ENVIRONMENTAL ASSESSMENT
FOR
HYDROPOWER LICENSE

Center Rutland Hydroelectric Project

FERC Project No. 2445-028

Vermont

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, NE
Washington, D.C. 20426

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ACRONYMS AND ABBREVIATIONS

APE	area of potential effect
certification	water quality certification
C.F.R.	Code of Federal Regulations
cfs	cubic feet per second
CEQ	Council of Environmental Quality
Center Rutland	Center Rutland Hydroelectric Project No. 2445
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DBH	diameter at breast height
DO	dissolved oxygen
EA	environmental assessment
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
°F	degree Fahrenheit
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
fps	feet per second
FWS	U.S. Fish and Wildlife Service
GMP	Green Mountain Power
HPMP	Historic Properties Management Plan
Interior	U.S. Department of the Interior
IPaC	Information for Planning and Consultation
kW	kilowatt
mg/L	milligrams per liter
MWh	megawatt-hours
MW	megawatt
National Register	National Register of Historic Places
NERC	North American Electric Reliability Corporation
NGVD29	National Geodetic Vertical Datum of 1929
NHPA	National Historic Preservation Act
NLEB	northern long-eared bat
NPCC-New England	Northeast Power Coordinating Council's New England Region
O&M	operation and maintenance
PA	Programmatic Agreement
rpm	revolutions per minute
SCORP	Statewide Comprehensive Outdoor Recreation Plan
USGS	U.S. Geological Survey
Vermont ANR	Vermont Agency of Natural Resources
Vermont DEC	Vermont Department of Environmental Conservation
Vermont SHPO	Vermont State Historic Preservation Officer

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Center Rutland Hydroelectric Project
FERC Project No. 2445 – Vermont

1.0 INTRODUCTION

1.1 APPLICATION

On December 23, 2021, Green Mountain Power Corporation (GMP) filed an application with the Federal Energy Regulatory Commission (Commission or FERC) for a subsequent license to continue to operate and maintain the Center Rutland Hydroelectric Project No. 2445 (Center Rutland Project, or project).[1] The 275-kilowatt (kW) project is located on Otter Creek in Rutland County, Vermont (see Figure 1).

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the Center Rutland Project is to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a subsequent license to GMP for the Center Rutland Project, and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing the waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, and water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

[1] *See OMYA, Inc.*, 62 FERC ¶ 62,224 (1993).

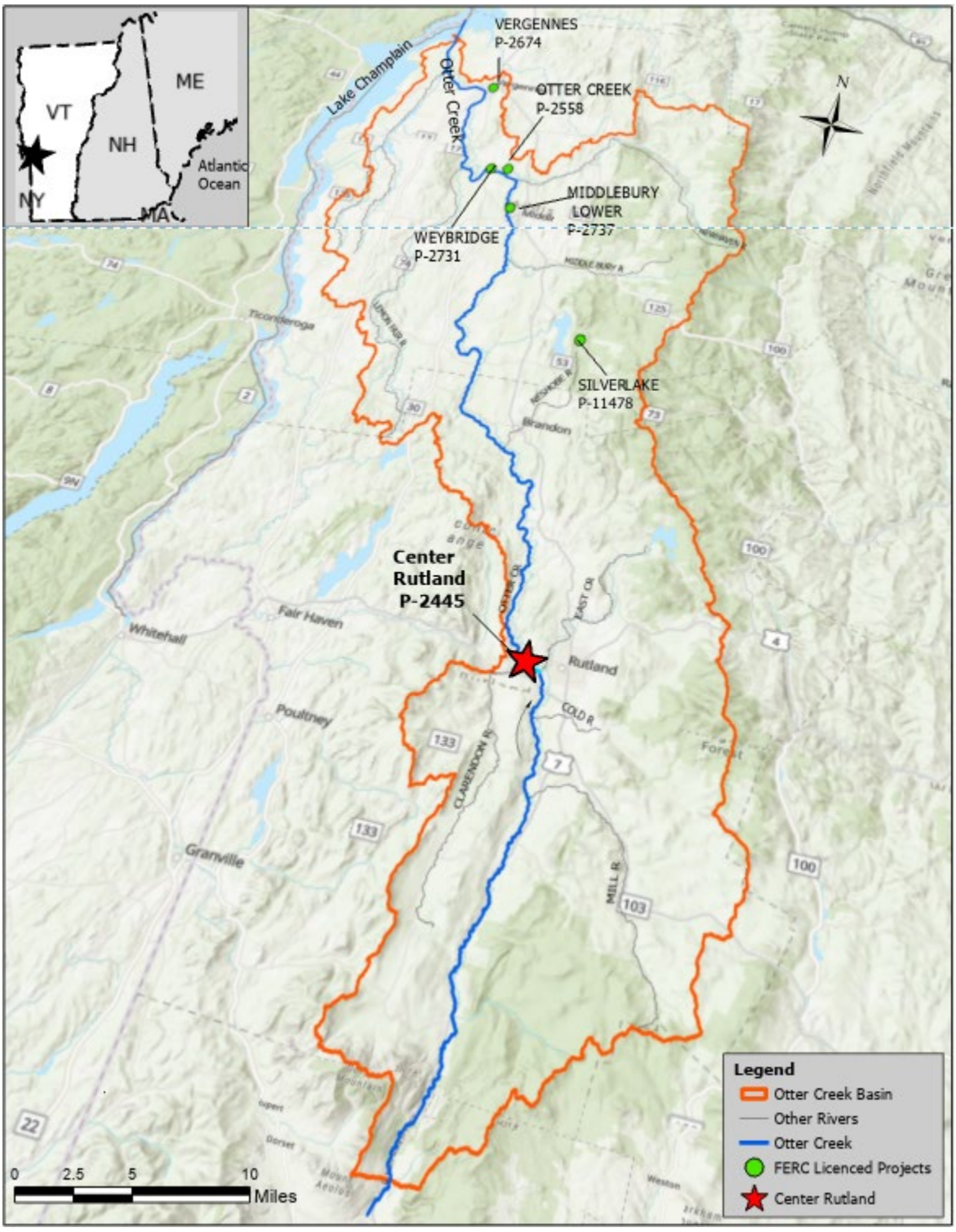

Figure 1. Location of the Center Rutland Project and other FERC-licensed Hydroelectric Projects on Otter Creek (Source: Staff).

Issuing a subsequent license for the Center Rutland Project would allow GMP to continue to generate electricity at the project for the term of the license, making electric power from a renewable resource available to its customers.

We prepared this environmental assessment (EA) in compliance with the requirements of the National Environmental Policy Act of 1969 (NEPA),[2] the Council on Environmental Quality's (CEQ) regulations for implementing NEPA,[3] and the Commission's implementing regulations.[4] This EA assesses the environmental and economic effects associated with continued operation of the project, and alternatives to the proposed project. It includes recommendations to the Commission on whether to issue a subsequent license, and if so, recommends terms and conditions to become a part of any license issued.

In this EA, we assess the environmental and economic effects of continuing to operate the project: (1) as proposed by GMP (Proposed Action), (2) the Proposed Action with additional or modified measures (Staff Alternative), and (3) the Staff Alternative with the mandatory conditions that have been filed to date. We also consider the effects of no action (No-Action Alternative). Under the No-Action Alternative, the project would continue to operate as it does under the existing license, and no new environmental protection, mitigation, or enhancement measures would be implemented. The primary issues associated with relicensing the project are minimum flows in the bypassed reach of Otter Creek, recreational access, federally listed endangered species, and cultural resources.

1.2.2 Need for Power

The Center Rutland Project provides hydroelectric generation to meet part of the New England Region's power, resource diversity, and capacity needs. The project has an installed capacity of 275 kW and an average annual energy production of about 541.7 megawatt-hours (MWh) from 2014 through 2020.

To assess the need for power, we looked at the needs in the operating region in which the project is located. The North American Electric Reliability Corporation (NERC) annually forecasts electrical supply and demand nationally and regionally for a 10-year period. The Center Rutland Project is located within the Northeast Power Coordinating Council's New England region (NPCC-New England) of the NERC. According to NERC's 2023 Long-Term Reliability Assessment, the net internal demand for this region is projected to increase by about 1.3% from 2024 through 2033 for summer and 3.5% for winter. The anticipated reserve margin (i.e., the primary metric used to evaluate the adequacy of projected generation resources to serve forecasted peak load) is expected to range from 9.2% in 2033 to 25.6% in 2024. The NPCC-

[2] National Environmental Policy Act of 1969, amended (Pub. L. 91-190. 42 U.S.C. §§ 4321–4347, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, Pub. L. 97-258, §4(b), September 13, 1982, Pub. L. 118-5, June 3, 2023).

[3] 40 C.F.R. Parts 1500-1508.

[4] 18 C.F.R. Part 380.

New England assessment area is forecasted to meet NPCC-New England's reference reserve margin of 12.9% in 2024, 12.6% in 2025, 11.0% in 2026 through 2029, 10.0% in 2030 through 2031, and 11.0% in 2032 through 2033 (NERC, 2023).

If relicensed, power from the Center Rutland Project would continue to help meet a need for power in the New England region in both the short and long-term. The project provides power that displaces generation from non-renewable sources. Displacing the operation of non-renewable facilities may avoid some power plant emissions and create an environmental benefit.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

A subsequent license for the Center Rutland Project would be subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described in Appendix D.

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 C.F.R. § 16.8) require applicants to consult with appropriate resource agencies, Tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and other federal statutes. Pre-filing consultation must be completed and documented according to the Commission's regulations.

1.4.1 Scoping

Before preparing this EA, staff conducted scoping to determine what issues and alternatives should be addressed. A scoping document was distributed to interested agencies and others on June 6, 2022. It was noticed in the *Federal Register* on June 10, 2022.[5] The Vermont Division of Historic Preservation (Vermont DHP) filed comments on July 7, 2022. Commission staff issued a letter on August 1, 2022, stating that a Scoping Document 2 was not warranted.

1.4.2 Interventions

On February 17, 2023, the Commission issued a notice accepting the application and setting April 18, 2023 as the deadline for filing motions to intervene and protests. The notice was published in the *Federal Register* on February 24, 2023.[6] The Vermont Agency of Natural Resources (Vermont ANR) filed a notice of intervention on April 18, 2023.

1.4.3 Comments on the Application

On February 17, 2023, the Commission issued a Ready for Environmental Analysis notice for the project, setting April 18, 2023 as the deadline for filing comments,

[5] 87 Fed. Reg. 35,539 (June 10, 2022)

[6] 88 Fed. Reg. 11,906 (February 24, 2023)

recommendations, terms and conditions, and prescriptions. The notice was published in the *Federal Register* on February 24, 2023.

On April 12, 2023, Vermont ANR filed comments and recommendations. On April 12, 2023, the U.S. Department of the Interior (Interior) requested that the Commission reserve authority to prescribe fishways under section 18 of the FPA in any license issued for the project. GMP did not file reply comments.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO ACTION ALTERNATIVE

Under the no-action alternative, the project would continue to operate under the terms and conditions of the current license, and no new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives, and to judge the benefits and costs of any measures that might be required under a subsequent license.

2.1.1 Current Project Facilities

The Center Rutland Project is located on Otter Creek in the Town of Rutland, in Rutland County, Vermont, approximately 71 river miles upstream of the mouth, located in Lake Champlain in Ferrisburgh, Vermont. Otter Creek flows approximately 100 miles north before reaching Lake Champlain. The current project boundary is shown in Figure 2.

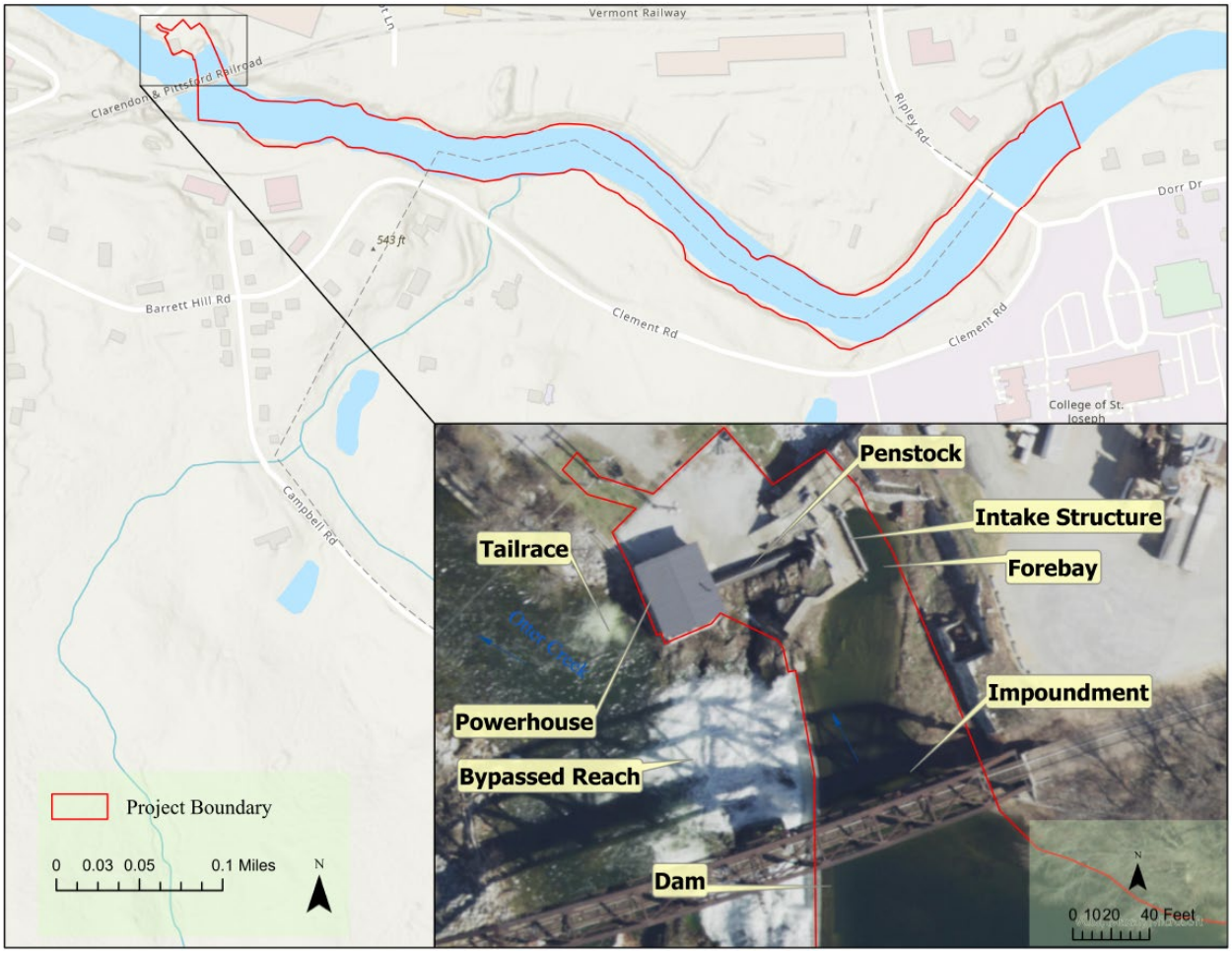

Figure 2. Current Center Rutland Project Boundary and Facilities (Source: Staff).

The Center Rutland Project includes a 190-foot-long, 14-foot-high concrete and stone masonry gravity dam that consists of: (1) a 174-foot-long spillway section with a crest elevation of 504.8 feet National Geodetic Vertical Datum of 1929 (NGVD 29);[7] and (2) a 16-foot-long non-overflow section. The project also includes a 13-foot-long, 7- to 30-foot-wide forebay; and a 39.58-foot-wide, 18-foot-high concrete and marble masonry intake structure with a 6.7-foot-wide, 6.5-foot-high steel headgate and a 30-foot-wide, 12-foot-high trashrack with 9/16-inch clear bar spacing.

The current license authorizes the use of 27-inch-high flashboards on top of the spillway and describes an impoundment surface elevation of 507.4 feet when the flashboards are in place, resulting in an impoundment surface area of about 12 acres. However, GMP states that it has not installed the flashboards since prior to 2012, when GMP acquired the project. Without the

[7] All elevations described in this EA are expressed in NGVD 29.

flashboards installed, the dam creates an impoundment that has a surface area of approximately 11 acres[8] at an elevation of 504.8 feet. The existing project facilities are shown in Figure 2.

From the impoundment, water flows through the intake structure to a 6-foot-diameter, 75-foot-long steel penstock that provides water to a 275-kilowatt (kW) horizontal Francis turbine-generator unit located in a 40-foot-long, 33-foot-wide stone and marble masonry powerhouse. Water is discharged from the turbine through a draft tube directly into Otter Creek. The project creates an approximately 100-foot-long bypassed reach.

There are no project recreational facilities.

The project generator connects to a 480-volt/12.47-kilovolt (kV) transformer and 80-foot-long, 12.47-kV transmission line that interconnects with the local distribution grid.

2.1.2 Current Project Boundary

The current project boundary encompasses approximately 11.2 acres (Figure 2). The project boundary encloses: (1) approximately 11 acres of land and water in and around the impoundment up to an elevation 507.4 feet; and (2) the project facilities listed above in section 2.1.1.

2.1.3 Project Safety

The Center Rutland Project has been operating for more than 30 years under its existing license. During this time, Commission staff has conducted operational inspections focusing on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance.

As part of the licensing process, Commission staff will evaluate the continued adequacy of the project's facilities under a subsequent license. Special articles will be included in any license issued, as appropriate. Commission staff would continue to inspect the project during the term of any subsequent license to assure continued adherence to Commission-approved plans and specifications, special license articles relating to construction (if any), operation and maintenance (O&M), and accepted engineering practices and procedures.

[8] Exhibit A of the license application and the 1993 license specify that the impoundment has a surface area of 13 acres at an elevation of 504.8 feet (the elevation without flashboards installed). *See OMYA, Inc.,* 62 FERC ¶ 62,224, at Ordering Paragraph B(2) (1993). However, the georeferenced shapefile of the project boundary filed on December 22, 2021, as part of the license application, indicates that the impoundment has a surface area of approximately 11 acres at an elevation of 504.8 feet. Commission staff used the georeferenced shapefile, aerial photographs, Exhibit G maps, and the project description in the 1993 license to confirm that the impoundment has a surface area of approximately 11 acres at elevation 504.8 feet.

2.1.4 Current Project Operation

GMP operates the project in a run-of-river mode using a pond level control system, such that outflow from the project approximates inflow to the impoundment at any given point in time. The surface elevation of the impoundment is maintained at 0.25 feet above the spillway crest elevation of 504.8 feet when providing the seasonal minimum flow noted below, and at the spillway crest elevation when minimum flows are not required. From June 1 through October 15, GMP provides a minimum flow of 80 cubic feet per second (cfs) or inflow to the impoundment, whichever is less, over the spillway and into the bypassed reach for the protection of aquatic and aesthetic resources. When refilling the impoundment following a drawdown for maintenance or emergencies, the current license requires a minimum flow release of 154 cfs or 90% of inflow to the impoundment, whichever is less, downstream of the powerhouse.

The turbine-generator unit has a minimum and maximum hydraulic capacity of 60 cfs and 190 cfs, respectively. When inflow to the impoundment is less than the minimum hydraulic capacity of the turbine plus the seasonal minimum flow, water is released over the spillway to the bypassed reach. When generating, GMP withdraws 60 to 190 cfs from the impoundment to generate electricity and releases it into Otter Creek. When inflow exceeds the maximum hydraulic capacity plus the seasonal minimum flow, GMP continuously operates the turbine-generator unit and releases excess flow from the spillway. The average annual energy production of the project from 2014 through 2020 was 541.7 MWh.

GMP manages vegetation by trimming vegetation back to a minimum of 15 feet from project structures once or twice per year, occasionally mowing and trimming vegetation surrounding the dam, intake, and powerhouse area, and periodically trimming an informal tailwater access trail that leads from an informal parking area to the Otter Creek shoreline below the project's powerhouse.

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Facilities

GMP proposes no changes to the current project facilities. Consistent with the discontinued use of flashboards since prior to 2012, GMP requests that the new license not include flashboards in the list of licensed project facilities.

2.2.2 Proposed Operation and Environmental Measures

As described in the license application, GMP proposes the following operational and environmental measures.

- To protect aquatic habitat, continue operating the project in a run-of-river mode, such that outflow from the project approximates inflow at any given point in time.

- To protect and enhance aquatic habitat and aesthetic resources, continue to provide a minimum flow of 80 cfs, or inflow, whichever is less, over the spillway into the bypassed reach from June 1 through October 15; and provide a minimum flow of

40 cfs, or inflow, whichever is less, over the spillway into the bypassed reach from October 16 through May 31.

- Develop an operation compliance monitoring plan within 6 months of any license issued and in consultation with Vermont DEC. The plan would define run-or-river operation and operational data to be monitored in order to maintain compliance, specify operational protocols under normal and adverse conditions, and specify requirements for consultation and record keeping.

- To protect the federally endangered northern long-eared bat (NLEB), avoid the removal of trees that are equal to or greater than 4 inches in diameter at breast height from April 15 through October 31.[9]

- To enhance recreation, establish a 1.9-acre land transfer or similar agreement with the Town of Rutland (Town) for the Town's development of a non-project pocket park[10] downstream of the dam, that would include two parking areas, a hand carry boat put-in, walking trails, beach access, observation area, picnic area, historic and informational signage.[11]

- To enhance recreation and awareness to the regional history, install a cultural heritage information kiosk for the Town's non-project pocket park.

- Develop an Historic Properties Management Plan (HPMP) in consultation with the Vermont SHPO to protect historic properties that are eligible for or listed on the National Register of Historic Places (National Register).

[9] GMP's proposal defines the diameter to be that which is measured at the tree's "base" height. However, diameter at breast height (DBH) is the standard for measuring trees in forestry, where the diameter of the tree is measured at 4.5 feet above the ground. Commission staff assumes that GMP's proposal to avoid trees of 4 inches or greater diameter at "base" height is a typographical error and that they meant DBH.

[10] A pocket park is a small recreational space, usually in an urban area, that is accessible to the public.

[11] The 1.9 acres of land GMP proposes to transfer to the Town is located on the south shoreline of Otter Creek, just downstream of the project's dam. It is owned by GMP, but outside of the project boundary.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would be operated as proposed by GMP, with the following modifications and additional staff-recommended measures, which include measures required by Vermont ANR's March 29, 2024 water quality certification (certification):[12]

- Implement an impoundment refill procedure following emergency and maintenance drawdowns, whereby 90% of inflow is passed downstream and 10% of inflow is used to refill the impoundment, to protect aquatic resources in the downstream reach.

- To protect NLEB, avoid the removal of trees that are equal to or greater than 3 inches in diameter at breast height (DBH) from April 1 through October 31, instead of GMP's proposal to avoid the removal of trees equal to or greater than 3 inches in DBH from April 15 through October 31 (condition E).

- Develop a recreation monitoring plan to evaluate and ensure recreation needs at the project are met over the term of any license issued.

Water Quality Certification Conditions Not Recommended

The staff alternative does not include the following water quality certification conditions because, pursuant to sections 4(e) and 10(a) of the FPA, the benefits would not justify the costs, or the conditions are for conditional future actions for which we cannot determine benefits and costs:

- Operate the project in an instantaneous run-of-river mode (condition B);

- Provide a year-round minimum flow of 60 cfs, or inflow if less, from the dam spillway into the bypassed reach (condition B); and

- Develop a plan to install upstream eel passage within 1 year of installation of upstream eel passage at the Otter Creek Hydroelectric Project (FERC No. 2558) (Otter Creek Project) (condition D).

2.4 STAFF ALTERNATIVE WITH MANDATORY CONDITIONS

We recognize that the Commission is required to include all section 401 water quality certification conditions in any license issued for the project. Therefore, the staff alternative with mandatory conditions includes all the measures included in the staff alternative with the addition

[12] Vermont ANR's certification for the Center Rutland Project is included in Appendix M. Vermont ANR conditions A and H through K are administrative in nature, and do not address specific resources; therefore, they are not analyzed in this EA. In addition to the certification conditions listed below, Vermont ANR conditions C (operation compliance monitoring plan) and F (recreation access and off-license pocket park) are consistent with GMP's proposal discussed above in section 2.2.2.

of the section 401 water quality certification conditions not included in the staff alternative, as discussed above in section 2.3, *Staff Alternative*.

2.5 ALTERNATIVE CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Project decommissioning was considered as an alternative to relicensing the project but has been eliminated from further analysis because it is not reasonable in the circumstances of this case. This alternative is presented in Appendix F.

