPDP) pursuant to license Article 401(a) with FERC. On February 2, 2016, Erie submitted the final fishway design plans to FERC. On February 16, 2016, FERC issued an Order Modifying and Approving the FPDP.[83]

On May 12, 2017, EBH filed an amendment to its FPDP. This amendment requested design changes and an extension of the completion date until December 2018. FERC issued the Order Amending the FPDP[84] on July 21, 2017.

83 FPDP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14147024
84 Amended FPDP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14641982

EBH completed construction of an upstream fishway at the development in 2018 to facilitate the movement of lake sturgeon, American eel, and other fish species (Figure 21). The downstream passage structure is operated annually from March 15 through November 30. Passage is provided through a rectangular gate, with a 4'x4' opening, transitioning to a 30 inch diameter steel pipe, which discharges to the tailrace. The downstream plunge pool depth is five feet below normal tailwater elevation. Normal operational flow through the downstream gated passage is 20 CFS.

D.6 Eel Weir

The Applicant states that the development satisfies the LIHI downstream fish passage criterion in ZOEs 14 by meeting alternative standard D-2 and in ZOE 15 by meeting alternative standard D-1. The Applicant is additionally requesting a D-PLUS standard at this development.

The FPPS found this area of the Oswegatchie River supports several percid and centrarchid species such as smallmouth bass, largemouth bass, walleye, pike, and yellow perch. Consistent with other impoundments and rivers in upstate New York, such species are important game fish species within the impoundments along this stretch. In addition, lake sturgeon, have been documented in the vicinity of the development.

EBH releases a minimum base flow of 325 CFS year-round from the Project's powerhouse. To exclude adult fish from being entrained through the turbines, EBH installed trashracks with 1-inch clear bar spacing.

On April 8, 2015, EBH filed its Fish Passage Plan (FPP) with FERC. On May 12, 2015, FERC issued an Order Modifying and Approving the FPP.[85]

EBH completed construction of an upstream fishway at the development in 2016 to facilitate the movement of lake sturgeon, American eel, and other fish species (see Figure 15 above). The downstream passage structure is operated from March 15 through November 30. Downstream passage is accomplished through the use of a modified existing sluice gate located adjacent to the powerhouse. Passage is provided through an approximate 2.2'x 2.1' rectangular opening, discharging approximately 20 CFS to a plunge pool with a depth of approximately 10.5 feet. An existing one-inch trashrack structure was repurposed for fish protection in conjunction with the new gate opening.

D.7 Summary

EBH maintains trashracks with 1-inch clear spacing on a year-round basis to exclude most adult game fish and other fish from potential entrainment at the Oswegatchie, Heuvelton and Eel Weir developments. By December 31, 2023, 1-inch trashracks must be installed at Browns Falls, Flat Rock and South Edwards developments. No other fish passage related measures were requested by any resource agencies for downstream fish passage at any of the Project's developments. There is no downstream fish passage monitoring associated with the operation of the Project.

My review found no license deviations nor any other issues pertaining to downstream fish passage. Provided that trashracks are installed as scheduled by 2023 at the Browns Falls, Flat Rock, and South Edwards developments, and given that downstream passage is currently provided at the developments downstream of the Natural Dam, it is my recommendation that the Project meets the applicable standards in each ZOE and conditionally satisfies the downstream fish passage criterion pending installation of the remaining

85 FPP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13873616

downstream passage facilities. The Applicant requested D-PLUS standard at Heuvelton and Eel Weir, but this review finds that the Project does not meet the PLUS standard since the downstream passage facilities are not adaptive management, basin-scale redevelopment, nor innovative technology.

E. LIHI Criterion-Shoreline and Watershed Protection

The shoreline and watershed protection criterion is designed to ensure that sufficient action has been taken to protect, mitigate and enhance environmental conditions on shoreline and watershed lands associated with the facility.

The Applicant states the LIHI shoreline and watershed protection criterion in all ZOEs are satisfied by meeting alternative standard E-1.

The FEA states the river is not currently considered impaired or threatened. There is no evidence that Project operation has contributed to existing shoreline erosion. There is no shoreline management plan required for the Project. The lands surrounding the Project are mostly hardwood-conifer forest at the four upstream developments, and mostly agricultural lands mixed with some northern hardwood forest at Heuvelton and Eel Weir. Heuvelton has suburban development while the others are mostly undeveloped. The change in elevation is more than 1,000 feet from the upstream end of the Project in the Adirondack Mountains to the downstream end in the St. Lawrence lowlands. Deep and shallow marshes, shrub swamp wetlands, and floodplain forests are common along the Project length (FEA pp. 48-50). While there are some areas considered to be of significant ecological value in the Project vicinity (see Section 7.F below), they may not be under the direct or indirect control of EBH.

Invasive plant species are also present. Condition 17 of the WQC and license article 401 required EBH to develop and file an Invasive Species Management Plan which EBH filed on June 26, 2013[86] and FERC approved on November 20, 2013.[87] The approved plan requires EBH to report to FERC on activities related to invasive species if found during activities that could disturb them. Based on the FERC elibrary, no such reports have been required or filed to date.

