

**PART II. STANDARDS MATRICES**

**Matrix of Alternative Standards**

**Facility Name: Newfound Hydroelectric Project**

**Zone of Effect: Zone 1 – Bypass Reach**

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes				X	
B	Water Quality	X				
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources			X		

**PART II. STANDARDS MATRICES**

**A. Ecological Flow Standards**

**Zone of Effect: Zone 1 – Bypass Reach**

**Table A  
Information Required to Support Ecological Flows Standards**

Criterion	Standard	Instructions
A	4	<p><u>Site-Specific Studies:</u></p> <ul style="list-style-type: none"> <li>Describe the site-specific, habitat evaluation technique that was used to define the ecological flow regime and how the results satisfy the goal of this criterion.</li> <li>Describe the resultant flow regime in terms of base flow, seasonal variability, high-flow events, short-term rates of change, and year-to-year variability.</li> <li>Describe the target fish and wildlife resources that were considered and how the resultant flow regime supports their habitat over their life cycles.</li> </ul>

On October 6, 2011 the United States Fish and Wildlife Service (USFWS) and New Hampshire Fish and Game (NHFG) participated in a demonstration flow study at the Newfound Hydroelectric Project

(Project) to determine an adequate bypass flow for protection of aquatic resources. The conclusions from the study are summarized in an e-mail dated October 25, 2011 from USFWS (see Appendix A1). The estimated flow that the USFWS and NHFG agreed to as acceptable was 12.7 cfs, less than the summer aquatic base flow of .5cfs or 49 cfs.

Eagle Creek Renewable Energy, LLC, the holding company of KTZ Hydro, LLC, made a request to both the USFWS and NHFG on behalf of KTZ Hydro, LLC, to review the current practice for flow and fish passage at the Project and provide input. In an e-mail dated August 17, 2016, John Warner (USFWS) indicated support for LIHI Certification for the Project subject to the continued provision of 12.7 cfs min flow (e-mail included as Appendix A2). In an e-mail dated April 28, 2017, Carol Henderson (NHFG) agreed with recommendations made in John Warner's August 17, 2016 e-mail (NHFG e-mail included as Appendix A4).

KTZ Hydro, LLC continues to pass the agreed upon 12.7 cfs into the bypass reach via a slot in the flashboards. Flows in the bypass reach continue to be maintained as described in the April 26, 2012 letter from KTZ Hydro, LLC to LIHI (included as Appendix A5). The station is visited at least once a day by Operations personnel who visually confirm that minimum flow is released into the bypass. This observation is noted in the station log book. The flashboards are reliable, and remain in place year round. Operations personnel maintain a 24/7 presence at the station during certain times of the year to manually prevent debris and ice from building up on the intake racks or blocking the slot in the flashboards that passes flow into the bypass reach.

During times when the flashboards are maintained or during impoundment drawdowns, bypass flow is released by removing stop logs from two bays located in the dam and diverting river flow through the two stop log bays. The 4'x4' waste gate, located at the intake behind the trash racks, is also opened to pass the remainder of river flows into the bypass reach. Although not typical, if the flashboards were to fail due to high flows, bypass flow would continue to be passed over the top of the dam, as flows subside, the waste gate is opened to release flows into the bypass.

Report of Algonquin Power (Beaver Falls) LLC, et al submitting notice of 2015 Minimum Flow Compliance for the projects listed under P-2593, et.al. Minimum flow compliance filed with FERC, including Newfound P-3107. <https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14163638>

Letter acknowledging receipt of Eagle Creek Renewable Energy's 3/4/16 filing of the Minimum Flow Compliance Report for the Beaver Falls Project et al under P-2593 et al. FERC acceptance of minimum flow compliance, including Newfound P-3107.

<https://elibrary.ferc.gov/idmws/common/OpenNat.asp?fileID=14173631>

**B. Water Quality Standards**

**Zone of Effect: Zone 1 – Bypass Reach**

**Table B  
Information Required to Support Water Quality Standards**

B	1	<u>Not Applicable / De Minimis Effect:</u> <ul style="list-style-type: none"><li>• If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.</li><li>• Explain rationale for why facility does not alter water quality characteristics below, around, and above the facility.</li></ul>
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Based on the LIHI Reviewer’s Certification Report dated November 11, 2011, the previous owner was unable to furnish a copy of the Water Quality Certificate that was issued to the Project in 1981. The Reviewer indicated that since the certification pre-dated 1987, it could not be used for the purposes of LIHI criteria compliance. In 2011, the Reviewer noted the New Hampshire Department of Environmental Service (NHDES) concluded that the river attained state water quality standards at the Project based on sampling completed by the former applicant in Summer 2011. The NHDES letter dated November 14, 2011 with these conclusions is included as Appendix B.