3.0 ENVIRONMENTAL ANALYSIS

This section includes: (1) a general description of the project vicinity, (2) an explanation of the scope of our cumulative effects analysis, and (3) our analysis of the proposed actions and other recommended environmental measures. Sections are organized by resource area (aquatics, recreation, etc.), with historic and current conditions described first. Current conditions are the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed protection, mitigation, and enhancement measures, and any cumulative effects of the proposed actions and alternatives. Staff conclusions and recommended measures are discussed in section 5.1, *Comprehensive Development and Recommended Alternative* and in Appendix I.[13]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The Center Rutland Project is located on Otter Creek in the Town of Rutland, Rutland County, Vermont. The Otter Creek watershed drains an area of 936 square miles in west central Vermont. Otter Creek originates at Emerald Lake and wetlands south of the lake in the town of Dorset, Vermont in northern Bennington County. From the project, Otter Creek flows north for approximately 71 miles and empties into Lake Champlain in Ferrisburgh, Vermont.

The Otter Creek watershed is known by two sections, the upper section, which begins at Emerald Lake and continues to Proctor, Vermont, and has moderately steep gradients and rapid flows. The Center Rutland Project is in the upper portion of the Otter Creek watershed. The lower portion of the Otter Creek watershed extends from Proctor to Vergennes, and has slow, meandering reaches with elevation drops that occur over a series of dams, and it generally flat from Vergennes to Lake Champlain in Ferrisburgh. The Otter Creek watershed is located within the Lake Champlain-Richelieu River Basin.

Significant water features in the Otter Creek Basin include Lake Dunmore, located downstream of the project, and the Chittenden Reservoir, located just upstream of the project at the head of East Creek. Tributaries of Otter Creek upstream of the Center Rutland Project

[13] Unless otherwise indicated, the sources of our information are the application for subsequent license filed by GMP on December 23, 2021, and GMP's May 20, 2022, October 3, 2022, November 23, 2022, and February 6, 2023 responses to staff's requests for additional information.

include East Creek, Mill River, and Cold River. Tributaries downstream of the project include the Clarendon River, Leicester River, Middlebury River, New Haven River, Lemon Fair River, and Dead Creek. East Creek joins Otter Creek approximately one mile upstream of the project and the Clarendon River joins Otter Creek approximately 0.3 miles downstream of the project.

Based on climatological data recorded at Rutland, Vermont for the period 1981 through 2020, the average monthly air temperature ranges from about 19 degrees Fahrenheit (°F) in January to about 69 °F in July. The average monthly precipitation ranges from about 2.1 inches in February to about 4.8 inches in July. Snowfall averages between about 13 and 19 inches per month from December through March.

There are currently nine dams on Otter Creek, beginning with the Emerald Lake dam, located at the headwaters for Otter Creek, in Dorset, Vermont. Seven of those dams currently include hydropower projects that operate under a FERC license. Table C-1 details the name, location, and attributes of the nine dams on Otter Creek from upstream to downstream. The dam locations are shown in Figure 1.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the CEQ's regulations for implementing NEPA, a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor, but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

Based on our review of the license application, as well as agency and public comments, we have identified streamflow as a resource that could be cumulatively affected by the continued operation and maintenance of the Center Rutland Project, in combination with other hydroelectric projects on Otter Creek and its tributaries. We discuss these cumulative effects at the end of section 3.3.1.

3.2.1 Geographic Scope

The geographic scope of the cumulative effects analysis defines the physical limits or boundaries of the proposed action's effect on the resources and contributing effects from other hydropower and non-hydropower activities within the Otter Creek Basin.

We have identified the geographic scope for streamflow to include Otter Creek and its tributaries. We chose this geographic scope because the operation and maintenance of the Center Rutland Project, in combination with the other dams on Otter Creek and its tributaries, could affect streamflow within the basin.

3.2.2 Temporal Scope

The temporal scope of our cumulative effects analysis includes a discussion of past, present, and reasonably foreseeable future actions and their effects on each resource that could be cumulatively affected. Based on the potential term of a subsequent license, the temporal scope looks 30 to 50 years into the future, concentrating on the effects on the resources from reasonably foreseeable future actions. The historical discussion is limited, by necessity, to the amount of available information. We identified the present resource conditions based on the license application, agency comments, and comprehensive plans.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the project-specific effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure project effects. We then discuss and analyze the site-specific environmental issues.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EA. Based on this, we have determined that aquatic resources; terrestrial resources; threatened and endangered species; recreation, land use, and aesthetic resources; cultural resources; and environmental justice communities may be affected by the proposed actions and alternatives. We have not identified any substantive issues related to geology and soils with the proposed actions; therefore, these resources are not assessed in the EA. We present our recommendations in section 5.1, *Comprehensive Development and Recommended Alternative*.

3.3.1 Aquatic Resources

3.3.1.1 Affected Environment

Water Quantity

Otter Creek at the project (river mile 71) has a drainage area of 307 square miles. The project dam creates an approximately 11-acre impoundment at an elevation of 504.8 feet.[14] Mean monthly flows at the project, from 1991 to 2020, range from a low of 223 cfs in September to a high of 1,417 cfs in April, with a mean annual flow of 606 cfs (see Table C-2).[15]

GMP operates the project as a run-of-river facility, such that outflow from the project approximates inflow. Flows in Otter Creek equal or exceed the 60-cfs minimum hydraulic capacity and the 190-cfs maximum hydraulic capacity of the project approximately 99% and

[14] Although the license includes 27-inch-high flashboards and an elevation of 507.4 feet, the flashboards have not been installed since 2012 and GMP is proposing to not reinstall them.

[15] These flows are reported at the U.S. Geological Survey (USGS) gage no. 04282000 on Otter Creek approximately 350 feet downstream of the project dam.

80% of the time, respectively, on an annual basis. Generation flows are discharged to Otter Creek at the end of the 100-foot-long bypassed reach. Flows in excess of the maximum hydraulic capacity, plus the required seasonal minimum bypassed reach flow, are released into the bypassed reach from the spillway.

Water Quality

State Water Quality Classifications

Vermont has regulatory authority over water quality in Otter Creek. Otter Creek at the project is classified as Class B(2) coldwater fish habitat in Vermont.[16]

In Vermont, the dissolved oxygen (DO) concentration must not be less than 6 milligrams per liter (mg/l) or 70% of saturation. The DO standard is 7 mg/l in designated salmonid spawning areas. The Vermont water quality standard for temperature states that the total increase in temperature from all discharges and activities must not exceed 1°F. The section of Otter Creek in which the project is located is not listed on the Clean Water Act section 303(d) list of impaired waters (Vermont ANR, 2022).

There are five wastewater treatment facilities that discharge to Otter Creek. Wallingford and Rutland are upstream of the project, and Proctor, Middlebury, and Vergennes are downstream of the project. The Rutland wastewater treatment facility discharge is located less than one mile upstream of the project dam and just upstream of the project boundary. There are no existing or proposed water withdrawals for irrigation, water supply, or other industrial uses within the project boundary.

Water Quality Data

Vermont Marble Company (the previous licensee for the project) conducted a comprehensive water quality survey at the project site from July 10 to 15, 1988. That study documented DO and temperature that met state water quality criteria at all but one site on one day. During that study, there was one DO measurement in the forebay during early morning hours that was 5.4 mg/l. That low-DO measurement was attributed to an algal bloom and the resulting overnight decline of DO.

Since the 1988 study, the most recent water quality data available are from Vermont DEC. Vermont DEC collects water quality data occasionally at sites 0.75 miles upstream of the project dam (approximately the upstream end of the impoundment) and at 1,000 feet downstream of the project dam. These data suggest that Class B water quality standards for DO are being met under existing conditions and project operation. Single-day measurements for DO in July 2020; August 2016; and September of 2006, 2016, and 2021 ranged from 7.7 mg/l to 10.2 mg/l at the upstream site. At the downstream site, the DO in October 2004 was 10.6 mg/l.

[16] In Vermont, Class B water bodies are considered acceptable for fishing, swimming, and other recreational purposes, and after treatment, are potential water supplies.

Additional evidence of good water quality at the project is provided by macroinvertebrate surveys conducted by Vermont DEC at the same two sites where DO was measured. At the upstream site, Vermont DEC described the species richness of mayflies, caddisflies, and stoneflies as "very good" in 2006 and "good" in 2016 and 2020. All surveys were conducted in late September. At the downstream site, Vermont DEC described the species richness for the same aquatic insect taxa as "good to very good" in October 2001.

Aquatic Habitat

The 11-acre impoundment is riverine in character, with an average depth of approximately 2.3 feet and width of 140 feet. Large woody debris and submergent and emergent vegetation provide habitat for aquatic organisms. Substrate in the impoundment ranges from silt and sand to gravel and cobble. An island in the impoundment provides additional shoreline areas with littoral vegetation that provides a variety of habitat for fish, and other aquatic habitat, including spawning and nursery habitat for fish.

The dominant features of the 100-foot-long bypassed reach include the bedrock falls that are approximately 60-feet-long, and an approximately 40-foot-long and 3- to 20-foot-deep pool at the base of the falls with a water surface elevation similar to the tailrace. There is minimal aquatic habitat in the bedrock falls section, but the deep pool provides protective cover for fish, as well as feeding and overwintering habitat. The deep pool is backwatered by and hydraulically connected to the tailrace outflow. Downstream from the tailrace, there is a 700-foot-long riffle that provides good habitat for fish, aquatic insects, and other aquatic organisms such as crayfish.

Fishery Resources

There are no migratory fish, including American eel, in the project area. The resident fish community within the impoundment and in Otter Creek downstream of the project has not been surveyed recently. However, past surveys in the project area and other reaches of Otter Creek documented a mix of coldwater and warmwater species, including brook trout, rainbow trout, brown trout, smallmouth bass, northern pike, yellow perch, tessellated darter, and several species of sunfish, minnows, and suckers.

The trout in the project area are primarily the result of stocking, although some natural reproduction is likely to occur in the riffles downstream of the project tailrace, as well as in free-flowing sections upstream of the project impoundment, or in tributaries of Otter Creek both upstream and downstream of the project. In 2020, Vermont Fish and Wildlife Department stocked 2,000 brown trout in the 6-mile reach upstream of the project and 1,000 brown trout in the 12-mile reach downstream of the project. The deep pool in the bypassed reach and the 700-foot-long riffle downstream of the tailrace are popular locations for trout angling.

Freshwater Mussels

GMP surveyed the impoundment for mussels in 2019. The survey identified three species, including the eastern elliptio (*Elliptio complanata*), creeper (*Strophitus undulatus*), and

the state-listed "rare" creek heelsplitter (*Lasmigona compressa*). Although the 2019 study also included surveys of the tailrace and bypassed reach, no mussels were found in these locations, most likely because the substrate is dominated by bedrock and boulders and does not include suitable mussel habitat.

3.3.1.2 Environmental Effects

Mode of Operation

GMP proposes to continue operating the project in a run-of-river mode, such that outflow from the project approximates inflow to the impoundment at any time, and the surface elevation of the impoundment is maintained at an elevation between 504.8 (elevation of the spillway crest) and 505.05 feet, the latter being the elevation which results in the 80 cfs minimum flow passing over the spillway and into the bypassed reach.

Vermont ANR's certification condition B specifies that GMP operate the project in an instantaneous run-of-river mode, whereby outflow from the project equals inflow at all times.

Our Analysis

The operation of hydropower projects in a run-of-river mode, whereby the total outflow from a project approximates the inflow to the impoundment, generally provides a more stable upstream and downstream environment than other modes of operation (i.e., peaking operation and storage projects). Compared to peaking projects and storage projects, run-of-river operation minimizes the degree of water level fluctuations and associated erosion and temperature fluctuations in impoundment surface waters (due to shorter residence times) and results in a downstream flow regime that is more similar in magnitude and timing to natural river flows.

As discussed in section 3.3.1.1, *Affected Environment, Water Quality,* DO, water temperature, and macroinvertebrate data indicate that water quality is adequate to sustain aquatic life.

The project's current run-of-river mode of operation limits fluctuating water levels, which influence the reproductive success of fish that spawn in near-shore areas (Sammons and Bettoli, 2000), such as smallmouth bass, northern pike, yellow perch, and sunfish. By continuing to operate the project in a run-of-river mode as proposed, habitat in the impoundment and habitat in Otter Creek downstream of the project would remain unchanged from current conditions for aquatic organisms, including fish, mussels, and macroinvertebrates. Additionally, continuing run-of-river operation would continue to minimize the length of time water is retained in the impoundment and would help avoid increasing water temperatures in the upper levels of the impoundment from solar heating, which would continue to benefit water quality, fish, and benthic macroinvertebrates.

Vermont ANR has not demonstrated the project is capable of operating in an instantaneous run-of-river mode, with total outflow from the project equaling inflow on an instantaneous basis. The project is currently operated in a run-of-river mode using an automatic pond level control system. This system measures changes to the surface elevation of the

impoundment, thus providing an indirect measure of changes to inflow. As inflow increases or decreases, a certain amount of time elapses before the impoundment elevation changes, depending on the rate and magnitude of the change in inflow. Once the change in inflow affects the impoundment elevation, the pond level control system automatically adjusts turbine flow. Based on these technical limitations and the delay associated with adjusting project outflow to match inflow, it would not be possible to match outflows and inflows on an instantaneous basis, as specified by Vermont ANR's certification condition B.

Continuing to operate the project such that the total outflow from the project *approximates,* rather than equals, inflow at any point in time would result in stable impoundment elevations, which in turn would help protect fish spawning areas and freshwater mussel beds from becoming dewatered and limit project-related erosion along the impoundment shoreline. Operating the project in this manner would likewise ensure that downstream flows are not affected by project operation. Therefore, operating the project as run-of-river – defined as the sum of all outflows approximating the sum of all inflows at any given point in time – would provide the same level of benefits to aquatic resources upstream and downstream of the project as Vermont ANR's instantaneous run-of-river mode of operation, and is operationally feasible.

Minimum Flow Releases

Under the current license, GMP releases a minimum flow of 80 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from June 1 through October 15. The rest of the year, flows spill into the bypassed reach only when flows are less than 60 cfs or greater than 190 cfs, the project's minimum and maximum hydraulic capacity, respectively.

GMP proposes to continue to provide a minimum flow of 80 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from June 1 through October 15. GMP proposes to release a minimum flow of 40 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from October 16 through May 31.

Vermont ANR's certification condition B specifies that GMP release a year-round minimum flow of 60 cfs, or inflow if less, from the spillway into the bypassed reach. Vermont ANR made this requirement after reviewing videos of flows that GMP apparently provided to Vermont ANR in the spring of 2023.[17]

Our Analysis

The current seasonal minimum flow of 80 cfs from June through mid-October that GMP is proposing to continue is based on a 1992 flow demonstration study, during which the Vermont

[17] Vermont ANR references the spring 2023 flow demonstration videos in its letter filed on April 12, 2023 and in the certification. GMP did not filed the spring 2023 flow demonstration videos, or a description of the observations, on the record. Therefore, staff rely on the 1992 study and the 2023 study findings as described in paragraphs 88 through 97, 144, and 145 of the certification.

Marble Company (the applicant at the time), in consultation with Vermont ANR, evaluated flows for aquatic habitat and aesthetics at 20, 40, 60, 80, and 100 cfs. Biologists from the Vermont Marble Company's consultant and Vermont ANR described the flow over the bedrock falls as primarily passing through two chutes that feed into the deep pool at the base of the falls. The amount of flow released over the spillway gradually increased the influence of the chutes' contribution to flow mixing and the complexity of flows within the deep pool at the base of the falls. Flow mixing improves aeration, which benefits fish and aquatic invertebrates. As flow complexity increases, so does the variety of microhabitats within the pool. Different species and life stages of fish have different preferences for flow velocities. An increase in flow complexity therefore provides suitable habitat for more species and life stages. The biologists noted that although this increase in mixing and complexity was evident up through a flow of 80 cfs, there was minimal change between 80 cfs and 100 cfs.

The nature of the bypassed reach, being dominated by bedrock and boulders, is such that any change in the structure, quantity, or quality of the habitat between 1992 and now is extremely unlikely. Therefore, the value of the flow demonstration study from spring 2023 (referenced by Vermont ANR) is unclear. The 1992 study already determined the apparent limit of increasing fish habitat benefits as somewhere between 80 cfs and 100 cfs. Additionally, photographs in GMP's application make it clear that there is virtually no fish habitat in the bypassed reach except for the deep pool, which is hydraulically connected to the tailrace.

GMP's proposed minimum flow regime from June 1 through October 15 would result in no change in aquatic habitat compared to existing conditions. The minimum flow of 80 cfs would continue providing the flow mixing and complexity within the deep pool described during the 1992 study. This mixing and flow complexity is an important factor in making the deep pool quality habitat for fish cover and feeding, especially during the open water months when fish are most active.

GMP's proposal to release a minimum flow of 40 cfs, or inflow, whichever is less, from October 16 through May 31 would provide some additional habitat benefits compared to the existing conditions, where there is no required minimum flow during this period. The 1992 study describes the effect of a 40 cfs flow as providing negligible flow mixing within the deep pool, but states that it is enough flow for the tailrace and deep pool to remain hydraulically connected. The benefits of a minimum flow of 40 cfs during this period would primarily be aesthetic in the bedrock falls portion of the bypassed reach (as describe in section 3.3.4.2 *Environmental Effects, Aesthetics*) because for most of the months during this period, the deep pool is covered with ice. Fish do not require as much flow complexity for feeding and cover in overwintering habitat because they have the cover of ice and are also not feeding as much as during the open water season when water temperatures are higher and fish are more active. Nevertheless, overwintering habitat for fish in the deep pool would be improved by a 40-cfs minimum flow compared to existing conditions, where there is no flow passing over the spillway and into the bypassed reach under certain flow and project operation conditions.

Vermont ANR's certification condition B specifies a year-round 60-cfs minimum flow, or inflow if less. Compared to GMP's proposed 80 cfs minimum flow, Vermont ANR's minimum flow requirement of 60 cfs would provide marginally less flow mixing and complexity benefits than GMP's proposed 80-cfs minimum flow from June 1 through October 15. While the

1992 study describes a 60-cfs flow as the flow at which an increase in mixing and complexity becomes apparent, it describes an 80 cfs flow as providing greater benefits.

From October 16 through May 31, Vermont ANR's specified flow of 60 cfs would increase the base level of flow mixing and complexity within the deep pool during the period over both current conditions. However, as discussed above for GMP's 40-cfs minimum flow proposal for this time period, the flow mixing and complexity benefits are not as critical during periods when the pool is covered by ice and fish are less active. Nevertheless, overwintering habitat would likely be somewhat improved under Vermont ANR's condition B, compared to both existing conditions and GMP's proposed 40-cfs minimum flow.

Impoundment Drawdown and Refill Procedure

Periodically, GMP draws down the project impoundment for maintenance and emergencies. During these times, run-of-river operation is temporarily interrupted. Under the existing license, GMP is required to release a flow of 154 cfs, or 90% of inflow, whichever is less, downstream of the powerhouse during impoundment refilling.

Our Analysis

Retaining all inflows to refill the impoundment after an impoundment drawdown would adversely affect aquatic resources by dewatering aquatic habitat in the bypassed and downstream reaches, potentially stranding fish, mussels, and other aquatic organisms. On the other hand, releasing all flows to the downstream reach would adversely affect aquatic life in the impoundment by sustaining the dewatered conditions. Implementing a refill procedure whereby the impoundment is slowly refilled by passing approximately 90% of the inflow downstream through the turbines and retaining the remaining 10% of inflow to refill the impoundment (90/10 refill procedure) would ensure that flows downstream of the powerhouse are kept near project inflow levels and that the impoundment is refilled in a timely manner following drawdowns for routine maintenance, such as crest gate repair. Minimizing the length of time that the impoundment is drawn down and that flows are reduced downstream would help maintain the existing aquatic habitat for fish and other aquatic species during drawdowns for routine maintenance.

Compliance Monitoring

GMP proposes to develop an operation compliance monitoring plan within 6 months of any license issued for the project and in consultation with Vermont DEC. The plan would define run-or-river operation and operational data to be monitored in order to maintain compliance, specify operational protocols under normal and adverse conditions, and specify requirements for consultation and record keeping.

Vermont ANR's certification condition C specifies that GMP develop an operation compliance monitoring plan to document compliance with run-of-river operation and flow releases, including methods for continuously monitoring flow releases, impoundment levels, and inflows; and provisions for flow data to be available on a "near real-time basis," if requested. Vermont ANR's condition C also specifies that GMP report deviations from required operating

conditions within 15 days of a deviation, including the cause, severity, and duration of the deviation; any adverse environmental impacts associated with the deviation; pertinent data relevant to the deviation; and measures to avoid recurrences of the deviation. Finally, Vermont ANR's certification condition H specifies that GMP consult with it prior to conducting maintenance or repair work that would cause a deviation from operational requirements that could affect water quality.

Our Analysis

Although compliance measures do not directly affect environmental resources, they do allow the Commission to verify that a licensee is complying with the environmental requirements of a license. An operation compliance monitoring plan would help GMP document compliance with the operational provisions of any license for the project and provide a mechanism for reporting deviations. An operation compliance monitoring plan would also help the Commission verify that the project is operating in compliance with any license, thereby facilitating administration of the license and assisting with the protection of resources that are sensitive to deviations from normal operating conditions. The plan could be developed in consultation with the resource agencies, and include: (1) a detailed description of how GMP will maintain, monitor, and document compliance with the operational requirements of the license; (2) a description of the gages and other measuring devices that would be used to monitor compliance with license requirements; (3) procedures for maintaining and calibrating monitoring equipment; (4) standard operating procedures to be implemented outside of normal operating conditions, such as scheduled and unscheduled facility shutdowns; and (5) a schedule for installing monitoring equipment needed to document compliance with the operational requirements of the license. In addition, notifying the Commission and resource agencies of planned and unplanned deviations from run-of-river, impoundment level, and flow requirements would ensure adequate information flows from GMP to the Commission and resource agencies during the term of the license.

Upstream Eel Passage

As discussed above, migratory fish, including American eel, are not currently present in the project area; however, American eel are present in Lake Champlain. Vermont ANR's certification condition D specifies that GMP is required to begin preparing a plan to provide upstream eel passage at the project within 1 year of installation of upstream eel passage at the Otter Creek Project (P-2588). As shown in Table C-1, the Otter Creek Project consists of three developments, the most upstream of which is at river mile 64, 7 miles downstream of the Center Rutland Project. Certification condition D states that the plan could include either trap and truck or an eel ramp, as possible methods for providing upstream eel passage at the project.

Our Analysis

If American eel are present in the project area in the future, then upstream passage for juvenile American eel at the project using such as trap and truck or an eel ramp would be beneficial by allowing American eel to move upstream past the project more efficiently than if GMP provides no eel passage measures. The magnitude of the potential benefit to American eel

populations would depend on the number of juvenile eels reaching the Center Rutland Project after passage at the Otter Creek Project, and the amount of habitat available for American eel between the two projects and upstream of the Center Rutland Project. Staff are not aware of any information in the record, however, to estimate those potential benefits at this time.

Potential for Entrainment and Impingement

As discussed in section 3.3.1.1, *Affected Environment, Fishery Resources*, Otter Creek in the project area supports a population of resident coldwater fish (e.g., trout and northern pike) and warmwater fish (e.g., smallmouth bass). These species utilize a variety of lotic and lentic habitats available in the project impoundment and the upstream reach of Otter Creek, and do not require downstream passage from the impoundment to complete their life history requirements.

Although fish in the impoundment do not require downstream passage to complete their life history requirements, fish could still encounter the project intake when foraging in the impoundment. Water intake structures can injure or kill fish that encounter intake screens/trashracks. At hydropower projects, fish that successfully pass through the intake(s) are also subject to potential turbine injury/mortality.

Fish that are wider than the clear spacing between the trashrack bars, and/or have burst swim speeds lower than approach velocities can become trapped against intake screens or bars of a trashrack. This process is known as impingement and can cause physical stress, suffocation, and death of some organisms (EPRI, 2003). Entrainment into the intake structure occurs if fish are small enough to pass between trashrack bars, and they are unable to overcome the approach velocity, or if they choose to pass downstream through the trashrack. If entrainment occurs, injury or mortality can result from collisions with turbine blades, exposure to pressure changes, shear forces in turbulent flows, or water velocity accelerations created by turbines (Rochester et. al., 1984). Altogether, fish that are entrained and killed are removed from the river population and no longer available for recruitment to the fishery.

The likelihood of a fish becoming impinged is a function of the spacing between the bars on an intake structure, as well as the size and body shape of the fish. To determine the potential for fish to become impinged on the trashrack, staff examined the correlation between fish size and trashrack bar spacing.

