	Place cursor in first fill-in field and use F11 to tab through fields. **Vermont Agency of Natural Resources** **Water Quality Certification Application** **for Hydroelectric Facilities**
Send to:	Peter LaFlamme, Director Watershed Management Division 1 National Life Drive, Davis 3 Montpelier, VT 05620-3522

Please type or print in black ink. ALSO be sure to complete the signature block on page two.

Application for ☑ New ☐ Amended Certification (Date of original certification:)

1. Applicant: Great River Hydro, LLC
Contact: John L. Ragonese, FERC License Manager
Mailing address: 69 Milk Street, Suite 306; Westborough, MA 01851
Work phone: 603-498-2851 E-mail address: jragonese@greatriverhydro.com

If an agent is acting for the applicant during the permit process, complete #2.

2. Authorized agent:
Contact: Secondary Contact: Jennifer Griffin
Mailing address: 2 Killeen Street, North Walpole NH 03609
Work phone: 603-966-0477 E-mail address: jgriffin@greatriverhydro.com

3. Project name: Vernon Hydroelectric Project FERC Project No. (if any): FERC No. 1904 Town(s): New Hampshire: Windham, Vernon; Vermont: Cheshire, Hinsdale	Geographic location (latitude/longitude): 42.771431, -72.514050 Waterbody (stream, lake or pond) affected: Connecticut River, Connecticut River Drainage Basin Dam name and Vermont Dam Inventory number (if any): Vernon Dam

4. Project description. Concisely describe the project infrastructure, how the project will be operated, the components of any proposed mitigation or enhancements and how the complete proposal will meet Vermont Water Quality Standards:

See separate and attached Project Description / Proposed Operation page

5. Attached materials:

List attachments. Include one printed copy and one digital copy (in Adobe Acrobat (pdf) format) of *Information Supporting a Vermont Water Quality Certification Application for a Hydroelectric Project* or a FERC application, and any other supporting documents. **List of Information Supporting Vernon Project VT Water Quality Certification Application is attached.**

6. Fee: Pursuant to 3 V.S.A. § 2822(j)(30) the application fee shall be equal to 1% of project cost with a maximum fee of $20,000. Project cost shall be calculated as the total of capital costs and operation and maintenance expenses over a default license term. For amended certifications, project costs shall be calculated as the total capital cost associated with the amendment.

Project Cost $ > $2M Total Enclosed $ $20,000

Application is hereby made for a water quality certification pursuant to 33 U.S.C. §1341. Upon request, I will make available any information necessary for the Vermont Agency of Natural Resources to make a water quality certification decision. I hereby certify that the information provided with this application is true and accurate to the best of my knowledge. I recognize that by signing this application I am giving consent to employees of the State to enter the subject property for the purpose of processing this application.

John Ragonese
Signature of applicant

04-18-2024
Date

Signature of authorized agent

Date

I hereby designate to act as my agent in matters related to this certification application.

Signature of applicant

Date

This application **must** be signed by the applicant and the agent, if an authorized agent is designated.

Vernon Hydroelectric Project Water Quality Certification Application
April 18, 2024

4. Project Description and Proposed Operation, Mitigation and Enhancements

The Project Description and the Proposed Operation, Mitigation and Enhancements are described in the amended Vernon Final License Application (Vernon FLA) submitted to Federal Energy Regulatory Commission (FERC or the Commission) on December 7, 2020[1], with a further revised composite Exhibit E for Wilder, Bellows Falls and Vernon Projects (Exhibit E) filed on June 7, 2023[2]. The Great River Hydro (GRH) proposal, as outlined in the Vernon FLA Exhibit B (Exhibit B) reflects the proposed operation in accordance with a Memorandum of Understanding (MOU) executed on December 1, 2020[3] between GRH, the Project certifying authorities (including VTDEC and VTDFW), and other participating stakeholders. The MOU includes an Exhibit A "Great River Hydro's Proposed Alternative Operation for the Projects" that is the basis of the proposed Project operation in the Vernon FLA. The Vernon FLA also includes a proposed set of fish passage environmental measures that have since been incorporated into a Settlement Agreement on Fish Passage (SAFP) executed by the Vermont Department of Fish and Wildlife among other state and federal agencies and filed with the Commission on August 2, 2022[4]. This Water Quality Certificate application presents information collected and presented in the Exhibit E and assumes future operations consistent with the Vernon FLA, MOU and SAFP. Exhibit E provides a full description of the proposed Project activity and is summarized below. Additional supporting information is provided in the ILP Water Quality Study 6 Updated Study Report dated 12-15-2016[5] and ILP Fish Assemblage Study 10 Report dated 08-01-2016[6].

