ASHTON DAM HYDROELECTRIC PROJECT
(FERC #P-14634)

Towns of Lincoln and Cumberland
Blackstone River, Providence County, Rhode Island

PRELIMINARY APPLICATION DOCUMENT FOR A MINOR WATER POWER PROJECT

Submitted To:

The Federal Energy Regulatory Commission
888 First Street, NE
Washington, D.C. 20426

Submitted By:

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January 2023

New England Hydropower Company, LLC

Preliminary Application Document
Table of Contents

List of Tables

List of Figures

List of Appendices:

PRELIMINARY APPLICATION DOCUMENT
PREPARED IN ACCORDANCE WITH 18 C.F.R. § 5.6(d)

1. Introduction

New England Hydropower Company, LLC (NEHC or the Applicant) submits to the Federal Energy Regulatory Commission (FERC or Commission) its Notice of Intent (NOI) to file an application for an original license, its Request to Use the Traditional License Process (TLP) and the Pre-Application Document (PAD) for the unconstructed, < 10 MW Ashton Dam Hydroelectric Project (P-14634) (Project). The Project is proposed be located in Providence County, Rhode Island, in the Town of Cumberland, adjacent to the Ashton Dam on the Lower. Blackstone River; see Figure 1. The Project Boundary is set forth in Figure 2. The Project will be a run-of-river, low-impact hydropower generating facility at an existing nonpowered dam, located within the Blackstone River Valley National Historic Corridor, used primarily for passive public recreation. The Project is estimated to provide 793kW and generate approximately 3,100 MWhrs annually.

This PAD has been prepared in accordance with18 C.F.R. § 5.6 and is submitted with the Applicant's NOI to seek an original license for the Project. The Applicant has distributed this NOI, TLP request, and PAD to federal and state natural resource agencies, local governments, Native American tribes, and members of the public, as listed in Appendix B: Distribution List. This PAD includes existing, relevant, available information about the Project, including prior history of consultations, as well as the results of studies performed by the Applicant, including media sampling, geotechnical analysis, physical stability analysis, and HEC RAS analysis.

1.1. Authorized Agents

The following persons are authorized to act as agent(s) for the Applicant:

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1.2. Licensing and Consultation History

The Applicant, since 2017, has been studying and assessing the feasibility of the Project. The Applicant requests authorization from the Commission to use the TLP for balance of the application development process; see Appendix C: Consultations.

The purpose of the PAD is to provide substantive information relating to Project engineering, design, operation, economics, and environmental effects. Through additional consultations, the Applicant intends to collaborate with the natural resource agencies and stakeholders to identify remaining outstanding issues and study needs. The Applicant will

use the TLP to develop protection, mitigation, and enhancement actions to be included in the final license application.

The PAD, which is presented in the format of a draft license application, reflects the research and studies engaged in by the Applicant concerning existing conditions at and near the Project Site. In the course of developing this information, the Applicant has consulted with the U.S. Fish and Wildlife Service (USFWS), the National Park Service (NPS), the Rhode Island Department of Environmental Management (RIDEM), the Rhode Island Office of Energy Resources (RIOER), the Rhode Island Department of Transportation (RIDOT), the Rhode Island Historical Preservation and Heritage Commission (SHPO), the Town of Cumberland, and the Blackstone River Watershed Association. The Applicant will continue to consult with these agencies and stakeholders to identify and develop and additional information or study needs.

1.3. PAD Content (18 C.F.R. §§ 5.6)

This PAD provides the content requirements prescribed by 18 C.F.R. §§ 5.6 and complies with the format and content requirements of a draft license application as prescribed by 18 C.F.R. §§ 4.32, 4.38, and 4.61.

The following Appendices are included in this PAD:

Appendix A:	Table of Project Structures, Components, Operations, Impacts, One Line Diagram
Appendix B:	Distribution List
Appendix C:	Consultations
Appendix D:	Exhibit F, Supporting Design Report (CEII)
Appendix E:	Water Quality Sampling, Annual Flow Duration Curves
Appendix F:	Wetlands
Appendix G:	Geotechnical Data Report
Appendix H:	Historical Assessment (Privileged)

2. Project Plans, Schedule, and License Protocol (18 C.F.R. §§ 5.3(b) and (c))

The Applicant is requesting the Commission's approval to use the Traditional Licensing Process (TLP) for the Project. The Applicant is submitting this request concurrently with the submission of the NOI and the PAD.

2.1. Process Plan and Schedule

The Process Plan and Schedule describes anticipated timeframes, deadlines, and responsibilities within the TLP. As prescribed by 18 C.F.R. § 5.6(d)(1), the Applicant is required to comply with the plan and schedule for pre-application activities, as set forth below in Table 2.1-1.

The Applicant is requesting that the Commission waive the Joint Agency Public Meeting and comments on the PAD given the extensive, previous reviews of the draft application in 2018 and 2022. The Applicant commits to using its best efforts to respond to any remaining issues or questions raised by this filing.

Table 2.1-1 Process Plan and Schedule

18 C.F.R.§§	Milestone	Estimated Date
5.5	File NOI	January 16,2023
5.6	File PAD	January 16,2023
5.7	Tribal Consultation	Waiver Requested
5.8	TLP Decision	TBD
4.38	Meeting Notice & Agenda	Waiver Requested
4.38	Joint Agency Public Meeting & Site Visit	Waiver Requested
4.38	PAD Comments & Studies	Waiver Requested
4.38(c)	Perform Studies	2018-2022
4.38(c)	Draft License Application	October 1, 2018 & December 21, 2020
4.38(c)	Comments on Draft Application	June 2018 - December 2022
4.38(d)	File License Application	TBD
4.32(b)	Commission Tendering Notice	TBD
4.32(b)	Request for Studies (60 days after Notice)	TBD
4.32(d)	Commission Notice of Acceptance	TBD
4.34(b)	Commission Ready for Env. Analysis (REA)	TBD
4.34(b)	Preliminary Terms and Conditions	60 days after REA
4.34(b)	Reply Comments	105 days after REA
380	EA	TBD

The Applicant has filed the results of the studies performed with this PAD.

2.2. Communications and Documents

The Applicant, through the use of a dedicated website: www.nehydropower.com/projects/ashton-hydro-llc, will provide all relevant Project information and documents, including but not limited to studies, inspections, comments, transcripts, draft applications, meeting materials, summaries, calendars, Commission determinations, and final license application.

The Applicant will use email notifications to participants to announce key dates and new information to provide for public review and comment.

The Applicant anticipates only limited meetings will be necessary over the course of the TLP, given the extensive consultations and studies performed by the Applicant between 2017 and 2022 and the review and scrutiny received through these consultations.[1] To the extent possible, the Applicant will use online-based calls and meetings and will post any relevant information and schedule(s) on the Project website.

[1] The Applicant has consulted with, including but not limited to, the U.S. Fish and Wildlife Service (USFWS), the National Park Service (NPS), the U.S. Army Corps of Engineers (USACE), the Rhode Island Department of Environmental Management (RIDEM), the Rhode Island Office of Energy Resources, the Rhode Island Department of Transportation (RIDOT), the Rhode Island Historical Preservation Commission, the Town of Cumberland, the Blackstone River Valley National Historic Corridor, and the Blackstone River Watershed Association.

The Applicant requests that correspondence or other materials relevant to the licensing process sought by the participants be directed to:

Carol Wasserman
New England Hydropower Company, LLC
100 Cummings Center Drive, STE 451C
Beverly, MA 01915
carol@nehydropower.com

The Applicant will distribute licensing documents through posting on the Applicant's website, emailing the Distribution List, and posting on the Commission's E-Library. Hardcopies will be made available to any participant, by request, who cannot access the website and in the Applicant's office.

2.3. Licensing Studies

The Applicant has conducted a series of studies characterizing river flows, geotechnical conditions, media contamination, stability analysis, and HEC RAS analysis. The information gained from these efforts is included here.

3. Project Location, Facilities, and Operations

3.1. River Basin, Stream Flow, and Water Regime

3.1.1. Existing Conditions

The Blackstone River has not had a natural flow for at least two centuries (Rhode Island Division of Planning (RIDP), 2004). At one time, 45 dams existed on the Blackstone River along its length through Massachusetts and Rhode Island (BRVC 2002). At present, 18 dams remain on the Blackstone River, and, within the state of Rhode Island, four operate hydroelectric plants under FERC jurisdiction (National Park Service (NPS), 2005; FERC, 2020). Two operating wastewater treatment facilities on the Blackstone River located in Woonsocket, RI and Worcester, MA, have also had a significant effect on river flows.

3.1.2. Blackstone River and Watershed

The Blackstone River originates in southern Worcester, Massachusetts, at the confluence of the Middle River and Mill Brook and flows southeasterly for approximately 48 miles to Narragansett Bay. Of that total, only 16.1 miles pass through Rhode Island. The Blackstone River is the largest freshwater river in Rhode Island carrying an average of 648 million gallons of water a day (MG/d) downstream (RIDP, 2016).

The Blackstone River Watershed comprises approximately 472 square miles, 373 square miles of which is in Massachusetts (RIDP, 2004). In Rhode Island, the watershed encompasses all or a portion of Burrillville, Central Falls, Cumberland, Glocester, Lincoln, North Smithfield, Pawtucket, Smithfield, and Woonsocket (RIDP, 2004).

3.1.3. Lower Blackstone River Watershed

With a drainage area of approximately 99 square miles, the Lower Blackstone River Watershed includes seven sub-watersheds: Clear River, Chepachet River, Branch River, Mill River, West to Peters River, Millers River, and the Peters River to mouth (RIDP, 2004).

As basin size and flows are used as the benchmarks for determining appropriate conservation flows at Ashton Dam, the Applicant commissioned a determination of the drainage area at the Dam. The size was determined by Normandeau Associates to be approximately 439 square miles. This watershed size has been used to perform an Aquatic Habitat Assessment and Flow Study to determine the flow volumes necessary to maintain the aquatic habitat and support designated uses at the Project Site.

3.1.4. Existing Dams and Hydroelectric Generation

There are nine existing dams between Woonsocket, RI and Pawtucket, RI. The existing dams are described below.

Table 3-1
Existing Dams and Hydropower Projects on the Blackstone River

Dam Name	Town	Owner	River Mile	Hydropower Project	FERC #	Fish Passage
Woonsocket Falls Dam	Woonsocket	U.S Army Corps of Engineers	14.3	Woonsocket Falls Hydropower Project	P-2972	No
Manville Dam	Cumberland	Town of Cumberland	9.9	None	None	No
Albion Dam	Cumberland	State of RI	8.2	Albion Dam Hydroelectric Project (under construction)	P-14633	Designed, but not constructed, as part of FERC Exemption; will contain eel passage
Ashton Dam	Cumberland	Ronci Estate	6.8	Ashton Dam Hydroelectric Project (to be constructed)	P-14634	Will be designed, but not constructed, as part of FERC License; will contain eel passage
Pratt Dam	Cumberland	Town of Cumberland	2.8	None	None	No
Valley Falls Dam	Central Falls	Blackstone Hydro Associates	2.0	Central Falls Hydropower Project	P-3063	No fish passage structure, but requirement for eel

Dam Name	Town	Owner	River Mile	Hydropower Project	FERC #	Fish Passage
						passage
Elizabeth Webbing Dam or Central Falls Dam	Central Falls	State of RI	0.8	None	None	No
Slater Mill Dam	Pawtucket	Slater Mill Association	0.2	None	None	No
Main Street Dam or Pawtucket Lower Dam	Pawtucket	Pawtucket Hydropower	0.0 Mouth of River	Pawtucket No.2	P-3689	No

USACE, 2020 (National Inventory of Dams)

3.1.5. Stream Flows and Water Regime

Stream flows in the Lower Blackstone Watershed are measured by the USGS at two gages, one upstream of the Ashton Dam, and one downstream.

The Woonsocket gage, the closest active gage upstream of Ashton Dam, was selected to provide estimated flows at Ashton Dam.

Average annual flow for the USGS period of record was estimated to be 790cfs (United States Geological Survey (USGS), 2022). A maximum flow of 32,900cfs was recorded at the Woonsocket gage on August 19, 1955 (the flood of record). Low flows historically have occurred between June and September. High flows have historically occurred between November and May. Annual flow duration curves are set forth in Appendix E: Water Quality.

Table 3.1.5-1
Blackstone River Information at USGS Gages Upstream and Downstream of the Project

Gage Information	Coordinates	Hydrologic Unit	Drainage Area	Period of Record	Water Quality Records	Gage Datum
Upstream 01112500 Blackstone River at Woonsocket, RI	Latitude: 42° 00’22” Longitude: 71° 30’ 13”	Providence County, HU 01090003, on right bank 50 ft. upstream from Peters River pressure conduit at Woonsocket. Records include flow of Peters River.	416 mi2	February 1929 to present	Water years 1952 – 53, 1957 – 58, 1962 – 67	106.64 feet above NAVD88 (Prior to May 5, 2020, datum of gage reported as 107.42 ft above NGVD29)
Downstream	Latitude:	Providence	474 mi2	October		33.66 ft above

01113895 Blackstone River at Pawtucket, RI	41° 53'19" Longitude: 71° 22' 55"	County, HU 01090003, on right bank at upstream side of Roosevelt Avenue bridge at Pawtucket.		2003 to November 2005, October 2006 to present.		NAVD88 (previously reported as 20 feet above NGVD29)

3.1.6. Flooding

The Lower Blackstone River Watershed has a significant history of flooding. Progressive urbanization within the areas surrounding the Lower Blackstone River Watershed has changed many natural hydrologic characteristics. Diminished wetland resource areas and increased impervious surfaces have exacerbated flooding. The Ashton Dam and the area where the turbines will be installed are both located in the Blackstone River, which is designated a Federal Emergency Management Agency (FEMA) Floodway. The electrical works will be housed in an 18' x 35' single story structure located in Zone AE (special flood hazard area adjacent to a floodway) and a small access road and the Department of Transportation owned bike path, to be used on a temporary basis, will be located in Zone X with a 1% Annual Exceedance Probability (FEMA, 2009). The flood map used to determine the zone is number 44007C0183G, effective on 03/02/2009 and is in use at the writing of this document. Breach analysis and inundation mapping modeling were undertaken, and the subsequent report issued by Kleinschmidt Associates is attached at Appendix C (CEII).

