Brookfield

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March 7, 2019

**Milford Project**
**FERC No. 2534**

Ms. Shannon Ames, Executive Director
Low Impact Hydropower Institute
329 Massachusetts Avenue, Suite 2
Lexington, MA 02420

**Subject: Low Impact Hydropower Institute Stage II Application for Recertification of the Milford Project (FERC No. 2534); LIHI Certificate No. 113**

Dear Ms. Ames:

On behalf of the Licensee, Black Bear Hydro Partners, LLC (Black Bear or BBHP), please find attached the Stage II Application for Recertification for the Milford Project on the Penobscot River in Maine. Black Bear's existing LIHI certification for the Project expires on May 31, 2019 (pursuant to an extension issued November 20, 2018). Black Bear's annual compliance statements attest that there have been no violations of the low impact criteria, no violations of the Certification Use Requirements, no changes in conditions relevant to the certification, and no notices of violation or non-compliance relevant to the facility's certification from any government agency, including its FERC license and Section 401 water quality certification for the duration of the previous certification.

The current Stage II application includes the following required submittals:

- Table B-1 Project Description
- List of hyperlinks to pertinent FERC and regulatory documents for the Project
- Zones of Effect delineated into the upstream regulated Penobscot River main stem; impounded reach upstream of both Milford and Gilman Falls Dams; bypass reach of Milford Dam; downstream regulated Penobscot River Stillwater Branch; and downstream regulated Penobscot River main stem
- Matrix of Alternative Standards for each Zone of Effect identified evaluating the LIHI certification standards for each requisite criteria, including water quality, fish passage and recreation
- Stage I Intake Review Report and Requested Supplemental Information
- Sworn Statement and Waiver Form
- Facility Contacts Form including pertinent NGOs, as appropriate.

Please call me at (207) 755-5606 or email me at Kelly.Maloney@brookfieldrenewable.com if you have any questions or need additional information regarding this submittal.

Sincerely,

Kelly Maloney
Manager, Compliance - Northeast

Attachments:
Cc: S. Michaud, N. Stevens, S. Mascarenhas, K. Bernier, J. Cole, R. Brochu, R. Dill

**Table B-1.1. Facility Information. Milford Hydroelectric Project (LIHI #113)**

| *Item* | *Information Requested* | *Response (include references to further details)* |
|---|---|---|
| ***Name of the Facility*** | Facility name (use FERC project name or other legal name) | Milford Project (Milford Dam and Gilman Falls Dam) |
| ***Location*** | River name (USGS proper name) | Penobscot River |
| | Watershed name<br>(select region, click on the area of interest until the 8-digit HUC number appears. Then identify watershed name and HUC-8 number from the map at: https://water.usgs.gov/wsc/map_index.html) | Lower Penobscot – HUC 01020005 |
| | Nearest town(s), county(ies), and state(s) to dam | Milford, Penobscot, Maine (Milford Dam)<br>Old Town, Penobscot, Maine (Gilman Falls Dam) |
| | River mile of dam | RM 37.00 (Milford Dam)<br>RM 5.65 from confluence of Stillwater and mainstem of Penobscot. RM 39.09 from Atlantic Ocean (Gilman Falls Dam) |
| | Geographic latitude of dam | 44°56'28.7"N (Milford Dam);<br>44° 57'5.13"N (Gilman Falls Dam) |
| | Geographic longitude of dam | 68°38'47.1"W (Milford Dam);<br>68° 41' 42.72"W (Gilman Falls Dam) |
| ***Facility Owner*** | Application contact names (Complete the Contact Form in Section B-4 also): | Kelly Maloney |
| | Facility owner company and authorized owner representative name.<br>**For recertifications: If ownership has changed since last certification, provide the date of the change.** | Brookfield Renewable Partners LP |
| | FERC licensee company name (if different from owner) | Black Bear Hydro Partners, LLC |
| ***Regulatory Status*** | FERC Project Number (e.g., P-xxxxx), issuance and expiration dates, or date of exemption | P-2534, issued April 20, 1998, expires March 31, 2038 |
| | FERC license type (major, minor, exemption) or special classification (e.g., "qualified conduit", "non-jurisdictional") | Hydropower license for Major Project; Federal Power Act |
| | Water Quality Certificate identifier, issuance date, and issuing agency name. Include information on amendments. | #L-16011-35-H-M, March 10, 2005, Maine Department of Environmental Protection |

| *Item* | *Information Requested* | *Response (include references to further details)* |
|---|---|---|
| | Hyperlinks to key electronic records on FERC e-library website or other publicly accessible data repositories[1] | See hyperlink list below for relevant records including FERC License and Amendment Orders; Section 401 Water Quality Certification; Lower Penobscot Comprehensive Settlement Accord; FERC and regulatory filings; and other key documents. |
| ***Powerhouse*** | Date of initial operation (past or future for pre-operational applications) | 1906 |
| | Total installed capacity (MW)<br>**For recertifications: Indicate if installed capacity has changed since last certification** | 8.23 MW pursuant to November 15, 2018 Revised Exhibit A filed with the FERC to correct installed capacity calculation |
| | Average annual generation (MWh) and period of record used<br>**For recertifications: Indicate if average annual generation has changed since last certification** | Average annual generation target is 51,060 MWh but the average annual generation for the past 3 years is 39,331 MWh. |
| | Mode of operation (run-of-river, peaking, pulsing, seasonal storage, diversion, etc.)<br>**For recertifications: Indicate if mode of operation has changed since last certification** | Run-of-River |
| | Number, type, and size of turbines, including maximum and minimum hydraulic capacity of each unit | 6 turbine units including: two Canadian Hydro Components (CHC) axial flow vertical propeller units (740 kW, 550 cfs hydraulic capacity); one fixed blade propeller unit (1,600 kW, 1,370 cfs hydraulic capacity); three Kaplan units (two at 1,600 kW with 1,420 cfs hydraulic capacity; one at 1,950 kW with 1,420 cfs hydraulic capacity) |
| | Trashrack clear spacing (inches), for each trashrack | Outer angled trashrack has a 4-inch clear spacing; the inner trashrack has 1-inch clear spacing |
| | Dates and types of major equipment upgrades | 2011: Two CHC units installed<br>2014: Fish lift and sorting facility installed |
| | Dates, purpose, and type of any recent operational changes | 6/20 – 9/21/17 for dam safety repairs-see https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14695636 |

[1] For example, the FERC license or exemption, recent FERC Orders, Water Quality Certificates, Endangered Species Act documents, Special Use Permits from the U.S. Forest Service, 3rd-party agreements about water or land management, grants of right-of-way, U.S. Army Corps of Engineers permits, and other regulatory documents. If extensive, the list of hyperlinks can be provided separately in the application.

| *Item* | *Information Requested* | *Response (include references to further details)* |
|---|---|---|
| | Plans, authorization, and regulatory activities for any facility upgrades or license or exemption amendments | See 2005 FERC License amendment and WQC amendment for unit upgrade authorization in FERC Regulatory Information. See 2018 revised Exhibit A for installed capacity calculation. |
| ***Dam or Diversion*** | Date of original construction and description and dates of subsequent dam or diversion structure modifications | 1905 – 1906 (both Milford and Gilman Falls dams) |
| | Dam or diversion structure height including separately, the height of any flashboards, inflatable dams, etc. | Milford average 20 feet;<br>Gilman Falls 4.0 feet |
| | Spillway elevation and hydraulic capacity | Milford 97.2 feet NGVD (permanent crest)<br>Milford 101.7 feet NGVD (steel hinge flashboard elevation and normal full pond)<br>Milford 101.7 feet NGVD (Obermeyer elevation)<br>Milford hydraulic capacity 6,730 cfs<br>Gilman Falls 97.3 feet NGVD (permanent crest)<br>Gilman Falls 101.7 feet NGVD (flashboard elevation and normal full pond) |
| | Tailwater elevation (provide normal range if available) | Milford 82.8 feet NGVD;<br>Stillwater Dam backwaters almost to the base of Gilman Falls dam and the normal full pond elevation is 94.65 feet NGVD. |
| | Length and type of all penstocks and water conveyance structures between the impoundment and powerhouse | None |
| | Dates and types of major infrastructure changes | 2011: Inflatable flashboard system installed at Milford Development |
| | Designated facility purposes (e.g., power, navigation, flood control, water supply, etc.) | Milford - hydropower generation;<br>Gilman Falls – regulates flows to Stillwater Branch |
| | Source water | Penobscot River |
| | Receiving water and location of discharge | Milford – Penobscot River; Gilman Falls – Stillwater Branch of the Penobscot River |
| ***Conduit*** | Date of conduit construction and primary purpose of conduit | N/A |
| ***Impoundment and Watershed*** | Authorized maximum and minimum water surface elevations<br>**For recertifications: Indicate if these values have changed since last certification** | Normal licensed operation 100.7 feet to 101.7 feet NGVD (full pond volume 2,250 acre-feet); no change since the 2005 water quality certification |

| *Item* | *Information Requested* | *Response (include references to further details)* |
|---|---|---|
| | Normal operating elevations and normal fluctuation range<br>**For recertifications: Indicate if these values have changed since last certification** | Normal licensed operation 100.7 feet to 101.7 feet NGVD (full pond volume 2,250 acre-feet)<br>Values have not changed since last certification. |
| | Gross storage volume and surface area at full pool<br>**For recertifications: Indicate if these values have changed since last certification** | 2,250 acre-feet; 235 acres<br>Values have not changed since last certification. |
| | Usable storage volume and surface area<br>**For recertifications: Indicate if these values have changed since last certification** | Usable storage volume is zero acre-feet as this is a run-of-river facility.<br>Values have not changed since last certification. |
| | Describe requirements related to impoundment inflow, outflow, up/down ramping and refill rate restrictions. | Run-of-river operations; no ramping or impoundment refill rate restrictions |
| | Upstream dams by name, ownership and river mile. If FERC licensed or exempt, please provide FERC Project number of these dams. Indicate which upstream dams have downstream fish passage. | On the main stem of the Penobscot River:<br><br>West Enfield Dam, Bangor-Pacific Hydro Associates, FERC No. 2600, river mile 55; has a downstream fish passage<br>Weldon Dam, Great Lakes Hydro America, LLC, FERC No. 2520, river mile 67; has a downstream fish passage<br><br>Numerous dams exist on tributaries upstream of the Milford Project |
| | Downstream dams by name, ownership, river mile and FERC number if FERC licensed or exempt. Indicate which downstream dams have upstream fish passage | On the main stem of the Penobscot River:<br>None<br>On the Stillwater Branch:<br>Stillwater Dam, co-licensee Black Bear Hydro Partners, LLC, FERC No. 2712, river mile 35.23; upstream fish passage for eels only<br>Orono Dam, co-licensee Black Bear Hydro Partners, LLC, FERC No. 2710, river mile 33; has an upstream fish lift and an upstream passage for eels |

| *Item* | *Information Requested* | *Response (include references to further details)* |
|---|---|---|
| | Operating agreements with upstream or downstream facilities that affect water availability and facility operation | Upstream hydropower and storage projects in the Penobscot River basin have numerous water management requirements contained in their FERC licenses that affect water availability at Milford; Milford Project is subject to the Lower Penobscot Settlement Agreement that dictates flow allocations to the mainstem and Stillwater Branch |
| | Area of land (acres) and area of water (acres) inside FERC project boundary or under facility control. | The FERC Project boundary extends landward up to elevation 105.0 feet NGVD. The area occupied by non-reservoir facilities (e.g., dam, penstocks, powerhouse) is approximately 1.2 acres, and the number of acres contained in a 200-foot zone extending around the entire impoundment is approximately 145.4 acres. The total acres of water within the Project boundary is approximately 235 acres. |
| ***Hydrologic Setting*** | Average annual flow at the dam, and period of record used | 9,191 cfs at Milford Dam<br>4,718 cfs at Gilman Falls Dam<br>(Pro-Rated from USGS West Enfield Gage # 01034500, Period of Record 1/1/1980-05/02/2010) |
| | Average monthly flows and period of record used | See Average Annual Flows in the Milford Project table attached below. |
| | Location and name of closest stream gauging stations above and below the facility | USGS 01034500 Penobscot River at West Enfield, Maine; none below facility |
| | Watershed area at the dam (in square miles). Identify if this value is prorated and provide the basis for proration. | 5,092 square miles |
| | Number of zones of effect | 5 |

| *Item* | *Information Requested* | *Response (include references to further details)* |
|---|---|---|
| ***Designated Zones of Effect*** | Upstream and downstream locations by river miles | Zone 1 – regulated river reach upstream of the Milford impoundment begins at the upstream extent of the Project boundary at approximately RM 40.4<br>Zone 2 – Milford impoundment extends from the Milford Dam at RM 37 to the upstream extent of the Project boundary at approximately RM 40.4<br>Zone 3 – bypass reach below Milford Dam extends from RM 36.85 to the Milford Dam at RM 37<br>Zone 4 – regulated downstream reach below Gilman Falls Dam extends from the Gilman Falls Dam at RM 5.68 on the Stillwater Branch to the downstream extent of the Project boundary at RM 5.65 on the Stillwater Branch.<br>Zone 5 – regulated downstream reach below Milford Dam ends at the bottom of the bypass reach at RM 36.85 |
| | Type of waterbody (river, impoundment, bypassed reach, etc.) | Zone 1 – regulated river reach upstream of the Milford impoundment<br>Zone 2 – Milford impoundment<br>Zone 3 – bypass reach below Milford Dam<br>Zone 4 – regulated downstream reach below Gilman Falls Dam<br>Zone 5 – regulated downstream reach below Milford Dam |
| | Delimiting structures or features | Milford Dam; Gilman Falls Dam |
| | Designated uses by state water quality agency | Drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation; navigation; and as a habitat for fish and other aquatic life. |
| ***Pre-Operational Facilities*** | | |
| ***Expected operational date*** | Date generation is expected to begin | N/A |

| *Item* | *Information Requested* | *Response (include references to further details)* |
|---|---|---|
| ***Dam, diversion structure or conduit modification*** | Description of modifications made to a pre-existing conduit, dam or diversion structure needed to accommodate facility generation. This includes installation of flashboards or raising the flashboard height.<br>Date the modification is expected to be completed | N/A |
| ***Change in water flow regime*** | Description of any change in impoundment levels, water flows or operations required for new generation | N/A |