Staff estimated the likelihood that a fish would be physically excluded by the present 9/16-inch trashrack configuration by using proportional measurements for smallmouth bass, northern pike, rainbow trout, brown trout, and brook trout, as reported by Smith (1985).[18] The maximum length for these species in northern Vermont is about 21, 40, 17, 21, and 20 inches, respectively. These species would be physically excluded from the turbines by the 9/16-inch

[18] Staff used proportional measurements to calculate a scaling factor of body width to total length (scaling factor = width/total length), and then used the scaling factor to estimate the length that would be physically excluded by the 9/16-inch trashrack. For smallmouth bass, northern pike, rainbow trout, brown trout, and brook trout Commission staff used scaling factors of 0.13, 0.08, 0.11, 0.11, and 0.12, respectively.

trashrack spacing if they are longer than 4.3, 7.0, 5.1, 5.1, and 4.7 inches, respectively. Shorter fish would not be physically excluded by the 9/16-inch trashrack and would be susceptible to entrainment.

Even if fish are small enough to fit through trashrack bars, however, they are likely to behaviorally avoid entrainment and could escape entrainment if their burst speed is greater than the water velocity at the intake (Knapp et al., 1982). Fish are able to detect obstacles using stimuli such as flow acceleration, turbulence, and sound (Coutant and Whitney, 2000). As fish approach the intake and the trashrack, they sense flow acceleration near the trashrack and sound from the turbine operation. Fish sensing these cues would typically respond by swimming away from the intake at burst speed. The burst speeds of certain fish species likely to occur in the project impoundment are shown in Table C-3. The headgate structure at the Center Rutland Project is currently screened by a trashrack that is approximately 30 feet wide by 12 feet tall, with 9/16-inch clear spacing. Nine feet of the 12-foot-tall trashrack is underwater. The approach velocity is 0.70 feet per second (fps). Commission staff calculated the average through-bar velocity for the existing trashrack at the Center Rutland Project at the current maximum hydraulic capacity of 190 cfs. The calculated through-bar velocity is 1.21 feet per second (fps).[19]

Adult smallmouth bass, northern pike, brook trout, brown trout, and rainbow trout could behaviorally avoid impingement and entrainment because their burst speeds exceed the calculated through-bar velocity under both current and proposed operation (see Table C-3). However, juvenile life stages of some fish species in the project impoundment would be susceptible to entrainment because they could fit through the clear bar spacing of the trashrack and their burst speeds do not exceed the calculated through-bar velocity at the trashrack. For example, juvenile brook trout burst speeds range from 0.1 to 2.0 fps, which overlaps with the calculated through-bar velocity of 1.21 fps when the project inflow is 190 cfs. Therefore, some juvenile brook trout at the project would be susceptible to entrainment. Juvenile rainbow trout, brown trout, and smallmouth bass at the project would not be susceptible to entrainment.

GMP did not conduct any turbine passage survival studies. The project has one horizontal Francis turbine-generator with a maximum hydraulic capacity of 190 cfs. The turbine has a rotational speed of 300 revolutions per minute (rpm). Winchell et al. (2000) compiled turbine passage survival data and found trends in survival related to fish size, turbine type, rotational speed, and hydraulic capacity. Winchell et al. (2000) found that a Francis turbine with a discharge capacity of 275 to 695 cfs, and a rotational speed greater than 250 rpm, has a turbine

[19] To estimate the flow velocity through the trashrack, Commission staff calculated the effective area in which flow could pass through the trashrack at the project. Specifically, staff accounted for the following parameters: (1) the effective intake width (18 feet), as calculated from (a) the clear spacing of the trashrack (9/16 inch) and (b) the number of bars necessary to span the 30-foot-wide trashrack (384 bars at an average bar thickness of 0.375 inches); and (2) the underwater trashrack height of 9 feet, installed at an angle of approximately 15 degrees from vertical. Staff calculated the velocity through the clear spaces of the trashrack at 190 cfs by dividing the maximum hydraulic discharge flow by the effective area of the trashrack (156.4 ft^2).

passage survival rate ranging from 31.0% to 97.6% (average of 70.1% for six turbines studied) for fish less than 4 inches in length. As discussed above, juvenile brook trout would be susceptible to entrainment and, as shown in Table C-3, can be less than 4 inches in length. Therefore, some turbine passage mortality could occur under current and proposed operation for juvenile brook trout. Turbine passage survival for brook trout through the project's Francis turbine could be greater than discussed by Winchell, however, because the project's Francis turbine discharges at a lower rate than discussed by Winchell.

Cumulative Effects

Streamflow

As discussed in section 3.1 *General Description of the River Basin*, and shown in Table C-1, there are two dams upstream of the Center Rutland Project and six dams downstream of the project, in addition to other dams on tributaries of Otter Creek. These dams contribute to a cumulative effect on streamflow by impounding riverine sections and, in the case of hydropower dams, often bypassing sections of the natural river channel by diverting water through a penstock to a powerhouse for generation some distance downstream from the dam.

The Center Rutland Project has the potential to have cumulatively beneficial effects on streamflow within the Otter Creek basin in two ways. First, continuing to operate in a run-of-river mode, as proposed by GMP, would preserve the riverine nature of the impoundment. Moreover, compared to the existing license, under which GMP is permitted to install 27-inch-high flashboards, GMP's proposal to not reinstall the flashboards would make the impoundment more closely resemble a free-flowing section of river because the depth would decrease and water velocity through the impoundment would increase.

The second way in which GMP's proposal would have cumulatively beneficial effects on streamflow is by providing a minimum flow during the period from October 16 through May 31, during which there is currently no required minimum flow. As discussed in section 3.3.1.2, *Environmental Effects, Minimum Flow Releases,* although the bypassed reach at the Center Rutland Project is relatively short, providing a flow of 40 cfs, or inflow, whichever is less, would marginally improve habitat in the deep pool at the downstream end of the bedrock falls and make this feature of the bypassed reach more closely resemble a free-flowing section of river, compared to existing conditions. Vermont ANR's certification, which specifies a 60-cfs minimum flow during this period, would also have cumulatively beneficial effects on streamflow for the same reasons and to a marginally greater degree.

3.3.2 Terrestrial Resources

3.3.2.1 Affected Environment

The Center Rutland Project is located in the Western New England Marble Valleys ecoregion (Griffith et al., 2009), which is characterized by irregularly shaped scenic lowlands with generally flat topography and outcroppings of erosion-resistant rocks from surrounding ecoregions. This region consists primarily of mixed and deciduous forests, pastures, cropland,

and urban areas. The Center Rutland Project is located in the Village of Center Rutland, Rutland County, Vermont. The project facilities are located in a highly developed area with commercial, industrial, and residential use. Approximately 0.3 acre of upland is located within the project boundary and is primarily occupied by project facilities or structures. The impoundment and tailrace shorelines are relatively steep and forested with a narrow buffer of deciduous overstory and understory species. These forested riparian areas are adjacent to the project boundary and provide suitable habitat for terrestrial species tolerant to urban activities. Similar forested habitat exists within the 1.9 acres of land GMP proposes to transfer to the Town for the development of a non-project pocket park.

According to FWS's National Wetlands Inventory system (FWS, 2022a), there are no palustrine wetlands located within the project boundary. Approximately 15 acres of forested wetlands occur 175 feet south of the impoundment. No wetlands are located within the land GMP proposes to transfer to the Town.

Upland, riparian, and wetland habitat in the vicinity of the project boundary support a variety of wildlife species. Mammals common to the area include eastern gray squirrel, racoon, porcupine, small rodents, and skunks, with occasional white-tailed deer. Many bird species are likely to occur in the area at various times throughout the year, including resident and migratory waterfowl, neotropical songbirds, and resident species. Birds common to the area include mallard duck, American black duck, American robin, European starling, flycatchers, sparrows, blue jays, and finches. Herptiles likely to occur in the area include various species of non-venomous snakes, turtles, frogs, toads, and salamanders.

3.3.2.2 Environmental Effects

Operation and Maintenance

GMP is not proposing any modifications to licensed project facilities, other than the proposal to not reinstall the flashboards, as described in section 2.2.1. Current and proposed vegetation management is limited to trimming vegetation back to a minimum of 15 feet from project structures once or twice a year; occasional mowing and trimming of vegetation surrounding the dam, intake, and powerhouse area; and periodically trimming the informal tailwater access trail that leads from the informal parking area to the shoreline below the powerhouse. Development of the non-project pocket park would include the conversion of approximately 0.5 acre of forested riparian habitat into foot paths, a kiosk, and an overlook area. The Town proposes minimal tree-clearing for park construction and replacement of any identified invasive plants species found in the area with native species.

GMP proposes to continue operating the project in a run-of-river mode, such that outflow from the project approximates inflow to the impoundment at any time and the surface elevation of the impoundment is maintained at an elevation of between 504.8 (elevation of the spillway crest) and 505.05 feet, the latter being the elevation which results in 80 cfs passing over the spillway and into the bypassed reach. GMP proposes to continue to provide a minimum flow of 80 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from June 1 through October 15. GMP proposes to implement a minimum flow of 40 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from October 16 through

May 31. GMP does not describe in detail its procedures for refilling the impoundment after scheduled maintenance or emergency shutdown and has not proposed an impoundment refill procedure, although the current license requires that GMP release a minimum flow of 154 cfs or 90% of inflow, whichever is less, downstream of the powerhouse during impoundment refilling.

Our Analysis

Continuing to operate the project in a run-of-river mode would maintain stable impoundment levels and minimize effects on terrestrial habitat along the shoreline of the impoundment and Otter Creek downstream of the project. Currently, there are no minimum bypassed reach flow requirements from October 16 through May 31. Releasing a continuous minimum flow of 40 cfs, or inflow, whichever is less, to the bypassed reach would provide habitat stability and could improve foraging opportunities for aquatic and semi-aquatic wildlife, including waterfowl and some mammals. Stable and consistent flow in the bypassed reach could improve the overall function of riparian habitat and provide a small benefit to wildlife.

Forested wetlands located 175 feet south of the impoundment occur at a higher elevation than the impoundment elevation of between 504.8 and 505.05 feet and would therefore not be affected by proposed operation of the project. There are no wetlands hydrologically connected to the impoundment; therefore, drawdowns and refills associated with project maintenance and emergencies would not affect wetlands.

Vegetation management activities at the project are limited to occasionally mowing and trimming vegetation away from and around project structures and periodically trimming the informal tailwater access trail. Current project operation and maintenance does not include any tree-clearing or major ground-disturbing activities, and GMP does not propose, nor do any action alternatives include, measures that would require tree-clearing or major ground-disturbing activities as part of relicensing.[20] Therefore, because there is minimal upland habitat in the project boundary and minimal vegetation management required at the project, relicensing the project would not significantly affect wildlife and terrestrial habitat.

Shoreline Erosion

Certain modes of operation of hydropower projects may result in rapid or repeated fluctuations in impoundment levels that can affect shoreline erosion. Peaking and flood-storage are examples of modes of project operation that have the potential to contribute to shoreline erosion. Compared to peaking projects and storage projects, run-of-river operation at the Center Rutland Project minimizes the degree of water level fluctuations in the impoundment, which, in turn, minimizes project effects on shoreline erosion.

The Center Rutland Project does not fluctuate impoundment levels for operational purposes or for flood mitigation. GMP propose to continue operating the project in a run-of-

[20] GMP proposes to transfer 1.9 acres of land to the Town of Rutland for the development of an off-license pocket park. Development of the land into a park would require some tree clearing.

river mode, such that outflow from the project approximates inflow to the impoundment at any time and the surface elevation of the impoundment is maintained at an elevation of between 504.8 (elevation of the spillway crest) and 505.05 feet. Continuing to operate the Center Rutland Project in a run-of-river mode would maintain stable impoundment levels and minimize project effects on erosion and terrestrial habitat along the shoreline of the impoundment and Otter Creek downstream of the project.

Pocket Park

The Town's current development plan for the non-project pocket park includes ground disturbance and minimal tree clearing in approximately 0.5 acre of upland forested habitat to construct foot paths, a kiosk, and an overlook area. Proposed vegetation management activities within the pocket park include the removal of invasive species and replanting with native species. Development of the pocket park would lead to the permanent removal of approximately 0.5 acre of terrestrial wildlife habitat and enhancement of the remaining 1.4 acres of terrestrial habitat within the pocket park through the replacement of invasive species with native species. Therefore, development of the pocket park, which is off-license, is unlikely to significantly affect terrestrial resources.

3.3.3 Threatened and Endangered Species

Section 7 of the ESA requires federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. According to the FWS's Information for Planning and Consultation (IPaC) database, the federally endangered NLEB (*Myotis septentrionalis*), proposed tricolored bat (*Perimyotis subflavus*), and candidate monarch butterfly (*Danaus plexippus*) could occur in the project vicinity.[21]

Our analyses of project impacts on the NLEB, tricolored bat, and monarch butterfly are summarized here and presented in full in Appendix E, *Biological Assessment*. Although proposed and candidate species are provided no special protection under the ESA, we nevertheless provide an analysis of the proposed action on these species because they may later be added to the list of federally endangered and threatened species.

ESA-Listed Species

Although no tree-clearing activities are proposed by GMP as part of relicensing, project maintenance activities during the term of any license could require periodic tree removal that may affect NLEB habitat. Avoiding the removal of trees with diameters that are equal to or greater than 3 inches at breast height from April 1 through October 31 would reduce the likelihood of disturbing NLEB in the vicinity of the project boundary and ensure that any tree

[21] *See* Commission staff's March 26, 2024 Memorandum on FWS's Updated List of Threatened, Endangered, Candidate, and Proposed Species; *see also IPaC*, FWS, https://ipac.ecosphere.fws.gov/ (accessed March 26, 2024). A previous IPaC list was requested on August 31, 2023.

removed within the project boundary is not actively occupied by NLEB. We conclude that licensing the project with tree-removal restrictions from April 1 through October 31 for trees equal to or greater than 3 inches DBH is not likely to adversely affect the NLEB.

The Town proposes minimal tree clearing for development of the non-project pocket park and would conduct any tree clearing following protocols from the Vermont ANR and the FWS. Therefore, construction of the pocket park may affect but is unlikely to adversely affect NLEB.

Proposed Species

Project maintenance activities that could affect the tricolored bat are the same as those noted for the NLEB. Avoiding the removal of trees with diameters that are equal to or greater than 3 inches at breast height from April 1 through October 31, would limit project effects on any bats present at the project. We conclude that relicensing the project is not likely to jeopardize the continued existence of the tricolored bat.

Candidate Species

Project operation and maintenance at the Center Rutland Project may affect monarch butterfly or its habitat. Habitat is seasonal and must be present at the time vegetation management activities occur to be affected. Vegetation management activities within the project boundary, including periodic mowing and trimming, are not conducted on a set schedule, and areas within the project boundary that are potentially suitable to support monarch butterfly habitat are not unique compared to areas outside the project boundary in the surrounding vicinity. Therefore, we conclude that any project effect on monarch butterflies would be minor and insignificant.

The Town proposes to remove invasive plant species from the non-project pocket park, and continued park maintenance could require periodic vegetation management that may affect monarch butterfly or its habitat; however, effects would be temporary and localized. Therefore, we conclude that the any effect of the construction and operation of the pocket park by the Town on monarch butterflies would be minor and insignificant.

3.3.4 Land Use, Recreation, and Aesthetics

3.3.4.1 Affected Environment

Land Use

The project is located within the most developed area of the Otter Creek watershed. Land use in the immediate project vicinity is industrial, commercial, and residential (Vermont CGI, 2018). Land cover in the immediate vicinity is predominately developed areas and forest, with areas dominated by wetlands and cultivated crops occurring upstream and downstream of the

project (MRLC, 2021). Current uses of Otter Creek water include hydroelectric power generation, wastewater assimilation, and recreation.

The current project boundary encompasses approximately 11.2 acres (Figure 2) and encloses: (1) approximately 11 acres of land and water in and around the impoundment up to an elevation 507.4 feet; and (2) the project facilities listed above in section 2.1.1. No federal land exists within or adjacent to the project boundary.

Statewide Recreation Plan

The 2019-2023 Vermont Statewide Comprehensive Outdoor Recreation Plan (SCORP) assesses outdoor recreation needs and priorities in the state and sets forth a plan of action for achieving outdoor recreation goals. The SCORP recommends enhancing and expanding recreation programs and participation by emphasizing the health benefits of recreation, opportunities for public recreation access on private lands, and the tourism and economic benefits of protecting natural and cultural heritage (Vermont ANR, 2019).

Regional Recreation Opportunities

Otter Creek is the longest river in Vermont, traveling northward and terminating into Lake Champlain from southern Vermont. The Otter Creek watershed contains numerous opportunities for public recreation, many of which wholly exist or are accessible from within 10 miles of the project.

Within a relatively short drive of the project, there are extensive recreational opportunities. The project is located approximately five miles west of the Green Mountain National Forest (GMNF), Vermont's largest contiguous public land area, with more than 400,000 acres and over 900 miles of mixed-use trails, recreational areas, wilderness areas, downhill and cross-country skiing areas, camping, picnicking, fishing, non-motorized boating, swimming, and wildlife viewing (USFS, no date). A portion of the National Park Service's 14-state, 2,190-mile-long, Appalachian National Scenic Trail is approximately 6 miles southeast of the project boundary. The State of Vermont also operates and maintains a plethora of public recreation areas, wilderness areas, and forests with recreational opportunities within 10 miles of the project, including year-round recreational trails for walking, hiking, biking, horseback riding, snowshoeing, skiing, and/or snowmobiling; swimming, camping, wildlife viewing, boating, paddling, hunting, and trapping. Additionally, the Nature Conservancy manages several publicly accessible conservation parcels within the watershed, which include opportunities for hiking and fishing.

The Town of Rutland operates and maintains several recreational areas and sports fields within 10 miles of the project (Rutland RPD, no date), which include opportunities for ice skating, fishing, walking, hiking, bicycling, picnicking, arboretum, sports fields and courts, playgrounds, and fields. The Town operates and maintains Northwood Park, located approximately four miles northeast of the project and adjacent to the Rutland City Reservoir, which includes hiking and biking trails, tennis courts, basketball court, disc golf course, and pool (The Town of Rutland, Vermont, 2019; Google Earth, 2022). The Town of West Rutland owns,

operates, and maintains the West Rutland Recreation Area and Town Forest, located approximately four miles southwest of the project, which includes a playground, basketball court, baseball field, fields, and dog park (West Rutland Town, 2019; Google Earth, 2022).

Project Recreation Use and Access

There are no formal project recreational facilities; however, GMP allows public use and access of the project land and water for recreation. The public accesses the Otter Creek shoreline via two user-created, informal tailwater access trails. Anglers, hand-carry boaters, and swimmers access Otter Creek by crossing project land, below Old Falls Road on the north bank of Otter Creek, just below the powerhouse. The informal trail, which GMP periodically maintains by trimming vegetation, is an approximately five-foot-wide and 38-feet-long dirt trail that connects an informal parking area to the shoreline of Otter Creek.[22] Additionally, anglers, hand-carry boaters, and swimmers access Otter Creek on the south shoreline, downstream of the dam, via a second user-created trail that starts from a gravel turn off along Simons Avenue (Figure B-2). For safety purposes, all project structures are behind fences and gates to restrict public access. GMP also annually installs a boat barrier upstream of the project dam to warn boaters to exit the river.

Over the term of the current license, GMP documented a significant increase in recreation use at the project, recording 100 recreation days in 2002, and 299 recreation days in 2014. In 2014, GMP also reported that the downstream tailwater access was at 50% capacity utilization.[23] Article 407 of the 1993 license required GMP to develop a recreation plan that included provisions for installing an off-street parking area, signage, landscaping, and a marked footpath to Otter Creek, to be located on land owned by GMP, on the south bank of the river, downstream of the project dam.[24] To date, none of these facilities have been constructed.

Aesthetics

The Center Rutland dam is located on top of the historic Mead Falls, also known as Gookin Falls or Center Rutland Falls. Mead Falls is a natural, 24-foot-high and 60-foot-long ledge and natural rock outcropping spanning the width of Otter Creek. Mead Falls was named for John Mead, who established grist and sawmills in the area and operated a ferry on Otter Creek at the location of the project. The bedrock outcrop below the dam creates a natural waterfall, as the veil of flow over the dam cascades over the natural large boulders into a deep pool at the base of the falls.

From June 1 through October 15 annually, GMP provides a minimum flow of 80 cfs over the spillway, which provides a continuous veiled flow over the natural rock falls. The northern

[22] GMP occasionally maintains the trail as part of its vegetation management practices to trim vegetation back to a minimum of 15 feet from project structures.

[23] *See* Omya 2003, GMP 2015

[24] *See* Omya, Inc., 62 FERC ¶ 62,224 (1993).

shoreline of the impoundment is surrounded by trees and is bordered by residential and industrial development, and the southern shore is surrounded by trees and an old mill building. The wooded banks of the impoundment generally limit visibility from the shoreline to the project water.

Vermont has ten designated scenic byways, three of which pass through Rutland County. Of those three, the Crossword of Vermont Byway, which spans 50 miles and runs from Hartford, Vermont, to West Rutland, Vermont, passes by the Center Rutland Project on U.S. Route 4 (Elm Street). The Center Rutland Project is located in a suburban area, just south of U.S. Route 4 and Vermont Route 3, which are heavily trafficked commuter routes into and out of the Town of Rutland. The Delaware and Hudson Railroad bridge, which is an active Vermont Rail System railroad trestle, crosses perpendicularly over Otter Creek, approximately 15 feet above the project's dam.

The concrete and stone gravity dam and stone and masonry powerhouse are visible downstream of the dam. The dam is partially visible from portions of the northern bank of Otter Creek, and is fully visible to pedestrians on the southern bank of Otter Creek, where GMP and the Town are proposed to develop the non-project pocket park. The project dam is also minimally visible from the U.S. Route 4 (Elm Street) vehicular bridge, which crosses Otter Creek approximately 700 feet downstream of the dam.

3.3.4.2 Environmental Effects

Recreation Use and Access

Currently, GMP allows public use and access of project land and water for recreation. The project's bypassed reach is a popular fishing location, as anglers use the two user-created, informal tailwater access trails to fish downstream of the dam. Swimmers and hand-carry boaters also access Otter Creek downstream of the dam. Anglers, boaters, and swimmers use two informal trails to access Otter Creek, one on the north bank and one on the south bank. The informal tailwater access trail located immediately downstream of the project's powerhouse, along Old Falls Road on the north bank of Otter Creek, is wide enough to transport a hand-carry boat to the shoreline, and GMP periodically maintains the path by trimming vegetation. Anglers and swimmers access the south bank of Otter Creek via a second user-created, informal tailwater access trail that starts at a gravel turn-off along Simons Avenue, downstream of the dam.

GMP's documented increase in informal recreational use and access to the south bank of Otter Creek prompted GMP and the Town to collaborate on the design and development of a small, publicly accessible park (pocket park) on GMP and Town properties located between Simons Avenue and Otter Creek (Figure B-2). In order to accommodate development of the pocket park, GMP proposes to transfer ownership of 1.9 acres of land that is adjacent to the project boundary, to the Town. The land where the park would be located includes the location of the informal tailwater access trail on the south bank of Otter Creek (Figure B-1). GMP states that the park will be designed, constructed, and managed by the Town; therefore, GMP is not proposing the park as a designated project recreation facility. The Town obtained a municipal planning grant from the State of Vermont in 2020 to develop plans for construction of the park

and conducted stakeholder and public meetings to solicit input on design in 2021 and 2022. The preliminary pocket park design includes two parking areas, a hand carry boat put-in, walking trails, beach access, observation areas, a picnic area, and historic and informational signage.

Additionally, GMP proposes to develop and install an informational kiosk featuring cultural heritage information next to the parking area of the Town's non-project pocket park. GMP proposes to collaborate with the Vermont Division of Historic Preservation, the Abenaki Nation, and the Stockbridge Munsee Band of the Mohicans to provide accurate regional cultural information for the storyboard-style kiosk.

Vermont ANR's certification condition F specifies that GMP continue to: (1) provide public access to project land and water; (2) provide access to and maintain the hand-carry put-in/fishing access area located on the north bank, downstream of the powerhouse; and (3) establish an agreement with the Town for a pocket park.

Our Analysis

Article 407 of the 1993 license required GMP to develop a recreation plan that included provisions for installing an off-street parking area, signage, landscaping, and a marked footpath to Otter Creek, all to be located on land owned by GMP on the south bank of the river, downstream of the project dam.[25] Additionally, the license required GMP to explore the feasibility of providing a canoe portage route along the south bank of Otter Creek near Simons Avenue, which traverses lands owned by GMP, Vermont ANR, and the Town. On April 15, 2004, the Commission approved GMP's proposed recreation plan, filed on July 29, 2002,[26] which included plans for installation of a picnic area, kiosk, viewing platform, signs, guard rails, chain link fence, footpath, and a 10-space parking lot with one universally accessible space, as required by Article 407. The recreation plan did not include plans to develop a canoe portage route along the south bank, as required by the license; however, Commission staff determined that the existing informal access trail on the north bank of the river was adequate for canoe access to the project tailwaters. On June 21, 2006, GMP filed a request to amend the approved recreation plan. The amendment, approved by Commission staff on April 10, 2007, still included the construction of a picnic area, small off-street parking area, signage, landscaping, and a marked footpath to the river on the south bank of Otter Creek, but removed the requirement to install a kiosk and viewing platform because GMP was unable to secure the appropriate land use and access from the Town in order to construct and install these facilities.