The Vernon Project dam and powerhouse are located on the Connecticut River at river mile (RM) 141.9, approximately 2 miles upstream of the Ashuelot River confluence and 7.4 miles downstream of the West River, in the town of Vernon, Vermont, and in the town of Hinsdale, New Hampshire. The Project consists of a concrete gravity dam; an approximately 26-mile impoundment; a powerhouse, storage/maintenance building and yard; fish passage facilities; and appurtenant facilities. The location of the project is shown in Figure 1 below.

The dam is a composite overflow and non-overflow ogee-type, concrete gravity structure extending across the Connecticut River from Vernon, Vermont, to Hinsdale, New Hampshire. The dam is 956 ft long

[1] Accession Nos. 20201207-5219 (Public), - 5220 (Privileged);-5221 (CEII); Amended Final License Applications of Great River Hydro, LLC for Bellows Falls Project, et. al. under P-1855 et. al.
[2] Accession No. 20230608-5103 Great River Hydro, LLC submits Revised Final License Application and Exhibits for the Bellows Falls Hydroelectric Project et. al. under P-1855 et. al. Includes composite Exhibit E for Wilder, Bellows Falls and Vernon Projects revised 06-07-2023.
[3] Memorandum of Understanding between Great River Hydro and the United States Fish and Wildlife Service, the New Hampshire Department of Environmental Services, the New Hampshire Fish and Game Department, the Vermont Department of Environmental Conservation, the Vermont Department of Fish and Wildlife, The Nature Conservancy, and the Connecticut River Conservancy; filed with Vernon Project FLA Exhibit B of Amended Final License Applications of Great River Hydro, LLC for Bellows Falls Project, et. al. under P-1855 et. al. Accession Nos. 20201207-5219 (Public),
[4] Accession No. 20220803-5124 Great River Hydro, LLC submits Offer of Settlement between Great River Hydro, LLC and the U.S. Department of Interior et. al, and Revisions to Exhibit D Documents for the Vernon Hydroelectric Project et, al. under P-1855, et. al.
[5] Accession No. 20161215-5280 ILP Study Reports 6, 25 and 30, final reports and supplements, TransCanada Hydro Northeast Inc. under P-1892, et al filed December 15, 2016
[6] Accession No. 20160801-5232 TransCanada Hydro Northeast Inc. August 1, 2016 Updated Study Report under P-1855, et. al.

with a maximum height of about 58 ft. It consists of an integral powerhouse with a sluice gate block section that is about 356 ft long and a concrete overflow spillway section about 600 ft long. The spillway portion of the dam is divided into 12 bays containing, from west to east, a trash/ice sluice, 4 tainter gates, 2 hydraulic flashboard bays, 3 stanchion bays, and 2 tainter gates. In addition, 8 submerged hydraulic flood gates (6 functional) are located below the ogee spillway and the 10-ft by 50-ft tainter gates. The trash sluice is a skimmer gate that passes logs and other debris deflected away from the powerhouse by a log and ice boom in the powerhouse forebay.

The Project impoundment extends upstream about 26 miles to the Route 123 Bridge at Westminster Station, Vermont. The Project has limited storage capacity because of the relatively flat terrain from the upper extent of the Project impoundment to the dam. The impoundment has a surface area of 2,550 acres and about 69 miles of shoreline and a total volume of 40,000 acre-feet (acre-ft) at elevation (El.) 220.13 ft at the top of the stanchion boards. Maximum drawdown to the spillway crest (at El. 212.13 ft) if hydraulic and stanchion flashboards are lowered or removed under high flows equates to a maximum usable storage capacity of 18,300 acre-ft.