## Average Annual Flows at the Milford Project

| | Milford Inflows | Milford Outflows | |
|---|---|---|---|
| **Month** | **Mainstem Flows (cfs)** | **Average Mainstem Flow (cfs) (Settlement Agreement Reallocation)** | **Average Stillwater Branch Flow (cfs) (Settlement Agreement Reallocation)** |
| January | 9,203 | 5,522 | 3,681 |
| February | 8,468 | 5,081 | 3,387 |
| March | 11,625 | 6,975 | 4,650 |
| April | 36,316 | 25,334 | 10,982 |
| May | 22,662 | 15,431 | 7,231 |
| June | 12,204 | 7,911 | 4,293 |
| July | 8,813 | 5,800 | 3,013 |
| August | 7,676 | 5,143 | 2,533 |
| September | 7,908 | 5,154 | 2,754 |
| October | 11,772 | 7,763 | 4,009 |
| November | 15,670 | 10,523 | 5,147 |
| December | 14,587 | 9,652 | 4,935 |
| Total Average | 13,909 | 9,191 | 4,718 |

(Pro-Rated from USGS West Enfield Gage # 01034500, Period of Record 1/1/1980-05/02/2010)

# MILFORD PROJECT FERC AND REGULATORY INFORMATION

## FERC License and Amendment Orders:

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15093715 (November 8, 2018 Revised Exhibit A)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12957467 (2012 amendment of Milford license to incorporate new generating units #1 and #2 and the Obermeyer inflatable flashboard system)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10499161 (FERC April 18, 2005 amendment of Milford license to incorporate settlement agreement)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=8155669 (1998 Milford FERC license)

## Maine DEP Section 401 Water Quality Certification and Amendment:

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10459103 (2005 amendment of Milford Water Quality Certification to incorporate settlement agreement)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10761736 (1992 Milford Water Quality Certification)

## Maine DEP Water Quality Monitoring Report:

https://www.maine.gov/dep/water/monitoring/305b/2016/28-Feb-2018_2016-ME-IntegratedREPORT.pdf (2016 Maine Department of Environmental Protection Integrated Water Quality Monitoring and Assessment Report)

## Lower Penobscot Comprehensive Settlement Accord:

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10188480 (2004 submittal of settlement agreement to FERC)

## Species Protection Plan and Biological Opinion:

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14462501 (Black Bear January 9, 2017 Sturgeon Handling Plan for the Milford and Orono Projects).

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13349195 (Black Bear September 13, 2013 Revised Species Protection Plan for the Lower Penobscot River)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13111384 (FERC October 9, 2012 approval of fish passage plans for the Milford Project incorporating the Biological Opinion into the Milford license)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13057314 (NMFS August 31, 2012 Biological Opinion for the Lower Penobscot River)

Regulatory Filings:

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15112565 (Black Bear December 7, 2018 dissolved oxygen report)

http://elibrary.FERC.gov/idmws/file_list.asp?accession_num=20181004-5017 (Black Bear October 4, 2018 filing to correct authorized installed capacity at the Milford Project)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15004450 (FERC August 27, 2018 environmental inspection report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14757194 (FERC November 15, 2017 approval of Recreation use and Facility Report)

https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14695629 (Black Bear September 28, 2017 notification to FERC regarding temporary modification of normal operations for emergency dam repairs)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14414134 (Black Bear December 1, 2016 Recreation Use and Facility Report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14117608 (Black Bear January 13, 2016 update to FERC on canoe portage trail)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13300284 (Black Bear July 9, 2013 Operations and Flow Monitoring Plan)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10845840 (Black Bear October 11, 2005 Stream Bank Stabilization Plan)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15100029 (Black Bear November 19, 2018 Report on stream bank stabilization activities)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=8415872 (Black Bear May 27, 1999 Cultural Resource Management Plan).

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=10835003 (FERC June 1, 1999 Order modifying and approving Log removal plan)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=84744 (Bangor Hydro-Electric Co submittal of log removal plan October 16, 1998)

Fish Passage Filings (Including Studies)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15160948 (Black Bear February 12, 2019 diadromous fish passage report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14920201 (FERC May 15, 2018 reply, diadromous fish passage studies)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14885207 (Black Bear April 12, 2018 diadromous fish passage report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14856327 (FERC March 29, 2018 approval of fish lift public viewing facility)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14850291 (Black Bear March 26, 2018 upstream eel passage report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14847748 (Black Bear March 23, 2018 Atlantic salmon SPP report - incorrect date of 3/23/17 on letter)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14532197 (Black Bear March 23, 2017 Atlantic salmon SPP report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14262864 (Black Bear May 31, 2016 Atlantic salmon SPP report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13813797 (Black Bear March 24, 2015 Atlantic salmon SPP report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13493920 (FERC March 27, 2014 Order approving Revised SPP and Revised Salmon passage study plan)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14843541 (Black Bear March 16, 2018 diadromous fish passage study plan)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14205388 (Black Bear April 14, 2016 diadromous fish passage report for alosines and American eels)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=15130476 (Black Bear December 28, 2018 incidental take annual report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14787614 (Black Bear December 29, 2017 incidental take annual report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14456203 (Black Bear December 30, 2016 incidental take annual report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14083148 (Black Bear December 28, 2015 incidental take annual report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13725508 (Black Bear December 30, 2014 incidental take annual report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=14559539 (Black Bear April 13, 2017 diadromous fish passage report for alosines and American eels)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13813195 (Black Bear March 24, 2015 2014 American Eel Upstream Passage Operation and Monitoring Report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13490439 (Black Bear March 24, 2014 American Eel upstream passage 2013 O&M report)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13817826 (Black Bear March 27, 2015 Fish Passage Operations and Maintenance Plan)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13460664 (FERC February 11, 2014 Order modifying and approving diadromous fish passage study plan)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13690125 (Black Bear November 19, 2014 Review of Fish lift incident)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13718417 (MDMR December 22, 2014 comments)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13698988 (FERC December 02, 2014 Fish kill incident not a violation of license)

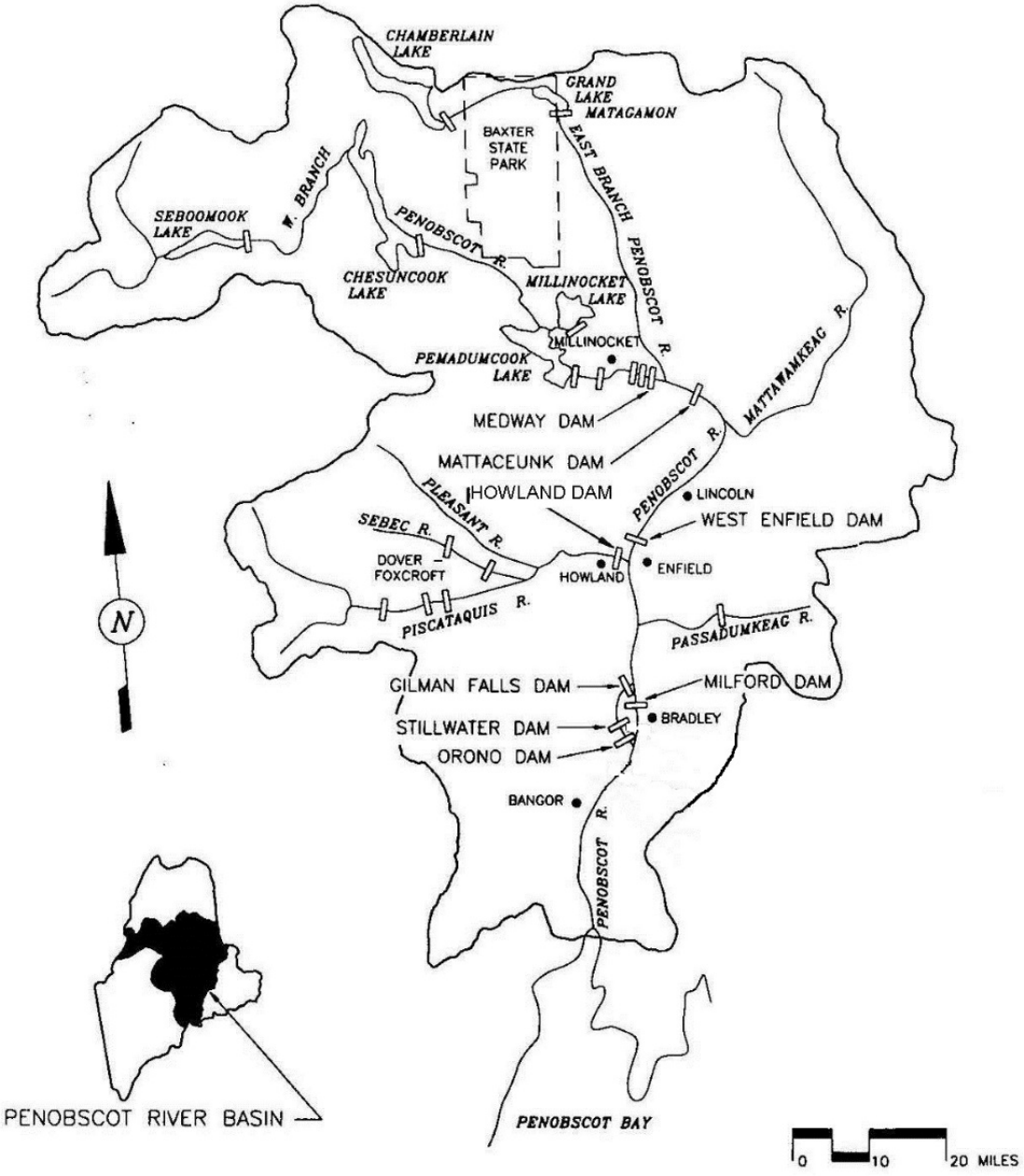
https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=13752839 (FERC January 27, 2015 Fish kill incident discussion)

https://elibrary.ferc.gov/idmws/common/opennat.asp?fileID=12829331 (Black Bear November 20, 2011 Fish Passage Design Plans and Drawings)