To date, however, none of the facilities proposed have been constructed. Instead, GMP proposes to transfer 1.9 acres of GMP-owned land to the Town for the development of a non-project pocket park on the southern shoreline, downstream of the project. The proposed pocket

[25] *See* Omya, Inc., 62 FERC ¶ 62,224 (1993).

[26] *See* Omya, Inc., 107 FERC ¶ 62,042 (2004).

park would be in the same area as the facilities proposed, but never constructed, in the recreation plan approved pursuant to Article 407 of the current the license.

The documented ongoing, informal recreational use of the southern shoreline of Otter Creek, at the location of the proposed pocket park, suggests a need for formal recreational facilities to meet recreational demand in the vicinity of the project. The proposed pocket park would improve the recreational experience over existing conditions by providing formalized and maintained recreational access to Otter Creek's southern shoreline, downstream of the project dam, for hand-carry boaters, anglers, swimmers, and passive recreationists. It also would provide new amenities in the form of a picnic area, beach access, observation points, and historic and cultural signage. Improved recreational access to Otter Creek and new recreational amenities would satisfy the need for recreational facilities at the project and in Otter Creek, which has been demonstrated by documented recreational use of the project. As proposed, GMP's pocket park design, operation, and maintenance would be executed by the Town, which has obtained a municipal planning grant from the state of Vermont and started soliciting input and developing plans for the pocket park design. While it would not be a project facility, the Town's ownership of the land would ensure it remained publicly accessible even if the pocket park amenities were not built.

To confirm that recreational needs at the project are being met throughout the term of any license issued, it would be beneficial to periodically assess recreational demand at the project and the adequacy of existing recreational features to meet that demand. Further, the development of the proposed pocket park and its associated amenities would create new and expanded recreational access and opportunities at the project. As a result, it is reasonable to expect that recreational demand at the project, and at the proposed pocket park, may increase over the term of any new license issued.

Regular monitoring of recreational use at the project would ensure that the existing informal access along the northern bank and the proposed pocket park on the southern bank continue to meet current and future recreation needs for angling, boating, and swimming in Otter Creek. Developing a recreation monitoring plan would ensure that recreational use data is captured at reasonable and regular intervals and that the data clearly describes existing recreational use at the project. Conducting recreation use monitoring within five years after completion of the proposed pocket park would be beneficial to evaluate and determine the adequacy of the newly completed recreational amenities and access at the park. A good recreation monitoring plan should collect the following recreation use data, at a minimum: (1) number of recreational users, (2) types of recreational use observed, (3) duration of time recreational users spend at the site, (4) adequacy of amenities and access to meet recreational demand, and (5) a description of the methods used to collect use data. A good plan would also include provisions for consulting with stakeholders and the process for identifying the need for any additional recreational facilities. After performing an initial monitoring report, the plan could also specify how stakeholders would be consulted to determine the frequency of subsequent recreational use monitoring efforts at the project.

GMP also proposes to develop and install an informational kiosk featuring cultural heritage information at the pocket park. According to the proposal, the kiosk would detail the

history of the falls and surrounding area and would be located within the proposed pocket park's boundary, on the south bank of Otter Creek. While GMP would design and construct the proposed kiosk, the kiosk would be maintained by the Town. Installation of the kiosk would improve the recreational user experience by providing historic significance and cultural context of the area to visitors.

Vermont ANR's certification condition F specifies that GMP continue to provide public access to the project's land and water, which GMP currently provides and proposes to continue to provide in any subsequent license. Vermont ANR's certification condition F also specifies that GMP continue to provide access and maintain the hand-carry put-in/fishing access area located downstream of the powerhouse, which GMP also proposes to continue to provide in any subsequent license. Finally, Vermont ANR's certification condition F specifies that GMP establish an agreement with the Town for a pocket park, which is similar to GMP's proposal.

Land Use

No issues related to land use were identified during scoping and GMP does not propose any measures regarding land use, nor does GMP propose any changes to the project boundary.

Our Analysis

Project boundaries should enclose "only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources." Although GMP is not proposing changes to the project boundary, it is proposing to not reinstall the flashboards, which are included in the project facilities under the current license, and which have not been installed since 2012. The wooden flashboards were 2-foot-3-inches high by 174-feet-long and held the impoundment at a normal pool of 507.4 feet. Without the flashboards in place, the impoundment is currently held at a normal pool elevation of 505.05 feet.

With the proposal to make the removal of the flashboards permanent, the impoundment would be maintained at an elevation of 505.05 feet when a seasonal minimum flow of 80 cfs is being released over the spillway. The existing project boundary around the impoundment, however, assumes the presence of flashboards and follows a contour elevation of 507.4 feet, which results a net increase of approximately 1.2 acres of shoreline around the project impoundment. Consequently, the existing project boundary around the impoundment would require revisions to exclude land above the 505.05 feet contour. With the removal of the flashboards, the inclusion of this land within the project boundary does not appear to be warranted, and removal of this land from the project boundary would not affect project uses or substantially affect land use.

As GMP is not proposing any changes to the management of land within the proposed project boundary, continued operation of the project would have no effect on land use resources.

Aesthetics

GMP is not proposing any new construction or changes to project facilities; however, to enhance and protect both aquatic and aesthetic resources, GMP proposes to continue operating the project in a run-of-river mode and providing a minimum flow of 80 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from June 1 through October 15. To improve aquatic and aesthetic resources, GMP also proposes to implement a minimum flow of 40 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from October 16 through May 31. Currently, there are no minimum flow requirements from October 16 through May 31.

Vermont ANR certification condition B would require GMP to release a year-round minimum flow of 60 cfs, or inflow, whichever is less, into the bypassed reach.

Our Analysis

As part of the previous licensing process, the Vermont Marble Company (the applicant at the time), Kleinschmidt Associates (Vermont Marble Company's consultants), and Vermont ANR conducted a flow demonstration study for aesthetics and fish habitat in the project's bypassed reach. The results of the 1992 study, which evaluated flows of 0, 20, 40, 60, 80, and 100 cfs, indicate that at 40 cfs some minor falls were visible; at 60 cfs the minor falls widened and much more coverage of the rock chutes was evident; at 80 cfs the chutes were well covered with white water and provided what was considered an optimum veil of water over the spillway; and at 100 cfs, little additional coverage was noticeable, but the depth of the chutes and volume of the minor falls increased slightly. The study results also state that there was no significant change in the acoustics of the fall volume from 60 to 100 cfs.

On December 8, 2021, GMP, Vermont ANR, and Vermont Fish and Wildlife Department agreed to study five aesthetic flows of 20, 40, 60, 80, and 100 cfs during the spring 2022 study season. However, on October 3, 2022, GMP reported that it was unable to conduct the aesthetic flow study as planned, due to extreme low flow conditions. Therefore, GMP utilized the results of the 1992 study to develop the proposed flow volume that would be most beneficial for aesthetic resources at the project. The bypassed reach is only 100-feet in length, and consists of bedrock and boulders, which is unlikely to have changed significantly in structure, quantity, or quality since 1992. Therefore, the 1992 flow demonstration study results are sufficient to adequately determine the characteristics and benefits of a variety of flow ranges in the bypassed reach.

GMP's proposal to continue to maintain the seasonal minimum flow of 80 cfs, or inflow, whichever is less, over the spillway from June 1 through October 15 would result in no change in aesthetic resources compared to existing conditions. It would ensure existing visual and sound aesthetics at the project are maintained by providing a consistent veil of water over the spillway through the peak recreation season and would provide sufficient water levels to continue supporting boating and angling in the bypassed reach. The proposed seasonal minimum flow of 80 cfs would continue to provide a continuous veil of water over the spillway, a pleasing sound in the project vicinity, and an improved recreational experience for recreationists downstream of the dam.

GMP's proposal to release a minimum flow of 40 cfs, or inflow, whichever is less, from October 16 through May 31 would provide some added visual and sound benefits compared to the existing conditions, because there is no required minimum flow during this period. The 1992 flow demonstration study found that from October 16 through May 31, flows in Otter Creek exceed the project's maximum hydraulic capacity of 190 cfs 93% of the time, resulting in frequent flow releases over the crest of the Center Rutland Project's spillway. In the months of April and May, the maximum hydraulic capacity of the project is exceeded 99.74% of the time and 98.70% of the time, respectively. In addition, the 1992 flow demonstration study describes a 40 cfs flow as providing negligible flow over the spillway, but states that it is enough flow for the tailrace and deep pool to remain hydraulically connected. Nevertheless, the proposed 40 cfs minimum flow from October 16 through May 31 would be an overall improvement to the visual aesthetics at the project by providing a continuous, regular flow over the spillway and into the bypassed reach. Additionally, the sound aesthetics in the bypassed reach would be improved by providing a 40 cfs minimum flow compared to existing conditions when there could be little or no flow passing over the spillway and through the bypassed reach under certain flow and project operation conditions.

Vermont ANR's certification condition B specifies that GMP release a year-round minimum flow of 60 cfs to the bypassed reach, which is 20 cfs less than GMP's proposed seasonal minimum flow release of 80 cfs from June 1 through October 15. Currently, GMP provides a minimum flow of 80 cfs, or inflow, whichever is less, into the bypassed reach to protect water quality, fish and wildlife resources, and aesthetic resources. As determined by the 1992 flow demonstration study, study participants determined that 80 cfs was the preferred flow because it protected aquatic resources by maintaining interconnected aquatic habitat, improved water quality, and improved aesthetics for summer months, when project recreation use is highest. At 80 cfs, chutes in the bypassed reach were well covered with white water and it provided an optimum veil of water over the spillway. Vermont ANR's certification specification would reduce the minimum flow volume, which would result in a reduction in the overall quality of the visual and sound aesthetics for recreational users at the project. Additionally, a lower minimum flow during peak recreation season would reduce wetted areas in the bypassed reach, and impact recreational boating and angling downstream of the dam.

Vermont ANR's certification specification that GMP release a year-round minimum flow of 60 cfs to the bypassed reach would also be 20 cfs more than GMP's proposed seasonal minimum flow of 40 cfs from October 16 through May 31. A 20 cfs increase from GMP's proposed minimum flow in the bypassed reach would slightly enhance visual and sound aesthetics at the project by maintaining a consistent, fuller veil of water over the spillway and onto the rocks in the bypassed reach through the fall and winter months. However, these benefits would be minimal because portions of the falls and bypassed reach are likely to be covered in ice during this period, reducing the effects of any visual and sound aesthetics. Vermont ANR's certification specification would provide minimal enhancements to the visual aesthetics by only slightly increasing wetted areas in the bypassed reach and whitewater over the spillway. Further, providing a 60 cfs minimum flow in the off-season would offer negligible benefits to visitors and recreationists at the project, as "winter access to viewing locations is unlikely."

3.3.5 Cultural Resources

3.3.5.1 Affected Environment

Section 106 of the NHPA requires that the Commission take into account the effects of its actions on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment on the undertaking. Historic properties are those that are listed or eligible for listing on the National Register. The regulations implementing section 106 of the NHPA also require that the Commission seek concurrence with the SHPO on any finding involving effects or no effects on historic properties, and consult with interested Indian Tribes or Native Hawaiian organizations that attach religious or cultural significance to historic properties that may be affected by an undertaking. In this document, we also use the term "cultural resources" for properties that have not been determined eligible for listing on the National Register. Cultural resources represent things, structures, places, or archaeological sites that can be either prehistoric or historic in origin. In most cases, cultural resources less than 50 years old are not considered historic.

Area of Potential Effect

Pursuant to section 106 of the NHPA, the Commission must take into account whether any historic properties within the proposed project's area of potential effect (APE) could be affected by the issuance of a license for the project. The Advisory Council on Historic Preservation defines an APE as the geographic area or areas in which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist (36 C.F.R. § 800.16(d)).

GMP defines the APE as including: (1) the project boundary and/or lands located with 10-meters (32.8 feet) of the edge of the riverbank; (2) two GMP-owned parcels at the northwestern portion of the APE; (3) three houses located across Old Falls Road; (4) the area for the proposed pocket park downstream of the dam; and (5) all infrastructure associated with the project.[27] On September 24, 2020, the Vermont SHPO concurred with GMP's APE.[28]

Pre-Contact Period

The pre-contact history of the Northeast is generally characterized by the Paleoindian, Archaic, and Woodland periods. The earliest known archaeological remains in Vermont date to the Paleoindian period. These sites were created by small groups of hunter-gatherers who colonized the recently deglaciated sections of the state during the eleventh millennium before present (BP) (Deller and Ellis, 1992; Stork, 1997 and 2004). Paleoindian people living in the

[27] *See* December 23, 2021, final license application at E-4-91.

[28] Documentation of concurrence with the APE was filed with GMP's February 6, 2023 response to the Commission's November 23, 2022 Additional Information Request.

region were highly mobile hunters and gatherers reliant mainly on caribou that were abundant at that time (Spiess et al., 1998).

The Archaic period represents the longest cultural period in the region. The Archaic period is subdivided in to at least three sub periods, the Early (10,000 to 7500 BP), Middle (7500 to 6000 BP), and Late Archaic (6000 to 3000 BP). These sub-periods are largely demarcated by changes in projectile point styles. The Early Archaic was contemporaneous with a climatic warming trend. The draining of the Champlain Sea and post-glacial lakes down to their current elevations created drastic changes in Vermont's landscape, with the creation of substantial wetlands, the opening of major river valleys and floodplains, and an increase in forest cover. Sites of the Archaic period onwards tend to be found close to significant water sources.

The Woodland period is marked by the introduction of ceramic technology about 3,000 years ago. The largest sites did not occur until the later portion of the Woodland period and are most often located in the lower reaches of Vermont's major river valleys. During the Middle Woodland period, areas along the lower reaches of rivers were used for large gatherings of people who fished, harvested nuts, and hunted. Throughout the Northeast, the Late Woodland period is associated with the introduction of horticulture, particularly the importation of domesticated maize. Although maize was adopted throughout New England, there is little evidence of the development of large sedentary villages based on maize horticulture (Petersen and Cowie, 2002). Rather, archaeological evidence indicates that people remained mobile hunter-gatherers who only used maize as a dietary supplement. The Late Woodland period ended with European contact in approximately 1600 Common Era (CE).

Post-Contact Period

The initial settlement around the area of present-day Town of Rutland started in the mid-18th century. In 1770, the James Mead family became the first permanent family to settle in Rutland (Henry, 1988). The family settled about one-half mile west of the Center Rutland falls. Within a few years, James Mead built the first mills (both saw and grist) to take advantage of the waterpower at the falls, which were later named after Mead. By the 1820s, many Rutland farmers were raising sheep for wool, and between 1830 and 1850 the town had the largest sheep population in the country (Vermont Division for Historic Preservation, 2018). Agriculture remained important in the second half of the 19th century as farmers gradually shifted their emphasis from raising sheep to dairying.

Marble quarrying on a large scale began in the area in the late 1830s and 1840s (Henry, 1988). In the 1850s, Rutland became the railroad center of Vermont. Railroad lines from Rutland ran north and south and west and southeast. Arrival of the railroad aided in the growth of the marble industry and by 1870, Rutland was located at the center of the world's largest marble business. After 1880, the marble industry was overwhelmingly dominated by the Vermont Marble Company based out of the Town of Proctor, located just downstream of the Center Rutland dam (Rutland Historical Society, No Date).

After James Mead built the first grist and sawmills at Mead Falls, William and Richard Gookin acquired the land surrounding the falls and proceeded to develop other small water-powered industries, including a fulling mill on the south side of the falls and a paper mill, as well as a grist mill, on the north side (Henry, 1988). Dr. James Porter subsequently acquired part of

the Gookin property at the falls. Dr. Porter and William F. Barnes established the first marble mill situated on the north side of the dam near the present-day powerhouse. In about 1850, the first railroad reached Mead Falls (then referred to as Gookin Falls) and crossed the Otter Creek on a multi-span, wood-truss bridge constructed directly over the falls. The introduction of vastly improved transport likely induced Charles Clement and William Gilmore to purchase land on the south side of the river and construct a second marble mill at the falls (Henry, 1988).

The 1870s brought enormous expansion of the Rutland marble industry, accompanied by major corporate consolidation (Henry, 1988). The many small firms that had emerged at the middle of the century were rapidly absorbed into an even smaller number of ever larger and more powerful companies. The Clement firm disappeared at the beginning of 1877 and was bought by the Rutland Marble Company (Henry, 1988). The corporate consolidation of the Rutland marble industry culminated in 1880 with the merging of the Rutland Marble Company and its principal competitor, the Sutherland Falls Marble Company, into Vermont Marble Company with headquarters located at Sutherland Falls in nearby Proctor. Through this merger, the Vermont Marble Company acquired both marble mills, the dam, and the related property at the Center Rutland falls (Henry, 1988).

The project's stone masonry dam was originally constructed by the Clement, Gilmore & Co. marble firm circa 1850 for the first marble mill (Henry, 1988). The dam was rebuilt in 1928. The existing marble block and rubble project powerhouse was originally built circa 1878 by the Rutland Marble Company for a hydromechanical system. The powerhouse was enlarged circa 1900 by the Vermont Marble Company after a new turbine and penstock had been installed (Henry, 1988). The powerhouse building was then reconstructed in 1914 to accommodate the installation of hydroelectric generating equipment. The generating equipment originally installed in 1914 was partly rebuilt in 1940 but retains the original casings and continues to represent early 20th century hydroelectric generating technology (Henry, 1988).

Project facilities remain virtually intact from 1914 when the Vermont Marble Company initiated electric generation at the site. Furthermore, it retains the layout and engineering design of the predecessor hydromechanical station dating from circa 1898 and incorporates some structural elements of the original development at this hydraulic setting from circa 1878 (Henry, 2018).

Previously Identified Historic Properties

Several project and non-project facilities have been previously identified as a historic district eligible for the National Register. The Center Rutland Hydroelectric Station Historic District (Historic District) includes the project dam, powerhouse and generating equipment, penstock, marble retaining wall, intake structure, marble pumphouse, former pumphouse, transformer yard, stream gaging station, the Delaware and Hudson Railroad bridge, the former Route 4 bridge abutments, Clement Mill ruins, and the Clarendon and Pittsford Railroad bridge.[29] The Historic District is considered historically significant because it includes both

[29] The Delaware and Hudson Railroad bridge and Clarendon and Pittsford Railroad bridge are not project facilities and are not owned by GMP. The Delaware and Hudson Railroad

industrial buildings and engineering structures that embody the distinctive characteristics of an early 20th century hydroelectric generating station and a contemporary hydromechanical-powered marble sawing mill.

Cultural Resources Investigations

GMP conducted an Archaeological Resources Assessment (ARA), Phase IB Survey Report (Phase IB), and subsequent Phase II Evaluation (Phase II) at one pre-contact archaeological site.[30]

The ARA identified six Archaeologically Sensitive Areas (ASAs) within and adjacent to the project's APE. Four of the identified ASAs contain portions of previously identified archaeological sites (VT-RU-0265, VT-RU-0267, VT-RU-0674, and VT-RU-0266).[31] Two ASAs were not found to contain any previously identified archaeological sites, and two ASAs were determined sensitive for post-contact Euro American resources and for pre-contact Native America resources. The ARA recommended a Phase I survey for the three identified ASAs that were determined sensitive for pre-contact archaeological sites given their location along alluvial riverside terraces. The Vermont SHPO concurred with this report and recommendation on October 28, 2020.

The Phase IB was conducted in November 2020. The Phase IB survey identified pre- and post-contact artifacts within the APE and previously identified site VT-RU-0266. The Phase IB survey report recommended that VT-RU-0266 undergo a Phase II archaeological evaluation as it was threatened by erosion and is located within the project's APE. Further Phase II evaluation was not recommended for VT-RU-0674, VT-RU-0267, and VT-RU-0265 as no project effects were identified. GMP recommended that VT-RU-0674, VT-RU-0267, and VT-RU-0265 undergo Phase II evaluation if any future project-related activities might result in project effects to the sites. The Vermont SHPO concurred with this report and recommendation on March 3, 2021.

GMP conducted a Phase II archaeological evaluation of the one archaeological site that was identified during the Phase IB (VT-RU-0266). The Phase II evaluation included additional archival research and fieldwork at the identified site. Site VT-RU-0266 is characterized as a multi-component pre- and post-contact era archaeological site. The post-contact portion of the site was recommended as eligible for listing on the National Register under Criterion D for the

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bridge crosses perpendicularly over Otter Creek, approximately 15 feet above the project dam, and the Clarendon and Pittsford Railroad bridge is located approximately 500 feet upstream of the project dam. Both bridges are located within the project boundary.

[30] *See* December 23, 2021 final license application, at Appendix E (privileged).

[31] Any information containing location, character, and ownership information about archaeological sites is considered privileged information and cannot be disclosed in this EA.

potential to yield important information about the Clement family.[32] The Clements played a major role in the early development of the marble, railroad, and banking industries, as well as late-nineteenth and early-twentieth century politics in Vermont.

3.3.5.2 Environmental Effects

Article 408 of the current license requires the licensee to implement provisions of the Programmatic Agreement Among the Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation, and the Vermont Division of Historic Preservation for the Management of Historic Properties Affected by the Continued Operation of the Center Rutland Hydroelectric Project executed on April 12, 1993. Pursuant to Article 408 of the current license, a Cultural Resources Management Plan (CRMP) was filed on July 28, 1999. In a letter filed on May 21, 2019, the Vermont SHPO states that compliance with the terms of the CRMP has been sporadic, resulting in an incomplete record of activities affecting cultural resources.

GMP proposes to continue operating the project in a run-of-river mode, such that outflow from the project approximates inflow. GMP also proposes to develop an HPMP in consultation with the Vermont SHPO to protect historic properties that are eligible for or listed on the National Register.

The Vermont SHPO recommended that GMP consult with the Stockbridge Munsee Band of Mohicans. GMP consulted with the Stockbridge Munsee Band of Mohicans on July 24, 2019, and on July 25, 2019, the Tribe responded that there are no anticipated concerns related to cultural resources because no ground disturbance is proposed.

On January 11, 2022, the Vermont SHPO filed comments stating that it commissioned a study, entitled *Run-of-River Hydroelectric Dam Bank Erosion and Cultural Resources in Vermont*, to examine how run-of-river operation affects riverbank erosion and deposition, and to assess the potential impact of run-of-river operation on cultural resources.[33] Based on the study results, the Vermont SHPO concluded that the project's run-of-river operation could affect archaeological resources in the floodplains and low alluvial terraces along the impoundment shoreline. As described in section 3.3.2.2, *Terrestrial Resources, Environmental Effects, Shoreline Erosion*, the SHPO's report concludes that the observed erosion along the shoreline of the impoundment is caused by: (1) the presence of the dam; (2) the accumulation of sediment in the impoundment; (3) water level fluctuations associated with project operation; and (4) local groundwater and sediment/soil pore pressures. The report states that the shoreline erosion could impact buried cultural resources and that the shoreline should be surveyed for cultural remains.

[32] Per 36 C.F.R. § 60.4, National Register Criterion D is defined as having yielded, or may be likely to yield, information important in prehistory or history.

[33] *See* the Vermont SHPO's January 11, 2022 Comments on Cultural Resource Studies and Run-of-River Hydroelectric Dam Bank Erosion and Cultural Resources in Vermont. This filing was submitted under several proceedings in Vermont, including the Center Rutland Project.

In addition, the report recommends mitigating the effects of shoreline erosion, but does not provide any specific measures.

Our Analysis

Area of Potential Effect (APE)

The APE for the project should include all land enclosed by the project boundary and land or properties outside of the project's boundary where project construction and operation or project-related recreational development or other enhancements may cause changes in the character or use of historic properties, if any historic properties exist.

GMP's APE includes the current project boundary and all infrastructure associated with the project, a 10-meter (32.8 feet) buffer around the project impoundment, two GMP-owned parcels at the northwestern portion of the APE, the area for the proposed pocket park, and three houses located across Old Falls Road.

According to public records, the three residential buildings across Old Falls Road are over fifty years old and it is possible, due to age, that the buildings are eligible for listing on the National Register based on criteria listed under 36 CFR § 60.4.[34] However, these buildings are not owned by GMP and are not used for any project purposes. GMP is not proposing any project related construction that would visually or physically impact these residential buildings, and continued operation and maintenance of the project would not have any reasonably foreseeable effects on the residential buildings. Additionally, GMP does not provide information regarding potential project effects on the three residential buildings. Therefore, the three residential buildings should not be included in the APE.