Based on a search of the NHDES website for Section 303 (d) Surface Water Quality List dated October 14, 2015, the Newfound River in the Newfound Project vicinity is not listed as an impaired water in need of TMDL.

This facility is operated as run of river with a continuous flow in the bypass reach. Flows into the bypass reach from the slot in the flashboards at the dam are highly aerated due to the steep gradient and rockiness of the terrain extending from the dam to the confluence with the Pemigewasset River. There have been no material changes at that site since the last NH DES review, including no changes to project operations nor have there been any changes in project facilities since the last certification.

**C. Upstream Fish Passage**

**Zone of Effect: Zone 1 – Bypass Reach**

**Table C  
Information Required to Support Upstream Fish Passage Standards**

C	1	<u>Not Applicable / De Minimis Effect:</u> <ul style="list-style-type: none"><li>• Explain why the facility does not impose a barrier to upstream fish passage in the designated zone.</li><li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li><li>• If migratory fish species have been extirpated from the area, explain</li></ul>
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		why the facility is or was not the cause of this.
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In the LIHI Reviewer’s Certification Report dated November 11, 2011, it was noted that the Project is not currently required by state or federal resource agencies to construct or maintain upstream and or downstream fish passage facilities. The FERC license (attached as Appendix C1) indicates that the USFWS has determined that the Newfound River does not provide suitable habitat for anadromous fish. In an e-mail dated November 7, 2011 (included as Appendix C2 with a letter from NHFG), the USFWS identified that the Newfound River is not currently targeted for anadromous fish restoration. The USFWS indicated that it is premature to require either upstream or downstream passage measures at the Newfound Project at this time. Based on improved upstream passage measures at downstream dams and/or better information on eel abundance in the Newfound River or Newfound Lake, eel passage may be warranted in the future. In a letter dated, November 7, 2011 (included as Appendix C2), NHFG noted that fish passage for species other than American eel, is currently a low priority for the NHFG at this site due to the impassible “waterfall”, an abandoned dam, in the bypass reach.

In 2011, both the USFWS and NHFG were in agreement that LIHI certification be contingent upon an agreement by the licensee to implement both upstream and downstream passage measures for American eel in a timely manner if passage is found to be necessary by the USFWS and / or NHFG.

The LIHI reviewer indicated that there is a limited amount of habitat between the Project and Newfound Lake; there are no significant tributaries in the reach and the river length between the Project and the Lake is relatively short. Furthermore, since the abandoned dam obscures the natural cascade, it is impossible to judge whether it would be a barrier to salmon.

Eagle Creek Renewable Energy, the holding company of KTZ Hydro, LLC, made a request to both the USFWS and NHFG a on behalf of KTZ Hydro, LLC, to review the current practice for flow and fish passage at the Project and provide input. In an e-mail dated August 17, 2016, John Warner (USFWS) indicated support for LIHI Certification for the Newfound Project subject to the continued provision for providing eel passage in the future, when needed (Appendix A2). In an e-mail dated April 28, 2017, Carol Henderson (NHFGD) (Appendix A4) agreed with the recommendations outlined in John Warner’s August 17, 2016 e-mail, that Low Impact Hydro Certification for the Newfound River project should be contingent upon an agreement by the licensee to provide both upstream and downstream American eel passage in a timely manner if passage is found to be necessary by the USFWS and NHFGD.

**D. Downstream Fish Passage**

**Zone of Effect: Zone 1 – Bypass Reach**

**Table D  
Information Required to Support Downstream Fish Passage Standards**

D	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines).</li> <li>• For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>
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As noted above, the Newfound River is not currently targeted for anadromous fish restoration and it is premature to require either upstream or downstream passage measures at the Newfound Project at this time. Based on improved upstream passage measures at downstream dams and/or better information on eel abundance in the Newfound River or Newfound Lake, eel passage may be warranted in the future. Reference 2011 correspondence from USFWS and NHFG included in Appendix C2.