**Atlantic Salmon Smolt Study Results Summary**

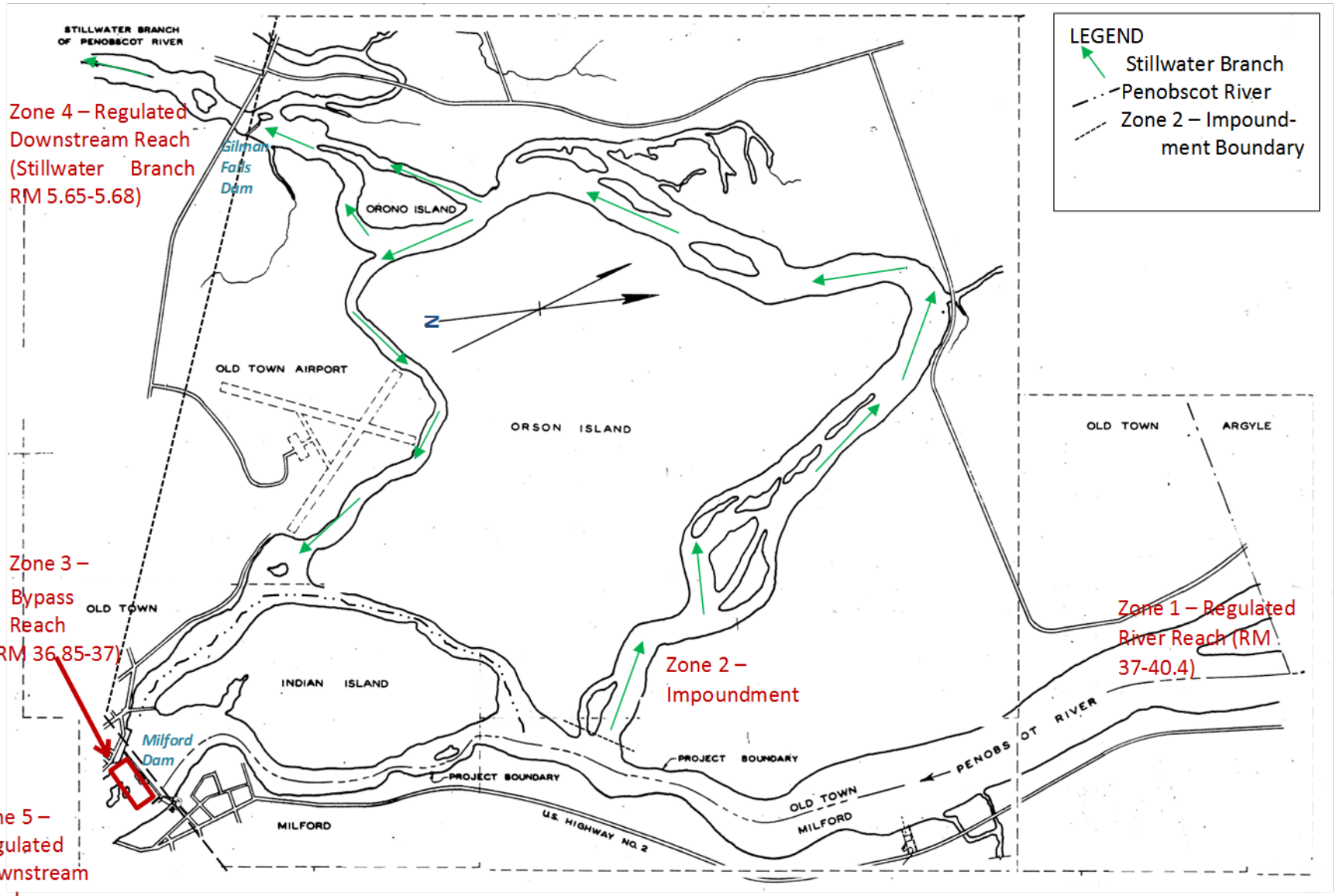
| Project | Year | No. Smolts | Estimated Project Survival (%) | 75% Confidence Interval | |
|---|---|---|---|---|---|
| | | | | Lower | Upper |
| West Enfield | 2014 | 75/48 | 95.7% | 87.1% | 100.0% |
| | 2015 | 212 | 75.1% | 67.2% | 78.4% |
| | 2016 | 233 | 96.8% | 95.4% | 97.9% |
| | 2017 | 253 | 94.8% | 92.7% | 96.8% |
| | 2018 | 246 | 91.8% | 89.2% | 94.7% |
| Milford | 2014 | 84/48 | 92.7% | 87.5% | 98.3% |
| | 2015 | 200 | 80.9% | 73.2% | 84.3% |
| | 2016 | 122 | 91.6% | 88.2% | 94.7% |
| | 2017 | 259 | 97.6% | 96.0% | 99.1% |
| | 2018 | 187 | 98.6% | 94.7% | 100.0% |
| Stillwater | 2014 | 73/48 | 98.2% | 92.5% | 100.0% |
| | 2015 | 127 | 69.2% | 62.3% | 76.2% |
| | 2016 | 162 | 94.3% | 91.9% | 96.5% |
| | 2017 | 163 | 95.3% | 93.2% | 97.5% |
| | 2018 | 165 | 91.7% | 88.7% | 94.5% |
| Orono | 2014 | 77/47 | 92.3% | 85.5% | 99.4% |
| | 2015 | 170 | 82.8% | 79.3% | 86.2% |
| | 2016 | 134 | 85.8% | 81.9% | 89.4% |
| | 2017 | 163 | 99.7% | 98.3% | 100.0% |
| | 2018 | 138 | 99.2% | 95.8% | 100.0% |

**MAP OF THE PENOBSCOT AND STILLWATER BRANCH WATERSHED**




PENOBSCOT RIVER BASIN

# ZONES OF EFFECT



Zones of Effect and Structures


Milford Dam and Powerhouse (Zone 1, Zone 2, Zone 3 and Zone 5)

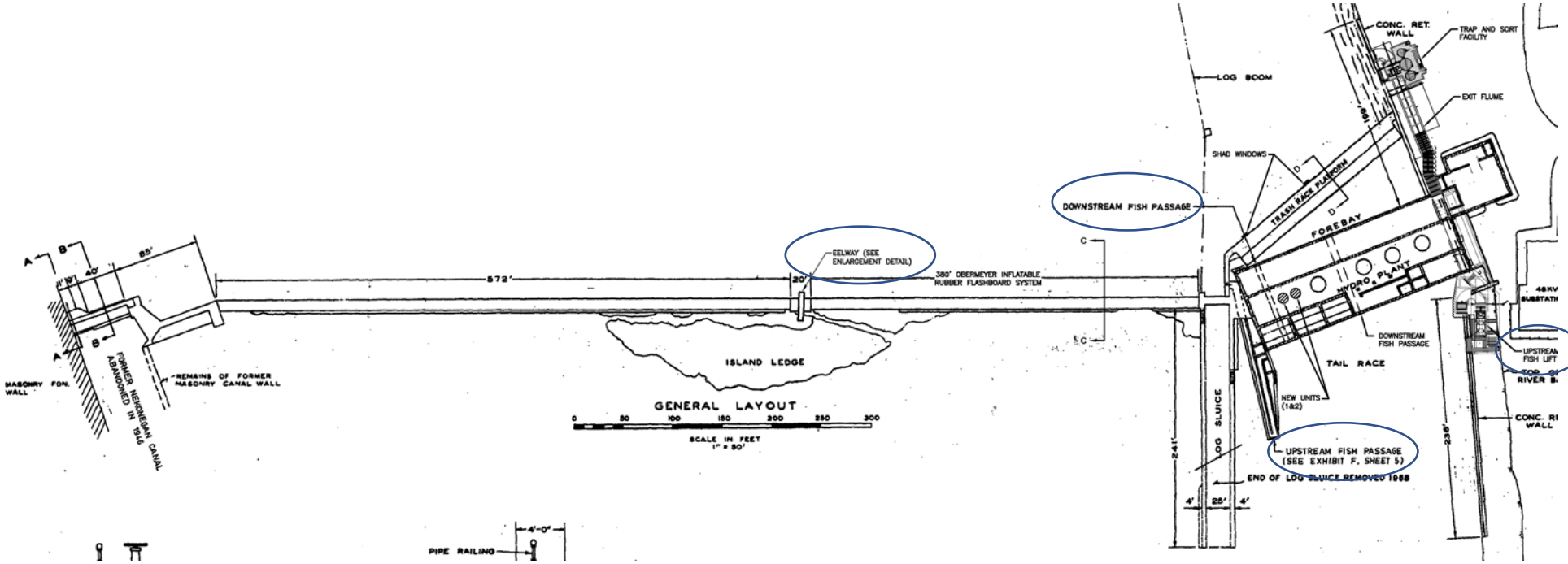
Gilman Falls Dam (Zone 2 and Zone 4)

Milford Dam Bypass Reach (Zone 3)

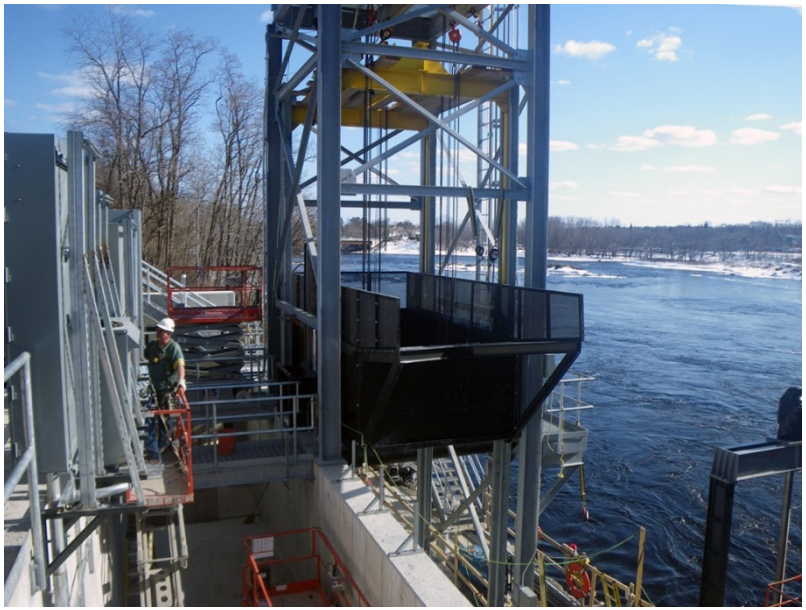
Gilman Falls Dam and Regulated River Reach (Stillwater) (Zone 4)

Milford Tailrace and Regulated River Reach (Main Stem) (Zone 5)

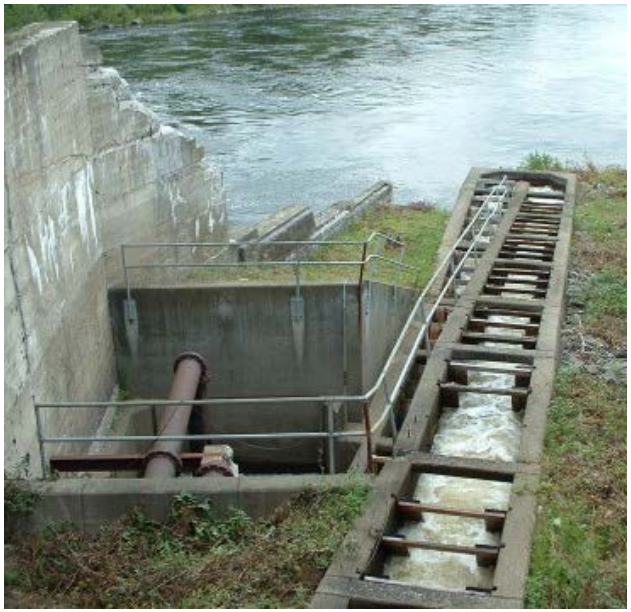
**FISH PASSAGE FACILITIES**



**Milford Fish Lift**



**Milford Denil**



**Milford Eel Passage**

# MATRIX OF ALTERNATIVE STANDARDS

**Facility Name: Milford Project** **Zone of Effect: 1 – Regulated River Reach**

| | 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 | | | | |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **A** | **1** | This reach receives run-of-river flows from upstream tributaries and the West Enfield Project. |
| **B** | **1** | This reach receives run-of-river flows from upstream tributaries and the West Enfield Project, and its water quality is not affected by Milford Project operations as it is upstream of any backwater effect from the Project impoundment. |
| **C** | **1** | There are no barriers to upstream fish passage in this reach; American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present in this river reach. Annual fish passage reports are provided to the FERC documenting fish passing Milford Dam into the impoundment and upstream reaches (see FERC and Regulatory Information). |
| **D** | **1** | There are no barriers to downstream fish passage in this reach; American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present. |
| **E** | **1** | This is outside the Milford Project boundary (see Exhibit G in FERC and Regulatory Information). |
| **F** | **1** | Endangered Atlantic salmon captured at the Milford fish lift are either released to the river to spawn naturally, or they are taken to a hatchery by the U.S. Fish and Wildlife Service (USFWS) for broodstock. Any salmon released to the river have the opportunity to migrate upstream through this river reach; Atlantic salmon kelts (post-spawning adult salmon) and smolts (downstream-migrating juvenile salmon) also migrate through this reach during their downstream migration to the Atlantic Ocean. |
| **G** | **1** | The river reach in Zone 1 is run-of-river and outside the Milford Project boundary. |
| **H** | **1** | The river reach in Zone 1 is run-of-river and outside the Milford Project boundary. |