GMP's APE also includes the area of the proposed pocket park. As discussed in section 3.3.4.2, *Land Use, Recreation, and Aesthetics, Environmental Effects*, the proposed pocket park is being developed by GMP and the Town through an off-license agreement. The park would not be considered a project facility and the land proposed to be developed is not currently part of the FERC-licensed project boundary. Therefore, any development of the proposed pocket park would not be considered project-related construction. Although GMP and the Town are still proposing to consult with the Vermont SHPO and Tribes on the development of the proposed pocket park, because it would be a non-project facility, the area should not be included in the APE.

As discussed in section 3.3.4, *Land Use*, the existing project boundary around the impoundment assumes the presence of flashboards and follows a contour elevation of 507.4 feet. GMP is proposing to not reinstall the flashboards, which would result in the impoundment being maintained between 504.8 (elevation of the spillway crest) and 505.05 feet. GMP has been

[34] In accordance with NHPA regulations, if there are potential project effects to project facilities over 50 years in age, they must be evaluated for eligibility for listing on the National Register.

operating the project without the flashboards since 2012. The change in impoundment elevation from 505.05 feet to 507.4 feet would result in a net increase of approximately 1.2 acres of shoreline around the project impoundment. While land above the 505.05-foot contour would not be needed for project purposes and therefore removed from the project boundary, due to the possibility of archaeological resources along the impoundment shoreline, this land should remain in the APE.

Shoreline Erosion

As discussed in section 3.3.2.2, *Terrestrial Resources, Environmental Effects, Shoreline Erosion*, the project operates in a run-of-river mode and does not fluctuate impoundment levels for peaking operation or flood mitigation. GMP proposes to continue operating the project in a run-of-river mode such that project outflow approximates inflow, and to not reinstall the flashboards.

Continuing to operate the project in a run-of-river mode, and to not reinstall the flashboards, would maintain stable impoundment levels and minimize project effects on erosion and cultural resources along the impoundment shoreline. Therefore, project-induced erosion would not be an adverse project effect on cultural resources.

Effects to Historic Properties

The Historic District is eligible for listing on the National Register, including contributing resources that are part of the project (i.e., the project dam, powerhouse and generating equipment, penstock, marble retaining wall, and intake structure). Continued operation and maintenance of the project could have adverse effects on the historic properties identified above if there are no protective measures in place. Specifically, adverse effects could occur in the event repairs are needed to maintain the structure and function of the project facilities that are contributing resources of the Historic District. Other contributing resources to the district include a marble pumphouse, former pumphouse, transformer yard, stream gaging station, the Delaware and Hudson Railroad bridge, the former Route 4 bridge abutments, Clement Mill ruins, and the Clarendon and Pittsford Railroad bridge. These resources are not project facilities; however, any alterations and/or continued operation and maintenance of the project facilities could diminish the visual integrity of the non-project contributing resources, which would result in an adverse effect to the Historic District. Additionally, Vermont ANR's certification specifies that GMP begin preparing a plan to provide upstream eel passage at the project. If the installation of an upstream eel passage facility is located at the dam, it may have an adverse effect on the project dam. Installation of the eel ramp could diminish the visual or physical integrity of the dam, or other contributing resources to the Historic District.

GMP's archaeological studies conclude that there are archaeologically sensitive areas within the APE for the project, as well as National Register-eligible site VT-RU-0266. Any maintenance activities during the term of any license could also require ground disturbance that could adversely affect archaeological resources. For safety purposes, GMP maintains the two user-created tailwater access trails at the project. Use and maintenance of the tailwater access trails has the potential to adversely affect cultural resources as a result of soil disturbance and

vegetation management as GMP conducts occasional mowing and trimming activities. Additionally, as discussed in section 3.3.4.2, *Land Use, Recreation, and Aesthetics, Environmental Effects*, GMP allows public use of project land and water for recreation. Trampling and looting that are sometimes associated with recreation access also have the potential to damage cultural resources.

GMP would need to consult with the Vermont SHPO and federally recognized Tribes prior to any ground disturbance to determine the effects of the activities and the need for any cultural resource measures. It is also possible that unknown historic properties may be discovered during project operation, or other project-related activities that require ground disturbance.

GMP proposes to develop an HPMP in consultation with the Vermont SHPO to protect historic properties that are eligible for or listed on the National Register. Developing and implementing an HPMP, in consultation with the Vermont SHPO, would ensure that measures are in place to protect historic properties in the APE from adverse effects related to the operation and maintenance of project facilities and potential adverse effects related to recreation enhancements. An HPMP would also ensure that any previously undiscovered archaeological resources within the APE are not adversely affected by the project during the term of any new license.

To meet the requirements of section 106 of the NHPA, the Commission intends to execute a Programmatic Agreement (PA) with the Vermont SHPO for the proposed project to protect historic properties. The terms of the PA would require GMP to develop and implement an HPMP to ensure that the proposed project does not adversely affect historic properties in the APE.

3.3.6 Environmental Justice

In conducting NEPA reviews of hydroelectric projects, the Commission follows Executive Orders 12898 and 14096, which direct federal agencies to identify, analyze, and address disproportionate and adverse human health or environmental effects of their actions on environmental justice communities.[35] Executive Order 14008 also directs agencies to develop programs, policies, and activities to address the disproportionate and adverse "human health, environmental, climate-related and other cumulative impacts on disadvantaged communities, as well as the accompanying economic challenges of such impacts."[36] Environmental justice is "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of

[35] Exec. Order No. 12,898, 59 Fed. Reg. 7629 (Feb. 11, 1994); Exec. Order No. 14,096, 88 Fed. Reg. 25251 (Apr. 21, 2023).

[36] Exec. Order No. 14,008, 86 Fed. Reg. 7619, at 7629 (Jan. 27, 2021).

environmental laws, regulations, and policies."[37] The term "environmental justice community" includes communities that have been historically marginalized and overburdened by pollution.[38]

Commission staff used *Promising Practices for EJ Methodologies in NEPA Reviews* (*Promising Practices*),[39] which provides methodologies for conducting environmental justice analyses throughout the NEPA process for this project. Additionally, consistent with EPA recommendations, Commission staff used EPA's Environmental Justice Screening and Mapping Tool (EJScreen) as an initial screening tool to better understand locations that require further review or additional information regarding minority and/or low-income populations; potential environmental quality issues; environmental and demographic indicators; and other important factors.[40]

Consistent with *Promising Practices*, and Executive Orders 12898 and 14096, we reviewed the project to determine if its resulting impacts would be disproportionate and adverse on minority and low-income populations and also whether impacts would be significant.[41] *Promising Practices* provides that agencies can consider any of a number of conditions in this

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[37] *See* EPA, EJ 2020 Glossary (Feb. 2024), https://www.epa.gov/system/files/documents/2024-02/ej-2020-glossary.pdf. Fair treatment means that no group of people should bear a disproportionate share of the negative environmental consequences resulting from industrial, governmental, and commercial operations or policies. *Id.* Meaningful involvement of potentially affected environmental justice community residents means: (1) people have an appropriate opportunity to participate in decisions about a proposed activity that may affect their environment and/or health; (2) the public's contributions can influence the regulatory agency's decision; (3) community concerns will be considered in the decision-making process; and (4) decision makers will seek out and facilitate the involvement of those potentially affected. *Id.*

[38] Environmental justice communities include, but may not be limited to minority populations, low-income populations, or indigenous peoples. *See* EPA, EJ 2020 Glossary (Feb. 2024), https://www.epa.gov/system/files/documents/2024-02/ej-2020-glossary.pdf.

[39] Federal Interagency Working Group on Environmental Justice & NEPA Committee, *Promising Practices for EJ Methodologies in NEPA Reviews* (Mar. 2016) (*Promising Practices*), https://www.epa.gov/sites/default/-files /2016-08/documents/nepa_promising_practices_document_2016.pdf.

[40] EPA, *Purposes and Uses of EJScreen* (Jan. 9, 2024) https://www.epa.gov/ejscreen/purposes-and-uses-ejscreen ("Screening tools should be used for a 'screening-level' look. Screening is a useful first step in understanding or highlighting locations that may be candidates for further review.").

[41] An agency may determine that impacts are disproportionate and adverse, but not significant within the meaning of NEPA and in other circumstances an agency may determine that an impact is *both* disproportionate and adverse and significant within the meaning of NEPA. *See Promising Practices* at 33.

determination and the presence of any of these factors could indicate a potential disproportionate and adverse impact.[42] For this project, a disproportionate and adverse effect on an environmental justice community means the adverse effect is predominantly borne by such population. Relevant considerations include the location of project facilities and the project's human health and environmental impacts on identified environmental justice communities, including direct, indirect, and cumulative impacts.

3.3.6.1 Affected Environment

Meaningful Engagement and Public Involvement

In addition to the information provided above, the Council on Environmental Quality's (CEQ) Environmental Justice Guidance Under the National Environmental Policy Act (CEQ, 1997) and *Promising Practices*, recommend that federal agencies provide opportunities for effective community participation in the NEPA decision-making process by: identifying potential effects and mitigation measures in consultation with affected communities; improving accessibility of public meetings, crucial documents, and notices; and using adaptive approaches to overcome potential barriers to effective participation. In addition, Executive Orders 13985 and 14096, strongly encourage independent agencies to "consult with members of communities that have been historically underrepresented in the Federal Government and underserved by, or subject to discrimination in, Federal policies and programs,"[43] and "provide opportunities for the meaningful engagement of persons and communities with environmental justice concerns who are potentially affected by Federal activities."[44]

The opportunities for public involvement during the Commission's review process are described in section 1.4, *Public Review and Comment*.

All documents that form the administrative record for this proceeding, with the exclusion of privileged or critical energy infrastructure information, are available to the public electronically on the FERC's website (https://elibrary.ferc.gov/eLibrary/search). We recognize that not everyone has internet access or is able to file electronic comments. Anyone may comment to FERC about the proceeding, either in writing or electronically.[45] All substantive

[42] There are various approaches for determining whether an impact will cause a disproportionate and adverse impact, and one recommended approach is to consider whether an impact would be "predominantly borne by minority populations or low-income populations." *See id.* at 44-46.

[43] Exec. Order No. 13985, 86 Fed. Reg. 7009, at 7011 (Jan. 20, 2021).

[44] Exec. Order No. 14,096, 88 Fed. Reg. 25254 (Apr. 21, 2023).

[45] The Office of Public Participation (OPP) provides members of the public, including environmental justice communities, landowners, Tribal citizens, and consumer advocates, with assistance in FERC proceedings—including navigating Commission processes and activities

environmental comments received prior to issuance of this EA have been addressed within this document. No entity provided comments or recommendations regarding the effects of the project on environmental justice communities in response to the Commission's notice that the application was ready for environmental analysis.

Identification of Environmental Justice Communities

According to CEQ's *Environmental Justice Guidance* and *Promising Practices*, minority populations are those groups that include: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Following the recommendations set forth in *Promising Practices*, FERC uses the **50 percent** and the **meaningfully greater analysis** methods to identify minority populations. Using this methodology, minority populations are defined in this EA where either: (a) the aggregate minority population of the block groups in the affected area exceeds 50 percent; or (b) the aggregate minority population in the block group affected is 10 percent higher than the aggregate minority population percentage in the county. The guidance also directs low-income populations to be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau. Using *Promising Practices'* **low-income threshold criteria** method, low-income populations are identified as census block groups where the percent low-income population in the identified block group is equal to or greater than that of the county. Here, Commission staff selected Rutland County, Vermont, in which the project action is located, as the comparable reference community to ensure that affected environmental justice communities are properly identified.

Table C-4 identifies the minority populations (by race and ethnicity) and low-income populations within the county affected by the relicense application (Rutland County, Vermont), and U.S. census block groups[46] within the vicinity of the project site. For this project, staff chose a 1-mile radius around the project boundary (Figure B-4). Staff determined that a 1-mile radius is sufficient to encompass and address any potential impacts that may arise from the proposed action given the limited scope of the proposed relicensing, including limited construction activities and the concentration of project-related effects within the project boundary. To ensure we are using the most recent available data, we use U.S. Census American

relating to the project. For assistance with interventions, comments, requests for rehearing, or other filings, and for information about any applicable deadlines for such filings, members of the public are encouraged to contact OPP directly at 202-502-6595 or OPP@ferc.gov for further information.

[46] Census block groups are statistical divisions of census tracts that generally contain between 600 and 3,000 people. U.S. Census Bureau. 2022. Glossary: Block Group. Available online at: https://www.census.gov/programs-surveys/geography/about/glossary.html#par_textimage_4. Accessed January 2024.

Community Survey File# B03002 for the race and ethnicity data and Survey File# B17017 for poverty data at the census block group level.[47]

Within the study area, staff identified three block groups that qualify as environmental justice communities with low-income populations (Census Tract 962600, Block Group 1; Census Tract 963200, Block Group 4; and Census Tract 963300, Block Group 4); and two block groups qualify as environmental justice communities with minority and low-income populations (Census Tract 963100, Block Group 2; and Census Tract 963200, Block Group 3).

3.3.6.2 Environmental Effects

The actions and PM&E measures proposed by GMP are described in section 2.2, *Applicant's Proposal,* and staff's recommended alternative is described in section 2.3, *Staff Alternative*.

No entity provided comments or recommendations regarding the effects of the project on environmental justice communities in response to the Commission's notice that the application was ready for environmental analysis.

Our Analysis

Staff evaluated the effects of continued project operation on aquatic resources, terrestrial resources, threatened and endangered species, land use, aesthetics, recreation resources, and cultural resources in sections 3.3.1 through 3.3.5 above.

GMP's proposal to continue operating the project in a run-of-river mode would result in stable impoundment elevations that would protect fish spawning habitat and mussel beds from becoming dewatered, and limit project-related erosion along the impoundment shoreline. GMP's proposal to provide a minimum flow during the period from October 16 through May 31, during which there is currently no required minimum flow, would marginally improve aquatic habitat, provide enough flow for the tailrace and deep pool to remain hydraulically connected, and increase visual and sound aesthetics at the project during the off-peak recreation season. GMP's proposal to transfer 1.9 acres of land to the Town to develop the non-project pocket park would enhance recreational opportunities by providing formal, maintained, recreational access to the project tailwater for angling, swimming, and boating in Otter Creek, but has the potential to adversely affect cultural resources as a result of soil disturbance and vegetation management.

Considering the included census data, the limited scope of the proposed project, the lack of a significant effect on environmental justice communities, and the environmental protection

[47] U.S. Census Bureau, American Community Survey 2022 ACS 5-Year Estimates Detailed Tables, File# B17017, *Poverty Status in the Past 12 Months by Household Type by Age of Householder*, https://data.census.gov/cedsci/table?q=B17017; File #B03002 *Hispanic or Latino Origin By Race*, https://data.census.gov/cedsci/table?q=b03002.

and enhancement measures for aquatic and recreation resources, continuing to operate the project would not result in a disproportionate and adverse impact on environmental justice populations.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the project's use of Otter Creek for hydropower generation to see what effect various proposed or recommended environmental measures would have on the cost to operate and maintain the project and on the project's power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corporation*,[48] the Commission compares the current cost to produce project power to an estimate of the cost to provide the same amount of energy and capacity for the region using the most likely alternative source of power (cost of alternative power). In keeping with the policy described in *Mead Corporation*, our economic analysis is based on current electric power cost conditions and does not anticipate or estimate changes in fuel costs that could occur during a project's license term.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the annualized cost of providing the individual measures considered in the EA; (2) the cost of the most likely alternative source of project power; (3) the total annual project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of the current alternative source of project power and the total annual project cost. If the difference between the cost to produce an equivalent amount of power from an alternative source and the total annual project cost is positive, the project produces power at a cost less than the cost of producing power from the most likely least-cost source of alternative power. If the difference between the alternative source of power's annual cost and the total annual project cost is negative, the project costs more to produce power than the cost to produce an equivalent amount of power from the most likely least-cost source of alternative power. This estimate helps support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

The power and economic benefits of the Center Rutland Project, and the comparison of the cost of each alternative for the project, are discussed in Appendix G. Appendix H presents the cost of the environmental enhancement measures considered in our analysis.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of

[48] *See Mead Corp.*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be, in the Commission's judgment, best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for relicensing the project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review of agency and public comments filed on the project and our evaluation of the environmental and economic effects of the proposed project and alternatives, we selected the staff alternative as the preferred alternative for the Center Rutland Project. We recommend this alternative because: (1) issuing a subsequent license for the project would allow GMP to continue operating the project as a dependable source of electrical energy; (2) the 275 kW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution; (3) the public benefits of the staff alternative would exceed those of the no-action alternative; and (4) the recommended measures would protect and enhance aquatic resources, terrestrial resources, federally listed species, recreation and aesthetic resources, and cultural resources.

In the following section, we make recommendations as to which environmental measures proposed by GMP, or recommended by agencies, should be included in any subsequent license issued for the project. We also recommend additional environmental measures to be included in any license issued for the project.

For the reasons outlined below, staff do not recommend certain of Vermont ANR's preliminary conditions. The measures we are not recommending include: (1) operate the project in an instantaneous run-of-river mode whereby outflow from the project equals inflow to the project at all times; and (2) release a year-round minimum flow of 80 cfs or inflow, whichever is less, to the bypassed reach.

5.1.1 Measures Proposed by GMP

Based on our environmental analysis of GMP's proposal in section 3, *Environmental Analysis,* and the costs presented in section 4, *Developmental Analysis*, and the accompanying appendices, we conclude that the following environmental measures proposed by GMP would protect and enhance environmental resources and would be worth the cost. Therefore, we recommend including these measures in any license issued for the project.

- To protect aquatic habitat, continue operating the project in a run-of-river mode, such that outflow from the project approximates inflow.

- To protect and enhance aquatic habitat and aesthetic resources, continue to provide a minimum flow over the spillway into the bypassed reach of 80 cfs, or inflow, whichever is less, from June 1 through October 15; and provide a minimum flow over the spillway into the bypassed reach of 40 cfs, or inflow, whichever is less, from October 16 through May 31.

- Develop an operation compliance monitoring plan within 6 months of any license issued for the project and in consultation with Vermont DEC. The plan would define

run-or-river operations and operational data to be monitored in order to maintain compliance, specify operational protocols under normal and adverse conditions, and specify requirements for consultation and record keeping.

- To protect the federally endangered NLEB, avoid the removal of trees that are equal to or greater than 4 inches in DBH from April 15 through October 31.

- To enhance recreation, establish a land transfer or similar agreement with the Town of Rutland for the Town's development of a non-project pocket park downstream of the dam that would include two parking areas, a hand carry boat put-in, walking trails, beach access, observation area, picnic area, historic and informational signage.

- To enhance recreation and awareness to the regional history, develop and install a cultural heritage informational kiosk for the Town of Rutland's non-project pocket park;

- Develop an HPMP in consultation with the Vermont SHPO to protect historic properties that are eligible for or listed on the National Register.

5.1.2 Additional Measures Recommended by Staff

Under the staff alternative, the project would be operated with GMP's proposed measures identified above, and the following additions and modifications. We discuss the basis for the staff-recommended measures and the rationale for modifying GMP's proposal in Appendix I.

- Implement an impoundment refill procedure following emergency and maintenance drawdowns, whereby 90% of inflow is passed downstream and 10% of inflow is used to refill the impoundment, to protect aquatic resources in the downstream reach.
- To protect NLEB, avoid the removal of trees that are equal to or greater than 3 inches DBH from April 1 through October 31, instead of GMP's proposal to avoid the removal of trees that are equal to or greater than 3 inches DBH from April 15 through October 31 (condition E).

- Develop a recreation monitoring plan to evaluate and ensure recreation needs at the project are met over the term of any new license.

5.1.3 Conclusion

Based on our review of the agency and public comments filed for the project and our independent analysis pursuant to sections 4(e), 10(a)(1), and 10(a)(2) of the FPA, we conclude that licensing the Center Rutland Project, as proposed by GMP with the additional staff-recommended measures, would be best adapted to a plan for improving the Otter Creek Basin.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Although fish kills have not been documented at the project, some resident fish could attempt to pass downstream through the project's turbine and could be injured or killed;

however, we would not expect any long-term effects on the aquatic community from this unavoidable project effect.

5.3 FISH AND WILDLIFE AGENCY RECOMMENDATIONS

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission finds that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency shall attempt to resolve such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of the agency.

No agency filed recommendations under section 10(j).

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2)(A) of the FPA, 16 U.S.C. § 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. Appendix J lists the comprehensive plans that are applicable to the Center Rutland Project. No inconsistencies were found.

6.0 FINDING OF NO SIGNIFICANT IMPACT

If the Center Rutland Project is issued a subsequent license, as proposed with the staff-recommended measures, the project would continue to operate as it does today, while providing protection and enhancements for water quality, fish and wildlife resources, recreation and aesthetic resources, federally listed species, and cultural resources in the project area.

Based on our independent analysis, issuance of a subsequent license the Center Rutland Project, with the staff-recommended environmental measures, would not constitute a major federal action significantly affecting the quality of the human environment.

7.0 LITERATURE CITED

The literature cited in this EA is presented in Appendix K.

8.0 LIST OF PREPARERS

The list of preparers of this EA is presented in Appendix L.

APPENDIX A

GLOSSARY OF TERMS

Capacity benefit: The benefit a project receives for providing capacity to the grid, which may be in the form of a dependable capacity credit or credit for monthly capacity provided.

Census block groups: Statistical divisions of census tracts that generally contain between 600 and 3,000 people (U.S. Census Bureau, 2021).

Diameter at breast height: Tree diameter as measured at 4.5 feet above the ground.

Dissolved oxygen: The amount of oxygen present in water.

Environmental justice: The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (EPA, 2021a).

Environmental justice community: Disadvantaged communities that have been historically marginalized and overburdened by pollution. The term also includes, but may not be limited to, minority populations, low-income populations, or indigenous peoples (EPA, 2021b).

Fall-swarming: The time between summer and winter hibernation. The purpose of swarming behavior may include the introduction of juveniles to potential hibernacula, copulation, and gathering at stop-over sites on migratory pathways between summer and winter regions.

Hibernacula: Where bats hibernate over the winter, such as caves. Minority: Individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic (CEQ, 1997 at 25).

Minority population: Block groups within the area of study where: (1) the aggregate minority population of the block group in the affected area exceeds 50%; or (2) the aggregate minority population in the block group affected is 10% higher than the aggregate minority population percentage in the county.

Pup season: The period of time when bats birth and nurse their young.

Spring-staging: The time period between winter hibernation and migration to summer habitat. During this time, bats begin to gradually emerge from hibernation and exit the hibernacula to feed but re-enter the same or alternative hibernacula to resume daily bouts of torpor (i.e., a state of mental or physical inactivity).

Swim speeds: Researchers use several metrics to quantify the swimming performance of fish: sustained swim speed, prolonged swim speed, critical swim speed, and burst swim speed. The sustained swim speed is the speed a fish can maintain indefinitely without becoming

fatigued. The prolonged swim speed is the speed a fish can maintain for a specific period of time (e.g., up to 200 minutes) that varies among studies. The critical swim speed is a subset of the prolonged swim speed: the duration researchers use to evaluate the critical speed also varies among studies. The burst swim speed is the fastest swimming speed, which can only be maintained for approximately 20 seconds.

Subsequent license: A license for a waterpower project that is issued under Part I of the FPA after the expiration of a minor license that is not subject to sections 14 and 15 of the FPA. 18 C.F.R. § 16(2)(d) (2020).

Undertaking: A project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval. 36 C.F.R. § 800.16. For purposes of this NEPA document, the undertaking is the potential issuance of a subsequent license for the Center Rutland Project.

White-nose syndrome: A fungal infection that agitates hibernating bats, causing them to rouse prematurely and burn fat supplies. Mortality results from starvation or, in some cases, exposure.