3.2. Potential Impacts and Proposed Measures

During construction, temporary upstream and downstream cofferdams will allow in-water excavation and construction. Once the cofferdams are installed, the entirety of the river flow will be directed over the main spillway of the Dam to create a dry area for construction. They will be removed once construction is complete.

No long-term impacts to the watershed, existing dams, operating hydroelectric generation or stream flows are expected. The StreamDiver turbines will be installed in a trench within the riverbed and will be fully submerged by water so as not to create an additional obstruction to river flow. To minimize the impacts of flooding and ensure the Project, once constructed, passes floodwaters as the site currently does, the trash rack will be nearly horizontal, angled at 8 degrees. High sweep velocities over the bars (relative to the normal flow velocities through the bars) encourage fish to continue traveling to the chute between the Obermeyer crest gates, where they exit the downstream fish passage. For analysis purposes, the trash rack was conservatively designed with 1/2" wide square (non-hydraulically optimized shape) bars that are spaced 1/2" apart, providing a blockage ratio 0.5. The bars were further specified with a depth in excess of 1" to ensure laminar flow. This will ensure all but the smallest debris and fish are excluded from entering the turbine intake.

In addition, the Project will operate in a run-of-river manner where outflow will approximate inflow. Excess flows will pass over the main portion of the dam, restoring an intermittent veil flow. It is anticipated the main portion of the dam will be wetted more often than it has been since 2010 when inoperable control gates on the small, lower-level spillway washed out in a flood. More consistent

wetting of the main portion of the dam may be beneficial for both aquatic life downstream as well as the health and aesthetic appearance of the dam itself.

Based on dam breach analysis performed by Kleinschmidt Associates in 2022, failure of the Ashton Dam would not result in probable loss of life or significant damage to structures. In addition, the spillway at Ashton Dam is anticipated to pass the 100-year flood without overtopping any of the abutment structures. Please see the documents included in Appendix C for more detail.

Further HEC-RAS modeling by Kleinschmidt Associates determined the change in water surface elevations showed no increase in flooding potential as a direct result of the operation of the Project. To ensure the existing flood flow conditions are not altered as a result of construction of the Project, several measures will be in place to allow the 100-year flood to pass as it currently does. First, the approximately 3'8" drop gates that will span the length of the existing lower-level spillway will create a uniform height of the Dam, approximating conditions that existed prior to 2009. When flood flows deem it necessary, the gates will drop to pass additional flows, replicating current conditions. These gates are automatically controlled and integrated into the Project but can also be manually dropped if flood flows are anticipated. More detailed information is available in Appendix C.

The Project's four turbines will automatically switch on and off as river flows dictate. Sensors installed at the Project will feed data to a Programmable Logic Controller (PLC) which will automatically start or stop the turbines, depending on flows. Three of these units will be rated at 224 kW requiring approximately 311cfs each. The last unit will be rated at 121 kW requiring approximately165cfs. The larger units will turn on sequentially as flows allow. The smaller unit will turn on when the following conditions are met: the minimum capacity of a larger unit has not been reached or the minimum capacity of the small unit has been reached. The smaller unit will turn off when the minimum capacity of a larger unit has been reached, and a larger unit will turn on. This sequence of operating units will continue until the maximum station capacity is reached with all four units operating. Through a combination of operational units, the Project will automatically match the inflow of the river. Between the automatic operations of the turbines as well as the automatic or manual control of the crest gates (depending on flow conditions), flood flows and flood conditions will not be exacerbated at the Project site.

Essential Project components (e.g., control building) will be constructed so as not to be impacted by a 100-year flood. The Project has proposed, after consultation with the USFWS and RIDEM, to maintain a minimum of 100cfs conservation flow as long as river flows allow. If less river flow is available, the Project will shut down until flows increase. The Applicant is consulting with the USFWS and RIDEM regarding studies to be conducted to determine the adequacy of the proposed 100cfs conservation flows to protect water quality.

3.3. References

Blackstone Valley National Heritage Corridor Act of 1986, Pub. L. No. 99-647, §100 Stat. 3625, (1986)

Rhode Island Division of Planning. (2004). *Rivers Policy and Classification Plan.* (Report No. 92). Retrieved from http://www.planning.ri.gov/documents/guide_plan/rivers.pdf

United States Army Corps of Engineers, New England Division. (1994). *Blackstone River Restoration Study*. Retrieved from https://www3.epa.gov/region1/superfund/sites/peterson/266278.pdf

National Park Service. (2005). *Blackstone River & Canal Guide:* *Blackstone State Park to Pratt Dam – Intermediate Tours, Rhode Island.* Retrieved from https://www.nps.gov/blrv/planyourvisit/upload/Lincoln8x11.pdf

Federal Energy Regulatory Commission. (2020). *Environmental Assessment for Small Hydroelectric Project Exemption: Albion Dam Hydroelectric Project FERC Project No.14633-001 Rhode Island*. Retrieved from https://www.ferc.gov/sites/default/files/2020-04/P-14633-001-EA.pdf

Rhode Island Division of Planning. (2016). *Water Quality 2035: Rhode Island Water Quality Management Plan*. (Report No. 121). Retrieved from http://www.planning.ri.gov/documents/LU/water/2016/SGP_WQMP_Approved%2010.13.16.pdf

United States Geological Survey. (2022). *National Water Information System: Web Interface. USGS 01112500 Blackstone River at Woonsocket, RI*. Retrieved from https://nwis.waterdata.usgs.gov/nwis/inventory/?site_no=01112500&agency_cd=USGS&

Federal Emergency Management Agency. (2009). *FEMA Flood Map Service Center*. Retrieved from https://msc.fema.gov/portal/home

4. Land and Water Uses

4.1. Existing Conditions

The Project site is currently wooded with mature and scrub trees, some wetland areas, riverbank and the Blackstone River. The Ashton Dam's lower-level spillway abuts the riverbank with the rest of the Dam's main crest emanating from the lower-level spillway across the river. Prior to 2010, a large gating structure with several gates was located atop the lower-level spillway. This structure had been in disrepair for at least 50 years before being washed out in a flood in 2010.

4.1.1. Land Use

The Project will be constructed on the east side of the Blackstone River adjacent to the Ashton Dam in the Town of Cumberland. The StreamDiver units will be installed in the river at the current location of the lower-level spillway, which will be removed. Other Project structures, including electrical interconnection, air blast system, control building and concrete pads to support the transformer recloser, meter and switchgear, will be installed on the adjacent upland. A retention basin will also be constructed to filter stormwater runoff. The land surrounding the Dam currently consists of previously disturbed, vegetated upland. East of the Project Site is the Blackstone River Bikeway and east of the Bikeway is the Genesee and Wyoming-owned railroad track.

The two parcels affected by the Project consist of Plat 58, Lot 90, owned by the State of Rhode Island recorded at Book 435, Page 254 (managed by RIDEM), and another, Plat 2488, noted as Parcel 1A, recorded at Book 629, Page 226 (managed by RIDOT). Portions of both these parcels will be utilized for access easements, parking, and location of appurtenant structures supporting the in-river turbine array. This area comprises a portion of the Project Site, includes flowage and water rights, and is identified in Table 4-1.

Easement Agreements authorizing the Applicant to construct, secure, operate, and maintain the Project in accordance with all relevant federal, state, and municipal requirements have been finalized and approved by the Rhode Island State Properties Committee. The Easement Agreements are perpetual and will commence with construction staging for the Project. The Ashton Dam is owned by the Estate of Ronci Realty Co, Inc., and is in the process of being sold to the Applicant. Copies of the final closing documents and title deed will be provided to the Commission.

The Project Site is approximately 1.3 acres comprised of portions of the previously disturbed lots, discussed above, as well as the in-water area where the Project will be constructed and from which it will operate.

Table 4.1.1-1
Easements Secured Over Lots for Project

Owner	Plat, Lot	Address	Existing Use	Proposed Use	Zoning
State of Rhode Island	Plat 58, Lot 90	Rear Mendon St	Vacant land	Portion of access road, portion of laydown area and permanent parking, single line interconnect	Agricultural Medium Density
Estate of Ronci Realty, Co, Inc.			Dam	Dam	
State of Rhode Island	Plat 2488		Vacant land	Portion of access road and transformer/ control building	Light Industrial

An application for Project Site Plan Review will be submitted to the Town of Cumberland's Department of Planning and Development. The local permitting application process is anticipated to begin in the first quarter of 2023.

4.1.2. Water Use

In April 2013, RIDEM a Total Maximum Daily Load (TMDL) was approved for the Blackstone River segment where the Project is located (RI0001003R-01A). This is an 18.05-mile-long segment of the Blackstone River from the MA-RI border to the combined sewer overflow outfall located at River and Samoset Streets in Central Falls. This segment was listed as having a Use Attainment Status of "Not Supporting" for the categories of Fish and Wildlife Habitat, Fish Consumption, Primary Contact Recreation and Secondary Contact Recreation. (RIDEM, 2021). The topic of water quality is further discussed in Section 6.1 below.

Despite the TMDL development, existing uses of the Blackstone River within the Project Boundary include recreational activities such as fishing and boating. RIDEM annually stocks

brown and brook trout for recreational fishing in the river segment lying within the Towns of Cumberland and Lincoln (RIDEM, 2022a).

In addition to recreation, six major public water suppliers in Rhode Island withdraw water from the Lower Blackstone River Basin in Rhode Island (USGS, 2003). Water withdrawals for public supply in the Lower Blackstone River Basin, which amount to approximately 22,700 Mg/d, are from ground and surface water sources. (USGS, 2003).

Wastewater

The primary wastewater treatment plant discharging to the Lower Blackstone River in Rhode Island is the City of Woonsocket plant. The plant serves approximately 53,100 individuals in North Smithfield and Woonsocket, plus approximately 13,800 individuals in Blackstone and Bellingham, MA. The plant treats an average daily flow of 9.3 Mg/d with activated sludge, biological nutrient removal, tertiary treatment, chlorination, and de-chlorination. (RIDEM, 2020).

The State of Rhode Island requires all discharges into surface waters to obtain a Rhode Island Pollutant Discharge Elimination System (RIPDES) permit from RIDEM, establishing limits on the quantity and quality of discharges. RIPDES permits address wastewater discharges from agricultural activities, domestic sewage treatment works, subsurface sewage treatment and disposal, and manufacturing, commercial, and industrial activities (RIDEM, 2022b).

The Project will not generate point source discharges subject to an individual RIPDES Permit.

4.2. Potential Impacts and Proposed Measures

This small hydroelectric generation facility will be compatible with the existing dam structure and uses at the Site. The Project will restore the legacy of hydropower on the Blackstone, using modern, low impact technology. The Project will operate in a run-of-river manner and is not considered a consumptive use. Construction will require temporary, partial closures of the bike path and for a time, any portaging of paddle craft will have to take place on the western bank of the river. Once operational, the Project is not anticipated to affect the existing surrounding land uses. The upland structures will be fenced where determined appropriate and locked, for safety. No nighttime lighting is anticipated.

The current zoning for the upland area of the Project Site is listed by the town of Cumberland as A-2 Medium Density Agricultural with a Historic District overlay (MapGeo, 2023). An earlier zoning code amendment specifically allows small hydropower within the town boundaries (Town of Cumberland, 2021). Residential neighborhoods are north, south, and southeast of the Project, with the closest residences located approximately 300 feet to the northeast. These residences are located approximately 70 feet above the Project Site, atop a very steep rise from the riverbank, bike path and railroad up to Mendon Road. Mature deciduous trees along Mendon Road may partially visually screen the existing Dam structures and proposed structures from at least some of these residences. As the StreamDiver turbines and the majority of the accompanying works will be submerged, little visual impact is expected.

The range of potential impacts of an electric generation facility can include air emissions, noise, safety concerns, and visual impacts to sensitive receptors such as nearby residents, recreational areas and historic properties. These are addressed below.

Air Emissions: The Project is a small hydroelectric, renewable energy facility. No fossil fuels or chemicals will be used to generate electricity; therefore, the Project will produce no air emissions except from construction equipment during construction. Those impacts will be limited to the construction timeframe (approximately 5 months) and during the day. No overnight work is anticipated. There will be no long-term impacts to air quality following completion of construction. Once the Project commences operations, the electricity generated will displace electricity currently generated through the use of fossil fuels, reducing the overall carbon footprint within the State of Rhode Island.

Noise: During construction, noise generated by construction equipment will be temporary, will occur during daylight hours, and will be in compliance with the applicable Town of Cumberland noise ordinances and RIDEM noise limits. Given the distance to the nearest residences, no significant noise impacts from Project operation are anticipated.

Once operational, ambient noise levels surrounding the Project are not anticipated to change noticeably. The StreamDiver turbines are fully submerged and cannot be heard while operating. In addition, the control building, containing the electrics, will not generate noise. By employing the StreamDiver technology, the Applicant proposes to return an intermittent veil flow to the main spillway (as flows allow) as well as maintain a minimum flow over the lower-level spillway for downstream fish passage. The ambient noise of water spilling over the dam will be the primary sound heard by anyone passing by.

Safety: During construction, the Project construction contractor will be responsible for Project oversight, including on-site safety. Access to all work areas will be closed to the public during construction, and potential access points to construction areas will be barricaded and posted as being closed. Additional safety requirements include but are not limited to, identification and marking of subsurface utilities prior to excavation; daily inspections to ensure erosion control measures are in place and functioning; stabilization of stockpiles; protection of active construction areas from rising water levels; proper performance of water diversion structure; storage of any fuel and maintenance fluids in a covered upland storage area; and inspections of the Site by qualified technical personnel after rain events of one inch or greater detailing observations, maintenance and corrective actions taken, if warranted. Additional information will be provided, post-licensing, as part of the Project's Construction and Operations Plan.