**Facility Name: _Milford Project_____ Zone of Effect: _2 – Impoundment**

| | 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 | | | |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **A** | **1** | The Milford Project is licensed for run-of-river operations, and except for operating emergencies or upon mutual agreement between Black Bear and the Maine Department of Environmental Protection (Maine DEP), impoundment water levels must be maintained within 1 foot of full pond (101.7 feet msl). The Project operates under a FERC and agency-approved Operations Monitoring Plan for the protection of aquatic habitat (see FERC and Regulatory Information). |
| **B** | **2** | Subject to fish passage, settlement agreement, and recreation conditions, the Maine DEP issued an amended Water Quality Certification (WQC) in March 2005 certifying that the Milford Project, including the Milford impoundment, meets applicable water quality standards (see FERC and Regulatory Information). The Project is operated as a run-of-river facility with minimal fluctuation under a FERC and agency-approved Operations Monitoring Plan (see FERC and Regulatory Information). While the reach of the Penobscot River in the vicinity of the dam is identified as impaired for E. coli, the cause of impairment is identified as combined sewer overflow events unrelated to the Project (see FERC and Regulatory Information) |
| **C** | **1** | There are no barriers to upstream fish passage in the Milford impoundment; American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present in the impoundment. Annual fish passage reports are provided to the FERC documenting fish passing Milford Dam into the impoundment (see FERC and Regulatory Information). |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **D** | **2** | Downstream Atlantic salmon smolt monitoring studies have been conducted at the Milford Project since 2014, and the studies show that smolt survival at the Project meets the Endangered Species Act performance standard (96% survival within a 75% confidence interval; that is, 96% of downstream migrating smolts approaching the dam survive passing the dam within 24 hours, which would include from 200 meters upstream of the trashracks in the impoundment and continuing downstream to the point where latent effects of passage can be quantified). Studies of downstream-migrating adult alosines and American eels have also been conducted and demonstrated overall survival (i.e., including background/natural mortality) at the Project of 76% for American shad (initial 2017 study) and 90% for American eels. Based on the shad results, modifications were made to outer trashracks at Milford in 2018 that improved shad survival to 86% (see FERC and Regulatory Information); river herring survival was also 86%. American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present in the main stem of the Penobscot River and are passed downstream at Milford Dam. A September 11, 2018 fish passage certification letter provided by the USFWS, and forwarded to LIHI that day, affirmed that the fish passage facilities at the Milford Project have been designed and installed as prescribed, at least a year of testing has been completed, and the facilities are ready for routine operations. |
| **E** | **2** | Lands within the Project boundary are limited to those required for Project operations and Project recreation facilities. The Project's run-of-river operation and license requirements for minimal impoundment fluctuation (see section A above) provide protection for the Project's shoreline areas. Article 417 of the Milford FERC license requires additional protection measures (stream bank stabilization) along potentially impacted shorelines of Penobscot Indian Nation (PIN) lands, including Indian and Orson Islands. A Stream Bank Stabilization Plan submitted to FERC on October 11, 2005 (see FERC and Regulatory Information) was approved by FERC on December 21, 2005, and shoreline stabilization activities (i.e., riprapping of shoreline areas) have been ongoing since 2006 on Indian and Orson Islands (see 2018 report in FERC and regulatory information). |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **F** | **3** | Endangered Atlantic salmon captured at the Milford fish lift are either released to the river to spawn naturally, or they are taken to a hatchery by the USFWS for broodstock. Any salmon released to the river have the opportunity to migrate upstream through the Milford impoundment; Atlantic salmon kelts and smolts also migrate through the Milford impoundment during their downstream migration to the Atlantic Ocean. Black Bear has Endangered Species Act (ESA) authorization for operating the Milford Project through an approved Species Protection Plan (see FERC and Regulatory Information) and through a Biological Opinion with Incidental take Authorization issued by the National Marine Fisheries Service (see FERC and Regulatory Information). These documents also address two sturgeon species present in the lower Penobscot River that are listed under the ESA (shortnose and Atlantic sturgeon), and an updated Sturgeon Handling Plan for the Milford and Orono Projects was submitted to FERC on January 9, 2017 (see FERC and Regulatory Information). Since sturgeon habitat did not historically exist upstream of the Milford Project, any sturgeon captured at the Milford fish lift (several shortnose sturgeon to date) are handled pursuant to the Sturgeon Handling Plan, and they are trucked downriver of Milford Dam for release (i.e., they do not enter the Milford impoundment). Pursuant to these authorizations, annual reports on Species Protection Plan activities are submitted to FERC and the resource agencies, along with an annual incidental take report (see FERC and Regulatory Information). |
| **G** | **2** | Pursuant to Article 415 of the Milford Project FERC license, a Cultural Resource Management Plan (CRMP) for the Project (along with two other Projects) was developed and submitted to FERC on May 27, 1999 (see FERC and Regulatory Information). All fieldwork and excavations covered by the CRMP (approved by FERC on November 29, 1999) have been completed. Remaining work under the CRMP includes reporting and analysis of artifacts for one site (the Beaver archaeological site), and Black Bear has proposed to provide a final report to FERC on these activities by April 20, 2019. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **H** | **2** | Article 412 of the Milford Project's 1998 FERC license required installation of recreation facilities at the Project, while Article 414 requires preparation of a Recreation Use and Facility Report every 6 years that includes: (1) annual recreational and Indian cultural use figures; (2) a discussion of the adequacy of the Project's recreation facilities to meet recreation demand; (3) a description of the methodology used to collect study data; and (4) if there is a need for additional facilities, the licensee's design of the recreational facilities and how such design takes into account the national standards established pursuant to the Americans with Disabilities Act of 1990. The recreation facilities (boat launches; portage trails) were installed shortly after license issuance, and the most recent Recreation Use and Facility Report was submitted to FERC on December 1, 2016 (see FERC and Regulatory Information). The boat launches located at North 4th Street, River Road (Indian Island), and on Route 2 each provide access to the Milford impoundment, while the portage trails at the Milford and Gilman Falls dams both extend from the impoundment (Zone 2) to the tailraces of these facilities. Finally, as required by Article 421 of the Milford license, Black Bear consulted with PIN, the United States Bureau of Indian Affairs (BIA), the City of Old Town, Maine, and other affected landowners in 2015 and 2016 regarding whether a canoe portage trail should be constructed around Milford Dam on the west shore of the Penobscot River. As the result of these consultations, Black Bear indicated to FERC in January 2016 that this canoe portage is not needed and not advisable (see FERC and Regulatory Information). FERC has not responded to this letter, but stated in a report following their July 9, 2018 environmental inspection of the Project that no follow-up was needed regarding Article 421 (see FERC and Regulatory Information). |

**Facility Name:** _Milford Dam_____ **Zone of Effect:** _3 – Bypass Reach

| | 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 | | | |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **A** | **2** | By design, as approved by FERC and the agencies, and other than leakage, the bypass reach at Milford Dam only receives flows when the spillway flashboards are down or are being overtopped. Since the upstream fish passages are on the opposite (east) side of the river next to the Milford powerhouse, flows in the bypass reach are not desirable, as they attract upstream-migrating fish away from the fish passages. Thus, flows are provided to the bypass reach as a last option (after the powerhouse, fish passages, log sluice, and Obermeyer inflatable flashboards) when excess flows need to be released at Milford Dam (see 2013 Operations and Flow Monitoring Plan hyperlink in FERC and Regulatory Information). |
| **B** | **2** | Subject to fish passage, settlement agreement, and recreation conditions, the Maine DEP issued an amended Water Quality Certification (WQC) in March 2005 certifying that the Milford Project, including the bypass reach, meets applicable water quality standards. While the reach of the Penobscot River in the vicinity of the dam is identified as impaired for E. coli, the cause of impairment is identified as combined sewer overflow events unrelated to the Project (see FERC and Regulatory Information). |
| **C** | **2** | Migratory fish species are generally not attracted to the bypass reach as flows are limited to spill in this reach. When flows to the bypass reach do attract fish, Black Bear works with resource agencies to remove any fish that become stranded after flows to this area drop. Upstream passage is provided at the Project by the fish lift on the east side of the Project tailrace and by a Denil fishway on the west side of the tailrace (currently operated as a back-up to the fish lift). The upstream eel ladder is also located on the Project spillway. Requirements for upstream fish passage are dictated by the FERC license, Settlement Agreement, and Biological Opinion (see FERC and Regulatory Information). |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **D** | **2** | Downstream Atlantic salmon smolt monitoring studies have been conducted at the Milford Project since 2014, and the studies show that smolt survival at the Project (including passage over the spillway and into the bypass reach) meets the Endangered Species Act performance standard (96% survival within a 75% confidence interval; that is, 96% of downstream migrating smolts approaching the dam survive passing the dam within 24 hours, which would include from 200 meters upstream of the trashracks in the impoundment and continuing downstream to the point where latent effects of passage can be quantified). In accordance with the Adaptive Management Plan for downstream smolt passage, additional spill flow of between 20 and 50% of inflows are provided for downstream passage. The 2017 monitoring report was filed with FERC in March 2018 (see FERC and Regulatory Information). Studies of downstream-migrating adult alosines and American eels have also been conducted and demonstrate current overall survival (i.e., including background/natural mortality) at the Project of 86% for American shad and river herring and 90% for American eels (see FERC and Regulatory Information). American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present in the main stem of the Penobscot River and are passed downstream at Milford Dam and potentially through the bypass reach when flows are passing over the spillway. |
| **E** | **1** | Lands within the Project boundary are limited to those required for Project operations and recreation facilities. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **F** | **3** | As indicated in Sections A and C above, flows are not desirable in the bypass reach, as they attract upstream-migrating fish away from the fish passages. When flows to the bypass reach do attract fish, Black Bear works with resource agencies to remove any fish (including endangered Atlantic salmon) that become stranded after flows to this area drop. Atlantic salmon captured at the Milford fish lift are either released to the river to spawn naturally, or they are taken to a hatchery by the USFWS for broodstock. Any salmon released to the river have the opportunity to subsequently (after spawning) migrate downstream through the bypass reach as kelts; Atlantic salmon smolts also migrate through the bypass reach during their downstream migration to the Atlantic Ocean. Black Bear has ESA authorization for operating the Milford Project through an approved Species Protection Plan and through a Biological Opinion with Incidental take Authorization issued by the National Marine Fisheries Service (NMFS). These documents also address two sturgeon species listed under the ESA (shortnose and Atlantic sturgeon) that are present in the lower Penobscot River, and an updated Sturgeon Handling Plan for the Milford and Orono Projects was submitted to FERC on January 9, 2017. Since sturgeon habitat did not historically exist upstream of the Milford Project, any sturgeon captured at the Milford fish lift (several shortnose sturgeon to date) are handled pursuant to the Sturgeon Handling Plan, and they are trucked downriver of Milford Dam for release. FERC's October 9, 2012 approval of fish passage plans for the Milford Project incorporated the Biological Opinion into the Milford FERC license. Pursuant to these authorizations, annual reports on Species Protection Plan activities are submitted to FERC and the resource agencies, along with an annual incidental take report (see FERC and Regulatory Information section); the incidental take report includes a summary of any upstream-migrating adult Atlantic salmon removed from the bypass reach. NMFS has requested re-initiation of consultation (expected to begin in 2019) under the ESA to address the issue of salmon becoming stranded in the bypass reach, as this issue was not addressed in their 2012 Biological Opinion. See FERC and Regulatory Information. |
| **G** | **2** | Pursuant to Article 415 of the Milford Project FERC license, a Cultural Resource Management Plan (CRMP) for the Project (along with two other Projects) was developed and submitted to FERC on May 27, 1999 (see FERC and Regulatory Information). All fieldwork and excavations covered by the CRMP (approved by FERC on November 29, 1999) have been completed. Remaining work under the CRMP includes reporting and analysis of artifacts for one site (the Beaver archaeological site), and Black Bear has proposed to provide a final report to FERC on these activities by April 20, 2019. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **H** | **2** | There are no recreation facilities located in the bypass reach below Milford Dam (Zone 3). However, as required by Article 421 of the Milford license, Black Bear consulted with PIN, BIA, the City of Old Town, Maine, and other affected landowners in 2015 and 2016 regarding whether a canoe portage trail should be constructed around Milford Dam on the west shore of the Penobscot River (extending from the impoundment to just below the bypass reach). As the result of these consultations, Black Bear indicated to FERC in January 2016 that this canoe portage is not needed and not advisable. FERC has not responded to this letter but stated in a report following their July 9, 2018 environmental inspection of the Project that no follow-up was needed regarding Article 421 (see FERC and Regulatory Information). |