As specified in the OOS[88], but not required by the FERC license, is the establishment of the River Management Fund (RMF). EBH contributes $2,000 annually to the RMF for the term of the FERC license. The RMF is used for projects, studies, or services, for any of the following purposes along the Oswegatchie River:

- Ecosystem restoration and protection,
- Natural resource stewardship,
- Public education,
- Applied research or development necessary to accomplish these projects and provide these services,
- New recreation resources, and
- Additional public access to outdoor recreational resources not currently agreed to by the Settlement Parties.

86 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13290587
87 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13397718
88 OOS - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12567998

My review found no license deviations nor any issues pertaining to the Project's shoreline and watershed protection activities. Based on my review, it is my recommendation that the Project meets Standard E-1 in all ZOEs and satisfies the shoreline and watershed protection criterion.

F. LIHI Criterion-Threatened and Endangered Species

The threatened and endangered species protection criterion is designed to ensure that the facility does not negatively impact state or federally-listed threatened or endangered species. The Applicant states the LIHI threatened and endangered species criterion is satisfied in all ZOEs by meeting alternative standard F-3.

On January 31, 2019, the USFWS provided three separate letters (Appendix A pp. A-4 to A-18) in response to a request for information on rare, threatened or endangered (RTE) species within the Project area:

1. List of RTE species that may occur and/or affected by the Browns Falls and Flat Rock Developments.
2. List of RTE species that may occur and/or affected by the South Edwards and Oswegatchie Developments.
3. List of RTE species that may occur and/or affected by the Heuvelton and Eel Weir Developments.

There are no critical habitats located within the Oswegatchie River Project area.

The northern long-eared bat (*Myotis septentrionalis*) may potentially occur within all of the development areas. The USFWS has not adopted a formal recovery plan for the northern long-eared bat. On January 14, 2016, the USFWS published the final 4(d) rule identifying prohibitions for the protection of northern long-eared bats.[89] Operations at the Project's developments, especially with regard to tree clearing from June 1 through July 31, adhere to the prohibitions outlined in the final 4(d) rule.

F.1 Brown Falls & Flat Rock

On January 3, 2019, EBH consulted with NYSDEC's Natural Heritage Program for an updated list of RTE species that may occur in the vicinity of these two developments. By letter dated January 30, 2019 (Appendix A, pp. A-19 to A-22), the NYSDEC indicated that the Common Loon (*Gavia immer*), which is a species of special concern, and Maple-Basswood Rich Mesic Forest have been documented in the vicinity of the developments. Confidential locational information has been removed from the public version of the LIHI application and this report. The NYSDEC has not adopted a formal recovery plan for the Common Loon).

89 https://www.fws.gov/midwest/endangered/mammals/nleb/4drule.html

License Article 406 required EBH to implement the Common Loon Nesting Platform Installation and Monitoring Plan (CLNPIMP) at the Browns Falls and Flat Rock developments. EBH initiated the 5-year period of loon raft installations and monitoring in 2013. A final loon raft monitoring report was completed in 2017 and submitted to FERC on October 19, 2017.[90] The monitoring included weekly canoe trips along the circumference of the impoundments to identify loon nesting activity and monitor the condition of installed nest platforms. Study results from 2014-2017 showed that no loons were observed nesting either naturally or on the platforms, but loons were observed on some occasions in the Browns Falls development in 2015-2017, and at Flat Rock on 3 occasions between 2015 and 2016.

At stakeholder request, EBH installed monofilament (fishing line) recycling containers during the monitoring season at the two impoundments since loons outside of the Project had been observed tangled in it, leading to death by starvation.

With regard to the Maple-Basswood Rich Mesic Forest, NYSDEC indicated that it is an upland "enormous" tract of intact forest in good condition, that only barely reaches lands close to or in the Project boundary. It is unlikely that Project operations would have any effect on that forest.

F.2 South Edwards & Oswegatchie

On January 3, 2019, EBH consulted with NYSDEC's Natural Heritage Program for an updated list of RTE species that may occur in the vicinity of these two developments. By letter dated January 31, 2019 (Appendix A, pp. A-23 to A-24), the NYSDEC indicated that the Maple-Basswood Rich Mesic Forest has been documented in the vicinity of these two developments. Confidential locational information has been removed from the public version of the LIHI application and this report.

The loon monitoring plan discussed above also included the South Edwards and Oswegatchie impoundments. Monitoring at Oswegatchie was discontinued after 2014 with resource agency approval since the impoundment is very small and only one platform had been installed that year with no loon activity observed. No loons or nesting activity was observed at South Edwards from 2014-2017. That site also received a monofilament recycling container in 2016.

With regard to the Maple-Basswood Rich Mesic Forest, NYSDEC indicated that it is an upland "enormous" tract of intact forest in good condition, that only barely reaches lands close to or in the Project boundary. It is unlikely that Project operations would have any effect on that forest.

