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Connecticut River Conservancy

June 3, 2024

MassDEP - BWR
Attn: *FirstLight 401WQC*
100 Cambridge Street, Suite 900
Boston, MA 02114
dep.hydro@mass.gov

Re: Turners Falls Hydroelectric Project (FERC No. 1889) and Northfield Mountain Pumped Storage Project (FERC No. 2485) Relicensing and Massachusetts Clean Water Act § 401 Certification Application

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To Whom It May Concern:

The Connecticut River Conservancy ("CRC") respectfully submits this comment in strong opposition to FirstLight MA Hydro LLC's ("FirstLight") application for a 401 Water Quality Certification for the Turners Falls Hydroelectric Project (FERC No. 1889) and the Northfield Mountain Pumped Storage Project (FERC No. 2485) (collectively, "the FirstLight Projects").[1] As an environmental organization dedicated to the protection and restoration of the Connecticut River and its tributaries, CRC is deeply concerned about the significant and adverse impacts the FirstLight Projects have on water quality and aquatic ecosystems. FirstLight's 401 Application does not meet the requisite standard for ensuring the continued presence and operation of the FirstLight Projects will comply with Massachusetts Water Quality Standards ("WQS"). In addition to proposed conditions and operational changes that will result in non-compliance with Massachusetts WQS, the application fails to provide important information that

[1] *See* FirstLight, 401 Water Quality Certificate Application for Turners Falls Hydroelectric Project (FERC No. 1889) & Northfield Mountain Pumped Storage Project (FERC No. 2485) (submitted to Mass. Dep't of Env't Prot., 2024) (hereinafter "FirstLight 401 Application").

will allow for informed public comment, and, conversely, includes materials that are irrelevant to DEP's determination.

Under Section 401 of the Clean Water Act ("CWA"), any applicant seeking a federal license or permit for activities that may result in discharges into navigable waters must obtain a 401 Water Quality Certification from the state in which the discharge originates.[2] This certification is intended to ensure that the proposed activity will comply with state water quality standards and other relevant requirements of state law.[3] The 401 certification process empowers states to play a critical role in maintaining the integrity of their waters by imposing conditions or denying certification if the project does not meet water quality standards.[4]

The FirstLight Projects involve substantial modifications to the natural flow regime, aquatic habitat, and overall ecological health of the Connecticut River. The FirstLight Projects have historically caused negative impacts on water quality, leading to the river segments both above and below Turners Falls Dam ("TFD") to be listed as Impaired on Massachusetts' CWA 303(d) List due to dewatering, flow regime modifications, and streamside alterations, among other impairments.[5] Moreover, as discussed in greater detail below, the FirstLight Projects have blocked migratory and resident fish passage, cutting off important access to critical aquatic habitats for many species.[6]

Since 1952, CRC has worked to protect and restore the Connecticut River and its tributaries. CRC represents thousands of members across four states, including hundreds in Massachusetts, and as the only nonprofit organization dedicated to protecting the entire

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[2] 33 U.S.C. 1341.
[3] *Id.*
[4] *See generally* Christopher J. Eggert, *The Scope of State Authority Under Section 401 of the Clean Water Act After PUD No. 1 Washington Department of Ecology,* 31 WILLAMETTE L. REV. 851, 856–57 (1995) (describing the power states retain to block or allow certain local hydroelectric projects under Section 401 of the CWA); *see also* Daniel Pollak, *Annual Review of Environmental and Natural Resources Law: S.D. Warren and the Erosion of Federal Preeminence in Hydropower Regulation*, 34 ECOLOGY L. Q. 763, 793–94 (2007) (discussing how states have broad latitude under Section 401) ("state courts have upheld certification requirements that imposed land use restrictions… stream flow requirements based on aesthetic goals… and recreational improvements such as access improvements for fishermen and boaters").
[5] Rebecca L. Tepper, et al., Final Massachusetts Integrated List of Waters for the Clean Water Act 2022 Reporting Cycle, at 167–68 (Executive Office of Energy and Environmental Affairs, et al., 2023), https://www.mass.gov/doc/final-massachusetts-integrated-list-of-waters-for-the-clean-water-act-2022-reporting-cycle/download (last visited May 29, 2024).
[6] *See generally* Donald Pugh, *Affidavit on Behalf of the Connecticut River Conservancy* (hereinafter Pugh Affidavit), *in* Comments of Connecticut River Conservancy in Opposition to certain conditions from the March 31, 2023 Offer of Partial Settlement for the Turners Falls Hydroelectric Project et al. under P-1889 et al., FERC Accession No. 20230525-5090 (filed May 25, 2023) (hereinafter CRC Flows & Fish Passage Comment), attached as Exhibit A.

Connecticut River ecosystem, our comments consider not only the localized impacts of the projects, but also the watershed-wide implications of DEP's potential CWA 401 certification.

CRC has raised many of the issues contained in this comment with DEP over the past several years, including in a June 13, 2022 letter to Executive Office of Energy and Environmental Affairs Secretary Bethany Card, and where appropriate, CRC will incorporate those earlier communications by reference. A non-exhaustive summary of CRC's positions related to FirstLight's 401 Application are provided below; however, these positions may evolve based on the course of this proceeding as further facts, positions and arguments develop, more public input is collected, and DEP articulates its positions on these issues. CRC reserves the right to update its positions accordingly. For example, CRC is currently in the process of obtaining public records from state agencies that relate to some of the issues contained in this comment as well as awaiting the results of a DEP peer review related to erosion, which may cause CRC to update its positions or otherwise provide additional information, including expert testimony, to DEP.

Finally, CRC appreciates DEP's decision, at CRC's request, to include an additional comment period on DEP's draft decision. CRC hopes DEP is able to hold firm on its proposed timing for that comment period–Nov/Dec 2024–so the agency has the time necessary to fully consider and evaluate public comments on any proposed 401 conditions before issuing a final decision.[7] Further, CRC urges the agency to provide a 30-day comment period–rather than the 21-day period currently contemplated on DEP's website–so Massachusetts citizens have enough time to evaluate and respond to what undoubtedly will be complex and technical issues that potentially will govern the FirstLight Projects' operations for a generation. CRC looks forward to working with DEP during this process to ensure the protection and restoration of the Connecticut River for the next half century and beyond.

[7] *See MassDEP FirstLight Water Quality Certification Public Involvement Timeline*, MASS. DEP'T OF ENV'T PROT., https://www.mass.gov/doc/massdep-firstlight-water-quality-certification-public-involvement-timeline/download (last updated Apr. 25, 2024).

SUMMARY OF CRC's POSITIONS

Water Quality Standards & Impairment: The portions of the Connecticut River both above and below TFD are currently listed as impaired (not meeting state water quality standards) for various reasons, including dewatering, flow regime modification, and streamside alteration—impairments that are attributable in whole or in part to the operations of the FirstLight Projects. FirstLight's 401 Application does not meet its burden for showing how these portions of the river will move from "impaired" status to "attainment" status under the proposed renewed FERC license.

Aquatic Life Uses ("ALUs"): For the mile-stretch of river below TFD, the proposed minimum flows of 500 cubic feet per second ("cfs") from July 1 – Nov. 15 each year are inadequate to protect and maintain ALUs, including sensitive macroinvertebrate populations. According to CRC's expert, 500 cfs will allow for only 10% of maximum available habitat for macroinvertebrates, among other indicators of not supporting this use. CRC's position is that a minimum flow of at least 1,400 cfs from July 1 through Nov. 15 is needed to protect ALUs.

Rare Plant Species: Rather than base its proposed minimum flows on protecting the most sensitive ALUs, FirstLight is basing its proposed minimum flows on two non-aquatic, rare plant species that would not even exist in mile stretch below TFD except for the years of impairment due to dewatering. Notably, these plants may not even qualify as aquatic life, nor is there any information that these plants survived the July 2023 floods and still exist today. Additionally, the public has virtually no information to corroborate FirstLight's analysis, including any information about whether the plants can be transplanted to another location or if that option has even been evaluated. DEP and other state agencies, such as the Natural Heritage Endangered Species Program (NHESP), must make significantly more information publicly available to allow the public to make informed comments about the plants and for DEP to adequately consider their relevance, if any, to FirstLight's 401 Application.

Erosion above the Dam: The Turners Falls Impoundment (TFI) experiences significant fluctuations in river height due to the Northfield Mountain Pumped Storage facility ("NMPS"),

leading to severe shoreline erosion. This 20-mile stretch of the Connecticut River, serving as the lower reservoir for the storage facility, suffers from erosion exacerbated by the facility's operations, which vary the water level by up to five feet. Historical data and studies, including reports by the Army Corps and CRC hired expert, Dr. Evan Detheir, confirm that the pumping activities are a significant cause of the erosion. Despite documented evidence, FirstLight's application for operational changes, such as expanding the upper reservoir, fails to adequately address the erosion issue, potentially worsening it.

Recreation Below the Dam: CRC opposes FirstLight's proposed minimum flow of 500 cfs below TFD because the low flows negatively impact recreational activities, violating both state WQS and federal obligations. FirstLight's own Boating Navigability Study showed that even a flow of 545 cfs was inadequate for safe boating navigation, with participants rating it poorly. Proposed portage trails are not a viable solution, as they alter the recreational experience and may exclude less able-bodied paddlers.