During operations, the area around the Project Site will be accessible to the public on foot, as it is currently. Upland Project structures will be fenced and locked in accordance with FERC and Town security requirements, to limit entry to authorized personnel. Once constructed, the StreamDivers will be fully submerged and access to them will be restricted. Signage and safety devices (may include signs, buoys or positive restraint barriers) will be placed around the upstream intake area to alert boaters, though intake water velocities are relatively slow. Project operations will be remotely monitored 24 hours a day, seven days a week with the ability for immediate remote shutdown, if needed. Town of Cumberland emergency personnel will have keys and access to the Project facility, in the event of emergency. The Project Site will be

inspected regularly and the grounds maintained. The Towns of Lincoln and Cumberland emergency personnel, including Police, Fire and Engineering Departments will have keys to any locked components to allow immediate access to the Project and the dam in the event of an emergency.

Recreational boaters will still be able to portage around the dam on the western bank of the river, as construction and operation of the Project will not affect that side. During construction, recreational boaters will be directed by signage away from active construction. Once construction is complete, the Project structures are not anticipated to interfere with portage by recreational boaters as the upland facilities will be small and locked for safety. Portagers will still be able to transit the Site around the structures.

The dam will always be accessible to authorized personnel. The dam will be maintained in accordance with FERC requirements to ensure its structural integrity and safety.

During construction the Blackstone River Bikeway will be partially closed on occasion, as equipment is transported to the Site. Notice of any closures will be given in advance to RIDRM and RIDOT and will be posted onsite, so bicyclists and pedestrians can seek an alternate route or alternate time. Once operational, closures of the Bikeway will be limited to repair and emergency situations.

Traffic: Project-related traffic will increase during the 3 to 5 months required to construct the Project. This will include trucks bringing supplies, equipment, and construction personnel. Access to the site for all construction vehicles be via Front Street. Temporary construction areas and nearby materials laydown sites will be located on property owned by the State of Rhode Island, as depicted in the Ashton Easement Agreement.

A crane will install the StreamDivers (planned for one day). Drivers will be instructed to obey all applicable laws, and to drive courteously and attentively on all local streets.

During operations, the Project will largely be remotely operated, and therefore no significant traffic will be required to service the Project. The Project Site will be inspected at least weekly, by authorized personnel on foot.

Fugitive Dust and Dirt Tracking: During construction, fugitive dust will be controlled, as needed, through water sprays, sweeping paved areas, and, if needed, an anti-tracking apron installed at the construction entrance to prevent tracking of sediment offsite. If there is a need for a stone apron, it will periodically be top-dressed as needed. The Site will be seeded with native vegetation and stabilized following construction in accordance with applicable RIDEM and Town of Cumberland requirements. Project operation will not generate fugitive dust, dirt tracking, or other nuisance conditions.

Visual Impacts: During construction, vehicles, equipment, and some stockpiles will be visible from the western bank of the river and the Bike Path to the east of the Project Site. From the Blackstone River Bikeway along the eastern side of the Project Site, construction will be obvious and visible. Appropriate safety fencing will be installed along the Bike Path during construction and permanent safety railing or vegetative visual screening will be compatible with the surroundings during operation. Informational signs some signage may be installed to educate

the public about the Project during construction. Following commercial operation, the Applicant will install informative and educational signs created in collaboration with the RIHPHC. All visual impacts caused by construction will be temporary and limited in duration (3 - 5 months). No adverse visual impacts are anticipated from any residence on Mendon Road given the distance to the Site. The closest residence is approximately 350 feet to the east and is screened by mature vegetation and a 70-foot rise in elevation from the Site to Mendon Road.

Following completion of Project construction and commencement of Project operations, visual impacts are anticipated from the western riverbank. The Applicant is working with the RIHPHC to mitigate for these visual impacts through color, texture and style of the finished components. The control building and some appurtenant structures will be visible, depending on viewpoint, from both sides of the river, but will be consistent in scale, style, and use with the existing structures near the dam. The intake for the bays housing the StreamDivers will contain a 4- to 6-foot-high curb wall which may be visible depending on river flow. In addition, the adjustable crest gate atop the lower-level spillway, the back side of the reconstructed lower-level spillway and notches in the crest gate leading to a small ramp for downstream fish passage, will all be visible. Currently none of the lower-level spillway components are visible as the majority of the river flow passes over this spillway on a regular basis.

An underground transmission line will be installed to transmit power approximately 1,089 feet from the control building to an existing, or updated pole (to be determined by the utility, Rhode Island Energy). From there, the transmission line will be aboveground for approximately 125 feet, connecting at pole to be upgraded by Rhode Island Energy per their requirements.

The highest Project structure will be the control building, which will be a one-story building approximately 16 feet by 35 feet with the peak at 15 feet 4 inches above finished grade. The control building will be designed to be compatible with existing dam structures, in coordination with the Town Planning Division and Site Plan Review process and in consultation with the RIHPHC.

Nighttime lighting is not required to operate the Project, although motion activated safety lighting may be installed around the Project Site.

The closest recreational resource (aside from the Blackstone River itself) is the Blackstone River Bikeway adjacent to the Project Site. The Project is located in a National Heritage Corridor, further described in Section 12 (Historic and Archeological Resources). On the western side of the river, no residential or commercial properties will be affected by the Project construction or operation due to distance and intervening mature vegetation. Once completed, the Project works will be visible from the western side of the river, along the towpath, within the Blackstone River Valley National Historical Park.

The Project will not generate any discharges of pollutants into the Lower Blackstone River Basin. The Project will acquire a Stormwater General Construction Permit, if required, at least 30 days prior to commencement of construction. Water quality monitoring will be implemented over the first year of Project operations and BMPs will be employed to minimize any runoff during Project construction activities.

4.3. References

Rhode Island Department of Environmental Management, Office of Water Resources. (2021a). *State of Rhode Island 2022 Impaired Waters Report, December 2021.* Retrieved from https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/iwr22.pdf

Rhode Island Department of Environmental Management. (2022). *Designated Trout Waters*. Retrieved from http://www.dem.ri.gov/programs/fish-wildlife/freshwater-fisheries/troutwaters.php

United States Geological Survey. (2003). *Estimated Water Use and Availability in the Lower Blackstone River Basin, Northern Rhode Island, and Central Massachusetts, 1995 – 1999*. (Water Resources Investigations Report No.03-4190). Retrieved from https://pubs.usgs.gov/wri/wri034190/

Rhode Island Department of Environmental Management. (2020). Wastewater Treatment Facility Officials. *Office of Water Resources/WWTF*. Retrieved from http://www.dem.ri.gov/programs/water/wwtf/wwtf-officials.php

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MapGeo, (Cartographer). (2020). Town of Cumberland, RI. [Digital land use, parcel and zoning maps]. Retrieved from https://cumberlandri.mapgeo.io/?latlng=41.935826%2C-71.426392&panel=themes&zoom=13

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5. Geology, Soils and Groundwater

This section was developed from a review of published materials as cited, site reconnaissance, and two subsurface boring programs, the results of which are set forth in Appendix G.

5.1. Existing Conditions

The Blackstone River, as we know it, was formed about 15,000 years ago as the land in this area was shaped by the movement of glaciers, water erosion, and other geological processes. The river itself is a product of the melting of glaciers that once covered much of New England. As the glaciers melted, they left behind a large amount of sediment, which was carried downstream by the rivers that formed in the area. Over time, these rivers, including the Blackstone River, carved out valleys and formed the landscape we see today (NPS, 2021).

5.1.1. Bedrock Geology

The geologic map of Rhode Island identifies the bedrock at and near the Project Site as the Rhode Island Formation, a Pennsylvanian-age gray sandstone and siltstone (RIDEM n.d., USGS, n.d.). Bedrock in the region is characterized as metamorphic rock of the Blackstone Group, consisting of

quartzite, greenstone and/or schist (Kleinschmidt Associates, 2022). Field observations show no exposed bedrock on the eastern side of the river.

5.1.2. Surficial Geology and Soils

The unconsolidated material overlying bedrock in the vicinity of the Project Site consists primarily of glacial outwash deposits and glacial till (RIDEM, n.d., Kleinschmidt Associates, 2022). Alluvial deposits consisting of stratified silt sand and gravel are typically located in the area near the river (Kleinschmidt Associates, 2022).

Two geotechnical boring programs were undertaken first in 2016 by Ransom Consulting and supplemented in 2021 by Kleinschmidt Associates. During the first boring program, three borings were taken along the bank of the Blackstone River at the Project Site. Soil samples at the Project location were assessed and composited into one sample and evaluated for contaminants. No contaminants above EPA reporting levels were detected.

According to the field boring programs done in 2016, subsurface conditions encountered within the borings indicate that the area consists of fill soils ranging in thickness from 8 to 15 feet, overlying a native deposit of loose to dense alluvium consisting of silt, sand and gravels. Near a depth of 10 to 15 below ground surface, near elevation of 66 feet NAVD88, dense to very dense sand and gravel was encountered.

Underlying this dense alluvium is a loose to medium dense sand with minimal gravel. The deepest boring was advanced was to 49 feet below ground surface, corresponding to an approximate elevation of 28.2 feet NAVD88. Split-spoon sampling at this depth indicated practical refusal, and minimal sample was recovered to assess the reason for refusal. It is probable that refusal occurred due to the presence of bedrock. Bedrock was not encountered in any of the other borings but is exposed on the right bank of the river approximately 300 feet away.

In 2021, six additional borings were taken at locations near the Project components. According to the 2022 Kleinschmidt Associates Geotechnical Data Report, three of these borings were angled, sonic borings, ranging from 40 to 45 degrees and advanced 126 to 150 feet. Three were vertical geotechnical test borings, advanced from 37 to 70 feet. The purpose of the second boring program was to obtain information on the subsurface conditions near the footprint of the Project. Data collected has been used to inform the design of the Project such as seepage analysis, cofferdam design, preliminary dewatering estimates and evaluation of foundation support (Kleinschmidt Associates, 2022).

5.1.3. Groundwater

According to the geotechnical work previously performed, the Site is located in a GAA Groundwater Classification area. This classification designates groundwater resources that are known or presumed suitable for drinking without treatment. The three boring holes created to perform soil sampling were repurposed as groundwater monitoring stations. No contaminants were detected above EPA reporting levels in the groundwater at the Ashton Site.

5.2. Potential Impacts and Proposed Measures

During upland construction, the area will be prepped, and a laydown area cleared of brush and small trees. Where practicable, larger trees will remain to aid in erosion control and visual screening. The site will also include a small access road. BMPs will be employed to minimize erosion and siltation of water bodies due to soil disturbance, and to comply with RIDEM's requirements. Anticipated BMPs will include placement of erosion control barriers around upland work areas prior to the start of ground disturbing activities and environmental oversight to monitor compliance during construction.

Surface soils will be permanently disturbed to the extent necessary to level and grade the construction area, support a control building measuring approximately 16' x 35', support a transformer pad, create a small bio-retention basin, and install the electrical interconnection lines underground. Once construction is complete, the site will be landscaped and seeded with native grasses and/or other vegetation to restore the disturbed laydown and construction area. The site surrounding the control building and transformer pad will be maintained, mowed, and any shrubbery trimmed as appropriate.

No removal of soils to the depth of groundwater is expected and no pollutants will be discharged that will affect groundwater.

As the turbines will be submerged at the location of the existing lower-level spillway, and the upland Site will be replanted with native plants, there are not expected to be any continuing impacts to geology, groundwater or soils during Project operations.

Additional measures are being taken to ensure as much site knowledge as possible and to better understand the subsurface components closer to the Dam. To that end, the Applicant is planning a second geotechnical investigation, targeted closer to the Dam structure.

5.3. References

Geological History of Jamestown, Rhode Island (2016). *Jamestown-RI info*. Retrieved from http://www.jamestown-ri.info/geological_history.htm

Rhode Island Geographic Systems (Cartographer). (2016). Geology [Geology map]. Retrieved from https://www.rigis.org/datasets/edc::bedrock-geology-of-rhode-island/explore?location=41.586919%2C-71.504504%2C10.00

United States Geological Survey (n.d.). Rhode Island geologic map data. [GIS data]. Retrieved from https://mrdata.usgs.gov/geology/state/state.php?state=RI

6. Surface Water and Sediment Quality

The waters of the Blackstone River have long been used for industrial purposes. Dams were constructed to harness its power, the Blackstone Canal was constructed to utilize its flow for transport, and for generations, the river itself was used to dispose of industrial waste. Care is being taken by various groups to restore the Blackstone's water quality and mitigate, in locations, some of the contamination that exists. Recreation is allowed, but the water is still considered unsafe for primary contact activities such as swimming. Contaminants within the sediments is known only where testing has been actively performed and there has not been any sort of comprehensive evaluation and documentation of the quality of the sediments throughout the length of the Blackstone River. Because of the general lack of in-depth

information, the Applicant has undertaken some measures, and will continue to explore additional safeguards, as the Project progresses to address any contamination encountered.

6.1. Existing Conditions

The following information was compiled from RIDEM sources (as cited herein) as well as the Applicant's field investigations.

6.1.1. Surface Water

The Blackstone River from the MA-RI border to the combined sewer overflow outfall located at River and Samoset Streets in Central Falls, (Waterbody ID RI0001003R-01A) including Ashton Dam, is designated a Class B1 surface water body, to which RIDEM ascribes the following designated uses: primary and secondary contact recreational activities, fish and wildlife habitat and fish consumption. The waters in this category shall also be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. RIDEM acknowledges primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges (RIDEM, 2022).

In 2021 RIDEM issued the final version of its 2022 303(d) List of Impaired Waters designating Waterbody ID RI0001003R-01A with a Use Attainment Status of Not Supporting for Fish and Wildlife Habitat, Fish Consumption, Primary Contact Recreation and Secondary Contact Recreation (RIDEM, 2021).