F.3 Heuvelton & Eel Weir

On January 3, 2019, EBH consulted with NYSDEC's Natural Heritage Program for an updated list of RTE species that may occur in the vicinity of these two developments. By letter dated January 31, 2019(Appendix A, pp. A-25 to A-27), the NYSDEC indicated that the following state-listed threatened species has been documented in the vicinity of the two developments:

- Eastern Sand Darter (*Ammocrypta pellucida*)
- Lake Sturgeon (*Acipenser fulvescens*)
- Mooneye (*Hiodon tergisus*)

90 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14714557

- Blanding's Turtle (*Emydoidea blandingii*)

Confidential locational information has been removed from the public version of the LIHI application and this report. In addition, the NYSDEC indicated that the Common Loon (special concern), Blacknose Shiner (*Notropis heterolepis*) (unlisted but considered imperiled in New York State), and a Sinkhole Wetland (high quality occurrence of rare community type and globally uncommon) have been documented in the vicinity of the developments.

The NYSDEC has not adopted a formal recovery plan for the Eastern San Darter or Mooneye. However, the NYSDEC adopted the Lake Sturgeon Recovery Plan 2018 – 2024.[91] Recovery actions identified in the Plan include:

- Protection of lake sturgeon and spawning habitat preservation.
- Operations of the two developments with regard to limited impoundment fluctuations and construction a nature-like fishways are consistent with this recovery plan.

Additionally, the NYSDEC has adopted a conservation plan for Blanding's turtle in New York State.[92] Conservation actions identified in the plan include:

- Habitat preservation and monitoring efforts;
- Operations of the two developments are consistent with the conservation plan.

NYSDEC described the Sinkhole Wetland as a moderately large wetland complex with minor disturbances in a relatively intact but vulnerable forest landscape downstream of the Heuvelton dam. It is unclear whether the wetland is within the Project boundary but based on a comparison of the location to the application's Project maps it would seem not to be. Since the development is ROR, it is unlikely that Project operations would have any effect on that wetland.

F.4 Summary

My review found no license deviations nor any issues pertaining to the Project's threatened and endangered species activities. The Project appears to operate in accordance with applicable portions of recovery plans for the relevant species and Project operations are expected to have no effect on the noted rare community types. Based on the information provided, it is my recommendation that the Project satisfies the threatened and endangered species protection criterion.

G. LIHI Criterion-Cultural Resource Protection

The cultural and historic resource protection criterion is designed to ensure that the facility does not negatively impact approved state, provincial, federal, and recognized tribal plans designed for the protection, enhancement and mitigation to cultural and historic resources. The Applicant states the LIHI cultural and historic resources criterion in all ZOEs is satisfied by meeting alternative standard G-2.

The Applicant states the development facilities of the Project are in compliance with all requirements regarding cultural resource protection, mitigation, or enhancement included in the FERC license.

91 https://www.dec.ny.gov/docs/fish_marine_pdf/lakesturgeonrp.pdf
92 http://www.dec.ny.gov/docs/wildlife_pdf/blandingsplan.pdf

On October 4, 2010, the New York Historical Preservation Officer (SHPO) stated that the Browns Falls, Flat Rock, South Edwards, Heuvelton and Eel Weir hydroelectric facilities are eligible for listing on the National Register. The historical resources for the Browns Falls development include the Browns Falls Mill Complex Historic Site, and for the Flat Rock development, the Flat Rock Historic House.

License Article 404 required EBH to implement a PA, including the filing of a Historical Properties Management Plan (HPMP). EBH developed the HPMP in consultation with the SHPO and filed the HPMP with FERC on December 30, 2010. In 2012, EBH executed a PA[93] with FERC, the ACHP, and the SHPO for the Project. FERC approved the HPMP with issuance of the 2012 FERC license.

On March 20, 2017, Erie requested amendment of the HPMP monitoring schedule to replace biennial monitoring with a five-year monitoring schedule due to a lack of erosion at the monitoring sites. On May 2, 2017, FERC issued an Order Approving the Amended HPMP.[94]

The Project is in compliance with all license requirements regarding cultural resource protection. My review found no license deviations nor any issues pertaining to the Project's cultural and historical resources protection activities. Based on the information provided, it is my recommendation that the Project meets Standard G-2 and satisfies the cultural and historic resources protection criterion.

H. LIHI Criterion-Recreation

The goal of this criterion is to ensure that recreation activities on lands and waters controlled by the facility are accommodated and that the facility provides recreational access to its associated land and waters without fee or charge. The Applicant states the LIHI recreation criterion in all ZOEs is satisfied by meeting alternative standard H-2.

The Applicant states the Project's developments are in compliance with recreational access, accommodation, and facilities' conditions in the FERC license.