The powerhouse contains 10 turbine generating units. Unit Nos. 1-4 are single runner vertical Francis units each with a maximum hydraulic capacity of 1,465 cfs and minimum hydraulic capacity of 400 cfs. Unit Nos. 5-8 are vertical axial flow Kaplan units each with a maximum hydraulic capacity of 1,800 cfs and minimum hydraulic capacity of 300 cfs. Unit Nos. 9 and 10 are single runner vertical Francis units each with a maximum hydraulic capacity of 2,035 cfs and minimum hydraulic capacity of 500 cfs. At full load, with inflow equaling a maximum station discharge of at least 15,400 cfs, the Project has the capability of producing 32.0 megawatts (MW).

The Project currently includes an upstream fish passage ladder and downstream fish passage through a "fish pipe" that discharges through the powerhouse and a secondary smaller "fish bypass" at the Vermont end of the powerhouse. Recreation facilities, provided within the limited property GRH owned-in-fee and within the Project Boundary, include a boat launch, portage, picnic areas, open space land, fish ladder viewing area, and fishing access.

The GRH proposal, as outlined in Exhibit B, reflects the proposed operation in accordance with the MOU. The proposed operation will predominantly maintain a specified water surface elevation (Target WSE) at the dam and, as a result, maintain flow below the Project equal to the approximate inflow as measured or calculated at the dam (inflow equals outflow or IEO). Specifically, a Target WSE of 219.63 ft m.s.l. (NVGD 29) will be maintained at the Vernon dam by passing inflow within a Target WSE Bandwidth between 220.13 ft and 219.13 ft to account for potential differences between anticipated inflow and actual instantaneous inflow. In addition to IEO Operation, the Project will have restricted discretionary Flexible Operation capability to respond to elevated energy prices as well as unrestricted capability to respond to emergencies and ISO-NE transmission and power system requirements.

In general, the proposed operational changes are anticipated to provide environmental benefits for aquatic life by creating more stable reservoir water surface elevations, reducing the magnitude of changes and the frequency of sub-daily changes in discharge from the project, increasing the amount of time that the project is operated as inflow equals outflow and at full reservoir. Apart from the proposed changes to the operational conditions, no new development or construction will be associated with the

project other than fish passage related improvements outlined in Exhibit E reflecting the terms and conditions in the SAFP.

Multiple water quality studies have been completed in the Vernon Project area in support of the Vernon FLA. Overall, these studies found current project operations are meeting Vermont water quality standards and it is expected this will not change under the proposed operational changes as described in Exhibit E sections 3.5.1.2, 3.5.2.2, 3.5.3.2, and 3.5.4.2 and the ILP Study 6 Report. Additionally, discretionary Flexible Operation generation is proposed for a limited number of hours each month (1.4 to 9% of the total hours in a month), with fewer hours in the April-October period and more in the late fall to early spring months. This schedule would protect critical aquatic resource sensitive months between April and September while allowing for more operational flexibility during less sensitive winter months when many aquatic resources are dormant (Exhibit E Section 3.3 and Section 3.6).

Under the GRH proposal, current access to the river within the Project Boundary will be maintained or enhanced through the capital improvements to the boat launches, improved portage and general recreation area access and parking. The proposed operation will result in higher base flow conditions in the river that will more closely resemble natural flows, enhancing river paddling conditions while at the same time providing for stable impoundment water surface elevations that support power boating, flat water canoeing and rowing.

Current in-stream wading angling in the Vernon Project is largely limited to shallow depth, riparian shoreline or exposed sand or cobble bars. Under the proposed operation, impoundment water levels will be more stable and less likely to expose significant shoreline areas and higher, constant base flows will cause sand or cobble bars to be inundated or an increase in water depth. to increase will be the most affected change in current recreation use due to the proposed operation eliminating the 700 cfs minimum flow, in lieu of a higher, more naturalized flow below the station and dam. There are several locations where anglers are known to wade into the river to fish, or to reach exposed sandbars from which to fish. Safe opportunity for in-stream wading will likely be restricted to the riverbank unless assisted by flotation or boat. Combined with the anticipated improved aquatic resources, fishing conditions and opportunities should continue or improve under the proposed operation.