**Facility Name:** _Gilman Falls Dam__ **Zone of Effect:** _4 – Regulated River Reach (Stillwater Branch)

| | 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 | | | |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **A** | **2** | Article 403 of the Milford Project FERC license requires Black Bear to release a minimum flow of 3,800 cfs or inflow, whichever is less, from the Milford Project with a minimum of 3,268 cfs from the Milford powerhouse to the main stem of the Penobscot River, and a minimum of 532 cfs from the Gilman Falls Dam to the Stillwater Branch of the Penobscot River. In addition, the 2004 Settlement Agreement requires allocations of 30 – 40 percent of river flows to the Stillwater Branch to accommodate fish passage and hydro generation depending on total river flows and the time of year. The Project is operated in accordance with the 2013 Operations and Flow Monitoring Plan (see FERC and Regulatory Information). |
| **B** | **2** | Subject to fish passage, settlement agreement, and recreation conditions, the Maine DEP issued an amended Water Quality Certification (WQC) in March 2005 certifying that the Milford Project, including the Stillwater Branch at the Gilman Falls Development, meets applicable water quality standards. Minimum flows are required to the Stillwater Branch pursuant to the Settlement Agreement, WQC and Project License. While the reach of the Penobscot River in the vicinity of the dam is identified as impaired for E. coli, the cause of impairment is identified as combined sewer overflow events unrelated to the Project (see FERC and Regulatory Information). The Stillwater Branch is not identified as impaired in the 2016 303b list. |
| **C** | **2** | Upstream migrating fish (primarily river herring and Atlantic salmon) on the Stillwater Branch are captured at the new fish lift and trapping facility at Orono Dam (installed in 2014) and then trucked upstream past the Gilman Falls Dam. |
| **D** | **1** | There are no known barriers to downstream fish passage in the reach immediately below Gilman Falls Dam; the Gilman Falls Development has no hydroelectric generating facilities, and studies to date have revealed no issues for fish migrating downstream past Gilman Falls Dam. American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **E** | **1** | As discussed above, a 532 cfs minimum from the Gilman Falls Dam to the Stillwater Branch of the Penobscot River is required by the Project license. In addition, the 2004 settlement agreement requires allocations of 30 – 40 percent of river flows to the Stillwater Branch to accommodate fish passage and hydro generation depending on total river flows and the time of year. These license requirements provide adequate watershed and shoreline protections for the Stillwater Branch reach, and no additional protection measures are necessary. |
| **F** | **3** | Endangered upstream-migrating adult Atlantic salmon captured at the Orono fish lift are not released to the Stillwater Branch of the Penobscot River, and thus they do not enter Zone 4. Instead, the salmon are trucked upstream to the Milford fish lift for sorting, from which they are either released to the river to spawn naturally, or they are taken to a hatchery by the USFWS for broodstock. Any salmon released to the river have the opportunity to subsequently (after spawning) migrate downstream through the Stillwater Branch as kelts; Atlantic salmon smolts also migrate through the Stillwater Branch during their downstream migration to the Atlantic Ocean. Black Bear has ESA authorization for operating the Milford (and Orono) Project through an approved Species Protection Plan and through a Biological Opinion with incidental take authorization issued by NMFS (see FERC and Regulatory Information). These documents also address two sturgeon species listed under the ESA (shortnose and Atlantic sturgeon) that are present in the lower Penobscot River, and an updated Sturgeon Handling Plan for the Milford and Orono Projects was submitted to FERC on January 9, 2017. Since sturgeon habitat did not historically exist upstream of the Orono Project, any sturgeon captured at the Orono fish lift (none to date) would be handled pursuant to the Sturgeon Handling Plan, and then trucked downriver for release; thus, like upstream-migrating Atlantic salmon, they would not enter Zone 4. |
| **G** | **2** | Pursuant to Article 415 of the Milford Project FERC license, a Cultural Resource Management Plan (CRMP) for the Project (along with two other Projects) was developed and submitted to FERC on May 27, 1999 (see FERC and Regulatory Information). All fieldwork and excavations covered by the CRMP (approved by FERC on November 29, 1999) have been completed. Remaining work under the CRMP includes reporting and analysis of artifacts for one site (the Beaver archaeological site), and Black Bear has proposed to provide a final report to FERC on these activities by April 20, 2019. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **H** | **2** | Article 412 of the Milford Project's 1998 FERC license required installation of recreation facilities at the Project, while Article 414 requires preparation of a Recreation Use and Facility Report every 6 years that includes: (1) annual recreational and Indian cultural use figures; (2) a discussion of the adequacy of the Project's recreation facilities to meet recreation demand; (3) a description of the methodology used to collect study data; and (4) if there is a need for additional facilities, the licensee's design of the recreational facilities and how such design takes into account the national standards established pursuant to the Americans with Disabilities Act of 1990. The recreation facilities (boat launches; portage trails) were installed shortly after license issuance, and the most recent Recreation Use and Facility Report was submitted to FERC on December 1, 2016. Following a supplemental filing of the consultation record, FERC approved the 2016 Recreation Use and Facility Report on November 15, 2017 (see FERC and Regulatory Information). The portage trail at the Gilman Falls Dam extends from the impoundment (Zone 2) to the dam's tailrace, which is located on the Stillwater Branch of the Penobscot River in Zone 4. |

**Facility Name:** _Milford Dam____ **Zone of Effect:** _5 – Regulated Downstream River Reach (Main Stem)

| | 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 | | | |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **A** | **2** | Article 403 of the Milford Project FERC license requires Black Bear to release a minimum flow of 3,800 cfs or inflow, whichever is less, from the Milford Project with a minimum 3,268 cfs from the Milford powerhouse to the main stem of the Penobscot River, and 532 cfs minimum from the Gilman Falls Dam to the Stillwater Branch of the Penobscot River. In addition, the 2004 settlement agreement requires allocations of 30 – 40 percent of river flows to the Stillwater Branch to accommodate fish passage and hydro generation, depending on total river flows and the time of year (see FERC and Regulatory Information). |
| **B** | **2** | Subject to fish passage, settlement agreement, and recreation conditions, the Maine DEP issued an amended Water Quality Certification (WQC) in March 2005 certifying that the Milford Project, including the main stem of the Penobscot River at the Milford Development, meets applicable water quality standards. Minimum flows are required to the mainstem pursuant to the Settlement Agreement, WQC and Project license. As required under Article 405 of the Milford Project license, Black Bear further conducted dissolved oxygen monitoring downstream of Milford Dam in 2018. This monitoring was performed consistent with the September 2005 *"Dissolved Oxygen Monitoring Plan – Article 405"*), which was approved by FERC on October 27, 2005, and the report was submitted to FERC on December 7, 2018 (see FERC and Regulatory Information). As discussed in the Plan, the 2018 monitoring was conducted during the months of July and August, and Black Bear coordinated with PIN for the sampling. The purpose of this sampling is to ensure that river flows below the Milford Project, as measured immediately downstream of the Project tailrace, maintain dissolved oxygen content of no less than required by the State of Maine's water quality standards. Sampling is to be performed once every 5 years for the duration of the Milford license term (i.e., until 2038). |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **C** | **2** | As detailed in fish passage plans and design drawings submitted to FERC on November 30, 2011 (see FERC and Regulatory Information), a new upstream fish lift and sorting facility was completed at the Milford Project in 2014 as required by the FERC license, Settlement Agreement and NMFS Biological Opinion, and as designed in consultation with and approval by the fish passage agencies. The scientific basis for these facilities was incorporated into the agency consultation background documentation during the design process.<br><br>In addition, the existing Denil upstream fishway at the Milford Project remains operational, and the upstream eel ladder was modified in 2015 to improve effectiveness. American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present in the main stem of the Penobscot River and are passed upstream at Milford Dam. A September 11, 2018 fish passage certification letter provided by the USFWS, and forwarded to LIHI that day, affirmed that the fish passage facilities at the Milford Project have been designed and installed as prescribed, at least a year of testing has been completed, and the facilities are ready for routine operations. Except for upstream eel monitoring (which has been completed), upstream fish passage effectiveness monitoring for other species (Atlantic salmon; alosines) is ongoing through agency consultation. The fish lift at Milford Dam passes more Atlantic salmon than any facility in the United States (nearly 800 in 2018), and it also passed over 2.2 million river herring and almost 4,000 American shad in 2018. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **D** | **2** | Downstream Atlantic salmon smolt monitoring studies have been conducted at the Milford Project since 2014, and the studies show that smolt survival at the Project meets the Endangered Species Act performance standard (96% survival within a 75% confidence interval; that is, 96% of downstream migrating smolts approaching the dam survive passing the dam within 24 hours, which would include from 200 meters upstream of the trashracks in the impoundment and continuing downstream to the point where latent effects of passage can be quantified). The 2017 monitoring report was filed with FERC in March 2018. Studies of downstream-migrating adult alosines and American eels have also been conducted and demonstrate current overall survival (i.e., including background/natural mortality) at the Project of 86% for American shad and river herring and 90% for American eels. Based on the initial 2017 shad results, modifications were made to the outer trashracks at Milford in 2018 to improve shad survival, and results from 2018 monitoring were submitted to FERC on February 12, 2019 (see FERC and Regulatory Information). American eel, Alewife, blueback herring, Atlantic salmon, striped bass, sea lamprey, and American shad are diadromous fish species known to be present in the main stem of the Penobscot River and are passed downstream at Milford Dam. A September 11, 2018 fish passage certification letter provided by the USFWS, and forwarded to LIHI that day, affirmed that the fish passage facilities at the Milford Project have been designed and installed as prescribed, at least a year of testing has been completed, and the facilities are ready for routine operations. |
| **E** | **2** | The Milford Project is licensed for run-of-river operations, with minimum flow requirements and mainstem and Stillwater Branch allocation requirements outlined in the FERC license, WQC, and Settlement Agreement. These license requirements provide adequate watershed and shoreline protections for the main stem reach, and no additional protection measures are necessary. This reach of the river is outside of the Milford Project boundary. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **F** | **3** | After passing through the main stem of the Penobscot River downstream of Milford Dam (Zone 5), endangered Atlantic salmon captured at the Milford fish lift are either released to the river to spawn naturally, or they are taken to a hatchery by the USFWS for broodstock. Any salmon released to the river have the opportunity to subsequently (after spawning) migrate downstream through Zone 5 as kelts; Atlantic salmon smolts also migrate through the main stem of the Penobscot River downstream of Milford Dam during their downstream migration to the Atlantic Ocean. Black Bear has ESA authorization for operating the Milford Project through an approved Species Protection Plan and through a Biological Opinion with Incidental take Authorization issued by the NMFS (see FERC and Regulatory Information). These documents also address two sturgeon species listed under the ESA (shortnose and Atlantic sturgeon) that are present in the lower Penobscot River, and an updated Sturgeon Handling Plan for the Milford and Orono Projects was submitted to FERC on January 9, 2017. Since sturgeon habitat did not historically exist upstream of the Milford Project, any sturgeon captured at the Milford fish lift (several shortnose sturgeon to date) are handled pursuant to the Sturgeon Handling Plan, and they are trucked downriver of Milford Dam for release. FERC's October 9, 2012 approval of fish passage plans for the Milford Project incorporated the Biological Opinion into the Milford FERC license (see FERC and Regulatory Information). Pursuant to these authorizations, annual reports on Species Protection Plan activities are submitted to FERC and the resource agencies, along with an annual incidental take report (see FERC and Regulatory Information). |
| **G** | **2** | Pursuant to Article 415 of the Milford Project FERC license, a Cultural Resource Management Plan (CRMP) for the Project (along with two other Projects) was developed and submitted to FERC on May 27, 1999 (see FERC and Regulatory Information). All fieldwork and excavations covered by the CRMP (approved by FERC on November 29, 1999) have been completed. Remaining work under the CRMP includes reporting and analysis of artifacts for one site (the Beaver archaeological site), and Black Bear has proposed to provide a final report to FERC on these activities by April 20, 2019. |

| Criterion | Standard | Supporting Information |
|---|---|---|
| **H** | **2** | Article 412 of the Milford Project's 1998 FERC license required installation of recreation facilities at the Project, while Article 414 requires preparation of a Recreation Use and Facility Report every 6 years that includes: (1) annual recreational and Indian cultural use figures; (2) a discussion of the adequacy of the Project's recreation facilities to meet recreation demand; (3) a description of the methodology used to collect study data; and (4) if there is a need for additional facilities, the licensee's design of the recreational facilities and how such design takes into account the national standards established pursuant to the Americans with Disabilities Act of 1990. The recreation facilities (boat launches; portage trails) were installed shortly after license issuance, and the most recent Recreation Use and Facility Report was submitted to FERC on December 1, 2016. Following a supplemental filing of the consultation record, FERC approved the 2016 Recreation Use and Facility Report on November 15, 2017 (see FERC and Regulatory Information). The portage trail at Milford Dam extends from the impoundment (Zone 2) to the dam's tailrace (main stem of the Penobscot River in Zone 5). Finally, as required by Article 421 of the Milford license, Black Bear consulted with PIN, BIA, the City of Old Town, Maine, and other affected landowners in 2015 and 2016 regarding whether a canoe portage trail should be constructed around Milford Dam on the west shore of the Penobscot River (extending from the impoundment to the main stem in Zone 5). As the result of these consultations, Black Bear indicated to FERC in January 2016 that this canoe portage is not needed and not advisable. FERC has not responded to this letter, but stated in a report following their July 9, 2018 environmental inspection of the Project that no follow-up was needed regarding Article 421 (see FERC and Regulatory Information). |