The Fish and Wildlife Habitat use description is classified as *Not Supporting* based on the following causes and impairments: cadmium, iron, and non-native aquatic plants. No TMDL is required for those impairments not considered pollutants, such as invasive aquatic species (RIDEM, 2021).

The Fish Consumption use description is classified as *Not Supporting* based on mercury and PCBs in fish tissue. A TMDL was approved on 4/22/2013. Use attainment status for Primary and Secondary Contact Recreation were both found to be *Not Supporting* based on Fecal coliform and Enterococcus bacteria. A TMDL was approved on 4/22/13 for these impairments as well. For those impairments with an EPA approved TMDL, the impairment is considered delisted (RIDEM, 2021).

From 2016 through 2021, the Applicant conducted low-flow water quality sampling to measure Dissolved Oxygen (DO) concentrations and temperature at three locations at the Project Site. Low flow season occurred between July and September annually. Sampling consisted of weekly sampling events at one upstream location within the Blackstone River and two downstream locations. One location was below the lower-level spillway and another was several hundred feet downstream of the spillway.

The results of data collected throughout the sampling period are attached at Appendix E.

6.1.2. Sediment Quality

On November 4, 2016, May 8, 2019 and May 24, 2022, sediment sampling was performed at the embayment of the Dam. The results of these successive sampling efforts are set forth in the November 8, 2022 "Supplemental Sediment Investigation Report" included in Appendix D.

In 2016 eleven discrete sediment samples were collected from approximate depths ranging from six to 72 inches below the sediment substrate. One composite sediment sample combining the 11 discrete samples, was collected. One discrete sample was collected from an approximate depth of 72 inches.

Sediment concentrations were compared to applicable RIDEM Soil Objectives and EPA Region 4 Sediment Screening Values. RIDEM does not have promulgated sediment screening criteria and generally uses the Residential (RES) Direct Exposure Criteria (DEC) as a benchmark for cleanup.

Concentrations of PCBs, chlorinated herbicides, and VOCs were not detected above RIDEM, RES DEC sediment screening values.

According to the testing results of samples obtained at the Site, antimony, arsenic, lead, TPH, and some SVOCs exceeded RIDEM RES DEC sediment screening criteria.

6.2. Potential Impacts and Proposed Measures

Project design calls for an interim conservation flow of 100cfs, or inflow if less than 100cfs, through the turbines, and the downsteam fish passage notches over the turbines. Discussions are ongoing with RIDEM and USFWS as to the most appropriate amount. This flow has been proposed until the Project is operational and the flows can better be assessed. Prior to operation, a Flow Study Plan will be drafted proposing methodology to assess the adequacy of the proposed conservation flows. The plan will be implemented following operations.

To determine sediment quality and aid in the drafting of a Sediment Control and Disposal Plan, the Applicant has engaged in a more recent round of sediment sampling, as referenced above. As the initial sediment sampling was taken from farther upstream than the proposed location of construction, additional samples have been taken from near lower-level spillway.

Construction of the Project will permanently remove approximately 950cy of sediment and replace it with precast or poured concrete intake structures, a reconstructed lower-level spillway, the concrete housing for the StreamDiver turbines, and a precast or poured concrete tailrace. The design of the Project is intended to limit sediment transport and disturbance of contaminants.

During construction, some soil and sediment mobilization is to be expected, but construction BMPs will be adhered to, ensuring minimal effects. BMPs used at the Site may include runoff-limiting protections such as silt socks, silt fencing and/or haybales located in appropriate places and the construction of a small retention basin. Cofferdams will be in place both upstream and down, to limit sediment transport.

Additional protective measures include design plans and considerations as well. The gravel access road and temporary construction laydown area have been designed to occupy as small a footprint as is practicable. The Project will not require asphalt and will use BMPs to ensure that any runoff generated will either be diverted to and treated in an onsite retention basin. Any impacts to the Blackstone River and sediment disturbance should be short-term in nature and have no long-term negative effects on water quality. The Applicant will comply with all relevant time-of-year restrictions for in-water construction activities and dredging and will use BMPs to minimize any effects on water quality and total suspended sediments within the construction area.

No permanent, negative impacts to surface water or sediment quality are anticipated as a result of Project operations. The Project will not release chemical or physical pollutants into the Blackstone River and any runoff will be caught in a small retention basin constructed for that purpose. Part of the design includes a concrete intake intended to minimize sediment transport during operation. In addition, the Project will be largely remotely operated, limiting the need for access to and from the site other than for routine maintenance and groundskeeping which can mostly be accomplished without the use of heavy machinery.

The tailrace of the Project has also been designed with concrete apron to reduce sediment transport as well as intentionally placed riprap and rocks to dissipate flows as they return to the river. Once the Project is operational and a flow study is performed, the flows will be concentrated only as much as is needed, using natural means (placement of rocks), to attract fish to the location of a potential future fishway. An eel ramp will supply its own downstream flow. The flows will be dissipated in a manner as to not exacerbate any erosion on the western side of the riverbank or serve as a false attraction point.

Post-operational Project monitoring will include temperature and dissolved oxygen as required parameters, along with field notes addressing watercolor, surficial slicks, discolorations, and observation of foreign debris.

6.3. References

Rhode Island Department of Environmental Management, Office of Water Resources. (2021). *State of Rhode Island 2022 Impaired Waters Report, December 2021*. Retrieved from https://dem.ri.gov/sites/g/files/xkgbur861/files/2022-08/iwr22.pdf

Rhode Island Department of Environmental Management. (2022). *Water Quality Regulations*. Retrieved from https://rules.sos.ri.gov/regulations/part/250-150-05-1

Rhode Island Department of Environmental Management. (2013). *Total Maximum Daily Load Analysis for Blackstone River Watershed.* Retrieved from http://www.dem.ri.gov/programs/benviron/water/quality/rest/pdfs/blackstn.pdf

7. Fish, Aquatic Resources and Wetlands

Information in this section was developed from a review of available information (as cited herein) and consultations with the natural resource agencies, as well as field studies performed by Lucas Environmental within the Project Site in September 2016, Kleinschmidt Associates in September 2017, and Natural Resources Services, Inc. in October 2020. The field studies included wetlands delineation, botanical and biological surveys for state-listed endangered species (as further described in Section 9), and an evaluation of wetland functions, values, and impacts by Professional Wetland Scientists (PWS). In addition, flow and in-water mesohabitat assessments were performed and biologists experienced in Rhode Island inland aquatic and terrestrial habitats. The freshwater wetlands within the Project Site were re-delineated in the fall of 2020 by PWS from Natural Resource Services, Inc. (NRS). The 2016, 2017 and 2020 reports are included at Appendix F.

7.1. Existing Conditions

The Blackstone River and its tributaries provide habitat for warm-water fisheries. However, a variety of challenges continue to impose negative impacts upon the populations of migratory and resident fish identified within the Blackstone River Watershed (see Table 7-1 for known species in the Blackstone River). The Blackstone River water quality is still recovering from before the Federal Water Pollution Control Act Amendments of 1972, where several wastewater plants discharged untreated wastewater directly into the main stem of the Blackstone and its tributaries. Improvements have been seen through the species present in the lower Blackstone River Watershed. Early surveys showed that warm water species tolerant to poor water quality, such as white suckers, dominated the river (USACE, 1997). More recent surveys show fish species typical of better water quality conditions as set forth below.

Table 7-1
Blackstone River Identified Fish Species

Popular Name	Scientific Name	Popular Name	Scientific Name
American eel	*Anguilla rostrata*	Largemouth Bass	*Micropterus salmoides*
American Brook Lamprey	*Lampetra appendix*	Longnose Dace	*Rhinichthys cataractae*
Black Crappie	*Pomoxis nigromaculatus*	Northern Pike	*Esox lucius*
Blacknose Dace	*Rhinichthys atratulus*	Pumpkinseed	*Lepomis gibbosus*
Bluegill	*Lepomis macrochirus*	Rock Bass	*Ambloplites rupestris*
Brown Bullhead	*Ameiurus nebulosus*	Smallmouth Bass	*Micropterus dolomieu*
Chain Pickerel	*Esox niger*	Tessellated Darter	*Etheostoma olmstedi*
Common Carp	*Cyprinus carpio*	White Perch	*Morone americana*
Common Shiner	*Luxilus cornutus*	White Sucker	*Catostomus commersoni*
Fallfish	*Semotilus corporalis*	Yellow Bullhead	*Ameiurus natalis*
Golden Shiner	*Notemigonus crysoleucas*	Yellow Perch	*Perca flavescens*

(Source: A. Libby (RIDEM) personal communication 4/4/17 and Rhode Island Wildlife Action Plan 2015)

Trout Management

Fishing is an important recreational activity in the state of Rhode Island. It connects people with nature, attracts tourism, and is a tradition in many Rhode Island families. Rhode Island has about 750,000 recreational fishermen and recreational fishing contributes nearly $130 million to the economy each year (RIDEM, 2015). The Fisheries Division of RIDEM annually stocks approximately 180,000 catchable sized trout from the four fish hatcheries in Rhode Island. Trout are stocked into over 100 ponds, streams, and rivers for opening day (second Saturday in April) and several other times throughout the open fishing season (RIDEM, 2021). Stocking near the Project includes the Blackstone River at Cumberland and Lincoln.

7.1.1. Species Restoration

Damming and water use of the Blackstone River have historically led to lower water quality, causing a significant lack of biodiversity and a reduction in fish populations. Organizations such as Blackstone River Watershed Council/Friends of the Blackstone, Blackstone River Coalition and

state and federal environmental departments have come together to support efforts to clean up and restore the Blackstone River. Various water quality monitoring efforts keep record of the temperature and dissolved oxygen in the river. These parameters serve as an indication of basic health. Activities such as river-wide cleanups, fish stocking events and providing public access to the Blackstone River have helped over years to bring the river back to a usable condition.

In addition to water quality improvements, plans to restore key fish populations to the Blackstone River in the Project Vicinity are highly dependent upon installation of fish passage at the dams still existing downstream of the Ashton Dam. Fish ladder installation has been proposed and studied at Main Street Dam, Slater Mill Dam and Valley Falls Dam (USDA, 2008). In addition, the removal of the Elizabeth Webbing Dam has been studied and proposed. Although it has been decided that taking these measures would enhance upstream passage of migratory aquatic species, significant barriers exist to execute these projects and to date, none have been completed. The installation of the Project at Ashton Dam will include a design for an upstream fishpass that could be constructed at a later date when downstream passage is addressed.

The most recent available study and plan regarding fish restoration in the Blackstone River was issued in 2002. The *Blackstone River Fisheries Restoration Plan* lays out the existing conditions (as of 2002), lists target species for restoration efforts and describes actions that can be taken to enhance restoration. This plan was reviewed as part of the drafting of this application and the Project is not inconsistent with the plan. The Project will introduce an upstream eel passage and incorporate into its design safe downstream eel and fish passage. Upstream fish passage will be designed for potential construction at a later date, at the direction of USFWS and RIDEM, thus supporting the plan.

7.1.2. Benthos

On September 13, 2017 a study was performed by Kleinschmidt Associates to assess the availability and distribution of various aquatic habitat types, known as mesohabitats. These mesohabitats will be used to determine the types of flow needed to maintain and manage existing conditions immediately downstream of the tailrace and bypass reach. During the survey, five different mesohabitats were noted and mapped. They are described below.

Glide: moderately shallow, well-defined non-turbulent laminar flow, low velocity, well-defined thalweg, typically flat stream geometry, typically finer substrates, transitional from pool

Pool: deep, low velocity, well-defined hydraulic control at outlet

Rapid: shallow, moderate to high velocity, turbulent, chutes and eddies present, high gradient, large substrates or bedrock

Riffle: shallow, moderate velocity, turbulent, high gradient, moderate to large substrates (cobble/gravel)

Run: moderately deep to deep, well-defined non-turbulent laminar flow, low to moderate velocity, well-defined thalweg, typically concave stream geometry, varying substrates, gentle slope

In addition, a portion of the area below the dam was identified as exposed rock, boulder or cobble. It is expected at higher flows, these exposed areas would be covered.

Table 7-2
Mesohabitat Areas

MESOHABITAT	AREA (SQ FT)	PERCENT OF TOTAL AREA
Pool	19,248	60.0%
Run	11,736	36.6%
Exposed	1,080	3.4%
Total	**32,064**	**100%**

Freshwater Mussels

In the course of the mesohabitat study, mussel shells were observed in moderate abundance downstream of the dam; however, no live mussels were observed. The study mentions the presence of mussel shells in the study area may have resulted from shells displaced from upstream mussel populations.[2]

Total wetted area within the study area of the Ashton Dam encompassed 32,064 sq ft. Inflow into the study area remained consistent during the survey as evident by a steady water surface elevation (WSEL). Instream cover was limited to large and small boulders with very little woody debris or macrophytes present in the study area.

The table below shows freshwater mussels identified in Rhode Island waters.

Table 7-3
Rhode Island Identified Freshwater Mussels

Species	RI Status	Habitat	Range
Eastern Pearlshell (*Margaritifera margaritifera)*	Special Concern	Stream and rivers supportive of trout or salmon	Pawcatuck River Basin
Triangle Floater *(Alasmidonta undulata)*	Not listed	Streams, rivers, lakes with sand or gravel substrate	Widespread but uncommon at any given site
Creeper *(Strophitus undulatus)*	Not listed	Streams and rivers with sand or gravel substrate	Pawcatuck River Basin, Quinebaug River Basin, and the South Branch River.
Eastern Elliptio *(Elliptio complanata)*	Not listed	Large ponds, lakes, streams, and rivers	Most abundant and widespread mussel in Rhode Island
Eastern Floater *(Pyganodon cataracta)*	Not listed	Lakes, ponds, nutrient-rich water	Widespread and abundant throughout Rhode Island ponds, slow rivers, and modified habitats
Alewife Floater	Not listed	Streams, rivers, lakes,	Coastal rivers and ponds

[2] A freshwater mussel survey was performed by Biodrawversity in July 2020 at the Albion Dam, approximately 1.4 miles upstream of the Ashton Dam. One (1) live Triangle Floater was discovered, along with numerous empty shells.