On April 1, 2011, EBH submitted a Recreation Management Plan (RMP). License Article 403 required EBH to file for FERC approval a revised recreation plan to construct, operate, and maintain existing and proposed recreational facilities at each development. EBH filed the revised RMP[95] for the Project on June 30, 2013, and FERC issued an order approving the RMP[96], in part, on September 23, 2014. On September 21, 2015, EBH filed a request to amend the Project's revised RMP again[97], which was granted by FERC on February 27, 2018.[98] This amended RMP reconfigures portage routes to avoid steep slopes and the need to install boat slides. EBH stated that all portage work has been completed. A report detailing the completion of the proposed recreational facilities must be submitted to FERC by February 27, 2020.

EBH permits free public access to the shoreline of the Project's developments across EBH's lands where development facilities, hazardous areas and existing leases, easements, and private ownership do not preclude access.

The amended RMP facilities are:

93 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12906599
94 HPMP - https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14580083
95 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13295216
96 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13641237
97 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13992321
98 https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14830258

- At Browns Falls, there is a portage route, picnic table, parking area, as well as fishing access below the powerhouse.
- At Flat Rock, EBH operates and maintains a boat launch, floating dock, portage route, fishing access, an educational and historical kiosk, and a picnic area.
- At South Edwards, EBH operates and maintains two portage takeouts in the impoundment, one closer to the dam for through paddling, and a put in below the dam, a parking area, and picnic area.
- At Oswegatchie, EBH operates and maintains a portage route with special signage warning boaters of the rapids downstream of the development.
- At Heuvelton, EBH operates and maintains a day-use area which includes picnic tables, cooking grills, and a parking area. There is also a portage route around the development.
- At Eel Weir, EBH operates and maintains a portage route with take-out/put-in areas.

The Project is in compliance with the license recreational access, accommodation, and facility conditions. My review found no license deviations nor any issues pertaining to the Project's recreational resources activities, provided final approval of all recreational improvements that have been made (specifically, re-routed portage trails) is obtained. Therefore, based on the information provided, it is my recommendation that the Project meets Standard H-2 and conditionally satisfies the recreational resources criterion.

8. RECOMMENDATION

A review of the certification application and supporting documentation, and a search of the FERC docket shows EBH has successfully complied with the Project's FERC license articles and other requirements.

As required by the FERC license, 1-inch trashracks must be installed at all six Project developments by December 31, 2023. New 1-inch trashracks are still outstanding at the Browns Falls, Flat Rock and South Edwards developments.

FERC amended the RMP on February 27, 2018. This amended RMP reconfigures portage routes to avoid steep slopes and the need to install boat slides. EBH must submit a report detailing the completion of the proposed recreational facilities by February 27, 2020.

Since issuance of the current license in January of 2013, EBH has experienced nine minimum flow and/or pond level deviations. The main causes of these deviations are associated with loss of power, equipment malfunction or operator error at associated Project developments. The equipment malfunctions have been corrected and should not be repeated. Loss of power deviations could be reduced by the installation of automatic backup reserve generators, fueled by natural gas or propane, of sufficient capacity to keep the PLC operating. Operator errors could be reduced by providing annual reviews for appropriate personnel that reinforce each development's environmental flow requirements.

EBH indicates that a new operating procedure for the Eel Weir development to help eliminate future base flow deviation occurrences and a delay in the development of a required effectiveness testing of the nature-like fishway at Heuvelton is still ongoing with the agencies.

These issues require that a conditional LIHI certification be recommended as follows:

Condition 1 – By no later than the first annual certification submittal to LIHI after certification the Facility Owner shall:

a) Institute an annual review for appropriate personnel that reinforce each development's proper operation and environmental flow requirements. Documentation stating the personnel attending and a summary of the material discussed shall be provided in annual compliance submittals to LIHI.
b) Provide a copy of the final procedure developed for Eel Weir to help eliminate future base flow deviation occurrences. Copies of any FERC filings, approvals, and consultation summaries should also be provided in annual compliance submittals to LIHI.

Condition 2 - The Facility Owner shall provide a summary of the effectiveness testing of the nature-like fishway at Heuvelton when testing is complete. Copies of any FERC filings, agency approvals, and consultation summaries should also be provided in annual compliance submittals to LIHI until testing is completed. LIHI reserves the right to modify certification based on upstream passage effectiveness results.

Condition 3 – The Facility Owner shall provide a status update pertaining to the installation of 1-inch trashracks at the Browns Falls, Flat Rock and South Edwards in annual compliance submittals to LIHI. Copies of any FERC filings, approvals, and consultation summaries should also be provided to LIHI.

Condition 4 - The Facility Owner shall provide a copy of the report to be submitted to FERC detailing the completion of the proposed recreational facilities no later than February 27, 2020.

Based on my review, and the Applicant's adherence to these conditions, I recommend issuing a five (5)-year LIHI Certificate to EBH for the Oswegatchie River Project with the possibility to extend the term another three (3) years under the upstream passage PLUS standard, pending satisfaction of Condition 2 and provided effectiveness testing is satisfactory.