**I: BACKGROUND INFORMATION REVIEW**

| ***Information Type*** | ***Complete? (Y, N, NA)*** | ***Missing Information*** | ***Response*** |
|---|---|---|---|
| *Name of the Facility:* | Y | none | |
| *Location:* | N | Please provide the river mile of the Milford Dam. As the Gilman Falls Dam is part of the Milford Project, it's location on the Stillwater River (or Stillwater branch of the Penobscot River), nearest Town, latitude and longitude, river mile, etc. should also be listed in the application. | Table B-1 has been modified to provide the river mile of Milford Dam. The nearest Town, river mile and latitude and longitude of Gilman Falls Dam is provided in the revised Table B-1.<br>This information has also been added to the Zones of Effect map. |
| *Facility Owner:* | N | Please note on table B-1 that Black Bear Hydro Partners is a subsidiary of Brookfield Renewables. Table B1 lists Kelly Maloney and Kevin Bernier as application contacts, but contact data was only provided for Kelly Maloney. Should both be contacted for all questions? | Table B-1 has been revised to clarify a single contact. In addition, the Facility Owner Representative has been updated in Table B-1 due to a staffing change and this information has also been updated in the Facility Contacts Form. |
| *Regulatory Status:* | N | Please identify if any regulatory approvals were needed for the 2011 installation of the Inflatable flashboard system. This system does not appear to have been included in the previous application and certification review. | The 2012 FERC Order Amendment License to incorporate the inflatable flashboard system was previously listed and linked under the Project FERC and Regulatory Information. While Maine Waterway Development and Conservation Act and US Army Corps of Engineers permits are expected, these filings predate Brookfield's acquisition of the Milford Project and copies are not available. |
| *Characteristics of the Power Plant:* | Y | Table B-1 should identify the WQC and license amendments authorizing the new units rather than stating "none" to question on "Plans, authorization, and regulatory activities for any facility upgrades" | The 2005 FERC License amendment and WQC amendment for unit upgrade authorizations linked in the FERC Regulatory Information has been referenced in the revised Table B-1. |

| *Information Type* | *Complete? (Y, N, NA)* | *Missing Information* | *Response* |
|---|---|---|---|
| *Characteristics of the Dam or Diversion:* | N | The FERC license and original LIHI application state the height of the Milford Dam is "about 30 feet topped with 4.5-foot flashboards" but does not identify the height of the Gilman Falls dam. The application states the Milford Dam is 18.1 ft and Gilman Falls Dam is 4.0 ft. Please confirm (and correct as needed) the correct height of the dams without the flashboards and then identify the added height of the Inflatable flashboard system on the Milford dam. | The revised Exhibit A, filed with the Commission on November 15, 2018, description for the Milford Dam states "The dam is approximately 1,159 feet long, of concrete gravity design, and has an average height of approximately 20 feet exclusive of flashboards. The permanent concrete crest elevation of the dam is 97.2 feet.1 The dam is fitted with 4.5-foot high steel hinged flashboards on the western spillway and 4.0-foot high Obermeyer inflatable flashboards on the eastern spillway. Normal headpond elevation is 101.7 feet."<br><br>The revised Exhibit A, filed with the Commission on November 15, 2018, description for the Gilman Falls Dam states "…the main spillway, which has 4.4-foot-high flashboards and is 311-feet-long, including a center abutment 25-feet-wide, and has a permanent crest at elevation 97.3 feet."<br><br>Table B-1 has been revised to correct the height of the dams without flashboards and with flashboards. |
| *Characteristics of Conduit:* | Y | none | |
| *Characteristics of Reservoir and Watershed:* | N | Please confirm if the gross volume, area and pool height are with the flashboards extended to full height. Also, please provide this information for any impoundment behind the Gilman Falls dam. Please identify the dams located downstream of the Gilman Falls Dam on the Stillwater Branch. The number of acres within the Milford Project boundary (covered by the impoundment vs land) must be provided. | The Gilman Falls and Milford Dams create the same impoundment at a normal full pond of 101.7 feet NGVD. The gross volume and surface area provided in Table B-1 is correct.<br><br>The dams downstream of the Gilman Falls Dam on the Stillwater Branch are provided in the revised Table B-1.<br><br>The lands and waters in the Project boundary are included in the revised Table B-1. |
| *Hydrologic Setting:* | N | Data must be provided for and differentiated between the Milford and Gilman Fall Dam. | Table B-1 has been clarified to differentiate the average annual flow at both Milford and Gilman Falls Dams. |

| *Information Type* | *Complete? (Y, N, NA)* | *Missing Information* | *Response* |
|---|---|---|---|
| *Designated Zones of Effect:* | N | The boundaries of the ZOEs should be clarified on updated mapping, along with clear designation of what waterways are the Penobscot River (Main stem) and Stillwater Branch and the streamflow direction. The ZOE text description should also note the river mile of both the upstream and downstream boundaries of each ZOE. | A revised Zones of Effect map was distributed to LIHI on November 26, 2018 and has been included in this Stage II application package. |
| *Additional Contact Information:* | N | Please provide contact information for Kevin Bernier if he is to be contacted on questions. Please confirm that agency and NGO contacts are current as it appears that other individuals (for example) for the Penobscot Indian Nation (John Banks), USFWS (Antonio Bentivoglio) and Maine Department of Marine Resources (Gail Whipplehauser) are the individuals copied on filings but not on the provided Contact List. | Ms. Maloney is the primary contact and her information is on the Facility Contacts Form.<br><br>Gail Wippelhauser's contact information has been updated on the Facility Contacts Form. All other agency and NGO contacts listed are current. |
| *Photographs of the Facility* | N | Please provide an aerial photograph or diagram showing the location of the upstream and downstream fish and eel passage facilities to help identify their location relative to the ZOEs. Photographs of them would also be appreciated. Maps, aerials and photographs should be pdf format and capable of being copied into a report. | The location of the upstream eelway, upstream denil and upstream lift and the downstream fish passage facility on the Milford Dam is provided in this revised Stage II application.<br><br>Photographs of the fish passage facilities at Milford Dam have been included in this revised Stage II application. |
| *Map/aerial of facility and location of nearby dams* | N | No aerial or mapping of dams upstream and downstream of Milford Dam and Gilman Falls Dam were provided. Maps should be pdf format and capable of being copied into a report. | A map of the Penobscot River basin including the main stem and Stillwater Branch dams has been included in this revised Stage II application. |

***Questions for "New" Facilities Only:***

## ***GENERAL COMMENTS:*** NA

## II. CRITERIA INFORMATION REVIEW

***General Criteria Comments:*** This review used the five ZOEs as defined on the revised ZOE map. Please note the specific direction given regarding fish passage information needs. To facilitate application updating, such data can be provided as a separate section or appendix rather than incorporating it into the specific ZOE in the application tables.

### A. Ecological Flow Regime

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | A-1 | Y | none | |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | A-1 | N | Please confirm if the headpond limits have been satisfied during the past five years. This data is needed since compliance with these license requirements affects release of flows to downstream ZOEs. If deviations have occurred, please identify when the deviation occurred, for how long, actions taken to remedy the situation and whether or not FERC found it to be a violation. | As reported in the Annual Compliance Reports for the Project, there have been no notices of violation of the FERC License for the Milford Project. Only one deviation of normal operation (temporary drawdown) has occurred at the Project in the last 5 years to accommodate an emergency repair of the Milford Dam. A letter filed with FERC summarizing this deviation (which is allowable under the existing license) is provided in FERC and Regulatory Information. |
| #3 Bypass Reach of Penobscot River – below Milford Dam | A-2 | Y | None | |

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
|---|---|---|---|---|
| #4 Regulated Reach downstream of Gilman Falls Dam - Stillwater Branch | A-2 | N | Please confirm if the minimum flows, including the referenced "allocations of 30 – 40 percent of river flows to the Stillwater Branch for fish passage" have been satisfied during the past five years. If deviations have occurred, please identify when the deviation occurred, for how long, actions taken to remedy the situation and whether or not FERC found it to be a violation. Please note that the application states 3,268 cfs are to be released to the main stem of the Penobscot River but the 2013 Operations and Flow Monitoring Plan states 3,468 cfs. | No deviations of the referenced allocation of flows to the Stillwater Branch have occurred in the last 5 years.<br><br>The 2013 Operations and Flow Monitoring Plan has a typo, as the correct allocation at 3,800 cfs as measured at the Sunkhaze gage is 3,268 cfs to the mainstem. |
| #5 Regulated Reach downstream of Milford Dam - Penobscot River | A-2 | N | Same as above for ZOE #4. | No deviation of the minimum flow requirements at Milford Dam have occurred in the last 5 years. |

**B. Water Quality Protection**

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | B-1 | N | Water quality status of this reach should be identified. Please identify the page from the 2016 Integrated Water Quality Report listing this river section. | The regulated reach upstream of the Milford Project is discussed on page 102 and 139 of the 2016 Integrated Water Quality Report. This reach is identified as impaired by pollutants but reasonably expected to result in attainment for eutrophication, dissolved oxygen and dioxin. This reach is also identified as impaired by legacy pollutants (PCBs). |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | B-2 | N | Please identify the page from the 2016 Integrated Water Quality Report listing this river section. | The impoundment of the Milford and Gilman Falls Dams (including the Penobscot River and Stillwater Branch) is discussed on page 102, 103 and 139 |

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| | | | | of the 2016 Integrated Water Quality Report. |
| #3 Bypass Reach of Penobscot River – below Milford Dam | B-2 | N | Please identify the page from the 2016 Integrated Water Quality Report listing this river section. | This reach is not specifically identified in the 2016 Integrated Water Quality Report. |
| #4 Regulated Reach downstream of Gilman Falls Dam - Stillwater Branch | B-2 | N | Please identify the page from the 2016 Integrated Water Quality Report listing this river section. | The regulated reach downstream of Gilman Falls Dam – Stillwater Branch is listed in the 2016 Integrated Water Quality Report on page 71. |
| #5 Regulated Reach downstream of Milford Dam - Penobscot River | B-2 | N | Please identify the page from the 2016 Integrated Water Quality Report listing this river section. Please summarize the findings of the 2018 water quality sampling, including compliance with state standards, in the application body and provide a link to the final report expected to be completed in December 2018, along with comments provided by agency and NGO reviewers. | The regulated reach downstream of Milford Dam is listed in the 2016 Integrated Water Quality Report on page 72, 74, 103, and 139.<br><br>The 2018 Dissolved Oxygen Monitoring Report is linked in FERC and Regulatory Information. This Report does not require agency review. |

## C. Upstream Fish Passage

While LIHI has received numerous reports that include the Milford project in annual compliance statements, a list of the studies/reports/activities that were required/completed during the past five years associated with upstream fish passage for eel and anadromous species should be provided, along with a summary of the effectiveness testing requirements. Please denote whether monitoring was qualitative or quantitative and ensure all listed reports are linked. When specific data is discussed in the application, a link to or identification of the specific report for this data, rather than reference to the entire group of regulatory filings, should be included. Such organization will significantly facilitate review for these criteria since there are so many documents involved. Finally, key agency approvals received during this period, such as the USFWS certification of the fishways, approval of effectiveness testing results, etc. should be identified and linked, even if previously provided to LIHI for annual compliance purposes This is needed as stakeholders reviewing the application do not have access to these LIHI files.