In an e-mail dated August 17, 2016, John Warner (USFWS) indicated support for LIHI Certification for Newfound subject to the continued provision for providing eel passage in the future, when needed (Appendix A2). In an e-mail dated April 28, 2017, Carol Henderson (NHFGD) (Appendix A4) agreed with the recommendations outlined in John Warner’s August 17, 2016 e-mail, that Low Impact Hydro Certification for the Newfound River project should be contingent upon an agreement by the licensee to provide both upstream and downstream American eel passage in a timely manner if passage is found to be necessary by the USFWS and NHFGD.

**E. Shoreline and Watershed Protection Standards**

**Zone of Effect: Zone 1 – Bypass Reach**

**Table E**

**Information Required to Support Shoreline and Watershed Protection Standards**

E	1	<u>Not Applicable / De Minimis Effect:</u> <ul style="list-style-type: none"><li>• If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary).</li><li>• Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.</li></ul>
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The Newfound Project is located in downtown Bristol, a developed urban area. The riverbanks of the bypass reach are narrow, steep and rocky. No protected buffer zones have been created along the bypass reach through a settlement agreement or federal exemption. There are no Shoreline Management Plans required in the FERC license.

**F. Threatened and Endangered Species Standards**

**Zone of Effect: Zone 1 – Bypass Reach**

**Table F**

**Information Required to Support Threatened and Endangered Species Standards.**

F	1	<u>Not Applicable / De Minimis Effect:</u> <ul style="list-style-type: none"><li>• Document that there are no listed species in the facility area or affected riverine zones downstream of the facility.</li><li>• If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species.</li><li>• If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.</li></ul>
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Based on a recent review of the New Hampshire Natural Heritage Bureau (NHB) database, there are no threatened or endangered species located in the Newfound Project area; included as Appendix F is the report from the NHB.

There were no known listed species identified during the previous certification in 2011.

**G. Cultural and Historic Resource Standards**

**Zone of Effect: Zone 1 – Bypass Reach**

**Table G**

**Information Required to Support Cultural Resource Standards**

G	1	<u>Not Applicable / De Minimis Effect:</u> <ul style="list-style-type: none"><li>• Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility.</li><li>• Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are present on facility lands.</li></ul>
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In the November 10, 2011 Reviewer’s report, it was noted that there was no evidence of conflicts under normal operating procedures with respect to cultural resources protection. By letter dated June 1, 2011, the New Hampshire Division of Historic Resources also confirmed that the Newfound Project does not present a risk since no activities outside of normal operations are planned (included as Appendix G). There have been no changes to the operation of the Newfound Project nor have there been any construction projects that would involve cultural or historic resources since the previous LIHI certification of the Newfound Project. Additionally no such changes are proposed for the future.

**H. Recreational Resources Standards**

**Zone of Effect: Zone 1 - Bypass Reach**

**Table H**

**Information Required to Support Recreational Resource Standards.**

H	3	<u>Assured Accessibility:</u> <ul style="list-style-type: none"><li>• In lieu of existing recommendations and plans for recreational uses, document the facility’s current and future commitment to accommodate reasonable requests from public interest groups for adequate public access for recreational use of lands and waters of the facility, including appropriate recreational water flows and levels, without fees or charges.</li></ul>
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The bypass reach is very narrow, steep and rocky. There is a recreational trail along the B&M rail line, outside of the Project boundary, that parallels the southern side of the bypass reach. The public may access the trail across the Project boundary free of charge. Additionally, the Town of Bristol was granted an easement for public parking in an area downstream of the dam, within the Newfound Project boundary. KTZ Hydro is committed to accommodating any reasonable requests from public interest groups for public access for recreational use of land and waters within the Project boundary, free of charge.