APPENDIX B

FIGURES

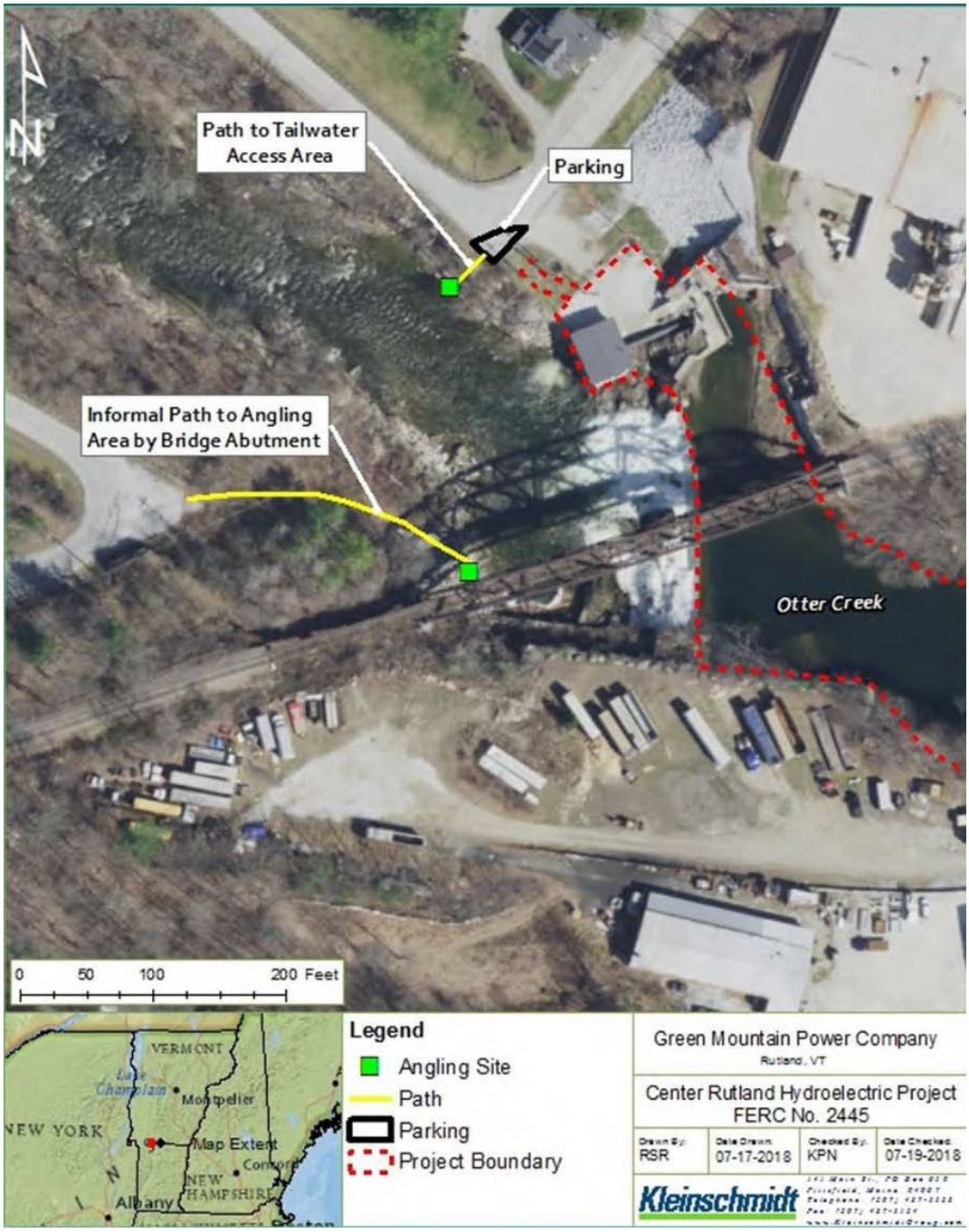

Figure B- 1. Existing informal recreational areas at the project (source: GMP).

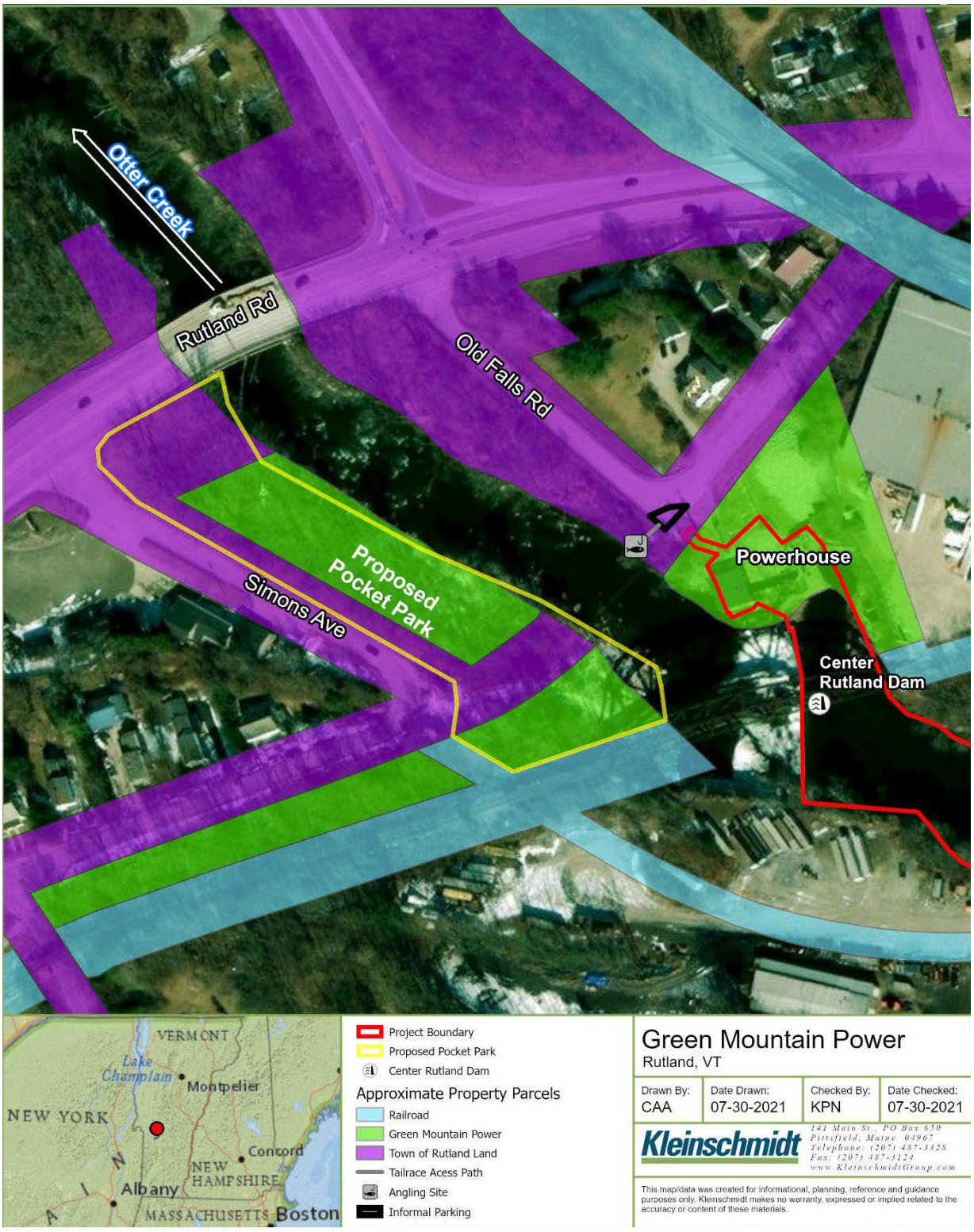

Figure B- 2. Proposed pocket park location and land ownership (source: GMP).

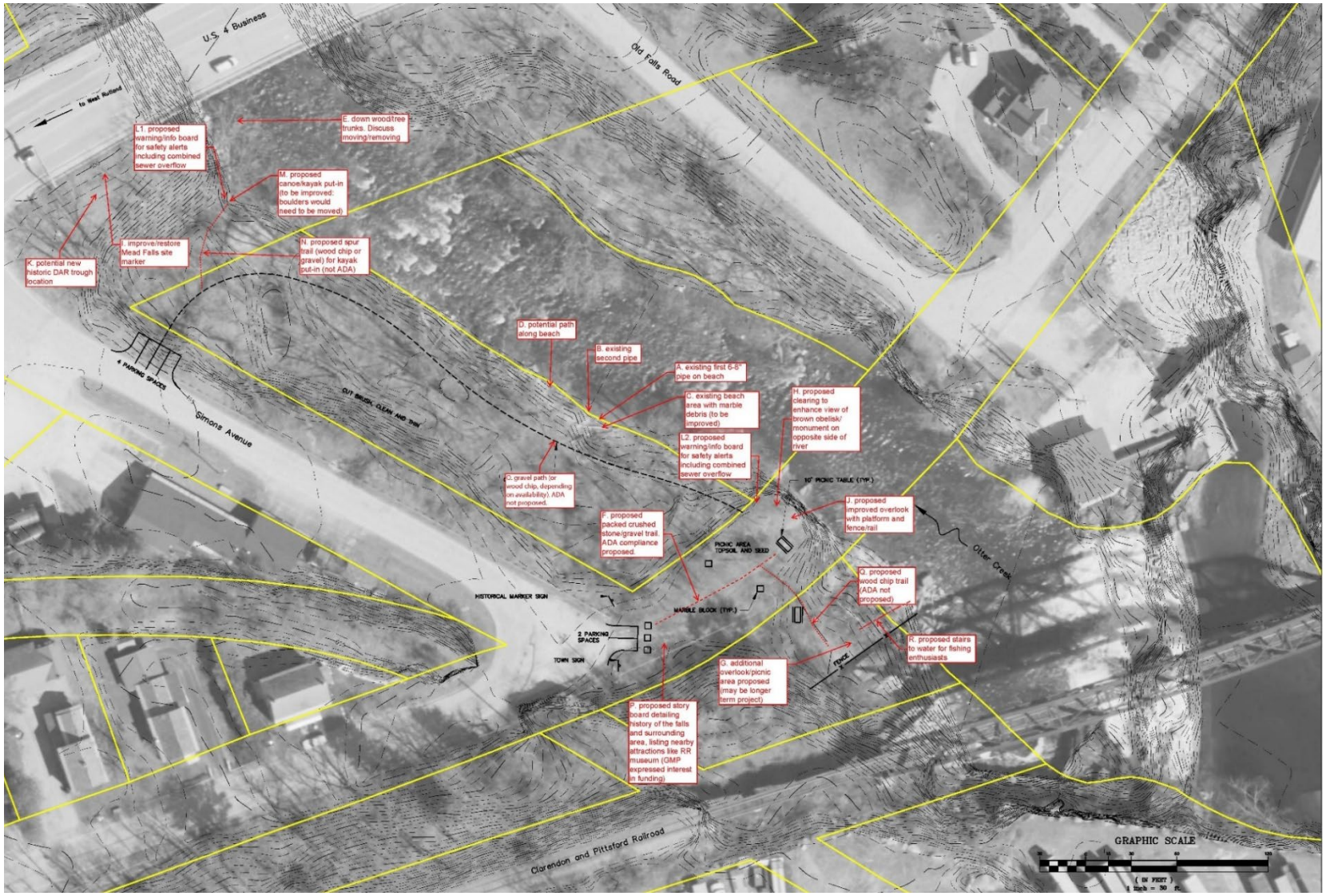

Figure B- 3. Proposed pocket park design (source: GMP).

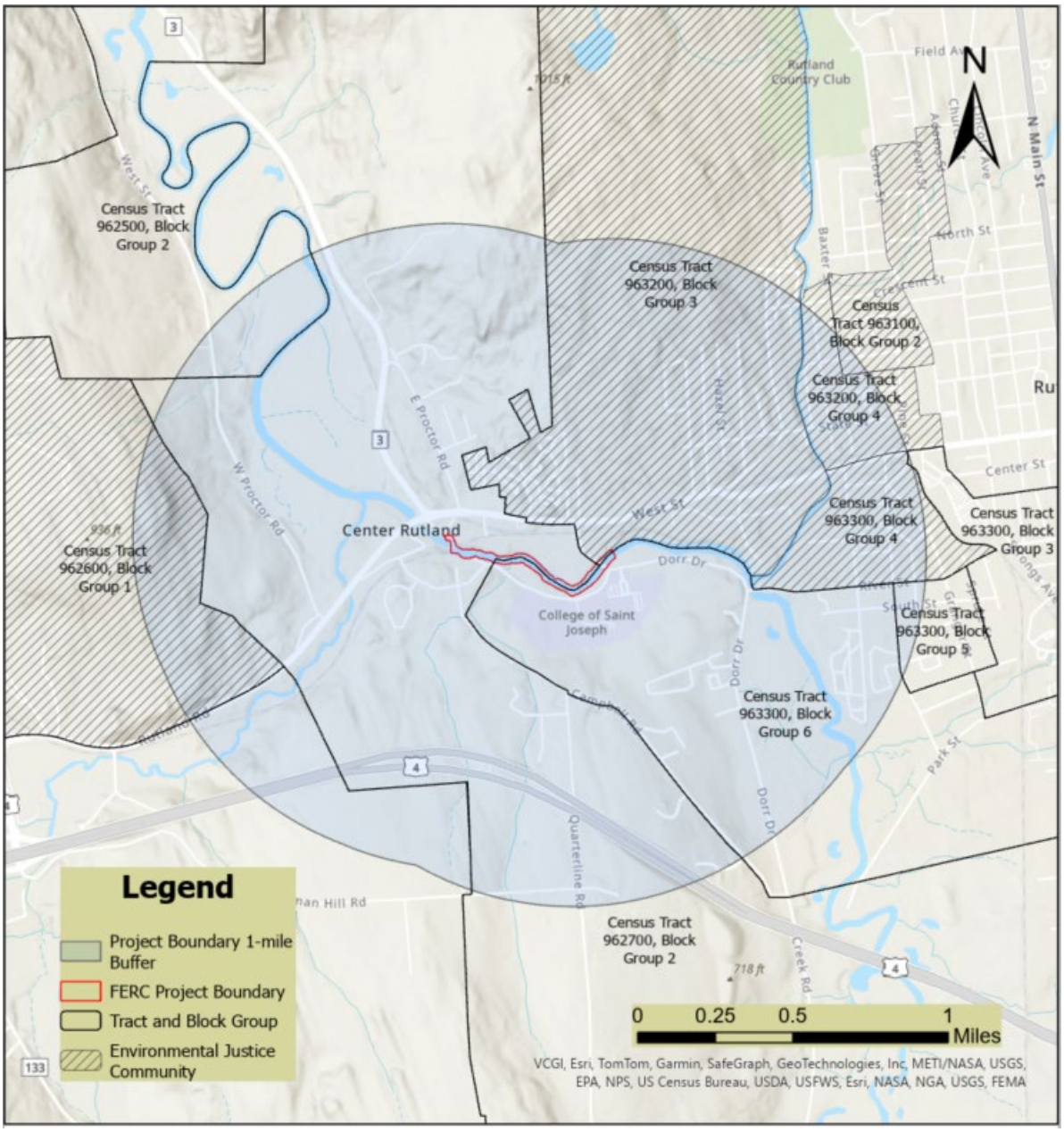

Figure B-4. Block Groups and Environmental Justice Communities within 1-mile of the project boundary (source: Staff).

APPENDIX C

TABLES

Table C-2. Dams on Otter Creek.

Dam/Project Name	FERC No.	FERC Project Type	River Mile	Generation Capacity (MW)	Dam Height (feet)
Emerald Lake	NA	NA	100	NA	X
Ripley Mills	NA	NA	72	NA	X
Center Rutland	**2445**	**License**	**71**	**0.275**	**14**
Proctor*	2558	License	64	10.2	13
Middlebury Lower	2737	License	27	2.25	30
Beldens Falls*	2558	License	23	5.8	15/24 (2 dams)
Huntington Falls*	2558	License	21	6.7	31
Weybridge	2731	License	20	3	30
Vergennes	2674	License	8	2.6	10

NA: Not applicable.
*Hydro developments that are part of GMP's Otter Creek Project (FERC Project No. 2558)
(Source: GMP, 2021, as modified by Staff).

Table C-3. Mean, Maximum, and Minimum Flows at the Center Rutland Project from 1991 to 2020.

Month	Mean Flow (cfs)	Maximum Flow (cfs)	Minimum Flow (cfs)
January	616	6,200	62
February	520	4,490	90
March	828	5,630	119
April	1,417	7,020	225
May	765	4,440	167
June	500	2,700	72
July	369	3,980	57
August	306	13,500	38
September	223	2,890	39
October	469	3,960	55
November	579	2,750	110
December	676	4,640	84
Annual	606	13,500	38

(Source: GMP, 2021, as modified by Staff).

Table C-4. Burst Speeds of Fish Species Likely to Occur in the Project Impoundment.

Fish Species	Life Stage	Burst Swim Speed (fps)	Length (inches)
Smallmouth bass	Adult[(a)]	3.5 – 5.6	9.4 – 15.0
	Juvenile[(b)]	2.6 – 3.6	3.6 – 3.7
Northern Pike [(c)]	Adult	1.25	7.9 – 19.7
Brook[(d)] Trout	Adult	7.0 – 12.7	6.0 – 14.0
	Juvenile	0.1 – 2.0	3.0 – 5.0
Brown Trout	Adult[(e)]	3.5	5.9
	Juvenile[(f)]	4.5	5.1
Rainbow Trout[(g)]	Adult/ Juvenile	2.75	5.9 – 11.8

[(a)] New York Power Authority, 2019.
[(b)] Appalachian Power Company, 2022.
[(c)] Keeyask, 2012.
[(d)] New York Power Authority, 2017.
[(e)] Katopodis and Gervais, 2016.
[(f)] Beamish, 1978.
[(g)] Blank et. al., 2020.

Table C-5. Environmental Justice Community Data for the Center Rutland Project (Source: U.S. Census Bureau, as modified by staff).

Geographic Area	Total Population	White Alone, not Hispanic (%) [a]	African American/ Black (%) [a]	American Indian/ Alaska Native (%) [a]	Asian (%) [a]	Native HI & Other Pacific Islander (%) [a]	Some Other Race (%) [a]	Two or More Races (%) [a]	Hispanic Origin (any race) (%) [a]	Total Minority Population (%) [a]	Households in Poverty (%) [b]
VERMONT	**643,816**	**91.4%**	**1.2%**	**0.2%**	**1.7%**	**>0.1%**	**0.2%**	**3.2%**	**2.1%**	**8.6%**	**10.6%**
Rutland County	**60,585**	**93.8%**	**0.6%**	**>0.1%**	**0.8%**	**0.0%**	**>0.1 %**	**3.1%**	**1.7%**	**6.2%**	**12.5%**
Census Tract 962500, Block Group 2	1243	97.5%	0.0%	0.0%	0.0%	0.0%	0.6%	1.9%	0.0%	2.5%	1.1%
Census Tract 962600, Block Group 1	1296	97.6%	0.6%	0.0%	0.0%	0.0%	0.0%	1.8%	0.0%	2.4%	13.8%
Census Tract 962600, Block Group 2	1079	96.8%	0.0%	0.0%	0.0%	0.0%	0.5%	2.1%	0.6%	3.2%	4.2%
Census Tract 962700, Block Group 2	824	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.9%
Census Tract 963100, Block Group 2	1272	86.5%	2.7%	0.0%	1.3%	0.0%	0.0%	9.3%	0.2%	13.5%	15.6%
Census Tract 963200, Block Group 3	778	89.7%	0.4%	0.4%	1.9%	0.0%	0.3%	2.8%	4.5%	10.3%	17.4%
Census Tract 963200, Block Group 4	719	97.6%	0.0%	0.0%	0.0%	0.0%	0.0%	2.4%	0.0%	2.4%	54.2%

Census Tract 963300, Block Group 3	243	99.2%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%
Census Tract 963300, Block Group 4	1003	93.2%	4.1%	0.0%	0.0%	0.0%	0.0%	2.7%	0.0%	6.8%	50.0%
Census Tract 963300, Block Group 5	349	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	10.6%
Census Tract 963300, Block Group 6	1437	99.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%	7.7%

[a] Percent of Total Population (Table B03002 – Hispanic or Latino Origin by Race. 2022 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates. Accessed December 11, 2023. https://data.census.gov/table?d=ACS+5-Year+Estimates+Detailed+Tables&tid=ACSDT5Y2022.B03002).

[b] Percent of Households (Table B17017 – Poverty Status in the Past 12 Months by Household Type and Age of Householder. 2022 ACS 5-Year Estimates Detailed Tables. U.S. Census Bureau, 2018-2022 American Community Survey 5-Year Estimates. Accessed December 11, 2023. https://data.census.gov/cedsci/table?d=ACS%205-Year%20Estimates%20Detailed%20Tables&tid=ACSDT5Y2022.B17017).

Note: Gray shading denotes an Environmental Justice community.

APPENDIX D

STATUTORY AND REGULATORY REQUIREMENTS

Federal Power Act

Section 18 Fishway Prescriptions

Section 18 of FPA, 16 U.S.C. § 811, states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of the U.S. Department of Commerce or the U.S. Department of the Interior.

On April 12, 2023, Interior requested that the Commission include a reservation of authority to prescribe fishways under section 18 in any license issued for the project.

Section 10(j) Recommendations

Under section 10(j) of the FPA, 16 U.S.C. § 803(j)(1), each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions in any subsequent license unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law.

Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

No agency filed recommendations under section 10(j) of the FPA.

Clean Water Act

Under section 401(a)(1) of the Clean Water Act (CWA), 33 U.S.C. § 1341(a)(1), a license applicant must obtain either a water quality certification from the appropriate state pollution control agency verifying that any discharge from the project would comply with applicable provisions of the CWA, or a waiver of such certification. A waiver occurs if the state agency does not act on a request for certification within a reasonable period of time, not to exceed one year after receipt of such request.

On April 12, 2023, GMP applied to the Vermont Department of Environmental Conservation (Vermont DEC) for a section 401 certification for the Center Rutland Project. Vermont DEC received the request on April 12, 2023.[49] Vermont ANR (on behalf of Vermont

[49] *See* Notice of Reasonable Period of Time for Water Quality Certification Application, issued by the Commission on April 21, 2022.

DEC) issued certification for the project on March 29, 2024. The conditions of the certification are included as Appendix M of this EA for informational purposes and are analyzed in the appropriate resource sections.

Endangered Species Act

Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. According to the U.S. Fish and Wildlife Service's (FWS) Information for Planning and Consultation (IPaC) database, the federally endangered northern long-eared bat (NLEB; *Myotis septentrionalis*) could occur in project vicinity.[50] No critical habitat has been designated for the NLEB.

The IPaC database indicates that the tricolored bat, proposed for listing as endangered or threatened under the ESA, and the monarch butterfly, a candidate species for listing under the ESA, may occur in the vicinity of the project.

Our analysis of project impacts on the NLEB, tricolored bat, and monarch butterfly is presented in Appendix E, *Biological Assessment,* and our recommendations are included in section 5.1, *Comprehensive Development and Recommended Alternative*. Avoiding the removal of trees with diameters that are equal to or greater than 3 inches at breast height from April 1 through October 31 would reduce the likelihood of disturbing NLEB and their newly born pups. We conclude that licensing the project with tree-removal restrictions from April 1 through October 31 may affect, but is not likely to adversely affect, the NLEB.

Coastal Zone Management Act

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. § 1456(c)(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA Program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

The state of Vermont does not have a Coastal Zone Management Program. Therefore, a coastal zone consistency review is not required.

National Historic Preservation Act

Section 106 of the NHPA, 54 U.S.C. § 306108, requires that a federal agency "take into account" how its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American

[50] *See* Interior's official list of threatened and endangered species, accessed by staff using the IPaC database (https://ipac.ecosphere.fws.gov/) on March 26, 2024, and placed into the record for Docket No. P-2445-028 on March 26, 2024.

history, architecture, engineering, and culture that are eligible for inclusion in the National Register.

In response to the licensee's request, the Commission designated it as the non-federal representative for carrying out consultation pursuant to section 106 of the NHPA. GMP initiated consultation with the Vermont State Historic Preservation Officer (SHPO) on December 21, 2018, to identify historic properties, determine the eligibility of cultural resources for listing on the National Register of Historic Places (National Register), and assess potential adverse effects on historic properties within the project's area of potential effects (APE). In response, the Vermont SHPO recommended that GMP consult with the Stockbridge-Munsee Band of Mohicans (Stockbridge-Munsee Tribe). GMP consulted with the Stockbridge-Munsee Tribe via letter sent on July 24, 2019. On July 25, 2019, the Stockbridge-Munsee Tribe responded that there are no anticipated concerns related to cultural resources because no ground disturbance was proposed. On September 19, 2022, Commission staff invited consultation with the St. Regis Mohawk Tribe. The St. Regis Mohawk Tribe did not respond to the initial consultation letter or file any comments on the record of the proceeding.

Our analysis of the project's effects on historic properties is presented in section 3.3.5.2, *Cultural Resources, Environmental Effects*. Historic properties have been identified in the project's APE, including the Center Rutland Hydroelectric Station Historic District (Historic District). The Historic District includes the project dam, powerhouse and generating equipment, penstock, marble retaining wall, intake structure, marble pumphouse, former pumphouse, transformer yard, stream gaging station, the Delaware and Hudson Railroad bridge, the former Route 4 bridge abutments, Clement Mill ruins, and the Clarendon and Pittsford Railroad bridge.[51] Additionally, there are archaeologically sensitive areas within the APE for the project, as well as a National Register-eligible archaeological site (VT-RU-0266).

We conclude that continuing to operate the project could result in adverse effects on historic properties. For example, adverse effects could occur in the event repairs are needed to maintain the structure and function of the project facilities that are contributing resources to the Historic District. Additionally, installation of an upstream eel passage facility at the dam, as discussed in detail in section 3.3.1, *Aquatic Resources*, may have an adverse effect on the dam by diminishing the visual or physical integrity of the dam, or other contributing resources to the Historic District. Adverse effects could also include any introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features or changes to the setting or feel of the historic property.

