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Renewable

July 19, 2021

VIA ELECTRONIC FILING

Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20246

**Re: Topsham Hydro Partners Limited Partnership
Pejepscot Hydroelectric Project, FERC Project No. 4784-106
Request for Trial-Type Hearing on Disputed Issues of Material Fact and
Alternative Prescriptions**

Dear Secretary Bose,

Pursuant to Section 18 of the Federal Power Act, 16 U.S.C. § 811, Part 45 of the regulations of the U.S. Department of the Interior (“Interior”), 43 C.F.R. Part 45, and Part 221 of the regulations of the U.S. Department of Commerce (“Commerce”), 50 C.F.R. Part 221, on July 19, 2021, Topsham Hydro Partners Limited Partnership (“Topsham Hydro”), Licensee of the Pejepscot Hydroelectric Project No. 4784 (“Project”), submitted to Interior’s Office of Environmental Policy and Compliance and to the National Marine Fisheries Service’s Office of Habitat Conservation a Request for Trial-Type Hearing on Disputed Issues of Material Fact pertaining to the preliminary Section 18 fishway prescriptions filed by Interior and Commerce with the Federal Energy Regulatory Commission on June 17, 2021. Topsham Hydro also submitted an Alternative Prescription pursuant to Section 33(b) of the FPA, 16 U.S.C. § 823d, to both Interior and Commerce.

A copy of Topsham Hydro’s Requests for Trial-Type Hearing and Alternative Prescriptions is attached hereto for inclusion in the relicensing docket for the Project.

If you have any questions regarding this filing or require additional information, please contact me by phone at (207) 755-5613 or by email at Luke.Anderson@BrookfieldRenewable.com.

Respectfully submitted,



Luke T. Anderson
Manager, Licensing
Brookfield Renewable

Enclosures

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July 19, 2021

VIA ELECTRONIC DELIVERY AND U.S. MAIL

Stephen G. Tryon, Director
Office of Environmental Policy and Compliance
United States Department of the Interior
1849 C Street, NW
Mail Stop 2629
Washington, DC 20240

**Re: Topsham Hydro Partners Limited Partnership
Request for Trial-Type Hearing on Disputed Issues of Material Fact and
Alternative Prescription Pertaining to a Preliminary Section 18 Fishway
Prescription Submitted to the Federal Energy Regulatory Commission by the
United States Department of the Interior for the Pejepscot Hydroelectric
Project, FERC Project No. 4784-106**

Dear Mr. Tyron:

Pursuant to Section 18 of the Federal Power Act, 16 U.S.C. § 811, and Part 45 of the regulations of the U.S. Department of the Interior (“Interior”), 43 C.F.R. Part 45, Topsham Hydro Partners Limited Partnership (“Topsham Hydro”), Licensee of the Pejepscot Hydroelectric Project No. 4784 (“Project”), hereby submits to Interior’s Office of Environmental Policy and Compliance the attached Request for Trial-Type Hearing on Disputed Issues of Material Fact pertaining to a preliminary Section 18 fishway prescription filed by Interior with the Federal Energy Regulatory Commission (“FERC”) on June 17, 2021, for inclusion in the new license for the Project. Also included are Notices of Appearance in the proceeding, and Topsham Hydro’s Alternative Fishway Prescription with respect to the upstream and downstream passage of American eel.

Pursuant to Topsham Hydro’s communication with Mr. Shawn Alam, Topsham Hydro is providing this submission via electronic mail and by U.S. mail. Topsham Hydro is also filing the submission with FERC and serving the documents on each “license party” to the FERC licensing proceeding for Project No. 4784. If you have any questions regarding this filing or require additional information, please contact me by phone at (207) 755-5613 or by email at Luke.Anderson@BrookfieldRenewable.com.

Respectfully submitted,



Brookfield

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Luke T. Anderson
Manager, Licensing
Brookfield Renewable

**UNITED STATES OF AMERICA
BEFORE THE
DEPARTMENT OF THE INTERIOR**

**Attention: Stephan G. Tryon, Director
 Office of Environmental Policy and Compliance
 United States Department of the Interior
 1849 C Street, NW
 Mail Stop 2629
 Washington, DC 20240**

Topsham Hydro Partners)	Docket No. _____
Limited Partnership)	(FERC Docket No. P-4784-106)

**TOPSHAM HYDRO PARTNERS LIMITED PARTNERSHIP
REQUEST FOR TRIAL-TYPE HEARING ON DISPUTED ISSUES OF MATERIAL
FACT PERTAINING TO A PRELIMINARY SECTION 18 FISHWAY PRESCRIPTION
SUBMITTED TO THE FEDERAL ENERGY REGULATORY COMMISSION BY THE
UNITED STATES DEPARTMENT OF THE INTERIOR FOR THE PEJEPSCOT
HYDROELECTRIC PROJECT (FERC PROJECT NO. 4784)**

Pursuant to Section 18 of the Federal Power Act (“FPA”)¹ and the regulations of the U.S. Department of the Interior (“Interior”),² Topsham Hydro Partners Limited Partnership (“Topsham Hydro” or “Licensee”), licensee of the Pejepscot Hydroelectric Project (Federal Energy Regulatory Commission (“FERC”) Project No. 4784) (“Pejepscot Project” or “Project”), hereby submits a request for a trial-type hearing on disputed issues of material fact. These issues of material fact pertain to a preliminary fishway prescription submitted by Interior to FERC on

¹ 16 U.S.C. § 811 (2018).

² 43 C.F.R. § 45.21 (2020).

June 17, 2021 (“Prescription”) with respect to the upstream and downstream passage of American eel.³

I. BACKGROUND

A. Project Location

The 13.88 MW Pejepscot Project is located on the Androscoggin River in the Village of Pejepscot and the Town of Topsham, Maine. The Project is the second of 22 hydroelectric projects on the mainstem Androscoggin River, located at approximately river mile (RM) 14. The Project dam is approximately 4 miles upstream of the Brunswick Hydroelectric Project (“Brunswick Project”) and 3.25 miles downstream of the Worumbo Hydroelectric Project (“Worumbo Project”). The Androscoggin River basin above the Project dam has a drainage area of approximately 3,420 square miles.

B. Project License

FERC issued a license for the Project in 1982 for a term of 40 years.⁴ The current license expires on August 31, 2022. Topsham Hydro commenced the relicensing process by filing a Notice of Intent to Relicense the Project and Pre-Application Document with FERC on August 31, 2017. After completing pre-filing consultation with federal and state resource agencies and conducting a number of environmental studies, Topsham Hydro filed a final application for a new license for the Project on August 31, 2020. FERC issued a “Notice of Application Accepted for Filing, Soliciting Motions to Intervene and Protests, Ready for Environmental Analysis, and Soliciting Comments, Recommendations, Terms and Conditions,

³ U.S. Department of the Interior, Comments, Recommendations, Prescriptions, at Attachment A, Project No. 4784-106 (filed June 17, 2021) (“Prescription”).

⁴ *Worumbo Hydro, Inc.*, 20 FERC ¶ 62,483 (1982).

and Prescriptions” on April 19, 2021. Interior filed its Prescription pursuant to FPA Section 18 in response to FERC’s notice.

C. Project Features and Operation

As shown in the figure below, the principal Project works include a 560-foot-long, 47.5-foot-high dam, a 480-foot-long spillway, fish passage facilities, and two powerhouses.⁵ Spillway capacity is provided by operating the gates on the crest of the dam, which is equipped with five, 96-foot-long by 3-foot-high hydraulically operated bascule gates separated by concrete piers.⁶ The bascule gates are constructed of steel and can be operated automatically or manually.⁷ The Project has a spillway discharge capacity of 95,000 cubic feet per second (“cfs”).⁸ The two Project powerhouses, both of which are integrated into the dam, include an original (northerly) powerhouse constructed in 1898 and a new (southerly) powerhouse constructed from 1985 to 1987.⁹

The original powerhouse contains three horizontal Francis units (identified as Units 21, 22, and 23) with a combined output capacity of 1.58 MW.¹⁰ The maximum flow through each of the three units is approximately 350 cfs, for a total of 1,050 cfs.¹¹ The newer powerhouse contains a vertical-shaft, low speed, adjustable-blade, propeller type Kaplan turbine-generator unit (identified as Unit 1) rated at 12.3 MW.¹² The minimum and maximum rated flow

⁵ Topsham Hydro Partners Limited Partnership, Application for New License for the Pejepscot Hydroelectric Project, Project No. 4784-106 (filed Aug. 31, 2020) (“Final License Application”).

⁶ *Id.* at A-3.

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.* at A-3 to A-4.

¹¹ *Id.* at A-4.

¹² *Id.*

through Unit 1 is 1,170 and 7,550 cfs, respectively.¹³ When Unit 1 nears its maximum flow capacity, one or more of the three small units (Units 21, 22, and 23) is manually started.¹⁴ The small units are mainly operated during high spring runoff and after large storm events.¹⁵ Inflows in excess of the hydraulic capacity of the units (which occurs approximately 25% of the time) are passed at the spillway.¹⁶ The Project is required to release a continuous minimum flow of 1,710 cfs or inflow, whichever is less.¹⁷

The Project has two separate intake structures: the older powerhouse intake and the new powerhouse intake, both of which are integral with the powerhouses.¹⁸ The old powerhouse intake is constructed of concrete and has 1.5-inch clear spacing on the trashracks.¹⁹ The trashracks have a top elevation of 69.7 feet and extend down to an elevation of 43.3 feet; the racks are approximately 71.4 feet wide.²⁰ The new powerhouse intake is also constructed of concrete and has 1.5-inch clear spacing at the top of the trashrack (from elevation 61.35 feet to elevation 55.1 feet) and 2.5-inch clear spacing at the bottom (from elevation 55.1 feet to elevation 36.0 feet).²¹ The trashracks on the new powerhouse intake are approximately 91.6 feet wide.²²

¹³ *Id.*

¹⁴ *Id.* at B-1.

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.*

¹⁸ *Id.* at A-4.

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

The Project includes an upstream fish passage facility consisting of a vertical lift (elevator) that moves migratory fish in a hopper about 30 feet vertically from near the new powerhouse tailrace to the impoundment.²³ The fish lift is designed to pass American shad and river herring and other migratory species such as Atlantic salmon and is operated from April 15 to November 15 each year.²⁴ There are no fish passage facilities at the Project specifically designed to move American eel upstream.

Downstream fish passage facilities at the Project—for all species—consist of two steel entry weirs, one on either side of the Unit 1 turbine intake. From each weir, an outlet pipe conveys downstream migrating fish in water down to the tailwater.²⁵ The weir gates are 4 feet wide. The northerly (left) weir has a 30-inch diameter steel transport pipe that is approximately 185 feet long; the southerly (right) weir has a 24-inch diameter steel transport pipe that is approximately 60 feet long.²⁶ The downstream fishway is operated from April 1 to December 31 annually for all species as river conditions allow.²⁷

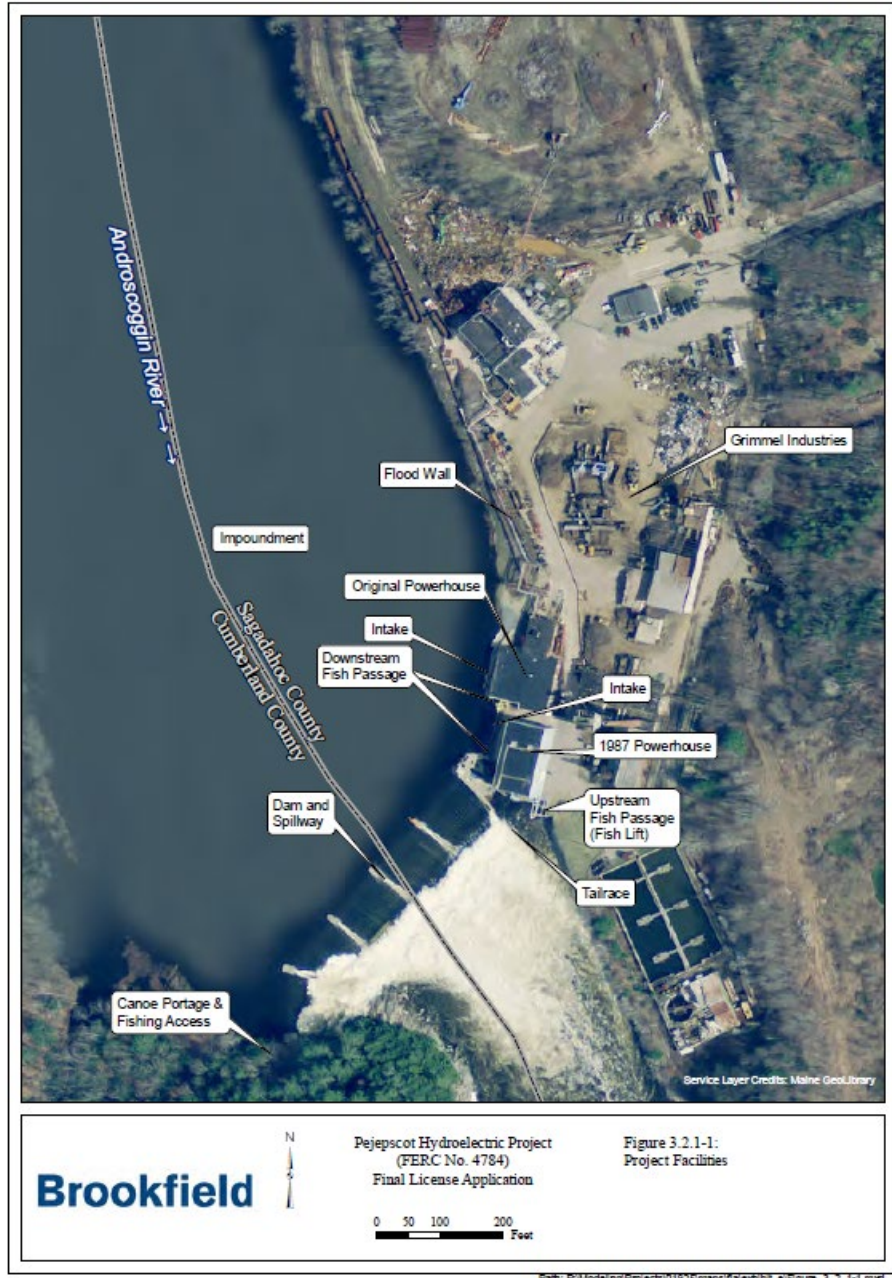
²³ *Id.*

²⁴ *Id.* at A-4 to A-5.

²⁵ *Id.* at A-5.

²⁶ *Id.*

²⁷ *Id.* at A-5 to A-6.



D. Fish Resources in the Project Vicinity

Fish assemblage in the Androskoggin River reflects natural and anthropogenic gradients, from its upper reaches in New Hampshire to the tidal waters near Brunswick, Maine. In the lower reaches, including in the Project vicinity, the fish assemblage consists of but is not limited

to anadromous migrants such as Atlantic salmon, American shad, alewife, and blueback herring as a result of fish passage facilities, stocking, and trap and transport programs.²⁸ Additionally, American eel have been documented in areas in the vicinity of the Project.

Based on electrofishing surveys and other fish assemblage assessments, eels are in relatively low abundance both upstream and downstream of the Project. The relative abundance of American eel upstream of the Project is 0.3%; within the Project impoundment 0%; and downstream of the Project 0.5%.²⁹ That equates to two eel upstream of the Project, none within the impoundment, and 3 downstream of the Project.³⁰ In most years between 2000 and 2019, fewer than five eels were counted at the downstream Brunswick Project, with between zero and three American eel counted in each of the last five years for which data is available.³¹ There are no specific eel passage facilities at the Brunswick Project, although it is anticipated that eel passage facilities will be installed as a result of the relicensing of the Brunswick Project, the license for which expires in 2029. Upstream, at the Worumbo Project, upstream eel passage facilities were installed in 2012.³² Twenty-five eels were counted there in 2018, the most recent year for which data are available.³³

As part of its upstream passage relicensing studies, Topsham Hydro conducted juvenile eel monitoring surveys to evaluate the need and potential location for an upstream eel passage facility at the Project. A total of 14 nighttime visual surveys were conducted between June 17

²⁸ *Id.* at E-76.

²⁹ *Id.* at E-78.

³⁰ *Id.*

³¹ *Id.* at E-81.

³² *Id.* at E-86.

³³ *Id.*

and August 26, 2019, though no juvenile eels were observed during visual surveys at the Project.³⁴

As part of its downstream passage relicensing studies, Topsham Hydro conducted an evaluation of downstream passage effectiveness for adult American eel using radio-telemetry during the 2019 fall migration season. The study results indicated that American eels migrate very quickly past the Project, the majority of eels migrate past the Project at night, and eels do not experience significant delay.³⁵ The preferred route of passage for adult eels is Unit 1, which resulted in a high estimated passage survival of 91.7%. Downstream passage survival for the entire Project reach is high as well, at 90%.³⁶ These data were confirmed by a desktop evaluation of entrainment and turbine survival through Unit 1, and by a qualitative assessment of entrainment potential and turbine survival for American eel.³⁷

E. Topsham Hydro's Proposal for Fish Passage in the New License

Based on the low abundance of American eel both upstream and downstream of the Project, as part of its relicensing proposal Topsham Hydro proposed to install and operate an interim trap structure to further investigate upstream eel passage at the Project. For the first three passage seasons after the effective date of the new license, Topsham Hydro proposed to operate a temporary portable eel trap, to be installed on the bedrock outcrop on the right bank during the first full passage season after the effective date of the new license, and operated from June 1 through September 15.³⁸

³⁴ *Id.* at E-94.

³⁵ *Id.* at E-144.

³⁶ *Id.*

³⁷ *Id.* at E-101.

³⁸ *Id.* at E-143.

The results of the interim eel trap evaluation would inform the location of the permanent upstream eel ramp.³⁹ Due to the relatively low number of eels currently in the system, Topsham Hydro proposed to construct a permanent upstream American eel ramp, to be operated annually from June 1 through September 15, when upstream eel passage facilities are constructed at the downstream Brunswick Project as part of its upcoming relicensing proceeding.⁴⁰

To enhance downstream passage of American eel and other species at the Project, Topsham Hydro, in consultation with resources agencies, proposed to install and operate a fish guidance system/debris boom to direct downstream migrants to a new bypass within bascule gate no. 1, beginning in the second full passage season after the effective date of the new license.⁴¹ Topsham Hydro also proposed to discontinue the north (left bank) downstream fish bypass (which would effectively be covered by the fish guidance system) beginning in the second full passage season after the effective date of the new license, but to continue operation of the south (right bank) downstream fish bypass from April 1 to December 31 annually for the term of the new license.⁴² In addition, to enhance downstream passage for American eel specifically, Topsham Hydro proposed to reduce the operational setting for Unit 1 (a “unit turndown”) to approximately 3,480 cfs (resulting in intake approach velocities of less than 1.5 feet per second to decrease vulnerability to entrainment) for eight hours during the night (8:00 pm to 4:00 am) between September 1 and October 31 annually.⁴³

³⁹ *Id.*

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² *Id.* at E-144.

⁴³ *Id.* at E-144 to E-145.

II. INTERIOR'S SECTION 18 PRESCRIPTION

On June 17, 2021, Interior filed its Prescription with FERC pursuant to its authority under FPA Section 18 and Part 45 of Interior's regulations. Although the Prescription stated that Interior was submitting its supporting administrative record with the Prescription—which is required by its regulations—Interior did not file any documents not already in the record until twelve days later, on June 29, 2021.⁴⁴

The Prescription acknowledges the “general agreement among parties regarding the need for eel passage,”⁴⁵ but prescribes a means and timing for achieving upstream and downstream passage of American eel at the Project that differs from Topsham Hydro's proposal. To facilitate the passage of American eel upstream of the Project, Interior's Prescription requires the Licensee to repeat the visual monitoring surveys previously conducted during the relicensing study phase and deploy temporary upstream eel ramps with collection traps for the first two full passage seasons after license issuance.⁴⁶ In addition to deploying a temporary eel ramp on the bedrock outcrop on the right bank—as Topsham Hydro proposed—Interior's Prescription also requires the deployment of a second ramp near the exit of the south (left bank) downstream bypass, with additional locations to be determined in consultation with the U.S. Fish and Wildlife Service (“USFWS”) and other resource agencies.⁴⁷

⁴⁴ 43 C.F.R. § 45.20(a)(1).