Species	RI Status	Habitat	Range
Anodonta implicata)		and ponds supportive of anadromous clupeids	
Eastern Pondmussel *(Ligumia nasuta)*	Special Concern	Coastal ponds, streams, and rivers	Pawcatuck River Basin
Eastern Lampmussel *(Lampsilis radiata)*	Not listed	Streams, rivers, lakes, and ponds with sand or gravel substrate	Pawtuxet river and Pawcatuck River Basin

(Source: Raithel & Hartenstine, 2006)

7.1.3. Wetlands

Inland wetlands and watercourses are regulated in accordance with Rhode Island General Law Sections 2-1-18 through 2-1-25; State of Rhode Island and Providence Plantations Department of Environmental Management Rules and Regulations Governing the Administration and Enforcement of the Fresh Water Wetlands Act (July, 2014, as amended July 2022); Section 404 of the Clean Water Act (33 U.S.C. 1344); the USACE Wetland Delineation Manual (1987); and the Northcentral and Northeast Regional Supplement (2012).

On September 20-22, 2016 at the request of the Applicant, PWS from Lucas Environmental performed an inspection of wetland and watercourse resources at and in the vicinity of the Project Site. This delineation also included a wetlands functions and values assessment. The subsequent report and assessment are included here at Appendix F. An update/re-delineation of wetlands was performed in October of 2020 by PWS from NRS, Inc. and is also included in Appendix F.

The Project will be located within the statutory wetland/watercourse that is the river as well as the riverbank. In addition to those areas, a small upland wetland exists to the east of the Dam and is outlined in Project maps within the 2020 wetland delineation report (attached at Appendix F).

7.2. Potential Impacts and Proposed Measures

Several measures will be implemented to protect identified impacts to fish, aquatic resources and wetlands. Design elements as well as in water construction being limited to the low flow period (July 1 to September 30), will help ensure habitat and species protection.

7.2.1. Exclusionary Design and Conservation Flows to Protect Aquatic Species

The StreamDiver turbines are submersible, unregulated Kaplan style turbine. Although this style turbine is not intended to pass fish downstream as part of its design, the manufacturer has determined a relatively high survival rate of juvenile and small fish species through computational model-based assessment. Using the BioPA[3] model on the two sizes of turbine to be installed at the Project, the manufacturer determined that expected fish survival through the smaller unit was

[3] BioPA is a digital toolset available to hydropower turbine manufacturers, including Voith, the manufacturer of the StreamDiver, to aid in the design of the turbine. It models and estimates the risk of adverse effects or injury to fish during passage through a turbine and can help manufacturers design their product to limit or mitigate for rapid decompression, shear, strike and turbulence. For more information, please see https://hydropassage.org/biopa

approximately 80% and survival through the larger units was approximately 87%. This model assumed no bypass and a fish length of 6 inches.

Despite this relatively encouraging information from the model, the Applicant has chosen to introduce additional design elements into the Project to accommodate safer downstream travel for a more varied population of aquatic species. By installing an angled trash rack with narrow bar spacing, coupled with a continuous flow above the turbines, through a wetted notch flowing to a downstream ramp, the Applicant believes most species will find safer passage over the Dam than currently exists. At present, any downstream migrants are simply carried over the edge of the lower-level spillway by river flows. The trash rack bar spacing is designed to be between 12 and 14mm (0.5 in) with a through velocity of approximately 0.5 m/s during highest flows. This narrow bar spacing should keep all but the young-of-the-year sized fish out of the turbines completely. The intentionally shallow angle of the trash rack, currently designed at 8°, will also decrease chances of impingement or entrainment of adult fish. By creating this bypass, the majority, if not all, downstream migrants should pass with the flows, up and over the turbines.

During construction, temporary cofferdams above and below the Dam will divert River flows away from the lower-level spillway to the main spillway of the Dam. This will send the entirety of the flow over the main spillway, which will help ensure aquatic habitats downstream of the Dam are protected. The Applicant will construct during the low flow period and will keep in-water work as short a timeframe as is practicable. Any impacts because of this temporary coffer damming and construction should be minimal and short-term.

Once the Project is constructed, the Applicant will ensure appropriate conservation flows are maintained through monitoring. Sensors placed upstream and downstream of the StreamDiver turbines will record flow data in real time and allow for adjustments in the conservation flows to be made if needed.

In an effort to enhance downstream habitat, proposed conservation flows will be maintained at approximately 100cfs (subject to available flows) or a more appropriate volume as determined in consultation with USFWS and RIDEM once the Project is operational. This minimum flow was initially determined using the USFWS's Aquatic Base Flow (ABF) policy. In the absence of any site-specific data, the ABF policy recommends a generic, statistically derived base flow that approximates the unregulated August median flow.

7.2.2. Minimization of False Attraction Flows

Velocities through the StreamDiver turbines will be relatively slow, but the flow still has the potential to create a false attraction for upstream migrants. Since the upstream fish passage will be designed, but not installed in the immediate, the Applicant plans to use rocks and natural streambed features to dissipate the outflow from the turbines and minimize attraction flows. In addition, the upstream eel pass entrance will be located away from this fanned portion of the outflow to encourage eels to seek out the eel pass instead of the turbine outflow.

7.2.3. Wetlands

There will be no temporary and permanent impacts to delineated wetlands in the upland areas during construction of the Project. The Applicant will implement all applicable RIDEM and Town of

Cumberland BMPs, including but not limited to stabilization and erosion controls, use of hay bales, fencing, and additional measures, as needed to ensure existing upland wetlands impacts will be avoided.

The Project has been designed to avoid a small upland wetland located adjacent to the Project. This wetland within the Project Site delineated by Lucas Environmental, and confirmed by Natural Resource Services, Inc., did not appear, at the time of the survey, to provide significant beneficial habitat for reptiles, amphibians, and mammals. The limited size and proximity to existing development reduced the overall value of the habitat.

In collaboration with the USFWS, the Applicant will undertake an invasive species survey to identify existing invasive aquatic and terrestrial species within the Project Site. The locations of any invasives discovered will be mapped and a plan drafted to ensure the spread of such invasives is not exacerbated by the construction and operation of the Project. The plan will include specifications for both aquatic and terrestrial invasives and will draw guidance from existing state resources governing the treatment in invasive species. The plan will include a protocol in line with the RI Aquatic Invasive Species Management Plan or other guidance and may draw from a list of terrestrial invasives known to exist in Rhode Island (RIDEM Aquatic Nuisance Species Task Force, 2007; Rhode Island Natural History Survey (RINHS) 2013).

7.3. References

U.S. Army Corps of Engineers. (1997). *Blackstone River Watershed Reconnaissance Investigation, Vols. 1-2*. Retrieved from https://www.nae.usace.army.mil/Portals/74/docs/Topics/BlackstoneRestStudy/BRWInvestigationVol1.pdf
and
https://www.nae.usace.army.mil/Portals/74/docs/Topics/BlackstoneRestStudy/BRWInvestigationVol2.pdf

Rhode Island Department of Environmental Management. (2015). *2015 Rhode Island Wildlife Action Plan* Retrieved from http://www.dem.ri.gov/programs/fish-wildlife/wildlifehuntered/swap15.php

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United States Army Corps of Engineers. Engineer Research and Development Center. (2012). *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region.* (Report No. ERDC/EL TR-12-1). Retrieved from https://www.mvp.usace.army.mil/Portals/57/docs/regulatory/Website%20Organization/Northcentral%20and%20Northeast%20Regional%20Supplement.pdf

Aquatic Nuisance Species Task Force. *Rhode Island Aquatic Invasive Species Management Plan*. (2007). Retrieved from http://www.crmc.ri.gov/invasives/RIAIS_Plan.pdf

Rhode Island Natural History Survey. (2013). *Rhode Island Natural History Survey Invasive Species List for Plants Present in the State, October 2013*. Retrieved from http://rinhs.org/wp-content/uploads/2011/10/Rhode-Island-Invasive-Species_2013_b.pdf
and
https://dem.ri.gov/environmental-protection-bureau/water-resources/research-monitoring/aquatic-invasive-species-0

8. Terrestrial Vegetation and Wildlife

Professional wetlands scientists from NRS performed a wetland report on behalf of the Applicant in September of 2020, the findings of which are summarized below. The report, along with earlier wetland delineations, functions and values assessment and mesohabitat survey can be found at Appendix F.

8.1. Existing Conditions

Existing terrestrial vegetation and wildlife information has been collected through various ground surveys and reviews of published materials.

8.2. Terrestrial Vegetation

The upland Project Site is located within the Eastern Temperate Forest ecoregion and, more specifically, the Northeastern Coastal Zone sub-ecoregion. The area is currently vegetated with some mature trees as well as a scrub understory. The entire area shows evidence of past disturbance. It is known from review of historic aerial photography, the Project Site was once a canal, devoid of vegetation, later filled and allowed to revegetate over time.

PWS from Lucas Environmental performed habitat evaluations and wetlands and vegetative surveys on behalf of the Applicant on September 20-22, 2016. A comprehensive report is attached at Appendix F.

According to the report drafted by Lucas Environmental, some footpaths exist between the bike path and the area around the Dam, and there is evidence of previous disturbance. As currently field surveyed, the uplands have a dense overstory vegetated with a mix of sycamore (*Platanus occidentalis*), black oak (*Quercus velutina*), shagbark hickory (*Carya ovata*), and white oak (*Quercus alba*). The understory is vegetated with a mix of black cherry (*Prunus serotina*), red cedar (*Juniperus virginiana*), and invasive species such as burning bush (*Euonymus alatas*), glossy buckthorn (*Frangula alnus*), honeysuckle (*Lonicera sp*.), multiflora rose (*Rosa multiflora*), common buckthorn (*Rhamnus cathartica*), Virginia creeper (*Parthenocissus quinquefolia*), and oriental bittersweet (*Celastrus orbiculatus*). The herbaceous layer is vegetated primarily with poison ivy (*Toxicodendron radicans*), white snakeroot (*Ageratina altissima*), and seedlings of the overstory.

8.2.1. Terrestrial Wildlife

The area within the Project Site has been developed over the years from river bank, to channelized lowland, to filled upland with depressions, creating small wetlands. The Site is currently a narrow piece of land bordered to the west by the Blackstone River, to the east by developed upland containing an active railway and a paved recreational bike path, and to the south by a large impervious parking lot. Occurring within this narrow band is a highly disturbed site containing a small wetland offering little to no wildlife habitat and some upland forested area. The terrestrial wildlife likely to occur in this type of habitat include common species well adapted to fragmented ecosystems and those needing lesser amounts of geographical space. A listing of terrestrial wildlife observed (either directly or indirectly) at the Site can be found below.

The Project Area provides three distinct and adjoining habitats for terrestrial wildlife. The Blackstone River provides a permanent source of water and access to an open area for feeding and drinking, the banks of the river and other wetlands provide a transitional habitat for insects and amphibians, and upland forested areas provide foraging, shelter and canopy cover for birds and mammals. The larger wetlands and connected forested uplands north of the Project Area provide important habitat for wildlife and should not be affected by Project construction or operation.

As part of the wetland and habitat survey, Lucas Environmental compiled a list of wildlife observed and expected to be found at or in the vicinity of the Project Site. In addition, Natural Resource Services, Inc. is drafting the Applicant's wetland permit for submission to the State of Rhode Island and will confirm and edit this list as necessary. Wildlife directly or indirectly observed during initial field surveys, (including visual confirmation, and evidenced through scat or tracks) are briefly discussed below.

Reptiles

Based on information provided by the Lucas Environmental wildlife habitat evaluation reptile and amphibian species observed by PWS during site visits included: Redback Salamander (*Plethodon cinereus*), Pickerel Frog (*Lithobates palustris*), Eastern Painted Turtle (*Chrysemys picta picta*), Eastern American Toad (*Bufo americanus*), Green Frog (*Lithobates clamitans*).

Birds

Avifauna of inland Rhode Island consist of common songbirds, raptors and mostly freshwater aquatic species. The species expected and observed at the Project Site were noted by PWS during the Site visit conducted on September 22, 2016: Great Blue Heron (*Ardea herodias*), Hooded Merganser (*Lophodytes cucullatus*), Mallard (*Anas platyrhynchos*), Canada Goose (*Branta canadensis*), Mute Swam (*Cygnus olor*), Blue Jay (*Cyanocitta cristata*), American Crow (*Corvus brachyrhynchos*), Red-breasted Nuthatch (*Sitta canadensis*), Veery (*Catharus fuscescens*), Mourning Dove (*Zenaida macroura*), Downy Woodpecker (*Picoides pubescens*), Northern Flicker (*Colaptes auratus*), Eastern Phoebe (*Sayornis phoebe*), American Robin (*Turdus migratorius*), Gray Catbird (*Dumetella carolinensis*).

Mammals

Mammalian species common to fragmented, suburban and developed land are expected to occur in the Project Site. Lucas Environmental noted the expected species occurring in Rhode Island and recorded the presence of observed species while conducting a wildlife survey on September 22, 2016. Species observed include in-field sightings as well as evidence such as scat or footprints. Raccoon (*Procyon lotor*), Eastern Chipmunk (*Tamias striatus*), Gray Squirrel (*Sciurus carolinensis*), Coyote (*Canis latrans*), White-tailed Deer (*Odocoileus virginianus*).

8.3. Potential Impacts and Proposed Measures

The Site will be altered through removal of trees, removal of scrub shrubs and surface grubbing. The Project has been designed to clear and alter as small a space as practicable, while allowing safe staging and operational areas for the Project. Once operational only the gravel access area and footprint of appurtenant structures will remain altered. The remainder of the site will be reseeded with native vegetation and allowed to revegetate naturally. During construction, the soils will be stabilized to reduce runoff and it is expected any wildlife utilizing the area will move on to another nearby area. The small upland wetland will be protected through the use of BMPs such as silt fencing and hay bales. The access road has been designed to avoid this area and no fill will occur here. A retention basin will be constructed to ensure any runoff and stormwater is collected and filtered before it returns to the river.