Developing and implementing an Historic Properties Management Plan (HPMP), in consultation with the Vermont SHPO, would ensure that measures are in place to protect historic properties in the APE from adverse effects related to the operation and maintenance of project facilities and potential adverse effects related to recreation enhancements. An HPMP would also ensure that any previously undiscovered archaeological resources within the APE are not

[51] Contributing resources that are project facilities are the project dam, powerhouse and generating equipment, penstock, marble retaining wall, and intake structure.

adversely affected by the project during the term of any new license. To meet the requirements of section 106 of the NHPA, we intend to execute a PA with the Vermont SHPO for the protection of historic properties from the effects of proposed project modifications, operation, and maintenance. Federally recognized Tribes and GMP will be invited to concur with the terms of the PA. The terms of the PA would ensure that GMP protect all historic properties identified within the project's APE through the implementation of the HPMP.

APPENDIX E

BIOLOGICAL ASSESSMENT

Affected Environment

Northern Long-eared Bat

The NLEB was reclassified from a federally threatened species to a federally endangered species under the ESA on March 31, 2023.[52] The traditional range for the NLEB includes most of the central and eastern U.S., as well as the southern and central provinces of Canada, coinciding with the greatest abundance of forested areas. The NLEB, whose habitat includes large tracts of mature, upland forests, typically feeds on moths, flies, and other insects. These bats are flexible in selecting roost sites, choosing roost trees that provide cavities and crevices, with a diameter equal to or greater than 3 inches at breast height. Human-made structures, such as buildings, barns, bridges, and bat houses also can be considered potential summer habitat. However, trees in predominately unforested urban areas (e.g., street trees, downtown areas) and individual trees greater than 1,000 feet from forested areas are not suitable NLEB habitat (FWS, 2023b). In Vermont, NLEB are generally active within forested habitat from April 15 through October 31, and hibernate over the winter season (FWS, 2023a). Winter hibernation typically occurs in caves, and areas within 5 miles of the hibernaculum are used for fall-swarming and spring-staging. NLEB are most vulnerable to tree removal activities during cool spring months (when bats enter torpor), or summer and early fall when flightless pups or inexperienced flying juveniles are present (FWS, 2022b).

White-nose syndrome was confirmed in Rutland County, where the project is located, during the 2007-2008 hibernation period. While there is no documented NLEB roost trees or hibernacula within the project boundary or surrounding 1 mile, including the non-project pocket park, the riparian forested areas within the project boundary and forested areas immediately adjacent to the project boundary and within the proposed pocket park may provide suitable habitat for NLEB summer roosting and foraging activities. No critical habitat has been designated for this species.

Tricolored Bat

The tricolored bat has been proposed by the FWS for listing under the ESA as endangered,[53] due to the range-wide impacts of white-nose syndrome which have caused estimated declines of more than 90% in affected colonies. Critical habitat is not being proposed for the species.

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[52] 88 Fed Reg. 4908 (Jan. 26, 2023).

[53] 87 Fed. Reg. 56381 (Sept. 14, 2022).

Tricolored bats are known to occur in 39 states, including all the central and eastern United States, including Vermont.[54] During the spring, summer, and fall (non-hibernating seasons), tricolored bats disperse and primarily roost among live and dead leaf clusters of live or recently dead deciduous hardwood trees. Female tricolored bats exhibit high site fidelity, returning year after year to the same summer roosting locations. The female bats form maternity colonies and switch roost trees regularly (e.g., between 1.2 days and 7 days at roost trees in Indiana), typically giving birth to two pups between May and July (FWS, 2021a). Wooded uplands within the project boundary contain suitable habitat for tricolored bat summer roosting and foraging activities.

Monarch Butterfly

The monarch butterfly is a candidate for listing as a threatened or endangered species under the ESA.[55] Monarch butterflies migrate thousands of miles across North America in the spring and fall. In eastern North America, the monarch butterflies migrate between Mexico and Canada over a period of two to three successive generations. In Vermont, the monarch butterfly may be present during the summer months.

Adult monarch butterflies are dependent on nectar-bearing flowers for food. The monarch butterfly breeding season occurs during the summer when the butterflies lay their eggs exclusively on milkweed (genus *Asclepias*) plants. Larvae emerge from eggs in 2 to 5 days and then feed on milkweed over a period of 9 to 18 days. The larva then pupates into a chrysalis, emerging 6 to 14 days later as an adult butterfly. Because of the monarch butterfly larva's dependence on milkweed, loss of milkweed host plants due to herbicide use and habitat loss have been identified as contributing factors in the decline of the monarch butterfly (FWS, 2021b).

The project is located within the range of the monarch butterfly. Although there is no documentation of monarch butterfly at the project, numerous nectar-bearing plants and nine species of milkweed are known to occur in Rutland County, Vermont (Kartesz, 2015). Land within and immediately adjacent to the project boundary consists of land cover types that could contain milkweed plants that provide habitat for monarch butterfly reproduction and nectar-bearing plants that provide foraging habitat.

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[54] FWS, *Species Status Assessment Report for the Tricolored Bat* (*Perimyotis subflavus*), Version 1.1. December 2021. Hadley, MA., https://www.fws.gov/sites/default/files/documents/Tricolored_Bat_SSA.pdf.

[55] 85 Fed. Reg. 81813 (Dec. 17, 2020). Although candidate species are provided no special protection under the ESA, we nevertheless provide an analysis of the proposed action on monarch butterfly because FWS's Information for Planning and Consultation database has identified the species as potentially occurring within the project boundary and the species may become federally listed during the term of a subsequent license.

Environmental Effects

Northern Long-eared Bat

GMP proposes to continue mowing and trimming vegetation around project facilities during the growing season. GMP's proposal does not include any ground-disturbing or tree-clearing activities within the project boundary that would affect potential NLEB summer roosting and foraging habitat. Vermont ANR certification condition E specifies that GMP avoid tree-trimming or removal of trees 3 inches in diameter at breast height (DBH) or greater between April 1 and October 31.

Our Analysis

Although no tree-clearing activities are proposed by GMP, project maintenance activities during the term of any license issued could require periodic tree removal that may affect NLEB habitat. While no maternity roost trees are known to occur within 1 mile of the project, no surveys have been conducted to verify the absence of maternity roost trees.

NLEB choose roost trees with a diameter of 3 inches or greater at breast height (FWS, 2014). Land within and adjacent to the project boundary contains some forested land cover that could provide roosting and foraging habitat for NLEB. GMP has not proposed any ground-disturbing or tree-clearing activities that would remove potential NLEB roosting or foraging habitat within the project boundary. GMP's practice of trimming vegetation back to a minimum of 15 feet from project structures may affect NLEB if trimming disturbs roosting bats. However, no known roost trees or hibernacula occur within the project boundary and surrounding 1 mile, and vegetation trimming is infrequent, only occurring once or twice a year. The Town of Rutland proposes minimal tree clearing for development of the proposed non-project pocket park and would conduct any tree clearing following protocols from Vermont ANR and FWS.

While NLEB are not known to occur within the project boundary, avoiding the removal of trees 3 inches DBH from April 1 through October 31 would reduce the likelihood of disturbing NLEB in the vicinity of the project boundary and ensure that any tree removed within the project boundary is not actively occupied by NLEB. Tree removal in the cooler winter months, specifically November 1 through March 31, would coincide with the period when NLEB are likely hibernating in caves. With the implementation of tree-removal restrictions, staff conclude that relicensing the Center Rutland Project may affect but is not likely to adversely affect the NLEB.

Tricolored Bat

As noted above, GMP proposes to continue mowing and trimming vegetation around project facilities during the growing season. GMP has not proposed any ground-disturbing or tree-clearing activities that would affect potential tricolored bat summer roosting and foraging habitat. GMP does not propose any measures for the protection of the tricolored bat, and no stakeholders filed comments, recommendations, terms, or conditions regarding the tricolored bat.

Our Analysis

Project maintenance activities that may affect the tricolored bat are the same as those noted above for the NLEB. Although no tree-clearing activities are proposed by GMP, project maintenance activities during the term of any license could require periodic tree removal that may affect tricolored bat habitat. Restricting tree removal within the project boundary between April 1 through October 31 to protect NLEB would also minimize project effects on tricolored bats, including during the tricolored bat pup season which generally overlaps with that of NLEB. Therefore, we conclude that relicensing the Center Rutland Project with tree-removal restrictions from April 1 through October 31 is not likely to jeopardize the continued existence of the tricolored bat.

Monarch Butterfly

GMP does not propose any measures for the protection of the monarch butterfly, and no stakeholders filed comments, recommendations, terms, or conditions regarding the monarch butterfly.

Our Analysis

Due to the variety of milkweed and nectar-bearing species present in Rutland County, there is potential for monarch butterfly breeding and foraging habitat to exist seasonally within the project boundary and surrounding areas. GMP's occasional mowing and trimming of vegetation surrounding the dam, intake, and powerhouse area, and periodical trimming of the informal tailwater access trail that leads from the informal parking area to the shorelines below the powerhouse may temporarily affect milkweed or nectar-bearing plants, if these plants are present within the project boundary at the time that vegetation management occurs. In addition, vegetation management at the project could affect monarch butterfly eggs, larvae, and chrysalides, if present at the time and location that vegetation management occurs. GMP does not conduct vegetation management activities at the project on a set schedule, and areas within the project boundary that are potentially suitable to support monarch butterfly habitat are not unique compared to areas outside the project boundary in the surrounding vicinity. Therefore, any project effects to monarch butterflies would be localized and insignificant.

The Town of Rutland's proposal to remove invasive species from the pocket park and park maintenance that could require periodic vegetation management may temporarily affect milkweed or nectar-bearing plants and affect monarch butterfly eggs, larvae, and chrysalides, if present within the park at the time that vegetation management occurs. Areas within the pocket park that are potentially suitable to support monarch butterfly habitat are not unique compared to areas outside the park in the surrounding vicinity. Therefore, any effects of the construction and maintenance of the pocket park on monarch butterflies would be localized and insignificant.

APPENDIX F

ALTERNATIVE CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Project decommissioning was considered as an alternative to the project but has been eliminated from further analysis because it is not reasonable in the circumstances of this case.

As the Commission has previously held, decommissioning is not a reasonable alternative to relicensing a project in most cases.[56] Decommissioning can be accomplished in different ways depending on the project, its environment, and the particular resource needs.[57] For these reasons, the Commission does not speculate about possible decommissioning measures at the time of relicensing, but rather waits until an applicant actually proposes to decommission a project, or a participant in a relicensing proceeding demonstrates that there are serious resource concerns that cannot be addressed with appropriate license measures and that make decommissioning a reasonable alternative.[58]

GMP does not propose decommissioning, nor does the record to date demonstrate there are serious resource concerns that cannot be mitigated if the project is relicensed. As such, there is no reason, at this time, to include decommissioning as a reasonable alternative to be evaluated and studied as part of staff's NEPA analysis.

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[56] *See*, *e.g.*, *Eagle Crest Energy Co.*, 153 FERC ¶ 61,058, at P 67 (2015); *Pub. Util. Dist. No. 1 of Pend Oreille Cty.*, 112 FERC ¶ 61,055, at P 82 (2005); *Midwest Hydro*, *Inc.*, 111 FERC ¶ 61,327, at PP 35-38 (2005).

[57] In the event that the Commission denies relicensing of a project or a licensee decides to surrender an existing project, the Commission must approve a surrender "upon such conditions with respect to the disposition of such works as may be determined by the Commission." 18 C.F.R. § 6.2. This can include simply shutting down the power operations, removing all or parts of the project (including the dam), or restoring the site to its pre-project condition.

[58] *See generally Project Decommissioning at Relicensing; Policy Statement*, FERC Stats. & Regs., Regulations Preambles (1991-1996), ¶ 31,011 (1994); *see also City of Tacoma, Washington*, 110 FERC ¶ 61,140 (2005) (finding that unless and until the Commission has a specific decommissioning proposal, any further environmental analysis of the effects of project decommissioning would be both premature and speculative).

APPENDIX G

DEVELOPMENTAL RESOURCES

Power and Economic Benefits

Table G-1 summarizes the assumptions and economic information used in the analysis. Most of this information is provided by the applicant in its license application. Some is developed by Commission staff. The values provided by the applicants are typically reasonable for the purposes of our analysis. If they are not, it is noted below. Cost items common to all alternatives include taxes and insurance, estimated capital investment required to develop the project or major modifications for relicensing, licensing costs, normal operation and maintenance cost, and Commission fees. All costs are adjusted to current year dollars.

Table G-1. Parameters for the Economic Analysis of the Center Rutland Project.

Parameter	Value
Installed Capacity	0.275 MW
Average annual generation	541.7 MWh
Period of analysis	30 years
Federal income tax rate	Included in the O&M[a] cost
Local tax rate	Included in the O&M cost
Insurance rate	Included in the O&M cost
Interest rate	5.5%
Construction cost [b]	$0
Application cost [c]	$203,500
Operation and maintenance [c]	$60,079
Estimated Commission annual charges [d]	$0
Alternative source of power's cost (2023) [e]	
1) Energy cost	$71.42/MWh
2) Capacity benefit cost	$179.08/kW-year

(Source: GMP, and Staff).

[a] Operation and maintenance.
[b] Excludes protection, mitigation, and enhancement measures and licensing cost.
[c] Cost escalated to 2023 dollars.
[d] Under the regulations currently in effect, projects with an authorized installed capacity of less than or equal to 1,500 kW will not be assessed an annual charge.
[e] The alternative source of power's cost is based on the current cost of providing the same amount of generation and capacity from a natural gas-fired combined cycle plant, as reported by the U.S. Energy Information Administration (EIA), Annual Energy Outlook 2023, for the

Division 1, New England Region (EIA, 2023). The alternative source of power cost reported in Table G-2 is a combination of the cost of energy and capacity benefit.

Comparison of Alternatives

Table G-2 summarizes the installed capacity, annual generation, capacity benefit, alternative source of power's cost, estimated total project cost, and difference between the alternative source of power's cost and total project cost for each of the alternatives considered in this EA: no-action, the applicants' proposal, the staff alternative, and the staff alternative with mandatory conditions.

Table G-2. Summary of the Annual Cost of Alternative Power and Annual Project Cost for the Three Alternatives for the Center Rutland Project.

	No Action	Applicants' Proposal	Staff Alternative	Staff Alternative with Mandatory Conditions
Installed capacity	0.275 MW	0.275 MW	0.275 MW	0.275 MW
Annual generation	542 MWh	538 MWh	538 MWh	537 MWh
Capacity benefit [a]	0.195 MW	0.195 MW	0.195 MW	0.195 MW
Current alternative source of power's cost [b]	$73,695	$73,402	$73,402	$73,038
Total annual project cost (2021) [c]	$159,708	$160,527	$160,527	$160,527[d]
Difference between the alternative source of power's cost and total annual project cost [e]	($86,013)	($87,125)	($87,923)	($88,287)

(Source: Staff).

[a] Staff estimated the capacity benefit based on the ratio of the median flow available for generation for each of 12 months, and the hydraulic capacity of the project. This ratio is multiplied by the authorized installed capacity to determine the capacity benefit.

[b] The alternative source of power cost for the Center Rutland Project is based on the alternative source of power cost in the New England Region, as identified in Table G-1 above.

[c] Project costs include the cost of environmental measures listed in Appendix H, and the costs identified in Table G-1. All project costs were adjusted to 2023 dollars.

[d] The annual project cost under the staff alternative with mandatory conditions does not include a cost for developing a plan to install upstream eel passage within 1 year of

installation of upstream eel passage at the Otter Creek because the measure is based on a future, uncertain event that lacks specificity needed to estimate a cost.

[e] A number in parentheses denotes that the difference between the alternative source of power cost and total project cost is negative, thus the project's cost to produce power is greater than the alternative source of power cost.

No-Action Alternative

Under the no-action alternative, the project would have an installed capacity of 0.275 MW, a capacity benefit of 0.195 MW, and an average annual generation of 542 MWh. The alternative source of power's current cost to produce the same amount of energy and provide the same capacity benefit is $73,695. The total annual project cost is $159,708. Subtracting the total annual project cost from the alternative source of power's current cost, the project's cost to produce power and capacity is $86,013 more than that of the alternative source of power's cost.

Applicant's Proposal

Under the applicant's proposal, the project would have a total installed capacity of 0.275 MW, a capacity benefit of 0.6 MW, and an average annual generation of 538 MWh. The alternative source of power's current cost to produce the same amount of energy and provide the same capacity benefit would be $73,402. The total annual project cost would be $160,527. Subtracting the total annual project cost from the alternative source of power's current cost, the project's cost to produce 538 MWh of power and 0.6 MW of capacity would be $87,125 more than that of the alternative source of power's cost.

Staff Alternative

Under the staff-recommended alternative, the project would have a total installed capacity of .0275 MW, a capacity benefit of 0.195 MW, and an average annual generation of 538 MWh. The alternative source of power's current cost to produce the same amount of energy and provide the same capacity benefit would be $73,402. The total annual project cost would be $160,527. Subtracting the total annual project cost from the alternative source of power's current cost, the project's cost to produce 538 MWh of power and 0.195 MW of capacity would be $87,923 more than that of the alternative source of power's cost.

Staff Alternative with Mandatory Conditions

Under the staff-recommended alternative with mandatory conditions, the project would have a total installed capacity of 0.275 MW and a capacity benefit of 0.195 MW, and an average annual generation of 537 MWh. The alternative source of power's current cost to produce the same amount of energy and provide the same capacity benefit would be $73,038. The total annual project cost would be $160,527. Subtracting the total annual project cost from the alternative source of power's current cost, the project's cost to produce 537 MWh of power and provide a 0.195 MW capacity would be $88,287 more than that of the alternative source of power's cost.

Cost of Environmental Measures

Appendix H presents the cost of each environmental enhancement measure considered in our analysis for the Center Rutland Project. All costs are in 2023 dollars. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

APPENDIX H

COSTS OF ENVIRONMENTAL MEASURES

Table H-1. The Cost of Environmental Measure Considered in Assessing the Environmental Effects of Operating the Center Rutland Project.

Enhancement/Mitigation Measure	Entity	Capital Cost (2023$)	Annual Cost[a] (2023$)	Levelized Annual Cost[b] (2023$)
Project Operation				
Continue operating the project in a run-of-river mode, such that outflow approximates inflow at all times.	GMP, Staff	$0	$0	$0
Operate the project in an instantaneous run-of-river mode, such that outflow to the project equals inflow at all times.	Vermont ANR	Unknown	Unknown	Unknown[c]
Develop an operation compliance monitoring plan to document compliance with run-of-river operation, impoundment levels, minimum bypassed reach flows, and aesthetic flows.	GMP, Vermont ANR, Staff	$5,400	$0	$372
Aquatic Resources				
Continue to release a minimum flow of 80 cfs over the spillway, or inflow, whichever is less, from June 1 through October 15.	GMP, Staff	$0	$0	$0
Release an additional minimum flow of 40 cfs over the spillway, or inflow, whichever is less, from October 16 through May 31.	GMP, Staff	$0	$0[d]	$0

Enhancement/Mitigation Measure	Entity	Capital Cost (2023$)	Annual Cost[a] (2023$)	Levelized Annual Cost[b] (2023$)
Release a minimum flow of 60 cfs over the spillway, or inflow, whichever is less, year-round.	Vermont ANR	$0	$0[e]	$0
Develop a plan to install upstream eel passage within 1 year of installation of upstream eel passage at the Otter Creek.	Vermont ANR	Unknown – recommendation based on a future, uncertain event that lacks specificity needed to estimate a cost.	Unknown – recommendation based on a future, uncertain event that lacks specificity needed to estimate a cost.	Unknown – recommendation based on a future, uncertain event that lacks specificity needed to estimate a cost.
Implement an impoundment refill procedure following emergency and maintenance drawdowns, whereby 90% of inflow is passed downstream, and the impoundment is refilled on the remaining 10% of inflow to the project.	Staff	$0	$0	$0
Threatened and Endangered Species				
Avoid the removal of trees with a 3-inch DBH from April 1 through October 31 to protect NLEB.	Staff	$0	$0	$0

Enhancement/Mitigation Measure	Entity	Capital Cost (2023$)	Annual Cost[a] (2023$)	Levelized Annual Cost[b] (2023$)
Recreation Resources				
To enhance recreation, establish a land transfer or similar agreement with the Town of Rutland for the Town's development of a non-project pocket park downstream of the dam that would include two parking areas, a hand carry boat put-in, walking trails, beach access, observation area, picnic area, historic and informational signage.	GMP, Staff	$0	$0	$0
Develop a recreation monitoring plan, to be conducted every five years, to evaluate and ensure recreation needs at the project are met over the term of any new license.	Staff	$5,000	$2,500[f]	$800
To enhance recreation and awareness to the regional history, develop and install a non-project cultural heritage informational kiosk for the Town of Rutland's non-project pocket park.	GMP, Staff	$1,100[g]	$0	$76
Cultural Resources				
Develop an HPMP in consultation with the Vermont SHPO to protect historic properties that are eligible for or listed on the National Register of Historic Places.	GMP, Staff	$5,400[h]	$0	$372

(Source: GMP, and Staff).

[a] Annual costs typically include operational and maintenance costs and any other costs that occur on a yearly basis.

[b] All capital and annual costs are converted to equal annual costs over a 30-year period to give a uniform basis for comparing costs.

[c] Costs related to any required new or upgraded equipment and expenses incurred due to compliance violations cannot be accurately estimated.

[d] Although there are no capital and annual costs for providing the additional minimum flow, there is an additional opportunity cost. The proposed changes would reduce generation by about 4.1 MWh/year. Using an energy cost of $71.42/MWh from Table G-1 as a proxy for the value of foregone generation, 4.1 MWh of foregone generation would be valued at about $293/year.

[e] Although there are no capital and annual costs for providing the 60-cfs minimum flow year round, there is an additional opportunity cost relative to the current opportunity cost for a seasonal 80-cfs minimum flow . The proposed change would result in a net reduction in generation of about 5.1 MWh/year. Using an energy cost of $71.42/MWh from Table G-1 as a proxy for the value of foregone generation, 5.1 MWh of foregone generation would be valued at about $364/year.

[f] The annual cost of this measure is discounted to account for the implementation schedule.

[g] Although GMP did not include a cost for this measure, staff estimates that there would be a capital cost of approximately $1,100 to develop and install a cultural heritage information kiosk for the Town of Rutland's off-license pocket park.

[h] GMP estimated that it would cost $20,000 to develop an HPMP. However, based on the cost to develop an HPMP at other hydropower projects within New England, a capital cost of $5,400 is a more reasonable estimate for the cost of this measure.

APPENDIX I

COMPREHENSIVE DEVELOPMENT

This appendix discusses the basis for the staff-recommended measures presented in section 5.1.2, *Additional Measures Recommended by Staff*, and the rationale for modifying Green Mountain Power's (GMP's) proposal.

Measures Recommended by Staff

Mode of Operation

GMP proposes to continue operating the project in a run-of-river mode such that project outflow approximates inflow to the impoundment at any time, and the surface elevation of the impoundment is maintained at 505.05 feet NGVD 29 (corresponding to the spillway crest gate elevation of 504.8 feet plus approximately 3 inches of spill over the crest gate of the dam).

Vermont ANR's certification condition B specifies that GMP operate the project in an instantaneous run-of-river mode, whereby outflow from the project equals inflow at all times.

As discussed in section 3.3.1.2, *Environmental Effects, Mode of Operation,* Vermont ANR has not demonstrated that the project is capable of operating in an instantaneous run-of-river mode, with total outflow from the project equaling inflow on an instantaneous basis. The project is currently operated in a run-of-river mode using an automatic pond level control system. This system measures changes to the surface elevation of the impoundment, thus providing an indirect measure of changes to inflow. As inflow increases or decreases, a certain amount of time elapses before the impoundment elevation changes, depending on the rate and magnitude of the change in inflow. Once the change in inflow affects the impoundment elevation, the pond level control system automatically adjusts turbine flow. Based on these technical limitations and the delay associated with adjusting project outflow to match inflow, it would not be possible to match outflows and inflows on an instantaneous basis, as specified by Vermont ANR. Moreover, Vermont ANR has not described how operating the project in an instantaneous run-of-river mode would provide additional protection or benefits to aquatic resources compared to current run-of-river operation.

Continuing to operate the project such that the total outflow from the project *approximates,* rather than equals, inflow at any point in time would result in stable impoundment elevations, which in turn would help protect fish spawning areas and freshwater mussel beds from becoming dewatered and limit project-related erosion along the impoundment shoreline. Operating the project in this manner would likewise ensure that downstream flows are not affected by project operation. Therefore, operating the project in run-of-river mode – defined as the sum of all outflows approximating the sum of all inflows at any given point in time – would provide the same level of benefits to aquatic resources upstream and downstream of the project as Vermont ANR's instantaneous run-of-river mode of operation, and is operationally feasible.