⁴⁵ Interior Prescription at 13.

⁴⁶ *Id.* at 19.

⁴⁷ *Id.*

In order to determine proper siting of a permanent upstream eelway (or multiple eelways if “more than one eelway may be needed to provide effective passage”), the Prescription requires Topsham Hydro to determine the design and location of the permanent upstream eelway, based on the results of the surveys and temporary collection locations, in consultation with the USFWS and other resource agencies.⁴⁸ The design of the permanent facility (or facilities) must be consistent with the USFWS’s design criteria, and the Licensee must construct the facility (or facilities) to be operational no later than May 1 of the third full passage season (which Interior determined to be May 1 to October 31, rather than June 1 through September 15, as Topsham Hydro proposed) after license issuance.⁴⁹ Thus, the Prescription differs from Topsham Hydro’s proposal for upstream passage by requiring multiple portable eel ramps and by requiring the construction of a permanent eelway (and possibly multiple permanent eelways) after only two seasons of surveys and temporary facilities—long before permanent facilities are constructed at the Brunswick Project.

With respect to downstream passage, the Interior Prescription requires Topsham Hydro, as an interim measure until permanent measures are implemented, to implement targeted nighttime turbine shutdowns during the downstream eel passage season (which Interior determines to be August 15 to November 15), rather than the nighttime turndowns Topsham Hydro proposed.⁵⁰ Turbine shutdowns must occur from dusk to dawn for three consecutive nights following rain accumulations of 0.25 inches or more over a 24-hour period,

⁴⁸ *Id.*

⁴⁹ *Id.*

⁵⁰ *Id.* at 19-20.

for the duration of the downstream passage season.⁵¹ In addition, the Prescription requires Topsham Hydro to construct a permanent downstream eel passage and protection system within three years of license issuance.⁵²

The Interior Prescription does not specify a particular means by which Topsham Hydro must provide permanent downstream passage. Rather, it requires the Licensee to develop a plan to provide permanent downstream eel passage and protection through “permanent passage facilities and/or operational measures” in consultation with the USFWS.⁵³ The design of any such facilities must be consistent with USFWS design criteria.⁵⁴ Interior’s Prescription casts doubt on the efficacy of the Licensee’s proposed fish guidance boom, stating that as bottom-oriented species, eels would “likely seek routes under or around” the boom.⁵⁵ It also notes that debris booms were not effective at preventing eel passage through turbines at several hydropower projects on the Connecticut River in Massachusetts and that a debris boom “performed poorly” at other sites for other species.⁵⁶ As a result, it concludes that Topsham Hydro’s proposed fish guidance boom is “not a suitable protective measure.”⁵⁷

Interior’s Prescription states that “safe, timely, and effective downstream passage for American eels can be achieved at the Project via an inclined screen for Unit 1 with 0.75 inch clear spacing or less and with bypasses capable of passing a minimum of 5% of station

⁵¹ *Id.*

⁵² *Id.* at 20.

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.* at 14.

⁵⁶ *Id.* at 14-15.

⁵⁷ *Id.* at 15.

capacity.”⁵⁸ Nonetheless, Interior did not prescribe an inclined screen for Unit 1. In fact, the USFWS Fish Passage Engineering Design Criteria states that while inclined screen technology has been installed in Europe with demonstrated effectiveness in protecting eels, USFWS notes that inclined screen technology is not common in the northeastern United States and is considered experimental technology.⁵⁹

The Prescription also suggests that screening Units 21, 22, and 23 with 0.75 inch clear spacing or less would prevent turbine passage through those units and improve eel survival.⁶⁰ In support of this contention, Interior maintains that trashracks with 0.75 inch clear spacing are “commonly prescribed in New England to prevent entrainment of American eels.”⁶¹ Notwithstanding this contention, Interior did not prescribe 0.75 inch trashracks for Units 21, 22, and 23 to effectuate downstream passage of American eel at the Project.

III. STATUTORY AND REGULATORY FRAMEWORK

Section 18 of the FPA provides the federal fishery agencies, including USFWS and the U.S. Department of Commerce’s (“Commerce”) National Marine Fisheries Service (“NMFS”), with mandatory conditioning authority to prescribe fishways for the safe and timely upstream and downstream passage of fish.⁶² FERC does not have the ability to reject or modify fishway prescriptions filed by USFWS or NMFS through Interior or Commerce under Section 18.⁶³ So

⁵⁸ *Id.* at 14.

⁵⁹ USFWS Fish Passage Engineering Design Criteria, § 9.6.3 (2019).

⁶⁰ Prescription at 21.

⁶¹ *Id.* at 14, 21 (citing the Woronoco Project No. 2631, Scotland Project No. 2662, Central Falls Project No. 3063, and Rollinsford Project No. 3777 as examples of where trashracks with 0.75 inch clear spacing were prescribed to prevent entrainment of American eel).

⁶² 16 U.S.C. § 811.

⁶³ *Am. Rivers v. FERC*, 201 F.3d 1186, 1206-11 (9th Cir. 2000).

while FERC may express its disagreement with any prescriptions it opposes, it will nonetheless include the prescriptions in any license it issues.⁶⁴

In 2005, Congress amended FPA Section 18 to grant license applicants the right to a trial-type hearing on the factual underpinnings for any mandatory fishway prescriptions. Under these revisions, a license applicant is entitled to a determination on the record, after opportunity for an agency trial-type hearing of no more than 90 days, on any disputed issues of material fact with respect to preliminary fishway prescriptions.⁶⁵ Congress also gave license applicants the right to propose alternatives to any proposed fishway prescriptions under Section 33 of the FPA.⁶⁶ Topsham Hydro's alternative to Interior's Prescription is set forth in a separate submission.

Congress directed Interior, Commerce, and the Department of Agriculture to establish procedures for such expedited trial-type hearings, including rules for discovery and cross-examination of witnesses. On March 31, 2015, the three Departments jointly issued revised interim rules, with a common preamble.⁶⁷ These rules became effective on November 23, 2016.⁶⁸ Interior's rules are codified at 43 C.F.R. Part 45.

Interior's regulations define a "material fact" as one "that, if proved, may affect a Department's decision whether to affirm, modify, or withdraw any condition or

⁶⁴ See, e.g., *Pub. Util. Dist. No. 1 of Pend Oreille Cty.*, 130 FERC ¶ 62,148 at P 32 (2010).

⁶⁵ 16 U.S.C. § 811.

⁶⁶ *Id.* § 823d(b).

⁶⁷ Resource Agency Hearings and Alternatives Development Procedures in Hydropower Licenses, 80 Fed. Reg. 17,156 (Mar. 31, 2015).

⁶⁸ Resource Agency Hearings and Alternatives Development Procedures in Hydropower Licenses, 81 Fed. Reg. 84,389, 84,389 (Nov. 23, 2016).

prescription.”⁶⁹ An administrative law judge (“ALJ”) decides all disputed issues of material fact. The ALJ’s decision is binding on all parties.

IV. DISPUTED ISSUES OF MATERIAL FACT, EXHIBIT AND WITNESS LISTS, AND CONSENT TO ELECTRONIC SERVICE

Although the Prescription touts a general agreement among the parties regarding the need for eel passage, Interior largely disregards Topsham Hydro’s proposal and suggests, in some cases without specifically prescribing, that different means of achieving upstream and downstream passage of American eel are preferable. Yet the basis for Interior’s suggestions include factual statements that are unfounded and erroneous, disputed and material. Moreover, Interior appears to rely upon supporting information that it did not submit into the record with the filing of its Prescription as required by its own regulations.

As detailed in Appendix A, Topsham Hydro disputes issues of material fact regarding the upstream migration period for American eel incorporated into passage measures in recent licenses issued in the Androscoggin River basin and nearby watersheds; whether currently available information indicates that effective downstream passage for American eels can be achieved at the Project via an inclined screen on Unit 1 with 0.75 inch clear spacing or less with bypasses capable of passing a minimum of 5% of station capacity; whether trashracks with 0.75 inch clear spacing are commonly prescribed in New England to prevent entrainment of American eels; and whether a nighttime turndown of Unit 1 would provide safe, timely, and effective downstream eel passage. Appendix A sets forth a list of the disputed issues of material fact with respect to Interior’s Prescription for the upstream and downstream passage of American eel. In accordance with Interior’s regulations, each issue identifies the specific

⁶⁹ 43 C.F.R. § 45.2.

factual assertion made, implied, or relied upon by Interior that Topsham Hydro disputes, along with an explanation of why Interior's assertion is erroneous or unfounded and why the dispute is material.⁷⁰ Appendix A also identifies the scientific studies, literature, and other documented information on which the Licensee presently relies to demonstrate the fallacy of Interior's assertions.

Appendix B is Topsham Hydro's list of exhibits, along with a notation whether each exhibit is contained in the FERC record for the Pejepscot Project relicensing. Topsham Hydro is providing an electronic copy of each exhibit that is not currently contained in the FERC record for the Project.

Appendix C identifies the witnesses Topsham Hydro presently intends to provide testimony at the hearing. Appendix C also includes each witness's contact information and qualifications and gives a brief narrative summary of each witness's expected testimony.

Topsham Hydro reserves the right to amend or supplement its exhibit and witness lists. Topsham Hydro also reserves the right to introduce additional exhibits at the hearing, even if not previously identified, for impeachment and rebuttal purposes. Topsham Hydro further reserves the right to call impeachment and rebuttal witnesses, even if not previously identified.

⁷⁰ 43 C.F.R. § 45.21.

Topsham Hydro consents to being served by electronic mail on the individuals identified below, pursuant to 43 C.F.R. § 45.21(b)(4).

Respectfully submitted,



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*Counsel for Topsham Hydro Partners Limited
Partnership*

DATED: July 19, 2021

APPENDIX A

Disputed Issues of Material Fact

I. List of Disputed Issues of Material Fact

(43 C.F.R. § 45.21)

1. Whether the upstream migration period for American eel in the Androscoggin River and nearby watersheds is June 1 to September 15.
2. Whether currently available information provides that effective downstream passage for American eels can be achieved at the Project via an inclined screen for Unit 1 with 0.75 inch clear spacing or less with bypasses capable of passing a minimum of 5% of station capacity.
3. Whether trashracks with 0.75 inch clear spacing are commonly prescribed in New England to prevent entrainment of American eels.
4. Whether a nighttime turndown of Unit 1 would provide safe, timely, and effective downstream eel passage.

II. Supporting Information for Each Disputed Issue of Material Fact

Disputed Issue of Material Fact No. 1:

Whether the upstream migration period for American eel in the Androscoggin River and nearby watersheds is June 1 to September 15.

a. Specific factual assertions made, implied, or relied upon by Interior

“Based on data from nearby watersheds and a recent license issuance upstream of the Project, approved fish passage protection measures shall be operational May 1 through October 31 for the upstream migration period.”¹

b. Why Interior’s statements are unfounded or erroneous

Interior’s statement that “nearby watersheds” have collected significant numbers of upstream migrating eels during the months of May, September, and October is unfounded.

Interior cites collections made in 2020 at the West Enfield Hydroelectric Project as supportive of its required migration period, but most of the eels were collected in the months of June (89.4%) and July (9.0%).² Other projects cited in the referenced report operated more in-line with the June 1 to September 15 timeframe.³

Interior’s Prescription, to the extent it relies on any recently issued licenses as a basis for prescribing a May 1 through October 31 upstream migration season, is unsupported. The most recent license issued in the Androscoggin River Basin, for the Barker’s Mill Project, FERC No. 2808, approved fish passage protection measures based on a June 1 – September 15 upstream eel migration period. All of the other most recently-issued licenses for hydropower projects in watersheds throughout Maine (the Penobscot, Kennebec, and Saco River Basins) similarly

¹ Prescription at 16.

² Bangor-Pacific Hydro Associates, 2020 American Eel Upstream Passage Operation and Monitoring Report for the West Enfield Project at 2, Project No. 2600-000 (filed Mar. 23, 2021) (reporting upstream eel passage operation at the following projects as follows: Milford: June 3 to September 15; Orono: May 29 to September 22; and Stillwater: May 28 to September 21).

³ *Id.* at 1.

approved upstream eel passage protection measures based on the same June 1 – September 15 or even shorter (June 1 – August 31) upstream eel migration period.⁴ Because eelways in the Androscoggin River Basin and other watersheds in the State of Maine do not pass many eels in the months of May, September, and October, the upstream migration period is generally prescribed as June 1 – September 15, consistent with USFWS’s American Eel Biological Species Report.⁵

c. Why the factual dispute is material

The use of a different upstream eel migration season than what has been established in all of the most recently-issued licenses in Maine lacks consistency with typical eel passage solutions implemented by MDMR and USFWS. Moreover, because Interior’s Prescription is based on a lengthier upstream eel migration season, it would require Topsham Hydro to conduct visual surveys and operate multiple portable eel ramps an additional 77 days for each year in which temporary eel ramps are required. The longer operation and maintenance period significantly adds to the time and expense of both temporary and permanent upstream eel passage measures. If it is established that the upstream eel migration season is June 1 – September 15, Interior could withdraw or revise its mandatory prescription with respect to American eel.

⁴ *KEI (Maine) Power Management (III) LLC*, 171 FERC ¶ 62,043 at P 42 n.27 and Appendix C at C-3 (2020) (establishing a June 1 – September 15 upstream eel migration period for the Barker’s Mill Project on the Little Androscoggin River); *Great Lakes Hydro America, LLC*, 174 FERC ¶ 62,135 at P 58 (2021) (establishing a June 1 – August 31 upstream eel migration period for the Mattaceunk Project on the Penobscot River); *KEI (Maine) Power Management (III) LLC*, 167 FERC ¶ 62,076 at P 41 (2019) (establishing a June 1 – September 15 upstream eel migration period for the American Tissue Project on the Cobbosseecontee Stream near the confluence with the Kennebec River); *Brookfield White Pine Hydro LLC*, 162 FERC ¶ 62,108 at P 40 (2018) (establishing a June 1 – September 15 upstream eel migration period for the West Buxton Project on the Saco River).

⁵ USFWS American Eel Biological Species Report at 16-17 (2015) (noting that upstream movement has been monitored at numerous Maine dams for more than a decade, with peak upstream movement at the initial dam typically in early June, with peak passage in late June and July).

d. Specific citations to information relied on by the Licensee

Exhibit 4, West Enfield Project 2020 Eel Report at 1-2.

Exhibit 5, Barker's Mill License Order at P 42 n.27 and Appendix C at C-3.

Exhibit 6, Mattaceunk License Order at P 58.

Exhibit 7, American Tissue License Order at P 41.

Exhibit 8, West Buxton License Order at P 40.

Exhibit 1, USFWS Eel Species Report at 16-17.

Disputed Issue of Material Fact No. 2:

Whether currently available information indicates that effective downstream passage for American eels can be achieved at the Project via an inclined screen for Unit 1 with 0.75 inch clear spacing or less with bypasses capable of passing a minimum of 5% of station capacity.

a. Specific factual assertions made, implied, or relied upon by Interior

“Based on currently available information, safe, timely, and effective downstream passage for American eels can be achieved at Pejepscot via an inclined screen for Unit 1 with 0.75 inch clear spacing or less with bypasses capable of passing a minimum of 5% of station capacity in accordance with Service guidelines (USFWS 2019).”⁶

b. Why Interior’s statements are unfounded or erroneous

Interior does not cite any currently available information for its statement that safe, timely, and effective downstream passage for American eels can be achieved at the Project via an inclined screen for Unit 1 with 0.75 inch clear spacing or less with bypasses capable of passing a minimum of 5% of station capacity. To the extent that Interior relies on USFWS 2019 as the “currently available information” supporting its factual assertions, Interior’s statement is unfounded. USFWS 2019 notes that “[i]n North America, inclined screens have been installed in diversion canals (Bomford and Lirette 1991) and powerhouse intakes (Amaral et al., 1999) to bypass salmon and other species. However, such guidance systems are not in common use in the northeastern U.S. As such, Engineering considers the technology experimental.”⁷ Even if there were information supporting Interior’s statements on the use of an inclined screen at Unit 1, any “currently available information” upon which Interior purports to rely that it filed into the record on June 29, 2021—twelve days after it filed the Prescription—should not be considered as evidentiary support because the submission did not comply with Interior’s regulations.⁸

⁶ Prescription at 14.

⁷ U.S. Fish and Wildlife Service Northeast Region, Fish Passage Engineering Design Criteria at p. 9-8 (2019).

⁸ 43 C.F.R. § 45.20 (requiring Interior to file with FERC, “at the time it files the preliminary condition or prescription” any of the documents relied upon that are not already in the record.”).

c. Why the factual dispute is material

The factual dispute is material because Interior rejected Topsham Hydro's proposed nighttime turndown to facilitate downstream passage of American eel. The Prescription instead suggests that an inclined screen for Unit 1 with 0.75 inch clear spacing, with bypasses capable of passing a minimum of 5% of station capacity, is the sole means of achieving safe, timely, and effective downstream passage of American eels at the Project even though it is experimental technology. The estimated capital for an inclined screen for Unit 1 is \$8.5 million and the operations, maintenance, and lost generation costs for an inclined screen for Unit 1 is approximately \$1.1 million annually or \$44 million over the course of the license (2021 dollars). If it is established that no currently available information indicates that safe, timely, and effective downstream passage for American eels can be achieved at the Project via an inclined screen for Unit 1 with 0.75 inch clear spacing, with bypasses capable of passing a minimum of 5% of station capacity, then Interior could withdraw or revise its mandatory prescription with respect to American eel.

d. Specific citations to information relied on by the Licensee

Exhibit 2, USFWS Fish Passage Design Criteria at p. 9-8.

Disputed Issue of Material Fact No. 3:

Whether trashracks with 0.75 inch clear spacing are commonly prescribed in New England to prevent entrainment of American eels.

a. Specific factual assertions made, implied, or relied upon by Interior

“Trash racks with 0.75 inch clear spacing are commonly prescribed in New England to prevent entrainment of American eels at hydropower projects (e.g., Woronoco FERC No. 2631, Scotland No. 2662, Central Falls FERC No. 3063, Rollinsford FERC No. 3777).”⁹

b. Why Interior’s statements are unfounded or erroneous

Trashracks with 0.75 inch clear spacing were not prescribed at the Woronoco, Scotland, or Rollinsford Hydroelectric Projects to prevent entrainment of American eel. USFWS reserved its authority to prescribe fishways at the Woronoco Project; the licensee subsequently proposed to install removable trashrack overlays with 0.75 inch clear spacing during the downstream eel migration.¹⁰ At the Scotland Project, Interior and Commerce reserved their authority to prescribe fishways, although the licensee subsequently proposed to install 0.75 inch trashracks.¹¹ At the Rollinsford Project, there was no prescription nor proposal for 0.75 inch trashracks.¹² Trashracks with 1.0 inch clear spacing are often prescribed at hydropower projects to prevent entrainment of American eels, and Interior’s statements regarding 0.75 inch clear spacing trashracks as a common prescription is not supported by the Woronoco, Scotland, or Rollinsford Projects.

⁹ Prescription at 14.

¹⁰ *Woronoco Hydro, LLC*, 99 FERC ¶ 62,075 (2002) (noting that Interior reserved its authority to prescribe fishways at the project); *Woronoco Hydro, LLC*, 130 FERC ¶ 62,171 (2010) (approving plans and schedules for trashrack screen installation consistent with the licensee’s proposal).

¹¹ *FirstLight Hydro Generating Co.*, 145 FERC ¶ 61,157 at PP 62, 86 (2013) (noting that Interior reserved its authority to prescribe fishways at the project and approving licensee’s proposal to install 1-inch trashracks to minimize fish entrainment). The licensee subsequently modified its plan to include 0.75 inch trashracks. *FirstLight Hydro Generating Co.*, 159 FERC ¶ 62,330 (2017) (modifying and approving upstream and downstream passage plans).