No impacts to terrestrial vegetation and wildlife are expected as the result of Project operation. As mentioned, once construction is complete, the site will be stabilized and restored in collaboration with RIDEM and the Town of Cumberland.

Temporary impacts will occur during construction, as the result of Site preparation, staging, and in-water and upland construction activities, but BMPs will be implemented in accordance with applicable permits. Permanent impacts include the loss of existing overstory and understory at the Project Site. Replanting will occur in consultation with a R.I. certified landscape architect with the goal of maintaining access to the Project components, erosion control and localized visual screening if necessary. It is presumed most local wildlife, accustomed to disturbed areas will vacate the area upon human arrival and will return once construction activities cease and the Project is operational.

No specific additional measures are planned with regard to common vegetation and wildlife, as the vegetation conversion in the area will be kept to a small footprint and reseeded upon Project completion.

8.4. References

McNabb, W.H. and Avers, P.E. (1994). *Ecological Sub-Regions of the United States*. (Report No.WO-WSA-5). Retrieved from USFWS: http://www.fs.fed.us/land/pubs/ecoregions/

9. Rare, Threatened, and Endangered Species

According to a species list generated by the USFWS at the request of the Applicant, no critical habitat for federally threatened or endangered species exists within the Project Boundary. The species list did, however, identify the Project Boundary as falling within the range of the federally threatened northern long-eared bat. As a result of this finding, the Applicant commissioned additional field surveys within the Project Boundary which have been submitted to the Commission under Docket No. 14634.

Based on the type of habitat offered by the Blackstone River Valley, some areas have the potential to contain State Species of Greatest Conservation Need (RIDEM, 2015). Although no species are specifically listed as occurring in the Project Area or in the Blackstone River Valley, the following is a list of species that have the potential to exist in habitat similar to that of the Project vicinity. The list was compiled from the *2015 Rhode Island Wildlife Action Plan* (RIDEM 2015).

Mammal Species of Greatest Conservation Need Rhode Island:

- American Water Shrew (*Sorex (Otisorex) palustris*)
- Big Brown Bat (*Eptesicus fuscus*)
- Eastern Mole (*Scalopus aquaticus*)
- Eastern Red Bat (*Lasiurus borealis*)
- Eastern Small-footed (*Myotis Myotis leibii*)
- Hoary Bat (*Lasiurus cinereus*)
- Little Brown (*Myotis Myotis lucifugus*)
- Northern Long-eared Bat (*Myotis septentrionalis*)
- Silver-haired Bat (*Lasionycteris noctivagans*)
- Smoky Shrew (*Sorex (Otisorex) fumeus*)
- Southern Bog Lemming (*Synaptomys cooperi*)
- Tri-colored Bat *(Perimyotis subflavus*)

Fish Species of Greatest Conservation Need in Rhode Island:

- Alewife (*Alosa pseudoharengus*)
- American Brook Lamprey (*Lampetra appendix*)
- American Eel (*Anguilla rostrate*)
- American Shad (*Alosa sapidissima*)
- Blacknose Dace (*Rhinichthys atratulus*)
- Blueback Herring (*Alosa aestivalis*)
- Brook Trout (*Salvelinus fontinalis*)

Research and field observations at the Project Site in and around the Blackstone River has not shown evidence of these species. This may be due to the habitat fragmentation of the area including the nearby paved parking area, industrial buildings, railroad, and bike path. Many of the aquatic species may not appear in the Project Area because they face obstacles posed by a series of existing downstream dams.

9.1. Existing Conditions

Normandeau Associates performed an investigatory acoustic bat survey on behalf of the Applicant to determine the presence of the federally listed northern long-eared bat. Overnight acoustic recordings were made on August 3 and 4, 2016. There have been no significant changes to the Project Site or the area around the Project Site that would affect this assessment.

Recordings were post processed by bat call recognition software and any "hits" were then analyzed by a biologist specializing in bat call identification. Calls from three species, including northern long-eared bat (*Myotis septentrionalis*), big brown (*Eptesicus fuscus*), and eastern red bat (*Lasiurus borealis*) were recorded. Northern long-eared bat calls were identified by the recording software and confirmed by specialists at one of the two stations set up within the Site. The acoustic surveys at the Project also yielded calls identified as big brown bat (*Eptesicus fuscus*) and eastern red bat (*Lasiurus borealis*), neither of which are identified as threatened or endangered but are listed as Rhode Island State Species of Greatest Conservation Need as listed above.

At the time of this document drafting, no comprehensive listing of State Species of Concern or State Species of Greatest Conservation Need had been published identifying species found specifically in the Blackstone River. However, according to the *2015 Rhode Island Wildlife Action Plan*, several aquatic and terrestrial State Species of Concern may be located in the Project Area. Those species have been discussed in the preceding section.

Based on previous conversations with and recommendations made by RIDEM staff, special care will be taken in the design of the Project to safeguard specific historic species that may be targeted for restoration. Alewife (*Alosa pseudoharengus*), Blueback Herring (*Alosa aestivalis*), American Shad (*Alosa sapidissima*), and Atlantic Salmon (*Salmo salar*) were historically present in the Blackstone River (RIDEM, 2002). Additional species such as American eel (*Anguilla rostrata*), American brook lamprey (*Lampetro appendix*), blacknose dace (*Rhinichthys atratulus*) and common shiner (*Luxilus cornutus*), were identified by RIDEM as aquatic species of greatest conservation need in the State's *2015 Wildlife Action Plan*, as mentioned above, and have the potential to be found in the Blackstone River (RIDEM 2015).

In addition, all bat species found in the acoustic survey are listed as Rhode Island Species of Greatest Conservation Need and are "indicative of the overall health of the state's wildlife resources" according to the *2015 Rhode Island Wildlife Action Plan* (RIDEM, 2015). The Applicant recognizes the importance of Rhode Island's species of concern and will continue to consult with RIDEM throughout Project development.

Although specific species within the Blackstone River have been targeted for restoration, no fish pass or other upstream passage currently exists at the Ashton Dam or at any of the existing dams located downstream of the Ashton Dam. Because of this, upstream passage remains a challenge to known migratory species.

9.2. Potential Impacts and Proposed Measures

With regards to the acoustic confirmation of federally listed northern long-eared bat within the Project Area, the Applicant consulted with USFWS and completed a Streamlined Consultation per the USFWS's request. The Streamlined Consultation process informs the USFWS of Project impacts and lists

measures the Applicant will be expected to comply with to safeguard listed species. Project impacts to habitat will be kept to a minimum and the following measures will be implemented:

- Implement BMPs, in consultation with RIDEM, to avoid degradation of upland habitat.
- As recommended by USFWS, time of year tree cutting restriction will be adhered to from April 1 to October 31 of the year in which construction commences.
- If any listed species are discovered within the Project Site during construction, the appropriate agencies will be notified and additional precautions will be determined at that time.

With regards to aquatic species, the Applicant will include in Project engineering and design plans, a structure for upstream fish passage, to be constructed within three years of notification by RIDEM that fish passage is needed.

9.3. References

Rhode Island Department of Environmental Management (2015). *2015 Rhode Island Wildlife Action Plan* Retrieved from http://www.dem.ri.gov/programs/fish-wildlife/wildlifehuntered/swap15.php

Rhode Island Department of Environmental Management & Narragansett Bay Estuary Program. (2002). *Blackstone River Fisheries Restoration Plan.* (Report No. 02-120). Retrieved from https://lowimpacthydro.org/wp-content/uploads/2020/07/Blackstone-River-Fisheries-Restoration-Plan.pdf

10. Aesthetics and Recreation

The Blackstone River Valley is known as the birthplace of the industrial revolution in the United States. In 1986, Congress recognized the Valley's national, historical, and cultural importance through the creation of the Blackstone River Valley National Heritage Corridor (Public Law 99-647, 1986). In 2015 a boundary creating the Blackstone River National Historic Park was authorized. This led to the acquisition of the historic Old Slater Mill (ca. 1793), the Wilkinson Mill (ca. 1810) and the Sylvanus Brown House (ca. 1753) and associated lands by the National Park Service (NPS). In addition, on March 27, 2021, the State of Rhode Island conveyed an 85-acre conservation and preservation easement to the NPS. This area, previously managed by the Blackstone River State Park added assets such as the historic canal and the Captain Wilbur Kelly House Museum to the NPS's care and management (Blackstone River Valley National Historical Park, 2021).

The Project Site includes the Blackstone River as well as a wooded area on the eastern side of the Blackstone River abutting a heavily used recreational biking and walking path known as the Blackstone River Bikeway. In addition to the bike path, the Blackstone River provides opportunities for boating and fishing. These recreational activities are guided and promoted by Blackstone Heritage Corridor, Inc., the organization that manages the congressionally designated John H. Chafee Blackstone River Valley Heritage Corridor in partnership with the NPS and with support from many constituents such as river and recreation organizations.

10.1. Existing Conditions

The Project Site is not included in any federally designated National Wild and Scenic Rivers System, National Trails System or designated Wilderness Area according to the provisions of the Wilderness Act. The area does, however, contain important recreational resources.

Bikeway

The Rhode Island Department of Transportation (RIDOT) has constructed a series of bikeways, including the Blackstone River Bikeway running along the river. At the Project location, the Bikeway passes immediately to the east, forming the eastern boundary of the Project. The Bikeway also connects over a pedestrian bridge to the western side of the river and contains several trails along the canal and river.

Canoe and Kayak

The Blackstone River Valley National Heritage Corridor (Blackstone Heritage Corridor) offers maps and provides information for self-guided paddling of the Blackstone River. Much of the River is navigable by kayak or canoe and several dams have accessible portages around them. (Blackstone Heritage Corridor, 2021). River and canal access is just below the Project site on the western side of the river, opposite the Project. It provides access to the Blackstone Canal that runs parallel to the river (Blackstone Heritage Corridor, 2006). The Blackstone Canal was built between 1824 and 1828 to carry cargo from the river mills to the port of Providence (National Park Service, 2017). It is now an integral part of the recreational system where paddlers can enter the River below the Ashton Dam, paddle downstream to the Pratt Dam, portage on the Bikeway and paddle the canal back northward to just below the Project Site and exit back into the parking area (Blackstone Heritage Corridor, 2006). Although the portages shown on maps are marked or maintained by NPS or the Blackstone Heritage Corridor, they are widely accepted and appear to be used.

Additionally, it is possible to portage around the Ashton Dam on the eastern side of the river, where the Project will be located. The Applicant has noted an eroded area above the dam and another eroded area downstream of the dam with an unmarked, unmaintained footpath connecting the two, crossing through the Project Site. This side may be less accessible at higher flow times because currently the majority, and often times the entirety, of the river flows pass through the lower-level spillway located on the eastern side. Because the flows are concentrated along the eastern shore, re-entry to the river may be more difficult at this location.

10.2. Potential Impacts and Proposed Measures

During construction, the portage area on the eastern riverbank will be temporarily inaccessible. Temporary cofferdams will direct river flows over the main spillway of the Dam, and paddlers will need to use caution to avoid these flows and to exit the River at the take-out point on the western side. During construction, views of equipment and constriction activity will be apparent to anyone utilizing the River or the bike path. In addition, the bike path will be closed to recreational users on occasion to transport equipment and materials to the site. This usage will be short-term, and signs will be posted giving clear warning of the time and impact of the closure. Access to the River for fishing will also be temporarily restricted during construction for safety purposes.

Views of the construction from the Bikeway on the western side of the River will be limited by intervening mature forest. Views from the bike path on the eastern side of the River, though fleeting, will offer visitors a chance to see some of the Project components during construction.

Once operational, the use of the bike path will be extremely limited and reserved for emergency use or necessary maintenance. Signage will inform viewers from the bike path about the Project and historic use of the Blackstone River to generate power. Also, portage of paddle craft around the Project Site will be reinstated once safe to do so. As flows will still be stronger on the eastern bank of the River than the western, paddlers may opt for the western side. Overall, the only anticipated impact from Project operations would be a modified and slightly longer portage trail on the eastern bank.

Project structures will be surrounded by safety fencing and access gates will remain locked. Public safety officials will have access to the structures 24 hours a day, in the case of an emergency. In addition, the Project facility will be electronically monitored and visible to the Applicant and select others through remotely operated cameras.

The Project Site will be professionally maintained and the structures will follow the aesthetic of the existing Dam structures. In addition, educational signage may be placed at appropriate locations to educate recreational users of the area about the benefits of the Project and the historic use of the Blackstone River. Once operational and safe to do so, individuals wanting to access the riverbank to fish will not be restricted.

10.3. References

Blackstone Heritage Corridor. (2017). Blackstone River and Paddling. *Blackstone River Heritage Corridor Search Results for "Paddling"*. Retrieved from https://blackstoneheritagecorridor.org/wp-content/uploads/2015/07/B-state-park-to-Pratt-Int-11x17.pdf

National Park Service. (2017). *Massachusetts and Rhode Island: Blackstone River Valley National Heritage Corridor*. Retrieved from https://www.nps.gov/articles/blackstone.htm

11. Socioeconomics

The Ashton Dam spans the Blackstone River, which serves as the boundary between the Towns of Lincoln and Cumberland, RI. Cumberland lies on the eastern side of the River and Lincoln is on the western side. Both towns are accessible by major highways I-95 and I-295 as well as state highways.

11.1. Existing Conditions

Cumberland

Cumberland is the northeastern most Town in Providence County and is just north of the two metro areas of Providence and Pawtucket RI. It is approximately 32 miles southwest of Boston. Cumberland is an example of a river mill town that has evolved into a suburban community. The efforts to retain the Town's past character and preserve its open space for future generations are mentioned as primary goals in its 2016 Comprehensive plan (Town of Cumberland, 2016).

The Town of Cumberland covers 28.4 square miles and has a population of approximately 34,000 people based on 2015 data (United States Census Bureau (US Census), 2015). The median family income for Cumberland in 2015 was estimated at $89,587 and the median house value was $248,900, both of which are slightly above the State median values (US Census. 2015).