| **Zone of Effect** | ***Standard selected*** | ***Complete? (Y or N)*** | **Information needed to complete the review** | **Response** |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | C-1 | Y | None | |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | C-1 | Y | None | |

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| #3 Bypass Reach of Penobscot River – below Milford Dam | C-2 | N | Please confirm whether the upstream eel passage is in this ZOE or ZOE #5. If it is located here, then information relative to its testing/monitoring must be discussed here.<br><br>Please summarize any events in the past five years when fish were stranded in the bypass and actions taken to minimize negative impacts. Any changes made to minimize such events should also be identified along with agency agreement with these changes. | As shown in the diagram above, the eel ladder is located on the dam spillway in ZOE #3. Eel passage study reports for the last 5 years are linked and identified in the FERC and Regulatory Information.<br><br>Periodic stranding of Atlantic salmon in the ledge pools were first observed in 2017. Concrete filling of the ledge pools in the middle of the bypass reach was undertaken during the emergency dam repair efforts in that same year. Periodic strandings have been observed in the far ledges in 2018 and communicated to the state and federal fisheries agencies. One relocation effort, on June 11 and 12, 2018, was undertaken in cooperation with the state and federal agencies.<br><br>BBHP will be reinitiating consultation with the National Marine Fisheries Service to address Atlantic salmon stranding at the Milford Project and determine corrective action. |
| #4 Regulated Reach downstream of Gilman Falls Dam - Stillwater Branch | C-2 | Y | None | |

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
|---|---|---|---|---|
| #5 Regulated Reach downstream of Milford Dam - Penobscot River | C-2 | N | Please provide the information described at the beginning of this Table for upstream passage activities. Also, please note whether the resource agencies found upstream effectiveness testing results to be satisfactory in terms of meeting the numerical performance standards for Atlantic salmon. The application should also identify why anadromous species upstream testing has not been done since 2015, as noted in the LIHI compliance letters, as stakeholders who may be reviewing the application do not have access to these compliance letters. Also, please discuss the October 2017 fish kill event associated with the fish lift, actions recommended by the fisheries agencies and improvements made to eliminate/minimize similar events in the future. | Quantitative upstream Atlantic salmon testing was conducted in 2015 and 2016, and qualitative night-time video monitoring of the fish lift was conducted in 2016 and 2017. Upstream Atlantic salmon testing demonstrated that greater than 95% of Atlantic salmon that approached the dam successfully passed upriver; however, the majority of the salmon took longer than the passage standard of 48 hours. Video monitoring and night-time operation of the lift in 2016 and 2017 revealed that salmon approaching the lift during night-time hours are not motivated to move into the hopper. BBHP has made improvements to the lift (primarily reduction of air entrainment) to improve performance; and will be reinitiating consultation regarding upstream performance standards.<br><br>Upstream adult river herring studies were attempted at the Project in 2015. Approximately 90% of radio tagged adults fell back downstream after release, and the study did not provide useful passage information. This study will be re-attempted in |

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| | | | | 2019 using an improved methodology.<br><br>To date, 5+ years of upstream adult shad passage studies have been conducted by the University of Maine downstream of Milford with nearly zero tagged fish approaching Milford dam. Studies are being conducted by the University in 2019, which will inform future study efforts at the Project.<br><br>Monitoring of upstream eel passage occurred at the Project from 2008 – 2018. In August 2018, the USFWS and MDMR indicated that monitoring (primarily trapping of eels migrating through the fishway to provide counts) could be terminated, stating, "The studies have demonstrated the efficacy of the fishway. There is no need to continue trapping at the center ledge eel fishway. In the future, it should be operated with a volitional exit and no trapping tub. This will allow eels to continue night migration and seek refuge in daytime, reducing any potential predation on daytime releases".<br><br>BBHP assumes that LIHI is referring to the May 2017 fish mortality event at the fish lift. On |

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| | | | | the morning of May 27, 2017, a MDMR staff member initiated the transfer of river herring that had collected in the fish lift hopper overnight (sorting gates and screens were left overnight with the intention of allowing fish access to the hopper) to an MDMR tank truck for transport to stocking locations upriver. A large number (8,000 to 10,000) of mortalities were observed in the pit under the hopper. Black Bear's investigation concluded that the lift was not lowered fully to the bottom of the hopper pit in the flume during the May 26 – 27 overnight period. This left gaps beneath and around the hopper, which allowed thousands of river herring and a few sea lamprey to crowd into the space with no exit upstream. The condition of the hopper structure and lift functions were inspected while the flume was dewatered, and it was discovered that stainless steel bolts on two punch plate panels had broken off, possibly limiting the travel elevation of the hopper to the bottom of the flume. Additionally, the hoist cable was not traveling correctly through the pulley block, thus causing the block to lose its level position. As a result of its independent investigation of this incident, Black Bear has (1) |

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| | | | | focused on improved collaboration with MDMR for operation of the fish lift sorting facility, (2) installed a visual means to ensure that the fish lift hopper is in its lowest position and seated properly prior to allowing fish to enter, and (3) worked with MDMR to develop specific Standard Operating Procedures for the Milford fish lift sorting facility. |

**D. Downstream Fish Passage and Protection**

Please provide the same information for downstream passage related activities as noted above for upstream passage. Critical to assessment of this criterion is identification of the exit of the downstream passage facilities for both eel and anadromous species, which is currently unclear. This is needed to ensure the discussions are included in the applicable ZOE. For most projects, only the impoundment has a barrier to downstream passage, i.e. the dam. If fish passed downstream into a ZOE have no barriers to their continued passage downstream once in this ZOE, perhaps such as ZOE #5, the main stem of the Penobscot River, then this ZOE should have standard D-1 and no study discussion is required.

| **Zone of Effect** | ***Standard selected*** | ***Complete? (Y or N)*** | **Information needed to complete the review** | **Response** |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | D-1 | Y | None | No issue |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | D-2 | N | Please provide the information described at the beginning of this Table for downstream passage activities. Also, please note whether the resource agencies found downstream effectiveness testing results to be satisfactory in terms of meeting the numerical performance standards for Atlantic salmon. Also, please discuss the November 2014 eel kill event along with the actions recommended by the fisheries agencies in December 2014, and improvements made to eliminate/minimize similar events in the future. | The results of downstream Atlantic salmon smolt studies conducted between 2014 and 2018 are provided in FERC and Regulatory Information. The 2012 Biological Opinion requires 3 consecutive years of meeting the performance standard, which has been achieved for the Milford Project only. BBHP will be reinitiating consultation regarding upstream performance standards in 2019.<br><br>Downstream juvenile river herring studies were conducted in 2015 with high mortality as a result of handling and tagging. This study is being re-attempted on the Penobscot River at a different project, which will inform the future studies at the Milford |

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| | | | | Project.<br><br>BBHP conducted downstream passage radio telemetry studies of post-spawn adult American shad at Milford in 2017 and 2018. Overall Project survival in 2017 was approximately 77%. The Milford powerhouse has an outer trash rack (4 inch clear spacing) and inner trash rack (1 inch clear spacing) system. Two surface bypasses (surface weirs) are located at the face of the inner trashracks affording downstream passage for fish. In 2017 many shad were observed milling upstream of the outer trash rack, even though they could easily have passed through the 4-inch clear spaced bars. Less than 20% of the shad that approached Milford passed through the outer rack and used the downstream passages located at the inner trash rack that year. The majority of the fish eventually passed downstream through the 25-foot-wide sluice gate located between the powerhouse and spillway dam that is operated infrequently most summers. In 2018, the outer trash rack was modified with two 6-foot-wide by 8-foot-deep "windows" in an attempt to improve shad passage through the outer rack and increase use of the downstream passages. |

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| | | | | Overall Project survival in 2018 was 86%. The windows were successful, as approximately 80% of the radio tagged fish approaching Milford passed through the new windows in the outer rack and used the downstream passages.<br><br>Downstream passage of post spawn adult river herring was studied at Milford in 2018. Overall Project survival was 86%, and 91% of the river herring that passed downstream used the downstream passages.<br><br>Based on the 2018 results for downstream passage of adult shad and river herring, we are not proposing any additional studies of downstream passage for those species at Milford.<br><br>On October 20, 2014, a number of downstream migrating adult eels (50+ silver phase adults) were trapped and died after entering the auxiliary water system (AWS) to the new upstream fish lift facility. The eels were found dead behind the diffusion/blocking screen upstream of the primary fish lift hopper. The eels entered the AWS system through several openings that developed around the edge of the punch plate screen that covers the AWS |

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| | | | | intake. The holes (up to 4 inches in diameter) were the result of eroding concrete and a panel that had become disconnected. In the week after the October 20 event, Brookfield hired divers to cover the holes and reconnect the panel so that eels could no longer enter the AWS system. BBHP communicated issue with the FERC and filed an update on November 19, 2014 (see in FERC and Regulatory Information). Since the fall 2014 eel mortality event, the punch plate screen has been inspected regularly by divers; to date no additional issues have been discovered with the screen, and there have been no eel mortalities related to the AWS system observed since 2014. Since 2015 BBHP has employed 4-5 seasonal fish passage technicians that inspect the Milford fish passages daily. |
| #3 Bypass Reach of Penobscot River – below Milford Dam | D-2 | N | Discussion of downstream fish and/or eel passage activities is only needed if individuals passing the downstream facility enter the bypass reach and there are barriers to continued passage downstream in the bypass reach. | There are no barriers to downstream passage in the bypass reach. |
| #4 Regulated Reach downstream of Gilman Falls Dam - Stillwater Branch | D-1 | Y | None | |

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| #5 Regulated Reach downstream of Milford Dam - Penobscot River | D-2 | N | Discussion of downstream fish or eel passage activities is only needed if individuals passing the downstream facility enter this ZOE and there are barriers to continued passage downstream in this ZOE. | There are no barriers to downstream passage in the regulated reach downstream of the Milford Dam. |

**E. Watershed and Shoreline Protection**

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | E-1 | N | Application should discuss if any changes in the regulatory need for shoreline protection have occurred since last certified by LIHI. Also, as noted in the LIHI Handbook (pg 63), please confirm that there are no lands with significant ecological value in this ZOE (e.g. describe the land use and land cover within the project boundary) for ZOEs using Standard E-1. | There have been no changes in the regulatory need for shoreline protection at the Project. The Project is operated in run-of-river mode with very little lands within the Project boundary and none of significant ecological value. |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | E-2 | N | Annual meetings with the PIN are required along with report issuance every three years describing the bank stabilization activities implemented. Please provide confirmation of the annual PIN consultations, identify assurances put in place to not miss future filings, and provide a link to the report committed to be provided to FERC by December 6, 2018, in response to the 2018 FERC Inspection Report. Also, please confirm which PIN contact is most familiar with these activities. | Since acquiring the assets in 2015, Brookfield has conducted the annual compliance and bank stabilization activities required under Article 417. Bank stabilization activities undertaken since acquisition (2016, 2017 and 2018) are summarized in the report linked under FERC and Regulatory Information.<br><br>BBHP uses a compliance tracking software program to ensure regulatory filings and deadlines are completed.<br><br>Jason Mitchell is the PIN contact most familiar with these activities and is listed on the Facility Contacts Form. |
| #3 Bypass Reach of Penobscot River – below Milford Dam | E-1 | Y | None | |

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
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| #4 Regulated Reach downstream of Gilman Falls Dam - Stillwater Branch | E-2 | N | Flow requirements are not typically applicable to this criterion. If you believe they uniquely apply to project, please provide additional explanation how they address the Shoreline Protection Standards descriptions on pg. 10 of the LIHI Handbook. Data requests under ZOE #1 also apply here as Standard E-1 may be more applicable, unless other shoreline protection requirements exist that are not currently described in the application. | |
| #5 Regulated Reach downstream of Milford Dam - Penobscot River | E-2 | N | Comment above for ZOE #4 also applies here. | |