**PART II. STANDARDS MATRICES**

**Matrix of Alternative Standards**

**Facility Name: Newfound Hydroelectric Project**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

Criterion		Alternative Standards				
		1	2	3	4	Plus
A	Ecological Flow Regimes	X				
B	Water Quality	X				
C	Upstream Fish Passage	X				
D	Downstream Fish Passage	X				
E	Watershed and Shoreline Protection	X				
F	Threatened and Endangered Species Protection	X				
G	Cultural and Historic Resources Protection	X				
H	Recreational Resources	X				

**PART II. STANDARDS MATRICES**

**A. Ecological Flow Standards**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table A  
Information Required to Support Ecological Flows Standards**

Criterion	Standard	Instructions
A	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• Confirm the location of the powerhouse relative to other dam/diversion structures to establish that there are no bypassed reaches at the facility.</li> <li>• If Run-of-River operation, provide details on how flows, water levels, and operation are monitored to ensure such an operational mode is maintained.</li> <li>• In a conduit project, identify the water source and discharge points for the conduit system within which the hydropower plant is located.</li> <li>• For impoundment zones only, explain how fish and wildlife habitat within the zone is evaluated and managed – <b>NOTE:</b> this is required information, but it will not be used to determine whether the Ecological Flows criterion has been satisfied. All impoundment zones can apply Criterion A-1 to pass this criterion.</li> </ul>

The Newfound Project is operated as a run-of-river facility. Operation of the Newfound Project is coordinated with the NHDES, who owns the upstream dam at Newfound Lake and releases water from the dam into the Newfound River. The reach from the Newfound Project tailrace to the confluence with Pemigewasset River receives inflow from station generation. During periods of no generation (when inflow at the powerhouse is less than the station’s capacity and minimum flow is passed into the bypassed reach), leakage from the turbines is passed to the tailrace. The area from the Newfound Project tailrace to the confluence with the Pemigewasset River, a length of approximately 175 feet, remains wetted, even during periods of no generation, due to the backwater from the Pemigewasset River. The backwater effect from the Pemigewasset River reaches up to the turbine discharge pipes at the powerhouse. Based on a phone call with John Warner (USFWS) on April 19<sup>th</sup> 2017, and a follow up e-mail dated May 10, 2017, John Warner supports the current flow regime in the tailrace due to its short length and the backwater effect from the Pemigewasset River (e-mail is included as Appendix A6).

**B. Water Quality Standards**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table B  
Information Required to Support Water Quality Standards**

B	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• If facility is located on a Water Quality Limited river reach, provide an agency letter stating that the facility is not a cause of such limitation.</li> <li>• Explain rationale for why facility does not alter water quality characteristics below, around, and above the facility.</li> </ul>
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Based on the LIHI Reviewer’s Certification Report dated November 11, 2011, the previous owner was unable to furnish a copy of the Water Quality Certificate that was issued to the Project in 1981. The Reviewer indicated that since the certification pre-dated 1987, it could not be used for the purposes of LIHI criteria compliance. In 2011, the Reviewer noted the NHDES concluded that the river attained state water quality standards at the Newfound Project based on sampling completed by the former applicant in Summer 2011. The NHDES letter dated November 14, 2011 with these conclusions is included as Appendix B.

Based on a search of the NHDES website for Section 303 (d) Surface Water Quality List dated October 14, 2015, the Newfound River in the vicinity of the Newfound Project is not listed as an impaired water in need of TMDL. There have been no material changes at that site since the last NH DES review, including no changes to project operations and no changes in the project’s facilities since the last certification. The reach from the station discharge to the confluence of the Pemigewasset River is a

short, rocky section that is well aerated and substantially influenced by the Pemigewasset River. The backwater effect from the significantly larger Pemigewasset River greatly dilutes the tailrace water.

**C. Upstream Fish Passage**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table C  
Information Required to Support Upstream Fish Passage Standards**

C	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• Explain why the facility does not impose a barrier to upstream fish passage in the designated zone.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>
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The FERC license (attached as Appendix C1) indicates that the USFWS has determined that the Newfound River does not provide suitable habitat for anadromous fish. In an e-mail dated November 7, 2011 (included as Appendix C2), the USFWS identified that the Newfound River is not currently targeted for anadromous fish restoration and that it is premature to require either upstream or downstream passage measures at the Newfound Project at this time. Based on improved upstream passage measures at downstream dams and/or better information on eel abundance in the Newfound River or Newfound Lake, eel passage may be warranted in the future. The Newfound Project tailrace is a manmade channel, as such, there is no historic basis for upstream fish passage. It is expected that when required, upstream fish passage measures would be focused on the historical stream at the dam.