Gary Franc

Gary M. Franc

FRANC LOGIC

Licensing & Compliance
Hydropower Consulting & Modeling

APPENDIX A
DOCUMENTS

Brookfield
Brookfield Renewable
184 Elm Street
Potsdam, NY 13676
Tel 315.267.1020
www.brookfieldrenewable.com

Submitted Electronically only

January 3, 2019

Ms. Jessica Hart
New York State Department of Environmental Conservation
317 Washington Street
Watertown, NY 13601

Subject: **Oswegatchie River Hydroelectric Project (FERC No. 2713)**
Low Impact Hydropower Institute Certification
Water Quality Certificate Verification

Dear Ms. Hart:

Erie Boulevard Hydropower, L.P. (Erie) is applying for Low Impact Hydropower Institute (LIHI) certification for the Oswegatchie River Hydroelectric Project (FERC No. 2713). This Project is comprised of six hydroelectric developments located at six dams along the Oswegatchie River in St. Lawrence County. From upstream to downstream, these are the Browns Falls (River Mile [RM] 96.9), Flat Rock (RM 95.5), South Edwards (RM 87.1), Oswegatchie (RM 86.6), Heuvelton (RM 12.0), and Eel Weir (RM 5.1) developments.

Erie is requesting confirmation from the New York State Department of Environmental Conservation stating that the 401 Water Quality Certificate issued for the operation of the Oswegatchie River Project on October 24, 2012 is still valid. Please provide this confirmation by reply to this letter via letter or email.

Erie respectfully requests a response within 30 days of the date of this letter. Thank you in advance for your assistance, and if you have any questions, please do not hesitate to contact me at (315) 267-1036 or by email at Danny.Maguire@brookfieldrenewable.com.

Sincerely,

Daniel Maguire, P.E.
Compliance Manager
North Atlantic Operations

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, Bureau of Ecosystem Health, Region 6
Dulles State Office Building, 317 Washington Street, Watertown, NY 13601-3787
P: (315) 785-2263 | F: (315) 785-2242
www.dec.ny.gov

1-14-2018

Daniel Maguire, P. E.
Compliance Manager
North Atlantic Operations
Brookfield Renewable
184 Elm Street
Potsdam NY 13676

Re: Oswegatchie River Hydroelectric project (FERC No. 2713) LIHI Re-Certification Water Quality Certificate Verification.

Dear Mr. Maguire

The current 401 water quality certification issued by the NYSDEC on October 24, 2012 for the operation of the Oswegatchie river hydroelectric projects (FERC No. 2713) is still valid.

If you have any questions, please do not hesitate to contact me at 315-785-2293

Sincerely,

Stephanie Larkin
Biologist
NYSDEC - Reg 6
Stephanie.Larkin@dec.ny.gov

NEW YORK | Department of Environmental Conservation

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To:
Consultation Code: 05E1NY00-2019-SLI-0793
Event Code: 05E1NY00-2019-E-02516
Project Name: Oswegatchie River Project - Browns Falls & Flat Rock

January 31, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/

eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2019-SLI-0793

Event Code: 05E1NY00-2019-E-02516

Project Name: Oswegatchie River Project - Browns Falls & Flat Rock

Project Type: DAM

Project Description: The Oswegatchie River Hydroelectric Project (FERC No. 2713) consists of six developments along the Oswegatchie River, located within St. Lawrence, New York. Progressing downstream, these are the Browns Falls (RM 96.9), Flat Rock (95.5), South Edwards (RM 87.1), Oswegatchie (RM 86.6), Heuvelton (RM 12.0), and Eel Weir (RM 5.1) developments. The Oswegatchie River Project is applying to the Low Impact Hydropower Institute (LIHI) for a certification of their project and is looking for information regarding rare, threatened or endangered species that may occur in the project area. LIHI requires documentation of a finding of no negative effects or documentation that the facility is in compliance with relevant conditions in the species recovery plans. This RTE request is specific to two of the developments included in the Oswegatchie River Project (Browns Falls and Flat Rock).

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.22363249687449N75.07670328395085W

Counties: St. Lawrence, NY

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. 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.

Mammals

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

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To:
Consultation Code: 05E1NY00-2019-SLI-0792
Event Code: 05E1NY00-2019-E-02514
Project Name: Oswegatchie River Project - South Edwards & Oswegatchie

January 31, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/

eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2019-SLI-0792

Event Code: 05E1NY00-2019-E-02514

Project Name: Oswegatchie River Project - South Edwards & Oswegatchie

Project Type: DAM

Project Description: The Oswegatchie River Hydroelectric Project (FERC No. 2713) consists of six developments along the Oswegatchie River, located within St. Lawrence, New York. Progressing downstream, these are the Browns Falls (RM 96.9), Flat Rock (95.5), South Edwards (RM 87.1), Oswegatchie (RM 86.6), Heuvelton (RM 12.0), and Eel Weir (RM 5.1) developments. The Oswegatchie River Project is applying to the Low Impact Hydropower Institute (LIHI) for a certification of their project and is looking for information regarding rare, threatened or endangered species that may occur in the project area. LIHI requires documentation of a finding of no negative effects or documentation that the facility is in compliance with relevant conditions in the species recovery plans. This RTE request is specific to two of the developments included in the Oswegatchie River Project (South Edwards and Flat Oswegatchie).