For all recreation in-stream users, anticipated and actual flow and discharge information below the Vernon Project will continue to be made available to the general public.

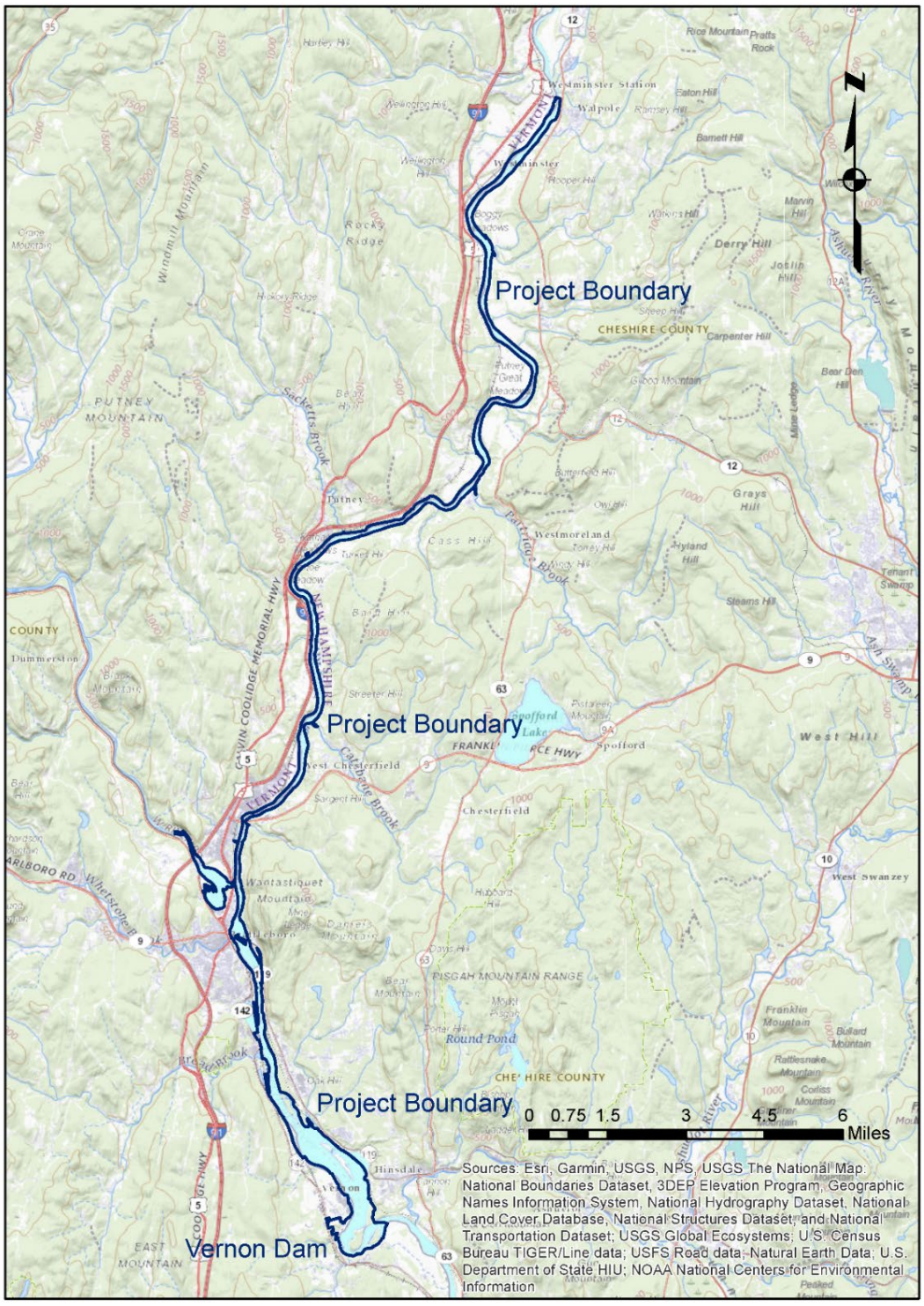

Figure 1. Location of Vernon Dam and Project Boundary

5. List of Information Supporting Vernon Project VT WQC Application

The list below identifies the main sources of information supporting this WQC Application:

Amended Vernon FLA 12-7-2020 (Including Initial Statement and Exhibits A, B, C, D, F, G, and H):

Accession Nos. 20201207-5219 (Public), - 5220 (Privileged);-5221 (CEII); Amended Final License Applications of Great River Hydro, LLC for Project, et. al. under P-1855 et. al.