Cumberland has a comprehensive Economic Development Plan that provides for a mix of industrial/commercial zoning in the multi-town Broad Street Regeneration Initiative (Town of Cumberland, 2016). This corresponds to residents' wishes to cluster new development in village and town areas and offer no more open space to large development.

Lincoln

Lincoln is located just west of Cumberland and encompasses approximately 18.9 square miles with a population of just over 21,300, according to 2015 data (US Census, 2015). Lincoln resides in Providence County, 37 miles southwest of Boston, MA and just north of the metro areas of Providence and Pawtucket, RI. The median family income of Lincoln is $86,800 with a median house value estimated at $264,800 both of which are slightly above the state median values (US Census, 2015).

The Town of Lincoln's Comprehensive Plan focuses on the balance between development of industry and business, growth of a variety of housing options, support of necessary infrastructure projects and preservation of open space (Town of Lincoln, 2017). The town recognizes the importance of the Blackstone River Heritage Corridor as a local and regional asset.

Ashton Dam

In preparation for Project licensing, the Ashton Dam has been researched and surveyed and is in good condition. Routine maintenance of Project components will be needed, but major improvements are not expected. The Dam has been unpowered for decades but is not slated for removal as it currently provides flood control. Restoration of hydropower to the Dam is not a development specifically prohibited by either town. The town of Cumberland passed a zoning ordinance update in 2019 allowing small hydropower projects by special use permit.

State Initiatives

The Applicant also reviewed other State of Rhode Island plans and initiatives to ensure the Project would be in concert with the plans' intentions. Executive Order 14-01 signed February 21, 2014 establishes Rhode Island's Executive Climate Change Council[4]. The Governor of Rhode Island, recognizing that climate change is having, and will continue to have, negative effects on the state, established the council to, among other things, investigate, evaluate and implement measures to combat and reduce the state's contributions to climate change. The Project certainly promotes the intent of the Order by offering into the grid, low impact, zero-emissions energy and helping to reduce Rhode Island's carbon footprint.

A review of all applicable and relevant comprehensive and management plans discovered through publicly available research is summarized in the table below. Several plans were deemed completely irrelevant to the Project and were not included in the table. Those below with a designation of NA (Not

[4] The full text of the Executive Order can be found here: https://theicnet.org/wp-content/uploads/2015/07/2014-03-RI-Executive-Order-CC-2014.pdf

Applicable) were reviewed based on the initial appearance of applicability and/or the belief that the Applicant needed to review said plan to better determine its applicability to the Project. Several plans designated as NA were reviewed based on a list supplied in a Deficiency Notice issued by the Commission on January 28, 2022 at https://cms.ferc.gov/media/list-comprehensive-plans

Plan Reviewed	**Project complies, does not comply, or plan is not applicable**	**Explanation**
Cumberland Comprehensive Plan	Complies	Of the numerous goals set forth in the Town Comprehensive Plan, the Project will comply with the overall goals of improving an underutilized resource, creating sustainable energy for local use, and falls within the designated zoned uses for the area.
National Park Service General Management Plan	NA	This Plan is not yet complete. The Applicant will review the Plan for compliance once it is drafted.
RI Comprehensive Emergency Management Plan	Complies	This Plan consists of several programs covered by the requirements set forth by FERC Dam Safety. The Project has been designed to minimize flood, comply with all state and federal Dam Safety regulations, mapping, floodplain management, insurance, emergency operations and failure planning requirements.
RI Ocean Special Area Management Plan	NA	This Plan applies to oceanic resources. The Project does not lie within the CZMA Coastal Zone and is located on the Blackstone River approximately 39 (straightline) miles away from the Ocean Special Area Management Boundary and its construction and operation will have no bearing on the management of this Special Area.
Atlantic States Marine Fisheries Commission Addendum to the Fishery Management Plan for inshore stocks of Winter Flounder	NA	This Plan applies to oceanic and estuarine resources and habitats. The Project is located on the Blackstone River approximately 8.5 river miles upstream from the closest listed migrating Winter Flounder habitat.
Atlantic States Marine Fisheries Commission Interstate Fishery Management Plan for Atlantic Striped Bass	NA	This Plan applies to oceanic and estuarine resources and habitats. The Blackstone River flows approximately 6.7 river miles from the Project location before reaching the farthest upstream estuarine area. Plans for maintaining and enhancing Atlantic Striped Bass populations and habitat will not be impacted by the Project.
Atlantic States Marine Fisheries Commission Interstate Fishery Management Plan for Weakfish	NA	This Plan applies to oceanic and estuarine resources and habitats. The Blackstone River flows approximately 6.7 river miles downstream from the Project location before reaching the farthest upstream estuarine area. Plans for maintaining and enhancing Weakfish populations and habitat will not be impacted by the Project.

Plan Reviewed	Project complies, does not comply, or plan is not applicable	Explanation
Atlantic States Marine Fisheries Commission Amendment 1 to the Interstate Fishery Management Plan for Atlantic Sturgeon	Complies	This Plan provides guidance for the management of Atlantic Sturgeon and their habitat. Although these fish migrate upriver to spawn, several dams lacking fish passage remain on the Blackstone River, downstream of the Project. As a result, Sturgeon cannot currently migrate up the Blackstone. As part of the Project licensing, a fish pass will be designed into the plans for implementation when and if the downstream becomes passable to migratory species. This mitigation measure puts the Project in compliance with the Plan.
Atlantic States Marine Fisheries Commission Amendment 1 to the Interstate Fishery Management Plan for Shad and River Herring	Complies	This Plan provides guidance for the management of Shad and River Herring and their habitat. Although these fish migrate upriver to spawn, several dams lacking fish passage remain on the Blackstone River, downstream of the Project. As a result, Shad and River Herring cannot currently migrate up the Blackstone. As part of the Project licensing, a fish pass will be designed, with input from regulatory agencies, into the plans for implementation when and if the river downstream becomes passable to migratory species. This mitigation measure puts the Project in compliance with the Plan.
Atlantic States Marine Fisheries Commission Interstate Fishery Management Plan for American Eel	Complies	This Plan provides guidance for the management of American Eel and their habitat. These fish migrate upriver and downriver, and regularly find their way past several dams lacking fish passage downstream. Because these migratory fish currently reside in and around the Project area, the Applicant will install upstream and downstream eel passage as part of the Project construction. This measure will enhance eel passage in the area where currently there is none.
NOAA Fisheries Atlantic Sea Scallop Management Plan	NA	Although NOAA Fisheries maps show the estuarine areas of Rhode Island, including the approximate location of confluence of the Blackstone River with the Seekonk River, as *the Georges Bank/Southern New England Scallop Dredge Exemption Area*, it is highly unlikely Sea Scallops would be found in an area dominated by fresh water flows. The Project will not impact the management activities put forth in this Plan.
NOAA Fisheries Priority Actions 2021-2025, Atlantic Salmon Plan	Complies	This Plan provides for the management of Atlantic Salmon, an anadromous and endangered species. Wild Atlantic Salmon inhabited most coastal rivers along the Atlantic north of the Hudson River in New York prior to the widespread installation of dams. The species is monitored carefully in Maine where the only known wild populations still exist. As several dams lacking fish passage remain on the Blackstone River, downstream

Plan Reviewed	Project complies, does not comply, or plan is not applicable	Explanation
		of the Project, Salmon cannot currently migrate up the Blackstone. As part of the Project licensing, a fish pass, designed with input from and approval by regulatory agencies, will be designed into the plans for implementation when and if the river downstream becomes passable to migratory species. This mitigation measure puts the Project in compliance with the Plan.
NOAA Fisheries Recovery Plan for Shortnose Sturgeon	Complies	When the initial Recovery Plan was drafted, it was noted that no known populations existed in or around the Blackstone River. That said, historically, Shortnose Sturgeon and Atlantic Sturgeon have been known to co-occur in the same river systems. As they are known to spend more time in rivers than the open ocean, the Applicant is aware of the importance of consideration of this species. The Project plans will include fish passage design, for implementation at a later date, and as dictated by state and federal wildlife agencies. This mitigation measure puts the Project in compliance with the Plan.
Rhode Island DEM Strategic Plan for the Restoration of Anadromous Fishes to Rhode Island Coastal Streams	Complies	The Project will not have a negative effect on the implementation of this Plan, whose objective is to identify where anadromous fisheries restoration initiatives should be conducted. By designing a fish ladder to be installed at a later date, at the direction of state and federal agencies, the Applicant is mitigating for undesired effects of the Project's construction and operation in an area targeted for eventual fisheries restoration.
National Park Service Nationwide Rivers Inventory	NA	This inventory documents the locations of "free-flowing river segments in the U.S. that are believed to possess one or more "outstandingly remarkable values." The Blackstone River does not contain any listed segments.
Rhode Island Department of Environmental Management and Narragansett Bay Estuary Program Blackstone River Fisheries Restoration Plan	Complies	The Project will not have a negative effect on the implementation of this Plan, whose objective is to identify ways to restore anadromous fish to the Blackstone River. By designing a fish ladder to be installed at a later date, at the direction of state and federal agencies, the Applicant is mitigating for undesired effects of the Project's construction and operation in an area targeted for eventual fisheries restoration.
Rhode Island Wildlife Action Plan	Complies	The Applicant has consulted with the Rhode Island Department of Environmental Management and has been informed that as a part of the Project, a migratory fish ladder will be designed with the intent it be constructed when fish are discovered downstream. Currently, several downstream barriers exist,

Plan Reviewed	Project complies, does not comply, or plan is not applicable	Explanation
		prohibiting the movement of migratory species of concern in this area of the Blackstone River. Eel passage for both upstream and downstream movement will be included in the construction of the Project, as these animals are known to be in the vicinity.
U.S. Fish and Wildlife Service Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service	Complies	This Plan promotes ways to enhance recreational fishing through habitat and fisheries restoration as well as balancing the needs of future development projects with increasing demands for recreational fishing. The Project will not conflict with this plan as it will allow for recreational fishing space once constructed and operational. In addition, upstream fish passage will be designed into the Project plans for implementation at a later date, enhancing anadromous fisheries.
Rhode Island Shellfish Management Plan	Complies	The Applicant has undertaken a freshwater mussel survey to identify any freshwater mussels.
Rhode Island Shoreline Change Special Area Management Plan	NA	This Plan addresses coastal erosion and shoreline use issues. The Project will not impact the concerns raised by the Plan.
Rhode Island Comprehensive Nutrient Management Plan	NA	This Plan addresses wastewater issues created by manure handling and storage. These activities will not occur at the Project Site.
Rhode Island Forest Action Plan	NA	This Plan sets forth goals for managing the State's forests. The Project site is not in state forest land but contains approximately 0.5 acres of mixed scrub shrub and trees located between commercial buildings, a paved trail, a railroad and the Blackstone River.
Rhode Island Long Range Transportation Plan	NA	The newest version of this Plan is still in development. It addresses the goals and strategies to efficiently move people and goods throughout the State of Rhode Island. The Project is too small and does not include transportation infrastructure. Its construction and operation will not have an impact on the goals set forth in this Plan.
Rhode Island Rising: A Plan for People, Places and Prosperity (Economic Development Plan)	Complies	Although this Plan does not specifically address hydropower, it mentions goals of enhancing aspects of a cleantech economy resilient to the stresses of climate change. The Project supports that goal by supplying locally produced, clean energy into the grid.
Energy 2035, Rhode Island State Energy Plan	Complies	This Plan encourages the integration of all renewable energy sources, including hydropower, to broaden Rhode Island's energy supply and reduce greenhouse gas emissions.
Protecting Our Legacy of	Complies	This Plan describes the initiatives undertaken to

Plan Reviewed	Project complies, does not comply, or plan is not applicable	Explanation
Buildings, Places, and Culture: An Historic Preservation Plan for Rhode Island		recognize, preserve and protect historic structures and areas in the State of Rhode Island. It recognizes that where progress and history collide, mitigation measures may suffice to keep the knowledge of history alive. The Project complies with the intent of this Plan as it has gone through the Section 106 process, including consultation with interested parties and a mitigation plan is being developed for the portion of the historic structure that will be redeveloped.
Ocean State Outdoors: Rhode Island's Comprehensive Outdoor Recreation Plan	Complies	The Project complies and is consistent with the goals of this Plan to enhance and encourage public use of outdoor recreational opportunities. Construction of the Project will temporarily limit access to the site for recreation for safety reasons. Once complete, the area near the Project will once again be accessible for fishing and general public access. In addition, the adjacent bike path will be utilized at limited times for transport of equipment to and from the site. A plan is in progress to inform the public as to when these limited closures will occur.
A Greener Path: Greenspace and Greenways for Rhode Island's Future	Complies/NA	This Plan supports the expansion and maintenance of open space and greenways throughout Rhode Island. The Project does not specifically comply nor conflict with this Plan simply because of the small size and undesignated use of the greenspace near the Project. Although some recreational uses of the Project area will be restricted during construction, most of the area will be opened up for recreation once the Project is complete.
Rhode Island Comprehensive Solid Waste Management Plan	NA	This plan acknowledges the limitations of landfilling solid waste in the State of Rhode Island. The Project will create very little in the way of solid waste and will not contribute to the State's need to limit and plan for solid waste disposal.
Rhode Island Water 2030	Complies/NA	This Plan focuses on the drinking water supply for the State of Rhode Island. The Project will not impact the quality or the ability to extract either ground water or surface water for consumption within the State. Best Management Practices will be employed during construction to ensure no contamination of water sources by construction equipment and the least amount of sedimentation generated as is practical.
Water Quality 2035	Complies	This Plan describes practices and recommendations with respect to water quality areas. As part of Project licensing, the Applicant will obtain a 401 Water Quality Certification. The Applicant will ensure Best Management Practices are employed to reduce any

Plan Reviewed	Project complies, does not comply, or plan is not applicable	Explanation
		sedimentation and runoff during construction. Once operational, the Project will adhere to specific operating parameters to reduce, to the greatest extent practicable, any negative effects on water quality. Design provisions such as reducing turbulence upon discharge of tailwater, minimizing erosion, and operating at specific flows will help ensure no negative effects on water quality.