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.27782348848024N75.22082832105758W

Counties: St. Lawrence, NY

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. 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.

Mammals

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

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
Phone: (607) 753-9334 Fax: (607) 753-9699
http://www.fws.gov/northeast/nyfo/es/section7.htm

In Reply Refer To:
Consultation Code: 05E1NY00-2019-SLI-0791
Event Code: 05E1NY00-2019-E-02512
Project Name: Oswegatchie River Project - Heuvelton & Eel Weir

January 31, 2019

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). This list can also be used to determine whether listed species may be present for projects without federal agency involvement. New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list.

Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC site at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list. If listed, proposed, or candidate species were identified as potentially occurring in the project area, coordination with our office is encouraged. Information on the steps involved with assessing potential impacts from projects can be found at: http://www.fws.gov/northeast/nyfo/es/section7.htm

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/

eagle_guidance.html). Additionally, wind energy projects should follow the Services wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the ESA. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

New York Ecological Services Field Office
3817 Luker Road
Cortland, NY 13045-9385
(607) 753-9334

Project Summary

Consultation Code: 05E1NY00-2019-SLI-0791

Event Code: 05E1NY00-2019-E-02512

Project Name: Oswegatchie River Project - Heuvelton & Eel Weir

Project Type: DAM

Project Description: The Oswegatchie River Hydroelectric Project (FERC No. 2713) consists of six developments along the Oswegatchie River, located within St. Lawrence, New York. Progressing downstream, these are the Browns Falls (RM 96.9), Flat Rock (95.5), South Edwards (RM 87.1), Oswegatchie (RM 86.6), Heuvelton (RM 12.0), and Eel Weir (RM 5.1) developments. The Oswegatchie River Project is applying to the Low Impact Hydropower Institute (LIHI) for a certification of their project and is looking for information regarding rare, threatened or endangered species that may occur in the project area. LIHI requires documentation of a finding of no negative effects or documentation that the facility is in compliance with relevant conditions in the species recovery plans. This RTE request is specific to two of the developments included in the Oswegatchie River Project (Heuvelton and Eel Weir).

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/44.636784548908366N75.48826510499096W

Counties: St. Lawrence, NY

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

1. 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.

Mammals

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

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Caley, Katherine

From: naturalheritage@nynhp.org
Sent: Thursday, January 03, 2019 7:06 PM
To: Caley, Katherine
Subject: Confirmation of your submitted request to New York Natural Heritage

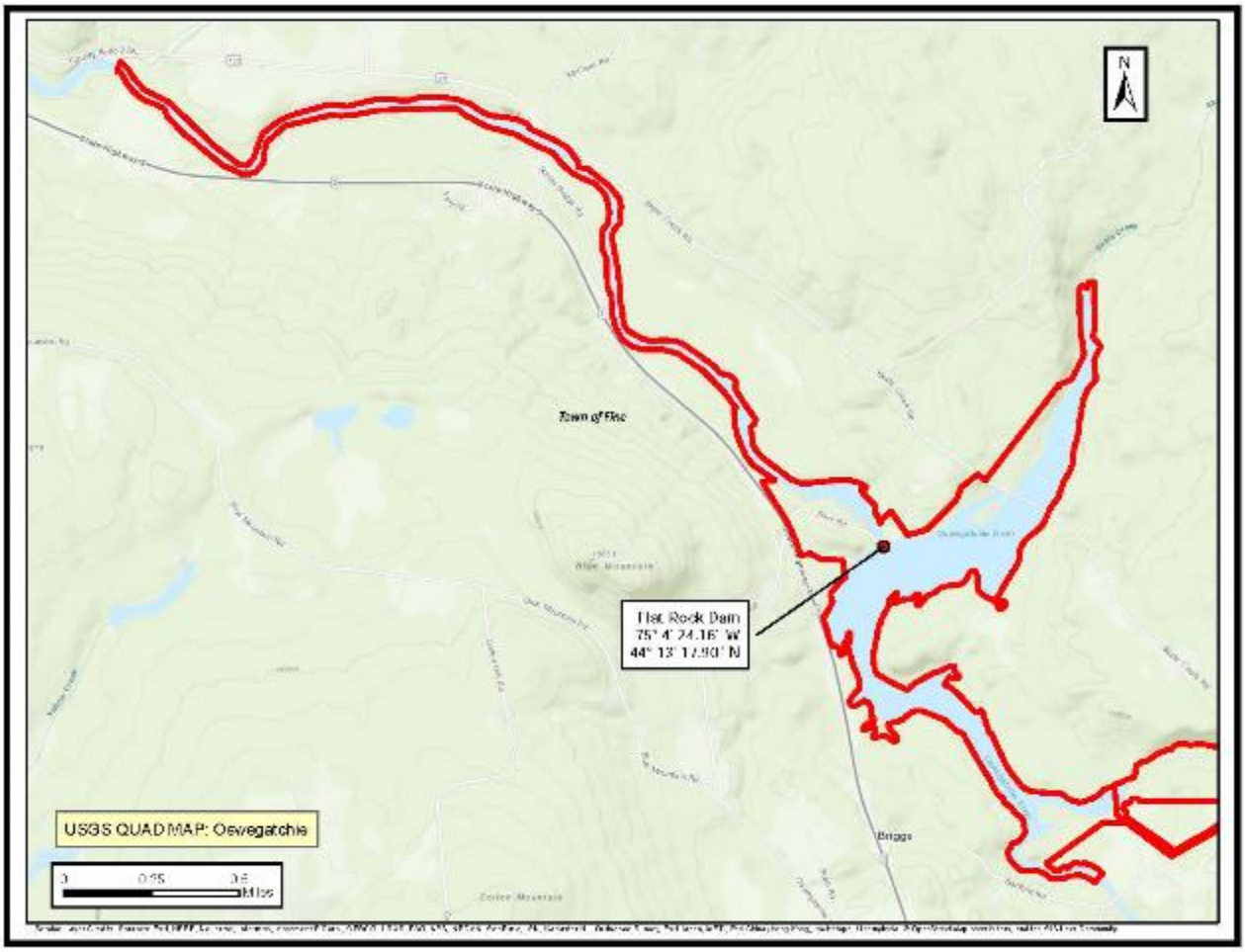
Submission ID: 2905
Submitted on Thursday, January 3, 2019 - 19:05 Submitted values are:

Company, Organization, or Agency: HDR, Inc.
Requestor Name: Katherine Caley
Requestor Address (Street/PO Box): 1304 Buckley Road, Suite 202 Requestor City: Syracuse Requestor State: New York Requestor Zip Code: 13212 Requestor Telephone #: 315-414-2213 Requestor Email: Katherine.Caley@hdrinc.com Project Type: hydroelectric facility/project Project Name: Browns Falls & Flat Rock LIHI Consultation Project Applicant: Erie Boulevard Hydropower Project County: St Lawrence Town (St Lawrence County):
- Clifton
- Fine
Project Summary:
Erie is presently working with the Low Impact Hydropower Institute (LIHI) to certify the Oswegatchie Hydroelectric Project (FERC No. 2713) as a low impact project. In preparing the application for LIHI certification, Erie must update or confirm consultation with resource agencies with respect to the presence of threatened or endangered species within the vicinity of the hydroelectric developments. Per the request from LIHI, Erie respectfully requests information on the presence of threatened or endangered species within the vicinity of the Browns Falls and Flat Rock developments.

As a matter of background, the license from the Federal Energy Regulatory Commission (FERC) was issued for this Project on November 26, 2012. Project operations and environmental protection measures at this Project have been largely determined by a comprehensive Offer of Settlement that Erie developed in conjunction with the New York State Department of Environmental Conservation and other entities in 2010. The licensing processes for this Project included consultation with resource agencies regarding threatened and endangered species.

Current Land Use: The site is currently developed for the primary purpose of hydroelectric energy production on the Oswegatchie River.
Tax parcel number:
Latitude: 44.212
Longitude: -75.037
Street Address of Project:
Project Notes:


N
Browns Falls Dam
75° 7' 14.36" W
44° 12' 44.56" N
Town of Fine
Town of Clifton
USGS QUADMAPS: Oswegatchie and Newton Falls
Miles


N
Town of Fine
Flat Rock Dam
75° 4' 24.16" W
44° 13' 17.90" N
USGS QUAD MAP: Oswegatchie
0
0.25
0.5
Miles
Briggs

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

January 30, 2019

Katherine Caley
HDR, Inc.
1304 Buckley Road, Suite 202
Syracuse, NY 13212

Re: Browns Falls & Flat Rock LIHI Consultation
County: St Lawrence Town/City: Clifton, Fine

Dear Ms. Caley:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 6 Office, Division of Environmental Permits at dep.r6@dec.ny.gov, (315) 785-2245.

Sincerely,

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

13

NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Caley, Katherine

From: naturalheritage@nynhp.org
Sent: Thursday, January 03, 2019 7:14 PM
To: Caley, Katherine
Subject: Confirmation of your submitted request to New York Natural Heritage

Submission ID: 2906
Submitted on Thursday, January 3, 2019 - 19:13 Submitted values are:

Company, Organization, or Agency: HDR, Inc
Requestor Name: Katherine Caley
Requestor Address (Street/PO Box): 1304 Buckley Road, Suite 202 Requestor City: Syracuse Requestor State: New York Requestor Zip Code: 13212 Requestor Telephone #: 315-414-2213 Requestor Email: Katherine.Caley@hdrinc.com Project Type: hydroelectric facility/project Project Name: South Edwards & Oswegatchie LIHI Consultation Project Applicant: Erie Boulevard Hydropower Project County: St Lawrence Town (St Lawrence County):
- Edwards
- Fine
Project Summary:
Erie is presently working with the Low Impact Hydropower Institute (LIHI) to certify the Oswegatchie Hydroelectric Project (FERC No. 2713) as a low impact project. In preparing the application for LIHI certification, Erie must update or confirm consultation with resource agencies with respect to the presence of threatened or endangered species within the vicinity of the hydroelectric developments. Per the request from LIHI, Erie respectfully requests information on the presence of threatened or endangered species within the vicinity of the South Edwards and Oswegatchie developments.