¹² U.S. Department of the Interior, Comments, Recommendations, Prescriptions, Rollinsford Hydroelectric Project No. 3777-011 (filed June 25, 2020).

c. Why the factual dispute is material

Installation and maintenance of 0.75 inch clear spacing trashracks has significant cost implications, and while decreasing entrainment potential, close-spaced trashracks also have the potential to increase impingement (defined as injurious contact with a bar rack) of American eel, as well as other fish species. Moreover, achieving USFWS's recommended intake velocities of 2 feet per second or less at the Project for an inclined trashrack design would require the length of the trashrack at the new powerhouse to increase from approximately 25 feet to 40 feet. This would require substantial new infrastructure with significant installation and maintenance cost. If it is established that 0.75 inch trashracks were not prescribed at the projects cited by Interior for support for its statement that 0.75 inch trashracks are commonly prescribed in New England, then Interior could withdraw or revise its mandatory prescription with respect to American eel.

d. Specific citations to information relied on by the Licensee

Exhibit 2, USFWS Fish Passage Design Criteria (2019) at p. 9-6.

Exhibit 9, Woronoco License Order.

Exhibit 10, Woronoco Order Approving Trashrack Screen Installation.

Exhibit 11, Scotland License Order.

Exhibit 12, Scotland Order Approving Passage Plans.

Exhibit 13, Rollinsford Prescription.

Disputed Issue of Material Fact No. 4:

Whether a nighttime turndown of Unit 1 would provide safe, timely, and effective downstream eel passage at the Project.

a. Specific factual assertions made, implied, or relied upon by Interior

“The Service is currently unaware of any cases of turbine turndowns implemented as a protective measure for eels in the northeastern United States and therefore there is no data to support this proposed mitigation measure. While turbine turndowns would reduce the approach velocity upstream of the Project’s intake racks, the turndowns would not prevent eels from entering the units volitionally by following the flow of water due to the fact that the rack spacing does not physically exclude American eel. Further, the proposed changes were not examined during studies conducted in support of this relicensing.”¹³

“Although whole station survival was estimated as 91.7% via radiotelemetry, the study did not consider drift of dead eels and did not use technology to reliably assess the fate of turbine-passed eels (e.g., Hi-Z balloon tags).”¹⁴

“Further, the proposed nighttime turbine turndowns are not suitable as downstream eel movements do not exclusively occur at night.”¹⁵

b. Why Interior’s statements are unfounded or erroneous

Interior points to a lack of data to justify its dismissal of Topsham Hydro’s proposal for nighttime turndowns. However, Topsham Hydro’s American eel route of passage studies estimated whole station survival at 91.7%, as Interior acknowledges. Studies at the West Enfield Project involved Hi-Z balloon tagging studies which estimated 96-hour survival at 90.0% for American eel.¹⁶ Because the West Enfield Project has Kaplan units similar to the Pejepscot Project unit, the studies conducted there support the survival estimate at Pejepscot.

Interior cites the Medway Project study where the downstream survival estimate for eels of 92% was adjusted downward by 8% to account for delayed mortality and drift of dead/injured

¹³ Prescription at 14.

¹⁴ *Id.* at 20.

¹⁵ *Id.* at 14.

¹⁶ Bangor-Pacific Hydro Associates, Downstream Adult American Eel Survival Study Report for West Enfield Hydroelectric Project, Project No. 2600-087 (filed Feb. 16, 2021).

eels. However, the study also noted that there are other sources of mortality that could have affected study results (i.e., natural and tagging-related), and the study was performed under worst-case conditions, with low flow and limited downstream passage options.¹⁷ Thus, delayed mortality may not substantially affect telemetry results.¹⁸

Interior rejects Topsham Hydro's proposal for nighttime turndowns on the basis that downstream eel movements do not exclusively occur at night, yet it prescribes nighttime shutdowns as a downstream passage measure, as it recently has at other projects.¹⁹ Moreover, Interior disregards Topsham Hydro's proposal on the basis that it is a proposed protective measure that may not before have been implemented at a project in the northeastern United States, yet other components of Interior's Prescription are supported by experimental technology that is not used in the Northeast.

c. Why the factual dispute is material

If it is established that nighttime turndowns would provide safe, timely, and effective downstream eel passage, then Interior could withdraw or revise its mandatory prescription with respect to American eel.

d. Specific citations to information relied on by the Licensee

Exhibit 2, FLA at E-99, E-111, E-144.

Exhibit 14, West Enfield Eel Survival Study Report.

Exhibit 15, Medway Downstream Passage Report at 2, 38.

¹⁷ Black Bear Hydro Partners, LLC, 2020 Evaluation of Downstream Passage Effectiveness for Adult American Eel at the Medway Hydroelectric Project, Project No. 2666-000 (filed Feb. 15, 2021).

¹⁸ Pflugrath et al., American eel state of buoyancy and barotrauma susceptibility associated with hydroturbine passage, 2019 (noting that eels are not likely to obtain neutral buoyancy given their swim bladder morphology and maintain a state of negative buoyancy). Dead or injured eels would therefore sink, where they would be more likely to settle or get caught on the bottom rather than drift long distances and any drift would be slower than for live eels.

¹⁹ See, e.g., *Great Lakes Hydro America, LLC*, 174 FERC ¶ 62,135 at App. B, § 12.4 (prescribing nightly generation shutdowns, from 8:00 pm to 4:00 am from August 1 through October 31 annually to facilitate downstream eel passage at the Mattaceunk Project).

Exhibit 16, Pflugrath et al., 2019.

Exhibit 6, Mattaceunk License Order at App. B, § 12.4.

APPENDIX B

List of Exhibits

List of Exhibits

I. Exhibits in the FERC Record for the Pejepscot Project

Ex.	Description	Citation	FERC Accession Number
1	USFWS Eel Species Report	Shepard, S. L. 2015. American eel biological species report. Supplement to: Endangered and Threatened Wildlife and Plants; 12-Month Petition Finding for the American Eel (<i>Anguilla rostrata</i>) Docket Number FWS-HQ-ES-2015-0143. U.S. Fish and Wildlife Service, Hadley, Massachusetts.	20210629-5059
2	USFWS Fish Passage Design Criteria (2019)	U.S. Fish and Wildlife Service Northeast Region, Fish Passage Engineering Design Criteria (2019).	20210629-5059
3	FLA	Application for New License, Pejepscot Hydroelectric Project, Topsham Hydro Partners Limited Partnership, Project No. 4784 (filed Aug. 31, 2020).	20200831-5221

II. Exhibits Not in the FERC Record for the Pejepscot Project (copies provided)

Ex.	Description	Citation
4	West Enfield Project 2020 Eel Report	Bangor-Pacific Hydro Associates, 2020 American Eel Upstream Passage Operation and Monitoring Report for the West Enfield Project, Project No. 2600-000 (filed Mar. 23, 2021).
5	Barker's Mill License Order	<i>KEI (Maine) Power Management (III) LLC</i> , 171 FERC ¶ 62,043 (2020).
6	Mattaceunk License Order	<i>Great Lakes Hydro America, LLC</i> , 174 FERC ¶ 62,135 (2021).
7	American Tissue License Order	<i>KEI (Maine) Power Management (III) LLC</i> , 167 FERC ¶ 62,076 (2019).
8	West Buxton License Order	<i>Brookfield White Pine Hydro LLC</i> , 162 FERC ¶ 62,108 (2018).
9	Woronoco License Order	<i>Woronoco Hydro, LLC</i> , 99 FERC ¶ 62,075 (2002).

10	Woronoco Order Approving Trashrack Screen Installation	<i>Woronoco Hydro, LLC</i> , 130 FERC ¶ 62,171 (2010)
11	Scotland License Order	<i>FirstLight Hydro Generating Co.</i> , 145 FERC ¶ 61,157 (2013)
12	Scotland Order Approving Passage Plans	<i>FirstLight Hydro Generating Co.</i> , 159 FERC ¶ 62,330 (2017)
13	Rollinsford Prescription	U.S. Department of the Interior, Comments, Recommendations, Prescriptions, Rollinsford Project No. 3777-011 (filed June 25, 2020).
14	West Enfield Eel Survival Study Report.	Bangor-Pacific Hydro Associates, Downstream Adult American Eel Survival Study Report for West Enfield Hydroelectric Project, Project No. 2600-087 (filed Feb. 16, 2021).
15	Medway Downstream Passage Report	Black Bear Hydro Partners, LLC, 2020 Evaluation of Downstream Passage Effectiveness for Adult American Eel at the Medway Hydroelectric Project, Project No. 2666-000 (filed Feb. 15, 2021).
16	Pflugrath et al., 2019.	Pflugrath et al., American eel state of buoyancy and barotrauma susceptibility associated with hydroturbine passage, 2019.

APPENDIX C

List of Witnesses for Topsham Hydro

Witness List

1. **Kirk Smith**

Gomez and Sullivan Engineers, DPC
41 Liberty Hill Road
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Henniker, NH 03242
Tel: (603) 428-4960
ksmith@gomezandsullivan.com

Mr. Smith is the Project Manager for the Pejepscot Project relicensing. He has a B.S. in Geology with a focus in Hydrology from the University of New Hampshire. He has 28 years of experience in licensing FERC hydropower projects. With a strong background in hydrology, he has performed a wide variety of tasks related to licensing including instream flow studies, headwater benefit studies, energy analyses, hydrologic and aquatic habitat studies, recreation inventories, and environmental analyses of hydropower project impacts. Mr. Smith has been involved in over 30 hydroelectric project licensing proceedings, in which he has been responsible for licensing strategy, development, resource issue identification, study scoping and execution, preparation of license applications, National Environmental Policy Act documents, state water quality certifications, and managing licensing compliance studies.

Mr. Smith will testify on issues related to upstream and downstream American eel passage technologies, and their application to FERC hydropower projects.

2. **Drew Trested**

Normandeau Associates, Inc.
30 International Drive, Suite 6
Portsmouth, NH 03801
Tel: (603) 319-5310
dtrested@normandeau.com

Dr. Trested is the Normandeau Project Manager for the Pejepscot Project relicensing and serves as the Normandeau contact with the primary relicensing consultant (Gomez and Sullivan). Normandeau's roll in the Pejepscot Project relicensing has been the design and execution of field studies related to diadromous fish species and their passage. He has his M.S. and PhD in Fisheries Biology from Clemson University. He has 22 years of experience working with diadromous fish species, the last 18 of which have been as a project scientist at Normandeau. With a strong background in fisheries and aquatic sciences, he has conducted a range of studies associated with FERC relicensing efforts including fish community assessments, macroinvertebrate sampling, water quality, instream habitat, and fish passage. Dr. Trested has managed or conducted passage effectiveness evaluations for upstream or downstream passage of diadromous fish species at 28 hydroelectric projects around the Northeast. He has been involved in 17 hydroelectric project licensing efforts with a primary responsibility of fisheries and aquatics resource study development and execution.

Dr. Trested will testify on issues related to the downstream American eel effectiveness testing and turbine survival studies.

3. Ian Kiraly, FP-C

Environmental Scientist | Lead Fisheries Biologist
Gomez and Sullivan Engineers, DPC
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Mr. Kiraly is a Certified Fisheries Professional, who holds a B.S. in natural resources with a concentration in applied ecology from Cornell University, and an M.S. in wildlife ecology from the University of Maine. Between his undergraduate and graduate careers, Mr. Kiraly conducted a variety of fisheries surveys in lakes and streams for Cornell University, the New York State Department of Environmental Conservation, and the U.S. Geological Survey. While obtaining his master's degree, Mr. Kiraly characterized fish assemblages in the Penobscot River relative to the location of dams. Since joining Gomez and Sullivan Engineers, Mr. Kiraly has been involved in a variety of environmental studies as part of FERC licensing projects, including the development and review of studies on diadromous fish in the Connecticut and Susquehanna Basins (e.g., American shad and American eel).

Mr. Kiraly will testify on the life history aspects of American eel, and the timing of upstream and downstream migration movements.

**UNITED STATES OF AMERICA
BEFORE THE
DEPARTMENT OF THE INTERIOR**

Topsham Hydro Partners)
Limited Partnership) **Docket No. P-4784-106**

**TOPSHAM HYDRO PARTNERS LIMITED PARTNERSHIP SUBMITTAL OF AN
ALTERNATIVE FISHWAY PRESCRIPTION FOR THE PEJEPSCOT HYDROELECTRIC
PROJECT (FERC PROJECT NO. 4784)**

Pursuant to Section 33(b) of the Federal Power Act (FPA)¹ and the regulations of the United States Department of the Interior (“Interior”),² Topsham Hydro Partners Limited Partnership (“Topsham Hydro”) hereby submits its alternative prescription (“Alternative Prescription”) to the preliminary fishway prescription (“Interior’s Prescription”) submitted to the Federal Energy Regulatory Commission (“FERC” or “Commission”) by Interior on June 17, 2021 for the Pejepscot Hydroelectric Project (“Pejepscot Project” or “Project”). As discussed herein, the Alternative Prescription proposed by Topsham Hydro will be no less protective than Interior’s Prescription, will cost significantly less to implement, and will provide benefits to the migratory fish populations of the Androscoggin River.

1 Legal Basis for Alternative Prescription

Section 241 of the Energy Policy Act of 2005 (“EPAct”) amended the FPA to include Section 33(b),³ which authorizes an applicant seeking a hydropower license to propose an alternative fishway⁴ prescription whenever the Secretary of the Department of the Interior or Department of Commerce prescribes a fishway pursuant to the FPA.⁵ Interior’s regulations implementing Section 241 of EPAct provide that a license applicant or other license party may submit an alternative prescription to the Office of Environmental Policy and Compliance within 30 days of the date that Interior files its preliminary prescription with FERC.

By statute, the Secretary of Interior must adopt an alternative proposed by a license party if she determines that the alternative prescription: (1) is no less protective than the fishway initially prescribed by the Secretary; and (2) will, as compared to the fishway initially proposed by the Secretary, either cost significantly less to implement or result in improved operation of the project for electricity production.⁶ As detailed below, the fishways proposed in Topsham Hydro’s Alternative Prescription will be as effective *and* cost significantly less than the fishways set forth in Interior’s Prescription. Moreover, Topsham Hydro’s alternative is based on substantial evidence either in the record, submitted to Interior as part of this filing, or otherwise available to the Secretary. Accordingly, the Secretary must accept the Topsham Hydro’s Alternative Prescription.⁷

2 Interior’s Preliminary Prescription

Interior’s Prescription requires Topsham Hydro, to implement, as an interim measure, targeted⁸ nighttime shutdowns for downstream migrating American eel (*Anguilla rostrata*) during the downstream

¹ 16 U.S.C. § 823d(b).

² 43 C.F.R. Part 45.

³ 16 U.S.C. § 823d(b).

⁴ Sections 4(e) and 18 of the FPA require FERC to include conditions and fishway prescriptions submitted by Interior in any hydroelectric power license FERC issues. *Id.* at §§ 797(e), 811.

⁵ This process also applies to alternative conditions proposed by the Departments under 16 U.S.C. § 823d(a).

⁶ 16 U.S.C. § 823d(b)(2); *see also* 43 C.F.R. § 45.74(b).

⁷ 16 U.S.C. § 823d(b)(4).

⁸ Turbine shutdowns will occur from dusk to dawn for three consecutive nights following rain accumulations of 0.25 inch or more over a 24-hour period. Turbine shutdowns should occur during the duration of the downstream eel passage season (August 15 to November 15).

eel passage season (defined as August 15-November 15) until permanent measures are implemented. Construction of permanent downstream eel passage and protection are required in Year 3 of the license term⁹. Interior's Prescription does not specify which permanent downstream measures would be required by USFWS. Interior's Prescription only states that the design of permanent eel passage facilities and/or operational measures be developed in consultation and require approval by USFWS, as well as be consistent with the USFWS fish passage design criteria. However, Interior's Prescription does suggest that downstream passage for American eel can be achieved with the installation of an inclined screen for Unit 1 with 0.75 inch clear spacing or less with bypasses capable of passing a minimum of 5% of station hydraulic capacity. The USFWS Fish Passage Engineering Design Criteria (2019)¹⁰ cite two European studies of inclined screen technology installed in Europe that demonstrated effectiveness in protecting eels at two small hydroelectric projects. However, USFWS notes that the system is not common in the northeastern United States and is still considered an experimental technology. Interior's Prescription also generally notes that trashracks with 0.75 inch clear spacing are commonly prescribed in New England to prevent entrainment of American eels at hydropower projects, but USFWS provides no design or operational details on such facilities or effectiveness testing.

Interior's Prescription also requires Topsham Hydro to construct new upstream fish passage facilities for American eel in the third passage season after license issuance. To determine proper siting of the new upstream passage facility, Topsham Hydro must conduct visual monitoring surveys in conjunction with temporary upstream eel ramp deployments with collection traps at multiple locations during the first two full passage seasons after license issuance¹¹. Interior defined the upstream eel passage season as May 1 to October 31.

Finally, Topsham Hydro must implement various monitoring and reporting requirements, including the adoption of a Fishway Operating and Maintenance Plan (FOMP) and a Fishway Effectiveness Monitoring Plan (FEMP). The FEMP requires quantitative fish passage effectiveness testing and evaluation of the American eel fishways for a minimum of two years.

3 Topsham Hydro's Alternative Prescription

Attached to this document as [Appendix A](#) is Topsham Hydro's written Alternative Prescription, which describes Topsham Hydro's proposal in an equivalent level of detail as Interior's Prescription. Topsham Hydro's Alternative Prescription makes several changes to Interior's prescriptions for upstream and downstream eel passage facilities. The changes are intended to ensure that Interior considers all relevant factors as well as prescriptive requirements from other conditioning agencies before requiring Topsham Hydro to install/implement passage facilities/measures. The changes are described below and shown in Table 3-1.

Interior has implied via its prescription of interim targeted nighttime shutdowns that they are a viable means to protect downstream migrating American eel. The USFWS Fish Passage Engineering Design Criteria (2019)¹² also notes that "Operational alternatives such as nightly project shutdowns can be effective at passing eels provided an alternative egress (e.g., spillway, bypass) is available". In addition, nighttime shutdowns were recently prescribed by Interior at several other hydropower projects in Maine (e.g., Shawmut FERC No. 2322¹³, Mattaceunk FERC No. 2520¹⁴) as a protection measure for downstream migrating silver American eels.

Accordingly, Topsham Hydro's Alternative Prescription requires nighttime turbine shutdowns at both the new and old powerhouses beginning in the 1st passage season after license issuance. These turbine shutdowns will occur from dusk to dawn during the duration of the downstream eel passage season (August

⁹ Preliminary Prescription at 19 and 20.

¹⁰ U.S. Fish and Wildlife Service. 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts at 9-8.

¹¹ Preliminary Prescription at 19.

¹² U.S. Fish and Wildlife Service. 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts at 13-12.

¹³ Accession Number: 20200827-5121.

¹⁴ Accession Number: 20170523-5083.

15 to November 15). The term of the shutdowns would continue over the license term, but they would also be aligned with the downstream passage adaptive management plan contained within the Department of Commerce’s Preliminary Prescription (“Commerce’s Prescription”). Specifically, the Commerce Prescription requires installation of a fish guidance/debris boom and bypass in bascule gate No. 1 for alosines and Atlantic salmon to be installed before the beginning of the 2nd passage season. If the fish guidance/debris boom is not effective, then the Commerce adaptive management plan requires measures that may include installation of an Alden-style weir and/trashrack with close spacing of 1-inch or less. Under Topsham Hydro’s Alternative Prescription, if close spaced trashracks are chosen as an adaptive measure within the Commerce Prescription during the term of the new license, then nighttime shutdowns for eel protection would cease. If close spaced trashracks are not installed as an adaptive management measure, then nighttime shutdowns would continue over the license term.