As discussed in section 5.1.1, *Measures Proposed by GMP*, staff recommends GMP's proposal to continue operating the project in a run-of-river mode, such that outflow from the project approximates inflow to the project impoundment. Based on the technical limitations of the project described above, staff does not recommend operating the project in an instantaneous run-of-river mode, whereby outflow from the project equals inflow on an instantaneous basis, as specified by Vermont ANR.

Minimum Bypassed Reach Flow Releases

Under the current license, GMP releases a minimum flow of 80 cubic feet per second (cfs), or inflow, whichever is less, over the spillway and into the bypassed reach from June 1 through October 15. The rest of the year, flow spills into the bypassed reach only when flow volume is less than 60 cfs or greater than 190 cfs, the project's minimum and maximum hydraulic capacity, respectively.

GMP proposes to continue to provide a minimum flow of 80 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from June 1 through October 15. GMP also proposes to release a minimum flow of 40 cfs, or inflow, whichever is less, over the spillway and into the bypassed reach from October 16 through May 31.

Vermont ANR's certification condition B specifies that GMP release a year-round minimum flow of 60 cfs, or inflow if less, from the spillway into the bypassed reach. The bypassed reach is 100 feet long and includes a 60-foot-long bedrock falls with virtually no aquatic habitat value, and a 40-foot-long and 3- to 20-foot-deep pool at the downstream end of the bedrock falls. The deep pool is backwatered by, and hydraulically connected to, the tailrace outflow at all flows 40 cfs and greater. The bypassed reach is fully visible from the southern shoreline of Otter Creek downstream of the dam, and minimally visible from the U.S. Route 4 (Elm Street) bridge, further downstream of the project.

Aquatic Habitat

As discussed in section 3.3.1.2, *Environmental Effects, Minimum Flow Releases*, the current minimum flow of 80 cfs is based on a 1992 flow demonstration study, and the benefits to aquatic habitat are well-supported during the period from June 1 through October 15, when a flow of 80 cfs creates good cover and feeding habitat for fish in the deep pool at the downstream end of the bedrock falls. A flow of 80 cfs enhances the habitat by resulting in a mixing and complexity of flows within the deep pool.

However, during the period from October 16 through May 31, the deep pool is covered in ice much of the time; therefore, cover and feeding habitat is less critical. Fish do not require as much flow complexity for feeding and cover in overwintering habitat because they have the cover of ice and are also not feeding as much as during the open water season when water temperatures are higher and fish are more active. GMP's proposal to release a minimum flow of 40 cfs, or inflow, whichever is less, from October 16 through May 31 would provide some additional habitat benefits compared to the existing conditions, where there is no required minimum flow during this period. A flow of 40 cfs provides negligible flow mixing within the

deep pool, but would provide enough flow for the tailrace and deep pool to remain hydraulically connected.

Vermont ANR's condition B specifying a year-round 60-cfs minimum flow, or inflow if less, would increase the base level of flow mixing and complexity within the deep pool during the period from October 16 through May 31, compared to both current conditions and GMP's 40 cfs proposal. However, as stated above, the benefits of these changes in overwintering habitat for fish are not clear. From June 1 through October 15, Vermont ANR's specified minimum flow of 60 cfs would provide marginally less flow mixing and complexity benefits than both current conditions and GMP's proposed 80 cfs minimum flow.

Aesthetic Resources

As discussed in section 3.3.4.2, *Environmental Effects, Aesthetics*, the current minimum flow of 80 cfs is based on the findings of the 1992 flow demonstration study, and the benefits to aesthetic resources are well-supported for the peak recreation season of June 1 through October 15, when a flow of 80 cfs is considered the optimum flow for increasing wetted areas in the bypassed reach, enhancing visual aesthetics by creating an ideal veil of water over the spillway, improving sound aesthetics by increasing the amount of whitewater splashing over the spillway and falls, and enhancing recreational angling and boating downstream of the project in Otter Creek.

However, the period from October 16 through May 31 is the off-peak season for recreation and public enjoyment at the project, resulting in a significant decrease in recreation and public visits to the project, and a period when portions of the Otter Creek bypassed reach are covered in ice. The 1992 flow demonstration study found that from October 16 through May 31, flows in Otter Creek exceed the project's maximum hydraulic capacity of 190 cfs 93% of the time, resulting in frequent flow releases over the crest of the Center Rutland Project's spillway. In the months of April and May, the maximum hydraulic capacity of the project is exceeded 99.74% of the time and 98.70% of the time, respectively. Therefore, providing additional flow is not necessary for enhancing the visitor experience from October 16 through May 31.

GMP's proposal to release a minimum flow of 40 cfs, or inflow, whichever is less, from October 16 through May 31 would provide some additional aesthetic benefits compared to existing conditions, where there is no required minimum flow during this period. As determined by the 1992 flow demonstration study, 40 cfs is the minimum acceptable aesthetic flow, as it provides a veil across the entire top of the dam and there is sufficient water over the falls for the scale of the site.

As discussed in section 3.3.4.2, *Environmental Effects, Aesthetic,* Vermont ANR's certification condition B specifies that GMP provide a minimum flow of 60 cfs, or inflow if less, to the bypassed reach year-round. Vermont ANR's specification would require GMP to release 20 cfs more than GMP's proposed seasonal minimum flow release of 40 cfs from October 16 through May 31. A 20-cfs increase in the minimum flow would slightly enhance visual and sound aesthetics at the project by maintaining a consistent, fuller veil of water over the spillway and onto the rocks in the bypassed reach through the fall and winter months. However, these benefits would be minimal because portions of the falls and bypassed reach are likely to be

covered in ice during this period, reducing the effects of any visual and sound aesthetics. Additionally, providing a 60 cfs minimum flow in the off-season would offer negligible benefits to visitors and recreationists at the project because visitation to the project is limited during this time. Further, during winter months, the flow in Otter Creek exceeds the project's maximum hydraulic capacity of 190 cfs approximately 93 % of the time, resulting in higher volumes passing over the crest of the dam. In April and May, Otter Creek flows exceed the maximum hydraulic capacity 99.7 % of the time and 98.7 % of the time, respectively.

Vermont ANR's certification condition B specification is also 20 cfs less than GMP's proposed seasonal minimum flow release of 80 cfs from June 1 through October 15. Currently, GMP provides a minimum flow of 80 cfs, or inflow, whichever is less, into the bypassed reach to protect water quality, fish and wildlife resources, and aesthetic resources. As determined by the 1992 aesthetic flow study, study participants determined that 80 cfs was the preferred flow to protect aquatic resources, improve water quality, and improve aesthetics in the summer months when recreation at the project is highest. Reducing the minimum flow during peak recreation season to 60 cfs would reduce wetted areas in the bypassed reach and could impact recreational boating and angling downstream of the dam.

Summary

As discussed above, Vermont ANR's certification condition B specification of a year-round minimum flow of 60 cfs, or inflow if less, could minimally improve fish habitat, and slightly increase the visual and sound aesthetics at the project from October 16 through May 31, compared to GMP's proposal of 40 cfs; however, the benefits to aquatics and aesthetics would be minimal. Although the additional opportunity costs associated with Vermont ANR's certification condition B and GMP's proposed minimum flows are essentially the same ($293 versus $264), Vermont ANR's certification condition B flow would adversely affect aquatic, aesthetic, and recreation resources from June 1 through October 15, as described above. Because the additional benefits to overwintering fish habitat, visual and sound aesthetics, and recreation resources during the period October 16 through May 31 would be marginal, they are not justified by the cost to fishery, aesthetic, and recreation resources during the summer and early fall period of June 1 through October 15. Therefore, pursuant to sections 4(e) and 10(a) of the FPA, we conclude that the most appropriate balance among the use of flow for project generation, fishery resources, aesthetics, and recreation is provided by GMP's minimum flow release proposal, and accordingly, we recommend GMP's flow proposal instead of Vermont ANR's certification condition B

Operation Compliance Monitoring Plan

GMP proposes to develop an operation compliance monitoring plan within 6 months of any license issued for the project and in consultation with Vermont DEC. The plan would define run-or-river operation and operational data to be monitored in order to maintain compliance, specify operational protocols under normal and adverse conditions, and specify requirements for consultation and record keeping. Vermont ANR's certification condition C specifies that GMP develop an operation compliance monitoring plan to document compliance with run-of-river operation and flow releases, including methods for continuously monitoring flow releases,

impoundment levels, and inflows; and provisions for flow data to be available on a "near real-time basis," if requested.

As discussed in section 3.3.1.2, *Environmental Effects, Operation Compliance Monitoring*, an operation compliance monitoring plan would help GMP document compliance with the operational provisions of any subsequent license for the project and provide a mechanism for reporting deviations. An operation compliance monitoring plan would also help the Commission verify that the project is operating in a run-of-river mode, maintaining an impoundment elevation within 3 inches of crest elevation of 505.05 feet NGVD 29, and releasing required minimum bypassed reach flows, thereby facilitating administration of the license and avoiding misunderstandings.

We recommend that the plan include: (1) a detailed description of how GMP will maintain, monitor, and document compliance with the operational requirements of any license issued for the project; (2) a description of the gages and other measuring devices that would be used to monitor compliance with license requirements; (3) procedures for maintaining and calibrating monitoring equipment; (4) standard operating procedures to be implemented outside of normal operating conditions, such as scheduled and unscheduled facility shutdowns; and (5) a schedule for installing monitoring equipment needed to document compliance with the operational requirements of the license. In addition, notifying the Commission and resource agencies of planned and unplanned deviations from run-of-river, impoundment level, and flow requirements would ensure adequate information flows from GMP to the Commission and resource agencies during the term of the license. We recommend that GMP develop an operation compliance monitoring plan with these components and conclude that the benefits of an operation compliance monitoring plan with these components would outweigh the estimated annual levelized cost of $372.

Impoundment Drawdown and Refill Procedure

Periodically, GMP may need to draw down the project impoundment for maintenance and emergencies. During these times, run-of-river operation would be temporarily interrupted. As discussed in section 3.3.1.2, *Environmental Effects, Impoundment Refill Procedure,* retaining all inflows to refill the impoundment after an impoundment drawdown would adversely affect aquatic resources by dewatering aquatic habitat in the bypassed and downstream reaches, potentially stranding fish, mussels, and other aquatic organisms. On the other hand, releasing all flows to the downstream reach would adversely affect aquatic life in the impoundment by sustaining the dewatered conditions. Releasing 90% of the project impoundment's inflow during impoundment refilling would minimize the length of time the impoundment is drawn down and that flows are reduced downstream, which would help to maintain the existing aquatic habitat for fish and other aquatic species, as well as wetlands. Implementing this procedure would have no cost and we recommend that it be included in any subsequent license issued for the project.

Northern Long-Eared Bat Protection

GMP proposes to avoid the removal of trees that are equal to or greater than 4 inches in diameter at breast height (DBH) from April 15 through October 31 to protect the northern long-eared bat (NLEB) during operation and maintenance of the Center Rutland Project.

As discussed in section 3.3.3, *Threatened and Endangered Species*, and Appendix E, *Biological Assessment,* the federally endangered NLEB has the potential to occur in the project boundary. NLEB could be affected by vegetation maintenance activities at the project if removal of trees equal to or greater than 3 inches DBH were to occur during the bat's active season. Trees equal to or greater than 3 inches DBH provide roost sites for adult NLEB throughout their active season, maternity colonies during the summer, and inexperienced flying juveniles during the late summer and early fall. Implementing a seasonal restriction for the removal of trees with diameters that are equal to or greater than 3 inches at breast height from April 1 through October 31, as specified in Vermont ANR's certification condition E, would reduce the likelihood of disturbing any roosting NLEB. These measures would benefit NLEB by protecting it from project-related activities, at no additional cost to GMP, and staff recommends it.

NLEB select trees with a diameter equal to or greater than 3 inches DBH for roosts (FWS, 2014). GMP's proposed seasonal tree-removal restriction applies to trees equal to or greater than 4 inches DBH. Therefore, staff does not recommend GMP's proposal to implement a tree-clearing restriction that only includes trees with a 4-inch or greater DBH.

Recreation Resources

GMP proposes to establish a land transfer or similar agreement with the Town of Rutland for the Town's development of a non-project pocket park downstream of the dam, which would include two parking areas, a hand carry boat put-in, walking trails, beach access, observation area, picnic area, historic and informational signage.

As discussed in section 3.3.4.2 *Recreation Resources, Environmental Effects*, the documented increase in recreation use at the project demonstrates the local demand for recreational access to Otter Creek at the project. Establishing a land transfer for the Town of Rutland's development of a pocket park, as proposed by GMP and specified in Vermont ANR's certification F, would provide continued access and new recreational amenities for anglers, hand-carry boaters, swimmers, passive recreation, and nature viewing on the south shoreline of Otter Creek, downstream of the project. As proposed, the pocket park's design, operation, and maintenance would be executed by the Town, which has obtained a municipal planning grant from the state of Vermont and started soliciting input and developing plans for the pocket park design. While the proposed pocket park would not be a project facility, there is every indication that the Town would construct the park as proposed. Further, the Town's ownership of the land would ensure it remained publicly accessible even if the pocket park amenities were not constructed. Given that the proposed pocket park would meet recreational demand in the vicinity of the project and access to Otter Creek downstream of the project would not cease over the term of a subsequent license for the project, it does not appear to be necessary to make the proposed pocket park a project facility. Further, because the Town and GMP have an agreement for GMP to transfer the land necessary to develop and maintain the proposed pocket park to the

Town, there is no need to require GMP to construct the facility. Because we do not recommend that GMP develop the pocket park, and because the land to be transferred is non-project land, there is no basis to require the land transfer.

However, to ensure recreational needs at the project are met throughout the term of any license issued, staff recommends GMP develop a recreation monitoring plan to evaluate recreational demand and the adequacy of recreational amenities to meet that demand. Regular monitoring of recreational use at the project would help ensure that the proposed pocket park and informal access along the northern bank continue to meet existing demand and future recreational needs, such as access for angling, boating, and swimming in Otter Creek. As discussed in 3.3.4.2 *Recreation Resources, Environmental Effects*, to be effective for the project, the recreation monitoring plan would need to include the following, at a minimum: (1) number of recreational users, (2) types of recreational use observed, (3) duration of time recreational users spend at the site, (4) adequacy of amenities and access to meet recreational demand, and (5) a description of the methods used to collect use data. An effective project-specific plan would also need to include provisions for consulting with stakeholders and the process for identifying the need for any additional recreational facilities. Conducting an initial use monitoring survey within the first five years following completion of the proposed pocket park would ensure the adequacy of the newly completed recreation amenities and access at the park to meet recreational demand. After performing an initial monitoring report, the plan could specify how stakeholders would be consulted to determine the frequency of subsequent recreational use monitoring efforts at the project. Conducting periodic monitoring surveys throughout the term of any license issued would ensure that the recreational use data is captured at reasonable and regular intervals and that the data clearly describes the recreational use at the project. Further, it would help Commission staff monitor whether the pocket park has been constructed and whether it is meeting the recreational needs of the project. Staff estimates that the recreation monitoring plan would have an annualized cost of $800 and find that the benefits are worth the cost.

GMP also proposes to collaborate with the Town of Rutland and stakeholders to develop and install a cultural heritage information kiosk for the Town of Rutland's non-project pocket park to bring awareness to the regional and cultural history. As discussed in section 3.3.4.2 *Recreation Resources, Environmental Effects*, the installation of an informational kiosk at the proposed non-project pocket park would improve the recreational user experience by providing the lengthy historic significance and cultural context of the falls, hydropower, and cultural significance of the lands and Otter Creek the area to visitors. GMP proposes to design and construct the kiosk; however, maintenance would be the responsibility of the Town. Implementing this proposal would have a minimal, one-time cost of approximately $1,100 and we recommend that it be included in any subsequent license issued for the project.

Cultural Resources

As discussed in section 3.3.5.2, *Cultural Resources, Environmental Effects*, the project's area of potential effects (APE) includes the Center Rutland Hydroelectric Station Historic District (Historic District). The Historic District includes the project dam, powerhouse and generating equipment, penstock, marble retaining wall, intake structure, marble pumphouse, former pumphouse, transformer yard, stream gaging station, the Delaware and Hudson Railroad

bridge, the former Route 4 bridge abutments, Clement Mill ruins, and the Clarendon and Pittsford Railroad bridge.[59] The APE also includes archaeologically sensitive areas within the area of potential effects (APE) for the project, as well as a site (VT-RU-0266) that is eligible for listing on the National Register of Historic Places (National Register). Finally, the installation of an upstream eel passage facility at the dam, as discussed above in *Upstream Eel Passage*, could have an adverse effect on the dam by diminishing the visual or physical integrity of the dam, or other contributing resources to the Historic District. Adverse effects to historic properties could occur in the event repairs are needed to maintain the structure and function of the dam, or to fix structural damage that occurs in the course of project operation. It is also possible that unknown historic resources may be discovered during project operation.

GMP proposes to consult with the Vermont State Historic Preservation Office (SHPO) to develop an Historic Properties Management Plan (HPMP) to protect historic properties at the project that are eligible for or listed on the National Register. Developing and implementing an HPMP, in consultation with the SHPO, would ensure that measures are in place to protect historic properties in the APE from adverse effects related to the project. An HPMP would also ensure that any previously undiscovered archaeological resources within the APE are not adversely affected by the project during the term of any subsequent license. We estimate that the levelized annual cost of developing an HPMP would be $370, and conclude that the benefits of an HPMP outweigh the cost. Accordingly, we recommend GMP's proposal to develop and implement an HPMP in consultation with the Vermont SHPO and federally recognized Tribes to protect historic properties that are eligible, or potentially eligible, for listing on the National Register.

Measures Not Recommended by Staff

The following discussion includes the basis for staff's conclusion not to recommend such measures.

Upstream Eel Passage

Although American eel are not present in the project area, they are present in Lake Champlain. Vermont ANR's certification condition D specifies that GMP begin preparing a plan to provide upstream eel passage at the project within 1 year of installation of upstream eel passage at the Otter Creek Hydroelectric Project (FERC No. 2588), the most upstream development on Otter Creek, located at River Mile 64, 7 miles downstream of the Center Rutland Project. Condition D states that the plan could include either trap and truck or an eel ramp as possible methods for providing upstream eel passage at the project.

If American eel are present in the project area in the future, then upstream passage for juvenile American eel at the project could be beneficial by allowing American eel to efficiently move upstream past the project. The magnitude of the potential benefit to American eel

[59] Contributing resources that are project facilities are the project dam, powerhouse and generating equipment, penstock, marble retaining wall, and intake structure.

populations would depend on the number of juvenile eels reaching the Center Rutland Project after passage at the Otter Creek Project, and the amount of habitat available for American eel between the two projects and upstream of the Center Rutland Project. The conditional aspect of Vermont ANR's future eel passage plan, and the fact that the plan contemplates two different methods for providing upstream eel passage make the estimated cost unknown. Therefore, because we cannot weigh the benefits versus the costs of the measure, we have no basis for recommending the plan under sections 10(a) of the FPA.

APPENDIX J

LIST OF COMPREHENSIVE PLANS

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APPENDIX K

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APPENDIX L

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APPENDIX M

VERMONT AGENCY OF NATURAL RESOURCES WATER QUALITY CERTIFICATION

A. Compliance with Conditions. The Applicant shall operate and maintain this Project consistent with the findings and conditions of this certification. The Applicant shall not make any changes to the Project or its operations that would have a significant or material effect on the findings, conclusions, or conditions of this Certification without approval of the Department.

See finding 133 for a statement of necessity. 10 V.S.A. § 1258 & Vt. Code R. 12 030 026 § 29A-101.

B. Flow Management. The Project shall be operated in instantaneous run-of-river mode. Instantaneous run-of-river mode means no utilization of impoundment storage and that outflow from the facility is equal to inflow to the impoundment on a near instantaneous basis except for short term, unavoidable deviations.

The Applicant shall provide a conservation flow of 60 cfs, or inflow if less, to the bypassed reach year-round. The conservation flow shall be provided via spillage over the dam, unless otherwise described in the flow management and monitoring plan or approved by the Department. When the Project is not operating, all flow shall be spilled at the dam.

See findings 141, 144, and 146 for a statement of necessity. 10 V.S.A. § 1258 & Vt. Code R. 12 030 026 § 29A-304 & § 29A-306 (b)(3)(B) & § 306 (c)(3)(B)(i).

C. Flow Management and Monitoring Plan. The Applicant shall develop, within 180 days of the effective date of the FERC license, a flow management and monitoring plan detailing how the Project will operate in instantaneous run-of-river mode and comply with the conservation flow requirements. The plan will also include a method for continuous monitoring and reporting of flow releases (e.g. conservation flow, spillage, and turbine discharge) at the Project, impoundment levels, and inflow. The plan shall include provisions for the flow data to be available on a near real-time basis to allow for records to be furnished upon request.

The plan will include procedures for reporting deviations from prescribed operating conditions to the Department. Reports shall be made within 15 days after a deviation and will include, if possible, the cause, severity, and duration of the deviation, observed or reported adverse environmental impacts from the incident, pertinent data, and measures to be taken to avoid recurrences.

The plan shall be subject to Department approval. The Department reserves the right to review and approve any material changes made to the plan.

See finding 133 for a statement of necessity. 10 V.S.A. § 1258 & Vt. Code R. 12 030 026 § 29A-304 & § 29A-306(b).

D. American Eel Passage. Within 1 year of upstream American eel passage having been installed at the Otter Creek Hydroelectric Project (FERC No. 2558), the Applicant shall initiate plan development for American eel passage. Before developing the plan, the Applicant shall consult with the Vermont Agency of Natural Resources and the U.S. Fish and Wildlife Service. The plan shall be reviewed and approved by the Vermont Agency of Natural Resources and the U.S. Fish and Wildlife Service before implementation. In addition to the method of passage, the plan shall include an implementation schedule. The plan can include, but is not limited to, a trap and truck program or eel ramp installation, or other appropriate measures.

See finding 154 for a statement of necessity. 10 V.S.A. § 1258 & Vt. Code R. 12 030 026 § 29A-306(b)(3)(A).

E. Northern Long-eared Bat Protection. The Applicant shall avoid tree trimming and removal of trees 3- inch diameter breast height or greater in the project boundary between April 1st and October 31st to avoid any roost disruption of the Northern long-eared bat, except when necessary to protect public safety or respond to emergency conditions. In case of a public safety issue or emergency where tree trimming or removal are required during the seasonal protective period, the Applicant will consult with the Department as soon as practical after conducting the trimming or removal.

See finding 158 for a statement of necessity. 10 V.S.A. § 5403.

F. Recreation. The Applicant shall continue to: (1) provide public access and use of Project lands and waters; (2) provide access to and maintain the hand carry put-in/fishing access area located downstream of the powerhouse; and (3) establish an agreement with the Town of Rutland for a pocket park pending appropriate approvals.

See finding 162 for a statement of necessity. 10 V.S.A. § 1258 & Vt. Code R. 12 030 026 §29A- 303(d-f).

G. Debris Disposal. Debris associated with Project operations shall be disposed of in accordance with the Standards and applicable state laws and regulations.

See findings 164 for a statement of necessity. 10 V.S.A. § 1258 & Vt. Code R. 12 030 026 § 29A-303(1).

H. Maintenance and Repair Work. The Applicant shall consult with the Department prior to conducting Project maintenance or repair work that necessitates a deviation from the conditions that assure compliance with water quality requirements (e.g., water level or flow management). Such maintenance and repair work shall be subject to review and approval by the Department.

See findings 149 and 151 for a statement of necessity. 10 V.S.A § 1258 & Vt. Code R. 12 0330 026 § 29A-304(d) and § 29A-306(b).

I. Compliance Inspection by Department. The Applicant shall allow the Department to inspect the Project area at any time to monitor compliance with certification conditions.

See findings 2 and 133 for a statement of necessity. 10 V.S.A § 1258 & Vt. Code R. 12 0330 026 § § 29A-104(a).

J. Posting of Certification. A copy of the certification shall be prominently posted within the Project powerhouse.

See findings 2 and 133 for a statement of necessity. 10 V.S.A § 1258 & Vt. Code R. 12 0330 026 § 29A-104(a).

K. Modification of Certification. The conditions of this certification may be altered or amended by the Department to assure compliance with the Vermont Water Quality Standards and to respond to any changes in classification of management objectives for the waters affected by the Project, when authorized by law, and, if necessary, after notice and opportunity for hearing.

See findings 2 and 133 for a statement of necessity. 10 V.S.A § 1258 & Vt. Code R. 12 0330 026 § 29A-104(a).