GRH Relicensing Website:
https://relicensing.greatriverhydro.com/overview/documents/?eeFront=1&ee=1&eeFolder=Documents%2F80-Amended-Final-License-Applications-AFLA%2F20-Vernon&eeListID=1

Revised Amended Exhibit E for Wilder, Bellows Falls and Vernon Projects; Revised 06-07-2023:

Accession No. 20230608-5103 Great River Hydro, LLC submits Revised Final License Application and Exhibits for the Bellows Falls Hydroelectric Project et. al. under P-1855 et. al

GRH Relicensing Website: http://relicensing.greatriverhydro.com/wp-content/uploads/simple-file-list/Documents/85-Revised-Final-License-Application-BF-Min-Flow-Unit/2023-06-07-WLDR-BF-VERN-RFLA-Exhibit-E.pdf

Memorandum of Understanding executed December 1, 2020:

Included in 12-7-2020 FLA Exbibit B, Accession Nos. 20201207-5219 (Public) (see above). MOU between Great River Hydro and the United States Fish and Wildlife Service, the New Hampshire Department of Environmental Services, the New Hampshire Fish and Game Department, the Vermont Department of Environmental Conservation, the Vermont Department of Fish and Wildlife, The Nature Conservancy, and the Connecticut River Conservancy.

GRH Relicensing Website: http://relicensing.greatriverhydro.com/wp-content/uploads/simple-file-list/Documents/80-Amended-Final-License-Applications-AFLA/10-Wilder/2020-12-07_WLDR_Amend_FLA_ExABCDFGH.pdf

Settlement Agreement on Fish Passage (SAFP) 08-02-2022:

Accession No. 20220803-5124. Settlement Agreement on Fish Passage (SAFP) executed by New Hampshire Fish and Game Department among other state and federal agencies and filed with the Commission on August 2, 2022.

GRH Relicensing Website: http://relicensing.greatriverhydro.com/wp-content/uploads/simple-file-list/Documents/80-Amended-Final-License-Applications-AFLA/70-AFLA-Settlement-Agreement-Fish-Passage/2022-08-02-GRH-AFLA-Fish-Passage-Settlement-Agreement.pdf

ILP Study 6 Water Quality Updated Study Report:

Accession No. 20161215-5280 ILP Study Reports 6, 25 and 30, final reports and supplements, TransCanada Hydro Northeast Inc. under P-1892, et al filed December 15, 2016

GRH Relicensing Website:
https://relicensing.greatriverhydro.com/overview/documents/?eeFront=1&ee=1&eeFolder=Documents%2F50-Study-Reports%2F130-Study-Reports-1-33%2FStudy-06-Water-Quality-Monitoring&eeListID=1

ILP Study 10 Fish Assemblage Study Report:

Accession No. 20160801-5232 TransCanada Hydro Northeast Inc. August 1, 2016 Updated Study Report under P-1855, et. al.

GRH Relicensing Website:
https://relicensing.greatriverhydro.com/overview/documents/?eeFront=1&ee=1&eeFolder=Documents%2F50-Study-Reports%2F130-Study-Reports-1-33%2FStudy-10-Fish-Assemblage&eeListID=1

All Final Study Reports for ILP Studies 1 through 33 can be found in the GRH Relicensing Public Information Library on the GRH Relicensing Website:

https://relicensing.greatriverhydro.com/overview/documents/?eeFront=1&ee=1&eeListID=1&eeFolder=Documents/50-Study-Reports/130-Study-Reports-1-33

Various Submittal Filings were made in order to submit all the final Study Reports to the FERC. They can be accessed here:
https://relicensing.greatriverhydro.com/overview/documents/?eeFront=1&ee=1&eeFolder=Documents%2F50-Study-Reports&eeListID=1