Aesthetics: According to Massachusetts WQS, Class B waters are designated not only for aquatic life uses and recreation but also for their aesthetic significance. Despite FirstLight's acknowledgment that higher bypass flows would enhance the river's visual and auditory appeal, the proposed 500 cfs flow is insufficient to restore the river's natural aesthetic, leaving large portions of the riverbed exposed. This undermines the Connecticut River's status as a vital natural resource and a nationally recognized Blueway, emphasizing the need for higher minimum flows, such as 1,400 cfs, to meet both ecological and aesthetic standards.

Impingement/Entrainment at Northfield: At NMPS, fish entrainment and impingement occur when water is pumped from the river to the holding reservoir. FirstLight proposed installing a fish barrier net from June 1 to November 15 to mitigate these impacts but CRC questions the net's efficacy, as the velocity models FirstLight used did not accurately reflect real conditions, and only preliminary field testing was conducted, which occurred before the Flows and Fish Passage Settlement Agreement changed a few of the operational conditions. Studies show that the proposed net might not prevent fish impingement during pumping operations. CRC supports

the barrier net, but additional Adaptive Management Measures (AMMs) are needed if performance targets are not met in order to adequately protect ALUs.

Financial Assurances: CRC emphasizes the necessity for any 401 certification to include provisions mandating decommissioning plans and financial assurances from FirstLight for when the facilities are ready for retirement and removal. This measure is crucial to prevent further water quality degradation and ensure that Massachusetts taxpayers do not bear the financial burden of decommissioning. Given the inevitable end of these projects' useful lives as energy producers, CRC stresses the importance of ensuring that funds for decommissioning are readily available.

Timeline for Fish Passage Installation: CRC opposes the proposed timeline for the Spillway Lift at TFD, arguing that the projected 9-year period for full implementation is excessive and will result in continuing and unnecessary harm to ALUs. Similar fish lifts in other river systems have been designed and constructed in much shorter time frames, typically ranging from 4 to 6.5 years. The design and construction of the lifts could feasibly be completed within a shorter duration, with few prospective unknowns that would justify the extended timeline proposed. Drawing comparisons to complex fish passage facilities on the Columbia River, CRC's expert opines that a schedule of approximately 4–6.5 years for full implementation is more reasonable.

Cultural Resources: Maintaining higher river flows would protect culturally important sites on Rawson Island and Peskeomskut Island by impeding public foot access that may otherwise cause damage to cultural artifacts. CRC stresses the importance of considering Indigenous perspectives in the relicensing process, which previously have been overlooked by regulatory agencies and are still largely being dismissed by FirstLight.

CWA 401 CERTIFICATION

The CWA's 401 Water Quality Certification process is a critical regulatory mechanism that empowers states to protect their water resources.[8] The certification can include conditions necessary to ensure compliance, and states have the authority to deny certification if the project fails to meet water quality standards or poses significant risks to water resources.

The 401 Water Quality Certification process is intrinsically linked to Massachusetts water quality standards (WQS), which are designed to secure the benefits of the CWA and to "designate the most sensitive uses for which the various waters of the Commonwealth shall be enhanced, maintained and protected."[9] Uses identified by the state for different river segments, including aquatic life and recreation, must be protected and restored. State WQS also "contain regulations necessary to achieve the Designated Uses and maintain existing water quality including, where appropriate, the prohibition of discharges."[10] To maintain a water body's uses, Massachusetts has established specific criteria for water quality, including limits temperature, pH levels, and dissolved oxygen, among other pollutants.[11] These standards are crucial for maintaining the ecological health of water bodies, protecting fish and wildlife habitats, and ensuring the water is safe for recreational activities and aesthetic purposes.[12]

In the context of the FirstLight Projects, 401 certification requires compliance with Massachusetts' WQS.[13] Because the FirstLight Projects seek renewed federal licenses that may last for the next half-century,[14] this 401 certification process is of generational importance and must take into account rapidly changing factors including energy technology and climate change when determining whether the proposed operations will comply with MA WQS today and several decades from now. Moreover, given the significant modifications the FirstLight Projects impose on the natural flow and ecological dynamics of the Connecticut River, CRC is concerned about whether and how the river will be "enhanced, maintained and protected" under these

[8] 33 U.S.C. § 1341(a)(1).
[9] *See* 314 CMR 4.01(3) (noting also that Massachusetts WQS "prescribe the minimum water quality criteria required to sustain the Designated Uses…").
[10] *Id.*
[11] *See, e.g.,* 314 CMR 4.05(3)(b) (providing certain requirements specific to Class B-designated waters).
[12] *See id.*
[13] 33 U.S.C. § 1341.
[14] 16 U.S.C. § 808(e) ("any license issued by the [Federal Power Commission] under this section shall be for a term which the [Federal Power Commission] determines to be in the public interest but not less than 30 years, nor more than 50 years, from the date on which the license is issued").

conditions.[15] Thus, DEP must assess whether these hydroelectric activities comply with the state's WQS, as ensuring compliance with these standards is vital for protecting the Connecticut River now and for future generations.

COMPLIANCE WITH MASSACHUSETTS WATER QUALITY STANDARDS

CRC's Proposed Recommendation for Flows Below Turners Falls Dam

CRC recommends a minimum flow of at least 1,400 cfs below TFD between July 1 – November 15, as supported by the previous CRC comments on FirstLight's "Ready for Environmental Analysis" (REA) application,[16] its comments on the proposed Fish Passage and Flows Settlement Agreement,[17] and the expert testimony of Donald Pugh.[18] In brief, a minimum flow of 1,400 cfs will uphold state water quality standards by

(1) increasing available habitats for fluvial fish species and macroinvertebrates,

(2) providing adequate recreational opportunities, and

(3) enhancing the aesthetics of the approximately one-mile river segment below TFD by fully covering the riverbed with water.

Proposed Minimum Flows under FirstLight's 401 Certificate Application.

As provided in FirstLight's 401 Certificate Application, upon its requested FERC license issuance, FirstLight provides that it will discharge below TFD the following seasonal minimum flows:[19]

[15] *Id.*; 314 CMR 4.01(3), 4.03(3) & 4.04.
[16] *See* Comments of Connecticut River Conservancy on the amended final license application re the Turner Falls Hydroelectric Project, FERC Accession No. 20230525-5090 (filed May 22, 2024) at 7–20 (hereinafter CRC REA Comment), attached as Exhibit B.
[17] *See* Exhibit A (CRC Flows & Fish Passage Comment) at 4–10.
[18] *See id.*, Pugh Affidavit, ¶¶ 9–18.
[19] *See* FirstLight 401 Certificate Application, at 24.

Date	Minimum Flows below Turners Falls Dam
01/01-03/31[1]	• If the Naturally Routed Flow (NRF- definition provided later in this article) is ≤ 400 cubic feet per second (cfs), the Minimum Flow below Turners Falls Dam shall be 400 cfs or the NRF, whichever is less. • If the NRF is > 400 cfs, the Minimum Flow below Turners Falls Dam shall be 400 cfs.
04/01-05/31	• If the NRF is ≤ 6,500 cfs, the Minimum Flow below Turners Falls Dam shall be 67% of the NRF. • If the NRF is > 6,500, the Minimum Flow below Turners Falls Dam shall be 4,290 cfs.
06/01-06/15[2,3]	• If the NRF is ≤ 4,500 cfs, the Minimum Flow below Turners Falls Dam shall be 67% of the NRF. • If the NRF is > 4,500 cfs, the Minimum Flow below Turners Falls Dam shall be 2,990 cfs.
06/16-06/30[3]	• If the NRF is ≤ 3,500 cfs, the Minimum Flow below Turners Falls Dam shall be 67% of the NRF. • If the NRF is > 3,500 cfs, the Minimum Flow below Turners Falls Dam shall be 2,280 cfs.
07/01-11/15[1]	• If the NRF is ≤ 500 cfs, the Minimum Flow below Turners Falls Dam shall be 500 cfs or the NRF, whichever is less. • If the NRF is > 500 cfs, the Minimum Flow below Turners Falls Dam shall be 500 cfs.
11/16-12/31[1]	• If the NRF is ≤ 400 cfs, the Minimum Flow below Turners Falls Dam shall be 400 cfs or the NRF, whichever is less. • If the NRF is > 400 cfs, the Minimum Flow below Turners Falls Dam shall be 400 cfs.

Figure 1: Minimum Flows below TFD[20]

Of particular concern are the proposed minimum flows of 500 cfs during the period spanning from July 1 to November 15. As will be discussed in great detail below, FirstLight has primarily based its harmful lower flows below TFD for that portion of the year on the presence of two state-listed threatened or endangered plants (Tradescant's Aster and Tussock Hairgrass) that have established themselves in the bypass reach due to the years of dewatering that has occurred there as a result of TFD operations.[21]

Additionally, the Connecticut River from TFD to the Holyoke Dam is designated as a Class B water under Massachusetts WQS.[22] Class B waters are Inland Waters that "are designated as a habitat for fish, other aquatic life, and wildlife, including for their reproduction, migration, growth and other critical functions, and for primary and secondary contact recreation."[23] DEP also requires that Class B waters maintain a "consistently good aesthetic value."[24] In this context, the proposed minimum flow of 500 cfs in Reach 1 fails to maintain, restore, or protect its existing and designated Class B uses because it fails to support Aquatic Life Uses (ALUs), does not sufficiently support recreational activities, and and fails to meet the WQS's "consistently good aesthetic value" standard.