In addition, Topsham Hydro’s Alternative Prescription modifies the operational period of the upstream eel passage facilities. Interior’s Prescription cites collections made in 2020 at the West Enfield Hydroelectric Project¹⁵ as being supportive of its required May 1 to October 31 operating period. However, those data indicate that a total of 218,755 eels were collected at West Enfield in 2020, with most of the eels collected in the month of June (89.4%), followed by July (9%). The months of May, September, and October represented only 0.9%, 0.1%, and 0.0%, respectively, of the total collections made in 2020 at West Enfield. Given these data, Topsham Hydro’s Alternative Prescription requires operation of the upstream passage facilities from June 1 to September 15.

The other components of Topsham Hydro’s Alternative Prescription essentially adopt the measures contained in Interior’s Prescription. Specifically, Topsham Hydro would also construct new upstream fish passage facilities for American eel. To determine proper siting of the new upstream passage facility, Topsham Hydro will conduct visual monitoring surveys in conjunction with temporary upstream eel ramp deployments with collection traps at multiple locations during the first two full passage seasons after license issuance. Once an optimal location(s) is selected, Topsham Hydro would construct permanent upstream eelway(s) in the 3rd passage season after license issuance.

Finally, Topsham Hydro will also implement a FOMP and a FEMP, as described by Interior’s Preliminary Prescription.

Table 3-1: Changes to Interior Prescription relative to Topsham Hydro Alternative Prescription

Interior Prescription	Topsham Hydro Alternative Prescription
<p><u>Downstream Eel Passage:</u> Implement, as an interim measure, targeted nighttime turbine shutdowns until permanent measures are implemented. Turbine shutdowns shall occur from dusk to dawn for three consecutive nights following rain accumulations of 0.25 inch or more over a 24-hour period. Turbine shutdowns shall occur from dusk to dawn during the August 15 to November 15 period.</p> <p>Implement permanent downstream eel passage and protection measures within three years of license issuance. (Install ¾-inch angled trashrack at new powerhouse and ¾-inch overlay at older powerhouse)</p>	<p><u>Downstream Eel Passage:</u> Implement nighttime turbine shutdowns to protect emigrating eels during the downstream eel passage season beginning in the first passage season after license issuance. Turbine shutdowns shall occur from dusk to dawn during the August 15 to November 15 period.</p>
<p><u>Upstream Eel Passage Season:</u> May 1 to October 31</p>	<p><u>Upstream Eel Passage Season:</u> June 1 to September 15</p>

¹⁵ Milford Project (FERC No. 2534); West Enfield Project (FERC No. 2600); Stillwater Project (FERC No. 2712); Orono Project (FERC No. 2710); 2020 American Eel Upstream Passage Operation and Monitoring Report. Accession No. 20210323-5236.

4 Topsham Hydro's Proposed Alternative Prescription Will Be No Less Protective than the Prescription Proposed by Interior

The measures contained in Topsham Hydro's Alternative Prescription address each of the fishery management concerns identified by Interior. Specifically, during nighttime shutdowns, downstream migrating silver American eels will be protected from turbine entrainment; thus, avoiding mortality or injury. Also, since the turbines will be shutdown, impingement of American eel on the trashracks will not be a concern either. To ensure that eels pass the Project during the shutdowns in a timely manner and avoid delay, passage will be provided via the existing north and south downstream fish bypasses, as well as spillage over the dam and via the new downstream fish bypass proposed at bascule gate No. 1, which will pass 5% of station hydraulic capacity.

Nighttime shutdowns are expected to be highly effective when implemented during the peak downstream silver eel migration period. Topsham Hydro is not aware of any site-specific information on the seasonal timing of downstream eel movement on the Androscoggin River. However, information is available from other locations in Maine and elsewhere on the east coast. A 2015 study conducted at the Stillwater Hydroelectric Project¹⁶, located on the Penobscot River in Maine, showed that 86% of the eel observed passed downstream during the week of September 27 – October 3. Moreover, 97% of the eel passing the Stillwater Project were observed over a 5-hour period on September 30 during a rain event. Also, according to the Maine Department of Marine Resource's monthly silver eel out-migration data collected at 19 commercial weirs from 1987 to 2000, 80.7% of the silver eel in Maine migrate downstream during September and October. In terms of daily timing, Topsham Hydro's downstream route of passage study for American eel¹⁷ indicated that most individuals (58%) passed downstream at dusk (hours 1800 – 2200) with a peak in the number of downstream passage events (20%) during the hour of 2000. Overall, 84% of American eel passed the Project between hours 1800 to 0600. A recent study of eel outmigration on the Merrimack River in New Hampshire/Massachusetts demonstrated a comparable pattern of downstream passage timing for outmigrating silver eels with 93%, 95%, 97%, and 95% passing downstream at the Garvins Falls, Hooksett, Amoskeag¹⁸, and Lowell¹⁹ Dams, respectively between the hours of 1800 to 0600. A study of five dams on the Shenandoah River demonstrated a decrease in the rate of eel turbine mortality from 14-36% during generation to 0-6% during shutdown periods (Eyler et al. 2016²⁰). Based on this information, Topsham Hydro's Alternative Prescription of nighttime turbine shutdowns from dusk to dawn from August 15 to November 15 would be expected to have an estimated passage effectiveness of approximately 85% to 95% for American eel.

In terms of the ¾- inch trashracks to be installed at both the new and old powerhouses as suggested by Interior's Prescription, the USFWS Fish Passage Engineering Design Criteria (2019) notes that Travade et al. (2005)²¹ found that a bar spacing of 20 mm (0.79 inches) was able to prevent 88% of European eels, an acceptable surrogate for American eels, from passing through trashracks and becoming entrained and subject to mortality or injury. However, closer spaced trashracks while decreasing entrainment potential also have the potential to increase impingement (defined as injurious contact with a bar rack) of American eels. Typically, intake velocities of 2 feet per second (fps) or less are recommended by USFWS to reduce

¹⁶ Black Bear Hydro Partners, LLC; Black Bear SO LLC; and Black Bear Development Holdings, LLC. 2016. 2015 Diadromous Fish Passage Report for Alosines and American Eels (Milford, Stillwater, and Orono Projects; FERC Nos. 2534, 2712, and 2710, respectively). Accession Number: 20160414-5188.

¹⁷ Topsham Hydro. 2020. Updated Study Report Fall Diadromous Fish Passage Effectiveness Pejepsco Project (FERC No. 4784).

¹⁸ Normandeau Associates, Inc. 2020. The 2019 American Eel Downstream Routing Study: Merrimack River Project. Report prepared for Central Rivers Power NH.

¹⁹ Normandeau Associates, Inc. 2021. Technical Report for the Downstream American Eel Passage Assessment Lowell Hydroelectric Project (FERC No. 2790). Report prepared for Central Rivers Power. Accession Number: 20200930-5137.

²⁰ Eyler, S.M., S.A. Welsh, D.R. Smith, and M.M. Rockey. 2016. Downstream Passage and Impact of Turbine Shutdowns on Survival of Silver American Eels at Five Hydroelectric Dams on the Shenandoah River. *Transactions of the American Fisheries Society* 145: 964-976.

²¹ Larinier, M., Travade, F., Porcher, J. P. 2002. Fishways: biological basis, design criteria and monitoring. *Bull. Fr. Peche Piscic.* 364 supplement. 206 pp.

impingement potential. At Pejepscot, replacing the existing trashracks with full depth ¾-inch trashracks within the existing intake bay at the new powerhouse would result in intake velocities at full generation of approximately 3.1 fps. To reduce intake velocities, a ¾-inch trashrack would need to be angled horizontally to increase the overall surface area. At Pejepscot, to achieve the 2 fps intake velocity criteria, the width of the trashrack would need to increase from approximately 92 feet to 140 feet. The inclined (vertically) ¾ trashrack alternative noted in Interior's Prescription would require the trashrack length to be increased from approximately 25 feet to 40 feet to achieve the 2 fps intake velocity criteria at the new powerhouse.

5 Topsham Hydro's Proposed Alternative Prescription Will Cost Significantly Less To Implement than Interior's Preliminary Prescription

Topsham Hydro estimates the fish passage measures included in its Alternative Prescription would cost approximately \$11,402,000 (2021 dollars)²² to implement over the expected 40-year license term ([Appendix B](#)). In contrast, Topsham Hydro estimates that the fish passage measures prescribed by Interior would cost \$50,539,000 (2021 dollars) to implement over the expected 40-year license term. Therefore, Topsham's Alternative Prescription costs significantly less while achieving similar benefits to the resource ([Appendix C](#)).

This cost difference is attributable to the difficulty of constructing a new trashrack structure. Either an angled or inclined ¾-inch trashrack system for Unit 1 would require substantial new infrastructure. Installation will require full depth cofferdams, severely reducing or eliminating generation for the duration of construction. Also, cleaning of either an inclined or angled rack will be challenging since the rack would be located a distance upstream of the exiting intake platform, due to the need to increase length/width of the rack to decrease intake velocity. It is likely that a new rack cleaning mechanism would need to be installed as well to access and clean the track surface. Finally, cleaning of racks typically necessitates a turndown of turbine generation loads while cleaning is implemented. With increased debris loads on the rack surface caused by the ¾-inch spacing, the frequency of these turndowns will be more common resulting in greater generation losses.

6 Explanation of How the proposed Alternatives Will affect the Issues Set Forth in 43 C.F.R. § 45.71(B)(4)

6.1 Energy Supply, Distribution, Cost and Use

Topsham Hydro's Alternative Prescription will have less of an impact on energy use than Interior's Preliminary Prescription because it preserves more of the Pejepscot Project's low-cost power. Topsham Hydro's Alternative Prescription would result in an estimated lost average annual generation cost of \$268,000 (2021 dollars) ([Appendix B](#)). This lost annual generation is associated with the nighttime turbine shutdown for downstream American eel passage protection, and the downstream fish bypass flow.

By comparison, Interior's Preliminary Prescription would result in a lost average annual generation cost of \$1,016,550 (2021 dollars). This lost annual generation is associated with the interim nighttime turbine shutdown for downstream American eel passage protection, the downstream fish bypass flow, and losses associated with increased trashrack cleaning and hydraulic head loss resulting from close bar spacing (¾-inch).

Neither Interior's Preliminary Prescription nor Topsham Hydro's Alternative Prescription will have an impact on the distribution of energy generated at the Project.

6.2 Flood Control

The construction and operation of the fishways described in Topsham Hydro's Alternative Prescription will have no impact on flood control.

²² These costs do not reflect any adjustment for annual inflation.

6.3 Navigation

The construction and operation of the fishways described in Topsham Hydro's Alternative Prescription will have no impact on navigation.

6.4 Water Supply

The construction and operation of the fishways described in Topsham Hydro's Alternative Prescription will have no impact on water supply.

6.5 Air Quality

Unlike electricity produced by fossil fuel generation, the electricity produced at the Pejepscot Project does not produce harmful emissions of greenhouse gases or other pollutants, such as sulfur dioxide, nitrogen oxide and mercury. Electricity generation from the Pejepscot Project displaces generation from fossil fuel sources, such as coal and natural gas, which leads to reduced emissions of pollutants including carbon dioxide, sulfur dioxide, and nitrogen oxide. Less efficient and higher emitting fossil fuel resources likely will be needed to replace the Pejepscot Project's lost generation. Such a result would be contrary to federal policies encouraging greater use of renewables and a reduction in fossil fuel sources of generation.

6.6 Other Aspects of Environmental Quality

Topsham Hydro has not identified any other impacts to environmental quality that would result from either Topsham Hydro's Alternative Prescription or Interior's Preliminary Prescription.

7 Scientific Studies and Other Information Relied Upon by Topsham Hydro

Citations to the scientific studies, literature, and other documented information relied in preparing this Alternative Prescription are provided throughout the Alternative Prescription and its appendices.

8 Conclusion

WHEREFORE, for the foregoing reasons, Topsham Hydro respectfully requests that Interior adopt Topsham Hydro's Alternative Prescription as proposed herein and expeditiously file the adopted prescription with FERC as Interior's Modified Prescription.

Respectfully submitted,



Mr. Tom Uncher
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July 19, 2021

APPENDIX A-TOPSHAM HYDRO ALTERNATIVE PRESCRIPTION

TOPSHAM HYDRO ALTERNATIVE PRESCRIPTION

1. ALTERNATIVE PRESCRIPTION FOR FISHWAYS

Department of Interior (Interior) filed its preliminary prescription for fishways pursuant to Section 18 of the Federal Power Act (FPA) for the Pejepscot Hydroelectric Project (Project) with the Federal Energy Regulatory Commission (FERC) on June 17, 2021. Pursuant to Section 33(b) of the FPA²³ and Interior's regulations²⁴, Topsham Hydro provides below its proposed alternative fishway prescription (Alternative Prescription), described in an equivalent level of detail to Interior's Preliminary Prescription²⁵. Cost estimates for the facilities described in this Alternative Prescription, are provided in [Appendix B](#).

1.1. Upstream and Downstream Passage

Topsham Hydro will construct, operate, maintain, monitor, and periodically test the effectiveness of fishways for American eel (the “target species”) as described below. The fishways will be designed, constructed, maintained, and operated (which includes project operations) to safely, timely, and effectively pass the target species upstream and downstream of the Project.

1.2. Fish Passage Operating Periods

Topsham Hydro will operate fishways for upstream and downstream passage of the target species during the migration periods identified in [Table 1](#) below.

Table 1. Summary of migration periods for which fish passage will be provided.

Species	Upstream Migration Period	Downstream Migration Period
American eel	June 1-September 15	August 15 – November 15

1.3. Fishway Operation and Maintenance Plan

Within 12 months of license issuance, Topsham Hydro will develop and submit to the USFWS, the MDMR, the MDIFW, and NMFS, a Fishway Operation and Maintenance Plan (FOMP) covering all operations and maintenance of the upstream and downstream fish passage facilities in operation at the time.

The FOMP will include:

- Schedules for routine fishway maintenance to ensure the fishways are ready for operation at the start of the migration season.
- Procedures for routine upstream and downstream fishway operations.
- Procedures for monitoring and reporting on the operation and maintenance of the facilities as they affect fish passage.

The FOMP will be submitted to the USFWS (and other resource agencies) for review and approval prior to submitting the FOMP to the Commission for its approval. Thereafter, Topsham Hydro will keep the FOMP updated on an annual basis, to reflect any changes in fishway operation and maintenance planned for the year. If the USFWS requests a modification of the FOMP, Topsham Hydro will amend the FOMP within 30 days of the request and send a copy of the revised FOMP to the USFWS. Any modifications to the FOMP by Topsham Hydro will require the approval of the USFWS prior to implementation and prior to submitting the revised FOMP to the Commission for its approval.

²³ 16 U.S.C. § 823d(b).

²⁴ 43 C.F.R. Part 45.

²⁵ 43 C.F.R. § 45.71(b)(1).

1.4. Inspection

Topsham Hydro will provide access to the project site and to pertinent project records to USFWS personnel and its designated representatives, for the purpose of inspecting the fish passage facilities and to determine compliance with the Prescription.

1.5. Scheduling

Timely construction, operation, maintenance, and measures for upstream and downstream fish passage, including studies and evaluations, are necessary to ensure their effectiveness and to achieve restoration goals. Therefore, Topsham Hydro will notify, and obtain approval from, the USFWS for any extension to comply with prescribed conditions.

1.5.1. Implementation

Topsham Hydro shall develop design plans for fishways and submit these plans to the USFWS and other resource agencies for review and approval during conceptual, 30 percent, 60 percent, and 90 percent design stages. This will ensure safe, timely, and effective fishway passage is designed and constructed on a timely schedule to meet the implementation dates indicated below. Designs shall be consistent with the 2019 Fish Passage Engineering Design Criteria Manual (USFWS 2019, entire) or updated version.

Topsham Hydro shall adhere to the following dates for installing fishways:

- The temporary upstream eel passage systems are to be installed and operated for two full seasons beginning the first full passage season following license issuance;
- The permanent upstream eel passage is to be operational prior to the third full passage season following license issuance; and
- The downstream eel passage measures are to be operational beginning the first full passage season following license issuance

Topsham Hydro shall adhere to the following design milestone schedule for the upstream eel passage system(s):

- 30 percent design 12 months prior to the start of construction, and following delivery of the eelway siting survey report;
- 60 percent design 6 months prior to the start of construction; and
- 90 percent design 3 months prior to the start of construction.

For downstream eel passage systems, Topsham Hydro shall adhere to the following design milestone schedule:

- conceptual designs 24 months prior to the start of construction;
- 30 percent design 18 months prior to the start of construction;
- 60 percent design 12 months prior to the start of construction; and
- 90 percent design and Basis of Design Report 6 months prior to the start of construction.

Following approval by the USFWS and other resource agencies, Topsham Hydro shall submit final design plans to the Commission for its approval prior to the commencement of fishway construction activities. Once the fishways are constructed, final as-built drawings that accurately reflect the Project as constructed shall be filed with the USFWS, the other resource agencies, and the Commission.

1.6. Fish Passage Effectiveness Measures

Effectiveness testing of both upstream and downstream American eel passage is critical to evaluating passage success, diagnosing problems, determining when fish passage modifications are needed,

and what modifications are most likely to be effective over the term of the license.

1.6.1. Fishway Effectiveness Monitoring Plan

Topsham Hydro will develop a Fishway Effectiveness Monitoring Plan (FEMP) in consultation with and requiring approval by the USFWS. The FEMP will contain plans for ensuring (1) the effectiveness of the upstream and downstream eel passage measures required pursuant to Sections 1.7 and 1.8; and (2) that the proposed minimum flow requirement of 1,710 cfs provides safe, timely, and effective downstream passage to emigrating diadromous species (i.e., does not strand fish). The FEMP shall be submitted to FERC for approval 6 months prior to the implementation dates for installing upstream fish passage systems specified in Section 1.5.1.

Topsham Hydro shall begin implementing effectiveness testing measures at the start of the first migratory season after the fishway(s) are operational and shall conduct quantitative fish passage effectiveness testing and evaluation for a minimum of two years. If the USFWS requests a modification of the FEMP, Topsham Hydro shall amend the FEMP within 30 days of the request and send a copy of the revised FEMP to the USFWS and resource agencies. Any modifications to the FEMP by Topsham Hydro will require approval by the USFWS prior to implementation.

Topsham Hydro will submit yearly interim study reports to the USFWS following the conclusion of each study year. The interim reports for upstream passage studies will be submitted to the USFWS by February 15 following each study year. The final study report will be submitted to the USFWS within 6 months after the completion of the study. The final study report will include methods, data analysis, results, an assessment of any factors or potential problems hindering passage effectiveness, and provide recommended modifications to achieve safe, timely, and effective passage. In conjunction with submitting the final study report, Topsham Hydro will also provide electronic copies of all data collected from studies to the USFWS.

Topsham Hydro shall meet annually, in the late fall, with the USFWS and the other resource agencies to report on the occurrence of fish passage maintenance and operations, monitoring results, and review the operating plan. Any changes and planned maintenance will be accomplished 30 days prior to the start of the next migratory season.

1.7. Upstream American Eel Passage

- Topsham Hydro shall construct, operate, and maintain upstream fish passage facilities that provide safe, timely, and effective upstream passage for American eels.
- To determine proper siting of the upstream eelway(s), Topsham Hydro shall conduct visual monitoring surveys in conjunction with temporary upstream eel ramp deployments with collection traps for the first two full passage seasons after license issuance. Based on the visual survey and trapping results, Topsham Hydro shall, in consultation with the USFWS and other resource agencies, determine optimal locations for siting the permanent upstream eelway(s).
- Temporary upstream eel ramps shall be deployed in areas where flowing water may attract migrating eels. At a minimum, Topsham Hydro shall deploy temporary eel ramps on the bedrock outcrop located on the right bank (as proposed in the final license application) and near the exit of the downstream bypass. Additional locations should be decided in consultation with the USFWS and the other resource agencies. Based on results of the surveys, Topsham Hydro shall, in consultation with the USFWS and other resource agencies, determine optimal locations for siting the permanent upstream eelway(s).
- Permanent upstream eelways shall be operational no later than June 1 of the third full passage season (June 1 to September 15) after license issuance.
- The upstream facilities shall be designed in consultation with the resource agencies, and the resource agencies shall review the 30 percent, 60 percent, and 90 percent drawings.
- The designs shall be consistent with the Service's 2019 Fish Passage Engineering Design Criteria

Manual (USFWS 2019, entire) or updated version.