11.2. Potential Impacts and Proposed Measures

No negative impacts to either Town are expected as a result of the construction and operation of the Project. As a zero-emissions, renewable energy site, the Project is likely to draw positive attention to the Towns. The construction of the Project will be a beneficial use of a now undeveloped site.

There will be no negative effects on socioeconomics during construction. Construction will provide temporary employment opportunities in Cumberland and Lincoln. Local firms, technicians and professionals have been, and will continue to be, utilized when and where appropriate, benefiting the local economies. Construction crews will follow established town rules and ordinances (lighting, noise, fugitive dust, weight limits, etc.) and will utilize local businesses for meals, fuel and other necessities related to their construction activities at the Site.

During Project operations, the public, educators, potential developers, and regulators can be expected to visit and learn about the advanced technology available to generate low-impact hydropower. The increased visitation to the area will benefit local restaurants and other small businesses.

The Project is not anticipated to increase demand for public services such as fire, police or emergency medical technicians, or to increase public school enrollments. Once operational, the Project will be remotely operated and have the capacity to shut down as required by the towns or in response to emergency conditions. As a result of this remote and automatic operation, no full-time personnel will be required at the Project Site. Therefore, there will be no increased demand for housing and only a temporary increase in traffic during construction.

The Project follows the intent of both the Cumberland and Lincoln comprehensive plans by utilizing a small parcel in a highly developed area to generate clean, renewable energy. It also advances the initiatives set in place by the state of Rhode Island to achieve higher renewable energy goals. Generating clean power on a river traditionally known for its industrial uses also restores a productive purpose to the Ashton Dam.

Finally, environmental justice principles are not applicable to the Project. Presidential Executive Order No. 12898 states the goals of environmental justice considerations should include "…addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…" (1994). Neither Cumberland nor Lincoln is considered an environmental justice community. The closest

community is Central Falls, located at the southern borders of both Cumberland and Lincoln (RIDEM, n.d.).

Regardless of the fact that neither Cumberland nor Lincoln is considered an environmental justice community, the nature of the Project ensures no detriment to human health and very little in the way of environmental effects. Although the Project is being constructed to generate electricity, it will do so in an environmentally friendly and renewable way. The electricity created by the Project will offset approximately 1,341 metric tons of carbon emissions annually (EPA, 2022).

11.3. References

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Town of Lincoln, RI. (2003). *Town of Lincoln Comprehensive Plan*. Retrieved from http://www.lincolnri.com/cms/Planning/comprehensive%20plan%202003/01%20Table%20of%20Contents%20and%20Introduction.pdf

Exec. Order No. 12,898 59 Fed. Reg. 32 (Feb. 11, 1994)

Rhode Island Department of Environmental Management (Cartographer). (n.d.). Static Map of E.J. Areas. [Location map]. Retrieved from http://www.dem.ri.gov/envequity/graphics/ejareas.jpg

12. Historic and Archaeological Resources

Under Section 106 of the National Historic Preservation Act (16 USC § 470 et seq, 2006) and its implementing regulations (36 CFR Part 800, 2012), federal agencies must take into account the effect of any proposed undertaking (such as the Project, which requires a federal license) on properties listed or eligible for listing in the National Register of Historic Places (NRHP) (termed 'historic properties'). This requires, in part, notifying the State Historic Preservation Office (SHPO), applicable federally recognized Native American Tribal Nations, and the federal Advisory Council on Historic Preservation about an undertaking, and offering these entities a reasonable opportunity to comment.

12.1. Existing Conditions

The Project Site resides in the U.S. Congressionally designated John H. Chafee Blackstone River Valley National Heritage Corridor. The Corridor is overseen by Blackstone Heritage Corridor, Inc. (BHC), a 501(c)(3) non-profit corporation that works in partnership with a broad variety of organizations and residents to preserve and promote the Valley's historic, cultural, natural and recreational resources. The Blackstone River Valley National Historical Park, was established in 2014 and the two organizations work in concert to manage the area.

In July of 2021, the boundary of the Blackstone River Valley National Historical Park was finalized and now includes a federal conservation easement over approximately 85 acres of land as well as the Blackstone Canal on the Lincoln side of the River (NPS, 2022). See:(https://www.nps.gov/blrv/planyourvisit/basicinfo.htm)

The Blackstone River Valley was designated a National Heritage Corridor by the U.S. Congress in 1986. This designation recognized the area as the birthplace of the American Industrial Revolution in the late eighteenth century and established its importance in this revolution. Critical to the success of the Industrial Revolution in the Valley was the harnessing of the water power resources of the Blackstone River. During this period, virtually every mile of the Blackstone River was dammed to harness its power, thereby changing the natural character of the River (USACE, 1994).

The damming of the Blackstone River, along with the dumping of industrial waste and sanitary sewage, significantly degraded the integrity, water quality, and sediments of the River for decades. Recognition of the scope and complexity, as well as the interrelationship of the impacts to the River, of this history of damming and dumping, has resulted in a series of federal and state initiatives intended to restore flow regimes and aquatic habitat, to support the restoration of significant fisheries, and to improve the integrity and infrastructure of the Blackstone River Valley National Historic Corridor (USACE, 1994).

The Ashton Dam is considered a contributing resource to the Ashton Historic District which is listed in the National Register of Historic Places

12.2. Known and Potential Archaeological and Cultural Resources at and Near Site

The Applicant originally consulted with the Rhode Island Historical Preservation and Heritage Commission (RIHPHC) in 2017 and in May 2021 received notice that no archaeological survey work would be warranted at the Ashton site. There are no known archaeological resources at or near the site, as it is a small, fragmented and previously disturbed location. The Project vicinity consists of several structural components including the Ashton Dam, associated gating structures on the River and on the Canal, the Blackstone Canal, and remnants of the Canal towpath. The Project Site lies on the eastern side of the River adjacent to the Ashton Dam and its associated gating structures.

In January 2022, the NPS submitted a Study Request to the Applicant, intended to assess the effects of the proposed hydroelectric development on Ashton Dam and the Blackstone Canal which are both listed on the National Register of Historic Places (NPS, 2022). NPS posed the following questions:

Question 1: Analyze the impact of removing the easternmost river left (looking downstream) position of the stone masonry dam and replacing it with two submerged concrete bays on the stability of the remaining historic structure, including the east abutment in the Town of Cumberland, the drain gate pier, and the remaining ~ 203' overflow dam section and west abutment.

Question 2: Analyze the impact of raising normal pool elevations in the head pond by 2' on Ashton Dam, its abutments, and historic stone bank protection above and below the dam.

Question 3: Assess effects of increased water levels and project operations on the Blackstone Canal with particular attention to the stability of historic stonework at the head of the canal and any need for new or

restored control structures to manage the flow of water into the canal and protect the segment downstream.

Question 4: Assess the visual impacts of project works, including those not detailed in the current license application, on Ashton Dam, the Blackstone Canal, and the Ashton Historic District.

The Applicant, in response to the NPS concerns raised, contracted with Kleinschmidt Associates and with the Public Archeology Laboratory to address the stated concerns. The conclusions, which are described in Appendix H and include specific details about the Area of Potential Effect (APE), determined that there would be no impacts on physical stability of the Dam, its supporting structures, or the Blackstone Canal. There will be an adverse visual impact, about which the Applicant will consult with the RISHPO and the Town of Cumberland.

The NID lists the Ashton Dam as having been completed in 1885 (NID, 2017). The Dam served to provide and control water levels into the Ashton Mill. The Dam is listed in the buildings inventory and is located in the Ashton Historic District (RIHPC, 1998).

The Ashton Historic District (NRIS ID 84000367) encompasses "roughly Mendon, Scott, and Old Angell Roads and Store Hill Road, and Front and Middle Streets" according to the National Register of Historic Places Inventory Nomination Form (USDOI, 1982).

The Town of Cumberland Historic Districts overlay map shows that while the Ashton Dam structure is not within State Registered Historic Districts, the property along the Blackstone River is included, and extends upstream from the Dam approximately 220 ft., and downstream approximately 887 ft. to the Ashton Viaduct at Route 166 and continues downstream 1,300 ft. (MapGeo, 2016). In the Town of Lincoln, no historic overlay district exists.

The Ashton Viaduct (constructed 1934-1945) carries Route 116 across the Blackstone River and was determined by a RIDOT 1987 study to be formally eligible for NRHP registration (Town of Cumberland, 2016).

Ashton Mill was originally constructed in 1867 as an expansion of the Lonsdale Company, replacing the company's earlier mill located on the Lincoln side of the river (USDOI, 1982). The Ashton Mill originally produced cotton textiles, like many of the mills along the Blackstone, and it may have been the site of the first large scale use of the Sawyer spindle, an early high-speed spindle (USDOI, 1982). It was originally powered by both water and steam engine, necessitating the need for direct access to water, which ran through a canal dug along the riverbank specifically to feed the mill. In 1935, the mill ceased manufacture of textiles and was purchased six years later by the Owens-Corning Company, to produce glass fibers (USDOI, 1982).

The mill building has been renovated for residential use and has been renamed "River Lofts at Ashton Mill" overlooking the Blackstone River.

The Blackstone Canal (Canal) was proposed in the 1790s and constructed between 1824 - 1828 to provide water transportation for raw materials and goods between Worcester, MA and Providence, RI. The Canal parallels the Blackstone River along its 46-mile length. Tow paths ran the length of the Canal to accommodate draft animals used to move the canal boats. The Canal was constructed largely by hand, dug with pickaxes, shovels, and spades.

The Canal was not economically successful, and in 1847, with the opening of the Providence & Worcester Railroad, it closed. In many locations along its 46-mile length, the Canal Trench was converted to power canals to serve existing and new mills.

The full length of the Canal is listed in the National Register of Historic Places as two separate districts, one in Massachusetts and one in Rhode Island. The best-preserved section of the Canal runs through the Town of Lincoln, RI, within the Blackstone River Park (NPS, 2011).

In April 2021, the National Park Service commissioned an assessment of the section of the Canal beginning just north of the Ashton Dam at the intake to the Canal from the Blackstone River and extending south approximately one mile in Lincoln, RI. (Building and Monument Conservation, September 2021).

The findings of the 2021 Assessment were laid out for the dry laid stone retaining walls, the mortar laid retaining walls, and the 1902-constructed concrete buttresses:

> **Dry Laid Stone Walls (Constructed Without Mortar)**. The walls were constructed from flat pieces of slate and shale. The outcroppings of stone are composed of some form of igneous stone that does not resemble any of the stones used to construct the walls.
>
> The purpose of the walls was to maintain the width and depth of the Canal by preventing the collapse of the edge of the soil embankment and limit the amount of sediment entering the Canal.
>
> Virtually all of the walls are leaning inward toward the Canal such that the upper courses are cantilevered over the lower portions of the walls. The unrestrained growth of trees alongside the walls has contributed significantly to the collapse of the sections of the walls adjacent to the trees. Sections of the walls in the direct path of stream flows have toppled.
>
> **Mortar Laid Walls and Buttresses**. The mortar walls are generally located at the northern end of the Blackstone River Park and are associated with the intake of water from the Blackstone River into the Canal. In addition to the mortar laid walls, there are two concrete buttresses and a sluice gate dated from 1902.
>
> Sometime in 1970, rip rap was dumped into the Canal entrance to reduce the flow of water into the Canal. The rip rap blocking the Canal entrance eliminated the utility of the granite steps and landing that were constructed at some point earlier to provide canoe portage around the Ashton Dam. The granite steps have heaved and are heavily damaged.
>
> The concrete buttresses that flank the Canal, constructed in 1902, have reached the end of their service life. The concrete is spawling and cracking and are not structurally sound enough for reuse. The only viable option, from an historical perspective, is to document the buttresses and then replace them with new buttresses (Building and Monument Conservation, September 2021).

Myjer, I., Building and Monument Conservation; *Blackstone Canal, Blackstone River State Park, Lincoln, RI, Masonry Assessment Report* (September 17, 2021).

12.3. Potential Impacts and Proposed Measures

The Project proposes reconstructing the low flow spillway at the Ashton Dam but does not anticipate adverse impacts to the Ashton Dam. The Project will not adversely affect the downstream Ashton Mill, or the Blackstone Canal. During construction, visual impacts will be apparent as the area where the lower-level spillway sits, along with the upland adjacent to the Dam will become a construction site. The finished Project will be kept in scale and harmony with the surrounding area and the StreamDiver units will be underwater. In addition, the Project will once again restore the historic use of the Ashton Dam and revive the use of hydropower within the Blackstone River Heritage Corridor.

The RIHPHC determined that the introduction of a small hydropower project into an historic district, on an historic resource such as the Ashton Dam, will have impacts to the nature of the resources. The construction of the Project will introduce visual aspects not currently within the viewshed. It will also physically alter the historic dam structure.

The Applicant previously consulted with the RIHPHC to determine the level of mitigation appropriate for the installation of the Project. The RIHPHC concluded documentation of the existing structures, mindful visual design of Project components, educational signage, and the drafting of an Historic Properties Management Plan would provide the level of mitigation necessary. The Applicant plans to perform these tasks as part of the licensing process.

The Applicant previously notified the Narragansett Tribal Offices by submission of earlier materials (substantially similar to this submission) and received no input or response on those materials. THPOs will be notified again of this submission and given opportunity to comment if desired.

In summary, this small innovative renewable energy project will restore hydropower to this reach of the Blackstone River, a use consistent with historic industrial activities in the Towns of Cumberland and Lincoln as well as the Blackstone River Valley. Following commencement of Project operations, the Applicant proposes to develop and install educational signage to relate to the public the historic legacy of hydropower in this part of the Heritage Corridor and to explain the use and benefits of low-impact hydropower as installed and operated at the Ashton Dam.

12.4. References

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