**F. Threatened and Endangered Species Protection**

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | F-1 | Y | None | |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | F-3 | N | The application states that Incidental Take Reports and Species Protection Plan Reports must be filed annually, but only the 2017 reports were linked. Please provide links for the reports filed for 2013, 2014, 2015 and 2016. If the 2018 reports are available, those should also be linked. If any report identified the need for any significant changes to fish passage facilities, project operations or other measures to minimize harm to the protected species, please summarize those concerns and actions taken to remedy the problem.<br><br>Discussion of performance standards established for passage of salmon are discussed under the two fish passage criteria. | The 2013 – 2016 reports are linked under FERC and Regulatory Information.<br><br>Changes to the fish lift to reduce air entrainment were implemented in 2016. A plan to replace the broodstock collection trap at the top of the denil will be undertaken in 2019.<br><br>See linked FERC and Regulatory Information |
| #3 Bypass Reach of Penobscot River – below Milford Dam | F-3 | N | Submission of the information identified for ZOE #2 would also address this data gap as the noted reports also address sturgeon which are only found downstream of Milford Dam. | See linked FERC and Regulatory Information |
| #4 Regulated Reach<br><br>downstream of Gilman Falls Dam - Stillwater Branch | F-3 | N | Submission of the information identified for ZOE<br><br>#2 would also address this data gap. | See linked FERC and Regulatory Information |
| #5 Regulated Reach downstream of Milford Dam - Penobscot River | F-3 | | Submission of the information identified for ZOE #2 would also address this data gap as the noted reports also address sturgeon which are only found downstream of Milford Dam. | See linked FERC and Regulatory Information |

**G. Cultural and Historic Resource Protection**

The application states that only one archaeological site still requires monitoring under License Article 415, but the same site was identified under ZOEs #2 through #5. Thus, the same comment was listed below for these four ZOEs. If this is inaccurate, the final application should identify which ZOE(s) includes this "active" archaeological site. If sites have been completed in other ZOEs in the past five years, please identify which site in the ZOE, and the year the work was completed.

| **Zone of Effect** | ***Standard selected*** | ***Complete? (Y or N)*** | **Information needed to complete the review** | **Response** |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | G-1 | Y | None | |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | G-2 | N | Annual monitoring of identified cultural sites and reporting of such investigations is required by License Article 415. The FERC Environmental Inspection Report stated that the last report was filed in 2014 for 2013 activities. That report states that several sites were still being addressed in 2013. Please provide confirmation that the 2014-2018 monitoring was conducted, what year the other sites studied in 2013 were completed and identify assurances put in place to not miss future filings. It is assumed that the final application will be submitted to LIHI prior to the April 2019 commitment date made in response to the 2018 FERC inspection report for the multi-year cultural resource report. | All fieldwork and excavations covered by the May 27, 1999 Cultural Resource Management Plan (CRMP) for the Milford Project (approved by the Commission on November 29, 1999) have been completed. Remaining work under the CRMP includes reporting and analysis of artifacts for one site (the Beaver archaeological site) which is due to FERC April 20, 2019. |
| #3 Bypass Reach of Penobscot River – below Milford Dam | G-2 | N | Same as above | Same as above |
| #4 Regulated Reach downstream of Gilman Falls Dam - Stillwater Branch | G-2 | N | Same as above | Same as above |

| **Zone of Effect** | ***Standard selected*** | ***Complete? (Y or N)*** | **Information needed to complete the review** | **Initial issue identification and standards recommendations** |
|---|---|---|---|---|
| #5 Regulated Reach downstream of Milford Dam - Penobscot River | G-2 | N | Same as above | Same as above |

**H. Recreational Resources**

| Zone of Effect | *Standard selected* | *Complete? (Y or N)* | Information needed to complete the review | Response |
|---|---|---|---|---|
| #1 Regulated Reach upstream of Milford Dam - Penobscot River | H-1 | Y | None | |
| #2 Milford Dam Impoundment - Penobscot River and Stillwater Branch | H-2 | N | 1) Please confirm whether or not the canoe portage on the west side of the Milford dam has been constructed. If it has not, please note if there is a target date for its development. The Jan 13, 2016 letter to FERC says BBHP is working with City of Old Town and PIN on the construction of the canoe path on Old Town property.<br><br>2) The FERC license (Article 413) and WQC also require development of a plan for removal of semi-buoyant logs found in the impoundment that may cause navigational safety concerns. The Plan involves identification of problematic logs by the PIN for removal by BBHP. Please provide an update as to these activities between 2013-2018. Also, please confirm the PIN contact most familiar with these activities | 1) As indicated in the January 13, 2016 filing with FERC to satisfy Article 421, BBHP was required to consult with PIN, BIA, and the city of Old Town regarding the need for a canoe portage. As a result of the consultation, PIN and the city were interested in creating a canoe portage on their own property and outside the Milford Project boundary. BBHP agreed to support that effort. However, to date and to our knowledge, PIN and the city have not progressed their canoe portage plans.<br><br>2) See the April 18, 2005 License amendments section E stating the following "The licensee will work with the PIN Department of Natural Resources on an annual basis through the term of the existing Milford license to relocate semi-buoyant logs that PIN has determined to be navigational hazards within the Milford impoundment. The PIN Department of Natural Resources will contact the licensee on or before June 30 of each year to confirm its interest in either meeting to discuss and plan for |

| | | | | |
|---|---|---|---|---|
| | | | | removal of logs, or to confirm that no such navigational hazards are present and that log removals are not necessary for that calendar year."<br>PIN has not contacted BBHP per the modified plan. |
| #3 Bypass Reach of Penobscot River – below Milford Dam | H-2 | N | Same as that described for item #1 under ZOE #2. | See response above. |
| #4 Regulated Reach downstream of Gilman Falls Dam - Stillwater Branch | H-2 | N | Same as that described for item #1 under ZOE #2. | See response above. |
| #5 Regulated Reach downstream of Milford Dam - Penobscot River | H-2 | N | Same as that described for item #1 under ZOE #2. | See response above. |

**Evaluation of PLUS Standard Selection**

| Criterion and Zone | *Complete? (Y or N)* | Information needed to complete the review | Initial issue identification and standards recommendations |
|---|---|---|---|
| None | | | |
| | | | |
| | | | |

## B.3 Sworn Statement and Waiver Form

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

**SWORN STATEMENT**

*As an Authorized Representative of Black Bear Hydro Partners, LLC, the Undersigned attests that the material presented in the application is true and complete.*

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

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

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

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

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

Company Name: Black Bear Hydro Partners, LLC

Authorized Representative:

Name: Thomas Uncher

Title: VP, Operations

Authorized Signature: _____

Date: 3/13/19

## B.4 Contacts Forms

All applications for LIHI Certification must include complete contact information.

### A. Applicant-related contacts

| **Facility Owner: Black Bear Hydro Partners, LLC** | |
|---|---|
| Name and Title | Steve Michaud; Director, Operations |
| Company | Brookfield Renewable |
| Phone | (207) 480-0883 |
| Email Address | Stephen.Michaud@brookfieldrenewable.com |
| Mailing Address | 150 Main Street, Lewiston, Maine 04240 |
| **Facility Operator (if different from Owner):** | |
| Name and Title | |
| Company | |
| Phone | |
| Email Address | |
| Mailing Address | |
| **Consulting Firm / Agent for LIHI Program (if different from above):** | |
| Name and Title | |
| Company | |
| Phone | |
| Email Address | |
| Mailing Address | |
| **Compliance Contact (responsible for LIHI Program requirements):** | |
| Name and Title | Kelly Maloney; Manager, Compliance - Northeast |
| Company | Brookfield Renewable |
| Phone | (207) 755-5606 |
| Email Address | Kelly.Maloney@brookfieldrenewable.com |
| Mailing Address | 150 Main Street, Lewiston, Maine 04240 |
| **Party responsible for accounts payable:** | |
| Name and Title | Lisa Di Padre; Controller |
| Company | Brookfield Renewable |
| Phone | (819) 561-2722 |
| Email Address | Lisa.DiPadre@brookfieldrenewable.com |
| Mailing Address | 41 Victoria, Gatineau, Quebec J8X2A1 |

**B. Current and relevant state, federal, and tribal resource agency contacts with knowledge of the facility (copy and repeat the following table as needed).**

| | |
|---|---|
| **Agency Contact** (Check areas of responsibility: Flows_x_, Water Quality _x_, Fish/Wildlife Resources _x_, Watersheds _x_, T/E Spp. _x_, Cultural/Historic Resources __, Recreation _x_): | |
| Agency Name | United States Fish and Wildlife Service |
| Name and Title | Steven Shepard; C.F.P. |
| Phone | (207) 902-1572 |
| Email address | Steven.Shepard@fws.gov |
| Mailing Address | P.O. Box A, 306 Hatchery Road, East Orland, Maine 04431 |
| **Agency Contact** (Check areas of responsibility: Flows_x_, Water Quality __, Fish/Wildlife Resources _x_, Watersheds __, T/E Spp. _x_, Cultural/Historic Resources __, Recreation __): | |
| Agency Name | National Marine Fisheries Service |
| Name and Title | Jeff Murphy; Penobscot SHRU |
| Phone | (207) 866-7379 |
| Email address | Jeff.Murphy@noaa.gov |
| Mailing Address | Maine Field Station, 17 Godfrey Drive, Orono, Maine 04473 |
| **Agency Contact** (Check areas of responsibility: Flows_x_, Water Quality _x_, Fish/Wildlife Resources _x_, Watersheds _x_, T/E Spp. _x_, Cultural/Historic Resources __, Recreation _x_): | |
| Agency Name | Maine Department of Environmental Protection |
| Name and Title | Kathy Howatt; Hydropower Coordinator |
| Phone | (207) 446-2642 |
| Email address | Kathy.Howatt@maine.gov |
| Mailing Address | Central Maine Regional Office, 17 State House Station, Augusta, Maine 04333 |
| **Agency Contact** (Check areas of responsibility: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources _x_, Recreation __): | |
| Agency Name | Maine Historic Preservation Commission |
| Name and Title | Kirk Mohney; Director |
| Phone | (207) 287-3811 |
| Email address | Kirk.Mohney@maine.gov |
| Mailing Address | 55 Capitol Street, 65 State House Station, Augusta, Maine 04333 |
| **Agency Contact** (Check areas of responsibility: Flows_x_, Water Quality __, Fish/Wildlife Resources _x_, Watersheds __, T/E Spp. _x_, Cultural/Historic Resources __, Recreation __): | |
| Agency Name | Maine Department of Marine Resources |
| Name and Title | Gail Wippelhauser, |
| Phone | (207) 624-6349 |
| Email address | Gail.Wippelhauser@maine.gov |
| Mailing Address | 21 State House Station, Augusta, Maine 04333 |

| **Agency Contact** (Check areas of responsibility: Flows_x_, Water Quality __, Fish/Wildlife Resources _x_, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __): | |
|---|---|
| Agency Name | Maine Department of Inland Fisheries and Wildlife |
| Name and Title | Kevin Dunham; Fisheries Biologist |
| Phone | (207) 732-4131, x4004 |
| Email address | Kevin.Dunham@maine.gov |
| Mailing Address | Penobscot Region, 16 Cobb Road, Enfield, Maine 04493 |

**C. Current stakeholder contacts that are actively engaged with the facility (copy and repeat the following table as needed).**

| **Stakeholder Contact** (Check areas of interest: Flows_x_, Water Quality _x_, Fish/Wildlife Resources __, Watersheds __, T/E Spp. __, Cultural/Historic Resources __, Recreation __): | |
|---|---|
| Stakeholder Organization | Penobscot Indian Nation |
| Name and Title | Dan Kusnierz; Water Resources Program Manager |
| Phone | (207) 817-7361 |
| Email address | Dan.Kusnierz@penobscotnation.org |
| Mailing Address | 12 Wabanaki Way, Indian Island, Maine 04468 |
| **Stakeholder Contact** (Check areas of interest: Flows__, Water Quality __, Fish/Wildlife Resources __, Watersheds _x_, T/E Spp. _x_, Cultural/Historic Resources __, Recreation __): | |
| Stakeholder Organization | Penobscot Indian Nation |
| Name and Title | Daniel McCaw; Fisheries Program Manager |
| Phone | (207) 817-7377 |
| Email address | Dan.McCaw@penobscotnation.org |
| Mailing Address | 12 Wabanaki Way, Indian Island, Maine 04468-1254 |
| **Stakeholder Contact** (Check areas of interest: Flows_x_, Water Quality _x_, Fish/Wildlife Resources __, Watersheds _x_, T/E Spp. __, Cultural/Historic Resources __, Recreation __): | |
| Stakeholder Organization | Penobscot Indian Nation |
| Name and Title | Jason Mitchell; Water Resources Field/NPS Coordinator |
| Phone | (207) 817-7381 |
| Email address | Jason.Mitchell@penobscotnation.org |
| Mailing Address | 12 Wabanaki Way, Indian Island, Maine 04468 |