1.8. Downstream American Eel Passage

- Topsham Hydro shall design, operate, and maintain a downstream eel passage and protection system that provides safe, timely, and effective downstream passage for American eels.
- Topsham Hydro shall implement nighttime turbine shutdowns at new and old powerhouses to protect emigrating eels during the downstream eel passage season beginning in the first passage season after license issuance. Turbine shutdowns shall occur from dusk to dawn. Turbine shutdowns should occur during the duration of the downstream eel passage season in accordance with provisions of Section 1.2.
- The shutdowns shall align with the downstream passage adaptive management plan contained within the Department of Commerce's Preliminary Prescription (Commerce Prescription). Specifically, the NMFS Prescription requires installation of a fish guidance/debris boom and bypass in bascule gate No. 1 for alosines and Atlantic salmon to be installed before the beginning of the 2nd passage. If the fish guidance/debris boom is not effective, then the Commerce adaptive management plan requires measures that may include installation of an Alden-style weir and/trashrack with close spacing of 1-inch or less. If close spaced trashracks are chosen as an adaptive measure within the Commerce Prescription during the term of the new license, then nighttime shutdowns for eel protection would cease. If close spaced trashracks are not installed, then nighttime shutdowns would continue over the license term.

APPENDIX B-COST ANALYSIS OF TOPSHAM HYDRO'S ALTERNATIVE PRESCRIPTION

Category	Prescription Measure	Implementation Year	Capital Cost (2021)	Annual O & M Cost (2021)	Annual Generation Loss (2021)	Total Cost over 40-Year License Term (2021)
Upstream Passage-American Eel	Conduct visual monitoring surveys in conjunction with temporary upstream eel ramp deployments with collection traps for the first two full passage seasons after license issuance.	2023-2024	\$40,000	\$20,000	\$0	\$80,000
	Install and maintain, from June 1 to September 15 annually, an upstream American eel ramp(s) before the beginning of the third full passage seasons after license issuance.	2025-2062	\$100,000	\$5,000	\$0	\$290,000
Downstream Passage-American Eel	Implement nighttime turbine shutdowns to protect emigrating eels during the downstream eel passage season beginning in the first passage season after license issuance. Turbine shutdowns shall occur from dusk to dawn during the August 15 to November 15 period.	2023-2062	\$0	\$0	\$268,000	\$10,720,000
Monitoring Plans	Fishway Effectiveness Monitoring Plan (FEMP) 6 months prior to installing upstream fish passage structures	2025-2026	\$0	\$150,000	\$0	\$300,000
	Fish Operation and Maintenance Plan (FOMP)	2023	\$0	\$12,000	\$0	\$12,000
Total						\$11,402,000

APPENDIX C-COST ANALYSIS OF INTERIOR'S PRELIMINARY PRESCRIPTION

Category	Prescription Measure	Implementation Year	Capital Cost (2021)	Annual O & M Cost (2021)	Annual Generation Loss (2021)	Total Cost over 40-Year License Term (2021)
Upstream Passage-American Eel	Conduct visual monitoring surveys in conjunction with temporary upstream eel ramp deployments with collection traps for the first two full passage seasons after license issuance.	2023-2024	\$40,000	\$27,500	\$0	\$95,000
	Install and maintain, from May 1 to Oct 31 annually, an upstream American eel ramp(s) before the beginning of the third full passage seasons after license issuance.	2025-2062	\$100,000	\$7,500	\$0	\$385,000
Downstream Passage-American Eel	Implement, as an interim measure, targeted nighttime turbine shutdowns until permanent measures are implemented. Turbine shutdowns shall occur from dusk to dawn for three consecutive nights following rain accumulations of 0.25 inch or more over a 24-hour period. Turbine shutdowns shall occur from dusk to dawn during the August 15 to November 15 period.	2023-2024	\$0	\$0	\$134,000	\$268,000
	Implement permanent downstream eel passage and protection measures within three years of license issuance. (install ¾-inch angled trashrack at new powerhouse and ¾-inch overlay at older powerhouse)	2025-2062	\$8,515,000	\$15,000	\$1,063,000	\$49,479,000
Monitoring Plans	Fishway Effectiveness Monitoring Plan (FEMP) 6 months prior to installing upstream fish passage structures	2025-2026	\$0	\$150,000	\$0	\$300,000
	Fish Operation and Maintenance Plan (FOMP)	2023	\$0	\$12,000	\$0	\$12,000
Total						\$50,539,000

Brookfield

Renewable

July 19, 2021

VIA ELECTRONIC DELIVERY AND HAND DELIVERY

Kara Meckley, Director
Habitat Protection Division
NMFS Office of Habitat Conservation
1315 East-West Highway, F/HC2
Silver Spring, MD 20910

**Re: Topsham Hydro Partners Limited Partnership
Request for Trial-Type Hearing on Disputed Issues of Material Fact and
Alternative Prescription Pertaining to a Preliminary Section 18 Fishway
Prescription Submitted to the Federal Energy Regulatory Commission by the
United States Department of the Interior for the Pejepscot Hydroelectric
Project, FERC Project No. 4784-106**

Dear Ms. Meckley:

Pursuant to Section 18 of the Federal Power Act, 16 U.S.C. § 811, and Part 221 of the regulations of the U.S. Department of Commerce (“Commerce”), 50 C.F.R. Part 221, Topsham Hydro Partners Limited Partnership (“Topsham Hydro”), Licensee of the Pejepscot Hydroelectric Project No. 4784 (“Project”), hereby submits to the National Marine Fisheries Service’s Office of Habitat Conservation the attached Request for Trial-Type Hearing on Disputed Issues of Material Fact pertaining to a preliminary Section 18 fishway prescription filed by Commerce with the Federal Energy Regulatory Commission (“FERC”) on June 17, 2021 for inclusion in the new license for the Project. Also included are Notices of Appearance in the proceeding, and Topsham Hydro’s Alternative Fishway Prescription with respect to the upstream passage of anadromous fish.

Topsham Hydro is providing this submission via electronic mail and by hand delivery. Topsham Hydro also is filing the submission with FERC and serving the documents on each “license party” to the FERC licensing proceeding for Project No. 4784. If you have any questions regarding this filing or require additional information, please contact me by phone at (207) 755-5613 or by email at Luke.Anderson@BrookfieldRenewable.com.

Respectfully submitted,



Luke T. Anderson
Manager, Licensing
Brookfield Renewable

I. BACKGROUND

A. Project Location

The 13.88 MW Pejepscot Project is located on the Androscoggin River in the Village of Pejepscot and the Town of Topsham, Maine. The Project is the second of 22 hydroelectric projects on the mainstem Androscoggin River, located at approximately river mile (RM) 14. The Project dam is approximately 4 miles upstream of the Brunswick Hydroelectric Project (“Brunswick Project”) and 3.25 miles downstream of the Worumbo Hydroelectric Project. The Androscoggin River basin above the Project dam has a drainage area of approximately 3,420 square miles.

B. Project License

FERC issued a license for the Project in 1982 for a term of 40 years.⁴ The current license expires on August 31, 2022. Topsham Hydro commenced the relicensing process by filing a Notice of Intent to Relicense the Project and Pre-Application Document with FERC on August 31, 2017. After completing pre-filing consultation with federal and state resource agencies and conducting a number of environmental studies, Topsham Hydro filed a final application for a new license for the Project on August 31, 2020. FERC issued a “Notice of Application Accepted for Filing, Soliciting Motions to Intervene and Protests, Ready for Environmental Analysis, and Soliciting Comments, Recommendations, Terms and Conditions, and Prescriptions” on April 19, 2021. Commerce filed its Prescription pursuant to FPA Section 18 in response to FERC’s notice.

⁴ *Worumbo Hydro, Inc.*, 20 FERC ¶ 62,483 (1982).

C. Project Features and Operation

As shown in the figure below, the principal Project works include a 560-foot-long, 47.5-foot-high dam, a 480-foot-long spillway, fish passage facilities, and two powerhouses.⁵ Spillway capacity is provided by operating the gates on the crest of the dam, which is equipped with five, 96-foot-long by 3-foot-high hydraulically operated bascule gates separated by concrete piers.⁶ The Project has a spillway discharge capacity of 95,000 cubic feet per second (“cfs”).⁷ The two Project powerhouses, both of which are integrated into the dam, include an original (northerly) powerhouse constructed in 1898 and a new (southerly) powerhouse constructed from 1985 to 1987.⁸

The original powerhouse contains three horizontal Francis units (identified as Units 21, 22, and 23) with a combined output capacity of 1.58 MW.⁹ The maximum flow through each of the three units is approximately 350 cfs, for a total of 1,050 cfs.¹⁰ The newer powerhouse contains a vertical-shaft, low speed, adjustable-blade, propeller type Kaplan turbine-generator unit (identified as Unit 1) rated at 12.3 MW.¹¹ The minimum and maximum rated flow through Unit 1 is 1,170 and 7,550 cfs, respectively.¹² When Unit 1 nears its maximum flow capacity, one or more of the three small units (Units 21, 22, and 23) is manually started.¹³ The

⁵ Topsham Hydro Partners Limited Partnership, Application for New License for the Pejepscot Hydroelectric Project at A-2 to A-3, Project No. 4784-106 (filed Aug. 31, 2020) (“Final License Application”).

⁶ *Id.*

⁷ *Id.*

⁸ *Id.*

⁹ *Id.* at A-3 to A-4.

¹⁰ *Id.* at A-4.

¹¹ *Id.*

¹² *Id.*

¹³ *Id.* at B-1.

small units are mainly operated during high spring runoff and after large storm events.¹⁴ Inflows in excess of the hydraulic capacity of the units (which occurs approximately 25% of the time) are passed at the spillway.¹⁵ The Project is required to release a continuous minimum flow of 1,710 cfs or inflow, whichever is less.¹⁶

The Project has two separate intake structures: the older powerhouse intake and the new powerhouse intake, both of which are integral with the powerhouses.¹⁷ The old powerhouse intake is constructed of concrete and has 1.5-inch clear spacing on the trashracks.¹⁸ The trashracks have a top elevation of 69.7 feet and extend down to an elevation of 43.3 feet; the racks are approximately 71.4 feet wide.¹⁹ The new powerhouse intake is also constructed of concrete and has 1.5-inch clear spacing at the top of the trashrack (from elevation 61.35 feet to elevation 55.1 feet) and 2.5-inch clear spacing at the bottom (from elevation 55.1 feet to elevation 36.0 feet).²⁰ The trashracks on the new powerhouse intake are approximately 91.6 feet wide.²¹

The Project includes an upstream fish passage facility consisting of a vertical lift (elevator) that moves migratory fish in a hopper about 30 feet vertically from near the new powerhouse tailrace to the impoundment.²² As described in Topsham Hydro's Final License

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ *Id.* at A-4.

¹⁸ *Id.*

¹⁹ *Id.*

²⁰ *Id.*

²¹ *Id.*

²² *Id.*

Application,²³ the fish lift is designed to pass 85,000 American shad and 1,000,000 river herring annually. The hopper is constructed of steel and is approximately 20 ft long and 7 ft wide with a sloping bottom that assists in removal of the fish from the hopper. The hopper has a capacity of approximately 1,000 gallons. The inlet to the hopper is a V-trap about 8 inches wide by 8 ft high. In front of the entry gate there are four attraction pumps under a grating that create an additional flow up to 160 cfs through the entry channel to attract the fish to the lift. These pumps can be sequenced to change the volume of water passing through the entry channel, depending on the flow out of the powerhouse tailrace. The hopper discharges the fish into a metal flume about 6 ft wide and 8 ft high. The flume is approximately 110 ft long from the lift hopper to the gate at the dam. There is a continuous flow of about 30 cfs from the impoundment to the hopper to attract the fish to the impoundment.

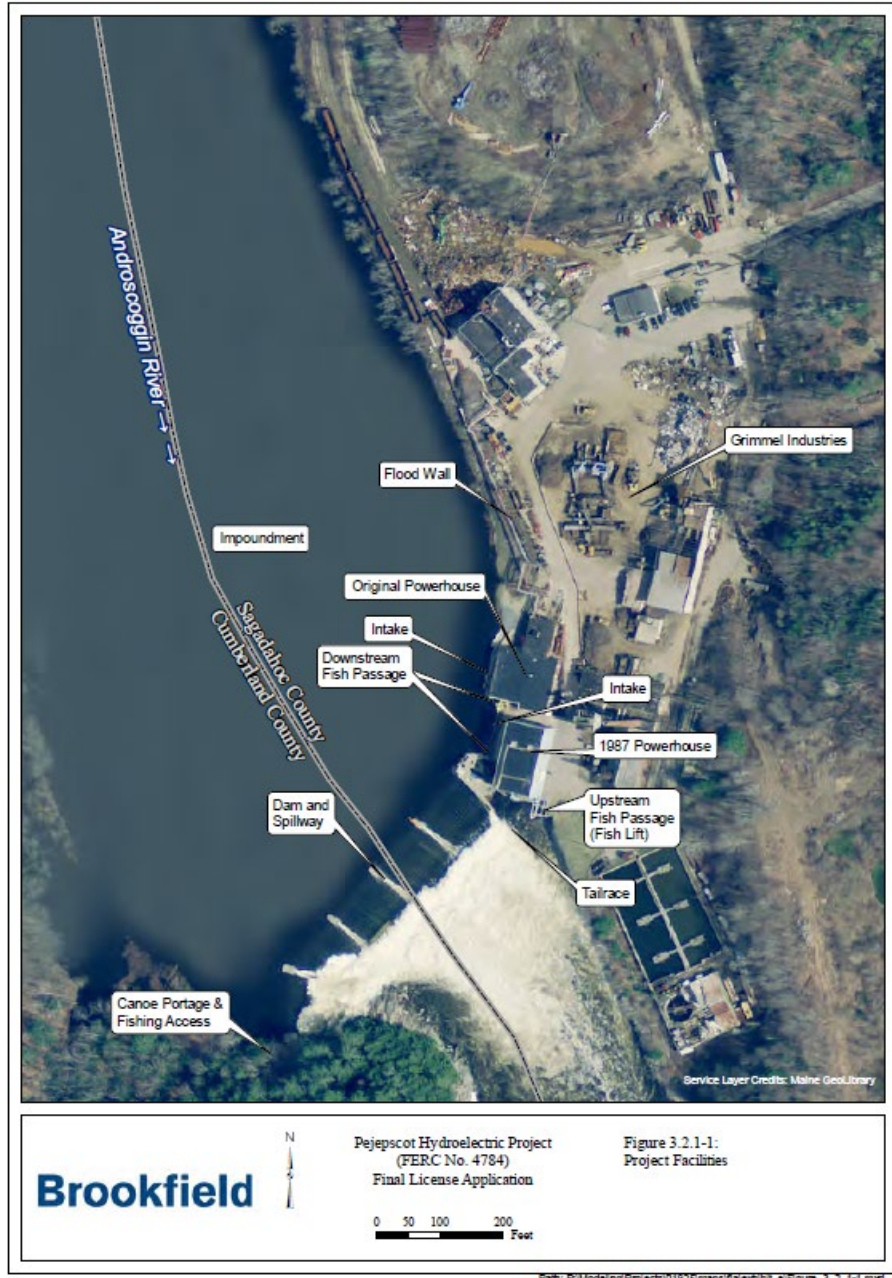
The upstream fish passage is operated annually from April 15 to November 15. The lift is operated automatically, except under high water conditions when it is operated manually, to lift the fish hopper every two hours beginning at 8 a.m. for a total of five lifts per day. The four attraction pumps are set by the station operator; the number of pumps operating is determined based on the flow coming through the turbine and out the tailrace. When river flows are less than 1,700 cfs, one pump is operated (total attraction flow 70 cfs). When river flows are between 1,700 and 3,500 cfs, two pumps are operated (total attraction flow 110 cfs). When river flows are between 3,500 and 5,200 cfs, three pumps are operated (total attraction flow 150 cfs). Finally, when river flows are greater than 5,200 cfs, four pumps are operated (total attraction flow 190 cfs). The total of 190 cfs (attraction flow from four pumps (160 cfs)

²³ *Id.* at A-4 to A-6.

plus an additional 30 cfs provided from the impoundment via the exit trough) represents approximately 2.2% of the Project maximum turbine discharge capacity (8,600 cfs). When river flows are 15,000 cfs (impoundment El. of approximately 69.5-70.0 ft) or higher, the fishway is shut down.

A preset weir in the channel provides an attraction flow through the flume and hopper. The flume from the hopper to the impoundment is opened when the seasonal operation is started for passage of diadromous fish. The gates in the channel that allow fish to be counted through the observation window are left open unless they are being used for counting. Fish within the lift are not actively counted and, historically, the counting facilities have only been used for efficiency tests of the lift.

Downstream fish passage facilities at the Project—for all species—consist of two steel entry weirs, one on either side of the Unit 1 turbine intake. From each weir, an outlet pipe conveys downstream migrating fish in water down to the tailwater. The weir gates are 4 feet wide. The northerly (left) weir has a 30-inch diameter steel transport pipe that is approximately 185 feet long; the southerly (right) weir has a 24-inch diameter steel transport pipe that is approximately 60 feet long. The downstream fishway is operated from April 1 to December 31 annually for all species as river conditions allow.



D. Fish Resources in the Project Vicinity

Fish assemblage in the Androskoggin River reflects natural and anthropogenic gradients, from its upper reaches in New Hampshire to the tidal waters near Brunswick, Maine. In the lower reaches, including in the Project vicinity, the fish assemblage consists of but is not limited

to anadromous migrants such as Atlantic salmon, American shad, alewife, and blueback herring as a result of fish passage facilities, stocking, and trap and transport programs.²⁴ Additionally, American eel have been documented in areas in the vicinity of the Project.

Several studies have been conducted at the Project to assess both upstream passage effectiveness and downstream passage effectiveness, route of passage, and survival for various diadromous species. These studies were conducted in the early 1990s, shortly after the Project fish lift was constructed, and more recently as part of Topsham Hydro's Endangered Species Act consultation with resource agencies related to Atlantic salmon, as well as during the FERC relicensing process. In 2019, Topsham Hydro evaluated the effectiveness of the existing upstream passage facilities for adult American shad and river herring. Topsham Hydro's Computational Fluid Dynamics modeling study showed that entrance jet velocities occasionally exceeded the U.S. Fish and Wildlife Service's ("USFWS") Fish Passage Engineering Design Criteria for river herring (i.e., greater than the recommended velocity of 6 feet per second ("fps")) for some fish lift entrance gate and attraction flow settings.²⁵ However, the current vertical gate configuration can meet USFWS design criteria for entrance jet velocity and hydraulic drop, so long as the appropriate fish lift entrance gate and attraction flow settings are selected to match the criteria.

E. Topsham Hydro's Proposal for Fish Passage in the New License

Based on existing information and the results of its relicensing studies, Topsham Hydro proposed a suite of protection, mitigation, and enhancement measures to address fish passage

²⁴ *Id.* at E-76.

²⁵ Topsham Hydro Partners Limited Partnership, Updated Study Report – Computational Fluid Dynamics Modeling Within the Pejepscot Fishway and Tailrace at 31, Project No. 4784-106 (filed Mar. 30, 2021).

performance at the Project. As relevant to the Commerce Prescription, Topsham Hydro proposed to develop a plan and schedule, in consultation with resource agencies, containing potential physical and/or operational modifications to be constructed/implemented no later than Year 3 of the new license, to address factors (i.e., internal and external attraction flow hydraulics and acoustics) that may be impacting upstream passage of migratory fish species.²⁶ Topsham Hydro did not propose immediate replacement of the lift entrance gate because the current vertical gate configuration can meet USFWS design criteria for entrance jet velocity and hydraulic drop, so long as the appropriate fish lift entrance gate and attraction flow settings are selected to match the criteria. Topsham Hydro's 2019 radio telemetry study²⁷ indicated good nearfield attraction (approximately 93%), but low overall fish lift effectiveness (approximately 20%) for river herring, suggesting that the river herring were entering the existing fish lift entrance gate but not completing passage through the remaining portions of the fish lift. Topsham Hydro, did, however, propose to increase the frequency of fish lift operations,²⁸ and conduct fish lift efficiency testing for adult river herring during the fourth full passage season after the effective date of the new license.²⁹

To provide safe, timely, and effective downstream fish passage at the Project, Topsham Hydro, in consultation with resources agencies, proposed to install and operate a fish guidance system/debris boom to direct downstream migrants to a new bypass within bascule gate no. 1,

²⁶ Final License Application at E-13 to E-14.

²⁷ Topsham Hydro Partners Limited Partnership, Updated Study Report – Spring Anadromous Fish Passage Effectiveness at 22, Project No. 4784-095 (filed July 10, 2020).

²⁸ Final License Application at E-13.

²⁹ *Id.* at E-14.

beginning in the second full passage season after the effective date of the new license.³⁰

Topsham Hydro also proposed to discontinue the north (left bank) downstream fish bypass (which would effectively be covered by the fish guidance system) beginning in the second full passage season after the effective date of the new license, but to continue operation of the south (right bank) downstream fish bypass from April 1 to December 31 annually for the term of the new license.³¹

II. COMMERCE’S SECTION 18 PRESCRIPTION

On June 17, 2021, Commerce filed its Prescription with FERC pursuant to its authority under FPA Section 18 and Part 221 of Commerce’s regulations. Although the Prescription stated that Commerce was submitting its supporting administrative record with the Prescription—which is required by its regulations—it is not clear that Commerce submitted those documents with its Prescription, or until several days later, on June 21, 2021, when they were posted to the FERC docket.³²

Commerce’s Prescription requires several measures related to upstream fish passage facilities for anadromous fish.³³ Specifically, the Prescription requires Topsham Hydro within two years of license issuance to replace the existing vertical entrance gate at the Project’s existing fish lift with a bottom-opening flap gate.³⁴ Commerce requires that the new gate accommodate the full 160 cfs of attraction flow or more. It further requires that the top of the gate be positioned a minimum of 3.0 feet below the tailrace elevation over the range of

³⁰ *Id.* at E-144.

³¹ *Id.*

³² 50 C.F.R. § 221.20(a).

³³ Prescription at 52, 53.

³⁴ *Id.*

operating flows so as to maintain an entrance velocity within the 4-6 fps range for alosines and up to 8 fps for Atlantic Salmon, and a hydraulic drop at the entrance of approximately 0.8 feet normally with the capability of increasing up to 1.5 to 2.0 feet.³⁵ Commerce's Prescription also requires that Topsham Hydro operate the attraction water system at full capacity, regardless of unit discharge, unless monitoring studies indicate different operations are warranted.³⁶

Beginning in the first full passage season after the effective date of the new license, Commerce's Prescription also requires Topsham Hydro to operate the existing fish lift based on a lift cycle frequency to be determined annually in consultation with Commerce's National Marine Fisheries Service ("NMFS"), Maine Department of Marine Resources, and the USFWS. The Prescription anticipates that lift frequency may vary from every 15 minutes during peak migration periods to once every 2 hours, with frequency and operating hours to be managed based on site-specific conditions in consultation with the agencies.³⁷

Acknowledging that there is some uncertainty that implementation of these measures will potentially satisfy the standard of a safe, timely, and effective fishway, Commerce's Prescription requires additional measures to be implemented if the above-prescribed measures do not achieve certain passage performance standards.³⁸ These adaptive requirements could include the construction of additional fishway entrances and/or fishways if monitoring demonstrates their necessity.³⁹ The timing of implementation of these additional measures is

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.* at 55.

³⁸ *Id.* at 67-68.

³⁹ *Id.* at 68-69.

tied to the resolution of the upcoming Brunswick Hydroelectric Project FERC relicensing process. The current license for that project has an expiration date of 2029.⁴⁰

Commerce's Prescription also requires several downstream fish passage measures related to anadromous fish.⁴¹ Topsham Hydro is required within two years of license issuance to install a fish guidance/debris boom and construct a new bypass within bascule gate no. 1. In addition, Topsham Hydro must open bascule gate no. 1 (closest to the powerhouse) 50% to provide approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May. These requirements are consistent with Topsham Hydro's proposal. Unlike Topsham Hydro's proposal, however, the Prescription requires Topsham Hydro to maintain availability of use of the existing north (left bank) downstream fish bypass throughout the new license term.⁴² In addition, Commerce's Prescription requires additional adaptive management measures to be implemented if the above-prescribed measures do not achieve certain passage performance standards. Such adaptive measures may include, but not be limited to the installation of an Alden-style (bypass) weir and/or rigid rack structure(s) with close spacing of 1-inch or less.⁴³

Finally, the Prescription requires Topsham Hydro to implement three years of monitoring studies for juvenile and adult alosines and Atlantic salmon after the initial modifications are made to the upstream and downstream fish passage facilities, as well as any subsequent modifications made as part of adaptive management planning.⁴⁴

⁴⁰ *Id.* at 70.

⁴¹ Prescription at 60, 61.

⁴² Topsham Hydro had proposed to discontinue use of the north bypass as described in the Final License Application. Final License Application at E-144.

⁴³ Prescription at 61.

⁴⁴ *Id.* at 67, 68.

III. STATUTORY AND REGULATORY FRAMEWORK

Section 18 of the FPA provides the federal fishery agencies, including NMFS and USFWS, with mandatory conditioning authority to prescribe fishways for the safe and timely upstream and downstream passage of fish.⁴⁵ FERC does not have the ability to reject or modify fishway prescriptions filed by NMFS or USFWS through Commerce or Interior under Section 18.⁴⁶ So while FERC may express its disagreement with any prescriptions it opposes, it will nonetheless include the prescriptions in any license it issues.⁴⁷

In 2005, Congress amended FPA Section 18 to grant license applicants the right to a trial-type hearing on the factual underpinnings for any mandatory fishway prescriptions. Under these revisions, a license applicant is entitled to a determination on the record, after opportunity for an agency trial-type hearing of no more than 90 days, on any disputed issues of material fact with respect to preliminary fishway prescriptions.⁴⁸ Congress also gave license applicants the right to propose alternatives to any proposed fishway prescriptions under Section 33 of the FPA.⁴⁹ Topsham Hydro's alternative to Commerce's Prescription is set forth in a separate submission.

Congress directed Interior, Commerce, and the Department of Agriculture to establish procedures for such expedited trial-type hearings, including rules for discovery and cross-examination of witnesses. On March 31, 2015, the three Departments jointly issued revised

⁴⁵ 16 U.S.C. § 811.

⁴⁶ *Am. Rivers v. FERC*, 201 F.3d 1186, 1206-11 (9th Cir. 2000).

⁴⁷ *See, e.g., Pub. Util. Dist. No. 1 of Pend Oreille Cty.*, 130 FERC ¶ 62,148 at P 32 (2010).

⁴⁸ 16 U.S.C. § 811.

⁴⁹ *Id.* § 823d(b).

interim rules, with a common preamble.⁵⁰ These rules became effective on November 23, 2016.⁵¹ Commerce’s rules are codified at 50 C.F.R. Part 221.

Commerce’s regulations define a “material fact” as one “that, if proved, may affect a Department’s decision whether to affirm, modify, or withdraw any condition or prescription.”⁵² An administrative law judge (“ALJ”) decides all disputed issues of material fact. The ALJ’s decision is binding on all parties.

IV. DISPUTED ISSUES OF MATERIAL FACT, EXHIBIT AND WITNESS LISTS, AND CONSENT TO ELECTRONIC SERVICE

The Prescription largely requires the measures Topsham Hydro proposed for passing anadromous fish at the Project. Topsham Hydro agrees with Commerce’s Prescription to operate the attraction water system at full capacity and position the entry gate (submergence depth) no less than 3.0 feet below the tailrace water surface. However, Commerce’s requirement for Topsham Hydro to replace the entrance gate on the existing fish lift to provide safe, timely, and effective upstream passage is based on factual statements and assumptions that are unfounded and erroneous, disputed and material. Moreover, Commerce appears to rely upon supporting information that it did not submit into the record with the filing of its Prescription as required by its own regulations.⁵³

As detailed in Appendix A, Topsham Hydro disputes several issues of material fact that relate to Commerce’s requirement for Topsham Hydro to replace the existing vertical entrance

⁵⁰ Resource Agency Hearings and Alternatives Development Procedures in Hydropower Licenses, 80 Fed. Reg. 17,156 (Mar. 31, 2015).

⁵¹ Resource Agency Hearings and Alternatives Development Procedures in Hydropower Licenses, 81 Fed. Reg. 84,389, 84,389 (Nov. 23, 2016).

⁵² 50 C.F.R. § 221.2.

⁵³ This appears to include Mulligan 2019 and the 2017 USFWS Engineering Design Criteria which Commerce filed with FERC several days after the submission of its Prescription.

gate with a bottom-opening flap gate, which erroneously assume that the existing gate cannot meet key parameters to increase efficiency, and the frequency of the fish lift operation.

Appendix A sets forth a list of the disputed issues of material fact with respect to Commerce's Prescription. In accordance with Commerce's regulations, each issue identifies the specific factual assertion made, implied, or relied upon by Commerce that Topsham Hydro disputes, along with an explanation of why Commerce's assertion is erroneous or unfounded and why the dispute is material.⁵⁴ Appendix A also identifies the scientific studies, literature, and other documented information on which the Licensee presently relies to demonstrate the fallacy of Commerce's assertions.

Appendix B is Topsham Hydro's list of exhibits, along with a notation whether each exhibit is contained in the FERC record for the Pejepscot Project relicensing. Topsham Hydro is providing an electronic copy of each exhibit that is not currently contained in the FERC record for the Project.

Appendix C identifies the witnesses Topsham Hydro presently intends to provide testimony at the hearing. Appendix C also includes each witness's contact information and qualifications and gives a brief narrative summary of each witness's expected testimony.

Topsham Hydro reserves the right to amend or supplement its exhibit and witness lists. Topsham Hydro also reserves the right to introduce additional exhibits at the hearing, even if not previously identified, for impeachment and rebuttal purposes. Topsham Hydro further reserves the right to call impeachment and rebuttal witnesses, even if not previously identified.

⁵⁴ 50 C.F.R. § 221.21.

Topsham Hydro consents to being served by electronic mail on the individuals identified below, pursuant to 50 C.F.R. § 221.21(b)(4).

Respectfully submitted,



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Counsel for Topsham Hydro Partners Limited Partnership

DATED: July 19, 2021

APPENDIX A

Disputed Issues of Material Fact

I. List of Disputed Issues of Material Fact

(50 C.F.R. § 221.21)

1. Whether submergence depth for a fish lift entrance gate is the key factor affecting passage efficiency.
2. Whether the gate at the Project's existing fish lift can meet the key requirements identified in the Prescription.
3. Whether the type of bottom-opening flap gate required by the Prescription is commonly used in the Northeast.
4. Whether Atlantic salmon are likely to migrate upstream when river temperatures are over 22°C.

II. Supporting Information for Each Disputed Issue of Material Fact

Disputed Issue of Material Fact No. 1:

Whether submergence depth for a fish lift entrance gate is the key factor affecting passage efficiency.

a. Specific factual assertions made, implied, or relied upon by Commerce

“Based on the best scientific information available at this time, we conclude that a bottom-opening entrance gate, as described above, in combination with our required modifications to operational frequency of the existing fish lift . . . could potentially satisfy the standard of a safe, timely and effective fishway. We have confidence based on experience that this design will function for the full suite of diadromous species.¹

“Furthermore, we note that design and specifications of the entrance gate that we are requiring are consistent with fishway design guidelines set forth by the U.S. FWS (USFWS, 2017).”²

b. Why Commerce’s statements are unfounded or erroneous

The 2019 study cited in Commerce’s Prescription indicated that submergence depths greater than 3.0 feet appeared to greatly increase alosine entrance efficiency at fish lifts.³ In particular, increases in submergence depth were shown to be the most influential predictor variable of passage time, followed then by gate type (e.g., vertical, overshoot, and reversed overshoot or also referred to as a “flap gate” by NMFS) and river temperature.⁴ Nearfield attraction effectiveness for river herring was 92.6%, indicating that the primary issue for river herring appears to be internal to the fish lift, rather than an entrance gate issue. Commerce’s requirement for a new entry gate to the existing fish lift

¹ Prescription at 54.

² *Id.* at 55. Notably, the 2017 USFWS Fish Passage Design Criteria cited by Commerce does not discuss the overshoot or reversed overshoot gate, though the 2019 USFWS criteria—which is not included in Commerce’s list of literature cited—does.

³ *Id.* at 54, 75 (citing Mulligan, K. B., Haro, A., Towler, B., Sojkowski, B., & Noreika, J. (2019). Fishway entrance gate experiments with adult American Shad. *Water Resources Research*, 55 (“Mulligan 2019”).

⁴ Mulligan 2019 at 1.

disregards the key factor—cited in the very report it references—affecting passage efficiency: submergence depth, and that the comparable submergence depth could be achieved with either the vertical gate or the alternative gate proposed by NMFS.

c. Why the factual dispute is material

Commerce’s Prescription requires Topsham Hydro to install a new entry gate to the existing fish lift at great expense, despite the fact that the existing entry gate fulfills the key factor required for such gates. If it is established that submergence depth is the key factor affecting passage efficiency, then Commerce could withdraw or revise its mandatory prescription with respect to installation of a new entrance gate.

d. Specific citations to information relied on by the Licensee

Exhibit A, Mulligan 2019.

Exhibit B, Pejepsco CFD Modeling Study.

Exhibit C, Pejepsco Spring Passage Effectiveness Study.

Disputed Issue of Material Fact No. 2:

Whether the gate at the Project’s existing fish lift can meet key requirements identified in the Prescription.

a. Specific factual assertions made, implied, or relied upon by Commerce

“Based on the best scientific information available at this time, we conclude that a bottom-opening entrance gate, as described above, in combination with our required modifications to operational frequency of the existing fish lift . . . could potentially satisfy the standard of a safe, timely and effective fishway. We have confidence based on experience that this design will function for the full suite of diadromous species.⁵

“Furthermore, we note that design and specifications of the entrance gate that we are requiring are consistent with fishway design guidelines set forth by the U.S. FWS (USFWS, 2017).”⁶

b. Why Commerce’s statements are unfounded or erroneous

The 2019 study cited in Commerce’s Prescription indicated that submergence depths greater than 3.0 feet appeared to greatly increase alosine entrance efficiency at fish lifts.⁷ In particular, increases in submergence depth were shown to be the most influential predictor variable of passage time, followed then by gate type (e.g., vertical, overshoot, and reversed overshoot or also referred to as a “flap gate” by NMFS) and river temperature.⁸ The author also notes that the overshoot gate is “less common” in existing fishways and the reversed overshoot gate (which is the type required in the Prescription) is “novel” to fishways.⁹ Moreover, neither the overshoot gate nor reversed overshoot gate is discussed in the 2017 USFWS design guidelines cited by Commerce. Due to the unproven, prototypical nature of the overshoot gate design and the 2019 study finding that

⁵ Prescription at 54.

⁶ *Id.* at 55.

⁷ *Id.* at 54, 75 (citing Mulligan 2019).

⁸ Mulligan 2019 at 1.

⁹ *Id.* at 1, 2, 16.

submergence depth was the key factor affecting passage efficiency, the Prescription's disregard of the capability of the existing gate in meeting the key factor (submergence depth) is unfounded.

c. Why the factual dispute is material

If the current vertical gate can meet the FWS design criteria for submergence depth, entrance jet velocity, and hydraulic drop under the operational protocol required by Commerce's Prescription, Topsham Hydro could avoid the extensive resources and expense required in installation of a new gate. If it is established that the Project's existing fish lift can meet these key requirements identified in the Prescription, Commerce could withdraw or revise its mandatory prescription with respect to the new gate requirement.

d. Specific citations to information relied on by the Licensee

Exhibit A, Mulligan 2019.

Exhibit B, Pejepsco CFD Modeling Study.

Exhibit C, Pejepsco Spring Passage Effectiveness Study.

Disputed Issue of Material Fact No. 3:

Whether the type of bottom-opening flap gate required by the Prescription is commonly used in the northeast.

a. Specific factual assertions made, implied, or relied upon by Commerce

“Based on the best scientific information available at this time, we conclude that a bottom-opening entrance gate, as described above, in combination with our required modifications to operational frequency of the existing fish lift . . . could potentially satisfy the standard of a safe, timely and effective fishway. We have confidence based on experience that this design will function for the full suite of diadromous species.¹⁰

“Furthermore, we note that design and specifications of the entrance gate that we are requiring are consistent with fishway design guidelines set forth by the U.S. FWS (USFWS, 2017).”¹¹

b. Why Commerce’s statements are unfounded or erroneous

Commerce supports its requirement for a new bottom-opening flap gate at the Project based on its confidence and experience with the design. However, Commerce does not cite any projects that utilize this design, and the 2019 Mulligan study upon which it appears to base such confidence notes that an overshot gate is used at one project but is “less common” in existing fishways and a reversed overshot gate is “novel” to fishways. In addition, neither the overshot gate nor reversed overshot gate prescribed by Commerce is discussed in the 2017 USFWS design guidelines cited by Commerce in support of its Prescription. Commerce expressly acknowledges some uncertainty that implementation of the measures it prescribes—including the bottom-opening entrance gate—will satisfy the standard of a safe, timely, and effective fishway.¹²

¹⁰ Prescription at 54.

¹¹ *Id.* at 55.

¹² *Id.* at 54.

c. Why the factual dispute is material

If it is established that the bottom-opening flap gate Commerce seeks to require is not common—or is even prototypical or novel in nature—Commerce could withdraw or revise its mandatory prescription with respect to the new gate requirement.

d. Specific citations to information relied on by the Licensee

Exhibit A, Mulligan 2019.

Exhibit D, USFWS 2017.

Disputed Issue of Material Fact No. 4:

Whether Atlantic salmon are likely to migrate upstream when river temperatures are over 22°C.

a. Specific factual assertions made, implied, or relied upon by Commerce

“Given the above, we find that Topsham Hydro’s proposal to operate the fishway once a day would be inadequate to ensure that any adult Atlantic salmon would be permitted to volitionally move upstream to satisfy any of its biological requirements, consistent with the physical and biological features of migratory habitat, as defined in the Atlantic salmon critical habitat designation.”¹³

b. Why Commerce’s statements are unfounded or erroneous

Water temperature measured by the Licensee at the Pejepscot Project in 2019 documented summer temperatures higher than 22°C in July, August, and September.¹⁴ Downstream of the Project, temperatures remained above 22°C until the second week in September. Salmon would need to seek thermal refuge during this period, and would cease upstream migration until the water cools, with few exceptions. Therefore, operation of the fish lift once per day from July 2 until September 1 would be adequate to ensure that adult Atlantic salmon would be permitted to pass upstream of the Project, should there be any rare instances of salmon moving upstream during the warm, summer period. This is supported by passage studies at other projects.¹⁵

¹³ *Id.* at 58.

¹⁴ Topsham Hydro Partners Limited Partnership, Initial Study Report – Water Quality Study at 10, 19, Project No. 4784-095 (filed July 12, 2019).

¹⁵ This includes data from the Lockwood and Milford Projects. *See* Normandeau Associates, Inc., An Evaluation of the Upstream Passage Effectiveness for Adult Atlantic Salmon during 2017 at the Lockwood Hydroelectric Project Fish Lift, Kennebec River, Maine, prepared for Merimil Limited Partnership, licensee of the Lockwood Project, Project No. 2574-027 (filed Mar. 29, 2018); *see also* Kleinschmidt, 2015 Adult Atlantic Salmon Upstream Passage Study, Milford Hydroelectric Project, Penobscot River, prepared for Black Bear Hydro Partners, LLC, licensee of the Milford Project, Project No. 2534-000 (filed May 31, 2016).

c. Why the factual dispute is material

If it is established that Atlantic salmon are not likely to move upstream when river temperatures are over 22°C, it would impact the frequency of lift operations, and Commerce could withdraw or revise its mandatory prescription with respect to the frequency of lift operations.

d. Specific citations to information relied on by the Licensee

Exhibit E, Pejepscot Water Quality Study at 10, 19.

Exhibit F, Lockwood Upstream Passage Evaluation.

Exhibit G, Milford Upstream Passage Study.

APPENDIX B

List of Exhibits

List of Exhibits

I. Exhibits in the FERC Record for the Pejepscot Project

Ex.	Description	Citation	FERC Accession Number
A	Mulligan 2019	Mulligan, K. B., Haro, A., Towler, B., Sojkowski, B., & Noreika, J. (2019). Fishway entrance gate experiments with adult american shad. <i>Water Resources Research</i> , 55.	20210629-5059
B	Pejepscot CFD Modeling Study	Topsham Hydro Partners Limited Partnership, Updated Study Report – Computational Fluid Dynamics Modeling Within the Pejepscot Fishway and Tailrace, Project No. 4784-106 (filed Mar. 30, 2021).	20210330-5404
C	Pejepscot Spring Passage Effectiveness Study	Topsham Hydro Partners Limited Partnership, Updated Study Report – Spring Anadromous Fish Passage Effectiveness, Project No. 4784-095 (filed July 10, 2020).	20200710-5191
D	USFWS 2017	USFWS (2017). <i>Fish passage Engineering Design Criteria</i> .	20210621-4007
E	Pejepscot Water Quality Study	Topsham Hydro Partners Limited Partnership, Initial Study Report – Water Quality Study, Project No. 4784-095 (filed July 12, 2019).	20190712-5078

II. Exhibits Not in the FERC Record for the Pejepscot Project (copies provided)

Ex.	Description	Citation
F	Lockwood Upstream Passage Evaluation	Normandeau Associates, Inc., An Evaluation of the Upstream Passage Effectiveness for Adult Atlantic Salmon during 2017 at the Lockwood Hydroelectric Project Fish Lift, Kennebec River, Maine, prepared for Merimil Limited Partnership, licensee of the Lockwood Project, Project No. 2574-027 (filed Mar. 29, 2018).
G	Milford Upstream Passage Study	Kleinschmidt, 2015 Adult Atlantic Salmon Upstream Passage Study, Milford Hydroelectric Project, Penobscot River, prepared for Black Bear Hydro Partners, LLC, licensee of the Milford Project, Project No. 2534-000 (filed May 31, 2016).

APPENDIX C

List of Witnesses for Topsham Hydro

Witness List

1. **Kirk Smith**

Gomez and Sullivan Engineers, DPC
41 Liberty Hill Road
P.O. Box 2179
Henniker, NH 03242
Tel: (603) 428-4960
ksmith@gomezandsullivan.com

Mr. Smith is the Project Manager for the Pejepscot Project relicensing. He has a B.S. in Geology with a focus in Hydrology from the University of New Hampshire. He has 28 years of experience in licensing FERC hydropower projects. With a strong background in hydrology, he has performed a wide variety of tasks related to licensing including, instream flow studies, headwater benefit studies, energy analyses, hydrologic and aquatic habitat studies, recreation inventories, and environmental analyses of hydropower project impacts. Mr. Smith has been involved in over 30 hydroelectric project licensing proceedings, in which he has been responsible for licensing strategy, development, resource issue identification, study scoping and execution, preparation of license applications, National Environmental Policy Act documents, and state water quality certifications, and managing licensing compliance studies.

Mr. Smith will testify on issues related to CFD modeling and fish lift hydraulics.

2. Drew Trested

Normandeau Associates, Inc.
30 International Drive, Suite 6
Portsmouth, NH 03801
Tel: (603) 319-5310
dtrested@normandeau.com

Dr. Trested is the Normandeau Project Manager for the Pejepscot Project relicensing and serves as the Normandeau contact with the primary relicensing consultant (Gomez and Sullivan). Normandeau's roll in the Pejepscot Project relicensing has been the design and execution of field studies related to diadromous fish species and their passage. He has his M.S. and PhD in Fisheries Biology from Clemson University. He has 22 years of experience working with diadromous fish species, the last 18 of which have been as a project scientist at Normandeau. With a strong background in fisheries and aquatic sciences, he has conducted a range of studies associated with FERC relicensing efforts including fish community assessments, macroinvertebrate sampling, water quality, instream habitat, and fish passage. Dr. Trested has managed or conducted passage effectiveness evaluations for upstream or downstream passage of diadromous fish species at 28 hydroelectric projects around the northeast. He has been involved in 17 hydroelectric project licensing efforts with a primary responsibility of fisheries and aquatics resource study development and execution.

Dr. Trested will testify on issues related to the upstream fish passage effectiveness studies.

3. Ian Kiraly, FP-C

Environmental Scientist | Lead Fisheries Biologist
Gomez and Sullivan Engineers, DPC
41 Liberty Hill Road
P.O. Box 2179
Henniker, NH 03242
Tel: (603) 428-4960
ikiraly@gomezandsullivan.com

Mr. Kiraly is a Certified Fisheries Professional, who holds a B.S. in natural resources with a concentration in applied ecology from Cornell University, and an M.S. in wildlife ecology from the University of Maine. Between his undergraduate and graduate careers, Mr. Kiraly conducted a variety of fisheries surveys in lakes and streams for Cornell University, the New York State Department of Environmental Conservation, and the U.S. Geological Survey. While obtaining his master's degree, Mr. Kiraly characterized fish assemblages in the Penobscot River relative to the location of dams. Since joining Gomez and Sullivan Engineers, Mr. Kiraly has been involved in a variety of environmental studies as part of FERC licensing projects, including the development and review of studies on diadromous fish in the Connecticut and Susquehanna Basins (i.e., American shad and American eel).

Mr. Kiraly will testify on the life history aspects of Atlantic salmon and the timing of upstream and downstream migration movements.

**UNITED STATES OF AMERICA
BEFORE THE
DEPARTMENT OF COMMERCE**

Topsham Hydro Partners)	
)	Docket No. P-4784-106
Limited Partnership)	

**TOPSHAM HYDRO PARTNERS LIMITED PARTNERSHIP SUBMITTAL OF AN
ALTERNATIVE FISHWAY PRESCRIPTION FOR THE PEJEPSCOT HYDROELECTRIC
PROJECT (FERC PROJECT NO. 4784)**

Pursuant to Section 33(b) of the Federal Power Act (FPA)¹ and the regulations of the United States Department of Commerce (“Commerce”),² Topsham Hydro Partners Limited Partnership (“Topsham Hydro”) hereby submits its alternative prescription (“Alternative Prescription”) to the preliminary fishway prescription (“Commerce’s Prescription”) submitted to the Federal Energy Regulatory Commission (“FERC” or “Commission”) by Commerce on June 17, 2021 for the Pejepscot Hydroelectric Project (“Pejepscot Project” or “Project”). As discussed herein, the Alternative Prescription proposed by Topsham Hydro will be no less protective than Commerce’s Prescription, will cost significantly less to implement, and will provide benefits to the migratory fish populations of the Androscoggin River.

1 Legal Basis for Alternative Prescription

Section 241 of the Energy Policy Act of 2005 (“EPAAct”) amended the FPA to include Section 33(b),³ which authorizes an applicant seeking a hydropower license to propose an alternative fishway⁴ prescription whenever the Secretary of the Department of the Interior or Department of Commerce prescribes a fishway pursuant to the FPA.⁵ Commerce’s regulations implementing Section 241 of EPAAct provide that a license applicant or other license party may submit an alternative prescription to the National Marine Fisheries Service (“NMFS”) Office of Habitat Conservation within 30 days of the date that Commerce files its preliminary prescription with FERC.

By statute, the Secretary of Commerce must adopt an alternative proposed by a license party if she determines that the alternative prescription: (1) is no less protective than the fishway initially prescribed by the Secretary; and (2) will, as compared to the fishway initially proposed by the Secretary, either cost significantly less to implement or result in improved operation of the project for electricity production.⁶ As detailed below, the fishways proposed in Topsham Hydro’s Alternative Prescription will be as effective *and* cost significantly less than the fishways set forth in Commerce’s Prescription. Moreover, Topsham Hydro’s alternative is based on substantial evidence either in the record, submitted to Commerce as part of this filing, or otherwise available to the Secretary. Accordingly, the Secretary must accept Topsham Hydro’s Alternative Prescription.⁷

2 Commerce’s Preliminary Prescription

Commerce’s Prescription requires several measures related to upstream fish passage facilities for anadromous fish⁸. Topsham Hydro is required within two years of license issuance to replace the existing vertical entrance gate with a “bottom-opening flap gate” at the Project’s existing fish lift. Commerce requires that the new gate accommodate the full 160 cfs of attraction water or more, and that the top of the

¹ 16 U.S.C. § 823d(b).

² 50 C.F.R. Part 221.7 et seq.

³ 16 U.S.C. § 823d(b).

⁴ Sections 4(e) and 18 of the FPA require FERC to include conditions and fishway prescriptions submitted by Commerce in any hydroelectric power license FERC issues. *Id.* at §§ 797(e), 811.

⁵ This process also applies to alternative conditions proposed by the Departments under 16 U.S.C. § 823d(a).

⁶ 16 U.S.C. § 823d(b)(2); *see also* 50 C.F.R. § 221.73(b).

⁷ 16 U.S.C. § 823d(b)(4).

⁸ Commerce’s Prescription at 52 and 53.

gate be positioned a minimum of 3.0 feet below the tailrace elevation over the range of operating flows so as to maintain an entrance velocity within the 4-6 ft/s range for alosines and up to 8 ft/s for Atlantic salmon and a hydraulic drop at the entrance of approximately 0.8 feet normally with the capability of increasing up to 1.5 to 2.0 feet. Commerce's Prescription also requires that Topsham Hydro operate the attraction water system at full capacity, regardless of unit discharge, unless monitoring studies indicate different operations are warranted.

Beginning in the first full passage season after license issuance, Commerce's Prescription also requires Topsham Hydro to operate the existing fish lift based on a lift cycle frequency to be determined annually in consultation with NMFS, Maine Department of Marine Resources ("MDMR"), and the United States Fish and Wildlife Service ("USFWS"). Commerce's Prescription requires additional measures to be implemented if the above prescribed measures do not achieve certain passage performance standards. These adaptive requirements could include the construction of additional fishway entrances and/or fishways if monitoring demonstrates their necessity. The timing of implementation of these additional measures is tied to the resolution of the upcoming Brunswick Hydroelectric Project FERC relicensing (current license expiration date of 2029).

Commerce's Prescription also requires several downstream fish passage measures related to anadromous fish⁹. Topsham Hydro is required within two years of license issuance to install a fish guidance/debris boom and construct a new bypass within bascule gate no. 1. In addition, Topsham Hydro must open bascule gate no. 1 (closest to the powerhouse) 50% to provide approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May. Topsham Hydro must maintain availability of use of the existing north (left bank) downstream fish bypass throughout the new license term¹⁰. Commerce's Prescription requires additional adaptive management measures to be implemented if the above prescribed measures do not achieve certain passage performance standards. Such adaptive measures may include, but not be limited to the installation of an Alden-style (bypass) weir and/or rigid rack structure(s) with close spacing of 1-inch or less.

Finally, Topsham Hydro must implement three years of monitoring studies for juvenile and adults alosines and Atlantic salmon after the initial modifications are made to the upstream and downstream fish passage facilities, as well as any subsequent modifications made as part of adaptive management planning¹¹.

3 Topsham Hydro's Alternative Prescription

Attached to this document as [Appendix A](#) is Topsham Hydro's written Alternative Prescription, which describes Topsham Hydro's proposal in an equivalent level of detail as Commerce's Prescription. Topsham Hydro's Alternative Prescription makes changes to Commerce's prescriptions for upstream and downstream fish passage facilities. The changes are intended to ensure that Commerce considers all relevant factors as well as align prescriptive requirements from other conditioning agencies before requiring Topsham Hydro to install/implement passage facilities/measures. In addition, Topsham Hydro proposes an alternative means to administer the adaptive management portion of the prescription to ensure timely steps are taken for proper implementation of new measures (e.g., one year shakedown period after installation of structural modifications before effectiveness monitoring begins), as well as consideration of other factors within the watershed that contribute to fish passage success. The changes are described below and shown in Table 3-1.

Regarding Topsham Hydro's Alternative Prescription, Commerce notes in its prescription that Topsham Hydro's CFD modeling study showed that entrance jet velocities occasionally exceeded the USFWS Fish Passage Engineering Design Criteria (2019)¹² for river herring (i.e., were greater than 6 fps) for some fish lift entrance gate and attraction flow settings. To address this issue, Topsham Hydro agrees

⁹ Commerce's Prescription at 60 and 61.

¹⁰ Topsham Hydro had proposed to discontinue use of the north bypass as described in the Final License Application (August 2020)

¹¹ Commerce's Prescription at 67 and 68.

¹² U.S. Fish and Wildlife Service. 2019. Fish Passage Engineering Design Criteria. USFWS, Northeast Region R5, Hadley, Massachusetts at 13-12.

with Commerce's prescriptions to operate the attraction water system at full capacity and position the entry gate (submergence depth) no less than 3.0 feet below the tailrace water surface. The 2019 study¹³ cited by Commerce indicated that submergence depths greater than 3.0 feet appeared to greatly increase alosine entrance efficiency at fish lifts. Increases in submergence depth were shown to be the most influential predictor variable of passage time, followed only then by gate type (e.g., vertical, overshot, and reversed overshot) and river temperature. However, the study notes that the overshot gate is "less common" in existing fishways and the reversed overshot gate is "novel" to fishways (collectively referred to by Commerce as the flap gate). Due to the prototypical nature of the overshot gate design and the 2019 study finding that submergence depth was the key factor affecting passage efficiency, Topsham Hydro's Alternative Prescription does not adopt the flap gate as an initial modification to the fish lift but would implement it as a subsequent modification no sooner than five years after license issuance, if Commerce's prescribed effectiveness monitoring shows that the initial modifications to the fish lift (i.e., increased attraction water, entrance gate setting no less than 3.0 feet, decreased lift cycle time) were not sufficiently effective. The current vertical gate can meet the USFWS design criteria for entrance jet velocity and hydraulic drop under the operational protocol described in Commerce's Prescription; therefore, the overall operational objective and intent can be met with the current vertical gate configuration.

In terms of adaptive management measures, Topsham Hydro's Alternative Prescription also recognizes that additional upstream passage measures that could include the construction of additional fishway entrances and/or fishways would not be implemented until resolution of the upcoming Brunswick Hydroelectric Project FERC relicensing. The other components of Topsham Hydro's Alternative Prescription related to upstream passage facilities adopt the measures contained in Commerce's Prescription.

Regarding downstream fish passage measures, Topsham Hydro's Alternative Prescription modifies the requirement to open bascule gate no. 1 (closest to the powerhouse) 50% to provide approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May. This measure will be implemented on an interim basis during the first passage season after license issuance and remain in effect, until Topsham Hydro installs the fish guidance/debris boom and constructs a new bypass within bascule gate no. 1, which is required within two years of license issuance. Since the new bypass in bascule gate no. 1 will be sized to pass 5% of station hydraulic capacity (approximately 430 cfs) per USFWS Fish Passage Engineering Design Criteria, the additional spill of 500 cfs would be duplicative and is not needed; however, the measure will be retained as an adaptive management measure if initial downstream passage measures for Atlantic salmon are not sufficiently effective.

Topsham Hydro's Alternative Prescription requires defined timeframes for implementation of adaptive management measures to ensure a timely start-up operation and construction period. These items include a one-year shakedown period after the implementation of any structural (non-operational) modifications to downstream fish passage facilities, as well as sufficient time to complete the design, permitting, and construction phases of a given modification. The other components of Topsham Hydro's Alternative Prescription related to downstream passage facilities adopt the measures contained in Commerce's Prescription.

¹³ Mulligan, K. B., Haro, A., Towler, B., Sojkowski, B., & Noreika, J. (2019). Fishway entrance gate experiments with adult American Shad. *Water Resources Research*, 55. Retrieved from <https://doi.org/10.1029/2018WR024400>.

Table 3-1: Changes to Commerce Prescription relative to Topsham Hydro Alternative Prescription

Commerce Prescription	Topsham Hydro Alternative Prescription
<p><u>Upstream Fish Passage:</u> Within two years of license issuance, the Licensee shall replace the existing vertical entrance gate with a bottom-opening flap gate. The gate shall be designed in consultation with NMFS and U.S. FWS to accommodate the full 160 cfs of attraction water or more with the top of the gate positioned a minimum of 3.0 feet below the tailrace elevation under varying river flows and maintain an entrance velocity within the 4-6 ft/s range for alosines and up to 8 ft/s for Atlantic salmon and a drop at the entrance approximately 0.8 feet normally with the capability of increasing up to 1.5 to 2.0 feet. Upon license issuance, the licensee shall operate the attraction water system at full capacity, regardless of unit discharge, unless monitoring studies indicate different operations are warranted.</p>	<p><u>Upstream Fish Passage:</u> Upon license issuance, Topsham Hydro shall operate the existing vertical entrance gate to accommodate the full 160 cfs of attraction water or more with the top of the gate positioned a minimum of 3.0 feet below the tailrace elevation under varying river flows and maintain an entrance velocity within the 4-6 ft/s range for alosines and up to 8 ft/s for Atlantic salmon and a drop at the entrance within the typical range of 0.5 to 2.0 feet.</p> <p>If the defined performance standards (section 1.4) cannot be met with the above proposed and required measures within the monitoring period defined therein, no sooner than five years after license issuance, Topsham Hydro shall replace the existing vertical entrance gate with a bottom-opening flap gate. The gate shall be designed in consultation with NMFS and USFWS to accommodate the full 160 cfs of attraction water or more with the top of the gate positioned a minimum of 3.0 feet below the tailrace elevation under varying river flows and maintain an entrance velocity within the 4-6 ft/s range for alosines and up to 8 ft/s for Atlantic salmon and a drop at the entrance approximately 0.8 feet normally with the capability of increasing up to 1.5 to 2.0 feet.</p>
<p><u>Downstream Fish Passage:</u> Open bascule gate No. 1 (closest to the powerhouse) 50% to provide approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May.</p>	<p><u>Downstream Fish Passage:</u> As an interim measure, open bascule gate No. 1 (closest to the powerhouse) 50% to provide approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May beginning in the first passage season after license issuance. This measure will remain in effect, until Topsham Hydro installs the fish guidance/debris boom and new bypass within bascule gate no. 1 described below.</p>
<p><u>Shakedown Period:</u> None specified</p>	<p><u>Shakedown Period:</u> Once each new fish passage facility is constructed, Topsham Hydro will operate each fish passage facility for a one-season "shakedown" period to ensure that it is generally operating as designed and to make minor adjustments to the facilities and operation. At the end of the shakedown period, Topsham Hydro shall have a licensed engineer verify that the facility is constructed and operating as designed. Topsham Hydro shall provide NMFS with a copy of the as-built fishway drawings as submitted to FERC, along with the licensed engineer's letter of verification.</p>

4 Topsham Hydro's Proposed Alternative Prescription Will Be No Less Protective than the Prescription Proposed by Interior

The measures contained in Topsham Hydro's Alternative Prescription address each of the fishery management concerns identified by Commerce, and essentially adopts the major components of Commerce's prescription for upstream and downstream passage. However, Topsham Hydro's Alternative Prescription delays the implementation of the prototypical reverse overshot gate (i.e., flap gate) design at the existing fish lift, which is targeted toward increasing the external efficiency of the fish lift, until other modifications targeting the lift's internal efficiency (attraction flow, decreased lift cycle time) are implemented and tested. This delay is supported by Topsham Hydro's 2019 radio telemetry study¹⁴ that found good nearfield attraction (approximately 93%), but low overall fish lift effectiveness (approximately 20%) for river herring, suggesting that the river herring were entering the fish lift entrance gate but not completing passage through the remaining portions of the fish lift. The Alternative Prescription requires implementation of the overshot gate (i.e., flap gate) design only after initial modifications targeting the internal lift efficiency are implemented and tested.

Topsham Hydro's Alternative Prescription also eliminates the duplicative requirement of providing approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May after the proposed fish guidance/debris boom and new bypass within bascule gate no. 1 are installed. The new bypass within bascule gate no. 1 will be no less protected than the spill requirement.

5 Topsham Hydro's Proposed Alternative Prescription Will Cost Significantly Less To Implement than Interior's Preliminary Prescription

Topsham Hydro estimates the fish passage measures included in its Alternative Prescription would cost approximately \$56,836,000 (2021 dollars)¹⁵ to implement over the expected 40-year license term ([Appendix B](#)). This assumes that the adaptive management measures identified in the prescription would be implemented over the new license term. In contrast, Topsham Hydro estimates that the fish passage measures prescribed by Commerce would cost \$59,484,000 (2021 dollars) to implement over the expected 40-year license term. This also assumes that the adaptive management measures identified in the prescription would be implemented over the new license term. Therefore, Topsham's Alternative Prescription costs significantly less while achieving similar benefits to the resource ([Appendix C](#)).

6 Explanation of How the proposed Alternatives Will affect the Issues Set Forth in 43 C.F.R. § 45.71(B)(4)

6.1 Energy Supply, Distribution, Cost and Use

Topsham Hydro's Alternative Prescription will have less of an impact on energy use than Commerce's Prescription because it preserves more of the Pejepscot Project's low-cost power. Topsham Hydro's Alternative Prescription would result in an estimated lost average annual generation cost of \$1,031,600 (2021 dollars) ([Appendix B](#)). This assumes that the adaptive management measures identified in the prescription would be implemented over the new license term.

By comparison, Commerce's Prescription would result in a lost average annual generation cost of \$1,097,425 (2021 dollars). This also assumes that the adaptive management measures identified in the prescription would be implemented over the new license term. Over the duration of the 40-year license term this would result in a significant savings.

Neither Commerce's Prescription nor Topsham Hydro's Alternative Prescription will have an impact on the distribution of energy generated at the Project.

¹⁴ Topsham Hydro. 2020. Updated Study Report Spring Anadromous Fish Passage Effectiveness Pejepscot Project (FERC No. 4784).

¹⁵ These costs do not reflect any adjustment for annual inflation.

6.2 Flood Control

The construction and operation of the fishways described in Topsham Hydro's Alternative Prescription will have no impact on flood control.

6.3 Navigation

The construction and operation of the fishways described in Topsham Hydro's Alternative Prescription will have no impact on navigation.

6.4 Water Supply

The construction and operation of the fishways described in Topsham Hydro's Alternative Prescription will have no impact on water supply.

6.5 Air Quality

Unlike electricity produced by fossil fuel generation, the electricity produced at the Pejepscot Project does not produce harmful emissions of greenhouse gases or other pollutants, such as sulfur dioxide, nitrogen oxide and mercury. Electricity generation from the Pejepscot Project displaces generation from fossil fuel sources, such as coal and natural gas, which leads to reduced emissions of pollutants including carbon dioxide, sulfur dioxide, and nitrogen oxide. Less efficient and higher emitting fossil fuel resources likely will be needed to replace the Pejepscot Project's lost generation. Such a result would be contrary to federal policies encouraging greater use of renewables and a reduction in fossil fuel sources of generation.

6.6 Other Aspects of Environmental Quality

Topsham Hydro has not identified any other impacts to environmental quality that would result from either Topsham Hydro's Alternative Prescription or Commerce's Prescription.

7 Scientific Studies and Other Information Relied Upon by Topsham Hydro

Citations to the scientific studies, literature, and other documented information relied in preparing this Alternative Prescription are provided throughout the Alternative Prescription and its appendices.

8 Conclusion

WHEREFORE, for the foregoing reasons, Topsham Hydro respectfully requests that Commerce adopt Topsham Hydro's Alternative Prescription as proposed herein and expeditiously file the adopted prescription with FERC as Commerce's Modified Prescription.

Respectfully submitted,



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APPENDIX A-TOPSHAM HYDRO ALTERNATIVE PRESCRIPTION

TOPSHAM HYDRO ALTERNATIVE PRESCRIPTION

1. ALTERNATIVE PRESCRIPTION FOR FISHWAYS

The Department of Commerce (Commerce) filed its preliminary prescription for fishways pursuant to Section 18 of the Federal Power Act (FPA) for the Pejepscot Hydroelectric Project (Project) with the Federal Energy Regulatory Commission (FERC) on June 17, 2021. Pursuant to Section 33(b) of the FPA¹⁶ and Commerce's regulations¹⁷, Topsham Hydro provides below its proposed alternative fishway prescription (Alternative Prescription), described in an equivalent level of detail to Commerce's Preliminary Prescription¹⁸. Cost estimates for the facilities described in this Alternative Prescription, are provided in [Appendix B](#).

1.1. Upstream Fish Passage

- Upon license issuance, Topsham Hydro shall operate the existing vertical entrance gate to accommodate the full 160 cfs of attraction water or more with the top of the gate positioned a minimum of 3.0 feet below the tailrace elevation under varying river flows and maintain an entrance velocity within the 4-6 ft/s range for alosines and up to 8 ft/s for Atlantic salmon and a drop at the entrance within the typical range of 0.5 to 2.0 feet.
- Upon license issuance, Topsham Hydro shall operate the attraction water system at full capacity, regardless of unit discharge, unless monitoring studies indicate different operations are warranted.
- Topsham Hydro shall operate the existing upstream fish lift on the following lift cycle frequency beginning in the first full passage season after the effective date of the new license:
 - Upon the passage of the first fish at the downstream Brunswick Project or by May 1 to July 31: lift frequency and facility operating hours will be determined on an annual basis, prior to the fish passage season in consultation with NMFS, MDMR, and USFWS. Lift frequency may vary from every 15 minutes during peak migration periods to once every 2 hours. Both lift frequency and operating hours will be adaptively managed based upon site-specific conditions, in consultation with the above resource agencies.
 - August 1 – November 15: lift frequency and facility operating hours will be determined on an annual basis, prior to the fish passage season, in consultation with NMFS, MDMR, and USFWS. Lift frequency may vary from every 15 minutes to once a day, upon any passage of salmon at Brunswick Dam during the passage season (May 1-November 15). Both lift frequency and operating hours will be adaptively managed based upon site-specific conditions, in consultation with the above resource agencies.
- If the defined performance standards (section 1.4) cannot be met with the above proposed and required measures within the monitoring period defined therein, no sooner than five years after license issuance, Topsham Hydro shall replace the existing vertical entrance gate with a bottom-opening flap gate. The gate shall be designed in consultation with NMFS and USFWS to accommodate the full 160 cfs of attraction water or more with the top of the gate positioned a minimum of 3.0 feet below the tailrace elevation under varying river flows and maintain an entrance velocity within the 4-6 ft/s range for alosines and up to 8 ft/s for Atlantic salmon and a drop at the entrance approximately 0.8 feet normally with the capability of increasing up to 1.5 to 2.0 feet.

1.2. Downstream Fish Passage

- As an interim measure, open bascule gate No. 1 (closest to the powerhouse) 50% to provide

¹⁶ 16 U.S.C. § 823d(b).

¹⁷ 50 C.F.R. Part 221.7 et seq.

¹⁸ 50 C.F.R. § 221.73(b).

approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May beginning in the first passage season after license issuance. This measure will remain in effect, until Topsham Hydro installs the fish guidance/debris boom and new bypass within bascule gate no. 1 described below.

- Install and operate a fish guidance system/debris boom, designed in consultation with NMFS, MDMR, and USFWS, to direct downstream migrants to a new bypass within bascule gate no. 1 beginning in the second full passage season after the effective date of the new license.
- Maintain availability and use of the north (left bank) downstream fish bypass, throughout the term of the new license. If new information indicates that continued operation of the north bypass is unnecessary or unwarranted, after consultation with NMFS, USFWS, and MDMR, Topsham Hydro may request discontinuation of the north bypass for FERC approval.
- If the defined performance standards (section 1.4) cannot be met with the above proposed and required measures within the monitoring period defined therein, additional adaptive measures will be implemented to further reduce fish injury and mortality to meet the defined performance standards. Such adaptive measures may include, but not be limited to the installation of an Alden-style weir and/or rigid rack structure(s) with close spacing of 1-inch or less. These measures will be implemented no sooner than 6 years after license issuance.

Topsham Hydro shall keep the downstream passage facilities in proper order and clear of trash, logs, and material that would hinder flow and passage. Anticipated maintenance shall be performed in sufficient time before a migratory period such that fishways can be tested and inspected and will operate effectively prior to the migratory periods. Additional measures specific to Atlantic salmon may also be required depending on the outcome of the ESA section 7 consultation and requirements of any Incidental Take Statement issued as part of the anticipated Biological Opinion.

Design review of any new downstream fish passage facility shall follow the process outlined in Section 1.5. Fishway Design Review such that modifications can be implemented and operational within two years of license issuance.

1.3. Seasonal Migration Windows

Based on state-wide and Androscoggin River watershed specific data, approved fish passage protective measures shall be operational during the migration windows for each life stage of Atlantic salmon (adults, kelts, and smolts), and adults and juveniles of American Shad, blueback herring, and alewife (Table 1). These dates may change based on new information and agency consultation.

Table 1. Summary of migration periods for which fish passage is required. The migration period for Atlantic salmon is dependent on presence and may be refined in consultation with the resource agencies.

Species	Upstream Migration Period	Downstream Migration Period
Atlantic salmon	May 1–November 10	April 1 – June 15 (smolts and kelts) October 15 – December 31 (kelts)
American shad	May 15–July 31	July 15 – November 30 (juveniles) June 1 – July 31 (adults)
alewife and blueback herring	May 1–July 1	July 15 – November 30 (juveniles) June 1 – July 31 (adults)

1.4. Passage Performance Standards and Monitoring

Topsham Hydro must monitor upstream and downstream fishways at the Project. Monitoring will ensure fish passage protection measures are constructed, operated and functioning as intended for the safe,

timely and effective passage of migrating fish. Monitoring over three-year terms is necessary to adequately account for the effect of environmental variability as it relates to passage efficacy at the Project.

- Topsham Hydro will develop study design plans in consultation with NMFS and state and federal resource agencies. Topsham Hydro must obtain approval from the resource agencies prior to filing with the Commission for final approval.
- Topsham Hydro must conduct all monitoring according to scientifically accepted practices.
- Topsham Hydro shall begin monitoring at the start of the first migratory season after each fishway facility is operational and the shakedown period is complete (section 1.5) and shall continue for up to three years or as otherwise required through further consultation.
 - For downstream passage, achievement of the performance standard will be based on the average survival over three years of study. Additional evaluation may be necessary during the term of any new license if there are changes in operational or environmental conditions that could affect fishway efficiency.
 - For upstream passage, upon implementation of the required measures, Topsham Hydro will conduct three years of study to adaptively manage the operation of the existing lift, to ascertain if the passage standards can be achieved with the prescribed measures. After the third study year, Topsham Hydro shall consult with the fishery agencies to identify potential issues causing any continued inefficiency and to develop measures to resolve them. Topsham Hydro shall conduct an additional three years of study following any modifications implemented because of this adaptive management.
- Topsham Hydro shall conduct studies to evaluate the effectiveness of fishways for juvenile and adult life stages of alosines and Atlantic salmon.
- Topsham Hydro shall provide monitoring study reports to the resource agencies for a minimum 30-day review and consultation prior to submittal to the Commission for final approval.
- Topsham Hydro shall include resource agencies' comments in the annual reports submitted to the Commission for final review.

1.5. Fishway Design Review

Regarding construction of the required entrance gate or any fishway or appurtenant structure determined necessary through the adaptive management, Topsham Hydro shall submit design plans to NMFS for review during the conceptual, 30, 60 and 90 percent design stages. Topsham Hydro shall incorporate into their schedule a minimum of 30 days of review time by resource agencies for each stage. Topsham Hydro shall allow reasonable time to construct the fishway such that it is operational as prescribed. Following NMFS review, Topsham Hydro shall submit final design plans to the Commission for final approval prior to the commencement of fishway construction activities.

Once each new fish passage facility is constructed, Topsham Hydro will operate each fish passage facility for a one-season "shakedown" period to ensure that it is generally operating as designed and to make minor adjustments to the facilities and operation. At the end of the shakedown period, Topsham Hydro shall have a licensed engineer verify that the facility is constructed and operating as designed. Topsham Hydro shall provide NMFS with a copy of the as-built fishway drawings as submitted to FERC, along with the licensed engineer's letter of verification.

1.6. Reservation of Authority

1.6.1. Upstream Fish Passage

NMFS reserves its authority to prescribe an additional fishway, fishway entrance or entrances, or operational or facility modifications for the benefit of our trust resources at the Pejepscot Project. NMFS will exercise its reserved authority after considering the requirements of Brunswick's subsequent license, if the Pejepscot Project does not demonstrate effectiveness consistent with the passage performance standards and monitoring protocol defined in section 1.4. Given NMFS's understanding of FERC's schedule for

relicensing at Brunswick, NMFS anticipates making its decision whether to exercise its reserved authority for the Pejepscot Project on or around February 28, 2029.

1.6.2. Sea Lamprey

There is no information available to evaluate the current survival and passage efficiency of sea lamprey at the Pejepscot Project, nor the potential beneficial effects of our required measures. NMFS also recognizes that management objectives for sea lamprey may change during the term of the new license. If a management program for sea lamprey is initiated for the Androscoggin River during the license term, and post-licensing monitoring information or desktop evaluations demonstrate that survival and passage efficiencies at the Pejepscot Project are insufficient to achieve those management objectives, then Topsham Hydro will need to modify operations or facilities that meet any standard established to achieve those objectives. Therefore, NMFS reserves its authority to prescribe operational or facility modifications or additional fishways for the benefit of sea lamprey in the future.

1.6.3. Standard Reservation

Commerce proposes to reserve authority by requesting that the Commission include the following condition in any license it may issue for the Project:

Pursuant to Section 18 of the Federal Power Act, the licensee shall build the fishways described in the National Marine Fisheries Service' Prescription for Fishways at the Pejepscot Hydroelectric Project (FERC No.4784). The Secretary of Commerce reserves authority to prescribe additional or amended fishways as he may decide are required in the future.

APPENDIX B-COST ANALYSIS OF TOPSHAM HYDRO'S ALTERNATIVE PRESCRIPTION

Category	Alternative Prescription Measure	Implementation Year	Capital Cost (2021)	Annual O & M Cost (2021)	Annual Generation Loss (2021)	Total Cost over 40-Year License Term (2021)
Upstream Passage-	Upon license issuance, operate the existing vertical entrance gate to accommodate the full 160 cfs of attraction water or more with the top of the gate positioned a minimum of 3.0 feet below the tailrace elevation under varying river flows	2023-2062	\$0	\$1,000	\$0	\$40,000
	Upon license issuance, operate the attraction water system at full capacity, regardless of unit discharge.	2023-2062	\$0	\$5,000	\$0	\$200,000
	Operate the existing upstream fish lift on an adaptive lift cycle frequency beginning in the first full passage season after the effective date of the new license	2023-2062	\$0	\$15,000	\$0	\$600,000
	If the defined performance standards cannot be met with the above proposed and required measures, no sooner than five years after license issuance, Topsham Hydro shall replace the existing vertical entrance gate with a bottom-opening flap gate.	2027	\$500,000	\$0	\$0	\$500,000
	Adaptive management measures to be implemented after resolution of Brunswick FERC licensing proceeding	2029	TBD	TBD	TBD	TBD
Downstream Passage	As an interim measure, open bascule gate No. 1 (closest to the powerhouse) 50% to provide approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May beginning in the first passage season after license issuance.	2023	\$0	\$0	\$13,000	\$13,000

Category	Alternative Prescription Measure	Implementation Year	Capital Cost (2021)	Annual O & M Cost (2021)	Annual Generation Loss (2021)	Total Cost over 40-Year License Term (2021)
	Install and operate a fish guidance system/debris boom, and new bypass within bascule gate no. 1 beginning in the second full passage season after the effective date of the new license.	2024-2062	2,075,000	\$20,000	\$131,000	\$7,964,000
	Maintain availability and use of the north (left bank) downstream fish bypass, throughout the term of any subsequent license.	2023-2062	\$0	\$5,000	\$0	\$200,000
	If the defined performance standards cannot be met with the above proposed and required measures additional adaptive measures will be implemented Such adaptive measures may include, but not be limited to the installation of: <ul style="list-style-type: none"> • an Alden-style weir • Rigid rack structure(s) with close spacing of 1-inch or less. 	2029-2062	\$967,000	\$15,000	\$0	\$1,477,000
		2029-2062	\$8,515,000	\$15,000	\$1,063,000	\$45,167,000
Monitoring	Juvenile and Adult alosines Effectiveness Testing	2025-2027	\$0	\$100,000	\$0	\$300,000
	Juvenile and adult Atlantic salmon Effectiveness Testing	2025-2027	\$0	\$125,000	\$0	\$375,000
Total w/Adaptive Management Options						\$56,836,000

APPENDIX C-COST ANALYSIS OF COMMERCE’S PRELIMINARY PRESCRIPTION

Category	Commerce's Prescription Measure	Implementation Year	Capital Cost (2021)	Annual O & M Cost (2021)	Annual Generation Loss (2021)	Total Cost over 40-Year License Term (2021)
Upstream Passage-	Within two years of license issuance, replace the existing vertical entrance gate with a bottom-opening flap gate.	2024	\$500,000	\$0	\$0	\$500,000
	Upon license issuance, operate the attraction water system at full capacity, regardless of unit discharge.	2023-2062	\$0	\$5,000	\$0	\$200,000
	Operate the existing upstream fish lift on an adaptive lift cycle frequency beginning in the first full passage season after the effective date of the new license	2023-2062	\$0	\$15,000	\$0	\$600,000
	Adaptive management measures to be implemented after resolution of Brunswick FERC licensing proceeding	2029	TBD	TBD	TBD	TBD
Downstream Passage	Open bascule gate No. 1 (closest to the powerhouse) 50% to provide approximately 500 cfs of spill at night (2000 – 0700 hours) during the month of May beginning in the first passage season after license issuance.	2023-2062	\$0	\$0	\$13,000	\$520,000
	Install and operate a fish guidance system/debris boom, and new bypass within bascule gate no. 1 beginning in the second full passage season after the effective date of the new license.	2024-2062	\$2,075,000	\$20,000	\$131,000	\$7,964,000
	Maintain availability and use of the north (left bank) downstream fish bypass, throughout the term of any subsequent license.	2023-2062	\$0	\$5,000	\$0	\$195,000

Category	Commerce's Prescription Measure	Implementation Year	Capital Cost (2021)	Annual O & M Cost (2021)	Annual Generation Loss (2021)	Total Cost over 40-Year License Term (2021)
	If the defined performance standards cannot be met with the above proposed and required measures additional adaptive measures will be implemented Such adaptive measures may include, but not be limited to the installation of:					
	<ul style="list-style-type: none"> an Alden-style weir 	2027-2062	\$967,000	\$15,000	\$0	\$1,507,000
	<ul style="list-style-type: none"> Rigid rack structure(s) with close spacing of 1-inch or less. 	2027-2062	\$8,515,000	\$15,000	\$1,063,000	\$47,323,000
Monitoring	Juvenile and Adult alosines Effectiveness Testing	2024-2026	\$0	\$100,000	\$0	\$300,000
	Juvenile and adult Atlantic salmon Effectiveness Testing	2024-2026	\$0	\$125,000	\$0	\$375,000
Total w/Adaptive Management Options						\$59,484,000

CERTIFICATE OF SERVICE

Pursuant to Rule 2010 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission, I hereby certify that I have this day caused the foregoing document to be served upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Washington, DC, this 19th day of July, 2021.

A handwritten signature in black ink, appearing to read "Chris Todd", written over a horizontal line.

Chris Todd
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