**D. Downstream Fish Passage**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table D  
Information Required to Support Downstream Fish Passage Standards**

D	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• Explain why the facility does not impose a barrier to downstream fish passage in the designated zone, considering both physical obstruction and increased mortality relative to natural downstream movement (e.g., entrainment into hydropower turbines).</li> </ul>
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		<ul style="list-style-type: none"> <li>• For riverine fish populations that are known to move downstream, explain why the facility does not contribute adversely to the sustainability of these populations or to their access to habitat necessary for successful completion of their life cycles.</li> <li>• Document available fish distribution data and the lack of migratory fish species in the vicinity.</li> <li>• If migratory fish species have been extirpated from the area, explain why the facility is or was not the cause of this.</li> </ul>
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The tailrace is a man-made channel, with no historical fish population. When agencies require downstream fish passage at the Newfound Project, site logistics dictate that the facilities be located at the dam for passage to the bypass reach (Zone 1). As seen in site photos, the intake for the units leads from the forebay via underground penstocks, approximately 420 feet in length, to the powerhouse and turbines. Due to the site arrangement, there would be no basis for downstream passage from the intake to the tailrace.

**E. Shoreline and Watershed Protection Standards**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table E  
Information Required to Support Shoreline and Watershed Protection Standards**

E	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• If there are no lands with significant ecological value associated with the facility, document and justify this (e.g., describe the land use and land cover within the project boundary).</li> <li>• Document that there have been no Shoreline Management Plans or similar protection requirements for the facility.</li> </ul>
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The Newfound Project is located in downtown Bristol, a developed urban area. The riverbanks of the approximately 175-foot long tailrace reach are narrow, steep and rocky. No protected buffer zones have been created along the tailrace reach through a settlement agreement or federal exemption. There are no Shoreline Management Plans required in the FERC license. However, as illustrated on site photos, the area abutting Zone 2, is completely vegetated. KTZ Hydro, LLC owns the land abutting both sides of the tailrace, and is committed to maintaining the buffer zone with no development of the river shoreline abutting the tailrace.

**F. Threatened and Endangered Species Standards**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table F  
Information Required to Support Threatened and Endangered Species Standards**

F	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• Document that there are no listed species in the facility area or affected riverine zones downstream of the facility.</li> <li>• If listed species are known to have existed in the facility area in the past but are not currently present, explain why the facility was not the cause of the extirpation of such species.</li> <li>• If the facility is making significant efforts to reintroduce an extirpated species, describe the actions that are being taken.</li> </ul>
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Based on a recent review of the New Hampshire NHB database, there are no threatened or endangered species located in the Project area. Included as Appendix F is the report from the NH NHB for the Project area.

**G. Cultural and Historic Resource Standards**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table G  
Information Required to Support Cultural Resource Standards**

G	1	<p><u>Not Applicable / De Minimis Effect:</u></p> <ul style="list-style-type: none"> <li>• Document that there are no cultural or historic resources located on facility lands that can be affected by construction or operations of the facility.</li> <li>• Document that the facility construction and operation have not in the past adversely affected any cultural or historic resources that are present on facility lands.</li> </ul>
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By letter dated June 1, 2011, the New Hampshire Division of Historic Resources confirmed that the Project causes no adverse effect since no activities outside of normal operations are planned (included as Appendix G). The November 10, 2011 Reviewer’s report confirmed there was no evidence of conflicts with cultural and historic resources protection under normal operating procedures.

There have been no changes to the operation of the Newfound Project nor have there been any construction projects that would involve cultural or historic resources since the previous LIHI certification. Additionally, no such changes are proposed for the future.

**H. Recreational Resources Standards**

**Zone of Effect: Zone 2 – Reach Downstream of the Powerhouse from the Tailrace to the confluence with the Pemigewasset River**

**Table H  
Information Required to Support Recreational Resource Standards**

H	1	<p><u>Assured Accessibility:</u></p> <ul style="list-style-type: none"> <li>Document that the facility does not occupy lands or waters to which public access can be granted and that the facility does not otherwise impact recreational opportunities in the facility area.</li> </ul>
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The short section of the tailrace reach from the powerhouse to the confluence with the Pemigewasset River is very narrow, about 30’ in width, portions of which are steep and rocky, or vegetated. There is no access for recreation in Zone 2 as there are no opportunities for recreation in this area. A gated fence, that crosses the driveway leading to the powerhouse, restricts public access from the driveway to the left embankment of the tailrace (looking downstream). Access to the right embankment of the tailrace (looking downstream) is restricted by the bypassed reach of the river and the land that forms the embankment on the right side of the tailrace.