[20] *See* CRC REA Comment at 8.
[21] *See* CRC REA Comment at 8; *See* FirstLight 401 Certificate Application, at Attachments C-8 & C-10.
[22] 314 CMR 4.06 (*see* Table 7).
[23] 314 CMR 4.05(3)(b).
[24] *Id.*

Proposed Flows Do Not Maintain, Restore, and Protect Aquatic Life Uses.

As a Class B water, the River Segment must provide essential conditions for "reproduction, migration, growth, and other critical [aquatic life] functions."[25] However, according to the expert affidavit from Donald Pugh,[26] FirstLight's proposed minimum flow of 500 cfs "is insufficient to provide a suitable amount and quality of habitat for most aquatic species inhabiting [the River Segment]."[27] Specifically, the proposed minimum flows would only allow for 10% of the maximum available habitat for macroinvertebrates, and less than 27% for several other fish species.[28] Instead, a minimum flow of 1,400 cfs is needed to address the impairments related to ALUs.[29]

FirstLight contends that based on Section 314 CMR 4.03(b) of Massachusetts WQS,[30] "the 500 cfs minimum flow represents an equivalent flow agreed upon by the [U.S. Fish & Wildlife Service], [National Marine Fisheries Service], and [Massachusetts Division of Fisheries & Wildlife] reflecting the balancing of aquatic resources and rare plants" (emphasis added).[31]

In Attachment C of its 401 Application, FirstLight claims that its proposed minimum flow of 500 cfs "reflects the balancing of many competing resources," including the aforementioned state-listed plants, certain ALUs, and recreational boating.[32] As a means of demonstrating a sort of ecological compromise, FirstLight explains that it opted for its proposed minimum flow of 500 cfs after initially proposing a summertime flow of 250 cfs.[33] According to FirstLight, it proposed the flow of 250 cfs "for the purpose of protecting rare plants."[34] As will

[25] 314 CMR 4.05(3)(b).
[26] Donald Pugh is an independent consultant with over twenty years of experience and expertise in analyzing fish passage at hydroelectric projects, including FERC licensing projects. Pugh formerly worked on both up- and downstream passage at the U.S. Geological Survey's S.O. Conte Anadromous Fish Research Laboratory, which is located on the Connecticut River just downstream of Turner's Falls Dam. Pugh has also been engaged in numerous fish passage projects or consultations, during which he has examined and analyzed fish passage requirements including aquatic habitat quality and use and minimum flow needs. *See* Exhibit A, Pugh Affidavit, at ¶ 1.
[27] *Id*. at ¶ 5.
[28] *Id.* at ¶¶ 6–7.
[29] *Id.*
[30] Providing that "[i]n waters where flows are regulated by dams or similar structures, the lowest flow condition at which aquatic life criteria must be applied is the flow equaled or exceeded 99% of the time on a yearly basis, or another equivalent flow agreed upon by the Department and the federal, state or private entity controlling the flow…"
[31] FirstLight 401 Certificate Application, at Att. C-8.
[32] *Id.* at Att. C-7 (note that FirstLight contends that the aquatic habitat is for a "variety of target species" including juvenile and adult life stages of fallfish, longnose dace, white sucker, walleye, and tessellated darter).
[33] *Id.* at Att. C-8.
[34] *Id.* (also providing that "[t]he 250 cfs flow was subject to an inspection of rare plants under Turners Falls Dam discharges ranging from 250-400 cfs").

be discussed below in the Recreation Use section, FirstLight then made the jump from 250 cfs to 500 cfs after it conducted its Boating Navigability Study and found that the minimum navigable flow for recreational boaters was approximately 545 cfs.[35] Thus, as a purported means of "balancing many competing resources," FirstLight found it best to increase its proposed minimum summertime flows from 250 cfs to 500 cfs.

FirstLight contends that the proposed minimum flows below TFD are needed due to the presence of two rare plant species in the river segment below the dam: Tussock Hairgrass (*Deschampsia caespitosa ssp. glauca*) and Tradescant's Aster (*Symphotrichum tradescanii*).[36] The Tussock Hairgrass, a perennial grass that typically thrives on rocky and gravelly river shores and is recognized for its tufted growth habit and white bloom.[37] Tussock Hairgrass is classified as "endangered" under the Massachusetts Endangered Species Act (MESA) Generally, the Tussock Hairgrass habitat relies on regular flooding and scouring, supposedly making existing populations vulnerable to threats from damming or other changes in hydrological conditions.[38] The second rare species, the Tradescant's Aster, is found in cracks or fissures within rocky streams or along river banks.[39] The Tradescant's Aster is listed as "threatened" under MESA.[40]

As an important initial matter, there is simply not enough publicly available information about the presence, elevations, or abundance of either of these species in the river stretch below TFD for CRC or the general public to make informed comments about the impacts, if any, of

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[35] *See* Gomez & Sullivan Engineers, Boating Navigability Study: Turners Falls Hydroelectric Project (No. 1889) (2021) (prepared for FirstLight) (hereinafter Boating Navigability Study), at 12.
[36] *See* FirstLight 401 Certificate Application, at Attachments C-8 & C-10; *See* FirstLight F&FP Response, FERC Accession No. 20230612-5216; *See also* CRC Flows & Fish Passage Comment, FERC Accession No. 20230525-5090, at 6–7 (citing Relicensing Study 3.5.1 Report: Baseline Inventory of Wetland, Riparian and Littoral Habitat in the Turners Falls Impoundment, and Assessment of Operational Impacts on Special-Status Species (2016), Project Nos. 1889-000 and 2485-000 (filed Mar. 2, 2016); Relicensing Study 3.5.1 Report: Inventory of Wetland, Riparian and Littoral Habitat in the Turners Falls Impoundment, and Assessment of Operational Impacts on Special-Status Species Addendum, Project Nos. 1889-000 and 2485-000 (filed Oct. 14, 2016); Relicensing Study 3.5.1 Report: Inventory of Wetland, Riparian and Littoral Habitat in the Turners Falls Impoundment, and Assessment of Operational Impacts on Special-Status Species Addendum 2, Project Nos. 1889-000 and 2485-000 (filed Apr. 3, 2017); Relicensing Study 3.5.1 Report: Inventory of Wetland, Riparian and Littoral Habitat in the Turners Falls Impoundment, and Assessment of Operational Impacts on Special-Status Species Addendum 3, Project Nos. 1889-000 and 2485-000 (filed Mar. 1, 2019)).
[37] Nat'l Heritage & Endangered Species Program, *Tussock Hairgrass*, Mass. Div. of Fisheries & Wildlife, https://www.mass.gov/doc/tussock-hairgrass/download (last updated 2015).
[38] Nat'l Heritage & Endangered Species Program, *Tussock Hairgrass*, Mass. Div. of Fisheries & Wildlife, https://www.mass.gov/doc/tussock-hairgrass/download (last updated 2015)..
[39] *Id.*
[40] *See* MassWildlife's Nat. Heritage & Endangered Species Program, *List of Endangered, Threatened, and Special Concern species*, MASS.GOV (Jan. 10, 2020), https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species#list-of-species-.

different flow levels. This is especially true given the Massachusetts' Natural Heritage and Endangered Species Program's acknowledgement that the general management requirements for Tussock Hairgrass are not well understood,[41] and the fact that it is unknown whether any evaluation of transplanting the plants has been undertaken. But even if the plant species are present at elevations that would be adversely affected by flows greater than 500 cfs, it still does not justify maintaining such exceptionally low flows for the next half century.

FirstLight's approach neglects the impaired aquatic habitat that is protected by Massachusetts WQS and the CWA.[42] When considering the range of designated ALUs and recreational/aesthetic uses that these proposed minimum flows fail to protect or restore, basing the minimum flows on just these two plant species is arbitrary and does not hold up under legal scrutiny for the following reasons:

First, the plants would not even be growing in their present locations in the bypass reach *but for* the artificial dewatering caused by the hydropower facilities.[43] Essentially, these plants only exist as a result of the ongoing impairment of the river. Therefore, using the presence of these plants to justify low flows to protect them creates a logical fallacy: the listed impairment for that river segment (i.e. dewatering) created the condition that initially facilitated the plants' establishment, which is now preventing the impairment from being rectified.

Second, it is unclear if the plants even qualify as ALUs.[44] The plants are also occasionally found in non-wetland areas and thus are not strictly *aquatic* species.[45] If the plants do not meet ALU criteria, then they are not a designated use protected under the CWA.[46] Furthermore, CRC has requested from Natural Heritage—but has not yet received—the most recent data and analysis concerning the locations and elevations of the plant communities in the

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[41] *See* MassWildlife's Nat. Heritage & Endangered Species Program, *List of Endangered, Threatened, and Special Concern species*, MASS.GOV (Jan. 10, 2020), https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species#list-of-species-.

[42] 314 CMR 4.03(4.05(3)(b)

[43] *See* CRC REA Comment at 8–10.

[44] *See* 314 CMR 4.02 (pursuant to Massachusetts WQS, "aquatic life" is defined as a "native, naturally diverse, community of aquatic flora and fauna including, but not limited to, wildlife and threatened and endangered species").

[45] 314 CMR 4.02 (pursuant to Massachusetts WQS, "aquatic life" is defined as a "native, naturally diverse, community of *aquatic* flora and fauna including, but not limited to, wildlife and threatened and endangered species") [emphasis added].

[46] 314 CMR 4.05(3)(b) (providing that Class B These "waters are designated as a habitat for *fish*, other *aquatic* life, and *wildlife*") [emphasis added].

bypass reach.[47] Additionally, it remains unclear if there has been any actual science done to confirm that a flow of 500 cfs is appropriate for these plant species, nor is it clear if analysis was done to ascertain the viability of moving the plants or propagating the seeds. While CRC acknowledges and respects the necessity of keeping precise location information of rare species confidential in most circumstances, FirstLight is attempting to use the plant data in this proceeding to justify flows in the Connecticut River below TFD for the next 40 to 50 years, to the detriment of other aquatic life. Given the enduring consequences of 401 certification, it is imperative for CRC and any invested public parties to have the most current plant data and analysis available. Simply put, if DEP intends to rely on the rare plant species in any way to set flow levels or otherwise condition the 401 certification, it must make its data and analysis available to the public and provide the public ample time to evaluate its determinations. The decision of the requisite flow levels below TFD–an area that has been impaired for years due to dewatering and that must be restored in order to comply with Massachusetts WQS–cannot be made in a black box.

Third, if we assume for the sake of FirstLight's argument, that the plants qualify as ALUs under Massachusetts surface WQS, DEP nevertheless has a discrete obligation to identify the *most sensitive* existing or designated use and to ensure that use is enhanced, maintained, and protected.[48] Thus, DEP must undertake its own independent analysis to determine the most sensitive ALUs needing protection in the bypass reach below the dam.[49] CRC submits that there are more sensitive truly water-dependent ALUs that require protection than the rare plants.

Fourth, even if the plants are ALUs, the plain language of the CWA evinces a preference for "fish, shellfish, and wildlife," versus plants.[50] Thus, if there are competing ALUs, the CWA's explicit hierarchy weighs against favoring aquatic flora over "fish, shellfish, and wildlife."

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[47] CRC originally requested information regarding the plant species from DEP but was provided no data or analysis and DEP withheld many documents as privileged or confidential.

[48] 314 CMR 4.01(3) ("To achieve the foregoing requirements the Department has adopted the Massachusetts Surface Water Quality Standards which designate the most sensitive uses for which the various waters of the Commonwealth shall be enhanced, maintained and protected…") [emphasis added].

[49] 314 CMR 4.01(3).

[50] *See* 33 U.S.C. § 1251(a)(2) ("[I]t is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983").

Fifth, relying solely on the presence of these plants to determine flow levels disregards the needs of Massachusetts fish species of special concern known to inhabit the area below the dam. CRC expects that flows sufficient to support ALUs would provide additional habitat for at least two MESA-protected fish species: the burbot (*Lota lota*) and longnose sucker (*Catostomas catostomas*).[51] Burbot is a freshwater fish belonging to the cod family, unique for its elongated body and single chin barbel.[52] Burbot thrive in cold, deep waters and is often found in the weedy areas of streams.[53] The Longnose sucker is a fish recognized for its elongated snout and torpedo-shaped body.[54] In Massachusetts, Longnose suckers are typically found in the cool, upper regions of rivers and streams with rocky substrates.[55] Although pollution and habitat alteration along the mainstems have drastically reduced the populations of Burbot and Longnose suckers, the water quality in the Connecticut River has significantly improved in recent decades, and the relicensing offers a once-in-a-generation opportunity to mitigate the adverse effects of habitat alteration.

The available scientific evidence demonstrates that accommodating FirstLight's proposed minimum flows will continue the degradation of water quality necessary to maintain and restore other ALUs. The applicable law does not permit this outcome.[56] Further, to CRC's knowledge, there has been no demonstration that any anticipated harm to the rare plants due to higher flows cannot be mitigated by the relocation of those plant communities, as has been done in related circumstances.[57] Furthermore, the floods in July 2023 caused flows as high as 105,000 cfs to pass downstream by the Northfield gauge.[58] Given that Turners Falls maximum hydraulic

[51] *See* MassWildlife's Nat. Heritage & Endangered Species Program, *List of Endangered, Threatened, and Special Concern species*, MASS.GOV (Jan. 10, 2020), https://www.mass.gov/info-details/list-of-endangered-threatened-and-special-concern-species#list-of-species-.
[52] *See* Nat'l Heritage & Endangered Species Program, *Burbot*, Mass. Div. of Fisheries & Wildlife, https://www.mass.gov/doc/burbot/download (last updated 2015) (noting that "[n]o other inland fish species in Massachusetts looks like this fish").
[53] *Id.*
[54] *See* Nat'l Heritage & Endangered Species Program, *Longnose sucker*, Mass. Div. of Fisheries & Wildlife, https://www.mass.gov/doc/longnose-sucker/download (last updated 2015).
[55] *Id.*
[56] 314 CMR 4.03(3)(b).
[57] *See e.g.* Deerfield Project, FERC Docket No. P-2323 (approving offer of settlement & issuing new license for Deerfield River Proj-2323 re New England Power Co. FERC Accession No. 19970411-0271. Article 419).
[58] *See* USGS Connecticut River Near Northfield, MA – 01161280 stream gage: https://waterdata.usgs.gov/monitoring-location/01161280/. See USGS Connecticut River Near Northfield, MA – 01161280 stream gauge: https://waterdata.usgs.gov/monitoring-location/01161280/. 105,000 cfs recorded on 7/11/23 at 7:30 pm.

capacity is 13,728 cfs, this means that approximately 91,000 cfs of flow was being spilled into the Bypass reach. This is much higher than the 500 cfs proposed to protect these two species. There has been no public evidence of the plants surviving the 2023 summer floods, and therefore the plants may no longer be present there. Even if a study were conducted and the plants are found to have survived the 91,000 cfs flow, then that is evidence to argue that the plants would be able to survive 1,400 cfs as well. Thus, the purported protection of the state-listed plants found in the river segment below TFD due to the ongoing impairments to the river should not and cannot be used as justification to set future flow levels.

Proposed Flows Do Not Maintain, Restore, and Protect Recreational Uses.

In addition to ALUs, the one-mile section of the river below TFD is also designated for primary and secondary contact recreational activities.[59] DEP defines *Primary Contact Recreation* as any water use "in which there is prolonged and intimate contact with the water with a significant risk of ingestion of water."[60] Primary contact activities include, but are not limited to, wading, swimming, diving, surfing and water skiing.[61] DEP defines *Secondary Contact Recreation* as any water use "in which contact with the water is either incidental or accidental."[62] Secondary contact activities include but are not limited to, fishing, fish consumption, boating, and shoreline activities.[63] Here, FirstLight's proposed minimum flow of 500 cfs falls short of providing adequate primary or secondary recreational opportunities, making it so that a portion of the river cannot meet its criteria as a Class B-designated water.[64]

As discussed above in the context of ALUs, FirstLight provided in its 401 Application that it opted to increase its proposed minimum flows from 250 cfs to 500 cfs to purportedly accommodate both the rare plants and recreational uses.[65] FirstLight explains that it increased its proposed minimum flows after it conducted "a boating study" wherein researchers assessed the impacts of different flows released from TFD on canoeists and kayakers.[66] Participants in the

[59] 314 CMR 4.05(3)(b) ("These waters are designated…for primary and secondary contact recreation").
[60] 314 CMR 4.02.
[61] *Id.*
[62] *Id.*
[63] *Id.*
[64] 314 CMR 4.05(3)(b).
[65] FirstLight 401 Certificate Application, at Attachment C-8.
[66] *See id.*; CRC believes that FirstLight is referencing its 2021 Boating Navigability Study (Gomez & Sullivan Engineers, Boating Navigability Study: Turners Falls Hydroelectric Project (No. 1889) (2021) (prepared for FirstLight) (hereinafter "Boating Navigability Study")), attached as Exhibit C.

study expressed concerns about navigability even at the 545 cfs flows, which were the highest flows FirstLight released that day even though higher demonstration flows were planned.[67] One participant stated that while the 545 cfs flows were an improvement as compared to the other (lower) flows, they were still "[n]ot great," and "not appropriate for beginners" with the rapid lines reportedly being "scratchy" and "hard to follow."[68] Likewise, another participant reported that the 545 cfs flow "[s]till require[d] river reading and maneuverability skills" and another complained about the rocks and about being pinned at the "Far Right ledges" and the "opening ledges."[69] Based on these results, CRC is concerned that the existing dissatisfaction may increase among beginner-level canoeists and kayakers, who may lack the experience to navigate the rocky center and right channels, and among less-able-bodied recreationists, who may struggle to portage their crafts if needed. Thus, it is highly questionable whether 545 cfs is an adequate minimum navigable flow, much less the proposed 500 cfs, and, at a minimum, DEP should require additional demonstration flows for a follow-up boating navigability study so boaters can evaluate the experience with higher flows as FirstLight's study initially intended.

FirstLight also proposes to construct new river accesses and put-ins around Peskeomskut Island as part of maintaining the recreational use WQS.[70] Yet, while FirstLight claims that these new constructions will "mitigate for navigability constraints in the upper bypass reach during the low flow period, and will provide better access for whitewater boating,"[71] it nevertheless fails to provide supporting evidence that canoeists and kayakers would prefer to walk around the island rather than paddle. Realistically, exiting the river to haul a watercraft, paddle, and gear along a trail significantly differs from the uninhibited navigation down the river channel. Thus, these "river accesses" completely alter the boating experience, which often deter recreationists and exclude individuals with little experience or who lack the ability to undertake such potentially strenuous maneuvers. Altering the boating experience to this extent also violates the river

[67] *See* Exhibit C (Boating Navigability Study), at Table A-4 (providing participant evaluations of Flow 3); *see also id*. at 9–10, Table 3.2-1 (showing target release flows were planned from the bascule gate #1 for 500, 670, 900, and 1,000 cfs) and Table 3.3-1 (showing actual releases only reaching 545 cfs).
[68] *Id.* (*see* Paddler 8's evaluation).
[69] *Id.* (*see* Paddlers 1 & 6's evaluations).
[70] *See* FirstLight 401 Certificate Application, at Attachment C-8; FirstLight F&FP Response, FERC Accession No. 20230612-5216, at 6; Recreation Settlement Agreement and Explanatory Statement of FirstLight MA Hydro LLC and Northfield Mountain LLC, Project Nos. 1889-000 and 2485-000, FERC Accession No. 20230612-5219 (filed June 12, 2023) (hereinafter FirstLight Recreation Settlement Agreement), at 10; *See also* Recreation Management Plan, *in* FirstLight Recreation Settlement Agreement, FERC Accession No. 20230612-5219, at Section 6.1.
[71] FirstLight F&FP Response, FERC Accession No. 20230612-5216, at 6.

segment's Class B-designated recreational uses.[72] Ultimately, CRC is concerned that these low flows do not provide acceptable navigability in the height of the summertime recreation season on New England's largest river and the country's only national Blueway–a clear lack of access to primary and secondary recreational activities and a violation of state WQS under 314 CMR 4.05(3)(b).[73]

Finally, CRC notes that while FirstLight attempts to draw attention to other non-riverine recreational activities it has funded in its 401 Application, CRC acknowledges that DEP is required by law to confine its review during the certification process to determining whether there is reasonable assurance that the proposed relicensed operations will be conducted in a manner which will not violate state WQS.[74] Thus, CRC will refrain from responding to FirstLight's purported recreational benefits claims under the assumption that those portions of the application and any supporting materials will not be part of the administrative record for this proceeding since they are irrelevant to DEP's certification determination. If CRC is wrong about this assumption and DEP plans to include those materials as part of the record, CRC requests DEP notify CRC so CRC can respond accordingly.

Proposed Flows Do Not Maintain, Restore, and Protect Good Aesthetic Values.

In addition to inadequate ALUs and recreational uses, FirstLight Project's 401 Application's proposed low flows are aesthetically unacceptable, violating Massachusetts WQS. Applicable here, DEP requires Class B waters to "have consistently good aesthetic value.[75] Although "good aesthetic value" is not defined under the standards, CRC believes that the Connecticut River should maintain a level of flow that preserves its natural beauty and ensures an enjoyable and visually appealing environment for all users–a qualitative standard that cannot be met under the FirstLight Project's proposed minimum flows below TFD.

[72] 314 CMR 4.05(3)(b) & 4.02 (CRC argues that the requirement for boaters to exit their watercrafts violates the definitions of both primary and secondary recreation).
[73] *See, Connecticut River*, AM. RIVERS, https://www.americanrivers.org/river/connecticut-river/ (last visited May 30, 2024) (providing that the Connecticut River is 410 miles long and its the United States' only Blueway).
[74] *See* MASS. DEP'T OF ENV'T PROT., MASSDEP FIRSTLIGHT WATER QUALITY CERTIFICATION: FREQUENTLY ASKED QUESTIONS 5–6 (2024).
[75] 314 CMR 4.05(3)(b).

The photos below, extracted from Appendix D of FirstLight's own Boating Navigability Study, illustrate the dewatered river channel at a flow rate of 545 cfs.[76] This depiction does not reflect the mighty nature of the Connecticut River; rather, it shows a minimal trickle of water.

Photo 3-05: Peskeomskut Island – Left Channel – North View

Figure 2: Peskeomskut Island, Left Channel

Photo 3-07: Put-In #2 – Access Trail – Downstream View

Figure 3: Put-In #2 Access Trail – Downstream View

[76] *See* Boating Navigability Study, at Appendix D-22 & D-23.

As exemplified by the photos, low flows can lead to exposed riverbeds and slow-moving or stagnant water, detracting significantly from the natural aesthetic of a flowing river. Low-flow conditions like these diminish the river's recreational value and undermine the visual enjoyment of residents and visitors who seek to connect with the Connecticut River's natural beauty. Thus, FirstLight's proposed low flows are aesthetically unacceptable, violating the state's explicit mandate that water bodies must sustain aesthetic quality as part of their ecological integrity.[77]

With support from the National Park Service Hydropower Assistance Program, the Hydropower Reform Coalition, Confluence Research and Consulting, and the Oregon State University, a conceptual framework was developed to illustrate the relationship between flows and aesthetics.[78] According to this framework, flows influence the resource conditions of an area, which in turn affect resource outputs such as recreational opportunities and aesthetic characteristics.[79] The framework also includes recommendations on whether and how to conduct flow-aesthetics studies during hydroelectric licensing.[80] Generally, these studies have been successfully implemented in FERC relicensing proceedings, positively contributing to the process by focusing on the parts of the river most valued by recreational stakeholders, providing a transparent and defensible record of the applicant's consideration of aesthetic values, and by improving information sharing across licensing proceedings.[81] During the 401 certification proceeding, CRC urges MassDEP to reference this framework as a means to protect the river's natural scenery now and for future generations.[82]

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[77] 314 CMR 4.05(3)(b).
[78] *See* DOUG WHITTAKER & BO SHELBY, FLOWS AND AESTHETICS: A GUIDE TO CONCEPTS AND METHODS (Supported by Nat'l Park Serv. Hydropower Assistance Program, Hydropower Reform Coal., Confluence Rsch. and Consulting, & Or.St. Univ., 2017).
[79] *Id.* at 6.
[80] *See generally* DOUG WHITTAKER & BO SHELBY, FLOWS AND AESTHETICS: A GUIDE TO CONCEPTS AND METHODS (Supported by Nat'l Park Serv. Hydropower Assistance Program, Hydropower Reform Coal., Confluence Rsch. and Consulting, & Or.St. Univ., 2017).
[81] *Id.* at 15–16.
[82] *Id.*; *See* 16 U.S.C. § 808(e) ("any license issued by the [Federal Power Commission] under this section shall be for a term which the [Federal Power Commission] determines to be in the public interest but not less than 30 years, nor more than 50 years, from the date on which the license is issued").

Proposed Flows Do Not Protect Cultural Resources.

Preservation of cultural resources may also play a role in the evaluation process for Section 401 certification under the CWA. As previously discussed, Section 401 empowers states to assess and certify that any proposed activity requiring a federal license or permit complies with state water quality standards and *any other appropriate requirement of State law*.[83] Applicable here, the Massachusetts Antiquities Act and the Massachusetts Environmental Policy Act (MEPA) provide that any projects that require funding, licenses, or permits from any state agency must be reviewed for compliance by the Massachusetts Historical Commission (MHC).[84] The purpose of the Antiquities Act and the applicable provision of MEPA is to standardize the procedures for conducting archeological field investigations to ensure the conservation of archeological resources.[85] Thus, while Section 401 of the CWA primarily focuses on water quality, 401(d)'s inclusion of the "*any other appropriate requirement of State law*" provision allows DEP to also consider threats to archaeological and Indigenous resources due to low flows below TFD.

In its response to FirstLight's proposed Fish & Flow Passage Settlement Agreement in the FERC proceeding, the Nolumbeka Project in coordination with the Chaubunagungamaug Band of Nipmuck Indians and the Elnu Abenaki Tribe commented in opposition to FirstLight's proposed minimum flows of 500 cfs, expressing concerns about the low flow's negative impact on aquatic species and other cultural resources.[86] The following is a powerful quote from the Nolumbeka Project's comment:

> *"When the waters that historically flowed through this stretch of the ancient riverbed are nearly completely diverted away from the river into the power canal, much historical cultural heritage is placed at risk.*

[83] 33 U.S.C. § 1341(d).
[84] *See* Antiquities Act, 950 CMR 70 (establishing M.G.L. c. 9, §§ 26–27C); *See also* Massachusetts Environmental Policy Act, 301 CMR 11.10; *Review and Compliance*, MASS. HIST. COMM'N, https://www.sec.state.ma.us/mhc/mhcrevcom/revcomidx.htm (last visited May 30, 2024).
[85] 950 CMR 70.02.
[86] *See generally* Notice to Intervene and Comments of The Nolumbeka Project Inc. at 4-5, Project Nos. 1889-000 and 2485-000, FERC Accession No. 20230525-5073 (filed May 25, 2023) (hereinafter The Nolumbeka Project's Comment), attached as Exhibit D.

The ancient shale beds once covered with a healthy flow of water year round are now exposed to the light a day when water is diverted from the river to the canal for hydropower. This condition leaves exposed to anyone who wishes to walk out on the dry land that was once river bottom, the ability to access ancient cultural resources that represented a people, who for generations have not been here to request the protection of the ancient resources of their people, are now unceremoniously assigned to the coffee tables and bookshelves of looters and sightseers."[87]

It is within DEP's authority under CWA 401(d) to consider the articulated harms to archaeological and Indigenous artifacts and sites that may occur at the proposed flow levels below TFD. Because higher flow levels between July 1 and November 15 will better protect sensitive ALUs and recreational uses *and* have the concomitant beneficial effect of providing protection for cultural resources, DEP should reject FirstLight's proposed low flows that are based primarily on protecting non-aquatic plants.

Fluctuations in River Height Have Caused Severe Erosion.

CRC is in complete alignment with the Franklin Regional Council of Governments (FRCOG)'s stance on the critical issue of fluctuations in river height causing severe erosion. CRC fully incorporates FRCOG's comment by reference, acknowledging the valuable insights and recommendations provided by FRCOG and its erosion expert.[88]

A. CRC's Northfield Mountain Erosion Mitigation Recommendations

1. Recommendations for Target Elevation and Normal Operational Range

The current fluctuations in river height in the TFI are causing extreme erosion and negatively impacting recreation. Thus, any surface water elevation fluctuations from facility operations in the future must not exceed current operational fluctuations and new conditions for future fluctuations need to be put in place.

[87] *Id.* at 4.
[88] *See* FRCOG Comments to DEP on FirstLight's 401 Water Quality Certificate Application, attached as Exhibit E.

DEP should instate a target river height (ex. 181 ft) for TFI that is consistent with operational levels from the past 50 years. From that target river height, operational measures be put in place for fluctuations to not exceed a certain elevation above or below the baseline level. The set range should be no more, and ideally less, than the average surface water elevations from years 2000 to 2014, because the river and its ecology has already adjusted to this range. If the operating range is not consistent with what it has been, more erosion will be caused as a result of those changes.

DEP should also mandate how often and when FirstLight can cause the river height to be above and below the target elevation. DEP should create a "normal operational range" which would be a certain number of feet above and below the target height and outline what percentage of the time the facility is mandated to operate within this range. For example, "*From the target river height of 181 ft, FirstLight must operate between 1 foot above and below this height 90% of the time and is allowed to operate between 2 feet above and below this height 10% of the time. If and only if there is an emergency operational situation, as outlined by emergency guidelines that DEP writes, can FirstLight exceed the 2 foot range.*" It is imperative that fluctuations in river elevation are minimized; CRC recommends that base operations do not exceed 1 foot in difference from the target water surface elevation.[89]

Additionally, DEP should require that 100% of the time during daylight hours, the river height must be above 179 ft to ensure safety and navigability for boats at Barton Cove. These operational measures for TFI fluctuation will help prevent further erosion as well as ensure safety and usability of the TFI for boaters.

2. Recommendations for Data Collection and Monitoring of Erosion

CRC also recommends that DEP require data collection of observed erosion and that the numbers be made public and filed with DEP. DEP should require FirstLight to report statistics in their annual compliance reports throughout the full term of the license, including the average TFI elevation for each month of the year, the average daily change, the highest elevation of the month, and the lowest elevation of the month. This report should also show that FirstLight is

[89] Federal Energy Regulatory Commission, "Connecticut River Conservancy submits comments on Settlement Process and Request for Ready for Environmental Analysis for the Turners Falls Project. et al. under P-1889, et al." FERC Accession No. 20220819-503 (August 18, 2022)

operating under the new framework as outlined above. The Full River Reconnaissance should continue to be required.

B. Unacceptable Erosion Is Occurring as a Result of Current Operations

Landowners along the Connecticut River in the Turners Falls Impoundment (TFI) have experienced and documented erosion since the project began in 1972.[90] Michael Bathory has lived along this portion of the river for 40 years and has records that the previous landowner kept of the erosion that began with the start of the pumping project.[91] In 1991, the Army Corps published study results that reported out of 148,000 feet of shoreline covered in the study, roughly one-third was experiencing active erosion. Furthermore, it stated that since the study was conducted in 1979, the riverbank erosion had increased by almost 300%. Since then, the issue has only continued to be exacerbated by continued operation and lack of mitigation.

This erosion of the riverbanks is a serious concern that has not been adequately addressed in FirstLight's 401 application, as it claims the erosion is not due to FirstLight's pumping. The Northfield Mountain Pumped Storage facility causes a four, sometimes five-foot variation in river level when it operates. Laura Wildman from Princeton Hydro assures that this big fluctuation in the impoundment causes the initial point in the erosion cycle.[92] Expert Dr. Dethier corroborates this, proving that erosion is clearly documented in both data and images produced by FirstLight.[93] Dethier also shows that the observations and measurements included in the FirstLight Full River Reconnaissance and Erosion Causation Study point to numerous ways in which its Project operations could exacerbate erosion.[94]

[90] Federal Energy Regulatory Commission, "Motion to Intervene of Connecticut River Conservancy under P-1889, et al." FERC Accession No. 20240522-5024 (May 21, 2024).
[91] *see* Michael Bathory Declaration in Federal Energy Regulatory Commission, "Motion to Intervene of Connecticut River Conservancy under P-1889, et al." FERC Accession No. 20240522-5024 (May 21, 2024).
[92]https://www.youtube.com/watch?v=l1yiOY7SeUk&list=PLab3dcAb-SUMJCbFpVWFYQ9m0h8YS3Eoi&index=3&t=6s
[93] Dr. Evan Dethier, Review of Erosion in the Turners Falls Impoundment (2024), attached as Exhibit F.
[94] Id.

C. Proposed Operational Changes Will Exacerbate TFI Erosion

FirstLight's AFLA proposes significant operational changes, including expansion of the upper reservoir at Northfield Mountain, which will continue to accelerate erosion and impact opportunities for recreation. The accelerated erosion impacts have been amply demonstrated by the conditions created on June 12 – 13, 2021, when FirstLight operations brought the impoundment down to a water level of 177.5 msl.This decrease in water level left boats stranded and exposed aquatic habitat. The lowered water level resulted from operational measures at Northfield Mountain responding to low or negative cost energy prices created during times of high solar energy generation. This scenario is likely to happen more often as energy generation shifts to these renewables, but the effect on the river in TFI is unacceptable. DEP must require FirstLight to minimize impacts to shoreline areas within the project reservoir and stream reaches in order to mitigate erosion.

D. Lower Water Levels in the TFI Cause Negative Recreation Impacts

Low water level in the river negatively impacts recreation. Relicensing study 3.6.6[95] looked at water levels at the Pauchaug Boat ramp within the TFI and concluded that water levels needed to be above 181 feet for the boat ramp to be usable for emergency motorboats.[96] Figure 4.2.2-3 in Relicensing Study 3.6.6 indicates that water levels dip below 181 feet at Pauchaug about 20% of the time throughout the course of the recreation season.[97] In its comment letter letter to FERC, CRC analyzed water level logger data and demonstrated that during summer months, it is common that water levels at Pauchaug are below 181 feet.[98]

[95] Gomez and Sullivan Engineers, Relicensing Study 3.6.6 Assessment of Effects of Project Operation on Recreation and Land Use Study Report Northfield Mountain Pumped Storage Project (No. 2485) and Turners Falls Hydroelectric Project (No. 1889) (prepared for FirstLight) at 4-4 (2016)
[96] FirstLight, Relicensing Study 3.6.6: Assessment of Effects of Project Operation on Recreation and Land Use Study Report (Oct. 2016) at 4-4, FERC Accession No. 20161014-5125 (filed Oct. 14, 2016).
[97] Id. at 4-8.
[98] Connecticut River Watershed Council comment, FERC Accession No. 20161215-5197 (filed Dec. 15, 2016), pg. 26.

Figure 4: Jonathan Trudel's photo of his unusable dock at low water.[99]

Resident Jonathan Trudel reported in a letter filed with FERC on March 4, 2024, that his personal dock in Gill on the River is often not usable due to pumping at Northfield Mountain.[100] The photo above in Figure 4 shows that, even with a dock designed to withstand river fluctuations, recreational use of the river is still impeded during low river levels from project operations.

Recreational access at Barton's Cove is also impacted by changing water surface elevations. Relicensing Study 3.6.6 *Assessment of Effects of Project Operation on Recreation and Land Use Study Report* evaluated water levels at recreation sites. Section 4.2.6 of Study 3.6.6 concluded that water level elevations need to be above 179 ft msl to adequately launch an

[99] Comments of Jonathan Trudel with photos of the depict low water level re the Turners Falls Dam of the Northfield Mountain Pumped Storage Project, FERC Accession No. 20240311-5044 (filed Mar. 11, 2024).
[100] Id.

emergency motorboat in Barton Cove. In Study 3.6.6, Figure 4.2.6-4 shows that the boat ramp elevation is at 184 ft msl, so when the TFI is above this elevation, parts of Barton Cove on the Gill side are under water.[101]

Changes to operational patterns could increase erosion and have detrimental impacts on the ecological life of the banks. New 401 certification conditions should ensure that the impoundment be held at the same baseline river height that has been in place under current operations. FirstLight and previous owners of the project have received temporary license amendments to use the expanded upper reservoir during the winters of 2005-2006, 2014-2015, 2015-2016, and summers of 2001 and 2006. As noted in previous CRC comments and interventions related to these temporary amendment requests, FirstLight held the average elevation of the impoundment about a half foot higher than usual during these temporary amendment periods, based on data FirstLight was required to file regarding operations during those temporary amendment periods. Extreme high and low surface water elevation events seem to be getting more common, based on anecdotal reports from residents along the river. However, there is no publicly available information about recent or long term daily TFI fluctuations as measured at the dam to inform these concerns.

FirstLight's Projected 9-Year Fish Passage Installation Timeline is Excessive.

CRC opposes the unnecessarily lengthy proposed timeframes for installing both upstream and downstream fish passage facilities.[102] The purpose of the fish passage facilities is to enhance migratory pathways for species in this stretch of the Connecticut River, addressing persistent challenges caused by outdated methods and years of blocked fish passage. Yet despite the potential benefits for migratory fish, FirstLight's 401 Application suggests that these fish passage facilities may not be operational for up to 9 years following its relicensing.[103] FirstLight has not adequately explained its lengthy construction timelines for these facilities or the perplexing decision to prioritize downstream facility construction over upstream facility

[101] See Connecticut River Conservancy Concerns About Settlement Process and Request for Ready for Environmental Analysis, Attachment A, FERC Accession No. 20220819-5033 (filed Aug. 19, 2022).
[102] *See generally* Exhibit A (CRC Flows & Fish Passage Comment) (CRC discussing in detail its objection to FirstLight's proposed Fish Passage implementation schedule); *See generally* Edwin T. Zapel, *Affidavit on Behalf of the Connecticut River Conservancy, in* CRC Flows & Fish Passage Comment (hereinafter "Zapel Affidavit").
[103] *See* FirstLight 401 Certificate Application, at 36–37.

construction.[104] Moreover, FirstLight does not provide sufficient justification for why construction of both upstream and downstream fish passages cannot occur simultaneously.[105]

Prioritizing downstream fish passage over upstream passage in the implementation schedule is unjustified, particularly for American Shad.[106] As CRC's expert,Edwin Zapel,[107] explains, if sequencing were necessary for the fish passage construction, upstream passage would provide far greater benefit to American Shad by at least three orders of magnitude.[108] Shad are iteroparous, migrating multiple times between the ocean and freshwater to spawn, and are highly fecund, producing 30,000 to 150,000 eggs per spawn.[109] They spawn in shallow areas with sandy or small gravel beds and do not exhibit strong natal homing, readily colonizing new habitats.[110] Given these characteristics and the availability of spawning habitat throughout the Connecticut River, enhancing upstream passage should be prioritized to increase spawning and juvenile production.[111] The current prioritization of downstream passage lacks substantial evidence and is counterintuitive without further biological justification.[112]

In addition to the unsupported downstream prioritization, the overall timelines for fish passage implementation at TFD are excessive. Again, according to Zapel, fish lifts like the types FirstLight has proposed typically follow predictable schedules and do not require a 9-year timeline.[113] In fact, Zapel stated that if the design were to begin upon FirstLight's license issuance, even taking into account agency reviews, a realistic schedule for full implementation should be approximately 4 to 6.5 years.[114] Further, rehabilitation of the Gatehouse Trapping facility could reasonably be accomplished within about 2 to 3.5 years (versus the proposed 9 years), given that no new structures should be necessary, and upgrades would likely be limited to

[104] Zapel Affidavit, at ¶ 4.
[105] *Id.* at ¶ 6.
[106] *Id.*
[107] Edwin Zapel is a Senior Hydraulic Engineer at Northwest Hydraulic Consultants with 36 years of experience in hydraulic, hydrologic, and fisheries engineering across the western United States, Alaska, and Canada. His projects include spillway and sluice gate designs, high-pressure valves, outlet works, small hydropower facilities, water temperature control structures, energy dissipation structures, river intake structures, reservoir intake and outlet structures, and river sediment control structures. He has designed numerous fish exclusion, guidance, screening, and bypass systems for dams and reservoirs handling up to 5,000 cfs for juvenile and adult salmonids (*see* Zapel Affidavit, at ¶ 1).
[108] Zapel Affidavit, at ¶ 7.
[109] *Id.*
[110] *Id.*
[111] *Id.*
[112] *Id.* at ¶¶ 7–8.
[113] *Id.* at ¶¶ 10–11.
[114] *Id.* at ¶¶ 11 & 20 (concluding that the fish passage construction timeline can be reduced to 2.5 to 5 years).

interior spaces, conveyance channels and hydraulic control features, and electrical upgrades with modern equipment replacing old equipment.[115] Likewise, the proposed 4-year implementation schedule for downstream fish passage facilities, including the design and installation of trash racks at Cabot Station and Station No. 1, is longer than necessary.[116] In short, given the decades of blockage of fish passage caused by FirstLight's Projects and the need for to protect and restore ALUs in that area of the river, DEP should ensure FirstLight's fish passage implementation is on the fastest track possible, and should not allow FirstLight to use agency reviews or oversight as an excuse for unnecessary delay.

CRC's Concerns and Recommendations Regarding FirstLight's New Barrier Net.

A. FirstLight's New Barrier Net Does Not Prevent Impingement and Entrainment.

At Northfield Mountain Pumped Storage, fish entrainment and impingement occur when water is pumped from the river to the holding reservoir.[117] To mitigate these impacts, FirstLight's 401 Application includes a fish barrier net to be installed from June 1 to November 15.[118] Yet, while the barrier net should improve some fish passage, CRC retains several concerns about the net's effectiveness and installation timeline.

First, as discussed in CRC's REA comment, CRC's primary concern is the efficacy of FirstLight's proposed barrier net.[119] In 2019, on FirstLight's behalf, Alden Research Lab studied the forces acting on the barrier net, focusing on velocities due to their potential to impinge fish.[120] The study modeled flow velocities at the net for the Connecticut River near the Northfield intake/tailrace at 5,000 cfs, 30,000 cfs, and 50,000 cfs.[121] However, the Pre-Application Document (PAD) indicated that flows of 30,000 cfs and 50,000 cfs are uncommon between June and November, not appearing on flow duration curves and thus not representative

[115] *Id*. at ¶ 12.
[116] *Id*. at 14–17.
[117] *See* FirstLight files the second year report for Relicensing Study No. 3.3.20 Study to Evaluate Entrainment of Ichthyoplankton at the Northfield Mountain Project & Relicensing Study 3.3.10 Odonates in the Connecticut River 2014-2016 Study Report under P-1889, FERC Accession No. 20161228-5079 (filed Dec. 28, 2016).
[118] FirstLight 401 Certificate Application, at 46–48.
[119] *See* Exhibit B (CRC REA Comment), at 28–29.
[120] *See generally* FirstLight submits the Northfield Station CFD Modeling for Fish Exclusion Net Forces Report under P-2485.et al., FERC Accession No. 20190603-5024 (filed June 3, 2019) (hereinafter "Alden Report").
[121] Alden Report, at viii.

of typical conditions.[122] Additionally, the water elevation for the 5,000 cfs flow was modeled at 179 ft and 181.4 ft at the Northfield Mountain tailrace, elevations that are exceeded at least 95% of the time.[123] Consequently, CRC argues that the studies did not simulate realistic flow or elevation scenarios. Moreover, CRC is concerned that the only field testing conducted was preliminary testing that occurred before the Fish Passage and Flows settlement agreement. Since then, the barrier net installation time has increased from August 1 - November 15 to June 1 - November 15th and CRC is unaware of any new testing with new proposed flows has been completed.

Second, CRC opposes the timeline for installing the Northfield Mountain Project intake barrier net, which is proposed to be operational by Year 7.[124] Despite concerns about the barrier net's effectiveness, CRC acknowledges that it will provide some relief to out-migrating species. However, the proposed timeline is excessively long, delaying benefits to the species for nearly a decade.[125] CRC's expert contends that if design begins upon license issuance, it is reasonable to expect that the new barrier net could be designed within 1 year and implemented within the following 2 years.[126] To exemplify this, CRC urges DEP to compare FirstLight's barrier net timeline to a comparable facility in Washington wherein similar large barrier exclusion nets at the Lake Shannon-Lower Baker Lake hydropower facility in Washington State were designed within about 2 years of license issuance and constructed the following year.[127] Not only that, but Mr. Zapel testifies that nets in Washington were much deeper and the reservoir experienced significant water level variations, which are among the most challenging design issues for barrier nets.[128] This demonstrates the feasibility of a more expedited timeline for the Northfield Mountain Project. Thus, FirstLight's 7-year timeline is excessive and should be replaced with a 2-year plan, with a commitment from state regulatory agencies to help expedite this schedule.

[122] *See* FirstLight Notice of Intent and Pre-Application Document, FERC Accession No. 20121105-4034 (filed Nov. 5, 2012), at Figures 4.3.1.2-19–21.
[123] *Id.* at Figures 4.3.1.2-13–18.
[124] FirstLight 401 Certificate Application, at 46.
[125] *Id.* at 46 ("The barrier net design shall be… operational no later than June 1 of Year 7 after license issuance) & 47 ("The Licensee shall complete construction of the Northfield Mountain barrier net, operate the barrier net for one season (shakedown year), and conduct representative and quantitative effectiveness testing in Years 10 and 11 to evaluate the downstream fish passage survival and time-to-pass compared to the performance goals below").
[126] Zapel Affidavit, at ¶ 19.
[127] *Id.*
[128] *Id.*

B. FirstLight Projected Adaptive Management Measures (AMMs) Timeline is Excessive, Reducing Efficacy.

Because the proposed timelines for fish passage construction are excessively long, the AMM timelines should be adjusted accordingly. Initial effectiveness studies for the Station No. 1 rack and Cabot Rack are proposed for Years 6 and 7, with developed reports for adult American Shad, juvenile American Shad, and adult American Eel due in Years 7 and 8.[129] Here, FirstLight does not justify why reporting for shad and adult eels would take longer. Additionally, there is no explanation for the lack of AMM effectiveness testing in Year 9. Effectiveness testing could begin the same year as the Round 1 AMMs are implemented, and this approach should apply to further rounds of AMM effectiveness testing in Years 12, 13, and 17.[130]

CRC also is concerned about the timeline for effectiveness testing at the TFD Plunge Pool. For the TFD Plunge Pool, initial effectiveness testing is proposed for Years 10 and 11, with Round 1 AMM effectiveness testing in Years 14 and 15.[131] CRC argues that because Round 1 AMMs involve modifying the bascule gate setting and resultant spill, including increasing the minimum flow and adjusting the bascule gates, these AMMs can be implemented without significant effort.[132] Accordingly, this AMM should be completed in Years 12 and 13.

FirstLight Must Condition 401 Certification on Financial Assurances for Decommissioning and Dam Removal.

In a June 13, 20233 letter to Bethany Card at the Executive Office of Energy and Environmental Affairs, CRC outlined why financial assurances for decommissioning and removal of FirstLight's Projects are necessary and appropriate conditions in the event of 401 certification. Specifically, CRC provided a memorandum outlining the legal authority for DEP to require such financial assurances as 401 certification conditions ("Financial Assurances Memo").[133] As CRC stated in its Financial Assurances Memo:

> Conditioning CWA § 401 certifications on such financial assurances will ensure that federal and state requirements are met and that the physical, chemical, and

[129] FirstLight 401 Certificate Application, at 40.
[130] *See* Exhibit A (CRC Flows & Fish Passage Comment), at 14.
[131] FirstLight 401 Certificate Application, at 40–41.
[132] *See* Exhibit A (CRC Flows & Fish Passage Comment) at 14.
[133] *See* Juen 12, 2022 letter to Secretary Bethany Card in Exhibit 4, attached as Exhibit G.

> biological integrity of rivers, including unobstructed flows, are restored to protect existing and designated uses. Requiring such financial assurances also will ensure that the Massachusetts tax and ratepayers and host communities are not burdened with the bill for such restoration, which is good public policy already being practiced in the context of many other energy generating contexts throughout the state.[134]

CRC incorporates its June 13, 2022 letter and Financial Assurances Memo by reference in this comment. The FirstLight Projects will be more than a century old when their next FERC licenses are set to expire. Requiring financial assurances now is necessary to ensure the money is available in the future to completely and effectively decommission and remove these projects and restore the Connecticut River to a natural flow regime that will protect existing and designated uses.

Transparency and Data Availability.

CRC supports the comments on Transparency and Data Availability by the Western Massachusetts delegates who convened to submit comments to FERC on the Amended Final License Application[135]. Over the terms of the next license, there will be considerable changes in the conditions and operations of these projects —changes that will fall well outside the conditions that were studied in preparation for the license. It is important that the impact on the environment be well-monitored and understood. Changing conditions also include ongoing climate change; the environmental improvements put in place by this license; and changing electric grids, policies, and markets. Additionally, there is a need for transparent data of the flows released from and pumped by the hydropower facilities to inform potential boaters and other river users. The United States Geological Survey (USGS) gauges are too far away from the facilities, and affected by multiple other inputs, and are not good predictors of sudden unexpected changes in flow and level. The Flows and Fish Passage Settlement Agreement provides for year-round hourly information on flows out of TFD, which is a good first step but

[134] *Id*. at 7.
[135] Letter from Jo Comerford, Natalie M. Blais, Daniel R. Carey, Mindy Domb, Lindsay Sabadosa, and Aaron L. Saunders, Mass. State Legislators to Debbie-Anne A. Reese, Acting Sec'y, Fed. Energy Regul. Comm'n (May 1, 2024)

DEP should require more additional, publicly-available data and analyses in the context of 401 certification, including:

a) Real-time data on the flows released from the hydropower facilities, and pumping.
b) Regular monitoring and publicly available data of macroinvertebrate populations in the Turners Falls bypass reach, downstream of Cabot station, and in the Turners Falls impoundment, as macroinvertebrates provide one of the best ways to assess stream ecosystem quality.
c) Monitoring of, and public data on, populations and passage through the Turners Falls impoundment and its shore banks of non-fish species that provide important ecosystem services, including native mussels and riparian species.
d) Annual reports on how operations are changing due to energy markets and policy, and due to FirstLight's flow and passage improvements; and the benefit to and impact on the environment and recreation. CRC also requests that these annual reports be sent to State and Federal officials.

The above comments outline the faults in FirstLight's current application for a 401 Water Quality Certification. FirstLight's 401 Application does not ensure that the continued presence and operation of the FirstLight Projects will comply with Massachusetts Water Quality Standards. CRC urges Massachusetts DEP to take close consideration of these comments as they create the draft certificate.

CRC appreciates the opportunity to comment in this 401 WQC process. Please feel free to contact me, Rebecca Todd, Executive Director of the Connecticut River Conservancy, at rtodd@ctriver.org or contact Nina Gordon-Kirsch, Massachusetts River Steward and the Connecticut River Conservancy, at ngordonkirsch@ctriver.org.

6/3/2024

Rebecca E. Todd
Executive Director
Connecticut River Conservancy

6/3/2024

Nina Gordon-Kirsch
Massachusetts River Steward
Connecticut River Conservancy

Connecticut River Conservancy Comment Exhibit List*

Exhibit A	Comments of Connecticut River Conservancy in Opposition to certain conditions from the March 31, 2023 Offer of Partial Settlement for the Turners Falls Hydroelectric Project et al. under P-1889 et al., FERC Accession No. 20230525-5090 (filed May 25, 2023)
Exhibit B	Comments of Connecticut River Conservancy on the amended final license application re the Turner Falls Hydroelectric Project, FERC Accession No. 20230525-5090 (filed May 22, 2024)
Exhibit C	Gomez & Sullivan Engineers, Boating Navigability Study: Turners Falls Hydroelectric Project (No. 1889) (2021) (prepared for FirstLight) ("Boating Navigability Study")
Exhibit D	Notice to Intervene and Comments of The Nolumbeka Project Inc. at 4-5, Project Nos. 1889-000 and 2485-000, FERC Accession No. 20230525-5073 (filed May 25, 2023) (hereinafter The Nolumbeka Project's Comment)
Exhibit E	FRCOG Comments to DEP on FirstLight's 401 Water Quality Certificate Application (June 3, 2024)
Exhibit F	Dr. Evan Dethier, Review of Erosion in the Turners Falls Impoundment (May 19, 2024)
Exhibit G	Connecticut River Conservancy letter to Secretary Bethany Card at the Executive Office of Energy and Environmental Affairs, Re: Turners Falls Hydroelectric Project, et al. under P-1889, et.al., FERC Relicensing and Massachusetts Clean Water Act § 401 Certification (June 13, 2022)

* These exhibits are large file sizes and CRC was unable to send them via email. They will be submitted via a Sharepoint folder that DEP will send to Nina Gordon-Kirsch at CRC, ngordonkirsch@ctriver.org. This information was given to Nina over email on 5/31/24 by Elizabeth Stefanik at DEP, who says that Victoria Wu will send the Sharepoint folder to Nina.