As a matter of background, the license from the Federal Energy Regulatory Commission (FERC) was issued for this Project on November 26, 2012. Project operations and environmental protection measures at this Project have been largely determined by a comprehensive Offer of Settlement that Erie developed in conjunction with the New York State Department of Environmental Conservation and other entities in 2010. The licensing processes for this Project included consultation with resource agencies regarding threatened and endangered species.

Current Land Use: The site is currently developed for the primary purpose of hydroelectric energy production on the Oswegatchie River.
Tax parcel number:
Latitude: 44.270
Longitude: -75.199
Street Address of Project:
Project Notes:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 | F: (518) 402-8925
www.dec.ny.gov

January 31, 2019

Katherine Caley
HDR, Inc.
1304 Buckley Road, Suite 202
Syracuse, NY 13212

Re: South Edwards & Oswegatchie LIHI Consultation
County: St. Lawrence Town/City: Edwards, Fine

Dear Ms. Caley:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 6 Office, Division of Environmental Permits at dep.r6@dec.ny.gov, (315) 785-2245.

Sincerely,

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

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NEW YORK STATE OF OPPORTUNITY. Department of Environmental Conservation

Caley, Katherine

From: naturalheritage@nynhp.org
Sent: Thursday, January 03, 2019 7:20 PM
To: Caley, Katherine
Subject: Confirmation of your submitted request to New York Natural Heritage

Submission ID: 2907
Submitted on Thursday, January 3, 2019 - 19:19 Submitted values are:

Company, Organization, or Agency: HDR, Inc Requestor Name: Katherine Caley Requestor Address (Street/PO Box): 1304 Buckley Road, Suite 202 Requestor City: Syracuse Requestor State: New York Requestor Zip Code: 13212 Requestor Telephone #: 315-414-2213 Requestor Email: Katherine.Caley@hdrinc.com Project Type: hydroelectric facility/project Project Name: Huevelton & Eel Weir LIHI Consultation Project Applicant: Erie Boulevard Hydropower Project County: St Lawrence Town (St Lawrence County)
- De Peyster
- Oswegatchie
Project Summary:
Erie is presently working with the Low Impact Hydropower Institute (LIHI) to certify the Oswegatchie Hydroelectric Project (FERC No. 2713) as a low impact project. In preparing the application for LIHI certification, Erie must update or confirm consultation with resource agencies with respect to the presence of threatened or endangered species within the vicinity of the hydroelectric developments. Per the request from LIHI, Erie respectfully requests information on the presence of threatened or endangered species within the vicinity of the Heuvelton and Eel Weir developments.
As a matter of background, the license from the Federal Energy Regulatory Commission (FERC) was issued for this Project on November 26, 2012. Project operations and environmental protection measures at this Project have been largely determined by a comprehensive Offer of Settlement that Erie developed in conjunction with the New York State Department of Environmental Conservation and other entities in 2010. The licensing processes for this Project included consultation with resource agencies regarding threatened and endangered species.

Current Land Use: The sites are currently developed for the primary purpose of hydroelectric energy production on the Oswegatchie River.
Tax parcel number:
Latitude: 44.618
Longitude: -75.404
Street Address of Project:
Project Notes:


N
Town of Lisbon
Heuvelton Dam
75° 24' 15.82" W
44° 37' 3.95" N
Town of Oswegatchie
Heuvelton
Town of De Peyster
Town of Oswegatchie
USGS QUAD MAP: Heuvelton
0 0.25 0.5 Miles

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Division of Fish and Wildlife, New York Natural Heritage Program
625 Broadway, Fifth Floor, Albany, NY 12233-4757
P: (518) 402-8935 I F: (518) 402-8925
www.dec.ny.gov

January 31, 2019

Katherine Caley
HDR, Inc
1304 Buckley Road, Suite 202
Syracuse, NY 13212

Re: Huevelton & Eel Weir LIHI Consultation
County: St Lawrence Town/City: De Peyster, Oswegatchie

Dear Ms. Caley:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the above project.

Enclosed is a report of rare or state-listed animals and plants, and significant natural communities that our database indicates occur in the vicinity of the project site.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. Depending on the nature of the project and the conditions at the project site, further information from on-site surveys or other sources may be required to fully assess impacts on biological resources.

Our database is continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the NYS DEC Region 6 Office, Division of Environmental Permits at dep.r6@dec.ny.gov, (315) 785-2245.

Sincerely,

Heidi Krahling
Environmental Review Specialist
New York Natural Heritage Program

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NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation