STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7628

Joint Petition of Green Mountain Power Corporation, Vermont Electric Cooperative, Inc., Vermont Electric Power Company, Inc., and Vermont Transco LLC for a certificate of public good, pursuant to 30 V.S.A. Section 248, to construct up to a 63 MW wind electric generation facility and associated facilities on Lowell Mountain in Lowell, Vermont, and the installation or upgrade of approximately 16.9 miles of transmission line and associated substations in Lowell, Westfield and Jay, Vermont	)	Technical Hearings held at Montpelier, Vermont February 3-10 and 22-24, 2011

Order entered: 5/31/2011

PRESENT: James Volz, Chairman
David C. Coen, Board Member
John D. Burke, Board Member

APPEARANCES: *(See Attachment A)*

FINDINGS AND ORDER

Table of Contents

I. INTRODUCTION

In this Order, the Vermont Public Service Board ("Board") approves, with conditions, the joint petition of Green Mountain Power Corporation ("GMP"), Vermont Electric Cooperative, Inc. ("VEC"), and Vermont Electric Power Company, Inc. and Vermont Transco LLC (together "VELCO")[1] for a certificate of public good ("CPG"), pursuant to 30 V.S.A. Section 248, to construct up to a 63 MW wind electric generation facility and associated facilities on Lowell Mountain in Lowell, Vermont, and to install or upgrade approximately 16.9 miles of transmission line and associated substations in Lowell, Westfield, and Jay, Vermont.[2] The proposed project consists of either 20 or 21 wind turbines and associated transmission and interconnection facilities. The turbines, each of which is expected to be over 400 feet tall, would be sited along the Lowell Mountain ridgeline in Lowell, Vermont.

After careful consideration of the comments raised by parties and the public and the evidence in the record, we find that, subject to a number of conditions set out in this Order, the proposed project will promote the general good of the state and the Petitioners should be granted a CPG under Section 248 authorizing construction and operation of the project.

The proposed project will be a source of energy that does not produce greenhouse gases. As a non-emitting renewable resource, it will contribute to meeting the need for renewable energy in the region and aid in achieving the standards of the Regional Greenhouse Gas Initiative ("RGGI"). The new source will help meet the state's goals of promoting the development of new renewable generation. These include the standards in the Sustainably Priced Energy Enterprise Development Program ("SPEED")[3] requiring that, by 2012, at least 10% of the state's energy load (as of 2005) be served by new sources of renewable energy, as well as the state's separate, longer-term goal of providing 25% of the energy used in Vermont from renewable resources.

---

1. Collectively, VELCO, GMP and VEC are referred to throughout this Order as the "Petitioners."

2. Chairman James Volz is issuing a separate concurring opinion, appended to today's Order.

3. SPEED projects are new electric generating projects that produce renewable energy. A "new" project means a project brought on-line after December 31, 2004. A SPEED project must use a technology that relies on a resource that is being consumed at a harvest rate at or below its natural regeneration rate. For more information about the SPEED program, visit the Vermont SPEED website at http://vermontspeed.com.

We also find that the proposed project will provide an economic benefit to the State of Vermont in the form of jobs and tax revenues, and, because it will not be merchant-owned, but would rather be the first large-scale generation facility proposed by one of Vermont's investor-owned regulated utilities since the Searsburg wind project was approved in 1996, it will also provide GMP and VEC with a long-term source of stably priced power. These economic benefits, coupled with the fact that the addition of a renewable source of power in the region is consistent with the state's legislated policy goals, have led us to conclude that we should approve the proposed project.

In reaching this decision, we are fully aware of the potentially significant impacts of the proposed project. A number of parties have expressed concerns over whether the project will cause undue adverse effects with respect to wildlife habitat, aesthetics, and noise, as well as questioned whether this particular power source is needed and whether it would provide an economic benefit to the state at all. Many members of the public have also spoken at public hearings or submitted letters and emails, both opposing and supporting the proposed project. Certainly, a wind facility, like any other generating facility or development, has an effect upon the environment. We have taken these environmental impacts, and the issues raised by parties and the public, into account and have throughout our analysis imposed conditions as necessary to address any instances where impacts would otherwise be unduly adverse.

The two primary conditions we adopt relate to mitigation of certain environmental impacts and ensuring there is a sufficient fund to properly decommission the proposed project upon cessation of commercial operations. There was significant disagreement among the parties about the extent of environmental impacts from the proposed project, and whether the Petitioners had proposed appropriate mitigation for those impacts. Ultimately, GMP entered into a Memorandum of Understanding with the Vermont Agency of Natural Resources ("Natural Resource MOU") to mitigate the impacts of the proposed project with respect to habitat fragmentation, necessary wildlife habitat, and state-significant natural communities. Our approval of the proposed project is expressly conditioned on GMP's compliance with its obligations in the Natural Resource MOU so that the environmental impacts from the proposed project that are addressed by the Natural Resource MOU are properly mitigated. Environmental

impacts not addressed by the Natural Resource MOU are addressed by additional conditions imposed in this Order.

Our second significant area of concern is the lack of any proposal from GMP to secure a decommissioning fund and to make it bankruptcy and creditor remote. GMP takes the position that these types of requirements are unnecessary because it is a regulated utility. We disagree, and impose conditions on GMP that are largely consistent with the decommissioning conditions we have imposed on merchant developers seeking to construct wind generation facilities in Vermont. In doing so, we are ensuring that there is inter-generational equity associated with the decommissioning costs of the proposed project. That is, the ratepayers that utilize the power produced by the proposed project will also be the ratepayers that fund its decommissioning through the payment of rates over the life of the facility. Given the importance of proper decommissioning to our approval of the proposed project, we conclude that these requirements are necessary and appropriate.

In addition to requirements that the Petitioners address these two significant concerns, we have adopted conditions to address other potential impacts of the proposed project. In particular, there was extensive testimony about the potential noise impacts of the proposed project. The modeling suggests that the noise arising from the turbines will be noticeable at some of the residences near the proposed project site. Accordingly, we are requiring GMP to meet specific standards limiting noise at nearby residences. This will ensure that any noise is at levels consistent with World Health Organization ("WHO") and Environmental Protection Agency ("EPA") guidelines. GMP appropriately bears the risk associated with complying with the noise level standards we impose, including the possible need to adjust operations.

For these reasons, and those set forth in detail throughout this Order, we find that, as conditioned, the proposed project's benefits outweigh its impacts and that construction and operation of the proposed project will promote the general good.

II. PROCEDURAL HISTORY

On May 21, 2010, the Petitioners filed with the Board a petition for a CPG, pursuant to 30 V.S.A. Section 248, to construct up to a 63 MW wind electric generation facility and associated facilities on Lowell Mountain in Lowell, Vermont, and to install or upgrade

approximately 16.9 miles of transmission line and associated substations in Lowell, Westfield, and Jay, Vermont.

On July 2, 2010, GMP filed a request for a waiver of the notice requirements of PSB Rules 5.402(B) and 5.403(B)(1). GMP determined that, due to a problem with the tax map in the Town of Jay, it had failed to provide notice that it had filed the petition to one adjoining landowner, Mr. Peter Sweeney, as required by PSB Rule 5.402(B). When GMP discovered the failure, it sent a letter to, and left a voice message for Mr. Sweeney, advising him that the petition had been filed and that a prehearing conference was scheduled for July 7, 2010. GMP further determined that it had failed to provide notice of the filing of the petition to the Lamoille County and Northwest Regional Planning Commissions as required by PSB Rule 5.403(B)(1). When GMP discovered this failure, it sent notices of the petition and prehearing conference to the two planning commissions on July 1, 2010, as well as advising them of the same via telephone. Both planning commissions had previously received the 45-day advance notice required under 30 V.S.A. § 248(f). In its Prehearing Conference Memorandum and Scheduling Order dated July 14, 2010, the Board established July 23, 2010, as the deadline for Mr. Sweeney and the two planning commissions to object to GMP's requested waiver, and determined that if no objections were filed, then the waiver request would be granted without further action. No objections were filed and the waiver was therefore granted.[4]

The Board convened a prehearing conference on July 7, 2010, to establish a schedule for this Docket, identify potential parties, and explore preliminary issues.

On July 23, 2010, Board staff conducted a workshop in the Board's Hearing Room in Montpelier, Vermont. Participation in the workshop was open to all parties and those entities or individuals that intended to seek intervention as full parties to the Docket. The workshop was designed to provide an opportunity for participants to obtain technical information from the Petitioners in order to better understand the proposed project prior to beginning the discovery phase of the proceeding.

On August 24 and September 3, 2010, the Board issued orders granting permissive intervention to several parties. Permissive intervention was granted to: Conservation Law Foundation ("CLF"); Vermont Public Interest Research Group ("VPIRG"); Central Vermont

4. *See* Order of 7/14/10 at 5.

Public Service Corporation ("CVPS"); Donald and Shirley Nelson (the "Nelsons");[5] Kevin McGrath; Milo and Bonnie Day (the "Days"); Jack Brooks; Lowell Mountains Group, Inc. ("LMG"); Green Mountain Club ("GMC"); Dyer-Dunn, Inc. ("Dyer-Dunn"); the Town of Albany ("Albany"); the Town of Craftsbury ("Craftsbury"); and the Town of Lowell ("Lowell").

A site visit and public hearing were held on September 23, 2010. The site visit included stops at numerous locations from which the proposed project would be visible if constructed. The public hearing was held in Lowell, Vermont, and 57 members of the public spoke at the hearing, with some of those speaking in support of the proposed project and others opposing it. Two additional site visits were held on November 12, 2010, and January 11, 2011, so that Board staff could view the site of the proposed project from areas that were not able to be incorporated into the initial site visit.

On October 22, 2010, the non-petitioning parties prefiled their testimony and exhibits, and on November 22, 2010, the Petitioners prefiled their rebuttal testimony and exhibits. The Petitioners' rebuttal testimony described changes to the proposed project that they were pursuing in response to some concerns raised in the non-petitioner testimony, and also included consideration of two new potential turbine models not previously mentioned. The changes to the proposed project described in the Petitioners' rebuttal testimony led to the filing of motions by Dyer-Dunn and Albany. Dyer-Dunn sought to have unspecified portions of the Petitioners' rebuttal testimony "stricken"[6] from the record because it contended that the changes amounted to a wholesale and radical modification of the proposed project which should not be allowed in rebuttal testimony. In the alternative, Dyer-Dunn asked the Board to direct the Petitioners to file an amended petition. We denied Dyer-Dunn's motion.[7]

Albany, based on the inclusion of the two new potential turbine models, sought modification of the schedule to allow its noise expert to analyze the sound levels that would be

---

5. In addition to Donald and Shirley Nelson, who are parties to this proceeding, the Petitioners presented a witness named Jeffrey A. Nelson. Any references in this Order to "Nelsons" refer to the parties Donald and Shirley Nelson, while any references to "Nelson" in the singular refer to the Petitioners' witness, Jeffrey Nelson. References to the "Nelson Farm" refer to the farm owned by parties Donald and Shirley Nelson.

6. Dyer-Dunn's motion should have been styled as an objection to the admissibility of testimony under PSB Rule 2.216(C), rather than a motion to strike. *See* Docket 7628, Order of 12/27/10 at 1, fn. 1.

7. Docket 7628, Order of 12/27/10.

produced by these two new potential models and to address the results of that analysis in its prefiled surrebuttal testimony. Albany requested that the schedule be amended by postponing the prefiling of surrebuttal testimony by non-petitioners from January 10, 2011, until February 4, 2011, with the balance of the schedule being adjusted accordingly. We granted Albany's motion in part by allowing its noise expert, and the noise expert of LMG, to prefile their testimony on January 24, 2011, with discovery between the parties on that testimony to follow. We left all other aspects of the schedule intact.

During the course of this proceeding, four memoranda of understanding ("MOU"s) were entered into among various parties. One was submitted as a prefiled exhibit and the other three were entered into evidence as exhibits during the technical hearings. The first MOU was entered into by GMP and the Vermont Agency of Natural Resources ("ANR") and addresses impacts to birds and bats from the proposed project ("Bird and Bat MOU"). The Bird and Bat MOU was filed as exhibit ANR-SD-2 to the prefiled testimony of ANR witness Scott Darling. The second MOU was entered into by GMP and CVPS and establishes a framework to address potential impacts to CVPS' electric distribution and transmission system ("CVPS MOU"). The CVPS MOU was entered into evidence as exhibit CVPS-KLJ-1 during the technical hearing on February 4, 2011. The third MOU was entered into by GMP and the Department of Public Service ("Department") and addresses issues of system stability and reliability under Section 248(b)(3) and least-cost transmission alternatives under Section 248(b)(10) ("DPS MOU"). The DPS MOU was entered into evidence as exhibit GMP-DPS-1 during the technical hearing held February 23, 2011. The final MOU was entered into between GMP and ANR and addresses issues of wildlife habitat, state significant natural communities and habitat fragmentation ("Natural Resource MOU"). The Natural Resource MOU was admitted into evidence as exhibit GMP-ANR-1 during the technical hearing held February 24, 2011.

On February 3-4, 7-10, and 22-24, 2011, the Board conducted technical hearings in the Board Hearing Room in Montpelier, Vermont.

At the conclusion of the technical hearings, in response to a joint motion filed by Albany, Craftsbury, LMG, GMC, the Nelsons, and Bonnie Day, the Board extended the due dates for the filing of briefs and reply briefs by the parties to March 24 and April 7, 2011, respectively. Briefs and reply briefs were filed by the parties and this matter is now ready for decision.

III. PROCEDURAL ISSUE REQUIRING RESOLUTION

Green Mountain Power's responses to record requests

On February 16, March 10, and March 24, 2011, GMP filed responses to a number of record requests made by the Board and parties during the course of the technical hearings in this Docket. On March 28, 2011, the Board issued a Memorandum informing the parties that if they had any objections to the admission of these materials into the evidentiary record, they should file them before close of business on April 4, 2011,[8] and that the Board would promptly rule on any such objections. The Memorandum further stated that if no objections were received by April 4, 2011, the materials would be admitted into the record without further action by the Board.[9]

No party objected to the admission of the materials filed by GMP, and they were therefore incorporated into the evidentiary record.

For purposes of clarification, readers should note that in this Order we refer to the cost estimate[10] related to compliance with the Natural Resource MOU[11] as exh. Pet.- Natural Resource MOU Costs. Additionally, the document submitted by GMP that shows the rate impacts of the costs associated with compliance with the Natural Resource MOU[12] will be referred to in this Order as exh. Pet.-AJK-1 (2nd revised).

IV. COMMENTS OF THE PUBLIC

The Board has provided opportunities for public comments in this Docket through a public hearing and the submission of written communications. The Board convened a public hearing on September 23, 2010, at the Lowell Graded School in Lowell, Vermont. Notice of the public hearing was published in *The Newport Daily Express* on September 14, 2010, *The*

---

8. The Memorandum incorrectly identified April 4, 2011, as a Friday, when it was actually a Monday. The error was brought to the attention of the parties and corrected by e-mail from the Clerk of the Public Service Board's office dated March 29, 2011.

9. Docket 7628, Memorandum dated 3/28/11.

10. Filed by GMP on March 24, 2011.

11. The Natural Resource MOU was entered into evidence as exhibit GMP-ANR-1 on February 24, 2011.

12. Filed by GMP on March 24, 2011.

Chronicle on September 15, 2010, and *The Caledonian Record* on September 16, 2010. Hundreds of people attended the public hearing, 57 of whom spoke. Additionally, the Board has received hundreds of written comments both in support of and opposed to the proposed project via post and e-mail.

Vermont law requires the Board to base its decision on the evidence presented by the parties during the evidentiary hearings. Even though the Board cannot rely on them as evidence, public comments played an important role in this Docket by offering local perspectives and bringing up new issues for the Board to consider. Specifically, the public comments assisted the Board in formulating questions to pose to the parties and witnesses during the technical hearings. The Board reviewed all of the comments made at the public hearing and in writing and sincerely appreciates the concerns expressed by interested individuals. While we cannot address each individual concern, a summary of the primary issues raised by the comments is provided below.

Comments Supporting the Proposed Project

The Board received many comments expressing support for the proposed project. Many of these comments stated that there is a real need to build local renewable generating sources to offset fossil-fuel generation and to combat climate change. Other commenters claimed that the aesthetic impact of the proposed turbines would not be adverse, but rather, would be something that they looked forward to seeing. Several comments focused on GMP's outreach efforts, and stated that the Lowell citizenry was very well informed, and had open and forthright informational meetings with GMP prior to the Town of Lowell vote on Town Meeting Day, March 2, 2010.

Comments Opposing the Proposed Project

The Board also received many comments expressing opposition to the proposed project.

Many of the comments addressed concerns regarding the potential aesthetic impacts of the proposed project, both visual and sonic. Many residents worried about the degradation of the view of the Lowell Mountains from their homes and therefore their quality of life, while others worried that the aesthetic impacts would hurt the tourism business in their communities. One frequently expressed concern was about the lighting, both of the meteorological test towers and the wind turbines. Several comments supported the use of the Object Collision Avoidance System ("OCAS") as a way to mitigate the impacts of lighting. Numerous residents worried

about the loss of quiet enjoyment of their properties and the potentially negative impacts of noise on human health. Some comments questioned whether the purported benefits of the proposed project would outweigh the potential costs to the beauty of the Northeast Kingdom.

Several comments suggested that the Section 248 process is prohibitively difficult for ordinary citizens to engage in with their limited time, resources and experience.

Many comments focused on impacts to the natural environment and wildlife of the Lowell Mountains. These comments noted the potential for bird and bat collisions with the turbines, habitat loss for mammals, and general disruption of the environment. Many members of the public noted Vermont's history of protecting its mountain ridgelines, and wondered why wind turbines should be an allowable use. Several comments encouraged the formulation of a decommissioning plan with adequate funding if the proposed project were approved. Some residents worried about the potential impacts of blasting on the environment, with concerns ranging from asbestos in the air and water to the disruption of drinking water sources and water well integrity.

Numerous comments stated support for renewable energy in Vermont, yet questioned whether utility-scale wind turbines are appropriate for Vermont. Some of these comments put forth that Vermont is a wind-poor state. Many people instead supported solar, biomass, hydro, and conservation, as well as wind turbines on a smaller scale. Some members of the public questioned whether the proposed project should even be considered before a statewide energy plan is devised. These comments often made mention of the Governor's plan to look at where large-scale wind projects should and should not be placed throughout the state. Several comments mentioned support for a centralized approach to wind farm siting, versus the apparent random situation at present. Many comments also addressed the intermittent nature of wind power, and questioned how much carbon dioxide would actually be avoided if the proposed project is built.

Many comments questioned the need for the proposed project given the New England region's surplus of generation capacity. With the need in question, many residents asserted that the Petitioners were pursuing the project instead for a variety of other reasons, including federal subsidies, without which the project would not go forward, and an attempt to "green-up" GMP's public image.

Some comments focused on the local support for the proposed project, as evidenced by the Town of Lowell vote on Town Meeting Day in 2010. Some comments claimed that the residents of Lowell were misled or were ill-informed when they voted on Town Meeting Day. Several asserted that the vote in favor was not about the project per se, but rather was a reflection of the tax relief being offered to the Town of Lowell by the Petitioners. Others stated that the proposed project did not have local support because the surrounding towns had not voted on whether to support the project.

This Order addresses many of these comments and concerns to the extent that they are within the Board's jurisdiction. In so doing, the Board has weighed the benefits and impacts of the proposed project based on the evidence and testimony presented by the parties in this case.

V. PROJECT DESCRIPTION

Findings

1. GMP, VEC, and VELCO are companies as defined by 30 V.S.A. § 201, and are subject to the Board's jurisdiction pursuant to 30 V.S.A. § 203. Petition at 1.

2. The proposed project consists of two components: (1) the wind generation facility to be constructed on approximately 3.2 miles of the Lowell Mountain ridgeline on private lands in Lowell, Vermont (the "Generation Component"); and, (2) associated transmission and substation facilities located in Lowell, Westfield, and Jay, Vermont (the "Transmission Component"). Estey pf. at 3-10; exh. Pet.-DR-2 at 2-3.

3. The proposed project will consist of 20 to 21 turbines, each with a capacity of 2.5 to 3.0 MW and an aggregate capacity of up to 63 MW. The final number and capacity of the wind turbines have not yet been determined, and will depend in large part on the results of an on-site wind resource assessment, environmental impact review, and other studies. Pughe pf. at 5.

4. The proposed project site was selected as being highly favorable for a wind generation facility based on a number of factors: (a) the anticipated level of the wind resource; (b) the length of ridgeline available for wind turbines; (c) the presence of existing roads and the proximity to existing transmission infrastructure; and, (d) the low potential for environmental or other impacts. Pughe pf. at 12.

5. GMP will own and be responsible for the operation of the Generation Component. Various segments of the Transmission Component will be owned and operated by either GMP, VEC, VELCO, or jointly by GMP and VEC. Pughe pf. at 15-17.

6. GMP asserts that the proposed Generation Component will be located on property on which it has the requisite property rights to construct the project in the manner requested by the Petitioners. Pughe pf. reb. at 3-4; exhs. Pet.-CP-1 and Pet.-IAJ-2 (Revised).

7. Lowell Mountain is a prominent north-south oriented ridgeline, with elevations ranging from 2190 feet to 2640 feet. Kane pf. at 5; exh. Pet.-DR-2.

8. The proposed site for the Generation Component currently contains three temporary meteorological (MET) stations. The MET stations consist of two 262-foot high towers (towers A and C) and one 164-foot high tower (tower B), each with several levels of meteorological sensors. While MET stations B & C will be removed, GMP intends to retain MET station A, in order to verify the turbine manufacturer's warranty concerning power output.[13] Zimmerman pf. at 6; Pughe pf. reb. at 2-3; exh. Pet.-JLZ-1.

9. The proposed project is projected to have annual net energy production of 149,000 MWh, assuming maximum project size of 63 MW. This would represent about 6.5 and 4.0 percent of GMP's and VEC's current annual energy requirements, respectively. Smith pf. at 18; Kieny pf. at 9; exhs. Pet.-CP-9 and Pet.-Kieny-1.

10. The proposed project is expected to operate for 25 years, based on routine maintenance and component refurbishment, and for a longer period if the Generation Component is repowered by refurbishing the turbines. Pughe pf. at 19; tr. 2/3/11 at 148 (Powell).

11. GMP entered into an agreement with the Town of Lowell, concerning the proposed project. The agreement addresses tax and supplemental payments, communication protocols, remediation of construction impacts, potential impacts to private property, decommissioning, noise monitoring, fire protection services, and other contractual terms. Dostis pf. at 4; exh. Pet.-RAD-1 (Revised).

12. GMP will create a Good Neighbor Fund for the proposed project. The fund will provide payments based on the proposed project output to the towns of Albany, Eden, Craftsbury, Irasburg, and Westfield. Dostis pf. at 5.

---

13. On February 8, 2010, in Docket 7558, GMP was granted a CPG for the temporary MET towers.

Project Elements

13. GMP has not selected a specific turbine model, but the proposed project will utilize three-bladed, horizontal axis, upwind wind turbines. Each wind turbine will be painted white or an off-white color and will be comprised of three components: a columnar tower; a nacelle; and three rotor blades. The turbines will be between 262 to 279 feet high at the nacelle and 410 to 459 feet high at the tip of the blades. Pughe pf. at 5-6; Pughe pf. reb. at 2; exhs. Pet.-CP-2, 10, and 11.

14. Four models of turbines are currently being considered for the proposed Generation Component: (1) General Electric 2.5 XL; (2) Vestas 90-3.0 MW; (3) Vestas V112-3.0 MW; and, (4) Siemens SWT-3.0-101. The Vestas V112-3.0 MW is the largest of the turbines under consideration. The nacelle height is 275.5 feet (84 meters), the rotor diameter is 367 feet (112 meters), and the height at the tip of the blades is 459 feet (140 meters). Pughe pf. at 5; Pughe pf. reb. at 2; exhs. Pet.-CP-2, 10, and 11.

15. Each turbine will have an associated step-up transformer to increase the nominal generated voltage of 690 V to 34.5 kV. The tower section of the proposed turbines will include a 34.5 kV sulfur hexafluoride ("SF6") gas circuit breaker. Estey pf. at 5; exh. Pet.-DPE-18 (revised) at 3-4.

16. The proposed turbines will be lit in accordance with Federal Aviation Administration ("FAA") lighting guidelines. To comply with FAA guidelines, approximately nine turbines would require night-time flashing red lights mounted on the turbine nacelle. Pughe pf. at 6; exh. Pet.-DR-2 at 44.

17. GMP intends to install, subject to FAA approval, a lighting system commercially known as the Obstacle Collision Avoidance System ("OCAS"). OCAS is a radar system that detects in-bound aircraft that will pass within a specified distance of the proposed project and then turns on the turbine lights (at night only) and broadcasts a radio warning to pilots. Although the FAA has approved use of the OCAS system for other applications, it has not yet approved its use for wind turbines. The FAA is scheduled to address this issue in the next several months. Pughe pf. reb. at 5-6; tr. 2/3/11 at 43-44, and 51 (Pughe).

18. The use of OCAS will require an 18-meter (approximately 61 feet) radar tower located south of the proposed wind generation site. The tower would require a 75-foot by 100-foot

cleared area. GMP is actively pursuing this location and will file a request for Board approval once the required analyses have been completed. Pughe pf. reb. at 6; tr. 2/3/11 at 45 (Pughe).

19. The proposed maintenance building will be constructed with a metal frame and insulated steel siding. The building will be approximately 30 feet deep by 70 feet wide by 30 feet high. The building roof and siding colors will be selected from among the manufacturer's standard colors to minimize the contrast with the surrounding landscape. The building will be used by on-site staff for office space, inventory, tools, and equipment storage. The building will be equipped with a drive-in bay. Pughe pf. at 8; exh. Pet.-CP-4.

20. The Generation Component will be monitored and controlled remotely by GMP using a Supervisory Control and Data Acquisition ("SCADA") system connected to GMP's control center. Pughe pf. at 15.

Interconnection and Transmission

21. The Generation Component will include an electric collection system with an underground 34.5 kV line that will carry power along the ridgeline from the transformers at the wind turbines to an overhead 34.5 kV line on wooden poles ranging from approximately 43 feet to 52 feet in height. The overhead 34.5 kV line will connect to a collector substation (the "Kingdom Community Wind Substation" or "KCW Substation"), which will be located adjacent to the proposed maintenance building approximately 1.3 miles from Route 100. Pughe pf. at 7; Jewkes pf. at 5; exhs. Pet.-DPE-5 (Revised) and 6.

22. The KCW Substation will transform the collector system voltage from 34.5 kV to 46 kV. The KCW Substation will be approximately 140 feet by 140 feet and 45 feet in height and will include: (1) open steel structures; (2) a 34 kV/46 kV step-up transformer on a concrete foundation with an oil-containment system; (3) yard lights on a manual switch for maintenance purposes; (4) perimeter fencing; and, (5) a control building approximately 20 feet by 15 feet and 10 feet high. Pughe pf. at 8; Estey pf. at 5-6; exh. Pet.-DPE-7.

23. The proposed electric collection system will extend west from the KCW Substation to Route 100, on wooden poles with an above-ground height of approximately 35 to 52 feet, and then will extend north approximately 2.5 miles along Route 100 to the proposed VEC Lowell #5 Substation, on approximately 35- to 52-foot-high poles. There will be a 50-foot-wide cleared

area along the overhead collector line, to protect the line from tree damage. Pughe pf. at 7-8; Estey pf. at 7; Jewkes pf. reb. at 3; exh. Pet.-DPE-5, 6.

24. The existing VEC Lowell #5 Substation will be consolidated with the VEC Irasburg #21 Substation, located approximately 50 feet away on Route 100 in Lowell. The existing VEC Lowell #5 and Irasburg #21 substations will be decommissioned. The new VEC Lowell #5 Substation will be constructed entirely within the existing footprint of the VEC Irasburg #21 substation, will be approximately 140 feet by 140 feet and 36 feet in height, and will include: (1) a new 46 kV/12.47 kV step-down transformer on a concrete foundation with an oil-containment system; (2) perimeter fence lighting on a manual switch for maintenance purposes; and, (3) a control building approximately 20 feet by 15 feet and 10 feet high. The existing Lowell #5 facilities will be decommissioned and the components will be removed. Pughe pf. at 8-9; Estey pf. at 7-9; exh. Pet.-DPE-11.

25. The existing 10.4-mile VEC 34.5 kV transmission line between the VEC Lowell #5 Substation and the VEC Jay 17 Substation, located southeast of the intersection of State Route 242 and Cross Road, will be upgraded to 46 kV. The proposed transmission upgrades will occur within the existing 50-foot right-of-way. The upgraded transmission line will be built in a single-pole configuration similar to the existing transmission line, consisting of open wire on cross-arm construction with a distribution underbuild. The current pole heights of 27 to 52 feet will be increased to 43 to 52 feet. Pughe pf. at 19; Estey pf. at 10; Castonguay pf. reb. at 2.

26. The VEC Jay 17 Substation will be upgraded from 35 kV to 46 kV voltage. The new substation will include: (1) a new 46 kV/12.7 kV step-down transformer; (2) a distribution bus structure incorporating four distribution breakers; (3) the existing underground distribution circuits; and, (4) perimeter fence lighting on a switched circuit to allow for emergency services. All improvements will be within the existing substation fence, and the height of the tallest components will increase from approximately 24 feet to approximately 45 feet. Pughe pf. at 10; Estey pf. at 10-11; exh. Pet.-DPE-13.

27. The two-mile VEC distribution line between the Jay 17 Substation and the existing VELCO 46 kV transmission line at the intersection of Route 105 and Cross Road will be rebuilt as a 46 kV transmission line with a distribution line underbuild. The upgraded line will be built in a single-pole configuration similar to the existing line, consisting of open wire on cross-arm

construction for the transmission and distribution lines. The current pole heights range from approximately 35 feet to 52 feet and will be increased to approximately 43 feet to 61 feet. Pughe pf. at 10-11; Estey pf. 11-12.

28. The existing two-mile VELCO 46 kV transmission line will be reconductored between the Route 105/Cross Road intersection and a 46 kV terminal at the proposed 46 kV VEC Jay Tap Switching Station, located west of Leavitt Circle and south of Route 105. (The proposed Jay Tap Switching Station is under review in Docket 7604.)[14] Pughe pf. at 11; Estey pf. at 12.

29. The proposed project will interconnect with the VELCO 115 kV transmission system at the proposed VEC Jay Tap Switching Station, where the 46 kV line will connect with the adjacent proposed VELCO Jay Tap Substation. (The proposed Jay Tap Substation is under review in Docket 7708.) Pughe pf. at 11-12; Estey pf. at 12.

30. The Petitioners will not begin construction of the proposed project without Board issuance of a CPG approving the proposed VELCO Jay Tap Substation and an amended CPG approving the VEC Jay Tap Switching Station. Petition at 2; tr. 2/3/11 at 121 (Pughe).

Joint Ownership and Power Purchase Agreements

31. GMP and VEC have negotiated a Joint Ownership Agreement ("JOA") for portions of the proposed project. Pughe pf. at 16-18; Castonguay pf. reb. at 5-6; exhs. Pet.-CP-5 and Pet.-JC-2.

32. Under the JOA, certain jointly-owned facilities will be owned 58.46% by GMP and 41.54% by VEC. In the JOA, these percentages are defined as each party's joint ownership share. Jointly-owned property under the JOA will be owned by GMP and VEC as tenants in common. Castonguay pf. reb. at 5-6; exh. Pet.-JC-2.

33. Under the JOA, GMP will be entitled to capacity in the upgraded transmission and distribution facilities equal to 75 MW or the Generation Component capacity (whichever is less), and VEC is entitled to the remaining capacity.[15] GMP will use its share to transmit the proposed

---

14. On August 6, 2010, in Docket 7604, VEC was granted a CPG for the proposed Jay Tap Switching Station. On January 21, 2011, VEC requested an amendment to its CPG. VEC's amendment request is currently pending in Docket 7604.

15. Given that the proposed project as filed has a maximum capacity of 63 MW, the capacity entitlement of up to 75 MW no longer would apply.

project output to the VELCO 115 kV system, including the share VEC will purchase. Pughe pf. at 17; exh. Pet.-JC-2.

34. Under the JOA, VEC will convey to GMP 58.46% of its interest in the transmission facilities between the Lowell #5 Substation and the proposed VEC Jay Tap Switching Station and associated easements, and VEC will retain a 41.54% share. This allocation reflects the anticipated allocation of use of the upgraded facilities between GMP and VEC. Pughe pf. at 17; exh. Pet.-JC-2.

35. GMP and VEC will outsource the design and construction of the proposed jointly-owned facilities, by competitive bid, to mutually agreeable vendors and they will jointly approve all designs. Once built, VEC will maintain the upgraded transmission facilities. The cost of construction and maintenance of the upgraded transmission facilities will be allocated on the same 58.46% / 41.54% basis. GMP will not own nor pay for any distribution equipment, except for distribution-related costs necessary to facilitate transmission upgrades. Pughe pf. at 17; exh. Pet.-JC-2.

36. GMP and VEC have agreed to a Renewable Energy Purchase Agreement ("REPA"), which reflects the terms under which VEC would purchase part of the Generation Component output. If the Generation Component is developed to the maximum size of 63 MW, VEC would purchase 8 MW of output, leaving approximately 55 MW of output for GMP. Smith pf. at 18-19; exhs. Pet.-CP-5 and Pet.-CP-9.

37. Under the REPA, VEC will pay GMP for VEC's percentage share of all costs incurred by the Generation Component on a monthly basis, regardless of output. In addition, VEC will pay GMP a development premium equal to two times VEC's percentage share of the development costs associated with the Generation Component, subject to a dollar cap that is calculated based on a formula set out in Exhibit D to the REPA. Kieny pf. at 2-3; exh. Pet.-CP-9 at Exhibit D.

38. The REPA and JOA allow VEC to receive all the benefits of owning its percentage share in the proposed project. Among these benefits is ownership of products in the Independent System Operator of New England, Inc. ("ISO-NE") administered energy and capacity markets and of Renewable Energy Certificates ("RECs") in certain states in the Northeast. Kieny pf. at 2.

Construction and Roads

39. GMP plans to clear approximately 151 acres during construction of the proposed project. Jewkes pf. reb. at 5.

40. Access to the proposed turbines will be over an approximately 2.5-mile gravel and stone access road from Route 100 in Lowell to the Lowell Mountain ridgeline. The width of the travel portion of the access road will generally be 18 feet and there will be three pull-over areas where the road width will be 32 feet, to permit vehicles to pass each other. The disturbed area of the access road will also include cut and fill slopes, an erosion-control zone, and stormwater treatment measures. Pughe pf. at 6; tr. 2/3/11 at 203 (Jewkes).

41. Along the ridgeline, the proposed turbine crane path will require a minimum passable width of 34 feet, to allow a large crawler-type crane to travel between wind turbine sites without the need for disassembly and reassembly. Additional width will be added, as needed, to the crane path for cut and fill, erosion control zones, and stormwater treatment measures. Pughe pf. at 6; exh. Pet.-IAJ-2 (Revised); tr. 2/3/11 at 203 (Jewkes).

42. The Petitioners will employ a micro-siting technique known as Variable Road Location Detail ("VRLD") to construct the access road and crane path. VRLD differs from conventional road design, by balancing the existing topography that must be excavated ("cuts") against the existing topography that must be filled in ("fills") for the road on a local basis (approximately every 300 to 500 linear feet). More accurate balancing occurs due to the ability to vary the actual road elevation and/or the actual road location within a corridor, instead of constructing the road in a fixed location, as with a conventional civil design. Jewkes pf. at 8; exh. Pet.-IAJ-3.

43. VRLD provides a number of benefits. The micro-siting process reduces the amount of material that must be transported by dump trucks either to or from the site along public roads, thus reducing exhaust emissions, fuel consumption, and truck traffic. By using VRLD, the Petitioners will avoid transporting approximately 125,000 cubic yards associated with excess cuts and fills, which translates into avoiding approximately 9,000 to 12,000 dump truck round trips to haul this excess fill to and from the site. Jewkes pf. at 9.

44. The VRLD process will significantly reduce the overall project site work schedule. A shortened schedule will reduce site equipment emissions and fuel consumption. The shortened

schedule will also reduce potential erosion arising during the period between soil disturbance and final site stabilization, as well as construction costs. Jewkes pf. at 9.

45. The use of VRLD will not require more tree cutting than conventional road building. VRLD requires that trees cut to survey and lay out the centerline of the roadway will always fall within the constructed project limit, which is the minimum area that trees need to be cut to construct the proposed project. Prior to any further tree cutting necessary for the road width beyond the centerline, GMP will require its contractor to determine any necessary horizontal and/or vertical re-alignment on the portion of the road being constructed. In this manner, tree cutting will be limited to that necessary to construct the roadway and crane path. Jewkes pf. reb. at 2.

46. To facilitate construction of the proposed Generation Component, there will be two main staging areas, an approximately 5.4-acre area at the intersection of the project access road and Vermont Route 100, and an approximately 0.75-acre area located approximately 1.3 miles up the access road from Route 100 adjacent to the site of the proposed KCW Substation and maintenance building. Pughe pf. at 6; Jewkes pf. reb. at 1-2.

47. In addition to the proposed access road, Meek Road (Town Highway 25) will be used during the initial weeks of construction to provide access for construction equipment to the upper staging area. The use of Meek Road will reduce the length of the construction period by permitting GMP to construct the access road in two directions with two separate crews. Access road construction is expected to take approximately nine weeks. Pughe pf. at 6-7.

48. After construction of the access road, Meek Road will continue to be used to provide an alternate access for automobiles and light truck traffic, which will minimize the amount of vehicle idling time while waiting to pass oversize equipment in access road turnouts. Pughe pf. at 7.

49. GMP plans to transport major proposed project components, including the wind turbines, installation cranes, and other oversize equipment, to the project site from Interstate 1-91, along Vermont Routes 58 and 100. A Vermont Agency of Transportation ("VTrans") permit for the work will be obtained prior to the scheduled transport of materials. Pughe pf. at 14.

50. The proposed project must be in service by December 31, 2012, in order to take advantage of the federal production tax credit. In order to meet that deadline, project construction must commence by the beginning of August, 2011. Tr. 2/3/11 at 93, 99, 120 (Pughe).

VI. SUBSTANTIVE CRITERIA OF SECTION 248(b)

Pursuant to statute, the Board is required to make positive findings related to criteria set out in 30 V.S.A. § 248(b) before it may issue a certificate of public good for a proposed project. Below, we address each of these criteria.

Orderly Development of the Region

[30 V.S.A. § 248(b)(1)]

Findings

51. The proposed project will not unduly interfere with the orderly development of the region, with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality. This finding is supported by findings 52-65, below.

52. The proposed project will be located in the Towns of Lowell, Westfield, and Jay, Vermont. All three towns are located in Orleans County in the northeast section of the state. Exh. Pet.-CP-1 (Revised).

53. The turbines and their associated infrastructure would be located in the Town of Lowell. The transmission portion of the proposed project would be located in the towns of Lowell, Westfield, and Jay. Pughe pf. at 5-12; exh. Pet.-CP-1 (Revised).

54. Other towns in the ten-mile radius of the proposed project include Albany, Barton, Belvidere, Coventry, Craftsbury, Eden, Glover, Greensboro, Hyde Park, Irasburg, Johnson, Montgomery, Troy, and Wolcott. Exh. Pet.-LP-1 at 2; exh. Pet.-DR-2 at Appendix 1.

55. On April 13, 2010, the Town of Lowell entered into an agreement with GMP that will provide the town with annual property tax payments, based on the fair market value of a constructed project, and supplemental payments, based on the capacity of a constructed project.

The agreement was amended on September 14, 2010, to clarify that the supplemental payments would continue until completion of decommissioning rather than cessation of commercial operations. Pion pf. at 4. The agreement was further revised to better reflect the understandings of GMP and the town on March 29, 2011. Pion pf. at 3-4; exh. Pet-RAD-1 (Revised).

56. The proposed project is located within the region covered by the Northeast Vermont Development Association's ("NVDA") Regional Plan which took effect August 4, 2006. Exh. Pet.-DR-2 at 67.[16]

57. The proposed project site is located within what the plan considers a Rural Area. The Regional Plan provides that Rural Areas "should receive very little commercial or industrial development unless it occurs in an established industrial park, in an area specifically designated in the local zoning bylaw, or occurs in an appropriate scale for its rural surroundings." Exh. Pet.-DR-2 at 68 (quoting NVDA Regional Plan).

58. Given the extensive amount of land in the region that is considered rural under the NVDA Regional Plan, the amount of land that will be cleared for construction and operation of the proposed project is relatively small. Exh. Pet.-DR-2 at 68.

59. The NVDA Regional Plan recognizes wind energy as part of the region's energy portfolio. The Plan also recognizes that commercial-scale wind projects raise significant issues and identifies criteria to consider in reviewing these projects:

> (1) The consistency of the proposal with not only the region's plan and the host town's plan and zoning bylaws, but also the plans and bylaws of other towns which may be impacted by the proposed project.
> (2) A weighing of the potential benefits as well as negative impacts on not only the host town but other impacted towns, including a possible outline of tax payment benefits to impacted towns.
> (3) Applicants must include a comprehensive de-commissioning plan when filing for a Certificate of Public Good.
> (4) Appearance and operation of facilities should be weighed as an aspect to change the essential character of the area.
> (5) Proposed turbines should be sited to minimize the visual impacts.

Exh. Pet.-DR-2 at App. 11 (excerpts of NVDA Regional Plan at 39).

---

16. According to Mr. Raphael's exhibit, the NVDA Regional Plan took effect on August 6, 2006. However, the NVDA website indicates an effective date of August 4, 2006. This is consistent with the Board's findings in its Final Order in Docket 7156. *See Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 22.

60. The Lowell Town Plan does not identify Lowell Mountain as a scenic area where development should be prohibited. However, the ridgeline portion of the proposed project site is within the Conservation Mountain District, which the town plan indicates should receive very low intensity of development. Exh. Pet.-DR-2 at 67.

61. "Windmills" are allowed as a conditional use in the Conservation Mountain District under Lowell's zoning bylaws. Exh. Pet.-DR-2 at 67; Blomberg pf. surreb. at 6; exh. LMG-LB-8.

62. The Lowell Town Plan recommends the development of renewable energy resources, including the use of wood, solar, wind and hydroelectric. Exh. Pet.-DR-2 at App. 11 (excerpts of Lowell Town Plan at 32).

63. GMP has proposed creation of what it calls the Kingdom Community Wind Good Neighbor Fund ("Good Neighbor Fund"). This fund will make annual payments to the Towns of Albany, Eden, Craftsbury, Irasburg and Westfield, which constitute the towns within a five-mile radius of the proposed project, with the exception of Lowell. Dostis pf. at 5.

64. Payments from the Good Neighbor Fund will be calculated at the rate of one-tenth of one cent for each kilowatt hour produced by the proposed project during the first ten years of operation. Payments will be allocated based on the acreage that each of the receiving towns has within a five-mile radius of the proposed turbines, subject to a minimum annual payment of $10,000. Dostis pf. at 5.

65. The Petitioners have no objection to a CPG condition requiring them to perform a pre-construction survey of radio and television reception in the area surrounding the proposed project site, and to address any degradation in that reception that may result after construction. Tr. 2/3/11 at 84-85 (Pughe).

Discussion

Section 248(b)(1) provides that, before the Board may issue a CPG for an in-state facility, the Board shall find that the facility:

> will not unduly interfere with the orderly development of the region with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal

> legislative bodies, and the land conservation measures contained in the plan of any affected municipality.[17]

The Petitioners contend that the proposed project will not unduly interfere with orderly development of the region because it is consistent with the Lowell Town Plan and zoning bylaws and the NVDA Regional Plan. The Petitioners further contend that there are no prohibitions against the proposed project in any of the surrounding towns' town plans. The Petitioners also rely on the March 2, 2010, vote by the citizens of Lowell in support of the proposed project.[18]

LMG argues that the proposed project would unduly interfere with orderly development in the region because it is inconsistent with the Lowell Town Plan and zoning bylaws, and because the benefits from the project would be limited. LMG also cites to the town plans of Eden, Westfield and Craftsbury, as well as the Orleans County Regional Plan,[19] and criticizes the March 2, 2010, vote in Lowell as "an end-run around the municipal planning process" that was "inappropriate at best and potentially corrupt."[20]

Dyer-Dunn contends that the Petitioners are seeking to avoid the "spirit" of the Lowell Town Plan and the NVDA Regional Plan and that such a large development cannot constitute orderly development of the region.[21]

The Department argues that the proposed project will not have an undue impact on orderly development of the region because the March 2, 2010, vote in Lowell[22] indicates the surrounding community views it as orderly development. The Department further contends that the proposed project is consistent with the portion of the NVDA Regional Plan that defers to local decision-making with respect to development, and that its impacts are acceptable because the commercial and industrial development will be minimal. Finally, the Department states that

---

17. Section 248(b)(1) contains additional provisions that only apply to natural gas transmission lines.

18. Petitioners' Proposed Decision at 12-14.

19. We assume this is a reference by LMG to the NVDA Regional Plan.

20. LMG Brief at 39-42.

21. Dyer-Dunn Brief at 4.

22. On March 2, 2010, residents of the Town of Lowell voted 342-114 in favor of the proposed project. The 456 residents who cast votes at the meeting represent 78% of the town's registered voters. Dostis pf. at 9; Pion pf. at 3.

the proposed project will not have an adverse impact on the orderly development of any other towns within the proposed project's 10-mile radius.

As the Board noted in its Order in *UPC Vermont Wind*, commercial wind development is inconsistent with certain portions of the NVDA Regional Plan. The proposed project will be located in an area designated as rural by that plan. Land use in these areas is described as receiving "very little commercial or industrial development" outside of industrial parks or occurring in "appropriate scale for its rural surroundings."[23] Given the size and number of the turbines proposed in that case, we concluded that they would constitute a large scale commercial development and would therefore be inconsistent with the land uses described as traditional in a rural area. However, we also noted that the NVDA Regional Plan specifically recognizes that commercial scale wind energy "needs to be considered as a resource" to meet some of the region's "current and future" energy needs, and that the plan also recognizes that there are "significant, legitimate issues surrounding commercial-scale wind generation," and it sets forth several criteria for the Board to consider in its review of these types of projects.[24] As we did in Docket 7156, we have considered all of the issues raised in the NVDA Regional Plan criteria elsewhere in this Order and have concluded that they have been adequately addressed. Therefore, we conclude that the proposed project is consistent with the Regional Plan on an overall basis.

We also conclude that the proposed project is consistent with the Lowell Town Plan.[25] While the ridgeline portion of the proposed project is within the Conservation Mountain District, which the plan indicates should receive very low intensity of development,[26] the plan also recommends the development of renewable energy resources, including the use of wood, solar, wind and hydroelectric.[27] Additionally, "windmills" are permitted as a conditional use in the

---

23. Exh. Pet.-DR-2 at 68 (quoting NVDA Regional Plan).

24. *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 26-27. *See* finding 59, above.

25. Nor do we find any prohibitions in the plans of any other towns in the proposed project's 10-mile radius. While LMG cited to provisions in the town plans of Eden, Westfield, and Craftsbury, it did not explain why the proposed project is prohibited by these plans.

26. Exh. Pet.-DR-2 at 67.

27. Exh. Pet.-DR-2 at App. 11 (excerpts of Lowell Town Plan at 32).

Conservation Mountain District. Taken together, along with the fact that it is well known that in Vermont, commercial wind generating facilities are likely to be located on high-elevation ridgelines, we conclude that the Lowell Town Plan does not seek to prohibit developments such as the proposed project.

Lastly, the issue of whether the proposed project might degrade television and radio reception was raised during the technical hearings. The Petitioners' witness stated they had no objection to the Board imposing a condition of approval that would require them to perform a pre-construction survey to determine the quality of reception in the area surrounding the site of the proposed project, and to address any degradation in signal quality that might result post-construction. Our approval today is expressly conditioned on that requirement.

Need for Present and Future Demand for Service

[30 V.S.A. § 248(b)(2)]

Findings

66. The proposed project is required to meet the need for present and future demand for service which could not otherwise be provided in a more cost-effective manner through energy conservation programs and measures and energy-efficiency and load management measures. This finding is supported by findings 67-69, below.

67. Significant portions of both GMP's and VEC's long-term power supply needs remain "open" at this time. This means that they do not yet have committed resources to meet the reasonably expected demands of their customers. Lamont pf. at 4; Smith pf. reb. at 4; Kieny pf. at 7-8.

68. Even under the most optimistic projections for demand-side management impacts, a significant residual load remains to be served by generation projects. Current Department of Public Service estimates of the potential for efficiency savings are on the order of 15%. Even if those savings could be achieved in a short time, the open positions of both GMP and VEC created as a result of expiring contracts with Vermont Yankee and Hydro Quebec would remain significant. Lamont pf. at 4-5.

69. Vermont's SPEED program sets certain goals for the acquisition of new renewable energy by Vermont's utilities. The proposed project would assist GMP and VEC in meeting those goals. Lamont pf. at 5; Kieny pf. at 8-9; Smith pf. at 4-5.

Discussion

Section 248(b)(2) of Title 30 requires the Board to find that the proposed project:

> is required to meet the need for present and future demand for service which could not otherwise be provided in a more cost effective manner through energy conservation programs and measures and energy-efficiency and load management measures, including but not limited to those developed pursuant to the provisions of sections 209(d), 218c, and 218(b) of this title.

GMP and VEC contend that the proposed project is needed due to each company's need to add committed resources to their power supply portfolios. They also argue that the proposed project will assist the companies in meeting their obligations under the SPEED program, obligations that cannot be fulfilled through energy efficiency and related measures.[28]

Similarly, the Department argues that the proposed project is needed due to the substantial open positions in the power supply portfolios of GMP and VEC, and that these needs cannot be met in a more cost-effective manner through alternate power supply resources, energy efficiency, load management, or other demand-side measures.[29]

Both GMP and VEC have significant open positions in their power supply portfolios on a going-forward basis due to the expiration of contracts with Vermont Yankee and Hydro Quebec. Accordingly, there is an established need for both utilities to arrange for new committed power supplies to meet the present and future demand for service.[30] Construction of the proposed project will help address the going-forward needs of both utilities with respect to meeting that demand for service. And, while it is reasonable to assume that some amount of future energy efficiency measures can be obtained by the companies at a cost less expensive than the power generated by the proposed project, it is not reasonable to assume that cost-effective energy

---

28. Petitioners' Proposed Decision at 14-18.

29. Department Brief at 9-10.

30. *See* exhs. Pet.-DCS-2 (Revised) and Pet.-Kieny-1 for an indication of the magnitude of the expected shortfall between power demand and supply in future years.

efficiency or other demand-side resources will meet anything approaching the amount of the companies' resource needs.[31]

Additionally, as a renewable energy facility, the proposed project will contribute to meeting the state's legislative goals for new renewable power. Pursuant to statute, "A state goal is to assure that 20 percent of total statewide electric retail sales before July 1, 2017 shall be generated by SPEED resources."[32] Additionally, Vermont has established a goal that its retail electric distribution providers obtain an amount of SPEED resources before July 1, 2012, equal to at least five percent of 2005 total statewide electric retail sales, plus statewide growth in electric retail sales between January 1, 2005, and July 1, 2012. However, in no event is the total amount required to exceed 10 percent of total statewide electric retail sales for calendar year 2005.[33] This policy of promoting the development of in-state, renewable resource generating facilities, and the goals established under the SPEED program, cannot be met through energy conservation or efficiency, or load management programs. Because the proposed project would be a qualifying SPEED resource, it would assist in meeting the goals established by the legislature.

These factors lead us to conclude that the proposed project would contribute to both GMP's and VEC's need for committed power-supply resources in their portfolios, as well as assist Vermont in meeting its goals related to new renewable power-supply resources, needs that cannot be met through energy conservation, energy efficiency, or load-management measures.

System Stability and Reliability

[30 V.S.A. § 248(b)(3)]

Findings

70. The proposed project will not have an adverse impact on system stability and reliability, if all necessary upgrades to the interconnecting system identified by the system impact study ("SIS") are constructed. This finding is supported by findings 71-81, below.

---

31. *See Petition of Green Mountain Power Corp.*, Docket 7590, Order of 5/13/10 at 7.

32. 30 V.S.A. § 8005(d)(2).

33. 30 V.S.A. § 8005(d)(1). If this interim goal is not met, then Vermont's retail distribution utilities will become subject to a renewable portfolio standard pursuant to 30 V.S.A. § 8004.

71. CVPS is the owner and operator of electric transmission and distribution system facilities that are located in areas adjacent to the proposed project. CVPS's adjacent facilities include a 34.5 kV transmission line that runs from Lowell, Vermont, to Johnson, Vermont. While the proposed project does not interconnect to CVPS's electric system, the interconnected parallel operation of the proposed project increases the risk that contingencies may adversely affect CVPS's system. Jones pf. at 4.

72. VEC's members in Westfield, Troy, and Jay are presently served by a radial VEC transmission line that originates at the CVPS Lowell Substation and that is nearing the end of its useful life. Loss of the VEC radial line results in power outages to the entire area, affecting approximately 600 members served by the VEC Jay 17 Substation. There is no back-up source for the Jay 17 Substation. The transmission and substation upgrades associated with the proposed project will result in replacement of these aging transmission facilities and will also provide a back-up to CVPS for the loss of any portion of its 34.5 kV system between VELCO's Irasburg and Lamoille County substations. Wright pf. at 5-6.

73. A Feasibility Study for the proposed project was completed on July 19, 2010. The Feasibility Study concluded that the proposed project, in conjunction with several recommended network upgrades, poses no significant adverse impact on the reliability and operating characteristics of the VELCO or VEC transmission systems, the transmission facilities of another transmission owner, or the system of a market participant. Exh. Pet.-DPE-18 (Revised) at 20-21.

74. The Feasibility Study identified certain contingencies that could result in thermal overload of CVPS's Lowell to Johnson 34.5 kV line. Exh. Pet.-DPE-18 (Revised) at Appendix H; exhs. CVPS-KLJ-1, and CVPS MOU at 2.

75. An SIS, which is not yet completed, will consider interconnection stability impacts as well as thermal and voltage issues. The preliminary results of the SIS indicate that in relation to VEC's system, the proposed project does not have an adverse impact on system stability and reliability. Tr. 2/4/11 at 227 (Estey).

76. Provided that any system upgrades and operational improvements identified in the final SIS are implemented, the proposed project will pose no significant adverse effects to the Vermont high voltage transmission system's reliability and stability. Estey pf. reb. at 2.

77. On January 14, 2011, GMP and CVPS entered into an MOU ("CVPS MOU") regarding the proposed project's effects to the CVPS distribution system. Under the MOU, CVPS and GMP will collaborate to design any mitigation strategies necessary or required to avoid adverse effects on the reliability and stability of the CVPS electric system as a result of contingencies that may be identified in the SIS. The terms of the MOU include the following:

> (a) The mitigation strategies to be designed and implemented pursuant to the MOU shall meet least-cost planning objectives while addressing adverse affects on the affected portions of the CVPS electric system for the identified contingencies.
> (b) CVPS and GMP shall design and implement the mitigation strategies consistent with good utility practice with reference to suitable engineering studies, if appropriate, conducted in accordance with prudent engineering practice.
> (c) CVPS and GMP agree to the timely implementation of necessary mitigation strategies to avoid adverse effects of proposed project operation on the stability and reliability of the CVPS electric system.
> (d) Mitigation strategies shall address the contingencies identified in the SIS, but notwithstanding anything contained in such studies shall not be required to address stability or reliability issues introduced by future load growth or system configuration changes on the CVPS system or elsewhere.
> (e) CVPS costs related to the design, procurement and construction of the mitigation strategies shall be allocated in accordance with the ISO New England Inc. Transmission, Markets and Services Tariff and will follow good utility practice as that term is defined by ISO New England.
> (f) The mitigation strategies developed as a result of the MOU shall address all material adverse reliability and stability issues raised by the SIS.

Exh. CVPS-1.

78. The MOU between CVPS and GMP, if approved by the Board, will address all of CVPS's concerns regarding impacts to its system and electric system stability and reliability. Tr. 2/4/11 at 40 (Jones).

79. On February 22, 2011, GMP and the Department entered into an MOU ("DPS MOU") confirming that, provided the proposed project is built consistent with the recommendations of the SIS, it would not adversely affect electric system stability and reliability. Exh. GMP-DPS-1.

80. The DPS MOU identifies the interconnection option proposed by GMP, labeled Alternative 1 in MOU Attachment A, as the least-cost option among alternatives for the proposed project. The DPS MOU requires GMP to revise Attachment A to incorporate the cost

of any facilities or actions required by the SIS and provide the revised Attachment to the Department. Exh. GMP-DPS- 1.

81. Provided the terms of the DPS MOU are adhered to, the proposed project will not have an undue adverse impact on system stability and reliability. Tr. 2/23/11 at 115-16 (St. Peter); exh. GMP-DPS- 1.

Discussion:

An SIS, which is not yet completed for the proposed project, will consider interconnection stability impacts as well as thermal and voltage issues. The preliminary results of the SIS indicate that in relation to VEC's system, the proposed project does not have an adverse impact on system stability and reliability.[34]

Pursuant to Section 248(o), a petition for a wind generation facility is not required to specify the exact make or dimensions of the turbine or rotors to be installed. As recognized in previous wind generation cases, to fully understand the impact of the proposed project on system stability, the operating characteristics of the turbines should be known. Accordingly, we recognize that for wind generation facilities, some additional level of post-certification review of system stability issues may be appropriate, provided that there is sufficient evidence to demonstrate compliance with the criteria of Section 248(b).[35] The evidence presented, including the testimony of the Petitioners' expert, the Department's engineer, the MOU between the Department and GMP, and the MOU between CVPS and GMP, support a positive finding under Section 248(b)(3), provided that the final SIS is filed with the Board before any construction activities can begin. Therefore, we are approving the DPS MOU and the CVPS MOU and require GMP to comply with all conditions and requirements set forth in both MOUs.

The Petitioners' expert and the Department's engineer, as well as the DPS MOU, have indicated that, provided the proposed project is built consistent with the recommendations of the SIS, it would not adversely affect electric system stability and reliability. Accordingly, prior to construction the Petitioners shall submit to the Board and parties the final SIS for a determination by the Board regarding whether the SIS fully satisfies any remaining issues

---

34. Tr. 2/4/11 at 227 (Estey).

35. *Petition of Georgia Mountain Community Wind*, Docket 7508, Order of 6/11/10 at 23; *Petition of Deerfield Wind*, Docket 7250, 4/16/09 at 26; *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 31.

associated with system stability and reliability. Parties shall have the opportunity to comment on the SIS and any required upgrades at that time. Except as identified in the CVPS MOU, GMP shall be responsible for all costs of system upgrades or changes necessary to ensure that the proposed project does not cause adverse impacts to the transmission system. In addition, the Petitioners must obtain Board approval for any necessary upgrades identified in the SIS prior to commencement of construction of the proposed project, including any Section 248 CPGs that may be required for the upgrades.

The Feasibility Study concluded that the proposed project will pose no significant adverse impact on system reliability in part due to recommended network upgrades. Accordingly, we require the Petitioners to implement all network upgrades recommended by the Feasibility Study for the proposed project.

The DPS MOU identifies the interconnection option proposed by GMP, labeled Alternative 1 in DPS MOU Attachment A, as the least-cost option among alternatives for the proposed project. The DPS MOU requires GMP to revise Attachment A to incorporate the cost of any facilities or actions required by the SIS and provide the revised Attachment to the Department. Prior to commencement of construction, the Petitioners shall submit to the Board and parties any revisions to Attachment A of the DPS MOU for a determination by the Board that the interconnection option for the proposed project remains the least-cost option among alternatives.

Economic Benefit to the State

[30 V.S.A. § 248(b)(4)]

Findings

82. The proposed project will result in an economic benefit to the state and its residents. This finding is supported by findings 83-100, below.

83. The proposed project will result in the creation of new jobs, increased tax revenue, and other direct and indirect benefits. Exh. Pet.-TEK-2 at 1.

84. The Petitioners performed an analysis using a regional input/output and econometric model (REDYN). Based on this analysis, the proposed project is projected to result in the following economic gains:

- $50 million in total state economic output during the construction/development phase;
- nearly $3 million in ongoing annual disposable income gains;
- more than $2 million in State General and Transportation Funds during the construction/development phase, and a total of more than $13 million over the 25-year life of the proposed project;
- initial direct state and local property tax payments of nearly $1 million per year;
- escalating land lease payments, most of which are local, expected to start at more than $320,000 per year;
- employment gains in the state of approximately 700 jobs (full-time-equivalent job years) during construction – about 80% of these in Orleans County; and,
- approximately 30 in-state jobs during the operational phase – at least 15 of these expected to be in Orleans County.[36]

Exh. Pet.-TEK-2 at 3-4.

85. The amount of the economic benefits listed in the preceding finding may be impacted based on the cost of power from the proposed project compared to the overall market price for power. Tr. 2/4/11 at 153 (Kavet).

86. Orleans County has the highest rate of unemployment in the state, and Lowell's reported annual average 2009 unemployment rate of 13.6% was more than double the statewide average calculated on the same basis. Consequently, the projected economic benefits of the proposed project will likely provide enhanced fiscal, economic, and social value for those communities. Exh. Pet.-TEK-2 at 4.

87. The cost-effectiveness of the proposed project has declined somewhat since the Petitioners originally filed their application with the Board in May of 2010, in part because both the near-term and long-term outlook for the price of market power has declined, while certain costs of the proposed project have increased. Smith pf. reb. at 4-10, 12; Pughe pf. reb. at 2-3.

88. Additionally, GMP entered into the Natural Resource MOU with ANR which was entered into evidence on February 24, 2011, the final day of technical hearings. Implementation of the terms of the Natural Resource MOU will further increase the costs of the proposed project

36. Out of these 30 jobs, 5.5 positions are expected to be permanent direct hires resulting from the proposed project, with the balance being indirect positions. Tr. 2/4/11 at 149-50 (Kavet).

by approximately $3 million. Exh. GMP-ANR-1; tr. 2/24/11 at 43; exh. Pet.-Natural Resource MOU Costs.

89. If the high side of the proposed VELCO Jay Tap Substation receives Pool Transmission Facilities ("PTF") treatment, the estimated cost of construction to GMP is $136,000,000, with the first-year costs being $18,230,000, and the projected annual levelized costs being $13,400,000. Under this scenario, the first-year base-case cost for power from the proposed project is $.14/kWh, declining to $.069/kWh in year 25. The projected levelized base case cost is $.103/kWh before factoring in costs associated with the Natural Resource MOU. Kvedar pf. reb. at 1-2; exh. Pet.-AJK-1 (Revised); exh. Pet.-AJK-2 (Revised); exh. Pet.-AJK-3 (Revised).

90. In the event that GMP is responsible for all of the costs associated with the high side of the proposed VELCO Jay Tap Substation, the estimated cost of construction to GMP is $152,770,000, with the first year costs being $20,690,000, and the projected annual levelized costs being $15,180,000. Under this scenario, the first-year cost per kilowatt hour is $.159/kWh, declining to $.077/kWh in year 25, with a projected levelized cost of $.116/kWh before factoring in costs associated with the Natural Resource MOU. Kvedar reb. at 1-2; exh. Pet.-AJK-4 (Revised); exh. Pet.-AJK-5 (Revised); exh. Pet.-AJK-6 (Revised).

91. When the costs of the Natural Resource MOU are factored in, the cost per kilowatt hour increases by approximately $.0014. Exh. Pet.-AJK-1 (2nd Revised).

92. It is likely that the Jay Tap substation components will qualify for PTF treatment. Tr. 2/4/11 at 12 (Castonguay).

93. In spite of the increased costs and lower market price outlook, the proposed project still remains a cost-effective option for GMP and VEC to obtain renewable resource power for their portfolios. Smith pf. reb. at 12; tr. 2/4/11 at 214-15 (Kieny).

94. Because it has no fuel or other variable operating costs, the proposed project will provide GMP and VEC with a long-term source of stably priced power which can act like a hedge against price fluctuations in the power market. Smith pf. at 4, 20; Kieny pf. at 4.

95. GMP entered into an agreement with the Town of Lowell whereby GMP will make minimum annual payments to the town in an amount that is expected to generate total payments of approximately $15 million over the term of the agreement if a 63 MW project is constructed. The initial minimum payment is $400,000 plus an additional $5,000 per MW to the extent the

proposed project exceeds 36 MW in capacity. The minimum annual payment is adjusted upward by $32,500 every five years, regardless of the size of the proposed project. Dostis pf. at 3; exh. Pet.-RAD-1 (Revised) at 2-3.

96. GMP will also establish the Good Neighbor Fund from which it will make annual payments to the Towns of Albany, Eden, Craftsbury, Irasburg and Westfield. Payments will be calculated at the rate of one-tenth of one cent for each kilowatt hour produced by the proposed project during the first ten years of operation. Payments will be allocated based on the acreage that each of the receiving towns has within a five-mile radius of the proposed turbines, subject to a minimum annual payment of $10,000. Dostis pf. at 5.

97. Because the proposed project will not produce any stack emissions, specifically carbon dioxide, it can provide some protection in the event of further escalation in the cost of carbon resulting from federal climate legislation or an expansion of the Regional Greenhouse Gas Initiative ("RGGI") program. Lamont pf. at 7.

98. While it is possible that some individual properties may experience negative value impacts as a result of the proposed project, there is no empirical basis to assume that the proposed project will have any negative impacts to aggregate town, county-wide, or regional real property values. Exh. Pet.-TEK-2 at 5; tr. 2/4/11 at 119 (Kavet); Becker pf. at 5-6.

99. The net present value of the benefits from the education property tax payments, annual payments to Lowell, and the Good Neighbor Fund payments is approximately $10.8 million. If it is assumed that all of the properties within 3 miles of the proposed project are devalued by 10%, this would result in an approximately $5.6 million reduction in property values. Using this conservative assumption as to devaluation, the proposed project still provides approximately $5.2 million in net benefits. Becker pf. at 9-10.

100. There is no empirical basis upon which to expect a significant adjustment – positive or negative – to likely tourism visitation or expenditures at the town, county, or regional levels as a result of the proposed project. Exh. Pet.-TEK-2 at 8.

Discussion

The Board, pursuant to 30 V.S.A. § 248(b)(4), must find that the proposed project "will result in an economic benefit to the state and its residents." Section 248 does not require us to

quantify exactly how much economic benefit the state would receive from the proposed project, but only determine that there will be some economic benefit.[37]

LMG argues that the Petitioners have not adequately quantified the amount of economic benefit that would flow from the proposed project, and that to the extent benefits were quantified, asserts that "the question becomes whether between $40 and $50 million over 25 years is a fair price to pay for destroying the Lowell Mountain range."[38]

Albany and Craftsbury argue that the Petitioners failed to take into account impacts on tourism and property values, rendering their economic analysis flawed. Albany and Craftsbury also criticized reliance by the Petitioners' expert on a particular study from the Lawrence Berkeley National Laboratory ("Berkeley Report")[39] that found no negative impacts to property values due to the presence of wind turbines, and argued that a property value guarantee should be in effect for the homes in the vicinity of the proposed project site.[40]

The Days argue that property values for homes near the proposed project site will be negatively impacted and also urge the Board to impose a property value guarantee for homes located within three miles of the proposed project site.[41]

The Nelsons assert that their property has already suffered a decline in value, and that given the criticisms of the study relied upon by the Petitioners' economics expert, his conclusions are not reliable.[42]

Dyer-Dunn argues that the economic benefits from the proposed project are not sufficient to warrant construction of the scale proposed on a Vermont mountain.[43]

---

37. *In re Amended Petition of UPC Vermont Wind, LLC,* 2009 VT 19 at ¶¶ 5-11.

38. LMG Brief at 42-44.

39. *The Impact of Wind Power Projects on Residential Property Values in the United States; A Multi-Site Hedonic Analysis*, December 2009, by Ben Hoen, Ryan Wiser, Peter Cappers, Mark Thayer, and Guatam Sethi.

40. Albany-Craftsbury Brief at 86-92.

41. Day Brief at 7-9.

42. Nelsons Brief at 10-11.

43. Dyer-Dunn Brief at 4-5.

CLF contends that the proposed project will result in an economic benefit to the state and its residents through avoided air emissions, resulting in a healthier environment, and helping the state remain in attainment of federal Clean Air Act requirements because non-attainment could result in limits on allowed activities and construction in Vermont.[44]

The Department concluded that the proposed project will result in an economic benefit to the state due to job creation, additional tax revenues, lease payments and payments from GMP's agreement with the Town of Lowell and the Good Neighbor Fund.[45] The Department noted that, while a measurable town-wide or county-wide reduction in property value was unlikely, it was possible for specific properties located near the proposed project to experience a decline in value, but the benefits from the proposed project were significant enough to offset any such impacts.[46]

The Petitioners argue that the proposed project will provide an economic benefit to the state and its residents because it would constitute a new long-term, stably priced source of power, would be a cost-effective new renewable power source with a projected cost generally consistent with market projections, and it would provide tax, job-related and other benefits to Lowell and the Northeast Kingdom.[47]

Those parties that are opposed to the proposed project make two basic arguments in support of their position. First, they argue that the economic benefits to be gained from the proposed project are not sufficient enough to warrant allowing such extensive construction and its related impacts along the Lowell Mountain ridgeline. Second, they argue that the Petitioners' economics expert improperly relied on the Berkeley Report to support his conclusion that there would not be aggregate town, county, or region-wide negative impacts to property values, and that individual properties proximate to the proposed project site were likely going to be negatively impacted. We address each of these arguments below.

---

44. CLF Brief at 3 (*citing* 42 U.S.C. § 7477).

45. Department Brief at 16-18.

46. Becker pf. at 6-10; Department Brief at 16.

47. Petitioners' Proposed Decision at 25-26.

First, 30 V.S.A. § 248(b)(4) requires that we find a net economic benefit from a proposed project. It does not set a minimum amount or require that we be able to quantify benefits with any particular degree of specificity.[48] Based on the evidence before us, we conclude that the proposed project will create an economic benefit to the state and its residents. The proposed project will provide increased tax revenues, jobs (both temporary during construction and permanent during operations), lease payments, and other direct and indirect economic benefits during construction and operation. These benefits have the potential of amounting to millions of dollars in state economic output, disposable income gains, state and local tax revenues, and other payments.[49] In particular, the proposed project is expected to result in approximately 700 jobs (full-time-equivalent job years) during construction with about 80% located in Orleans County, and approximately 30 in-state jobs during the operational phase with at least 15 of these expected to be in Orleans County.[50]

Additionally, the Town of Lowell will likely see substantial economic benefits due to the agreement it executed with GMP. Under that agreement, GMP will make minimum annual payments to the town in an amount that is expected to generate total payments of approximately $15 million over the term of the agreement if a 63 MW project is constructed. The initial minimum payment is $400,000 plus an additional $5,000 per MW to the extent the proposed project exceeds 36 MW in capacity. The minimum annual payment is adjusted upward by $32,500 every five years, regardless of the size of the proposed project.[51] The payments are a combination of annual property tax payments, based on the fair market value of a constructed project, and supplemental payments, based on the capacity of a constructed project.[52] The supplemental payment amount is determined by subtracting a given year's property tax payment from the amount calculated under the agreement, with GMP paying the difference to Lowell. In the event the property tax payment in a given year is equal to or greater than the amount

---

48. *Amended Petition of UPC Vermont Wind, LLC,* 2009 VT 19 at ¶¶ 5-11.

49. Exh. Pet.-TEK-2 at 3-4.

50. Exh. Pet.-TEK-2 at 3-4.

51. Dostis pf. at 3; exh. Pet.-RAD-1 (Revised) at 2-3.

52. Pion pf. at 3-4; exh. Pet.-RAD-1 (Revised) at 3.

calculated under the agreement, then only the property tax payment is due that year.[53] The tax payments are expected to pay for about 45% of the town's annual municipal budget, and the supplemental payments will be placed in a reserve fund to be spent in a manner decided by the voters of Lowell.[54]

Lastly, GMP has proposed the Good Neighbor Fund from which it will make annual payments to the Towns of Albany, Eden, Craftsbury, Irasburg and Westfield calculated at the rate of one-tenth of one cent for each kilowatt hour produced by the proposed project during the first ten years of operation. Payments will be allocated based on the acreage that each of the receiving towns has within a five-mile radius of the proposed turbines, subject to a minimum annual payment of $10,000.[55] While not as significant as the payments that will be made to Lowell, these annual payments represent an economic benefit to the receiving towns for the first ten years of project operations.

With respect to impacts to property values, we agree with the Petitioners that there is no empirical evidence to support a conclusion that there would be a net decrease in property values on a town, county, or region-wide basis. Even when taking into account the arguments of its critics, we find the Berkeley Report relied upon by the Petitioners' economics expert to be the best empirical information produced to date on the potential impacts of commercial-scale wind generation projects on property values. Based on that report, the Petitioners' expert concluded that there would not be any measurable town, county or region-wide impacts, and we find that conclusion reasonable. While both the Petitioners' and Department's economics experts agreed that it was unlikely there would be a measurable aggregate decline in property values on a town, county, or region-wide basis, they did both acknowledge that there may be some impacts to specific properties located close to the proposed project site.[56] However, Section 248 only requires a project to have a net economic benefit. It does not prohibit projects if there are some negative economic impacts, provided those impacts are outweighed by positive impacts so that

---

53. Pion pf. at 4; Becker pf. at 3; exh. Pet.-RAD-1 (Revised) at 2-3.

54. Pion pf. at 4; tr. 2/4/11 at 73-75 (Pion).

55. Dostis pf. at 5.

56. Exh. Pet.-TEK-2 at 5; tr. 2/4/11 at 119 (Kavet); Becker pf. at 5-6.

the net result is economic gain. We do not believe that the potential for a limited number of properties to see some decrease in valuation will offset the millions of dollars in benefits the proposed project will bring the region and the state.[57] Additionally, the best evidence of record indicates very little likelihood of negative impacts to property values. Therefore, we decline to establish any property value guarantee mechanism.

Lastly, with respect to tourism impacts, the record before us certainly suggests that tourism is an important part of the regional economy. However, the record evidence also leads us to conclude that there will not be a negative impact on tourism as a result of the proposed project being constructed. In fact, experience at Vermont's only working wind generation facility in Searsburg suggests that the facility there may be a tourist attraction, and there are no indications that area tourism has been negatively impacted in the years since the facility began operation.[58]

Aesthetics, Historic Sites, Air and Water Purity, the Natural Environment and Public Health and Safety

[30 V.S.A. § 248(b)(5)]

Finding

101. The proposed project, with the conditions required by this Order, will not have an undue adverse impact on aesthetics, historic sites, air and water purity, the natural environment, and public health and safety. This finding is supported by findings 102–400 below, which discuss in detail the proposed project's impacts on aesthetics, historic sites, air and water purity, the natural environment, and public health and safety.

57. *See* Becker pf. at 6-10 (setting forth an analysis based on conservative assumptions regarding negative impacts to property values and demonstrating a net economic gain).

58. Exh. Pet.-TEK-2 at 8.

Public Health and Safety

[30 V.S.A. § 248(b)(5)]

Findings

102. The proposed project, with the conditions required by this Order, will not have an undue adverse impact on public health and safety. This finding is supported by findings 103-126, below.

Ice Drop, Ice Throw, Structure Failure

103. Icing is caused by: (1) freezing precipitation that glazes exposed surfaces, including wind-turbine rotors; or (2) rime ice accretions caused by super-cooled water droplets in clouds or fog that freeze upon contact with a surface that is below the freezing point. Zimmerman pf. at 13-14.

104. Under certain conditions, a rotor may release the built-up ice ("ice drop" and "ice throw"), which can cause injury to persons sufficiently close to the wind turbine. The risk to humans of being injured by ice falling or thrown from a wind turbine rotor decreases with distance from the wind turbine. Zimmerman pf. at 14.

105. Ice detectors are typically mounted to the nacelle of a turbine or nearby meteorological tower and monitored by the wind-farm control system, triggering an automatic or remote manual shutdown of the wind farm in the event that icing conditions are detected. Exh. Pet.-ML-3 at 6.

106. Any ice build-up on the blades of an operating turbine will lead to additional vibration. This is caused by both mass and aerodynamic imbalances. All turbines are equipped with vibration monitors, which will shut the machine down during these periods. Exh. Pet.-ML-3 at 6.

107. An ice-drop and ice-throw risk analysis for the proposed project was conducted by the Petitioners' expert. The results of the ice-drop analysis indicate that 90 percent of the time ice drops will land within 45 meters from the turbine base, and the remaining 10 percent of the time ice drops will land approximately 45 to 97 meters from the turbine base. Leblanc pf. at 2; exh. Pet.-ML-3 at 10-11.

108. The ice-drop risk analysis indicates that the risk of a fragment of ice dropping and landing in a square meter a specific distance from a project turbine is reduced sharply for distances beyond 60 meters (in the range of the overhang of the wind turbine). Only about one

percent of the time ice drops will land beyond 60 meters of the turbine base. Exh. Pet.-ML-3 at 10-11.

109. The ice-drop risk analysis indicates that only very high winds in a specific direction may cause ice fragments of any significant mass to be blown beyond 60 meters of the turbine base. The probability of an ice fragment dropping in a particular square meter that is located at a distance of 60 meters from the turbine base is approximately once in every 938,000 years. Assuming an estimated 25 days of icing per year, this amounts to an individual risk for a stationary person present for all icing events located 60 meters from the turbine base of once in 112 years. Leblanc pf. at 2-3; exh. Pet.-ML-3 at 17.

110. The results of the ice-throw analysis indicate that, in the absence of any operating protocols, 90 percent of the time ice throws will land within 160 meters from the turbine base, and the remaining 10 percent of the time ice throws will land approximately 160 to 320 meters from the turbine base. Pet.-ML-3 at 10-11.

111. The risk from ice throw is minimized by the implementation of a winter operating protocol with redundancies that will curtail the operation of the wind turbines in the event of icing and when extreme weather conditions present unsafe conditions for the general public. Leblanc pf. at 3; exh. Pet.-ML-3 at 17.

112. The Petitioners are proposing to implement a winter operating protocol using automatic controls that will shut down the turbines under any of the following circumstances: (1) installed ice monitoring devices detect unsafe conditions; (2) ice accretion is recognized by a remote or on-site operator; (3) meteorological conditions are conducive to ice formation; (4) air temperature is several degrees above freezing after icing conditions; and, (5) any other weather condition that appears unsafe. Exh. Pet.-ML-3 at 6; tr. 2/10/11 at 214-15 (LeBlanc).

113. The Petitioners' proposed winter operating protocol will provide for turbines that present a safety risk to the public to be placed in "pause" mode, under which the units are inoperative. Exh. Pet.-ML-3 at 6; tr. 2/10/11 at 197 (LeBlanc).

114. Signage will be posted around the proposed wind turbines to alert people who are in close proximity to the wind turbines to the potential danger from ice during winter operating conditions. Zimmerman pf. at 15.

115. Maintenance personnel for the proposed project will be trained to follow industry-standard safety procedures when working in close proximity to wind turbines when icing conditions are present. Zimmerman pf. at 15.

116. Turbines and turbine control systems operate in a safe and reliable manner when subject to design standard specifications and a certification process. Compliance with the requirements for turbines and turbine safety systems is defined in the design standards International Electrotechnical Commission ("IEC") 61400-1 or IEC WT01:2001 and is verified through certification. Exh. Pet.-ML-4 at 4-5.

117. The likelihood of full blade failure occurring at any speed is approximately 1 in 2,400 turbines per year. Failure of a tip or piece of a blade is even lower at approximately 1 in 4,000 turbines per year. Blade failure is most often caused by design, manufacturing, or installation defects or unforeseen environmental events such as lightning. Exh. Pet.-ML-4 at 2.

118. Blade-failure rates in recent years have declined by a factor of three compared to failures in the 1990s. Exh. Pet.-ML-4 at 2.

119. Should a blade failure occur, experience shows that, with modern design and manufacturing techniques, it is much more likely that most parts of the damaged blade will remain attached to the turbine rather than a whole blade detaching. Leblanc pf. at 4; exh. Pet.-ML-4 at 6.

120. Research suggests that turbine tower failure is somewhat lower than blade failure at 1 in 7,700 turbines per year. The probability of tower failure during the operational lifetime of a turbine meeting the IEC 61400-1 or IEC WT01:2001 certification requirements is lower than the probability of a blade failure. Exh. Pet.-ML-4 at 3 and 6.

Shadow Flicker

121. Shadow flicker is defined as the modulation of light levels resulting from the periodic passage of a rotating wind turbine blade between the sun and a viewer. LeBlanc pf. reb. at 2.

122. It is generally accepted that shadow flicker does not occur at a distance expressed as 10 times the sum of hub height plus rotor radius. Thus, for example, for the Vestas V 112, a viewer does not perceive chopping light by turbines beyond 1400 meters. Exh. Pet.-ML-2 at 4.

123. The Petitioners' expert conducted a shadow-flicker analysis for the proposed project that included 89 dwellings located within 1500 meters of the turbines. Leblanc pf. at 2; exh. Pet.-ML-2 at 2.

124. Based on the modeling using Vestas V112 wind turbines with blade tip height of 140 meters, none of the 89 dwellings are predicted to experience more than 30 hours of shadow flicker per year or more than 30 minutes per day. The results of the modeling are conservative because they do not take into account the effects of weather patterns and cloud cover that would reduce the amount of time that shadow flicker could conceivably occur, do not consider the shielding effects of surrounding vegetation, and do not consider turbine shut down. Leblanc pf. at 2; exh. Pet.-ML-2 at 5.

Construction Blasting

125. A significant portion of the Generation Component will be built in areas with shallow depths to ledge. Blasting will be required in these areas to build the access roads and crane path. The Petitioners will complete a final project blasting plan after the appropriate geotechnical investigations and landowner notifications are complete. Jewkes pf. at 16.

126. The bedrock at the proposed Generation Component site consists of schist and phyllite metamorphic rock belonging to the Stowe Formation, which does not contain asbestos, unlike the Ultramafic bedrock formations located within the Vermont Asbestos Group mine site, which contain asbestos. Therefore, project blasting and other construction disturbance of the bedrock will not result in health or environmental hazards related to asbestos. Nelson pf. at 6; exh. Pet.-JAN-3.

Discussion

In this proceeding, parties raised several concerns related to the impact of the proposed project on public health and safety, specifically the potential impacts associated with ice drop, ice throw, turbine failure, shadow flicker, and blasting.[59]

The Petitioners claim that the proposed project will be constructed, operated and maintained in a manner that limits risk of ice throw, ice drop, turbine failure, and tower failure to acceptable levels. The Petitioners agree to site the turbines so that no turbine is within 60 meters of a non-participating adjoining landowner property line. The Petitioners agree to file for Board

59. We address concerns about noise impacts on public health and safety in the noise section below.

review a winter operating protocol to assure that the risks of ice throw are minimal. In addition, the Petitioners will select turbines for the proposed project that will be certified to IEC design standards to assure risk of tower failure is minimal.[60]

The Days, the Nelsons, and Albany-Craftsbury argue that the Board should impose additional setbacks beyond the 60 meters proposed by the Petitioners to protect the public and private landowners from the risks of ice throw, ice drop and turbine collapse.[61] Albany-Craftsbury supports a setback of at least 700 feet[62] to ensure a zero probability of ice throw impacting adjacent properties and of turbine collapse onto an adjacent property.[63]

The Department contends that, while the majority of local setback requirements in other states appear to be in the range of 1.1 to 1.5 times turbine height, there is a trend towards considering site-specific conditions in determining appropriate setbacks where height-based standards cannot be met.[64] The Department, consistent with a manufacturer's guideline,[65] recommends that the Board establish a set-back distance of 1.1 times the turbine height, measured at the tip of the blade in the vertical position, unless the petitioner can demonstrate that site-specific, risk-based set-backs should be permitted when the developer cannot meet that standard. The Department contends, given the remote terrain abutting the proposed project, that a set-back based on site-specific risk factors is appropriate. The Department recommends the Board impose a 60-meter set-back requirement if it issues a CPG for the proposed project.[66]

---

60. Petitioners Reply Brief at 24-26.

61. Day Brief at 7; Nelsons Brief at 6; Albany-Craftsbury Brief at 105-06.

62. Albany-Craftsbury bases this setback on their interpretation of a GE turbine guidelines document that recommends that the setback be greater than 1.5 times the hub height plus the rotor diameter if icing is likely at the turbine site. Exh. LMG-LB-13.

63. Albany-Craftsbury Brief at 105-106.

64. The Department Reply Brief examines the requirements of California, Massachusetts, and Rhode Island. Department Reply Brief at 5-8.

65. One turbine manufacturer guideline recommends a set-back of 1.1 times the turbine height or 1.5 times the turbine height if ice throw is likely. The guideline further provides that if developers cannot meet the recommended setback, they should contact the manufacturer to perform a detailed safety review based on site-specific factors. Exh. LMG-LB-13, GE Guidelines document.

66. Department Reply Brief at 9-10.

Given that the Petitioners have provided sufficient evidence to determine a risk-based set-back to address the threat to public safety, we decline to adopt the Department's proposed standard at this time. We see no need to establish a general standard in this proceeding given that the evidence allows us to conclude that, under the specific circumstances presented here, a 60-meter setback will protect public health and safety.

The Petitioners have agreed to develop a winter operating protocol for the proposed turbines and to select turbines for the proposed project that will be certified to IEC design standards. The risk related to ice throw is minimized by implementing a winter operating protocol with redundant systems that curtails the operation of the wind turbines during icing conditions.[67] The probability of blade failure and tower collapse are extremely rare during the operational lifetime of a turbine meeting the IEC certification requirements.[68] The Petitioners have demonstrated that the risk of ice drop on public safety will be minimized by siting the turbines at least 60 meters from the property line. As a condition of our approval of the proposed project, we require that the Petitioners implement winter operating protocols, and the proposed turbines meet IEC certification requirements.

Even with operating protocols in place to prevent ice throw, accumulated ice may drop from a stationary turbine. The results of the ice-drop analysis conducted for the proposed project indicate that there is less than a one percent probability of an ice fragment dropping in a particular square meter that is located more than 60 meters from the tower base.[69] In order to address public safety concerns, the analysis also evaluates risks to individuals present during an ice-drop event. Based on site conditions, including an estimated 25 days of icing per year, the probability of an ice fragment dropping on a stationary person in a particular square meter over 60 meters from the tower base is once in 112 years, assuming the person was present during all icing events.[70] As a condition of our approval of the proposed project, we require that the proposed turbines be set back at least 60 meters from the nearest property line.

---

67. Exh. Pet.-ML-3 at 6; tr. 2/10/11 at 214-15 (LeBlanc).

68. Exh. Pet.-ML-4 at 3 and 6.

69. Exh. Pet.-ML-3 at 10-11.

70. Exh. Pet.-ML-3 at 17.

The Petitioners intend to reduce the public safety risk associated with any ice drop or ice throw by gating the access roads and posting signs to warn and discourage the public from entering dangerous areas. As a condition of our approval of the proposed project, we require the Petitioners to implement these measures.

With regard to shadow flicker, the Petitioners have identified residences that will experience shadow flicker from the turbines. However, no residence will be affected, in a worst-case scenario, for more than 30 hours per year, and no more than 30 minutes per day. This estimate is conservative, and actual exposure will likely be significantly lower due to meteorological conditions such as cloud cover not considered in the analysis.[71] We conclude that the potential shadow flicker will not have an undue adverse effect due to the limited number of hours per year that shadow flicker will occur, and given the mitigating effects of vegetation. The actual shadow flicker effect will therefore be limited.

Blasting will be required during construction of the Generation Component to build the access roads and crane paths. The Department proposes a series of requirements to reduce risks to public health and safety from project blasting.[72] As a condition of our approval of the proposed project, as we have in previous cases related to commercial wind generation, we adopt these requirements in order to protect public health and safety. These conditions are set forth below.

In its motion to intervene, the Town of Albany requested intervenor status on the issue of public health and safety for several reasons, among them the concern about asbestos exposure.[73] The Vermont Asbestos Group Mine Site is located in Eden, Vermont, westward across a valley from the site of the proposed project. The Petitioners' bedrock geology map clearly distinguishes between the bedrock at the proposed project site and that at the Vermont Asbestos Group Mine Site.[74] Because the bedrock located at the Generation Component site does not contain asbestos,

---

71. Exh. Pet.-ML-2 at 2-5.

72. Department Brief at 33.

73. Albany Motion to Intervene at 3-4.

74. Exh. Pet.-JAN-3.

we find no evidence to support a conclusion that earth disturbance or construction-related blasting at the proposed project site will result in asbestos entering the atmosphere.

Therefore, the proposed project will avoid undue adverse impacts on public health and safety provided that the Petitioners are required to comply with the following conditions, including the conditions proposed by the Department:

> (1) The turbines shall be set back a distance of at least 60 meters from the nearest property line, measured from the base of the wind turbine(s).
> (2) The access roads shall be gated and signage shall be posted around the wind turbines to alert members of the public who are present in close proximity to the wind turbines to the potential danger from ice during winter operating conditions.
> (3) Turbines for the proposed project shall meet IEC 61400-1 or IEC WT01:2001 certification requirements including periodic testing of the turbines and blades.
> (4) Prior to commencement of construction, Petitioners shall prepare a winter operating protocol, subject to review by the parties and approval by the Board, which shall require that the proposed turbines be placed in pause mode under any of the following circumstances: (a) installed ice monitoring device(s) or heated wind sensors (installation subject to reliability testing) detect if unsafe conditions are present due to icing conditions; (b) ice accretion is recognized by the remote or on-site operator; (c) air temperature, relative humidity and other meteorological conditions at the site are conducive to ice formation; (d) air temperature is several degrees above 0 degrees Celsius after icing conditions; and, (e) any other weather conditions that may result in the unsafe operation of the turbines. The winter operating protocol shall include periodic testing to document protocol performance.
> (5) Blasting associated with construction of the proposed project shall be minimized to the extent practicable and performed only during the hours of 9:00 AM to 5:00 PM Monday-Friday, with the exception of State holidays.
> (6) All blasting for the proposed project shall be carried out by licensed and certified blasting technicians. All blasting shall be performed in accordance with any and all applicable laws and regulations, including, but not limited to, U.S. Department of Interior Rules 816.61-68 and 817.61-68 and the Blasting Guidance Manual, Office of Surface Mining, Reclamation and Enforcement, U.S. Department of Interior to limit peak particle velocity and ground vibration to safe levels. Noise and air blast effects shall be limited through application of proper techniques and blasting mats shall be used where needed to limit the occurrence of flyrock.
> (7) Prior to performing any blasting for the proposed project, the Petitioners shall develop and file for Board approval, a blasting plan that includes a pre-construction survey of any residential or agricultural water sources within one-half mile of any proposed blasting site, and shall arrange for a public information session with surrounding landowners to address concerns related to blasting. Parties with standing on this issue shall have two weeks, from the date this plan is

filed with the Board, to comment on the plan. The Petitioners cannot commence any blasting activities until the plan is approved.
(8) In the event surrounding landowners express concern regarding the impacts of blasting on wells or other structures on their property, the Petitioners shall perform evaluations to determine if any damage has occurred as a result of blasting activities and, if so, remediate any such damage.

Outstanding Resource Waters

[10 V.S.A. § 1424(a)(d)]

Finding

127. The proposed project is not located near outstanding resource waters. Nelson pf. at 5.

Water and Air Pollution

[10 V.S.A. § 6086(a)(1)]

Findings

128. The proposed project, with the conditions required by this Order, will not result in undue water or air pollution. This finding is supported by findings 129-156, below.

Air Pollution

129. With the condition related to SF6 gas described below, the proposed project will not result in undue air pollution. This finding is supported by findings 130-135, below.

130. No air emissions will occur during the operational phase of the proposed project. Nelson pf. at 6.

131. The proposed project will offset carbon dioxide emissions of the marginal generating unit in New England, which, during the majority of hours, is a combined-cycle gas plant. Lamont pf. at 7; Smith pf. at 5.

132. During the construction phase dust will be controlled by Erosion Prevention and Sediment Control ("EPSC") activities including mulching, temporary and permanent plantings, application of erosion-control blankets, and limiting the amount of land area disturbed at one time. Nelson pf. at 6.

133. Construction-related vehicular emissions will primarily be local and intermittent and will be regulated by state vehicular emissions control rules. These emissions will not result in a

significant degradation of air quality. Operation-related vehicular emissions will be minor. Nelson pf. at 6.

134. The VRLD to be employed in the road-building process will reduce the amount of material that must be transported to or from the project site, thus reducing vehicular emissions. Jewkes pf. at 8-9.

135. Each wind turbine will contain inside its base a 34.5 kV Sulfur Hexafluoride ("SF6") gas circuit breaker. GMP is not a member of the EPA's SF6 Emission Reduction Partnership for Electric Power Systems. GMP includes SF6 information in a report under the Global Reporting Initiative program. Estey pf. at 5; letter from Peter Zamore, Esq., to Susan M. Hudson, Clerk of the Board, dated March 10, 2011, at 2.

Discussion

With the condition related to SF6 gas described below, neither construction nor operation of the proposed project will result in undue air pollution. The design and construction plans are such that, during construction, vehicular emissions will be local and temporary. Operation of the turbines will not generate any air pollutants.[75] Instead, operation of the proposed project will likely reduce air emissions in the New England region by offsetting carbon dioxide and other air emissions of the marginal generating unit, which is most often a combined-cycle gas plant.

However, given that each turbine will have a 34.5 kV SF6 gas circuit breaker, we conclude that additional measures are required to ensure that the proposed project will not result in undue air pollution. Sulfur Hexafluoride is a commonly used insulator that is an extremely potent greenhouse gas. While GMP has submitted limited information regarding certain reporting related to SF6, GMP has not submitted evidence or testimony that demonstrates a plan to effectively avoid the emission of the SF6 contained in the 20 to21 proposed circuit breakers. In order to ensure that the SF6 is properly handled, and to preserve any benefits to air quality that the proposed project may cause, we require GMP to submit a plan, for Board approval prior to commencing turbine installation, that details how GMP will employ best management practices related to the installation, maintenance, and eventual disposal of the SF6-containing circuit breakers in order to avoid or minimize SF6 emissions.

---

75. The proposed project will not require an air pollution control permit from ANR. ANR Brief at 5.

LMG contends that the proposed project does not comply with 10 V.S.A. § 6086(a)(1) or 30 V.S.A. § 248(b)(5), because noise from the proposed project would cause an undue adverse impact on human health. Under Environmental Board precedent noise is considered air pollution under Criterion 1 of Act 250 when it may cause adverse health effects such as hearing damage.[76] Welfare Impacts, or well being, are considered under Criterion 8 of Act 250.[77] There is no indication in this case that the proposed project will pose adverse health effects. The Petitioners have performed noise modeling which demonstrates that the EPA and WHO guidelines designed to protect human health (including effects due to sleep disturbance) will be met. If the noise impacts are not as expected, the noise-related conditions that we impose below (in the discussion of noise as an aesthetic issue) will provide assurances that any undue noise levels will be properly mitigated.

Water Pollution

Findings

136. With the conditions established below, the proposed project will not result in undue water pollution. This finding is supported by findings 137-156, below, and by the specific findings under the criteria of 10 V.S.A. §§ 6086(a)(1)(A) through (G), below.

137. The proposed project will require both a National Pollutant Discharge Elimination System ("NPDES") construction-phase permit and an individual stormwater discharge ("INDS") operational-phase permit. Nelson pf. at 11.

138. The NPDES construction-phase permit is an EPA-mandated program for the discharge of stormwater runoff from construction sites with earth disturbance of one acre or more. The Generation Component will have up to 149 acres of earth disturbance. Burke pf. at 4; tr. 2/24/11 at 162-163 (Burke).

139. The NPDES construction-phase permit will address the issues of erosion control and earth disturbance during construction of the Generation Component, and will terminate upon completed construction of the proposed project and final stabilization of the disturbed areas. Burke pf. at 4.

---

76. *Re: Vermont RSA Limited Partnership*, DR #441, Memorandum of Decision at 2 (V.E.B. May 11, 2005).

77. *Re: City of Montpelier and Ellery E. & Jennifer D. Packard*, #5W0840-6-WFP, Order at 21 (V.E.B. May 22, 2000).

140. The construction-phase permit requires an Erosion Prevention and Sediment Control Plan ("EPSC Plan"). The EPSC Plan includes additional oversight and safeguards to mitigate the higher risks presented by the proposed project. Tr. 2/24/11 at 185-189 (Burke).

141. The EPSC Plan will include the installation of preventive measures, monitoring and maintenance of measures, inspections, and proactive action taken to properly manage stormwater runoff during construction of the proposed project. Particular attention will be given to: (1) minimizing disturbance; (2) managing runoff; (3) stabilizing promptly; and (4) monitoring, maintaining, and, if necessary, adapting EPSC measures to evolving site conditions. Minimizing disturbance will involve, to the extent practicable, maintaining existing topography, phasing major disturbance activities, and maintaining existing vegetation. With regard to managing runoff and stabilizing promptly, actions will be taken to (for example): divert potential runoff, stabilize flow paths; disperse concentrated flows through EPSC measures; and stabilize areas of disturbed soil within a specified time frame. With regard to phasing major disturbance activities, the general approach will involve (for example) the following sequence of activities:

> (1) Installation of specified EPSC measures (e.g., limits of disturbance barrier tape and fence, stabilized construction entrance, silt fence, sediment basins, sediment traps) prior to disturbance of any work area;
> (2) Clearing of vegetation with earth disturbance (e.g., removal of stumps) in areas where structures (i.e., turbines, substation, Operations & Maintenance (O&M) building, stormwater management systems, pole structures) will be necessary, in anticipation of installation/construction of these structures;
> (3) Construction of access roads, crane paths, lay down/staging areas, permanent stormwater management systems (likely to be utilized as temporary stormwater management systems during construction), turbine foundations, crane pads, substation, and O&M building; and,
> (4) Installation of turbines, as well as overhead and underground electrical collection lines and transmission lines.

Nelson pf. at 26-28.

142. The primary physical erosion and sediment control measures employed on the site during construction will include demarcation of project limits, silt fence, stone-lined swales, stone check dams, erosion control blankets, erosion control channel lining, fiber roll, temporary sedimentation basins, mechanical stabilization with stone, stabilized construction entrances, water bars, upslope diversion swales, and rip-rap outlet protection. Jewkes pf. at 14-15.

143. On November 12, 2010, GMP filed an application with the Vermont Department of Environmental Conservation ("DEC") for an individual NPDES construction-phase discharge

permit ("INDC"). The filing includes a site-specific EPSC Plan, developed in accordance with the *Vermont Standards and Specifications for Erosion Prevention and Sediment Control* (VT ANR, DEC 2006), and addresses how the proposed construction sequence and construction best management practices will ensure the protection of water quality and compliance with Vermont Water Quality Standards. Nelson pf. reb. at 11; Nelson pf. at 26.

144. For INDC permits, the DEC requires an EPSC specialist to provide additional oversight. The EPSC specialist will perform site visits to ensure that the EPSC Plan is being followed. The EPSC specialist will report to ANR on a weekly basis. Tr. 2/24/11 at 186 (Burke).

145. The INDC permit will also require that a preconstruction conference be held with ANR stormwater management staff, the permittee, the plan coordinators, specialists, and other relevant personnel to review the project, the EPSC Plan, expectations, project schedule, and to ensure that the EPSC plan is followed. Tr. 2/24/11 at 186 (Burke).

146. The proposed project will incorporate additional protective measures during the construction phase. Each earthwork crew will have its own dedicated on-site plan coordinator responsible for inspecting, maintaining and ensuring that the EPSC Plan is followed. Additionally, there will be an erosion-control crew working throughout the project site to supplement erosion control and to ensure compliance with the EPSC plan. Tr. 2/24/11 at 188 (Burke).

147. During construction of the proposed access road, the maximum concurrent earth disturbance that DEC will permit will be 14 acres. During construction of the proposed access road and the crane path, the permitted maximum concurrent earth disturbance will be 10 acres if the road and path are being constructed at the same time. During construction of the crane path along the ridgeline, the permitted maximum concurrent earth disturbance will be 7 acres. Tr. 2/24/11 at 172 (Burke).

148. An operational-phase individual stormwater discharge permit ("INDS") is required for impervious surfaces of one acre or more. The impervious surfaces proposed by the Petitioners total 27 acres and include the proposed crane path and access road, crane pads, turbine foundations, maintenance building rooftop and associated parking areas, and therefore require an INDS. The stormwater runoff from the impervious surface must be treated in accordance with

the standards set forth in the *Vermont Stormwater Management Manual* ("VSMM"). Burke pf. at 4-6, 9; tr. 2/24/11 at 164 (Burke).

149. An operational-phase stormwater permit remains active for the life of an impervious surface, and thus requires treatment of stormwater runoff from impervious surfaces until the impervious surface is removed. Maintenance of an operational-phase stormwater discharge permit may require annual operating fees, annual inspection, maintenance of the stormwater management system, and other reporting and certification requirements. Burke pf. at 12.

150. The operational-phase stormwater management practices are designed to manage the runoff from the impervious roadway and to remove sediment and other stormwater-related pollutants from the runoff. Tr. 2/24/11 at 176-77 (Burke).

151. The Petitioners will prepare an operational phase stormwater management plan to demonstrate how the project's stormwater treatment and control design elements will meet water quality and water quantity requirements of the 2002 VSMM for the Generation Component of the proposed project. Nelson pf. at 12.

152. On September 20, 2010, GMP filed an INDS application with the DEC. The INDS filing includes a description of the proposed project site and an explanation of how the proposed stormwater treatment and control systems comply with applicable standards. The application is currently under review. Nelson pf. reb. at 10-11; Burke pf. at 5.

153. The design goals of the stormwater treatment, collection, and detention system meet the standards of the VSMM, including the Water Quality Treatment Standard, Channel Protection Treatment Standard, Groundwater Recharge Standard, Overbank Flood Protection Standard, and Extreme Flood Protection Standard. The stormwater design will manage the entire frequency of storms anticipated over the life of the stormwater management system. Jewkes pf. at 12.

154. The stormwater treatment system will be designed in a manner that meets all VSMM requirements, and may include level spreaders, stormwater ponds, grass-lined swales, and vegetated filter strips. Jewkes pf. at 12.

155. The proposed project will also be operated under GMP's existing Spill Prevention, Control and Countermeasures ("SPCC") Plan that has been modified to address specific elements of the proposed project. The SPCC Plan is applicable to both the substations and Generation Components of the proposed project. The purpose of the SPCC Plan is to describe oil-spill

prevention measures, oil-spill control devices, and countermeasures developed to respond to oil spills. Nelson pf. at 12; exh. Pet.-JAN-5.

156. The decommissioning plan, as set forth in the Natural Resource MOU, calls for deep-ripping/scarification of the proposed crane path and a portion of the proposed access road to make the compacted surface pervious. This activity will necessitate the development of a new Erosion Prevention and Sediment Control plan and the issuance of a new construction-phase stormwater permit at the time of decommissioning. Exh. GMP-ANR-1 at 9; tr. 2/24/11 at 178 (Burke).

Discussion

The Petitioners have proposed construction measures and preliminary design plans intended to prevent soil erosion and stormwater runoff that may otherwise result in undue water pollution. Substantial expert testimony has been presented that demonstrates that the proposed project can be constructed and operated in compliance with applicable standards designed to protect water quality. The Petitioners have applied for, but not yet received, the INDC permit, which will include an approved EPSC plan in accordance with the *Vermont Standards and Specifications for Erosion Prevention and Sediment Control* (VT ANR, DEC 2006), and the INDS permit for the proposed project. The applications are currently being reviewed by DEC. With the conditions that the Petitioners' INDC and INDS applications are approved, and the Petitioners file the INDC permit with the Board prior to commencing any earth-disturbing activity, and file the INDS permit with the Board prior to creating any impervious surface, the proposed project will not result in undue water pollution. If the construction measures and design plans approved in the INDC and INDS permits represent a substantial change from the plans and material representations previously submitted to the Board, the Petitioners must receive Board approval prior to commencing construction.

Pursuant to the Natural Resource MOU, decommissioning of the project site will include deep-ripping or scarifying the crane path and a portion of the access road, thus rendering the surface pervious. ANR has indicated that this activity will require a new EPSC and construction-phase stormwater permit. Accordingly, we require petitioners to file the new EPSC and construction-phase stormwater permit prior to commencing this phase of decommissioning.

Headwaters

[10 V.S.A. § 6086(a)(1)(A)]

Findings

157. The proposed project, with the conditions imposed below, will meet all applicable health and environmental conservation regulations regarding reduction of the quality of ground or surface waters flowing through or upon headwaters areas, and therefore will not have an undue adverse impact to headwaters. This finding is supported by findings 158-171, below, and by the specific findings under the criteria of 10 V.S.A. § 6086(a)(1)(G) (wetlands), below.

158. The Generation Component of the proposed project, including portions of the proposed access road, is located on lands that constitute headwaters as defined in 10 V.S.A. § 6086(a)(1)(A). Nelson pf. at 10.

159. The wetlands along the ridgeline act as functional headwaters for many of the streams that originate on the site. The wetlands are a critical transition between groundwater and surface water. Headwater wetlands moderate water temperature and contribute organic matter to the stream, both of which are critical to stream biota. Morrison pf. at 4; Morrison pf. surreb. at 3.

160. There are several Class III wetlands on the Generation Component site that are important for groundwater recharge and discharge, and act as functional headwaters for intermittent and perennial streams. It is important to protect the water-quality function of the wetland and to protect the waters entering high-elevation streams. Morrison pf. at 9.

161. A fundamental objective of the proposed project design is to maintain natural drainage patterns and topography to the extent practical. This will be achieved by minimizing the amount of grading for road construction and turbine pad areas, maintaining natural surface-water flows associated with streams and wetlands crossed by the proposed access road and crane path, and providing buffers to water resource features wherever possible. Nelson pf. at 10-11.

162. There will be approximately 9,892 square feet of direct impacts to functional headwater wetlands at or near the ridgeline. Impacts from clearing, grading and other construction within close proximity to these types of wetlands can have indirect effects on their functions and values. The proposed project will also cross a number of streams and drainageways along the ridgeline. The cumulative effects of these impacts should be offset by appropriate mitigation. Morrison pf. surreb. at 3.

163. The comprehensive EPSC Plan will incorporate measures to protect water quality during construction, with particular attention being given to those areas of earth disturbance that are located within close proximity to receiving waters that are located above 2,500 feet in elevation. The permanent stormwater management plan will protect water quality and control runoff rates following construction. Nelson pf. at 11.

164. The Petitioners have agreed to move the access road for Tower 21 in an attempt to minimize impacts to wetland 2009-C42. The Petitioners have also agreed to introduce limestone-rich fill material for the turbines in order to avoid potential iron bacteria blooms. This construction-related mitigation is intended to protect the functions of headwater wetlands. Morrison pf. at 9-10.

165. The proposed project will require a Section 404 permit from the U.S. Army Corps of Engineers and a supporting Section 401 Water Quality Certification from DEC. Nelson pf. at 33.

166. The Section 404 permit is required under the Clean Water Act for depositing of fill or dredged material in waters or adjacent wetlands, for site-development fill for commercial developments, or for placement of riprap and road fills. Pughe pf. at 18.

167. The Section 401 Water Quality Certification is a certification that the project complies with Vermont Water Quality Standards. Tr. 2/24/11 at 152 (Morrison).

168. The Petitioners have applied for both the Section 401 certification and Section 404 permit. Tr. 2/24/11 at 152 (Morrison).

169. The Section 401 certification and the Section 404 permit will require mitigation due to the extent of impacts to wetlands and their functions. ANR is willing to follow the Army Corps of Engineers guidelines which establish a ratio of 15:1 (mitigation to impacted acres) where mitigation in the form of preservation is sought. Morrison pf. at 9; Nelson pf. surreb. at 15.

170. Appropriate mitigation to functional headwaters could include conservation of higher-elevation wetlands with similar functions and values as those being impacted. Morrison pf. surreb. at 2-3.

171. The Section 401 and Section 404 approval processes will address the need for appropriate mitigation for impacts to functional headwaters. Tr. 2/24/11 at 152 (Morrison).

Discussion

The Generation Component of the proposed project, including portions of the access road, is located in a headwaters area. The Petitioners' environmental consultant concluded that the proposed project will not have an undue adverse impact to headwaters.[78] ANR's wetlands expert, Shannon Morrison, testified that impacts to headwaters could be mitigated through conservation of high-elevation wetlands,[79] and the need for appropriate mitigation would be addressed in the Section 401 and 404 approval processes.[80] As discussed below in the section addressing wetlands impacts, our approval is conditioned on the Petitioners filing with the Board their mitigation proposal and supporting analysis for high-elevation wetlands, and parties with standing on these issues will have two weeks to file comments on the mitigation proposal and to request a hearing. If a party requests the opportunity for a hearing, it must demonstrate why a hearing is necessary. We also caution parties that the post-certification process is not an opportunity to present additional arguments on issues decided in this Order. Petitioners may not commence construction until they have received Board approval of the mitigation proposal.

The condition imposed in our wetlands discussion also requires the Petitioners to obtain the necessary Section 401 certification, Section 404 permit, and wetlands permits. The Petitioners must file these permits with the Board once they are obtained.

Waste Disposal

[10 V.S.A. § 6086(a)(1)(B)]

Findings

172. The proposed project will meet applicable health and DEC regulations for waste disposal and will not inject waste materials or any harmful toxic substances into groundwater or wells. This finding is supported by findings 173-176, below.

173. During construction of the Generation Component of the proposed project, sanitary wastewater disposal will be addressed by the use of on-site portable toilets serviced by a licensed septic hauler. Nelson pf. at 13.

---

78. Nelson pf. at 13.

79. Morrison pf. surreb. at 2-3.

80. Tr. 2/24/11 at 152 (Morrison).

174. During operation of the proposed project, the only sanitary wastewater generated will be associated with the maintenance building and will be disposed of via a leach field disposal system. The treatment and disposal system will be designed, permitted, and constructed to meet the applicable criteria of the 2007 *Vermont Wastewater System and Potable Water Supply Rules*. Nelson pf. at 13.

175. The proposed project will need to obtain a wastewater permit from DEC. Pughe pf. reb. at 12.

176. Solid waste disposal will be handled by local private haulers. Pughe pf. at 23.

Water Conservation

[10 V.S.A. § 6086(a)(1)(C)]

Findings

177. The proposed project will not require a new water supply and will not have an impact on existing water use. This finding is supported by findings 178-179, below.

178. Small amounts of water may be used during construction for dust suppression in accordance with the EPSC plan. Small amounts of water may also be used to pressure-wash the towers. Nelson pf. at 16.

179. The only ongoing water usage during operation of the proposed project will be potable water usage at the maintenance building. This potable water will be supplied by an on-site drilled bedrock well. This facility's water fixtures will incorporate water-conserving features. Nelson pf. at 16.

Floodways

[10 V.S.A. § 6086(a)(1)(D)]

Findings

180. The proposed project will not restrict or divert the flow of flood waters or increase the peak discharge of the rivers, brooks or streams, and endanger the health, safety and welfare of the public or of riparian owners during flooding. This finding is supported by findings 181-184, below.

181. There are no Federal Emergency Management Agency ("FEMA")-mapped floodways within any region of the Generation Component of the proposed project. Nelson pf. at 17.

182. The Transmission Component of the proposed project crosses near several FEMA-mapped Zone A, or "Special Flood Hazard Area," floodways. In Lowell, the Zone A floodways are associated with the East Branch of the Missisquoi River, Ace Brook, Truland Branch Brook, an unnamed tributary of the East Branch of the Missisquoi River, and LeClair Brook. In Westfield, the Zone A floodways are associated with the Missisquoi River, an unnamed tributary of the Missisquoi River, Taft Brook, an unnamed tributary of Taft Brook, and Mill Brook. In Jay, the Zone A floodways are associated with the Jay Branch and Crook Brook. Nelson pf. at 17.

183. There will be minimal to no alterations to the waterways, flood elevations, or the ability of the land to hold waters as a result of the transmission-line upgrades along the existing right-of-way, or new installation along existing roadway ROW. Nelson pf. at 17-18.

184. Substations associated with the Transmission Component are located outside of the FEMA-mapped Zone A floodways, and any potential substation upgrades will not impact floodways. Nelson pf. at 18.

Streams

[10 V.S.A. § 6086(a)(1)(E)]

Findings

185. The proposed project will, whenever feasible, maintain the natural condition of affected streams and will not endanger the health, safety, or welfare of the public or adjoining landowners. This finding is supported by findings 186-197, below.

186. The proposed project has been designed to avoid water-resource impacts and to minimize such impacts where unavoidable. Nelson pf. reb. at 3 (Revised).

187. Project plans include riparian buffer zones consistent with *ANR Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers*. The riparian buffer recommendations reflect ANR's priorities for riparian buffers, including water-quality protection, channel protection, and maintenance of wetlands. Nelson pf. at 21-22.

188. The Generation Component of the proposed project will have a direct stream impact of 0.189 acres. Nelson pf. reb. at 3 (Revised).

189. The streams located within the Generation Component include both Class A(1) and Class B waters, designated pursuant to the 2008 Vermont Water Quality Standards. Class A(1)

streams are those located above 2,500 feet in elevation above sea level. The Class A(1) waters include the upper reaches of the stream channels that the petitioners have identified as 2009-SC-C15a, 2009-SC-C15b, 2009-SC-C29, 2009-SC-C30, 2009-SC-C31, 2009-SC-C33 and 2009-SC-C57. The remaining waters are Class B. The streams will be further classified as part of the construction and operational-phase stormwater discharge permit applications. Nelson pf. at 19; exh. Pet.-JAN-6.

190. The majority of the Generation Component access-road infrastructure for stream crossings will be permanent, culverted crossings. The access road has been located and designed to minimize stream and riparian-zone impacts by using perpendicular crossing orientation and bottomless culverts, by minimizing riparian-zone vegetative clearing, by maximizing fill slopes where applicable, and by minimizing road and culvert footprints. Nelson pf. at 20.

191. Temporary stream crossings may be necessary for construction-phase access to pole-placement sites within the Transmission Component of the proposed project. Access to these sites will be designed in accordance with the *2006 Vermont Standards and Specifications for Erosion Prevention and Sediment Control*, which, along with the EPSC Plan for construction activities, will protect against stream channel impacts from erosion and sediment. The Section 401 and Section 404 approvals will include a review of stream crossing impacts. Nelson pf. at 20-21.

192. The delineated streams within the Transmission Component are primarily Class B waters, pursuant to the 2008 Vermont Water Quality Standards. However, there are Class A(2) waters including stream segments associated with the Coburn Brook and Coburn Brook Reservoir in Westfield, and upstream of the water intake of Coburn Brook. Petitioners have identified these streams as 2009-SC-C28b, 2009-TB-C29 (Coburn Brook), 2009-SC-C30, and 2009-TB/SC-C31. These streams will be further classified as part of the construction-phase stormwater discharge permit application. Nelson pf. at 19-20.

193. The water source for the Dyer-Dunn cabin is a spring-fed perennial tributary stream of Truland Brook, one of the identified headwaters of the Missisquoi River. The stream originates in springs on land leased to the Petitioners. This land will be subject to construction activities, including blasting. Dyer-Dunn pf. at 3-4; Nelson pf. reb. at 24.

194. There will be no project-related earth disturbance within the watershed of the tributary stream that supplies water for the Dyer-Dunn cabin. Nelson pf. reb. at 23-24; exh. Pet.-JAN-15.

195. There are two springs and four spring-fed ponds on the Nelsons' property at the base of the Lowell Mountain Range. The springs have historically served as water sources for the Nelsons' residence and farm. Nelsons pf. at 5; Nelsons pf. surreb. at 1.

196. The southerly spring is located approximately 3,400 feet from the nearest area of proposed earth disturbance associated with the proposed project, and the northerly spring is located approximately 3,000 feet from the nearest proposed earth disturbance. Nelson pf. reb. at 23.

197. Based on the distance between the proposed earth disturbance and the two Nelson springs, it is not expected that any impact will occur to either the quantity or quality of water of the springs. Nelson pf. reb. at 23.

Discussion

Several parties, including Dyer-Dunn and the Nelsons, have expressed concern that construction of the proposed project, and drilling and blasting in particular, may negatively impact water sources on their properties. Dyer-Dunn asserted that its water source is significant to the use and enjoyment of Dyer-Dunn's cabin, but may not be otherwise significant. Similarly, the Nelsons contended that their property may be impacted by the proposed project's effect on headwaters and the creation of impervious surfaces.[81] Dyer-Dunn proposed that, should the Board issue a CPG, the CPG should be conditioned in such a way as to protect the potability and flow of the stream water source.[82] The Nelsons did not propose any conditions.

Petitioner witness Jeffrey Nelson visited both the Dyer-Dunn and Don and Shirley Nelson properties to investigate their water sources and later mapped the sources with reference to proposed construction activities. Jeffrey Nelson concluded that, because there was either no proposed earth disturbance within the watershed of the source or there was significant intervening distance between the proposed earth disturbance and the water source, that there would be no expected adverse impact to these water sources. Neither Dyer-Dunn nor the Nelsons have presented evidence or questioned the evidence or conclusions of Jeffrey Nelson.

---

81. Nelsons Brief at 17.

82. Dyer-Dunn Brief at 3-4.

We find the evidence that there will be no adverse impact on these springs to be compelling, and therefore decline to adopt Dyer-Dunn's requested condition. However, elsewhere in this Order there are conditions that require the Petitioners to obtain all necessary permits, including those intended to protect water quality and quantity, and to submit a blasting plan for Board approval prior to commencing construction. GMP must include in its blasting plan a pre-construction survey of any residential or agricultural water sources within one-half mile of any proposed blasting site and to remediate any damage to these water supplies caused by the blasting. This provides further assurance that Dyer-Dunn's and the Nelsons' water sources, as well as those of other nearby landowners, will not be adversely affected.

Shorelines

[10 V.S.A. § 6086(a)(1)(F)]

Findings

198. To the extent that portions of the Transmission Component of the proposed project must of necessity be located along a shoreline in order to fulfill their purpose, the proposed project will, insofar as possible and reasonable, retain the shoreline and the waters in their natural condition, allow continued access to the waters and the recreational opportunities provided by the waters, retain or provide vegetation which will screen the project from the waters, and stabilize the bank from erosion, as necessary, with vegetation cover. This finding is supported by findings 199-205, below.

199. Shorelines are defined as the land adjacent to the waters of lakes, ponds, reservoirs, and rivers. Nelson pf. at 22.

200. The Generation Component of the proposed project will not be located near any shoreline. Nelson pf. at 22.

201. The Transmission Component of the proposed project crosses land adjacent to the East Branch of the Missisquoi River and the Missisquoi River. Nelson pf. at 22.

202. The Transmission Component will largely remain within the existing cleared ROWs, thus minimizing clearing and the associated environmental impacts. Nelson pf. at 23.

203. The permanently cleared width of the transmission ROW will be maintained at 50 feet. Tr. 2/7/11 at 78 (Wallin); Castonguay pf. reb. at 2.

204. The Petitioners will use low-growth vegetation and serpentine edge trimming to minimize the visual impact of the cleared corridor. Pughe pf. at 8.

205. There will be no change in accessibility to any waters and the recreational opportunities provided by the waters. Exh. Pet.-DPE-2.

Discussion

Subsection 6086(a)(1)(F) provides:

> A permit will be granted whenever it is demonstrated by the applicant that, in addition to all other criteria, the development or subdivision of shorelines must of necessity be located on a shoreline in order to fulfill the purpose of the development or subdivision, and the development or subdivision will, insofar as possible and reasonable in light of its purpose:
>
> (i) retain the shoreline and the waters in their natural condition,
>
> (ii) allow continued access to the waters and the recreational opportunities provided by the waters,
>
> (iii) retain or provide vegetation which will screen the development or subdivision from the waters, and
>
> (iv) stabilize the bank from erosion, as necessary, with vegetation cover.

This subsection makes clear that the intent of the Vermont General Assembly in enacting this statute was to provide substantial protection for the environmental, scenic, and recreational characteristics of the state's shorelines.

No party has questioned whether the proposed project "must of necessity be located on a shoreline in order to fulfill the purpose" of the project. In any event, this standard has been met in this case. The transmission lines will follow an existing transmission corridor for the majority of its length. This corridor is therefore the most economic and environmentally-feasible route.

The evidence indicates that the proposed project can be constructed to ensure that the shorelines and waters will be retained in their natural conditions, and that the banks will be stabilized from erosion, as necessary, with vegetation. The Petitioners will develop erosion prevention and sediment control plans for the entire proposed project, including the Transmission Component, for approval by ANR and the Board. As these plans have not yet been developed, we require the Petitioners to include plans specific to any shoreline crossings in their erosion prevention and control plan filings to ensure that shoreline banks will be stabilized.

The Transmission Component of the proposed project will be reasonably screened from the waters of the Missisquoi River. The project will remain within an existing corridor that already contains utility poles and power lines. The Petitioners will maintain the cleared width of the corridor and will provide low-growth vegetation and employ serpentine edge trimming to minimize any impacts from the proposed project.

Wetlands

[10 V.S.A. § 6086(a)(1)(G)]

Findings

206. The proposed project, with the conditions described below, will not violate the rules relating to significant wetlands, and will not have an undue adverse effect on wetlands. This finding is supported by findings 207-222, below.

207. Both the Generation Component and Transmission Component of the proposed project will impact Class II and Class III wetlands as designated under the Vermont Wetlands Rules that went into effect September 15, 2010. Nelson pf. reb. at 2; exh. Pet.-JAN-2 Appendix 2 (Revised); exh. Pet.-JAN-2 Appendix 1 (Revised).

208. The wetlands on the Generation Component site are a combination of forested wetlands and emergent wetlands that vary according to current and past silvicultural activities. Many of the wetlands on the Generation Component site are functional headwaters for the streams that originate on the site. Some of the headwaters on the Generation Component site provide flood storage overflow and water quality benefits for the streams. Other wetlands provide wildlife habitat as early green-up areas. Morrison pf. at 3-4.

209. Wetlands along the proposed Transmission Component are influenced by agricultural and residential land use. These wetlands tend to be either emergent wetlands or shrub wetland where they occur under the existing transmission lines. There are several forested wetlands and wetlands associated with open-water ponds, vernal pools and streams. The wetland functions and values along the transmission corridor vary depending on wetland size and location in the landscape. Morrison pf. at 4.

210. On September 15, 2010, new Vermont Wetlands Rules came into effect pursuant to Act 031. Petitioners have provided wetland classifications in accordance with the new rules for

wetlands and wetland buffers that will be impacted by the proposed project. ANR concurs with the classifications of affected wetlands. Morrison pf. at 4-5.

211. The Generation Component of the proposed project will result in direct, permanent wetland impacts totaling 0.267 acres, temporary wetland impacts of 0.11 acres, and secondary forested wetland impacts of 0.156 acres. None of the direct, permanent impacts will be to Class II wetlands. Nelson pf. reb. at 3 (Revised); exh. Pet.-JAN-2 Appendix 1 (Second Supplemental).

212. The Generation Component will result in direct, permanent impacts to Class II wetland buffers totaling 0.655 acres, and temporary impacts of 0.198 acres. Exh. Pet.-JAN-2 Appendix 1 (Second Supplemental).

213. The Generation Component of the proposed project will result in direct impacts of about 9,892 square feet of functional headwater wetlands along the ridgeline. Morrison pf. surreb. at 3.

214. Clearing and grading for the Generation Component in close proximity to functional headwater wetlands will result in indirect impacts to the wetlands. Morrison pf. surreb. at 3.

215. The Transmission Component of the proposed project will result in direct, permanent wetland impacts totaling 0.002 acres, temporary wetland impacts of 1.73 acres, and secondary forested wetland impacts of 0.83 acres. Nelson pf. reb. at 9 (Revised).

216. Impacts to wetlands have been avoided to the maximum feasible extent. Where unavoidable, the impacts to wetlands have been minimized to the extent feasible. Nelson pf. reb. at 15.

217. For those unavoidable impacts and encroachments to Class II wetlands or buffers, an application will be made for a Conditional Use Determination ("CUD") permit pursuant to 10 V.S.A. § 905. Nelson pf. at 24.

218. The proposed project will require a CUD as outlined in Section 9 of the Vermont Wetlands Rules, as well as an Army Corps of Engineers Section 404 permit and the state Section 401 certification. ANR participates in all of these permitting processes, and will require mitigation due to the extent of impacts to wetlands and their functions. Mitigation will be addressed as part of the wetlands permitting process. Morrison pf. at 8-9; tr. 2/24/11 at 152 (Morrison).

219. The Natural Resource MOU requires the Petitioners to obtain a permanent conservation easement on an approximately 178-acre parcel of land that includes 17 acres of wetlands (the "Moose Mountain Forestry Parcel"). This parcel lies to the west of the turbine array and south of the access road. Nelson pf. reb. at 15; exh. GMP-ANR-1 at ¶ 2.3 and Exhibit A.

220. Conservation of the Moose Mountain Forestry Parcel does not conserve the type of wetland being impacted by the Generation Component of the proposed project at the ridgeline. Mitigation for the loss of the functions and values associated with the high-elevation wetlands should include a mechanism for conserving higher-elevation wetlands. Morrison pf. surreb. at 4.

221. The Natural Resource MOU does not include additional mitigation to wetlands beyond that which was originally proposed by the Petitioners. Tr. 2/24/11 at 155 (Morrison).

222. The Natural Resource MOU does not address wetland or stream impact mitigation specifically. Tr. 2/24/11 at 259 (Nelson).

Discussion

The proposed project will result in permanent, temporary, and secondary impacts to both Class II and Class III wetlands, including ridgeline wetlands that function as headwaters. These impacts will be the result of road construction, tree clearing, transmission line construction, and stormwater treatment practices. The Petitioners will be required to obtain additional permits, including a CUD, an Army Corps of Engineers Section 404 permit and a Section 401 water quality certification from DEC.

Section 6086(a)(1)(G) of Title 10 requires that a proposed development comply with the state's rules relating to significant wetlands.[83] Section 9.5 of the Vermont Wetland Rules ("VWR") requires that any activity within a Class II wetland or its buffer zone have no undue adverse effect on protected functions and values. While several parties included in their briefs opinions as to whether the proposed project would have an undue adverse effect on wetlands, no party has addressed whether the project would comply with or violate the rules relating to significant wetlands. VWR 9.5b. states:

> An adverse effect on any protected function, other than a minimal impact, shall be presumed to constitute an undue adverse effect unless:

---

83. Under Section 248, the Board must give "due consideration" to the criteria specified in 10 V.S.A. § 6086(a)(1)(G). 30 V.S.A. § 248(b)(5).

> (1) The proposed activity cannot practicably be located outside the wetland or on another site owned or controlled by the applicant or reasonably available to satisfy the basic project purpose; and
> (2) If the proposed activity cannot practicably be located outside the wetland, all practicable measures have been taken to avoid adverse impacts on protected functions; and
> (3) If avoidance of adverse effects on protected function cannot be practically achieved, the proposed activity has been planned to minimize adverse impacts on the protected functions and a plan has been developed for the prompt restoration of any adverse impacts on protected functions.

Under the VWR, mitigation in the form of compensation may be considered "only when full compliance with the requirements of subsection b (1-3) is insufficient to achieve no net undue adverse effect on any protected function. Such compensation measures may include establishing new wetlands or enlarging the boundaries of an existing wetland to compensate for the adverse impact of the proposed activity."[84]

Based on the record evidence, as explained below, we conclude that, without additional mitigation, the proposed project would result in a net undue adverse effect on high-elevation wetlands, in particular their headwaters function, and would therefore violate the VWR. Therefore, as explained in more detail below, we are conditioning our approval today on the Petitioners filing a mitigation proposal for Board review and approval.

ANR, LMG and Jack Brooks each state that the Natural Resource MOU does not specifically address mitigation for wetland impacts. ANR points out that the Natural Resource MOU does not address wetlands, as the stipulating parties envisioned that mitigation for wetlands impacted by the proposed project would be addressed through the wetlands permitting process. ANR requested that any CPG include a condition that Petitioners obtain state and federal wetland permits and a Section 401 water quality certification prior to construction.[85] LMG states that Petitioners have not proposed any mitigation that preserves wetlands comparable to those that would be impacted by the proposed project, and that the Natural

84. VWR 9.5.c.

85. ANR brief at 10-11.

Resource MOU does not alter the originally proposed mitigation for wetlands.[86] Brooks concludes that the Natural Resource MOU "does nothing to mitigate high elevation wetlands."[87]

The Petitioners contend that Exhibit A of the Natural Resource MOU (including the update provided on March 10, 2011) identifies additional high-elevation wetlands that will be conserved in the area of overlap between Parcel 2 and Parcel 4, and note that this area was not part of the original mitigation proposal.[88] The Petitioners further state that there are no outstanding issues with ANR concerning natural resources.[89]

While we agree with the Petitioners that there are high-elevation wetlands identified for conservation in Exhibit A of the Natural Resource MOU, it remains unclear whether the functions and values of those wetlands are similar to those of the wetlands that will be impacted by the proposed project. Further, the total area of these wetlands has not been identified or characterized relative to the area of high-elevation wetlands that will be impacted.[90] We conclude, as have ANR and several other parties, that the Natural Resource MOU does not specifically address mitigation for wetlands impacts.

ANR's wetlands expert, Ms. Morrison, was very clear in her testimony that higher-elevation wetlands need to be conserved in order to mitigate for the impacts to similar high-elevation wetlands. She testified that the Moose Mountain Forestry Parcel beaver complex did not satisfy this requirement,[91] and that the Natural Resource MOU does not include any additional mitigation for wetlands beyond that which was originally proposed.[92] Ms. Morrison testified that appropriate mitigation for impacts to wetlands would be identified through the wetlands permitting process, as well as through the Section 401 certification.

---

86. LMG Brief at 14.

87. Brooks Reply Brief at 16.

88. Petitioners' Reply Brief at 19.

89. Petitioners' Reply Brief at 31, n. 193.

90. Mr. Wallin identified a complex of 7 small wetlands in close proximity to each other and located between Turbines 15 and 16, on the west side of the proposed project, that collectively measure 0.99 acres. Wallin pf. reb. at 7. It remains unclear whether this wetland complex is the same as that referred to in the Petitioners' reply brief.

91. Morrison pf. surreb. at 4.

92. Tr. 2/24/11 at 155 (Morrison).

In order for us to conclude that the proposed project will not result in undue adverse impacts to wetlands, impacts to high-elevation wetlands from the proposed project must be mitigated through protection of high-elevation wetlands of similar function and value. We condition issuance of the CPG on the Petitioners providing sufficient mitigation for impacts to high-elevation wetlands. The Petitioners must file their mitigation proposal for impacts to high-elevation wetlands with the Board for approval prior to commencement of construction.[93] The filing must include an analysis of how the wetlands are comparable in function and value to those that will be impacted by the project, and must demonstrate how the proposed mitigation complies with the compensation standards of VWR 9.5. Parties with standing on wetlands issues will have two weeks, from the time the mitigation proposal is filed with the Board, to file comments on the mitigation proposal and to request a hearing. If a party requests the opportunity for a hearing, it must demonstrate why a hearing is necessary. We also caution parties that the post-certification process is not an opportunity to present additional arguments on issues decided in this Order.

We also require the Petitioners to obtain the necessary Section 401 certification, Section 404 permit, and wetlands permits. The Petitioners must file these permits with the Board once they are obtained.

Sufficiency of Water and Burden on Existing Water Supply

[10 V.S.A. §§ 6086(a)(2)&(3)]

Findings

223. The proposed project will have sufficient water available for the reasonably foreseeable needs of the maintenance building, and will not cause an unreasonable burden on any existing water supply. This finding is supported by findings 224-229, below, and findings 137-156, above (water pollution).

224. The projected water demand during operation of the proposed project, in accordance with the design flow standards in Section 1-808 of the *Vermont Wastewater System and Potable Water Supply Rules*, will be 60 gallons per day. Nelson pf. at 24.

---

93. We expect that the proposed mitigation would consist, in whole or in part, of the mitigation that is required in the wetlands permitting processes.

225. Based on well completion reports for the 38 drilled bedrock wells within one mile of the proposed project, there is a 99% probability of drilling a bedrock well that will have sufficient water available for the needs of the maintenance building. Nelson pf. at 25.

226. The proposed project well will not cause any interference or loss of yield to any existing well due to its significant distance from existing water supplies and the small amount of water that the project well will produce. Nelson pf. at 25.

227. The Generation Component of the proposed project is not located within a wellhead protection area for any public water supply and will not have any impact on public water sources. Nelson pf. at 25.

228. Construction-related blasting for the proposed roads and wind-turbine infrastructure will not have any impact on existing water supplies. Bedrock blasting does not affect rock fractures or the integrity of wells beyond 200 feet. The bedrock well nearest the proposed project is approximately 650 feet west of the access road along Route 100. The proposed project blasting plan will ensure that off-site blast impacts to existing water supplies will be avoided.[94] Nelson pf. at 25.

229. The Transmission Component of the proposed project will not require blasting, will not require a long-term source of water, and will not be located within a wellhead protection area for any public water supply. Nelson pf. at 25.

Soil Erosion

[10 V.S.A. § 6086(a)(4)]

Findings

230. The proposed project will not result in unreasonable soil erosion or reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result, provided that petitioners construct and operate the proposed project in accordance with the National Pollutant Discharge Elimination System ("NPDES") construction-phase permit and an individual stormwater discharge ("INDS") operational-phase permit, and the Erosion Prevention and Sediment Control ("EPSC") Plan. This finding is supported by findings 137-156, above

94. *See* findings 125-126 and pages 45-46, above, for a more detailed analysis of the effects of blasting for the proposed project.

(water pollution), which discuss the required NPDES and INDS permits, and findings 231-232, below.

231. During construction of the proposed project, EPSC activities will include mulching, temporary and permanent plantings, application of erosion control blankets, and limiting the amount of land area disturbed at one time. Nelson pf. at 6.

232. The EPSC Plan will include the installation of preventative measures, monitoring and maintenance of the measures, inspections, and proactive action taken to properly manage stormwater runoff during construction. Nelson pf. at 26.

Transportation Systems

[10 V.S.A. § 6086(a)(5)]

Findings

233. The proposed project will not cause unreasonable congestion or unsafe conditions with respect to transportation. This finding is supported by findings 234-241, below.

234. All public roads are expected to be capable of accommodating the traffic associated with construction of the proposed project. Pughe pf. at 21; exh. Pet.-CP-7.

235. Adequate on-site space for worker parking and staging of materials will be available at the lower staging area adjacent to Route 100, and at the maintenance building area. The two areas provide over six acres for parking and staging. It is expected that the materials and components for the turbines will be delivered directly to the turbine locations. Pughe pf. at 21.

236. GMP plans to transport major components for the proposed project, including the wind turbines, installation cranes and other oversize equipment, to the project site from Interstate I-91, along Vermont Routes 58 and 100. Limited road improvements (crushed stone fill at sharp turns and road intersections) will be required to protect the road edges and allow for the turning radius of the specialty transport equipment. The roads must be clear to provide room for overhanging components at sharp turns and corners areas adjacent to the traveled portion of the road, which may require temporary removal of signage. Utility lines will be modified in some areas to assure the required overhead clearance. Pughe pf. at 14.

237. A VTrans permit for the work will be obtained prior to the scheduled transport of materials. Pughe pf. at 14.

238. A survey to document existing road conditions will be conducted with VTrans and officials of each affected town prior to transport of the components. Any damage caused by the transport activities will be measured against the pre-transport survey, and GMP will be responsible for paying to repair any damage identified. Pughe pf. at 14.

239. GMP will be filing a complete transportation plan if a CPG is issued. Pughe pf. at 14, 21.

240. The proposed project will include navigational lighting in compliance with Federal Aviation Administrtion ("FAA") standards. Pughe pf. at 21; exhs. Pet.-CP-3 and Pet.-CP-8.

241. The Petitioners are exploring the possibility of utilizing OCAS to comply with FAA standards while at the same time minimizing the impact of the lighting on the surrounding area. Pughe pf. at 5-6.

Discussion

The Petitioners have indicated the measures that they will take to ensure that disruptions to traffic flows are minimized and appropriate safety measures are taken. We explicitly condition approval of the proposed project on the requirement that the Petitioners fulfill these obligations and receive the necessary state and local permits for any public road or public facility improvements required by the proposed project, as well as receive the necessary permits from VTrans for oversized vehicles. Additionally, the Petitioners shall be responsible for any costs associated with road improvements or modifications necessary to transport the proposed project components to the site.[95] We also require GMP to file its complete Transportation Plan with the Board for approval prior to commencement of any construction activities.

95. The Petitioners' witness describes the potential need for improvements or modifications, but does not state that the Petitioners will bear the costs of any such work. On page 23 of Mr. Pughe's prefiled testimony, he does state that GMP will bear the costs of any modifications to existing town roads. The condition we are imposing here makes it clear that this obligation extends to all roads, not just town roads.

Educational Services

[10 V.S.A. § 6086(a)(6)]

Findings

242. The proposed project will not cause an unreasonable burden on the ability of a municipality to provide educational services. This finding is supported by findings 243-244, below.

243. The construction phase of the proposed project will span two construction seasons. It is unlikely that the families of the temporary construction workers would move to the area for these two seasons. Up to three full-time workers would be required at the site once the proposed project becomes operational. Pughe pf. at 21-22.

244. Both the Lowell Graded School and the North Country Supervisory Union have informed the Petitioners in writing that the proposed project will not create any unreasonable burdens on the educational system. Exh. Pet.-CP-7.

Discussion

Based on the preceding findings, we conclude that the proposed project will not cause an unreasonable burden on the ability of a municipality to provide educational services.

Municipal Services

[10 V.S.A. § 6086(a)(7)]

Findings

245. The proposed project will not place an unreasonable burden on the ability of the local governments to provide municipal or governmental services. This finding is supported by findings 246-251, below.

246. The on-site private roads for the proposed project will be maintained by GMP. Pughe pf. at 23.

247. Any modifications to existing town roads that are required to construct the proposed project will be made at GMP's expense, and any specific damage to existing state or town roads caused by transport of project components will be repaired at GMP's expense. Pughe pf. at 23.

248. Waste disposal will be handled by private local haulers and will not cause any additional burden to the Town of Lowell. Pughe pf. at 23.

249. Pursuant to its agreement with Lowell, GMP will provide free fire and rescue training to Lowell and the surrounding towns and GMP will provide all specialized equipment required for the training and work at the site, such as specialized harnesses for ascending the towers and appropriate vehicles to access the site during the winter months. Pughe pf. at 23; tr. 2/3/11 at 102, 115 (Pughe).

250. GMP has received written notifications from the Vermont State Police, the Orleans County Sheriff, the Lowell Volunteer Fire Department, and the Missisquoi Valley Ambulance Service that the proposed project will not create any unreasonable burdens with respect to the services they provide. Missisquoi Valley Ambulance Service did make some requests of GMP regarding access to the proposed project site, information about the activities that would be taking place over the construction term, and protocols for rescues at a wind turbine site. GMP has stated it will be conducting on-site training and addressing the needs of all first responders prior to the start of major construction. Exh. Pet.-CP-7; tr. 2/3/11 at 102-03, 115 (Pughe).

251. Additional traffic during the proposed project's operational phase will not cause an unreasonable increase in traffic levels or excessive wear and tear on the existing state or town roads. Pughe pf. at 23; exh. Pet.-CP-7.

Discussion

Based on the preceding findings, we conclude that the proposed project will not place an unreasonable burden on the ability of the local governments to provide municipal or governmental services. To the extent that the presence of the proposed project does create some level of demand for municipal services, that demand will be offset by payments from the agreement with the Town of Lowell and the Good Neighbor Fund. Our approval of the proposed project is expressly conditioned on the Petitioners organizing and conducting any necessary training for the area's first responders, and providing any and all specialized equipment needed for first responders to effectively provide their services, if needed, prior to the start of any significant construction activities.

Albany raised an issue in its initial brief related to the town's reliance on Shatney Brook as a water source for the purpose of providing firefighting services. Albany asserts that the brook is fed by headwaters at the site of the proposed project and that it is concerned that certain stormwater treatment practices at the site might reduce the flow of Shatney Brook during certain times of the year, thereby impacting the town's ability to provide those firefighting services. Albany asks that the Board impose a condition on the Petitioners, requiring them to work with the Town of Albany to determine the required minimum flow rates needed for the town's dry hydrants, conduct a pre-construction flow study at the dry hydrants, and perform post-construction testing to ensure that the dry hydrants have sufficient flow following construction. If sufficient flow is not maintained post-construction, Albany recommends that GMP be required to provide funds necessary to ensure that Albany is able to remedy the problem, including monies to retrofit the town school with a sprinkler system if necessary.[96]

We decline to impose the requested condition or to make any of the findings proposed by Albany on this issue. Under Vermont law, Board findings must be based exclusively on the record evidence and on matters officially noticed.[97] Albany is relying on statements from counsel in the transcript and a letter from the town selectboard dated March 16, 2011, to support its position on this issue. The letter was drafted after the close of evidence and was appended to Albany's Brief and is thus not record evidence. Additionally, the statements contained in cross-examination questions asked by counsel for Albany of ANR witness Burke during the February 24, 2011, technical hearing do not constitute evidence.[98] As to the other proposed findings regarding use of the dry hydrants to provide fire protection at the town school, the costs of installing a sprinkler system, and the improvements made by the installation of drywells to Shatney Brook, no mention is made anywhere in the transcript, by statement of counsel or

---

96. Albany-Craftsbury Brief at 107-09. Albany submitted a letter from the Town of Albany Selectboard dated March 16, 2011, in support of its position on this issue.

97. 3 V.S.A. § 809(g).

98. Rather, it is testimony given by the witness in response to those questions that constitutes evidence. And, in this case, the witness testified in response to a question from Albany counsel that he did not know if Albany utilized dry wells for fire fighting. Which prompted a follow-up question from counsel that began with the statement, "And several of those are pretty close to the project . . ." to which the witness did not provide a response. Tr. 2/24/11 at 158 (statement by counsel).

otherwise. Lastly, we note that Albany has not attempted to explain why it was unable to raise this issue in prefiled testimony or more fully during cross-examination of the Petitioners' witnesses during the technical hearings. The existence of stormwater treatment practices on the proposed project site has been a prominent topic since the beginning of this proceeding and the town had ample opportunity to address the issue but did not do so.

In declining to impose Albany's requested condition or to make any of its proposed findings on this issue, we also note that GMP has pointed out that the proposed project is largely on the opposite side of the Lowell Mountain ridgeline from Shatney Brook.[99] While GMP's assertion also does not cite to record evidence, it does appear to be supported by exh. Pet.-CP-1 (Revised).

Additionally, under questioning by counsel for Albany, one of the Petitioners' witnesses indicated that, while it was possible for some water flows into streams to be reduced by a small amount at certain times of the year as a result of stormwater treatment practices at the proposed site, it would not present a problem because the areas from which stormwater runoff would be collected were limited when compared to the overall area around the project site. When asked if this could present a problem for towns that relied upon dry hydrants for firefighting services, the witness responded that such a possibility would be "a little farfetched."[100]

In summary, Albany has not presented any record evidence in support of its proposed findings or requested condition on this issue. Rather, the evidence that is in the record on this issue supports the conclusion that there will not be an adverse impact on Albany's ability to draw water from any dry hydrants that it may have on Shatney Brook.

Aesthetics

[10 V.S.A. § 6086(a)(8)]

Findings

252. The proposed project, with the conditions required by this Order, will not have an undue adverse impact on the scenic and natural beauty of the area or aesthetics. This finding is supported by findings 253-279, below.

---

99. Petitioners Reply Brief at 32.

100. Tr. 2/3/11 at 217-18 (Jewkes)

253. Lowell Mountain, with a peak elevation of around 2,640 feet, is a prominent north-south oriented ridgeline within the center of the landscape. The western portion of the landscape, including the Towns of Lowell, Eden and Westfield are within a narrow valley, with the peaks of the northern Green Mountains forming the western boundary. Route 100 provides north-south access through this area. The character of this portion of the landscape is rural, with most land forested and a relatively undulating topography. Kane pf. at 5-6.

254. The eastern portion of the landscape, including the Towns of Irasburg, Albany and Craftsbury, is generally more open with more traditional village settlement patterns. The terrain, as part of the Vermont Piedmont physiographic region, is generally lower in elevation, but steadily rises to the east as it approaches the Northeast Highlands. Route 14 provides the main roadway connection in this portion of the landscape. The northern and southern ends of the landscape feature more varied and generally forested terrain with low overall population density. Kane pf. at 6; exh. DPS-MK-2, Figures 1-5.

255. Because Lowell Mountain is so prominent within its landscape, it commands a relatively large viewshed. The viewshed of the project could be as large as 25 percent of the overall land area within 10 miles of the project. The exact delineation of the viewshed is difficult given the important role that foreground screening (i.e., trees, structures, small terrain features) has on visibility. The areas east of the ridgeline appear to have a higher probability for views, because the terrain in these areas is less topographically varied and more open. Kane pf. at 6-7; exh. DPS-MK-2, Figures 6-8.

256. Areas of high visibility are highly correlated to large stretches of major roadways (Routes 100 and 14) and areas of recreational use (Tillotson Camp and Belvidere Fire Tower on the Long Trail, VAST trails and the Catamount Nordic Trail). Constructed in 1939, Tillotson camp is a shelter on the Long Trail where hikers often go to stay overnight. Visibility from areas in and around the Tillotson Camp site would allow the entire project to be seen. Kane pf. at 8-9; Vissering pf. at 4; exh. DPS-MK-2, Figure 12; Page pf. at 7, 16; exh. Pet.-DR-2 at 49.

257. The area east of Lowell Mountain within portions of Lowell and Albany along and adjacent to the Bayley Hazen Road is the area most directly and significantly impacted by the proposed project. This location is in close proximity (within 3 miles) to the ridgeline and has

areas of open land with potentially direct views. Kane pf. surreb. at 4; exhs. DPS-MK-SUR-1 and Pet.-DR-2 at 49.

258. The area east of Lowell Mountain within portions of Lowell and Albany along and adjacent to the Bayley Hazen Road has a low residential population. The actual number of residences in this area that may have visibility of some portion of the proposed project during the course of the day could be up to 120. It is likely that residents in this area will have frequent views of the proposed project in and around their properties and as they travel to and from their homes. Even if trees or an intervening hillside block their western facing windows, it is unlikely these residents will go about their daily lives oblivious to the proposed project because it will become part of the visual fabric within this community. In addition to this residential population, the area experiences recreational users who include snowmobilers, hikers and Nordic skiers. Kane pf. surreb. at 5.

259. While some of the private residences are within wooded settings and have other structures (barns, garages, and neighbors) or have small topographic changes that may reduce potential visibility, others have more open views of the ridgeline and project site. When the ridgeline is visible, it is the background element. The proposed project will be clearly visually dominant from this relatively short distance away. Kane pf. surreb. at 10; exh. Pet.-DR-2, Appendix 9D (Revised).

260. The closest year-round residential structure is located in a wooded area approximately 0.67 miles to the east of the site for the Generation Component of the proposed project. The area around the project site is also populated with seasonal camps. Only one home within one mile of the project site, the Nelson Farm, is in an open field. Exh. Pet.-DR-2 at 10 and 44.

261. The turbines will be of a light grey or white color allowing them to blend readily into the background sky color, which for 278 out of 365 days, or over 75 percent of the time, is either overcast or partly cloudy — typically resulting in a white, light or grey-colored sky. Exh. Pet.-DR-2 at 22.

262. In areas beyond about 3 miles, the ability of the project to "shock or offend" is diminished, not only by local obstruction, but more so by distance, the presence of other elements in the landscape, and the presence of multiple focal points to which the eye is drawn. Kane pf. surreb. at 10; exh. Pet.-DR-2 at 60-61.

263. No part of the proposed project will reduce or impact the amount of open space. The Generation Component is being constructed entirely on private land and using existing roads and clearings where possible. There is no appreciable impact on or loss of open space due to this component of the proposed project. The Transmission Component is being constructed within an already existing utility corridor for the most part, and the new substations are collocated within existing substation yards. Where transmission lines are being relocated, they will improve open space conditions because they will be moved closer to the road. Exh. Pet.-DR-2 at 23.

264. The access road and collector lines have been sited and designed in a way to minimize both their environmental and visual impact. Routing and alignment have limited overall length and where possible the collector line corridor and road have been collocated to minimize visual intrusion and provide a better fit with the existing landscape. Exh. Pet.-DR-2 at 10.

265. The project does not violate a clear, written community standard. The current local (Town of Lowell) and regional (Northeastern Vermont Development Association or NVDA) plans contain language that is general in nature and seeks to promote good stewardship of scenic resources without identifying specific actionable standards. Kane pf. at 12; Kane pf. surreb. at 10; exh. Pet.-DR-2 at 52; tr. 2/9/11 at 117 (Vissering).

266. The Lowell Zoning Bylaw lists "windmills" as a conditional use in the district in which the Generation Component would be located. Exh. Pet.-DR-2 at 52.

267. Nine of the turbines will have flashing, night-time lights, mounted atop the nacelle in accordance with FAA lighting guidelines. GMP intends to install, subject to FAA approval, an OCAS system that turns on the turbine lights when a radar system detects in-bound aircraft. Pughe pf. reb. at 5-6; exh. Pet.-DR-2 at 3; tr. 2/3/11 at 43-33, and 51 (Pughe).

268. The presence of the lighting for the proposed project will represent a substantial change from current conditions that will significantly diminish the scenic quality of the area at night. While the FAA lights will be directed upwards and be less intense due to their red color, their presence in an otherwise "dark" landscape may be considered offensive. This is particularly true for hikers along the Long Trail who, upon arrival at the Tillotson Camp will be subject to a full view of the project at night. Exh. DPS-MK-2 at 29.

269. If the project includes an OCAS system, that system provides reasonable and effective mitigation for visual impacts from the lights. Kane pf. surreb. at 11.

270. The Lowell Mountain project site has significant environmental and engineering constraints that preclude movement of turbines to the west. A combination of bear-scarred trees (indicative of bear habitat), wetlands, and steep grades seem to limit the flexibility of the site to adapt to design modifications intended to reduce visual impacts. Kane pf. surreb. at 12.

271. The terrain on the western flank of Lowell Mountain is quite steep and movement of turbines in that direction may result in more impacts because of the grading necessary to create sufficiently flat pads on which to place the turbines. Pughe pf. reb. at 7-8; Kane pf. surreb. at 12.

272. The Lowell Mountain site also does not appear to allow breaking up the array into two distinct clusters. The Petitioners do not control land further to the north or south which would allow the array to be meaningfully separated. It also appears that, given the spacing between turbines (needed, in part, to reduce turbulence between turbines), the removal of a single turbine would not result in significant enough separation to promote a clustered appearance. A large number of turbines would have to be removed (perhaps 3) in order to create a meaningful separation between clusters. Such a reduction may go beyond reasonable if it is not financially supportable. Pughe pf. reb. at 7-8; Raphael pf. reb. at 7-8; Kane pf. surreb. at 12.

273. Removal of three turbines at the end of the turbine array would not substantially change or mitigate the proposed project's visual presence. It will still be observed as a linear array of turbines along the Lowell Mountain Range. Raphael pf. reb. at 12-13; exh. Pet.-DR-2, Appendix 9G (Revised).

274. Any reduction in turbine height, while potentially helpful, does not significantly alter the relative scale of the project with respect to viewers, particularly those in close proximity. Raphael pf. reb. at 7-8; Kane pf. surreb. at 12.

275. The Petitioners have examined the cost and technical effectiveness of moving the overhead transmission line underground, but have concluded that such a move is cost prohibitive. G MP will use low-growth vegetation and serpentine edge trimming to minimize the visual impact of the cleared transmission right-of-way. This mitigation is reasonable and will, over time, reduce the visual impact created by the clearings. Pughe pf. at 8; Kane pf. surreb. at 12-13.

276. Although the Generation Component will be visible from the historic Bayley Hazen Road, this road is not well traveled since it is not readily passable for passenger cars in the summer or plowed in the winter. In fact, the website for the Bayley Hazen Road sends travelers on an alternative route. The use of the Bayley Hazen Road within this area is limited and to a large extent involves recreational activities (e.g., snowmobiling). Raphael pf. reb. at 5-6; exhs. Pet.-DR-2 at 30 and DPS-MK-2 at 16; tr. 2/9/11 at 31 (Kane).

277. Removal of one project turbine would result in the forecasted levelized cost of the proposed project to increase from $0.103/kwh to $0.1046/kwh, removal of 2 turbines would increase the cost to $0.1066/kwh, and removal of 3 turbines would increase the cost to $0.1089/kwh.[101] Pughe pf. reb. at 4-8.

278. It is likely that OCAS will require an 18-meter radar tower located off the Generation Component site to the south, requiring a 75-foot by 100-foot cleared area. GMP is actively pursuing this location and will file a request for Board approval once the required analyses have been completed. Tr. 2/3/11 at 45-46 (Pughe).

279. Interpretative information about the view contained online and on-site signage would be an appropriate mitigation measure. It could highlight and address the connections among forest health and recreation, global warming, and wind power, in terms of the overall efficacy of this form of power production in relation to its environmental footprint. Raphael pf. reb. at 13; exh. Pet.-LP-1 at 24.

Discussion

In determining whether a proposed project would have an undue adverse impact on aesthetics, the Board has adopted the Environmental Board's Quechee test. The Board has previously summarized the Quechee analysis:

> In order to reach a determination as to whether the project will have an undue adverse effect on the aesthetics of the area, the Board employs the two-part test first outlined by the Vermont Environmental Board in Quechee, and further defined in numerous other decisions.
>
> Pursuant to this procedure, first a determination must be made as to whether a project will have an adverse impact on aesthetics and the scenic and natural beauty. In order to find that it will have an adverse impact, a project must be out

101. The projected increase in levelized costs does not include the costs related to compliance with the Natural Resource MOU.

> of character with its surroundings. Specific factors used in making this evaluation include the nature of the project's surroundings, the compatibility of the project's design with those surroundings, the suitability of the project's colors and materials with the immediate environment, the visibility of the project, and the impact of the project on open space.
>
> The next step in the two-part test, once a conclusion as to the adverse effect of the project has been reached, is to determine whether the adverse effect of the project is "undue." The adverse effect is considered undue when a positive finding is reached regarding any one of the following factors:
>
> 1. Does the project violate a clear, written community standard intended to preserve the aesthetics or scenic beauty of the area?
>
> 2. Have the applicants failed to take generally available mitigating steps which a reasonable person would take to improve the harmony of the project with its surroundings?
>
> 3. Does the project offend the sensibilities of the average person? Is it offensive or shocking because it is out of character with its surroundings or significantly diminishes the scenic qualities of the area?[102]

In addition to the Quechee analysis, the Board's consideration of aesthetics under Section 248 is "significantly informed by overall societal benefits of the project."[103]

No party disputes that the proposed project would have an adverse aesthetic impact. The proposed turbines, due to their sheer size and industrial nature, are out of character with the predominately rural surrounding area. In addition, the presence of the lighting for the proposed project will represent a substantial change from current conditions that will significantly diminish the scenic quality of the area at night. The second step of the Quechee test is a determination of whether the adverse aesthetic impacts rise to the level of undue. This determination is made by answering the following questions: does the proposed project violate a clear, written community standard; has the Petitioner failed to take all reasonable steps to mitigate the proposed project's aesthetic impacts; or does the proposed project offend the sensibilities of the average person?

GMP claims that the proposed project does not violate a clear written community standard intended to preserve the aesthetics of the area. GMP states that nothing in the Lowell or NVDA plans specifically addresses particular resources on Lowell Mountain, and the project

---

102. *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 64–65.

103. *In Re: Northern Loop Project*, Docket 6792, Order of 7/17/03 at 28.

is permitted under the Lowell zoning bylaws as a conditional use.[104] GMP contends that it has taken generally available mitigating steps including the revegetation obligations contained in the Natural Resource MOU, efforts to implement the OCAS system, and an analysis of a reduction in turbine size or numbers, and turbine relocation.[105] GMP claims that the average person viewing the proposed project will not be shocked or offended because there are limited designated public vantage points, and the majority of the public viewing areas are at a sufficient distance from the proposed turbines that the turbines would not dominate the view.[106]

The Department claims that the proposed project does not violate any clear, written community standards. The Department contends that the Petitioners have taken all reasonably available mitigating steps to improve the proposed project's harmony with its surroundings, including pursuing the OCAS system, and examining alternative turbine sizes, numbers, and locations. The Department concludes that average persons within the area in and around Bayley Hazen Road heading west from Albany will be shocked or offended by this project, and therefore, the project has an undue adverse aesthetic impact on people in this area.[107] The Department further concludes, however, that the overall societal benefits of the proposed project outweigh these impacts, relying on the Board's analysis in prior cases.[108]

Albany-Craftsbury, LMG and the Days, the Nelsons, Brooks, and Dyer-Dunn contend that the proposed project will have an undue adverse effect on visual aesthetics and that a CPG should not be issued.[109] Albany-Craftsbury claim that the visual impacts of the proposed project fall mostly on them, and the proposed project is shocking and offensive to their residents.[110] Albany-Craftsbury and LMG argue that the Petitioners' aesthetic analysis is biased, flawed and

---

104. Petitioners Proposed Decision at 50-51.

105. Petitioners Proposed Decision at 51.

106. Petitioners Proposed Decision at 51.

107. Department Brief at 25.

108. Department Brief at 25-26, citing *Northern Loop Project*, Docket 6792, Order of 7/17/03 at 28; *Petition of EMDC*, Docket 6911, Order of 7/16/06 at 103.

109. Albany-Craftsbury Reply Brief at 6; LMG Brief at 45; Days Brief at 9-10; Nelsons Brief at 2-3; Brooks Brief at 6-9; Dyer-Dunn Brief at 2-3.

110. Albany-Craftsbury Reply Brief at 6.

fails to consider the impacts of the proposed project on the aesthetics of the surrounding area, including Craftsbury. Albany-Craftsbury and LMG claim that the Petitioners have not accurately applied the Quechee test, including the consideration of societal benefits of renewable power too soon in the analysis.[111] LMG contends that the proposed project violates the intent of the town and regional plans, and the Lowell Zoning Bylaw, and that when the regional plan is coupled with the zoning bylaw, a clear, written community standard emerges to preserve the aesthetics of the area.[112] Albany-Craftsbury and LMG claim that the Petitioners have not considered reasonably available mitigation, including reducing the size and number of turbines and providing additional setbacks.[113] LMG further contends that reducing the height of the turbines so as to avoid the necessity of the OCAS system would mitigate the adverse nighttime effects should this system prove impossible to implement, and would also reduce somewhat the dominance of the turbines over the surrounding landscape.[114] In addition, Albany-Craftsbury, LMG, and the Days argue that the Board's consideration of overall societal benefits of the project is not proper or permissible pursuant to the applicable statutory provisions of 30 V.S.A. § 248. They further contend that, even if this balancing act were applicable, the societal benefits do not outweigh the extensive impacts the proposed project would have on the aesthetic character of the area.[115]

GMC argues that the views, including the views at night with the project lighting, from Tillotson Camp are particularly sensitive, and require mitigation to reduce the impacts of the proposed project.[116] GMC claims that the proposed project violates a clear, written community standard because the Petitioners did not submit a comprehensive decommissioning plan, an alleged requirement under the NVDA Regional Plan.[117] GMC supports the proposed project

---

111. LMG Reply Brief at 3; Albany-Craftsbury Reply Brief at 6.

112. LMG Reply Brief at 6-8.

113. Albany-Craftsbury Reply Brief at 25; LMG Reply Brief at 3-6.

114. LMG Reply Brief at 3-6.

115. Albany-Craftsbury Reply Brief at 10-11 and 28; LMG Brief at 56-59; Days Reply Brief at 15.

116. GMC Brief at 14-16.

117. GMC Brief at 62-64.

with consideration for mitigating steps including the OCAS system to mitigate visual impacts, a reduction in the number of turbines, and revegetation of the access road and related stormwater management features at the end of the project's operational life.[118]

The first step in evaluating whether the proposed project would have an undue adverse aesthetic impact is to determine whether the project violates a clear, written community standard. We conclude that the applicable Regional and Town Plans contain no clear, written community standards with which the proposed project would be inconsistent. In order for a provision to be considered a clear, written community standard, it must be "intended to preserve the aesthetics or scenic beauty of the area" where the proposed project is located and must apply to specific resources in the proposed project area.[119] The language of the Lowell Town and NVDA Regional plans is general in nature and seeks to promote good stewardship of scenic resources without identifying specific actionable standards.[120]

With regard to GMC's claim that the Petitioners did not submit a comprehensive decommissioning plan, as addressed in the decommissioning fund section below, we conclude that the Petitioners have satisfied this aspect of the NVDA Regional Plan.

The Lowell Zoning Bylaw lists "windmills" as a conditional use in the district in which the proposed project is located.[121] We conclude that the zoning bylaws contain no clear, written community standards with which the proposed project would be inconsistent. Given our statutory charge, we also conclude that zoning regulations are not the most appropriate source for a clear, written community standard under the Quechee test, as applied by the Board in Section 248 proceedings. Because towns often grant exceptions and variances to these ordinances on a case-by-case basis, it is difficult to rely on a zoning ordinance as a clear and consistent statement of a community's policies or standards. The ability of a town to grant zoning variances will, in many cases, result in different zoning standards being applied

---

118. GMC Brief at 69.

119. *In re Halnon*, NM-25, Order of 3/15/01 at 22.

120. Kane pf. surreb. at 10.

121. Exh. Pet.-DR-2 at 52.

depending upon the individual circumstances of the permit application. Therefore, it is more appropriate to rely on the town plan as the primary source of clear written community standards.

The second step in evaluating whether the proposed project would have an undue adverse aesthetic impact is to determine whether the Petitioners have taken generally available mitigating steps which a reasonable person would take to improve the harmony of the project with its surroundings. It is not possible to completely conceal or screen a commercial scale wind project of this size from view. In order for the turbines to take advantage of the wind resource in Vermont, the turbines, in most cases, must be located at higher elevations and above tree lines and, consequently, will be visible to the surrounding area. In addition, the turbines require lighting to address aircraft safety and, consequently, will be visible at night. In this case, the Petitioners have taken steps to minimize the aesthetic impact of the proposed project, including the use of light-colored project components, limiting clearing, placing electrical connections underground at the turbines, and efforts to implement an OCAS system to reduce night lighting.[122] In addition, the Petitioners examined the impacts of reducing the size and number of turbines and relocating the turbines, and concluded that significant environmental, engineering and economic constraints preclude these options as a generally available step.[123] Therefore, we conclude that the Petitioners have taken reasonable steps to mitigate the aesthetic impacts of the proposed project.

The Petitioners are seeking FAA approval for an OCAS system for the proposed project. While the OCAS system represents a significant mitigation measure for the proposed project, without FAA approval the measure cannot be considered a generally available step. The Department, recognizing that the FAA may not approve the OCAS, recommends that the Board impose the following condition in the CPG for the proposed project: (1) Petitioners shall apply for and take all reasonable steps to obtain approval of the OCAS, and shall install the OCAS promptly should it obtain approval; and, (2) if Petitioners are unable to obtain approval of the OCAS, they shall submit for review by the Department and approval by the Board an alternative

122. Pughe pf. reb. at 5-6; exh. Pet.- DR-2 at 22-23; tr. 2/3/11 at 43-33, and 51 (Pughe).

123. Pughe pf. reb. at 4-8; Raphael pf. reb. at 7-8 and 12-13; exhs. Pet.-DR-2, Appendix 9G (Revised), Pet.-DR-3, and Pet.-DR-4.

Lighting Mitigation Plan, within 3 months of notification of disapproval of the OCAS. We include the proposed condition in the CPG.

The final step under the Quechee analysis is to determine whether the proposed project would be shocking or offensive to the average person. In this case, the evidence indicated that, from many of the public views, the aesthetic impact of the proposed project is not shocking or offensive and that the Petitioners have taken the generally available mitigation steps that can be taken for wind turbines.[124] However, average persons within the area in and around Bayley Hazen Road heading west from Albany may be shocked or offended by the proposed project.[125]

Pursuant to Board precedent, we consider the societal benefits associated with a project when evaluating the project's aesthetic impacts.[126] As discussed in detail in the General Good of the State section of this Order, the proposed project meets societal needs and provides important benefits to Vermont through the addition of a renewable resource, pursuant to state policy. In light of the societal need for and benefits of the proposed project, we conclude that the adverse effects around Bayley Hazen Road are not undue.

Albany-Craftsbury and LMG claim that the Petitioners' aesthetic expert improperly considered societal benefits in arriving at his conclusion that the proposed project would not have an undue adverse impact on aesthetics, because the aesthetic report is replete with descriptions of the benefits of wind. The Petitioners claim that their aesthetic expert properly conducted its analysis, including the application of the Quechee test. Even if we accept the argument that the Petitioners' witness improperly considered societal benefits, this conclusion does not matter to our application of the Quechee test. There is no requirement that parties perform a Quechee test as part of their aesthetic assessment. Instead, what is required is that the record include sufficient evidence for the Board to apply the Quechee test to assess the aesthetic impacts of the project. The evidence in the record, including expert testimony from the Petitioners and other parties, satisfies that requirement.

---

124. Kane pf. surreb. at 10; Pughe pf. reb. at 4-8; Raphael pf. reb. at 7-8 and 12-13; exhs. Pet.-DR-2, Appendix 9G (Revised); Pet.-DR-3; and Pet.-DR-4.

125. Kane pf. surreb. at 10.

126. *See, In re Petition of Tom Halnon*, CPG NM-25, Order of 3/15/01 at 10–11 ("Halnon"); *Petition of VELCO,* Docket 6860, Order of 1/28/05 at 80; *Amended Petition of UPC Vermont Wind,* Docket 7156, Order of 8/8/07 at 65; *Petition of Deerfield Wind,* Docket 7250, Order of 4/16/09 at 61.

Albany-Craftsbury, LMG, and the Days argue that the Board's consideration of overall societal benefits of the proposed project is not proper or permissible pursuant to the applicable statutory provisions of 30 V.S.A. § 248. Both Albany-Craftsbury and LMG are correct that Section 248 does not mandate the use of a societal benefits factor in analyzing the aesthetic impacts from a proposed project. However, what they fail to note is that the statute is actually silent on how the Board is to make its determination of whether a project's aesthetic impacts are unduly adverse. The statute vests in the Board discretion in how it approaches this determination, requiring only that "due consideration" be given to the criteria specified in 10 V.S.A. §§ 1424a(d) and 6086(a)(1) through (8) and (9)(K), including the aesthetics criterion set forth in § 6086(a)(8).[127] The so-called "Quechee test" was developed in the course of a permitting proceeding based on the sound discretion and informed judgment of the Environmental Board, and has been accepted and applied by the Vermont Supreme Court in Act 250 permit appeals ever since.[128] Similarly, the Board has developed and applied a modified version of the Quechee test for use in reaching a determination of whether a proposed project would have an undue adverse impact on aesthetics. Nothing in Section 248 requires the Board to utilize the Quechee test exactly as it was developed by the Environmental Board, nor is the Board prohibited from considering the overall societal benefits of a proposed project in reaching its determination. Our determination of whether a proposed project would have undue adverse impacts under Section 248, is based on both our analysis under the Quechee test and our consideration of overall societal benefits that will be derived from a particular proposed project. It is only after both of these factors have been considered that we reach our ultimate determination on the nature of the impacts. We conclude this approach is entirely consistent with the plain language of 30 V.S.A. § 248(b)(5).

In summary, no party disputes that the proposed project will have an adverse impact. Given their sheer size and industrial nature, the proposed turbines are out of character with the predominately rural surrounding area. Based upon the applicable law and the facts presented in this case and subject to the Petitioners' compliance with the condition regarding project lighting set forth above, our evaluation of the proposed project concludes that: (1) the proposed project

---

127. 30 V.S.A. § 248(b)(5).

128. *In re Halnon*, 174 Vt. 514, 515 (2002).

does not violate a clear, written community standard; (2) the Petitioners have taken reasonable steps to mitigate the aesthetic impacts of the proposed project; and, (3) the proposed project is not shocking or offensive, except from the area in and around Bayley Hazen Road. We further conclude adverse effects around Bayley Hazen Road are not undue, in light of the societal benefits of the proposed project. Therefore, we conclude that the proposed project will not result in an undue adverse effect on aesthetics or on the scenic or natural beauty of the area.

Noise

280. Noise levels produced by the proposed project, with the conditions required by this order, will not have an undue adverse impact on public health or aesthetics. This finding is supported by findings 281-302, below.

281. Noise levels can be described in terms of continuous equivalent sound level ("Leq"). The Leq is the average of the sound pressure over an entire monitoring period and expressed as a decibel ("dBA"). The monitoring period can be for any amount of time, for example, Leq (1 hour), Leq (24 hours), or Leq (night). Ln is the sound level exceeded *n* percent of the time. L10 is the sound level that is exceeded 10 percent of the time, while L90 is the sound level exceeded 90 percent of the time. Lmin and Lmax are the minimum and maximum sound level, respectively, monitored over a period of time. Exh. Pet.-KHK-2 at 6-7.

282. The manufacturer-guaranteed maximum sound power from the Vestas 90-3.0 MW is 107 dBA and for the GE 2.5-XL is 106 dBA, which translates into an approximate sound pressure level of 56 and 55 dBA, respectively, at 200 meters from the turbine base. The guaranteed maximum sound power for the Siemens SWT 3.0 101 is 107 ±1.5 dBA and for the Vestas V112 is 106.5 ±2.0 dBA. Exhs. Pet.-KHK-2 at 22-23 and Pet.-KHK-2 (Supp.) (Revised) at 2.

283. The nearest homes to the proposed project site are over 3,200 feet away from the nearest turbines. Kaliski pf. at 4.

284. The Petitioners conducted sound modeling on the four models of wind turbines being considered for the proposed project using the standards related to the attenuation of sound propagation outdoors as specified by the International Organization for Standardization ("ISO") ISO-9613-2 as implemented in the Cadna-A software program. Two types of modeling were

conducted: one using worst-case meteorology and one using one year of hourly meteorological data. Kaliski pf. at 4; exh. Pet-KHK-2 at 24-30.

285. The results of the sound modeling analysis indicate that, for the Vestas 90-3.0 MW and GE 2.5XL, the proposed project is expected to meet a noise standard of 45 dBA (exterior)(Leq)(1hr) at nearby residences. Kaliski pf. at 4; exh. Pet-KHK-2 at 26.

286. The results of the sound modeling analysis indicate that, for the Siemens SWT 3.0 101 and Vestas V112, under certain conditions the proposed project is not expected to meet a noise standard of 45 dBA (exterior)(Leq)(1hr) at nearby residences, unless both models are operated in a noise reduced operation ("NRO") mode. Kaliski pf. reb. at 26-28; exh. Pet.-KHK-2-Supp. (Revised) at 2-4.

287. Noise from the transmission lines and substations associated with the proposed project is expected to meet a noise standard of 45 dBA (exterior)(Leq)(1hr) at nearby residences. The Petitioners' sound expert recommends that any new transformers for the proposed project have sound emissions at least 5 dB below National Electrical Manufacturer's Association ("NEMA") TR-1 standards, if determined to be cost-effective. Kaliski pf. at 5; exh. Pet-KHK-2 at 31-39; tr. 2/22/11 at 182-184 (Kaliski).

288. Drilling and blasting associated with construction of the proposed project will occur during normal business hours. Due to distances between residences and construction locations, the time-of-day restrictions on drilling and blasting, and the limited duration of construction, construction noise will not create an undue adverse impact. Kaliski pf. at 5; exh. Pet-KHK-2 at 39.

289. Petitioners conducted background sound measurements at six sites adjacent to the proposed project measured over periods of seven to eight days. The resulting sound levels ranged from 16 to 35 dBA (L90)(night). The L90 is the sound level that is exceeded 90 percent of the time and is referred to as the residual level. Kaliski pf. at 3; Kaliski pf. reb. at 9; exh. Pet.-KHK-2 at 22; tr. 2/22/11 at 186 (Kaliski).

290. LMG conducted background sound measurements at seven sites adjacent to the proposed project measured within a two-day period. The resulting sound levels ranged from 21 to 31 dBA (Leq 1 min). LMG's measurements were designed to eliminate common rural noises,

such as wind, rain, dogs barking (31 dBA), and cars (45.3 dBA). James pf. at 6-7; exh. LMG-LB-11; tr. 2/22/11 at 223-24 and 226-28 (Blomberg).

291. There is no quantitative noise standard in the Town of Lowell Zoning Bylaw or Lowell Town Plan. Exh. Pet.-KHK-2 at 7.

292. The Environmental Protection Agency ("EPA") Sounds Levels Document identifies a level of 55 dBA (exterior)(Ldn) as the level that is protective of human health and welfare. This is the equivalent of 45 dBA during the night and 55 dBA during the day, averaged over the course of a year. Blomberg pf. surreb. at 21; exh. Pet.-KHK-2 at 7.

293. The 2009 World Health Organization ("WHO") Europe Noise Guidelines indicate that the Lowest Observed Adverse Effect Level ("LOAEL") is 40 dBA (exterior)(night)(annual). The "LOAEL of night noise, 40 dB $L_{night, outside}$, can be considered a health-based limit value of the night noise guidelines (NNG) necessary to protect the public, including most of the vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of noise." Exh. ALB-RJ-5 at Chapter 5, 109.

294. A noise standard of 45 dBA (exterior)(Leq)(l hr) and 30 dBA (interior bedrooms)(Leq)(l hr) is sufficient to protect human health and avoid sleep disturbance and is equivalent to, if not more stringent than, the 2009 WHO Guidelines (40 dBA (exterior)(night)(annual)). Irwin pf. at 2; Kaliski pf. reb. at 3; McCunney pf. reb. at 3-4; tr. 2/23/11 at 77-78 (Irwin).

295. Noise levels associated with adverse health impacts and sleep disturbances are typically higher than 45 dBA (exterior). However, there can be indirect health impacts from wind turbine generated noise levels below 45 dBA, including sleep disturbance or deprivation, annoyance, and stress. The WHO Guidelines indicate that, between 20 to 40 dBA (night)(exterior), the intensity of sleep effects depends on the nature of the source and number of events, with vulnerable groups more susceptible, and concludes that even in the worst cases the effects seem modest. McCunney pf. reb. at 3-4, and 12; tr. 2/10/11 at 40-41 (McCunney); exh. ALB-RJ-5 at Chapter 5, 108-109.

296. The lower the frequency of a sound, the higher the sound pressure needed for the sound to be heard by the average person. Infrasound is sound pressure fluctuations at frequencies below about 20 Hz. Sound below this frequency is generally not audible. There are, however,

different levels of hearing sensitivity that may allow some people to hear infrasound. McCunney pf. reb. at 5; exh. Pet.-KHK-2 at 25.

297. Low frequency sound is in the audible range of human hearing, that is, above 20 Hz, but below 100 to 200 Hz depending on the definition. While low-frequency sound may be audible when not masked by man-made and natural background sounds, the level of low-frequency sound from wind turbines usually contributes less to annoyance than a higher-frequency sound. Kaliski pf. reb. at 21; exh. Pet.-KHK-2 at 25.

298. All modern large wind turbines use an upwind design that has eliminated low frequency "thump" associated with very high infrasound and low-frequency harmonics caused by blade-tower interaction. There is still a modulation (swishing) of broadband sound created by the movement of the blade into and out of higher wind regimes, but it is not a pure tone low-frequency noise. Although there are rare reports of high-amplitude modulation and thumping, it is not characteristic of a properly operating wind farm. Kaliski pf. reb. at 19-20; exh. Pet.-KHK-2 at 25.

299. The results of studies on low-frequency sound and infrasound from wind turbines indicate that infrasound is inaudible to even the most sensitive people 305 meters (1,000 feet) from the wind turbines with the windows open or closed. Low-frequency sound above 40 Hz may be audible depending on background sound levels. McCunney pf. reb. at 8.

300. The American National Standards Institute ("ANSI") standard, ANSI S12.2, "Criteria for Evaluating Room Noise," recommends that low-frequency sound levels be kept below 65 dB at 16 Hz, 65 dB at 31.5 Hz, and 70 dB at 63 Hz inside the building to prevent moderately perceptible vibration and rattles. Exh. Pet.-KHK-2 at 25; tr. 2/22/11 at 26-27 (Kaliski).

301. The Petitioners' sound modeling conducted for low-frequency sound levels indicate that the worst-case sound levels are at the nearest residence to the north of the project. At this location, the modeled low-frequency sound levels for the GE 2.5-XL turbine do not exceed the ANSI criteria at 63 Hz. Sound modeling at 16 and 31.5 Hz was not conducted for this turbine because of the lack of turbine-manufacturer data. At the same location, the modeled low-frequency sound levels for the Vestas 90-3.0 MW turbine do not exceed the ANSI criteria at 31.5 and 63 Hz. Sound modeling at 16 Hz was not conducted for this turbine, again because of the lack of turbine-manufacturer data. Based on the spectral shape for similar turbines, the proposed

turbines are not expected to exceed the ANSI standard at any frequency. Exh. Pet.-KHK-2 at 30-31; tr. 2/22/11 at 26-27 (Kaliski).

302. The Petitioners have proposed to undertake a Board-approved post-construction sound monitoring plan that would include provisions addressing: (1) duration of monitoring; (2) frequency of monitoring throughout the year; (3) monitoring locations; (4) data to be collected; (5) monitoring of outside to inside level reduction; (6) background stations; (7) reporting; and, (8) complaint resolution. Kaliski pf. reb. at 24-26.

Discussion

The Petitioners support the noise standard applied in previous Board wind decisions, consisting of 45 dBA (exterior)(Leq)(1hr) and 30 dBA(interior bedrooms)(Leq)(1hr).[129] The Petitioners contend this standard will ensure that the proposed turbines will not create an undue, adverse impact on the public health and safety. The Department's health expert has concluded that the standard used in previous Board cases is equivalent to, if not more stringent than, the 2009 WHO guidelines. The Petitioners contend that the WHO guidelines represent a consensus view of international expert opinion and the noise produced by wind turbines is similar to the "continuous" sound associated with the transportation noise used to develop the WHO guidelines.[130]

The Petitioners claim that the proposed project noise will not have an undue adverse effect on aesthetics and that there are no clear written community standards that apply to sound. The Petitioners also contend that they have taken or will take reasonable steps to mitigate any potential noise impacts associated with the proposed project such as: (1) using wind turbines with an upwind design to minimize noise impacts; (2) siting the turbines such that all residences are greater than 3,200 feet from the nearest turbine, and there are only seven to eight full-time residences within a mile of the proposed project; and, (3) agreeing, prior to commencement of

129. *Petition of Georgia Mountain Community Wind*, Docket 7508, Order of 6/11/10 at 57; *Petition of Deerfield Wind,* Docket 7250, Order of 4/16/09 at 67; *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 73.

130. Petitioners Proposed Decision at 60.

operations, to submit to the Board for review and approval a post-construction noise monitoring plan.[131]

Albany-Craftsbury, LMG, Days, Nelsons, Dyer-Dunn, and Brooks claim the noise standard previously used by the Board is insufficient to protect public health.[132] Albany-Craftsbury support three different standards: a 30 dBA (interior)(instantaneous); a 35 dBA (exterior)(1 hr) at the residence; and a 40 dBA property line standard.[133] LMG also supports three different standards of 30 dBA(interior)(maximum of 1-hour), 35 dBA (exterior)(1 hour), and 35 dBA at the property line.[134] The Days and Dyer-Dunn support a "compound" noise standard measured at the property line of 50 dBA (exterior)(1 hr) with no sound higher than 55 dBA during the daytime, and 35 dBA (exterior)(1 hr) with no sound higher than 40 dBA during nighttime.[135]

Albany-Craftsbury, LMG, and Brooks claim that the WHO standards and other studies[136] recognize that there can be indirect health impacts from turbine noise levels below 45 decibels, including sleep disturbance or deprivation, annoyance, and stress, which may cause an adverse effect on people's health and well being.[137] Albany-Craftsbury and LMG further claim that the WHO analysis sets 40 dBA annual as a minimum, and the WHO findings suggest that even a 35dBA (exterior) limit may result in annoyance and sleep disturbance.[138] Albany-Craftsbury and LMG contend that the WHO standards are based on transportation noise and do not take into account the fluctuating nature of the sound produced by the turbines; the "swish swish" sound. They argue that a 35 dBA standard is necessary to address the unique sound

---

131. Petitioners Proposed Decision at 60.

132. Albany-Craftsbury Brief at 3, and 11-16; LMG Brief at 87-89; Days Brief at 6-7; Dyer-Dunn at 2-3; Nelsons Brief at 9-10; Brooks Reply Brief at 9-13.

133. Albany-Craftsbury Brief at 16.

134. LMG Brief at 65.

135. Day Brief at 7 and 21; Dyer-Dunn Brief at 2-3.

136. Exhs. DPS-Cross-3, Pet.-James-Cross-3, Pet.-James-Cross-4, Pet.-James-Cross-5, and ALB-RJ-4.

137. Albany-Craftsbury Brief at 6-20; LMG Brief at 87-90 and 97-98; Brooks Reply Brief at 9-13.

138. Albany-Craftsbury Brief at 9-11; LMG Brief at 88-90.

characteristics of wind turbines, the potential for annoyance and sleep disturbance, and to protect the rural character of the area.[139]

Albany-Craftsbury and LMG claim that the noise modeling performed by the Petitioners was inaccurate, including that the use of the Cadna/A acoustical modeling software is inappropriate, and does not support the contention that the proposed project, as currently designed, will meet a 45 dBA standard.[140] Albany-Craftsbury and LMG also contend that the Petitioners are unjustifiably relying on 15 dBA attenuation by structures to ensure that a 30 dBA interior standard is met, and the Board should therefore require, before issuing a CPG, that the Petitioners conduct sound level testing to demonstrate the 15 dBA attenuation by structures.[141] Albany-Craftsbury, LMG, and the Days claim that the NRO mode has not been demonstrated to work for the proposed project and that the proposed turbines should be selected to minimize noise. They assert that the Petitioners should be required to select turbines to meet the standard without the use of NRO mode, so that there is a margin of error for meeting the standard and in case noise modeling for the proposed project was incorrect.[142] LMG and the Days maintain that the Petitioners' noise analysis did not properly examine low frequency and infrasound.[143]

Albany-Craftsbury and LMG contend that the background noise monitoring conducted by the Petitioners overstates background noise levels, and noise from the proposed project will significantly exceed background levels resulting in an undue adverse impact on the aesthetics and character of the area.[144] LMG's expert witness conducted background noise monitoring showing dBA noise levels in the mid-to-high twenties and in some areas just around 30 dBA, consistent with the L90 results of the Petitioners' expert witness.[145] LMG contends that the noise produced from the proposed project is not consistent with the Lowell zoning bylaw that

---

139. Albany-Craftsbury Brief at 6-9; LMG Brief at 88-90.

140. Albany-Craftsbury Brief at 34-52; LMG Brief at 66-73.

141. Albany-Craftsbury Brief at 57-61; LMG Brief at 93-94.

142. Albany-Craftsbury Brief at 52-57; LMG Brief at 80-81; Days Reply Brief at 7-8.

143. LMG Brief at 69-70 and 97-98; Days Brief at 7.

144. Albany-Craftsbury Brief at 21-33; LMG Brief at 73-78.

145. James pf. at 6-7; exh. LMG-LB-11.

requires the developer to provide the noise levels and hours of operation of noise sources, and the town plan that limits development in the project area.[146]

Albany-Craftsbury and LMG contend that the Board should use a property-line noise standard to avoid the use of private property to attenuate the noise from the proposed turbines and restricting property owners' rights to construct dwellings consistent with the Town of Lowell setback requirements, 50 feet from property lines.[147] The Days argue that without a property-line standard their land is being used as a buffer without compensation and landowners should be compensated if they are affected by noise from the turbines.[148]

Albany-Craftsbury and LMG contend that the Petitioners have failed to provide a comprehensive noise monitoring plan for review and approval. They contend that the noise monitoring must include: (1) monitoring for infrasound; (2) sound level monitoring that ensures compliance with an interior noise standard; (3) more frequent monitoring during the year than proposed by the Petitioners; and, (4) no limits on the ability to file complaints through the life of the project.[149]

The Department supports an indoor standard of 30 dBA (Ldn) and contends this standard will ensure that the proposed turbines will not create an undue, adverse impact on the public health and safety. The Department raises concern with the predicted frequency of NRO for the Siemens SWT-3.0-101 and Vestas V112-3.0 MW turbine models. The Department claims that, while the NRO mode should enable the turbines to meet the Board's standard, frequent use of NRO mode could impact efficient operation of the proposed project. The Department recommends that the Petitioners report on usage of NRO mode such that the impact of NRO mode on production can be documented. The Department recommends that the Board impose a series of conditions, and a monitoring plan regarding noise from construction and operation of

146. LMG Brief at 82-83.

147. Albany-Craftsbury Brief at 61-62; LMG Brief at 84-85.

148. Days Brief at 15.

149. Albany-Craftsbury Brief at 63-65; LMG Brief at 91-93.

the turbines to ensure that residences near the proposed project are protected from undue noise impacts.[150]

Noise from the proposed project will likely be audible at residences surrounding the proposed project. The potential for adverse noise impacts from the turbines is an important concern for the Board and one of the principal concerns raised by the parties in this case. The Board concludes here, as we have in previous cases related to commercial wind generation, that the imposition of absolute standards with regard to noise levels at the nearest receptor locations is an appropriate means to ensure these areas are not unduly impacted. These standards are as stringent or more stringent than the WHO guidelines for exterior residential noise and include an additional residential-interior-noise standard. We also conclude that noise-level standards are a necessary and appropriate means of ensuring that the public is not subject to unduly adverse noise impacts from the operation of the proposed project.

All parties agreed that an indoor standard of 30 dBA is protective of health. Albany-Craftsbury and LMG called for an instantaneous indoor standard of 30 dBA to ensure, given averaging, that standard is not exceeded at any point during the hour, but did not address how this instantaneous standard was consistent with WHO standards or other studies. Both the Department's and Petitioners' health expert concluded that a standard based on a one-hour average is protective of health. The evidence in the record does not indicate there will be significant changes in sound levels from the proposed turbines across a one-hour period, especially given the continuous nature of noise from a wind turbine while the wind is blowing. We conclude that a one-hour average indoor standard is appropriate.

The Petitioners are the only parties that have conducted noise modeling in this case. The Petitioners' noise modeling uses the Cadna/A acoustical modeling software, an internationally accepted acoustical model used by many noise-control professionals in the United States and abroad. The results of the sound modeling analysis indicate that the proposed project is expected to meet a noise standard of 45 dBA (exterior)(Leq)(1hr) at nearby residences, with two of the

150. Department Brief at 29-30.

proposed turbine models requiring an NRO mode to meet the standard.[151] The Petitioners' noise analysis also included an examination of low frequency and infrasound.[152]

Albany-Craftsbury and LMG contend that the Petitioners are unjustifiably relying on 15 dBA attenuation by structures to ensure that a 30 dBA interior standard is met. Albany-Craftsbury and LMG claim that homes with less insulation and open windows will not attenuate sound by 15 dBA. The WHO Guidelines document indicates that sound levels are usually reduced, when windows are slightly open, by 10 to 15 dBA, and, with windows closed, are typically reduced by somewhat less than 24 dBA and in certain cases as much as 45 dBA, depending on the insulation value of the building.[153] The Petitioners' assumptions about attenuation are consistent with values in the WHO Guidelines, and therefore we conclude that the Petitioners' noise modeling is appropriate. We also note that the indoor standard of 30 dBA (interior bedrooms)(Leq)(1 hr) must be met regardless of the attenuation characteristics of the existing structure.

The Department, Albany-Craftsbury, LMG, and the Days have raised concern with the predicted frequency of NRO for the Siemens SWT-3.0-101 and Vestas V112-3.0 MW turbine models. The Petitioners' sound modeling analysis indicates these turbines are expected to meet the required noise standard when operated in the NRO mode.[154] We conclude that it is not necessary to restrict the Petitioners' use of these turbine models, recognizing that the proposed project will be required to meet an absolute noise standard. Furthermore, as recommended by the Department, we require that the noise monitoring plan for the proposed project include monitoring during the operation of the NRO mode and the reporting of instances when the NRO mode is triggered.

In addition, in response to the concerns raised by Albany-Craftsbury and LMG, we require the noise monitoring plan to include monitoring for low frequency sound, more frequent monitoring during the year than proposed by the Petitioners, at request of a homeowner,

---

151. Kaliski pf. at 4; Kaliski pf. reb. at 26-28; exhs. Pet-KHK-2 at 26 and Pet.-KHK-2-Supp. (Revised) at 2-4.

152. Kaliski pf. reb. at 19-24; McCunney pf. reb. at 5 and 8; exh. Pet.-KHK-2 at 25 and 30.

153. Exh. ALB-RJ-5 at Chapter 1, 9-11.

154. Kaliski pf. reb. at 26-28; exh. Pet.-KHK-2-Supp. (Revised) at 2-4.

monitoring to ensure compliance with an interior noise standard, and a process for complaint resolution established for the entire life of the project. We conclude that the noise monitoring plan need not include monitoring for infrasound, sound levels below 20 Hz. The Petitioners have demonstrated wind turbines are not likely to emit audible or perceivable infrasound.[155]

The Petitioners' sound expert recommends that the proposed project employ transformers with sound emissions at least 5 dB below NEMA TR-1 standards, if determined to be cost-effective. The Petitioners did not provide any cost information on complying with the requirement. For the proposed project substations, we require that the new power transformers comply with sound emissions at least 5 dBA below NEMA TR-1 standards, unless the Petitioners can demonstrate that these transformers are not cost-effective.

Albany-Craftsbury and LMG contend that the proposed project should not allow the use of private property to attenuate the noise from the proposed turbines and the Days have requested compensation for that use. The purpose of the Board's review under Section 248 is to determine whether a generation or transmission project will promote the general good of the state. In the course of this review, the Board considers the cumulative effect of impacts on individual landowners to the extent they are relevant under the Section 248 criteria. While we strive to ensure that developers minimize the impacts on individual landowners, we cannot deny a CPG based solely on the fact that a project may now, or in the future, negatively impact an individual landowner's property rights. In its *Bandel* decision, the Vermont Supreme Court stated that in a Section 248 proceeding, "The sole issue is the determination of whether or not under the criteria set forth in the statute the proposal for which a certificate is sought advances the public interest."[156] The Court continued, "Individual property rights not being at issue, they are not a basis for any special recognition of the property owners, nor do they support any special consideration for their protection in these proceedings."[157] Given the State of Vermont's policy supporting renewable energy and the benefits that will be provided by the proposed project, we have determined that the proposed project promotes the general good. In addition,

---

155. Kaliski pf. reb. at 19-24; McCunney pf. reb. at 5 and 8; exh. Pet.-KHK-2 at 25.

156. *Vermont Electric Power Company, Inc. v. Bandel*, 135 Vt. 141, 145 (1977) (quoting *Auclair v. Vermont Electric Power Co.,* 133 Vt. 22 (1974))

157. *Vermont Electric Power Company, Inc. v. Bandel*, 135 Vt. 141, 145 (1977).

we have imposed an absolute noise standard at the nearest residential receptor locations to ensure these areas are not unduly impacted by the proposed project.

Nevertheless, the Board is concerned that the argument made by the Days and the Nelsons as to the "taking" of their developmental rights for residential purposes has a more compelling character than is evident in the underlying *Bandel* rationale. We have found that a maximum project-related noise level of 45 dBA (exterior)(Leq)(1 hr) or 30 dBA (interior)(Leq)(1 hr) level at a residence is necessary to protect health. New residential structures which could otherwise be built, assuming local zoning, state wastewater and any other necessary permits could be obtained, could be eliminated solely because the noise standards were no longer attainable because of turbine proximity. For a landowner to be deprived of that potential solely by virtue of the inability to comply with the interior noise level allowed by the WHO guideline seems unfair. Although the *Bandel* Court concluded that the Board should not consider private property rights in determining whether to issue a Section 248 CPG, the Court was not considering, as we are here, a project that could entirely preclude certain development on neighboring properties for which there would not be the possibility of compensation in a subsequent condemnation proceeding. We thus find *Bandel* to be distinguishable from the case now before us.

In Vermont, such developmental rights are bought and sold all the time. The Vermont Land Trust, for instance, buys residential developmental rights to preserve farm land on a regular basis. The Board, in fact, has encouraged the purchase of such rights by petitioners to allow for mitigation of wetlands or wildlife impact. We thus adopt condition 5 below.

Therefore, the proposed project will avoid undue adverse impacts with regard to noise provided that the Petitioners are required to comply with the following conditions, including the conditions proposed by the Department:[158]

> (1) The Petitioners shall construct and operate the proposed project so that the turbines emit no prominent discrete tones pursuant to ANSI standards at the receptor locations, and project-related sound levels at any existing surrounding residences do not exceed 45 dBA (exterior)(Leq)(1 hr) or 30 dBA (interior bedrooms)(Leq)(1 hr).

---

158. A condition addressing noise from proposed project blasting is discussed in the public health and safety section.

(2) In the event noise from operation of the proposed project exceeds the maximum allowable levels, the Petitioners shall take all remedial steps necessary to bring the sound levels produced by the turbine(s) into compliance with allowable levels, including modification or cessation of turbine(s) operation.
(3) Prior to commencement of construction, the Petitioners shall prepare a Noise Monitoring Plan, subject to review by the parties and approval by the Board, which is consistent with the Plan recently approved by the Board in Docket 7156, but which extends from construction through the first two years of operations and includes: (a) monitoring for low frequency sound with the same regularity as monitoring for all frequencies; (b) a monitoring program to confirm under a variety of seasonal and climactic conditions compliance with the maximum allowable sound levels described above; (c) a means for ensuring that noise monitoring events shall be timed to coincide with those time periods when Petitioners' modeling indicates the likelihood that NRO mode will be triggered; (d) monitoring reports that document every instance when NRO mode is triggered, with a description of how NRO affected operations; (e) at the request of a homeowner, monitoring to ensure compliance with the interior noise standard; and, (f) a process for complaint resolution shall be established for the entire life of the project.
(4) For proposed project substations, new power transformers shall comply with sound emissions at least 5 dBA below NEMA TR-1 standards, unless the Petitioners can demonstrate, subject to Board review and approval, that these transformers are not cost-effective.

(5) The Petitioners, prior to operation of the project, shall propose a plan for Board approval to provide some form of compensation to adjoining landowners who can demonstrate that residential development of their land which otherwise could have occurred, can no longer happen solely because project-related sound levels at new residences on those parcels or subdividable portions thereof would exceed 45 dBA (exterior)(Leq)(1 hr) or 30 dBA (interior bedrooms)(Leq)(1 hr).

Historic Sites

[10 V.S.A. § 6086(a)(8)]

Findings

303. The proposed project will not have an undue adverse impact on historic or archaeological resources. This finding is supported by findings 304-322, below.

Archeological Resources

304. The Petitioners conducted an archaeological resource assessment to evaluate the potential impacts of the proposed project upon archaeological resources. Knight pf. at 1.

305. A review of the state's Vermont Archaeological Inventory indicates that no known precontact Native American archaeological sites exist within the proposed project area or within 5 kilometers of the Lowell Mountains. Exh. Pet.-CK-2 at 3.

306. The closest known archaeological site is located 4 kilometers east of the Lowell Mountains along the banks of the Black River. This site represents the remains of a farmstead in the area. Exh. Pet.-CK-2 at 3.

307. The archaeological resource assessment concluded that: (1) the proposed turbines, upper portion of the access road, and maintenance shed locations will not affect sensitive archaeological areas; (2) the level terrace adjacent to Route 100 that overlooks the East Branch drainage, and upon which the proposed Laydown Area and the lower portion of the access road are located, was identified to be archaeologically sensitive; and, (3) several discrete areas along the alignment of the new collector and transmission lines along Route 100 to Jay were identified to be archaeologically sensitive. Exh. Pet.-CK-2 at 5.

308. A Phase I study was conducted at the archaeologically sensitive areas identified along Route 100 and adjacent transmission areas. Although no archaeological sites have been found where studies have been completed, some areas have not yet been studied due to the lack of landowner permission. These sites are primarily along the Route 100 area. Knight pf. reb. at 1.

309. Once the Petitioners complete the remaining Phase I studies, if archaeological sites are found, Phase II studies will be required to evaluate the significance of the identified site. If the Phase II studies uncover culturally significant sites that cannot be avoided, the Petitioners will undertake Phase III data recovery to retrieve any archaeological samples. Knight pf. reb. at 1; exh. Pet.-CK-2 at 6.

310. The proposed project will not have an undue adverse effect on underground historic resources assuming the appropriate remaining archeological studies are completed in accordance with applicable archaeological requirements. Knight pf. reb. at 2.

Discussion

The Petitioners are in the process of completing the remaining Phase I archaeological studies along the proposed transmission line near Route 100. If archaeological sites are found, Phase II studies will be required to evaluate the significance of the identified site, and if the Phase II studies uncover culturally significant sites that cannot be avoided, the Petitioners will

undertake Phase III data recovery. When the Petitioners file the final design plans for the proposed project, they must demonstrate that remaining archeological studies have been completed in accordance with the results of the Phase I studies and any needed Phase II study.

Historic Resources

311. Over 120 individual sites or districts, either listed on, or eligible for listing in the State or National Registers of Historic Places, exist within the ten-mile radius viewshed area of the proposed turbines. Due to topography, buildings, and forested woodland, distant views from these sites are obscured from many vantage points. Exh. Pet.-LP-1 at 6-9.

312. Sixteen sites within the a ten-mile viewshed were identified both as important architectural resources, either listed on, or eligible for listing on the State or National Registers of Historic Places, and having the potential to be affected by the proposed project. Exh. Pet.-LP-1 at 2 and 9.

313. There are nine historic resources affected by the proposed project in the 5 to 10-mile viewshed, including Tillotson Camp, located on the Long Trail, approximately 7 miles from the proposed project. Views of the proposed project from these sites will be from a distance and will not compromise the settings of the resources. Exh. Pet.-LP-1 at 10 and 16.

314. There are three historic resources affected by the proposed project in the 3 to 5-mile viewshed, including the Eden Historic Camp District, approximately 3.5 miles from the proposed project. From a distance of 3 to 5 miles the visual impact of the proposed turbines will not be remarkable as the turbines would appear as only a component of a broader landscape comprised of many other elements in the foreground, middle ground, and distance. Exh. Pet.-LP-1 at 12-13 and 16-17.

315. There are three historic resources affected by the proposed project in the 1 to 3-mile viewshed. Views of the proposed project from these historic resources will be completely or largely blocked due to topography or vegetation, or will include other vegetation and structures that are the focal point in the foreground. Exh. Pet.-LP-1 at 13 and 17.

316. There is one historic resource in the one-mile viewshed, the Nelson Farm, located 0.83 miles from the proposed project. The Nelson Farm was placed on the State Register in 2003. The Nelson Farm retains an historic landscape with a high degree of integrity; however, the

buildings have undergone some modern changes to design and materials primarily due to the addition of the attached garage and connector, and new windows on the farmhouse, modern metal siding on the barn, and the smaller, new barn. Exh. Pet.-LP-1 at 7 and 15.

317. The proposed project will have an adverse effect on the viewshed of the Nelson Farm when approaching it from the south on the Bayley Hazen Road with the turbines clearly visible above the hillside backdrop. Although the turbines could appear as a focal point from this distance when approaching the site, the site will still be clearly understood as an historic landscape, and the public will be able to understand the distinctive character of the farmstead, including the broad open fields to the east. Exh. Pet.-LP-1 at 20.

318. The proposed project will not result in any physical destruction, damage, or alteration of the qualities that make important resources historic, such as an existing structure, landscape or setting. Exh. Pet.-LP-1 at 19.

319. The Petitioners have taken reasonable mitigating steps to preserve the character of the historic sites in the ten-mile viewshed by selecting the location for the proposed project in a forested area that is undeveloped in terms of housing and other historic resources. Exh. Pet.-LP-1 at 19.

320. The Lowell Town Plan and NVDA Plan identify important historic sites, and scenic views or landscape elements considered worthy of preservation, while recognizing the benefits of wind energy as a viable alternative to traditional sources of power. Exh. Pet.-LP-1 at 4-5.

321. The proposed project's impact on historic sites within the ten-mile viewshed will not be undue. At distances of more than one mile, the proposed turbines will not overwhelm or dominate the setting and characteristics that qualify the historic resources for listing in the State and National Registers, nor will they affect the ability of the public to interpret and appreciate these resources. Even with the intrusion of the proposed turbines on the ridgelines above the Nelson Farm, the public will still be able to appreciate and interpret the historic qualities of the farm. Pritchett pf. at 2; exh. Pet.-LP-1 at 24.

322. Throughout the entire length of the proposed transmission line, no significant historic resources or landscape features have the potential for adverse impacts. Visual effects from the transmission line will not be substantially different than the existing impacts from the current transmission lines along Route 100 and 105. Exh. Pet.-LP-1 at 23.

Discussion

LMG argues that the proposed project will have an undue adverse effect on historic sites because the project causes a direct impact on historic resources by permanently physically altering the mountain range and an indirect impact by causing significant alteration and deterioration of the setting and character of an historic resource.[159] LMG further claims that the Petitioners have failed to establish that the proposed project will not cause an undue adverse impact on historic sites. LMG contends that the Petitioners' historic evaluation was incomplete, including that it: (1) failed to consider a camp on Lake Eden where the poet Garcia Lorca once visited;[160] and, (2) did not analyze whether noise from the proposed project will create an unacceptable impact on historic sites.[161] The Nelsons are concerned that the proposed project will impact the historic character of their home.[162]

In response to LMG's brief, the Petitioners claim that the review of historic resources was thorough and complete. The Petitioners contend that there is no requirement to consider the camp visited by Mr. Lorca because it does not qualify as an historic resource under 10 V.S.A. § 6000(9).[163] The Petitioners argue that LMG's request that the Board make findings on this information is unsupportable because the Board declined to admit evidence of Lorca's stay at the camp into the record.[164] In addition, the Petitioners claim that the historic evaluation for the proposed project properly analyzed the impact of noise and concluded that the project will not introduce new audible elements to historic sites that are incongruous or incompatible with the sites' historic qualities.[165] In response to LMG's claim the historic evaluation did not consider that some turbine models may operate in NRO mode, the Petitioners contend that the

159. LMG Brief at 64-65.

160. LMG's Brief claimed that the poet had resided on Lake Eden, when in fact he had visited for a two-week period. Tr. 2/9/11 at 12-13 (Pritchett).

161. LMG Brief at 60-66.

162. Nelsons Brief at 4.

163. Petitioners Reply Brief at 27.

164. Tr. 2/9/11 at 18-19.

165. Petitioners Reply Brief at 27-28 and Exh. Pet.-LP-1 at 19.

conclusions of the historic evaluation apply to the NRO mode because the analysis assumes the Petitioners will operate the project in compliance with the noise standard adopted by the Board.[166]

We utilize the three-part test articulated by the Environmental Board in its *Middlebury College* decision to evaluate the impacts on historic sites.[167] The first issue is whether resources, including the proposed project site and the Nelson Farm, are historic sites. Pursuant to 10 V.S.A. § 6001(9), an "historic site" includes resources placed on the National or State Registers of Historic Places ("Registers"). In this case, the proposed project site itself does not include any resources listed on the Registers. The Nelson Farm is listed on the State Register. In addition, the Petitioners' historic evaluation identified over 120 individual sites or districts either listed, or eligible for listing, on the State or National Registers of Historic Places within the proposed project's ten-mile viewshed.[168] In this case, therefore, at least 120 properties within the ten-mile viewshed,[169] including the Nelson Farm, are considered historic sites.[170]

The second issue is whether the proposed project will adversely impact the historic sites. Adverse impacts include effects on the setting and landscape, "which are incongruous or incompatible with the site's historic qualities, including but not limited to . . . new visual, audible or atmospheric elements."[171] The Petitioners concluded that due to topography, buildings, and forested woodland obscuring many vantage points, only sixteen sites within the ten-mile

---

166. Petitioners Reply Brief at 28.

167. *Petition of Georgia Mountain Community Wind*, Docket 7508, Order of 6/11/10 at 62; *Amended Petition of UPC Vermont Wind, LLC,* Docket 7156, Order of 8/8/07 at 78 (citing *In re Middlebury College*, No. 9A0177-EB (V.E.B. Jan 26, 1990)).

168. Exh. Pet.-LP-1 at 6-9.

169. We use a ten-mile radius in our discussion of the impacts of the proposed project on historic sites because this distance was referenced by the Petitioners in their analysis of the proposed project's impact on historic sites. (*See* exhibit Pet.-LP-1 at 2.)

170. LMG claimed that the camp on Lake Eden where the poet Garcia Lorca once stayed is an historic site, but provided no evidence that the site was listed on a Register.

171. *Amended Petition of UPC Vermont Wind, LLC*, Docket 7156, Order of 8/8/07 at 78 (citing *In re Middlebury College*, No. 9A0177-EB (V.E.B. Jan 26, 1990)).

viewshed have the potential to be affected by the proposed project.[172] In addition, the Petitioners' noise modeling showed that noise from the proposed project's operation would be audible at some of these affected historic sites, including the Nelson Farm.[173] LMG argues that the Petitioner's evaluation was incomplete, but LMG did not identify additional sites impacted by the proposed project that are considered historic sites pursuant to 10 V.S.A. § 6001(9).[174] Consequently, we find that the proposed project's aesthetics and noise will adversely impact several historic sites within the ten-mile viewshed, including the Nelson Farm.

The final issue is whether the proposed project's adverse impacts on the historic sites are undue. Adverse impacts are considered undue when one of the following conditions is met:

> (a) The failure of an applicant to take generally available mitigating steps which a reasonable person would take to preserve the character of the historic site;
>
> (b) Interference on the part of the proposed project with the ability of the public to interpret or appreciate the historic qualities of the site;
>
> (c) Cumulative effects on the historic qualities of the site by the various components of a proposed project which, when taken together, are so significant that they create an unacceptable impact; and
>
> (d) Violation of a clear, written community standard which is intended to preserve the historic qualities of the site.[175]

The first issue is whether the Petitioners took generally available mitigating steps to preserve the character of historic sites. As discussed within the aesthetics section, above, the proposed project cannot be completely mitigated because the 20 to 21 proposed turbines will be set on a ridgeline. Noise from the proposed project will likely be audible at some historic sites surrounding the proposed project. However, as also discussed within the aesthetics section, the Petitioners have taken available mitigation measures to minimize the aesthetic impact of the proposed project. In addition, the Petitioners' compliance with an absolute noise standard will

---

172. Exh. Pet.-LP-1 at 2 and 9.

173. Exhs. Pet.-KHK-2 at 26-27 and Pet.-KHK-2(Supp.) at 4-6.

174. LMG Brief at 60-66.

175. *Petition of Georgia Mountain Community Wind*, Docket 7508, Order of 6/11/10 at 62; *Amended Petition of UPC Vermont Wind, LLC,* Docket 7156, Order of 8/8/07 at 79 (citing In re Middlebury College, No. 9A0177-EB (V.E.B. Jan 26, 1990)).

ensure that historic areas are not unduly impacted by the proposed project. Therefore, we conclude that the Petitioners have taken reasonable steps to mitigate the aesthetic impacts of the proposed project on all resources, including historic resources.

The next issue is whether the proposed project interferes with the public's ability to interpret or appreciate the historic qualities of an historic site and whether the proposed project's cumulative effects create an unacceptable impact on the historic qualities of the site. Neither LMG, the Nelsons, nor the Petitioners presented evidence that suggests any of the identified affected historic sites, with the exception of Tillotson Camp, are designated as such because they have an important view of the Lowell Mountains. Rather, the evidence indicates that the identified affected historic sites are so listed because of their architectural importance. As noted above, the proposed project will be located on a ridgeline and will not block the view of any historic resources. Tillotson Camp is both identified for its historic structure and views, but the turbines do not dominate the viewshed due to the seven-mile distance.[176] Consequently, we conclude the public will be able to interpret and appreciate the architectural importance of the historic sites with the inclusion of the proposed project's potentially adverse effects.

With respect to the question of whether the cumulative effects of the proposed project on historic sites creates an unacceptable impact, LMG contends that the proposed project will dominate the landscape for the historic sites within the ten-mile viewshed. However, the evidence presented indicates that the majority of the historic resources located within ten miles of the proposed project will have only limited views of the project, or the view will be from a distance of more than one mile, or the view from the historic resource will include other, more important focal points than the project area. For these reasons, we conclude that the proposed project will not interfere with the ability of the public to interpret or appreciate the historic qualities of historic resources within the viewshed of the project.

We next address the impacts of the proposed project on the Nelson Farm, the closest historic site to the proposed project. From the Nelson Farm building, the closest turbine will be at a distance of 0.83 miles. The proposed project will have an adverse effect on the viewshed of the Nelson Farm when approaching it from the south on the Bayley Hazen Road where the turbines will be clearly visible above the hillside backdrop. However, the site would still be

176. Exh. Pet.-LP-1 at 10 and 16.

clearly understood as an historic landscape, and the public will be able to understand the distinctive character of the farmstead, including the broad open fields to the east.[177] We conclude that the proposed project's impact from almost a mile away will not adversely affect the historical quality of the Nelson Farm or the public's ability to appreciate its historical qualities.

Given the limited impacts on the historic sites within the viewshed of the proposed project, we find that the proposed project will not overwhelm or dominate any historical resources' views so as to alter the characteristics that qualified them for listing on the Registers, nor will the proposed project affect the ability of the public to interpret and appreciate these resources.[178] In addition, any potentially adverse noise impacts will be mitigated by the conditions included above in the noise section, including an exterior noise standard for residences of 45 dBA (1 hr Leq). The Petitioners have presented evidence that the affected historic sites that are residences will meet a 45 dBA (exterior) standard. All other affected sites are modeled to be below 45 dBA, which is below the 55 dBA (exterior)(Ldn) level identified in the EPA Sound Level Document as a level that is protective of activity interference.[179] Thus, we conclude that cumulative impacts of the proposed project will not create an unacceptable impact on historic resources in the vicinity of the proposed project.

The final issue is whether the proposed project violates a clear, written community standard which is intended to preserve the historic qualities of an historic site. The Lowell Town Plan and the NVDA Plan encourage the protection of historic resources within the town, but also encourage the development of renewable wind energy. We read these two types of provisions, in conjunction, as the town's and region's attempt to ensure that wind generation projects are sited to minimize proposed project impacts on aesthetic resources, including historic sites. However, we conclude that these provisions do not represent a clear, written standard with regard to historic resources with which the proposed project would be inconsistent. Furthermore, we do not interpret these provisions as a prohibition against developing a ridgeline wind generation project, which contains historic resources within its viewshed. It is true that the

177. Exh. Pet.-LP-1 at 20.

178. Exh. Pet.-LP-1 at 24.

179. Exhs. Pet.-LP-1 at 9, Pet.-KHK-2 at 7 and 26-27, and Pet.-KHK-2(Supp.) at 4-6.

proposed project will be visible from historic resources in the host towns and the surrounding area. However, the intrusion into the scenic landscape will be indirect or minimal from most historic sites due to the mitigating factors discussed above. Thus, the proposed project does not violate a clear, written community standard which is intended to preserve the historic qualities of historic sites. Therefore, we conclude that the proposed project will not have an undue adverse effect on the historic properties within the project's ten-mile viewshed.

Rare and Irreplaceable Natural Areas

[10 V.S.A. § 6086(a)(8)]

Findings

323. The proposed project, with the conditions imposed in this Order, will not have an undue adverse effect on rare and irreplaceable natural areas. This finding is supported by findings 324-338, below.

Serpentine Outcrop

Findings

324. The Vermont Fish and Wildlife Department ("VFWD") developed a classification of more than 80 natural community types, and each community type is ranked according to its relative rarity in the state based on the State Rarity Rank System. The State Rarity Rank System ranks each natural community type based on the known number of occurrences of a natural community type, the total area occupied by that type, and the quality or condition of most occurrences. A rank of S1, the highest rank, means that the natural community type is very rare in the state, and there are generally fewer than five high-quality occurrences. ANR considers natural community occurrences that meet a combination of Rarity Rank and quality to be state-significant. Sorenson pf. at 5-6.

325. Serpentine Outcrop is considered to be a very rare (S1) natural community. Serpentine Outcrops are areas of exposed bedrock that originated deep within the earth's mantle and are unlike most other rock found on the earth's crust. Serpentine Outcrop bedrock was brought to the earth's surface as a result of mountain-building events millions of years ago, and was exposed as a result of glacial scouring and deposition resulting from the last glacial retreat,

which began about 20,000 years ago. Thus, Serpentine Outcrop is irreplaceable. Sorenson pf. at 10-11, 13.

326. There are only eight known occurrences of Serpentine Outcrop in Vermont, and they are all located in the Lowell area. One, located just east of Route 100 in Lowell in an area known as the West Farman Hill area, lies along the path of the proposed transmission line. Sorenson pf. at 10-11.

327. Serpentine Outcrops contain minerals that are toxic to plants in high concentrations, and soil derived from Serpentine Outcrops is low in typical plant nutrients such as calcium and phosphorus. This condition results in a natural community with a distinct set of plants, including several rare species. Two of the rare species at the West Farman Hill site are the Green Mountain maidenhair-fern (*Adiantum viridimontanum*), a rare state-threatened species in Vermont that is considered globally uncommon, and the large leaf sandwort (*Moehringia macrophylla*). Sorenson pf. at 11.

328. The West Farman Hill Serpentine Outcrop natural community is dominated by native species and is primarily influenced by natural processes. Sorenson pf. at 12-13.

329. Pursuant to the Natural Resource MOU, the Petitioners will prepare a revised management plan for the Serpentine Outcrop located in the transmission corridor to reflect and incorporate the recommendations of Eric Sorenson as outlined in his surrebuttal testimony. Exh. GMP-ANR-1 at 11.

330. The five-step plan to protect rare, threatened, and endangered species adopted for the National Grid G33 transmission line (Docket 7500) should be incorporated into the management plan for the West Farman Hill site. Sorenson pf. surreb. at 3.

331. New poles should be located in order to avoid direct impacts to state-threatened plants, including the Green Mountain maidenhair fern. Otherwise, the Petitioners must obtain an Endangered Species Takings permit from ANR prior to construction. Sorenson pf. surreb. at 4.

332. Standard soil-stabilization methods may not be appropriate for the Serpentine Outcrop area. Any seeding or planting in this area should be done in consultation with ANR. Sorenson pf. surreb. at 4.

333. The Petitioners' Serpentine Outcrop management plan should be revised to include the following:

- Monitoring for a minimum of three years for invasive species. Any species on the state Quarantine or Watch Lists will be removed by hand or per conditions below.

- Prior to any routine vegetation management occurring in this area a qualified botanist will flag and delineate the Green Mountain maidenhair fern and large-leaved sandwort or alternatively the area containing them.

- Mechanical clearing will be done during the dormant season.

- There will be no foliar herbicide application within the Serpentine Outcrop area.

- Cut stump application of herbicide may occur if farther than one meter from any individual of the Green Mountain maidenhair fern or large-leaved sandwort.

Sorenson pf. surreb. at 5.

Discussion

The West Farman Hill Serpentine Outcrop is a rare and irreplaceable natural area. The Serpentine Outcrop is an area that contains a natural community comprised in part of rare species of plants, and is primarily influenced by natural processes. There are only eight known instances of Serpentine Outcrop in Vermont, all located in the Lowell area. Due to its geologic formation and glacial exposure, the Serpentine Outcrop is irreplaceable.

In the Natural Resource MOU, ANR and the Petitioners agree that the West Farman Hill Serpentine Outcrop constitutes a rare and irreplaceable natural area and that, provided the Petitioners develop and implement a revised management plan for the Serpentine Outcrop area which incorporates the recommendations of ANR witness Sorenson as outlined in his surrebuttal testimony, the proposed project would not have an undue adverse impact on this rare and irreplaceable natural area. One of Mr. Sorenson's recommendations is that the five-step plan to protect rare, threatened, and endangered species adopted for the National Grid G33 transmission line in Docket 7500 be incorporated into the management plan for the West Farman Hill Serpentine Outcrop. The five-step plan adopted in Docket 7500 is as follows:

> (a) [The Petitioners] shall fence or otherwise protect all threatened and endangered species and rare species within the limits of disturbance of the proposed project or that occur close enough to the limits of disturbance that disturbance is a possibility, prior to construction and preconstruction clearing.

> (b) In the event that a taking of any threatened and endangered species is inevitable during proposed construction, a Takings Permit with appropriate mitigation as approved by ANR shall first be obtained by [the Petitioners]. If greater than 25 percent of a rare plant population is to be impacted by construction, the plants shall be transplanted and/or seeds collected for propagation adjacent to the disturbed area.
> (c) [The Petitioners] shall inspect the locations of all threatened, endangered, and rare species within the limits of disturbance and will install, maintain and deploy barrier fencing and signage during construction and annually for three seasons after the completion of the construction to determine plant distributions and make general observations for considerations related to future management efforts.
> (d) [The Petitioners] shall, if necessary, conduct additional monitoring work that may include removal of competing or noncompatible vegetation to ensure that the plants are not subject to encroachment following construction activities. If during the monitoring activities it is determined that the identified threatened or endangered species are being limited in extent or distribution due to encroachment of invasive species, the invasives shall be removed if feasible following coordination with the Nongame and Natural Heritage Program.
> (e) As part of their best efforts to avoid introducing new populations of invasive species, [the Petitioners] agree to clean all equipment of seeds and adhering soil prior to moving it onto the site, and use only clean fill and straw that is free of non-native invasive plants and seeds.[180]

We find that the provisions of the Natural Resource MOU, which include the development of a revised management plan for the West Farman Hill Serpentine Outcrop, will be protective of this rare and irreplaceable natural area and will avoid undue adverse impacts, provided that the plan incorporates all of the recommendations outlined by Mr. Sorenson. We require the Petitioners to file the revised management plan for Board approval prior to commencing construction of the Transmission Component.

State-Significant Natural Communities

Findings

334. Montane Spruce-Fir Forest occurs on mountain summits and ridgelines, typically at elevations above 2,500 feet in the northern part of Vermont. The community type is dominated by red spruce (*Picea rubens*) and balsam fir (*Abies balsamea*), and has varying amounts of hear-

180. *Petition of New England Power Company, d/b/a National Grid*, Docket 7500, Order of 8/3/10 at 22-23.

leaved paper birch (*Betula papyrifera* var. *cordifolia*). The total amount of Montane Spruce-Fir Forest on the Lowell Mountain ridgeline is approximately 94 acres, with only 81 acres of this forest on the proposed project property. Sorenson pf. at 7-9.

335. Montane Yellow Birch-Red Spruce Forest typically occurs on mountain slopes at elevations between 2,000 and 2,500 feet. The community type is dominated by red spruce and yellow birch (*Betula alleghaniensis*). The total area of Montane Yellow Birch-Red Spruce Forest on the slopes of Lowell Mountain is 977 acres. Sorenson pf. at 9-10.

336. Both the Montane Spruce-Fir and Montane Yellow Birch-Red Spruce Forests on Lowell Mountain are considered uncommon, but not rare, natural communities in Vermont. Sorenson pf. at 6-9.

337. Both the Montane Spruce-Fir and Montane Yellow Birch-Red Spruce Forests are considered state-significant natural communities due to their sizes, conditions, and the relatively unfragmented landscape in which they occur. The Montane Spruce-Fir Forest is a relatively small example of this natural community type, but is in very good condition. The Montane Yellow Birch-Red Spruce Forest is moderate in size for this community type, and is in good condition. Sorenson pf. at 10.

338. While the two montane forests are uncommon and considered state-significant natural communities, they are not rare and irreplaceable natural areas. Approximately 25.699 acres of Montane Spruce-Fir and 80.99 acres of Montane Yellow Birch-Red Spruce will be cleared for the proposed project. The construction and clearing associated with the proposed project will degrade the Montane Spruce-Fir Forest to the point that it will no longer be considered state-significant. Sorenson pf. at 13-14; tr. 2/3/11 at 207 (Jewkes).

Discussion

The two montane forest natural communities are uncommon in the state, but are not rare natural communities; therefore a finding that there will be no undue adverse impact is not required in order for the Board to issue a CPG for the proposed project. Nevertheless, we find that the mitigation and decommissioning measures provided by the Natural Resource MOU, as discussed below as they relate to necessary wildlife habitat and endangered species, will limit the impacts of clearing to being adverse in nature, rather than unduly adverse.

Wildlife, Including Necessary Wildlife Habitat and Endangered Species

[10 V.S.A. § 6086(a)(8)(A)]

Findings

339. The proposed project will not destroy or significantly imperil necessary wildlife habitat or any endangered species, with the implementation of the mitigation discussed in this section. This finding is supported by findings 340-400, below.

340. Habitat blocks are defined as areas of contiguous natural habitat that are bounded by fragmenting features. ANR has defined fragmenting features to include Class 1, 2, and 3 roads, houses and other development, and agricultural land. In the Northern Green Mountains of Vermont there are 337 habitat blocks. The Lowell Mountain habitat block is 29,680 acres, the twelfth largest habitat block in the biophysical region. Sorenson pf. at 18-19.

341. The proposed project access road, crane path and turbine pads will result in permanent forest canopy gaps, unlike the Class 4 roads on the Lowell Mountain Block that have mostly closed forest canopies. Sorenson pf. at 22.

342. Fragmentation means dividing land with naturally occurring vegetation and ecological processes into smaller areas as a result of roads, land clearing, development, or other land uses that remove vegetation and create physical barriers between previously connected natural vegetation. Fragmentation alters interior forest wildlife habitat, impairs the movement of some wildlife species, changes ecological processes, and increases the likelihood of introduction of non-native invasive plant species. Sorenson pf. at 18.

343. Habitat fragmentation can affect the types and abundance of species that inhabit an area. Some forest interior songbirds and black bear require large areas of remote, contiguous habitat to meet their life requisites. Austin pf. at 22-23.

344. The scale of the proposed project is large in the relative context of the remote, forested landscape where it will be located, and will result in a significant change to the natural environment of the Lowell Mountain ridgeline. Austin pf. at 8.

345. The proposed project will fragment this area of forest interior habitat. Tr. 2/7/11 at 178 (Austin).

346. Habitat fragmentation and loss are commonly considered by the professional conservation science community as among the greatest threats to wildlife and the conservation of

biological diversity, along with climate change and invasive species. The habitat fragmentation resulting from the proposed project will not be a benefit to wildlife. Sorenson pf. at 6; Austin pf. at 21.

347. The scale and clearing of the proposed project will increase the risk for introduction of non-native, invasive species into the natural communities of the Lowell Mountains. Sorenson pf. at 25.

348. Non-native, invasive species are aggressive colonizers of bare soils that have been exposed during construction or erosion, especially if there is abundant sunlight from tree canopy removal. Sorenson pf. at 25.

349. Invasive species, including honeysuckles (*Lonicera* spp.), buckthorns (*Rhamnus* spp.), and barberries (*Berberis* spp.), once established on forest edges can quickly spread into the interior of forests (especially those that are heavily managed or that have exposed soils associated with erosion or recreation trails) and reduce the quality of wildlife habitat, interfere with natural forest regeneration, and reduce the ecological integrity of the natural communities. Sorenson pf. at 25.

350. Some invasive plant species, such as those mentioned above, are spread by birds, especially bird species associated with forest edge habitat. Sorenson pf. at 25.

351. The common reed (*Phragmites australis*) and other invasive plant species are commonly spread to new sites in contaminated fill material trucked in for road construction or carried on construction machinery. Sorenson pf. at 25.

352. The linear orientation of the impacts and their location along the Lowell Mountain ridgeline will maximize the fragmenting effects of the clearing on the state-significant natural communities and on this large and currently unfragmented habitat block. Sorenson pf. at 20–21.

353. Absent the mitigation proposed and agreed to by ANR and GMP in the Natural Resource MOU, the proposed project would have an undue adverse effect on natural communities and the natural environment as a result of the fragmenting effects of the project. Exh. GMP-ANR-1 at 2.

354. Even with the mitigation proposed and agreed to by ANR and GMP in the Natural Resource MOU, the proposed project will still have an adverse effect on natural communities and the natural environment. Tr. 2/24/11 at 195 (Sorenson).

Deer and Moose Winter Habitat

355. The proposed project has been designed to avoid impacts to deer and moose winter habitat. Austin pf. at 8-9; Wallin pf. at 2-3.

356. The deer winter shelter ("DWS") habitat located on the site of the Generation Component offers cover that has marginal value, and signs of recent use by deer are not readily apparent. Therefore, the proposed project will not have a significant impact on this habitat. Exh. Pet.-JAW-2.

357. The four DWS sites identified along the proposed transmission corridor will not be impacted by the proposed project. Tr. 2/7/11 at 78 (Wallin).

358. The moose winter habitat that was identified in the vicinity of the Generation Component of the proposed project is largely on non-participating property. The moose winter habitat that is on proposed project land is an extension of that on non-participating property, and is currently of marginal value due to its young age, and should increase in value as it matures. The moose winter habitat is well outside of any impact zone of the proposed project. Exh. Pet.-JAW-2 at 5.

Black Bear Habitat

359. The Department of Fish and Wildlife considers three habitat types as necessary habitat for black bear including:

> (a) concentrated areas of American beech or oak trees for fall feeding habitat;
> (b) wetlands used as spring and summer feeding habitat and thermal refugia;
> (c) travel corridors associated with roads or other features on the landscape that affect or direct the movements of black bears for accessing important habitats and moving throughout their range.

Austin pf. at 9.

360. There are several areas of concentrated American beech trees that are used by black bears for fall feeding habitat as well as an array of forested wetlands and a beaver-influenced wetland complex that appears to provide spring and summer feeding and thermal refugia habitat for black bears on the land of the proposed Generation Component. Austin pf. at 9-10; exh. Pet.-JAW-4.

361. There are 146 acres of concentrated bear-scarred beech habitat within the areas of direct and indirect impact of the proposed project. Tr. 2/7/11 at 168 (Wallin); Austin pf. at 10.

362. Direct impacts involve the physical loss of habitat due to construction of a project. Tr. 2/7/11 at 159 (Austin).

363. The proposed project will directly impact 20.7 acres of bear-scarred beech habitat. Tr. 2/7/11 at 168 (Wallin).

364. Indirect impacts involve the potential for the construction and operation of various projects to displace or disturb wildlife from using necessary or important habitat. Austin pf. at 12.

365. The proposed project contains approximately 125 acres of bear-scarred beech habitat within the area of potential indirect impact. Tr. 2/7/11 at 21 (Wallin); Austin pf. surreb. at 12.

366. Proposed turbine #15 protrudes into the area of highest bear-scarred beech concentration. Austin pf. at 13.

367. ANR and GMP have proposed and agreed to mitigation for impacts to black bear habitat as set forth in the Natural Resource MOU. The Natural Resource MOU provides the following:

> 1. Turbine 15. ANR withdraws its opposition to Turbine 15.
> 2. Black Bear Habitat Mitigation Parcels. In mitigation of impacts to black bear habitat, GMP shall cause the following parcels to be subject to conservation easements and shall take the following actions:
> 2.1 Parcel 1
> 2.1.1 Location and size of Parcel 1: Parcel 1 will consist of approximately 292 acres as shown on Exhibit A. Parcel 1 shall be subject to a conservation easement of limited term as set forth below, until twenty five (25) years after completion of Project decommissioning. This area is bounded approximately as follows:
> a. Northerly by clearing limits for the Project access road and maintenance facilities as indicated on Exhibit A.
> b. Easterly by the westerly edge of the collector line clearing limits and one hundred feet from western edge of the proposed clearing limits of the crane path and turbine pads as generally indicated on Exhibit A Parcel 1.
> c. Southerly by Parcel 2.
> d. Westerly by Parcel 3 and the property boundary between Landowner and Roger Stewart.
> 2.1.2 Conditions and Restrictions
> a. During the conservation easement term, Parcel 1 shall be subject to an approved forestry and wildlife habitat management plan, to be established in coordination with GMP, ANR, and Landowner, that is consistent with the purposes and conditions set forth in the conservation easement, and that is consistent with Landowner's forest management objectives for the site, while

ensuring the proper stewardship and enhancement of the bear habitat features on Parcel 1. The forestry and wildlife habitat management plan may be implemented by amending the Landowner's use value appraisal plan. The forestry and wildlife habitat management plan shall be reviewed and approved by ANR and submitted to the Board for final approval prior to construction of the Project. The Landowner shall have the right to log the property provided such use is consistent with the forestry and wildlife habitat management plan and the conservation easements described herein. Landowner will avoid logging operations during the fall feeding period (September through and including November) and spring feeding season (April through and including May).

b. During the Parcel 1 conservation easement term the Landowner will be prohibited from building additional roads other than for logging operations and shall be prohibited from putting utility lines on Parcel 1 (collectively the "Logging Road Restrictions").

c. The Parcel 1 conservation easement shall provide that GMP may take actions to remove danger trees from along the collector line corridor at any time without being in conflict with the above requirements. GMP shall notify ANR any time it takes such action and shall identify any beech trees removed.

d. The Parcel 1 conservation easement shall acknowledge that there is an overlap with the land to be conserved in Parcel 4.

e. Any development other than development allowed pursuant to the ANR approved forestry and wildlife management plan is prohibited for the term of the conservation easement.

2.2 Parcel 2

2.2.1 Location and size of Parcel 2: Parcel 2 will consist of approximately 110.3 acres as shown on Exhibit A. This area is bounded approximately as follows:

a. Northeasterly by Parcel 1.

b. Northwesterly by land currently owned by Roger Stewart.

c. Southwesterly by land owned by Vermont Land Trust, Inc.

d. Southeasterly one hundred feet to the western edge of the proposed clearing limits of the crane path and turbine pads as generally indicated on Exhibit A.

2.2.2 Conditions and Restrictions. Parcel 2 shall be subject to a permanent conservation easement that will prohibit development other than as allowed below:

a. Parcel 2 shall be subject to an approved forestry and wildlife habitat management plan, to be established in coordination with GMP, ANR, and Landowner, that is consistent with the purposes and conditions set forth in the conservation easement, and that is consistent with Landowner's forest management objectives for the site, while ensuring the proper stewardship and enhancement of the bear habitat features on Parcel 2. The forestry and wildlife habitat management plan may be accomplished by amending the Landowner's use value appraisal plan. The forestry and wildlife habitat management plan shall be reviewed and approved by ANR and submitted to the Board for final approval prior to construction of the Project. The Landowner shall have the right to log the property provided such use is consistent with the forestry and wildlife habitat

management plan and the conservation easements described herein. Landowner will avoid logging operations during the fall feeding period (September through and including November) and spring feeding season (April through and including May).

b. The Landowner will be prohibited from building additional roads other than for logging operations and shall be prohibited from putting utility lines on Parcel 2 (collectively the "Logging Road Restrictions").

c. Any development other than development allowed pursuant to the ANR approved forestry and wildlife management plan is prohibited.

d. The Parcel 2 conservation easement shall acknowledge that there is an overlap with the land to be conserved in Parcel 4.

e. The requirements established for Parcel 2 shall be accomplished prior to commencement of construction activities for the Project.

2.3 Parcel 3

2.3.1 Location and Size of Parcel 3: Parcel 3 will consist of approximately 178 acres to the west of Parcel 1 and shall include the beaver wetlands as indicated in Exhibit A. This area is bounded approximately as follows:

a. Northerly by the southerly edge of the Field and the limits of clearing for the access road as shown on Exhibit A, then continuing along the easterly edge of the existing log landing just above the Field, and then along the southerly edge of the existing logging road and landing.

b. Easterly by a 100 foot off-set from the current location of the logging haul road (as measured from the center line), said easterly edge being the westerly edge of Parcel 1.

c. Southerly by land currently owned by Roger Stewart.

d. Westerly by land currently owned by Roger Stewart and then extending to the southerly edge of the Field.

2.3.2 Conditions and Restriction.

a. Parcel 3 shall be subject to a permanent conservation easement prohibiting both development and commercial logging of timber on Parcel 3, but allowing timber management to be done at the discretion of ANR.

b. Parcel 3 shall be managed in accordance with Army Corps of Engineers and ANR recommendations.

c. The Parcel 3 easement shall allow the Landowner to maintain and have use, and allow Landowner's invitees to have reasonable use, during frozen ground conditions, of the existing logging road consistent with past practice and the purposes of the mitigation parcel in its current condition, but not to install new logging roads or other infrastructure on Parcel 3.

d. The requirements established for Parcel 3 shall be accomplished prior to commencement of construction activities for the Project.

2.4 Nothing in the conservation easements or this Stipulation shall preclude GMP from using Parcels 1, 2 and 3 as mitigation for other Project impacts to meet regulatory requirements, provided such mitigation does not conflict with/is not inconsistent with the terms and conditions of the conservation easements established herein.

2.5 After the commencement of Project commercial operations, scheduled capital maintenance shall be planned to avoid fall (September through and including November) and spring (April through and including May) feeding seasons for bears. There shall be no timing restrictions on emergency or ordinary maintenance activities.

3. Habitat fragmentation mitigation parcels. In mitigation of Project fragmentation impacts, GMP shall cause the following parcels to be subject to conservation easements and shall take the following actions:

3.1 Parcel 4. GMP shall provide a permanent conservation easement for the ridgeline (the "Ridgeline Easement").

3.1.1 Location and Size of Parcel 4. Parcel 4 will consist of approximately 324 acres (including overlap with Parcels 1 and 2) as shown on Exhibit A. The northwesterly boundary of Parcel 4 shall be 500 feet from the centerline of the crane path, as constructed. The southwesterly boundary of Parcel 4 shall be 500 feet from the centerline of the crane path, as constructed, or to Landowner's property boundary, whichever is less.

3.1.2 Conditions and Restrictions.

a. The Ridgeline Easement, shall restrict future development to a renewable energy technology development project subject to the requirements of any CPG from the Board (or an analogous permit from any successor agency) or a telecommunications technology project subject to the requirements of a permit for the appropriate authority ("Future CPG Project"). To fit the definition of a Future CPG Project, the developers of that future project must have filed its petition or application for project approval before GMP ends Project commercial operations, any Future CPG Project must contain a decommissioning and site restoration plan that is at least as stringent and protective and contain at a minimum those protections and restrictions outlined and required by this Stipulation.

b. The Ridgeline Easement shall be conveyed prior to commercial operation of the Project. Nothing contained within the easement shall prohibit the Project from operating in accordance with the terms of this Stipulation.

c. Parcel 4 shall be subject to an approved forestry and wildlife habitat management plan, to be established in coordination with GMP, ANR, and Landowner, that is consistent with the purposes and conditions set forth in the Ridgeline Easement and is consistent with Landowner's forest management objectives for the site, while ensuring the proper stewardship and enhancement of the bear habitat feature on Parcel 4. The forestry and wildlife habitat management plan may be accomplished by amending the Landowner's use value appraisal plan. The forestry and wildlife habitat management plan shall be reviewed and approved by ANR and submitted to the Board for final approval prior to construction of the Project. The Landowner shall have the right to log the property provided such use in consistent with the forestry and wildlife habitat management plan and the conservation easements described herein. Landowner will avoid logging operations during the fall feeding period (September through and including November) and spring feeding season (April through and including May).

d. The Landowner will be prohibited from building additional roads other than for logging operations and shall be prohibited from putting in utility lines on Parcel 4 (collectively the "Logging Road Restrictions").
e. Any development involving the ridgeline other than a Future CPG Project or development allowed pursuant to the ANR approved forestry and wildlife management plan shall be prohibited.

3.2 Fragmentation-Connectivity Easements. Prior to commercial operation, GMP will secure prudent conservation easements of adequate size and location, as approved by ANR, to be held in perpetuity, to provide wildlife habitat connectivity to address fragmentation. GMP must consult with and obtain the approval of ANR for any parcel it seeks to secure to satisfy this requirement. ANR shall determine the adequacy of any parcel sought to be conserved to satisfy this requirement. ANR commits to work collaboratively with GMP to achieve these outcomes. If GMP cannot procure such conservation easements in proximity to the Project area consistent with discussions with ANR and the testimony of Eric Sorenson in Docket No. 7628, GMP and ANR will work in good faith to enable GMP to acquire connectivity easements of comparable scale and ecological value to address connectivity in the Lowell Mountain Habitat block.

. . .

6. Post Construction Invasive Species Monitoring. GMP agrees to monitor invasive species for a period of up to ten years at the Project site and at the Serpentine Rock Outcrop located in the transmission corridor adjacent to Route 100 in the town of Westfield, Vermont. ANR shall review and approve GMP's post construction and invasive species monitoring plan.

. . .

9. Site Access Restrictions. GMP will proceed to develop a site access plan in concert with ANR. Searsburg's public access plan will provide a guide for a development of the plan. The site access plan will be approved by ANR prior to submission to the Public Service Board. Any site access plan developed shall restrict motorized access by the public on the access road and crane path. There shall be no public access during fall (September through and including November) and spring (April through and including May) feeding periods.

Exh. GMP-ANR-1.

368. There are known land areas, including locations along the Boomhour Branch, that could serve to satisfy the fragmentation-connectivity easements requirement of the Natural Resource MOU. These lands have sections of road that do not have houses on them and have adequate cover to the edge of the road so that those areas can continue to be places where animals can move, and where species shift over time. Sorenson pf. surreb. at 13; tr. 2/24/11 at 201 (Sorenson).

369. Pursuant to the Natural Resource MOU, the proposed project cannot commence commercial operation if the fragmentation-connectivity easements are not obtained. Tr. 2/24/11 at 202 (Sorenson).

Discussion

Mr. Austin testified on behalf of ANR that, absent mitigation, the proposed project would have undue adverse impacts on black bear habitat in the form of bear-scarred beech habitat as well as the network of forested wetlands.[181] Mr. Austin proposed the following approach to appropriately mitigate the impacts to black bear habitat:

> (1) Move or eliminate turbine #15 that protrudes into the area of highest bear-scarred beech habitat concentrations;
> (2) Provide habitat compensation for unavoidable impacts at a ratio of 4:1, that is 4 acres of comparable bear-scarred beech habitat conserved for each acre impacted. The conservation would need to be into perpetuity and managed in such a fashion as to maintain and enhance the American beech component of the habitat;
> (3) Avoid construction during bear use of the habitat during the period from September 1 through November 30.
> (4) Commit to restrictions on use of the access road during the spring and fall feeding periods once the project is constructed, similar to the access restrictions used at the existing Searsburg wind energy facility.
> (5) In concert with a conservation easement, develop a habitat management plan that will guide the management and stewardship of the bear-scarred beech habitat on the property.[182]

The Natural Resource MOU meets some, though not all, of ANR's proposals for mitigation of impacts to black bear habitat. The Natural Resource MOU does not propose to move or eliminate turbine #15, but rather, ANR has withdrawn its objection to this turbine. Turbine #15 is located within the area of highest bear-scarred beech habitat on the project lands. There will be adverse impacts to this bear-scarred beech cluster; however, we find that through the Parcel 2 permanent easement the adverse impacts will not be undue. Parcel 2 is located immediately adjacent to turbine #15, to the northwest, and encompasses the area of potential indirect impact and beyond, for a total of 110.3 acres. Parcel 2 will be subject to the conditions

181. Austin pf. at 12.

182. Austin pf. at 13-14.

and restrictions described above, which will ensure the proper stewardship and enhancement of the bear habitat features.

Similarly, we find that the conditions and restrictions placed on the mitigation parcels will limit the direct and potential indirect impacts to bear habitat such that they will not be undue. While it remains unclear whether the total proposed mitigation land on Parcels 1-4 contains comparable bear-scarred beech habitat at a ratio of 4:1, it is clear that 610.4 acres containing black bear habitat will be permanently conserved through Parcels 2, 3 and 4, and that the bear habitat found on Parcel 1 will be conserved through the life of the proposed project, plus 25 years. Each parcel will be subject to a management plan, to be approved by ANR, that will ensure the proper stewardship and enhancement of the bear habitat features. The Natural Resource MOU specifies that the forestry and wildlife habitat management plans for Parcels 1, 2 and 4 must be approved by the Board prior to the commencement of construction. The Natural Resource MOU does not require any Board approval of plans for Parcel 3, but rather, states that Parcel 3 shall be managed in accordance with Army Corps of Engineers and ANR recommendations. Because Parcel 3 is part of the mitigation proposed for impacts to black bear habitat, we require the Petitioners to obtain Board approval of the management plan for this parcel prior to the commencement of construction. Use of the parcels for logging operations will be restricted during the fall and spring feeding periods, and access to the site will be restricted pursuant to a site access plan. We require the Petitioners to file the site-access plan for Board approval prior to commencing commercial operation.

ANR has agreed to work in good faith with GMP on all of the requirements of the Natural Resource MOU. Paragraph 3.2 of the Natural Resource MOU establishes that the fragmentation-connectivity easements must be secured prior to commercial operation of the proposed project. During the technical hearings it was established through Mr. Sorenson that in certain scenarios the Petitioners might not be able to secure from landowners easements of adequate size and location.[183] Pursuant to the Natural Resource MOU, the Petitioners may spend significant amounts of money to construct the proposed project, and in so doing fragment the on-site habitat, yet not be able to operate the project because adequate habitat has not been conserved. Petitioners are relying upon procuring these fragmentation-connectivity easements in

183. Tr. 2/24/11 at 201-04 (Sorenson).

order to avoid the undue adverse impacts to natural communities and wildlife habitat along the ridgeline that would occur absent this mitigation. Given the possibility that the Petitioners may not be able to secure adequate fragmentation-connectivity easements, we find that the proposed project may have an undue adverse effect on natural communities and wildlife habitat if this requirement is imposed solely prior to commercial operation. Only with secured adequate fragmentation-connectivity easements will we be able to find that this project will not have undue adverse impacts on wildlife habitat due to fragmentation. Therefore, we require the Petitioners to secure prudent fragmentation-connectivity easements of adequate size and location, pursuant to the requirements of paragraph 3.2 of the Natural Resource MOU, and file them for Board approval, prior to commencing construction.

Birds and Bats

370. The proposed project will not result in an undue adverse impact to bird or bat populations, with the conditions imposed in this Order. This finding is supported by findings 371-400, below.

371. Impacts to birds and bats have been documented at all operational wind facilities in the country. Therefore, there is a risk of impact to birds and bats at the proposed project. Gravel pf. at 4.

372. Pre-construction project site studies can be used to place bird and bat presence and activity into context with regional presence and activity, and into context with the study results of other regional wind facilities. Gravel pf. at 4.

Raptors

373. Field surveys to document raptor migration activity in the proposed project area occurred during the spring 2009 migration season. The survey documented raptors migrating through the proposed project area. Therefore, there is a potential risk of both direct and indirect impacts to raptors. Gravel pf. at 5.

374. The magnitude of impacts to raptors is expected to be low. The passage of raptors at the project site was low in comparison to regional surveys. No breeding raptors were observed during any on-site survey. Post-construction studies and other literature on raptor collision

mortality in the U.S. (outside of California) have documented low raptor collision rates and high rates of turbine-avoidance behavior. Post-construction studies and other literature on indirect impacts indicate that raptors often continue to use the area surrounding built wind facilities. Gravel pf. at 5.

Nocturnally Migrating Songbirds

375. Radar surveys to document nocturnal migrants were conducted during the fall of 2008 and spring of 2009. Gravel pf. at 5.

376. There is no reliable way to distinguish birds from bats during radar data analysis, so results refer only to "targets." Given that the number of potential bird species migrating across the proposed project area outweighs the nine bat species known to occur in Vermont, it is likely that the pool of observed targets is composed of a higher percentage of birds than bats. Gravel pf. at 5.

377. The fall and spring radar surveys documented targets moving through the proposed project area. Therefore, there is a risk of direct impacts to nocturnally migrating songbirds. The magnitude of impacts to nocturnally migrating songbirds is expected to be low. On-site radar survey passage rates were low compared to regional survey results. The vast majority of targets observed during the surveys were flying at consistently high altitudes above the proposed turbine height. Literature review indicates that impacts appear to be low since the number of individuals that have collided with turbines is very small relative to the large number of individuals moving through the landscape, and as compared to the size of the regional population. Gravel pf. at 6.

378. Data regarding nocturnal bird migrations is not indicative of a high potential of collision risk, since there is no way to accurately correlate radar data with collision risk at this time. Austin pf. at 16.

Breeding Birds

379. Petitioners conducted two rounds of on-site breeding bird surveys in June 2009. Playback surveys were conducted at each sample point to survey for Bicknell's thrush. Gravel pf. at 6.

380. On-site surveys documented abundances and species composition of breeding birds typical of this region of Vermont and associated habitats. Gravel pf. at 7.

381. Seven bird species identified on the proposed project site are listed on the Vermont Wildlife Action Plan as species of greatest conservation need, which are species that are rare, have declining populations, or are sensitive to habitat loss or disturbance. One such species is the Canada warbler which is a species of concern due to declining population trends. Austin pf. at 19.

382. Forest interior nesting songbirds, including those identified in the breeding bird survey for the proposed project, are habitat specialists that require large patches of unfragmented forest habitats to nest and reproduce successfully. Austin pf. at 22.

383. The proposed project is expected to decrease the capacity of the Lowell Mountain habitat block to support area-sensitive wildlife species and especially forest-interior species. Sorenson pf. at 22.

384. The proposed project will likely result in a shift in breeding bird species away from those that are forest-interior species and toward more forest-edge species. Sorenson pf. at 23.

385. Collision mortality for breeding birds has been documented at existing wind facilities. Gravel pf. at 7.

386. The magnitude of impacts to breeding birds is expected to be low. Literature review indicates that birds are less prone to collision during the breeding season than during migration. Many of the common species in the proposed project area are edge-associated species that are expected to become habituated to the presence of turbines. Gravel pf. at 7.

387. No Bicknell's thrush were observed in the proposed project area during breeding bird surveys. Gravel pf. at 7.

388. No federally or state-listed threatened or endangered species were observed in the proposed project area during breeding bird surveys. Austin pf. at 18-19.

Bats

389. Concerns about the proposed project's potential impacts on bat populations are based on findings initially revealed in 2003 that ridge-top wind facilities in the East result in the highest bat collision mortality levels among wind facilities in the nation. Darling pf. at 6.

390. As turbine and rotor heights have increased to over 400 feet in more recent years there is evidence that the taller turbines may be killing a greater number of bats. Darling pf. at 6.

391. ANR consulted with the Petitioners to develop a work plan for acoustic bat surveys and habitat suitability assessments for small-footed bats. Darling pf. at 7.

392. The Petitioners conducted on-site acoustic surveys to document bat activity between April 15 and October 15, 2009. On-site acoustic surveys documented typical species composition of bats. Overall acoustic activity rates above the tree canopy were low compared to other Vermont studies. Gravel pf. at 7-8.

393. Both migratory and resident bat species were detected at the proposed project site. Acoustic radar calls were most often identified as belonging to the BBSH (big brown bat/silver-haired bat) guild, and the majority of these were further identified as silver-haired bats. Exh. Pet.-AJG-1 at 56.

394. The vast majority of targets observed during on-site radar surveys were flying at consistently high altitudes above the proposed turbine height. Gravel pf. at 6.

395. There is a potential risk of direct impacts to bats. The magnitude of impact is expected to be moderate. Overall acoustic activity rates above the tree canopy were low compared to other Vermont sites. Results from regional post-construction surveys indicate that collision mortality occurs at wind facilities in the Northeast. Bats are most vulnerable to collision mortality during the fall migration period. Long-distance migratory bats species, including the silver-haired bat, red bat, and hoary bat, have comprised the majority of fatalities, although there is variability in rates of mortality and species composition at different sites. Patterns of collision mortality at the proposed project are expected to be similar to patterns at operational wind facilities in New England, where topography and habitat are similar to that of the proposed project, and where low levels of bat mortality have been documented. Gravel pf. at 7-8.

396. There is a potential risk of indirect impacts to bats due to removal of tree roosting habitat during construction. The magnitude of indirect impacts to bats is expected to be low given the large forest blocks surrounding the proposed project area and the disturbed nature of some habitats within the area as a result of current timber harvest. Gravel pf. at 8.

397. No potential day-roosts for small-footed bats were identified during a habitat assessment, and small-footed bat mortality has not been documented at existing wind facilities.

Therefore, it is expected that there will be no undue adverse impact to this state-threatened bat species. Gravel pf. at 8.

Mitigation

398. ANR and GMP have proposed and agreed to mitigation for impacts to birds and bats as set forth in exhibit ANR-SD-2, the "Bird and Bat MOU." The Bird and Bat MOU addresses ANR's concerns related to bird collisions and bats, and Exhibit A to the Bird and Bat MOU provides the following:

> General Requirements
> 1. All post construction monitoring of bird and bat mortalities on the [proposed] project shall be performed by an entity that is qualified, has experience in post-construction monitoring, and is acceptable to both VANR and GMP.
> Monitoring for Bird Fatalities
> 1. Three years of post construction monitoring will be performed at the project site for bird fatalities. After 2 years, results will be reviewed by VANR, GMP and GMP's consultants, and the need for a third year will be evaluated.
> 2. In general, survey methods will follow those found in "Evaluating avian and bat post-construction impacts at the Sheffield Wind Farm, Vermont" by Dr. E. B. Arnett and Dr. W. B. Ballard (hereafter "Sheffield Work Plan"). However, at the time this plan is being implemented at Kingdom Community Wind, it will be jointly reviewed by VANR and GMP for current best practices in the industry, and may be adjusted accordingly by joint written agreement by both parties.
> 3. In accordance with standard VANR procedures, the period of post construction monitoring for birds will be:
>
> a. Year 1 of the monitoring:
>
> i. April 15 through May 31;
> ii. June 1 through September 30 in conjunction with bat mortality searches; and
> iii. October 1 through October 15.
>
> b. Years 2 and 3 (if required) of the monitoring:
>
> i. April 15 through May 31;
> ii. September 1 through October 15.
>
> 4. All turbines will be surveyed on a weekly basis, in accordance with standard procedures approved in advance in writing by VANR.
> 5. Weather data (wind speed and temperature) will be collected from an on-site meteorological tower by GMP and will be related to patterns in mortality. All meteorological data will be provided to VANR upon request.
> Monitoring for Bat Fatalities

1. One year of post construction monitoring will be performed at the project site for bat fatalities.
2. In general, survey methods will follow those found in "Evaluating avian and bat post-construction impacts at the Sheffield Wind Farm, Vermont" by Dr. E. B. Arnett and Dr. W. B. Ballard (hereafter "Sheffield Work Plan"). However, at the time this plan is being implemented at Kingdom Community Wind, it will be jointly reviewed by VANR and GMP for current best practices in the industry, and may be adjusted accordingly.
3. The period of post construction monitoring for bats will be from June 1 to September 30 in accordance with standard procedures approved by ANR.
    a. Period of June 1 to June 30 addresses small-footed bat concerns.
    b. Period of July 1 to September 30 addresses general bat concerns.
4. All turbines will be surveyed on a daily basis, in accordance with standard procedures developed under 2 above and approved in writing by VANR.
5. Weather data (wind speed and temperature) will be collected from an on-site meteorological tower and will be related to patterns in mortality.
6. Operational adjustments for bat studies will be conducted for the period from June 1 until September 30.
7. Operational adjustments will occur during the overnight period beginning 30 minutes before sun down and continuing until sunrise.
8. Four groups for operational adjustments (sample size: ~5 turbines per group):
    a. Group 1 - cut in speed[184] set to 6.0 meters/second;
    b. Group 2 - cut in speed set to 5.0 meters/second;
    c. Group 3 - cut in speed set to 4.0 meters/second;
    d. Group 4 - cut in speed set to 3.0 meters/second (or bottom cut in limit for selected turbine - whichever is lower).
9. Turbines have not been selected at this time and therefore the cut-in speeds (particularly for the fully operational group) may be adjusted for the actual performance characteristics of the selected turbine by joint written agreement by both parties. Groupings will attempt to follow those used at Sheffield Wind Farm.
10. Turbines will be randomly assigned to a group on a nightly basis during the period June 1 to September 30, assuming turbine capabilities allow.
11. After Year 1 surveys are complete, results will be evaluated and an operational strategy for the facility will be developed.
    a. Searcher efficiency rates, scavenger removal rates, and observed mortality will be used to estimate total mortality.
    b. Mortality events will be related to weather data to confirm time periods and weather conditions associated with high risk.
    c. At the end of the survey period, results will be jointly reviewed and evaluated by VANR, GMP, and GMP'[s consultant] to determine the most effective means of limiting bat mortality to the bat fatality thresholds set out by VANR:

184. The cut-in speed is the minimum wind speed at which a turbine rotor will begin to operate.

i. An average of zero bats/turbine/year for rare, threatened, o rendangered bat species (Indiana bat [although KCW not within known Indiana bat range], small-footed bat);
ii. An average of 3 bats/turbine/year for migratory bat species (red bat, hoary bat, silver-haired bat);
iii. An average of 5 bats/turbine/year for all other species (little brown, northern long-eared, big brown, tri-colored).

d. The most effective means of limiting bat mortality may include decisions on:

i. Cut-in speed;
ii. Yearly curtailment period (number of days during certain times of the year);
iii. Nightly curtailment period (number of hours within the night);
iv. Weather characteristics (e.g., only above a given temperature threshold).

e. Effects on the treatment groups on energy production may be evaluated to guide decisions about the most effective operational strategy. In order to do so, GMP will share the necessary data with VANR to aid in the evaluation.

f. Should the parties not agree on an appropriate strategy, the lowest cut-in speed satisfying bat fatality thresholds will be set as the lower limit of acceptable cut-in speeds during June 1 through September 30, as determined by the results of this year of monitoring.

12. There is potential for additional monitoring during the second full year of operation.

a. If GMP finds that it is economically beneficial to conduct mortality searches under different curtailment strategies than those used during Year 1 (i.e., cut-in speeds other than 4.0, 5.0, 6.0 m/s), results from Year 2 mortality searches will be incorporated into the final operational strategy for the facility.

b. Average precipitation during Year 1 mortality searches that is 50% higher than the 20 year average precipitation for the June 1 to September 30 time period will result in a discussion with ANR on the need for a second year of monitoring.

13. Once mortality monitoring is complete, an operational strategy will be developed and implemented at KCW. This strategy may be altered during the life of the project in consultation with ANR.

a. If technology to deter bats becomes available during facility operations, then Green Mountain Power may elect to implement the technology at Kingdom Community Wind in consultation with ANR, and the operational strategy in place at that time may be altered.

b. New knowledge on different curtailment strategies may be determined during facility operations at KCW, and may be implemented in consultation with ANR.

14. Nothing in this agreement supersedes the Secretary's authority to require a State Threatened and Endangered Species Taking Permit.

Exh. ANR-SD-2 Attachment A.

399. The stipulations contained in the Bird and Bat MOU will result in an adequate reduction in bat fatalities through the systemic set of operational adjustments enabling GMP and ANR to establish the most effective and efficient long-term means of reducing bat fatalities. Operational adjustments at wind facilities in Germany and Alberta, Canada, have resulted in a roughly 50% reduction in bat fatalities. Darling pf. at 8-9.

400. Operational adjustments will likely have a minimal impact on energy production. The Bird and Bat MOU provides for a collaborative evaluation of the effects of the operational adjustments on energy production. Darling pf. at 10-11.

Discussion

LMG contends that the Petitioners have not presented adequate studies of the proposed project's potential impact on migrating birds and bats, and that at least a fall migratory bird analysis would be necessary to make the requisite findings.[185] LMG cites to *In re: EMDC, LLC, d/b/a East Haven Windfarm* ("East Haven"), in which the Board concluded that a CPG could not be issued because the petitioner in that case had not provided sufficient evidence on potential impacts to birds and bats. We are not persuaded by LMG's argument on this topic. The Petitioners collaborated with the Vermont Department of Fish and Wildlife on the design of the radar surveys for nocturnal bird migration, and ANR witness John Austin testified that the survey methods and data are satisfactory. Further, Mr. Austin was able to reach the conclusion that the data regarding nocturnal bird migration is not indicative of a high potential collision risk.[186] Similarly, ANR witness Scott Darling provided recommendations to the Petitioners regarding suitable habitat assessment and acoustic monitoring surveys. Mr. Darling stated that the Petitioners conducted these surveys satisfactorily and provided sufficient information to determine risks posed to bat populations.[187] Based on the Petitioners' expert testimony and reports and the testimony of ANR's witnesses, we find that, unlike in the East Haven proceeding, here there is

185. LMG Brief at 45.

186. Austin pf. at 16.

187. Darling pf. at 7.

sufficient evidence regarding potential impacts to migrating birds and bats to make the requisite findings.

With the mitigation to wildlife habitat and operational adjustments set forth in the Natural Resource MOU and the Bird and Bat MOU, the proposed project will not result in an undue adverse impact to birds and bats. Clearing associated with the proposed project will have direct impacts on forest-interior breeding bird species, and will likely result in a shift to more forest-edge bird species. However, as a result of the land conservation measures contained in the Natural Resource MOU, the impacts to breeding birds will not be unduly adverse. There is risk of collision fatalities to both birds and bats. However, ANR and GMP have agreed to and proposed mitigation in the Bird and Bat MOU that will avoid any undue adverse impacts to these species. The Bird and Bat MOU will result in the development of operational adjustments that will be both protective of migrating bird and bat species and will cause minimal impacts to energy production.

Development Affecting Public Investments

[10 V.S.A. § 6086(a)(9)(K)]

Findings

401. The proposed project would not unnecessarily or unreasonably endanger the public or quasi-public investment in public facilities, services, lands, or materially jeopardize or interfere with the function, efficiency, or safety of, or the public's use or enjoyment of or access to the public facility, service, or lands. This finding is supported by findings 402-408, below.

402. The proposed project does not directly abut any public investments, other than Route 100, which lies at the base of the proposed site. Exh. Pet.-DR-2 at 69.

403. A number of public resource investments are located nearby, or will have views of, the proposed project, including various area roadways, the Bayley-Hazen Road, the Catamount Trail, the Long Trail, including Tillotson Camp, and the Wild Branch Wildlife Management area ("WMA"), as well as schools, historic sites and recreational resources. Exh. Pet.-DR-2 at 69-70; exh. DPS-MK-2 at 6; exh. Pet-LP-1 at 6-18; Nelson pf. at 4; Buck pf. at 6.

404. The proposed project will not have an undue adverse impact on aesthetics or historic sites on public lands or facilities. *See* findings 253-279 and 304-322, above (aesthetics and historic sites).

405. The proposed project will not have an undue adverse impact on natural resources on public lands, if the conditions set forth in this Order are implemented. *See* findings 340-400, above (wildlife), and 415, below (outstanding resource waters).

406. While there will be an adverse impact to a few locations on the Long Trail within the 10-mile viewshed radius, most notably the view from Tillotson Camp, those impacts will not endanger the public in any fashion, rise to the level of undue, adverse impact, or unduly interfere with the public use and enjoyment of the trail. Exh. Pet.-DR-2 at 70.

407. A portion of the Catamount Trail, which is a statewide network of cross-country ski trails, is located along the eastern base of Lowell Mountain and climbs over the ridge at a location north of the proposed project. Users of this stretch of the trail will have views of the proposed project for a distance of approximately 0.7 of a mile. This stretch of the trail is co-located with a snowmobile route and travels through an active snowmobiling area, impacting the experience of the user in this area. Therefore, although relatively close, there will not be an undue impact on the public's use and enjoyment of the resource. Exh. Pet.-DR-2 at 70; exh. DPS-MK-2 at 6.

408. Although some may perceive their experience to be somewhat less remote in character, members of the public will still be able to freely access the WMA if the proposed project is built, and will still be able to engage in all the activities they would normally engage in at the WMA. Tr. 2/7/11 at 203-05 (Buck).

Discussion

The Petitioners contend that the proposed project will not have any undue adverse impacts to public resources in the vicinity of the proposed project.[188]

GMC refers to the public investment criterion in its proposed conclusions of law, but does not present any analysis specific to the proposed project's impacts under that criterion. GMC does refer to a Hearing Officer's Proposal for Decision in the *EMDC* proceeding[189] seemingly for the proposition that a CPG was denied in that Docket as the result of impacts to significant public investments.[190] However, by Order dated July 17, 2006, the Board declined to adopt that portion of the Hearing Officer's Proposal for Decision and concluded that the impacts to public

188. Petitioners' Proposed Decision at 77.

189. *In Re: Petition of EMDC, LLC, d/b/a East Haven Windfarm*, Docket 6911, Proposal for Decision of 3/28/06.

190. GMC Brief at 66.

investments were acceptable in that case.[191] The CPG was ultimately denied due to lack of sufficient evidence on which to make affirmative findings regarding project impacts to bats and birds.[192] Therefore, without additional explanation from GMC, it is difficult to discern what its position is under this criterion. To the extent GMC is relying on its assertion that the proposed project, without additional mitigation, fails the Quechee test, we address that below.

ANR submitted a number of proposed findings under this criterion, but did not present any argument or state a position one way or the other.[193]

The Department asserts that the proposed project meets this criterion because there is no evidence that suggests any risks to public investments themselves, and because the public will continue to be able to access these locations and to engage in all the permitted activities within them. Any impacts on the public's use and enjoyment, contends the Department, will be limited and therefore not material.[194]

Based on our findings above, we conclude that the proposed project would not unnecessarily or unreasonably endanger the public or quasi-public investment in public facilities, services, lands, or materially jeopardize or interfere with the function, efficiency, or safety of, or the public's use or enjoyment of or access to the public facility, service, or lands. Users of these resources will still be able to access them and engage in the same types of activities as they always have. As discussed in our aesthetics review above, the visual impacts to Tillotson Camp, the Long Trail and the Catamount Trail are not unduly adverse provided certain conditions are imposed. While users of these resources will undoubtedly have views of the turbines from certain vantage points, we do not believe their presence will materially interfere with the use and enjoyment of these resources because the visual impacts do not rise to the level of undue. Additionally, there is no evidence that the investments themselves, or users of the investments, will be placed at risk by the presence of the proposed project. While some users may confront some alteration in their experience utilizing the resources due to the presence of the turbines, because the impacts are

---

191. *Petition of EMDC*, Docket 6911, Order of 7/17/06 at 101-04.

192. *Petition of EMDC*, Docket 6911, Order of 7/17/06 at 104-05.

193. ANR Brief at 51-52.

194. Department Brief at 36-37.

limited, they will not rise to the level of material interference with the public's use and enjoyment of these resources.

Least-Cost Integrated Resource Plan

[30 V.S.A. § 248(b)(6)]

Findings

409. The proposed project is consistent with the principles for resource selection expressed in the Petitioners' approved least-cost integrated resource plans. This finding is supported by findings 410-411, below.

410. Based upon scenario and sensitivity analyses that evaluated a range of portfolio strategies looking at projected costs, potential cost variance, air emissions and flexibility, the most recently approved GMP Integrated Resource Plan indicated that robust GMP resource portfolios would likely include significant amounts of renewable generation, to the extent that they could be developed or purchased cost-effectively. Smith pf. at 15.

411. Section 11.3 of the VEC Integrated Resource Plan (T&D Action Plan) describes major capital projects required based on the corrective action plans developed as part of the following three efforts: (1) the Richford Accident Investigation performed by MPR Associates; (2) the System Condition Assessment performed by MPR Associates; and (3) VELCO's Analysis of VEC's 46 kV Transmission System. These analyses included the transmission components of the proposed project. Wright pf. at 6-7.

Discussion

Based on the above findings, we conclude that the proposed project is consistent with the least-cost integrated resource plans of GMP and VEC.

Compliance with Electric Energy Plan

[30 V.S.A. § 248(b)(7)]

Findings

412. The proposed project is consistent with the Vermont Twenty-Year Electric Plan. This finding is supported by findings 413-414, below.

413. The proposed project is consistent with the 2005 Vermont Electric Plan because it increases resource diversity and promotes clean and stably priced power sources. Smith pf. at 5.

414. On November 1, 2010, the Department, in response to a request from the Petitioners, determined pursuant to 30 V.S.A. § 202(f) that the proposed project was consistent with the Vermont Electric Plan. Exh. DPS-DL-1; tr. 2/24/11 at 88-89 (Lamont).

Discussion

Based on the above findings, we conclude that the proposed project is consistent with the Vermont Twenty-Year Electric Plan.

Outstanding Resource Waters

[30 V.S.A. § 248(b)(8)]

Finding

415. The proposed project is not located near outstanding resource waters. Nelson pf. at 5.

Waste-to-Energy Facility

[30 V.S.A. § 248(b)(9)

Finding

416. The proposed project does not involve construction of a waste-to-energy facility. Therefore, this criterion is inapplicable.

Existing or Planned Transmission Facilities

[30 V.S.A. § 248(b)(10)]

Findings

417. The proposed project, with the conditions required by this Order, can be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers. This finding is supported by findings 418-420, below.

418. CVPS is the owner and operator of an adjacent electric distribution and transmission system. Estey pf. at 3-4.

419. The CVPS MOU addresses the joint development of mitigation strategies to address any impact by the proposed project's interconnection with the electric system so that it will not adversely affect the stability and reliability of CVPS's electric system. Exh. CVPS-1.

420. The proposed transmission route is the least-cost transmission alternative. Exh. GMP-DPS-1 at 2.

Discussion

The existing two-mile VELCO 46 kV transmission line will be reconductored between the Route 105/Cross Road intersection and a 46 kV terminal at the proposed 46 kV VEC Jay Tap Switching Station, located west of Leavitt Circle and south of Route 105. (The proposed Jay Tap Switching Station is under review in Docket 7604.)[195] The proposed project will interconnect with the VELCO 115 kV transmission system at the proposed VEC Jay Tap Switching Station, where the 46 kV line will connect with the adjacent proposed VELCO Jay Tap Substation.[196] The Petitioners maintain that they will not begin construction of the proposed project without Board issuance of a CPG approving the proposed VELCO Jay Tap Substation and an amended CPG approving the VEC Jay Tap Switching Station.[197] Accordingly, the Petitioners shall not begin construction of the proposed project before a CPG approving the proposed VELCO Jay Tap Substation and an amended CPG approving the VEC Jay Tap Switching Station are issued by the Board.

VII. GENERAL GOOD OF THE STATE

[Section 248(a)]

Pursuant to Section 248(a)(2), no company or person may begin site preparation for, or commence construction of, a generation facility unless the Board first finds that construction of such generation facility will promote the general good of the state and issues a certificate of public

195. On August 6, 2010, in Docket 7604, VEC was granted a CPG for the proposed Jay Tap Switching Station. On January 21, 2011, VEC requested an amendment to its CPG. VEC's amendment request is currently pending in Docket 7604.

196. The proposed Jay Tap Substation is under review in Docket 7708.

197. Petition at 2; tr. 2/3/11 at 121 (Pughe).

good to that effect. While Section 248(b) requires the Board to find that a proposed generation project will meet specific criteria enumerated in subsection (b) of the statute, before it can issue a CPG the Board must also determine, pursuant to Section 248(a), that a proposed project promotes the general good of the state. As this Board has previously explained:

> In essence the factors enumerated in subsection (b) are "conditions precedent" to the ultimate conclusion that a proposal is consistent with the general good of the state, rather than being full proof of that conclusion. In other words, they are necessary, but they may not be sufficient.[198]

In this Order, we make positive findings under all of the criteria of Section 248(b) while at the same time recognizing the potential adverse impacts of the proposed project. These findings include an affirmative finding that the proposed project will provide an economic benefit to the State of Vermont, as required by Section 248(b)(4), through, among other things, employment and tax revenues. However, Section 248(b) only requires that we find that the proposed project will result in a net economic benefit of an unspecified amount. Pursuant to Section 248(a), we also must determine whether the proposed project will promote the general good of the state. In making this additional determination, we consider whether the benefits of the proposed project outweigh its potentially adverse impacts.

In prior cases involving wind generation facilities that were being proposed by non-utility merchant generators, we found that the projects would not provide sufficient benefit to the general good of the state absent the developers entering into stably priced power purchase agreements with Vermont utilities for a substantial portion of the projects' output.[199] However, the current proposal does not raise this issue as the proposed project will be constructed and operated by GMP, a Vermont regulated electric distribution utility, with a substantial portion of project output being used to meet GMP's own customers' demand. Additionally, that portion of the output not being used by GMP will be sold to VEC based on the terms and conditions of the REPA between GMP and VEC. GMP's use of project output, and VEC's purchase from GMP, will both feature the type of price stability that we found necessary in the proposed merchant plant proceedings.

---

198. *Petition of Georgia Mountain Community Wind*, Docket 7508, Order of 6/11/10 at 80 (quoting *Twenty-four Electric Utilities*, Docket 5330, Order of 10/12/90 at 46.

199. *See Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 35-36; *Petition of Deerfield Wind*, Docket 7250, Order of 4/16/09 at 42-44; and *Petition of Georgia Mountain Community Wind*, Docket 7508, Order of 6/11/10 at 82-83.

Accordingly, the issue that most concerned us in those prior cases is not presented directly in this case.

However, a related concern still exists with respect to whether the benefits of the proposed project, including the economic benefits under criterion (b)(4), are sufficient to outweigh any adverse impacts the proposed project might have so that it can be found to promote the general good of the state. That concern is whether the cost of power from the proposed project is so high that it limits the economic benefits to a level where they cannot be said to outweigh the proposed project's impacts.

The Vermont General Assembly has set out certain policy goals to be achieved by renewable energy in 30 V.S.A. § 8001:

> (a) The general assembly finds that it is in the interest of the people of the state to promote the state energy policy established in section 202a of this title by:
>
> > (1) Balancing the benefits, lifetime costs, and rates of the state's overall energy portfolio to ensure that to the greatest extent possible the economic benefits of renewable energy in the state flow to the Vermont economy in general, and to the rate paying citizens of the state in particular.
> >
> > (2) Supporting development of renewable energy and related planned energy industries in Vermont, in particular, while retaining and supporting existing renewable energy infrastructure.
> >
> > (3) Providing an incentive for the state's retail electricity providers to enter into affordable, long-term, stably priced renewable energy contracts that mitigate market price fluctuations for Vermonters.
> >
> > (4) Developing viable markets for renewable energy and energy efficiency projects.
> >
> > (5) Protecting and promoting air and water quality by means of renewable energy programs.
> >
> > (6) Contributing to reductions in global climate change and anticipating the impacts on the State's economy that might be caused by federal regulations designed to attain those reductions.

The wind project proposed by the Petitioners will contribute to diversification of the state's energy portfolio, reduction in global climate change caused by CO2 emissions, and protection of air quality. It would also result in long-term stably priced power resources for the regulated utility

owner of the facility, and in this case also for VEC due to the terms of the REPA between it and GMP. Accordingly, the proposed project would provide the economic benefits associated with the development of renewable projects, consistent with the state policy goals.

We recognize that there may be other sources of power that are less expensive than the power that will be produced by the proposed project. However, those sources of power are non-renewable, and typically will be fossil-fuel based. The evidence in this proceeding demonstrates that the proposed project is one of the most cost-effective sources of new renewable power for both GMP and VEC.[200] Given the cost-effective nature of the proposed project when compared to other renewable resource power options for GMP and VEC, and the state's legislated policy goals, we conclude that the economic benefits of this project are sufficient to outweigh its impacts, and its construction and operation will therefore promote the general good of the state.

LMG, in its reply brief, challenged the capacity factor utilized by the Petitioners' witness Mr. Kvedar in his calculation of the cost of power produced by the proposed project. LMG claims that it is unclear how losses from events such as turbine availability, icing, high wind hysteresis, blade soiling and a number of others were captured in the calculations. Of particular concern to LMG, is the fact that Mr. Kvedar's analysis used a 100% availability factor and only a 4.76% loss factor. LMG cites a number of information sources that are not part of the evidentiary record to calculate what it believes is the appropriate capacity factor for the proposed project, and asserts what it believes is the actual cost of energy from the proposed project. LMG argues that when this true cost is known and is then compared to wind projects nationally, as opposed to those with similar characteristics to the one under consideration here, the project must be found to be "profoundly cost- ***ineffective***." (Emphasis in original).[201]

LMG's argument appears to be based on an incomplete reading of the record. The Petitioners' witness John L. Zimmerman prefiled direct testimony in this matter on May 21, 2010. Mr. Zimmerman's company, Vermont Environmental Research Associates ("VERA"), performed a wind-resource assessment for the proposed project site, and using the wind-resource data, estimated the long-term energy production for the type of facility being contemplated by the Petitioners. VERA used modeling software to model the airflow of the wind resource over the

---

200. Smith pf. reb. at 12; tr. 2/4/11 at 214-15 (Kieny).

201. LMG Reply Brief at 15-17.

ridgeline and calculated a matrix of hub-height wind resource statistics taking into account wind speed and directional distributions and surface roughness considerations. VERA then used the results of the wind-resource modeling as an input into an energy production simulation program called WindFarmer, that micro-sites the turbines along the ridgeline to maximize energy production. WindFarmer calculates energy production for each turbine, taking into account expected losses from availability, turbine wakes, electrical losses, icing and other factors.[202] Because the calculated output, which includes plant unavailability, is compared to the nameplate capacity to arrive at a capacity factor, all losses that would normally be associated with unavailability are already incorporated in the calculation of the 28.42% capacity factor. Therefore, it was appropriate for Mr. Kvedar to utilize a 100% availability factor. And, contrary to LMG's understanding, the loss factor of 4.76% in Mr. Kvedar's calculation represents the line losses that result from transmission of the power from the point of generation to the point of metering and injection into the wholesale market, not a reduction in capacity due to events such as icing and mechanical malfunctions.[203] The line-loss factor thus reduces the calculated output, which already includes impacts from unavailability, from 156,844 MWh to 149,000 MWh. Accordingly, we see nothing inappropriate in Mr. Kvedar's methodology.

Additionally, to the extent LMG believes that the calculation of the annual output of the plant, which was used to determine the capacity factor, was performed incorrectly, it had ample opportunity to propound discovery on the Petitioners' witnesses, including Mr. Zimmerman, to present its own prefiled testimony on the subject, and to cross-examine the Petitioners' witnesses, including Mr. Zimmerman. Having elected not to do so, there is no basis on which to challenge the veracity of the calculated annual output and the resulting capacity factor. Therefore, we give no weight to LMG's arguments on this point.

We also reject LMG's assertion that the costs of power from the proposed project need to be compared against a national standard that is unobtainable for Vermont's distribution utilities. The fact that there may be wind generation projects in other regions of the country with lower per

---

202. Zimmerman pf. at 9.

203. If one compares the 156,844 Mwh from Mr. Kvedar's exhibit Pet.-AJK-1 (Revised) to the line-loss adjusted 149,00 Mwh from page 10 of Mr. Zimmerman's prefiled testimony, the difference equates to the 4.76% loss factor in Mr. Kvedar's exhibit. Exh. Pet.-AJK-1(Revised); Zimmerman pf. at 10.

unit costs due to a better wind resource or geography that allows for lower capital costs in construction, does not mean the proposed project is not cost-effective. The cost-effectiveness of this resource must be measured against other resources that are actually available to the Petitioners, not against hypothetical resources that cannot realistically be accessed by Vermont's electric distribution utilities. The Petitioners appropriately compared this resource against other new renewable resource options actually available to them and have shown that the proposed project is cost-effective within that context.

We also disagree with LMG's argument that revenues from the Production Tax Credit and the sale of RECs must be excluded from the calculation of power costs for the proposed project because they represent costs to society.[204] The existence of the Production Tax Credit and renewable portfolio standards in other states that lead to the purchase of RECs are due to legislative policy decisions made by Congress and other state legislatures.[205] In passing the underlying legislation, Congress and those state legislatures concluded that there was a societal benefit that outweighed any costs associated with these mechanisms. Accordingly, there is no basis to exclude them from the calculation. Additionally, the creation of these mechanisms was a policy decision that is not before the Board. If LMG is dissatisfied with the existence of these mechanisms, it needs to address its concerns to Congress and the relevant state legislatures.

In summary, we conclude that the benefits of constructing and operating the proposed project outweigh its impacts and will promote the general good of the state, because it will be a source of long-term, stably priced power for GMP and VEC, and because it will assist the state in meeting its legislated policy goals associated with the development of renewable power projects.

VIII. DECOMMISSIONING FUND

Findings

421. GMP submitted a proposed decommissioning plan as part of its application to construct the proposed project. *See* exh. Pet.-CP-6.

---

204. LMG Reply Brief at 18. LMG also incorrectly asserts that Mr. Kvedar's analysis does not include any profit for GMP. However, Mr. Kvedar's calculations include an entry for weighted cost of capital. *See*, exh. Pet.-AJK-1 (Revised). GMP's return on investment would be included in this weighted cost of capital.

205. Similarly, in Vermont, the state has legislated policy goals encouraging the development of renewable energy in Vermont, a policy that we must account for in reviewing the proposed project.

422. The proposed project is expected to operate for 25 years, based on routine maintenance and component refurbishment, and for a longer period if the project is repowered by refurbishing the turbines. Pughe pf. at 19.

423. Under the proposed decommissioning plan, decommissioning would consist of the following: (1) disassembling all turbines, including the rotors, nacelles, and tower sections, and transporting off-site for reconditioning, salvage, recycling, or disposal; (2) removing all turbine, maintenance building, and substation foundations to a depth sufficient to remove all anchor bolts, rebar, conduits, cable, and concrete to a depth of not less than two feet below grade; (3) removing the overhead power collection conductors and the power poles; (4) removing all underground infrastructure at depths less than two feet below grade; (5) abandoning in place all underground infrastructure at depths greater than two feet below finished grade; and, (6) disassembling the substation and interconnection facilities within those areas used solely for the transmission of electrical energy generated by the proposed project and removing, reconditioning, salvaging, recycling, or appropriately disposing of all components (including steel, conductors, switches, transformers, fencing, and control houses). The areas excavated during the decommissioning process will be graded to provide for permanent soil stabilization and to promote establishment of appropriate vegetation. Pughe pf. at 19; exh. Pet.-CP-6.

424. The Natural Resource MOU that GMP executed with ANR requires GMP to amend the proposed decommissioning plan to include a site restoration plan approved by ANR, including deep-ripping/scarification of the crane path, turbine pads, and the portion of the access road that lies within the Ridgeline Easement, contouring of these surfaces to establish a substrate with micro-topography that will be more conducive to colonization by vegetation, establishment of organic material on this recontoured substrate, and a plan for removal of or revegetation over the stormwater management features for the crane path. The Petitioners have agreed to develop a plan with ANR for the planting of vegetation in the prepared substrate as part of the decommissioning process. Determination of the appropriate vegetation shall be made at the time of decommissioning. Exh. GMP-ANR-1 at ¶ 4-4.4

425. ANR and GMP will work in good faith to develop a plan to be approved by ANR for monitoring and management of the ridgeline restoration area for five years. Exh. GMP-ANR-1 ¶ 4.5.

426. ANR and GMP will work in good faith to develop a plan to be approved by ANR for monitoring and management of non-native invasive species for up to ten years post-restoration. Exh. GMP-ANR-1 ¶ 4.6.

427. GMP will submit its site restoration plan, non-native invasive species monitoring plan, and restoration monitoring and management plan to ANR for review and approval prior to their submission to the Board. Exh. GMP-ANR-1 at ¶ 4.7.

428. Subject to prior approval by ANR, GMP may seek to modify the restoration plan in the future to incorporate advances in technology to better ensure the ecological success of the restoration efforts. Exh. GMP-ANR-1 at ¶ 4.8.

429. The Natural Resource MOU contemplates the possibility of future development within the Ridgeline Easement area, but the easement will restrict such development to a renewable energy technology project subject to the requirements of a CPG from the Board (or any analogous permit from a successor agency), or a telecommunications technology project subject to the requirements of a permit from an appropriate authority ("Future CPG Project"). To qualify as a Future CPG Project, the developer must file its permit application or petition for approval prior to cessation of commercial operations by GMP. Any Future CPG Project must also contain a site restoration and decommissioning plan that is at least as stringent and protective, and contain at a minimum the protections and restrictions outlined in the Natural Resource MOU. Any future development in the Ridgeline Easement area, other than a Future CPG Project or development allowed pursuant to the ANR-approved forestry and wildlife management plan, shall be prohibited. Exh. GMP-ANR-1 at ¶¶ 3.12(a) and 3.12(e).

430. The Natural Resource MOU provides that decommissioning will occur following the end of commercial operations for the proposed project, or at the conclusion of a permitting process for a Future CPG Project, whichever is later. At that time, the proposed project, or if a Future CPG Project is approved, an appropriate portion thereof, will be decommissioned and the site restored. Exh. GMP-ANR-1 at ¶ 4.

431. The proposed decommissioning plan, as amended by the Natural Resource MOU, only requires restoration and revegetation of the crane path, turbine pads and that portion of the access road that lies within the Ridgeline Easement area. The large majority of the access road and its associated stormwater management features would remain indefinitely. The access road and its

stormwater management features would likely remain visible to some degree after decommissioning from higher elevation vantage points such as the Long Trail. Tr. 2/24/11 at 243-44 (Sorenson); Vissering pf. at 6; exh. Pet.-DR-2 Appendix 9B (Revised), Appendix 9G and 9G Alternative.

432. In addition to the plans for restoration of the Ridgeline Easement area, the Natural Resource MOU requires GMP to work in good faith with ANR at the time of decommissioning to provide appropriate enhancements to restoration activities for the ridgeline crane path and turbine pad areas that are not included in the Ridgeline Easement. The goal of any such enhancements will be to prudently facilitate the return of the ridgeline to a natural and undeveloped condition. Exh. GMP-ANR-1 at ¶ 4.10.

433. GMP proposes to provide for a decommissioning fund through accumulated depreciation. The estimated annual depreciation expense was $157,250 per year, and the 25-year value of the fund was estimated to be approximately $3,931,250, prior to accounting for the increased decommissioning costs associated with the Natural Resource MOU. The Natural Resource MOU adds an estimated additional $1,450,000 to the costs of decommissioning, increasing the annual depreciation expense by approximately $68,000 for a total annual expense of $225,250. Exh. Pet.-CP-6; exh. Pet.-Natural Resource MOU Costs.

434. GMP is not proposing a letter of credit or similar security to back the decommissioning fund, or to make it bankruptcy or creditor remote. Tr. 2/3/11 at 104 (Pughe).

Discussion

As in past Dockets reviewing applications for commercial-scale wind electric generating facilities, we are again in this proceeding requiring submission of a decommissioning plan for Board review and approval, and the establishment of a decommissioning fund to ensure that funds are available to decommission the proposed project at the end of its useful life, or the end of commercial operations should they terminate prior to the expected useful life term.

GMC contends that the decommissioning plan submitted by GMP, and as amended by the Natural Resource MOU, is not sufficient because it does not call for the removal or revegetation and restoration of the access road and its related stormwater management features, except for the portion that lies within the Ridgeline Easement area. GMC contends that the proposed project

post-decommissioning still results in an undue adverse impact to the Long Trail, and in particular, Tillotson Camp, because the plan falls short of the NVDA Regional Plan requirement that a comprehensive decommissioning plan be submitted by allowing the majority of the access road to remain along with its stormwater management features, and by leaving a number of issues for post-certification resolution.[206] GMC also contends that leaving the access road and stormwater management features in place amounts to a failure to undertake reasonable mitigation and would offend the sensibilities of the average person, creating additional bases for a finding of undue impact.[207]

After a careful review of the record and the arguments presented by the parties, we conclude that the decommissioning plan submitted by the Petitioners, with the amendments required by the Natural Resource MOU, would restore this proposed project site to an acceptable condition after the cessation of commercial operations. With respect to the basics of the plan, it is largely consistent with decommissioning plans we have approved in prior wind electric generation proceedings in that it removes all above-ground components and structures associated with the proposed project, and those below ground to a depth of at least two feet below grade, and transports them off-site for reconditioning, salvage, recycling or disposal, with components located deeper than two feet below grade abandoned in place. The areas excavated during the decommissioning process will be graded to provide for permanent soil stabilization and to promote establishment of appropriate vegetation.[208] However, with respect to this particular proposed site, like ANR and GMC, we were concerned about the large cleared impervious surface areas associated with the crane path and turbine pads along the ridgeline, not only because of the visual and potential environmental impacts, but because of the potential for future increased development pressure for the ridgeline should these areas not be restored to a reasonable degree once the proposed project ceases commercial operations. We conclude that the requirements associated with additional decommissioning activities in the Natural Resource MOU adequately address these concerns.

---

206. GMC Brief at 20-21, 63-64.

207. GMC Brief at 65.

208. *See, e.g. Petition of Deerfield Wind*, Docket 7250, Order of 4/16/09 at 91-91; *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 107.

We disagree with GMC's arguments that the access road and its related stormwater management features need to be restored as part of decommissioning to avoid an undue adverse aesthetic impact post-operations. First, the NVDA Regional Plan's requirement that a comprehensive decommissioning plan be submitted with an application for a commercial wind generation facility has been met in this case. It is our judgment that the plan, as amended by the Natural Resource MOU, restores the site to an appropriate degree to protect against unwarranted environmental and aesthetic impacts and relieves any additional development pressures for the high elevation areas of the ridgeline that would not otherwise have been present. Accordingly, we conclude that the amended proposal is "comprehensive" as that term is used in the regional plan. Second, we do not agree that removal or restoration of the access road is necessarily a reasonable mitigation measure. The cost to restore and revegetate the crane path and turbine pad areas is estimated to be $1.45 million.[209] It is reasonable to conclude, therefore, that the cost of doing the same for the access road and related stormwater management features, while likely less, would still be significant, and we see little in added benefit that would result. A review of the visual simulations submitted by the Petitioners' witness on aesthetics shows the visual impacts of the clearing for the access road.[210] We do not view these visual impacts as having the capacity to shock or offend the average viewer. Given the limited aesthetic benefits that would be realized from restoration of the access road, we conclude that it would not be reasonable to require GMP to incur this additional expense.

With respect to the fund itself, we are concerned both with the lack of record evidence that demonstrates the adequacy of the assumed amount in the fund based on annual depreciation charges, and with GMP's lack of a proposal to secure the fund balance and to make it bankruptcy and creditor remote. GMP's proposal was simply to provide for a decommissioning fund through accumulated depreciation at an annual depreciation expense of $225,250. Other than GMP's proposal, no other party addressed the funding mechanism for decommissioning. Accordingly, we are imposing a number of conditions consistent with our past practice to ensure that the necessary funds are available to decommission the proposed project when the time arrives. In doing so, we are ensuring that there is inter-generational equity associated with the costs of decommissioning.

---

209. Exh. Pet.-Natural Resource MOU Costs.

210. *See* exh. Pet.-DR-2 Appendix 9B (Revised), Appendix 9G and 9G Alternative.

This means that the ratepayers who will be consuming the power produced by the proposed project will also be funding the costs of decommissioning through the purchase of that power over the proposed project's life. If we did not impose these requirements, there is a risk that future ratepayers would shoulder some portion, or even all, of the costs of decommissioning even though they never used the power produced by the proposed project.

These conditions are largely consistent with those imposed in prior wind generation proceedings. While there is no evidence in the record to raise any concerns over GMP's financial viability, we are not convinced that GMP's status as a regulated utility entirely eliminates its risks as an owner and operator of the proposed project. Accordingly, we see no reason not to be consistent with the precedent we established in our prior cases. Therefore, we impose the following conditions related to decommissioning:

> Prior to commencement of construction, GMP shall file a proposed decommissioning plan that incorporates the decommissioning requirements of the Natural Resource MOU in addition to the details contained in its original proposed plan. The plan shall contain a detailed estimate of the costs of decommissioning, covering all of the activities specified in the decommissioning plan. The plan shall certify that the cost estimate has been prepared by a person(s) with appropriate knowledge and experience in wind generation projects and cost estimating. The decommissioning plan may allow GMP to contribute to the decommissioning fund as the construction process proceeds such that the funding level is commensurate with the costs of removing infrastructure in place. The amount of the fund may not net out the projected salvage value of the infrastructure. GMP may utilize a letter of credit to secure the full amount of the fund, and must demonstrate that the fund will be managed independently and be creditor and bankruptcy remote in the event of GMP's insolvency or business failure. The letter of credit shall be issued by an A-rated financial institution, shall name the Board as the designated beneficiary, and shall be an "irrevocable standby" letter that includes an auto-extension provision (i.e., "evergreen clause"). The decommissioning plan shall also include a decommissioning review trigger whereby if actual production falls below 50%[211] of projected production during any consecutive two-year period, a decommissioning review is initiated.

---

211. In prior Orders, we set the triggering level at 65%, but provided the merchant plant developers an opportunity to seek a 50% trigger provided they entered into long-term, stably-priced power contracts with Vermont utilities. In this case we adopt the 50% trigger because much of the power is being utilized directly by GMP with the balance being sold to VEC, resulting in both entities receiving long-term, stably-priced power from the proposed project. *See Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 116; *Petition of Deerfield Wind*, Docket 7250, Order of 4/16/09 at 95-96; and *Petition of Georgia Mountain Community Wind*, Docket 7508, Order of 6/11/10 at 86.

GMP, at its option, may establish a separate fund, which also must be creditor and bankruptcy remote, in which it may place the funds from the accumulated depreciation charges associated with the proposed project. As the amount in this fund grows, GMP may reduce the balance of the letter of credit in like amount such that the letter of credit secures the amount of decommissioning costs that is not secured by the balance in this fund.

Both the letter of credit, and the accumulated depreciation fund, should GMP opt to establish it, shall account for inflation over time.

Parties with standing on this issue shall have two weeks from the date GMP files its decommissioning plan to file any comments in response. GMP may not commence construction of the proposed project until it has received Board approval of its decommissioning plan.

GMP shall submit to the Board, for review and approval, any executed lease agreements with involved private landowners. Any such lease agreements may be redacted to protect confidential business information. At a minimum, such lease agreements shall contain provisions which ensure that decommissioning can effectively occur in the event of GMP's insolvency or dissolution, the revocation of any permit issued to GMP, GMP's breach of any lease, or an order of the Board requiring decommissioning, and allow access to the impacted land for purposes of fulfilling any CPG condition, including access by representatives of the Department of Public Service, the Board, and the Agency of Natural Resources. Upon approval by the Board, a notice of leasehold interest for each lease agreement shall be recorded in the land records of the relevant municipality.

GMP shall file its site restoration plan, non-native invasive species monitoring plan, and restoration monitoring and management plan for review and approval by the Board. Parties with standing on this issue shall have two weeks from the date GMP files its plans to file any comments in response. GMP may not commence construction until it has received Board approval of these plans.

IX. POST-CERTIFICATION REVIEW

The Board typically requires that design-detail-level plans be filed for Board approval prior to construction. We continue this practice here. The Petitioners shall file design-detail plans with the parties and the Board for major project components, including access roads, the crane path, collector lines, turbines, the step-up substation, and the various elements of the Transmission Component. Parties will have two weeks, from the date each set of plans is filed with the Board, to comment on the plans. The Petitioners cannot commence construction until the plans are approved. In addition, in this Order the Board is requiring the Petitioners to file additional plans

and to make other compliance filings, including filings addressing blasting, winter operating protocols, transportation and a variety of environmental impacts. Opportunities for parties to respond and their associated time frames are set forth in the conditions established in this Order and included in the accompanying CPG. If a party requests a hearing be held on a particular compliance filing for which we have provided an opportunity for a hearing, it must demonstrate why a hearing is necessary. We also caution parties that the post-certification process is not an opportunity to present additional arguments on issues decided in this Order.

X. MISCELLANEOUS ISSUES

The Nelsons' Property

The Nelsons, who own land adjoining the proposed site for the Generation Component of the project, claim that the proposed project may encroach onto their property. They did not present any documentation supporting their claim. They also did not seek any Board determination on the issue and instead stated that they would pursue the issue in Orleans Superior Court.[212]

The Board does not have jurisdiction over property disputes, and instead is limited in this proceeding to a review of the proposed project under the Section 248 criteria. It is up to the Petitioners to ensure that they have appropriate legal rights to utilize the property needed to construct and operate the proposed project, and any disputes over those property rights are a matter for the civil courts, not this Board.[213] As indicated in Finding 6, above, GMP has asserted that it has secured the requisite property rights to construct and operate the proposed project. The rebuttal testimony and exhibits with boundary maps provide sufficient detail for the Board to review the potential impacts of the proposed project under the criteria of Section 248.

---

212. Nelsons pf. surreb. at 2-3.

213. *See Petition of Vermont Community Wind*, Docket 7526, Order of 8/28/09 at 4-5; *Amended Petition of Vermont Community Wind*, Docket 7518, Order of 8/28/09 at 8; *Amended Petition of UPC Vermont Wind*, Docket 7156, Order of 8/8/07 at 59.

Environmental Attributes

In its initial brief, the Department expressed concerns regarding protection of consumers from misleading advertising and marketing claims regarding the handling of environmental attributes associated with energy produced by the proposed project. The Department proposed the following condition to address its concerns:

> Petitioner agrees that it will not sell any renewable energy credits (RECs) or other environmental attributes directly attributable to the Project's electrical production to more than one consumer, or make any claims regarding those disaggregated attributes in any marketing or advertising if it has sold those disaggregated attributes.

The Petitioners oppose the requested condition and assert that the broad concerns held by the Department are more appropriately addressed in a comprehensive generic proceeding, such as one addressing retail labeling requirements under 30 V.S.A. § 209(f). The Petitioners also cite two cases[214] which they argue support their contention that a "claims-based" condition is not needed in this case. Both of the cited cases are distinguishable from the matter at hand. In the *Carbon Harvest* proceeding, the Department sought a condition similar to that which it seeks here, and the Board declined to impose the condition. However, the generation facility being proposed in *Carbon Harvest* was to be operated under the SPEED standard-offer program, and the Board was already in the process of establishing the standard-offer program in Docket 7533 and encouraged the Department to present its concerns in that forum. Thus, the Board imposed a condition that would require *Carbon Harvest* to comply with the outcome of that proceeding.[215] In the current proceeding, the proposed project is not part of the standard-offer program and the Petitioners will not be bound by the results of Docket 7533 on this particular issue.

Additionally, in *Carbon Harvest*, because the developer had agreed to the language in the conditions requested by the Department, and because the Order and CPG in that Docket required that construction, operation, and maintenance of the project would be in accordance with the plans and representations submitted in the proceeding, the Board was able to reasonably expect the

---

214. *Petition of Brattleboro Carbon Harvest, LLC*, Docket No. 7614, Order of 7/13/10 and *Petition of Green Mountain Power Corp.*, Docket No. 7590, Order of 5/13/10.

215. *Carbon Harvest*, Docket 7614, Order of 7/13/10 at 16-18.

developer to abide by the disclosure requirements related to the transfer of renewable attributes.[216] In this case, the Petitioners are actively opposed to the condition requested by the Department. Thus, we do not have the same basis to reassure us that we had in *Carbon Harvest* that the Petitioners will abide by the language of the proposed condition pending the outcome of a generic proceeding, assuming one is initiated.

In the *Green Mountain Power* proceeding (Docket 7590), this issue was never presented for the Board's consideration and therefore provides no support for the Petitioners' position.

In a case more directly on point, the Board in fact did impose a condition similar to the one the Department seeks here. In *Petition of twenty Vermont utilities and Vermont Public Power Supply Authority*[217] the question of whether to impose such a condition on the purchase of renewable power that included environmental attributes was presented to the Board for consideration for the first time. The Board distinguished that case from *Carbon Harvest* based on the fact that the seller was not participating in the standard-offer program, and even if the outcome of Docket 7533 were made applicable to purchase of the renewable power under consideration in Docket 7670, the conditions would need to be modified since the conditions being considered in Docket 7533 would apply to generators, not purchasers.[218]

Similar reasoning applies in this case. First, as noted above, the proposed project will not be operating within the SPEED standard-offer program so the outcome of Docket 7533 would not be automatically applicable. Additionally, even if we were to apply any conditions that result from that proceeding to the proposed project, they would very likely need to be modified because we have a hybrid situation with one Petitioner owning and operating the generation facility and another purchasing power along with the corresponding environmental attributes.

Accordingly, our approval today includes the following condition:

> Petitioners shall not sell any renewable energy credits (RECs) or other environmental attributes directly attributable to the Project's electrical production to more than one consumer, or make any claims regarding those disaggregated attributes in any marketing or advertising if they have sold those disaggregated attributes.

---

216. *Carbon Harvest*, Docket 7614, Order of 7/13/10 at 17-18.

217. Docket 7670.

218. *Petition of twenty Vermont utilities*, Docket 7670, Order of 4/15/11 at 54.

We are applying this condition because we find it appropriate to limit the Petitioners' ability to make claims and representations regarding the power produced by the proposed project if the Petitioners sell the environmental attributes to a third party; something they have stated they intend to do. Additionally, it is also appropriate to prevent the Petitioners from selling any renewable energy credits or other environmental attributes associated with the proposed project's power to more than one consumer to avoid double-counting of the attributes.[219]

Constitutionality of Section 248 Proceedings

Dyer-Dunn contends that there are serious questions relating to the constitutionality of the Section 248 process employed by the Board because the Board exercises both administrative and legislative powers, and because the process is overwhelming for individuals seeking to protect their property rights.[220]

The Petitioners respond that the separation of powers issue has been settled law for almost 100 years, and that the process employed by the Board is consistent with Vermont's Administrative Procedure Act. The Petitioners further argue that Dyer-Dunn failed to identify a specific shortcoming in the Board's procedures, and that it therefore has not properly raised a procedural due process claim.[221]

We conclude that we are without authority to address Dyer-Dunn's constitutional arguments. Dyer-Dunn, in questioning the constitutionality of the Section 248 process, actually appears to be arguing that the statute itself, 30 V.S.A § 248, is unconstitutional. In *Westover v. Barton*, the Vermont Supreme Court held that the Public Service Board did not have the authority to determine the constitutional validity of statutes. "Moreover, because administrative agencies are created to carry out statutory purposes, the legislature could not have intended that the Board

219. *See*, Docket 7670, Order of 4/15/11 at 57.

220. Dyer-Dunn Brief at 5-6.

221. Petitioners Reply Brief at 33.

would be able to question the very validity of its enactments."[222] Accordingly, we are without authority to address Dyer-Dunn's constitutional arguments.

Board Delegation of Authority

LMG contends that the Natural Resource MOU results in an impermissible delegation of authority from the Board to ANR. LMG asserts that there are "several general requirements" that will be met only if ANR permits are subsequently issued, and that this results in the ANR essentially making the decision about whether the proposed project's impacts are unduly adverse.[223] LMG further contends that the MOU requires fulfillment of multiple conditions subsequent which will result in changes to the Petitioners' application, delegating decisions to ANR that should be part of the Board proceeding.[224]

GMP responds that there is no impermissible delegation of authority to ANR under the Natural Resource MOU because the majority of actions in the MOU that GMP must undertake are subject to review and approval by the Board,[225] the items not subject to Board review and approval will conform to evidence already in the record, and the Board routinely conditions its determination of compliance with Section 248 criteria on the requirement that a petitioner obtain any necessary collateral permits from the relevant agency. The Petitioners also argue that LMG cites no legal authority to support its position, and that nothing in the Natural Resource MOU purports to divest the Board of its authority to oversee compliance with any CPG issued for the proposed project.[226]

---

222. *Westover v. Barton*, 149 Vt. 356, 359 (1988).

223. LMG Brief at 14.

224. LMG Brief at 44.

225. The Natural Resource MOU requires the submission for review and Board approval of the forestry and wildlife habitat management plans for parcels 1, 2, and 4, the site restoration plan, the decommissioning revegetation plan, the non-native species monitoring plan, the ridgeline restoration monitoring and management plan, and the site access plan. The MOU does not require the submission for review and approval of a management plan for parcel 3, the connectivity easement(s), the post-construction revegetation plan, the stormwater management features plan, and the invasive species management plan. Exh. GMP-ANR-1. However, elsewhere in this Order we have included conditions requiring GMP to submit, for Board review and approval, all of the actions that it will be undertaking pursuant to the Natural Resource MOU.

226. Petitioners Reply Brief at 21-22.

We disagree with LMG's first argument regarding the issuance of collateral permits. All of our affirmative findings under the criteria of Section 248(b) are made based upon evidence already in the record, thus our determinations do not rely on the Petitioners obtaining collateral permits. We do, however, require that any other legally required permits be obtained as a condition of our overall approval. If the terms of any of those permits result in the Petitioners having to undertake a substantial change to the project as approved, then they will be required to seek an amendment to the CPG.[227]

LMG's second point, that there are a number of actions required of GMP under the Natural Resource MOU that are not subject to Board review and approval, has some merit. We do not agree that there is an improper delegation of authority because, even as the MOU is written, it is not ANR that is making determinations of compliance with the criteria of Section 248. Instead, the Board is making these determinations. That said, the terms and conditions of the MOU are critical to our determination that the proposed project will not have undue adverse impacts with respect to wildlife habitat, state significant natural communities, and habitat fragmentation. Given the circumstances of this case, we are not prepared to allow the actions that GMP must undertake under the MOU to go unreviewed by this Board. Accordingly, earlier in this Order we required that all actions undertaken pursuant to the Natural Resource MOU be subject to Board review and approval. In this way, the parties with standing on the relevant issue will have an opportunity to provide comment and request a hearing, and the Board can determine if the actions were undertaken correctly such that our findings remain fully-supported.

XI. CONCLUSION

For the reasons described above, we conclude that the proposed project, subject to the conditions listed below, will promote the general good of the state, and a certificate of public good shall be issued allowing its construction and operation.

227. PSB Rule 5.408.

XII. ORDER

IT IS HEREBY ORDERED, ADJUDGED AND DECREED by the Public Service Board ("Board") of the State of Vermont that:

1. The 20 to 21 wind turbine, 50 to 63 MW wind electric generation facility and associated facilities on Lowell Mountain in Lowell, Vermont, and the installation or upgrade of approximately 16.9 miles of transmission line and associated substations in Lowell, Westfield, and Jay, Vermont, proposed by Green Mountain Power Corporation ("GMP"), Vermont Electric Cooperative, Inc., and Vermont Electric Power Company, Inc. and Vermont Transco LLC (collectively, the "Petitioners"), will promote the public good of the State of Vermont, and a certificate of public good ("CPG") shall be issued for the proposed project subject to the conditions below:

(1) Construction, operation and maintenance of the project shall be in accordance with the findings and requirements set forth in this Order.

(2) The Petitioners shall file for Board approval design-detail plans with the parties and the Board for major project components, including access roads, the crane path, collector lines, turbines, the step-up substation, and the various elements of the Transmission Component. Parties will have two weeks, from the date each set of plans is filed with the Board, to comment on the plans. The Petitioners cannot commence construction until the plans are approved.

(3) The Petitioners shall obtain all necessary permits and approvals for the project. Construction, operation, and maintenance of the project shall be in accordance with such permits and approvals.

(4) The Petitioners shall perform a pre-construction survey to determine the quality of television signal reception in the area surrounding the site of the project, and shall address any degradation in signal quality that might result post-construction.

(5) The Petitioners shall not sell any renewable energy credits (RECs) or other environmental attributes directly attributable to the project's electrical production to more than one consumer, or make any claims regarding those disaggregated attributes in any marketing or advertising if they have sold those disaggregated attributes.

(6) The Petitioners shall file a complete transportation plan for Board review

and approval prior to the commencement of construction activities. Parties with standing on this issue will have two weeks to file comments on the plan once it is filed.

(7) The Petitioners shall take measures to ensure that disruptions to traffic flows are minimized and will implement appropriate safety measures, as described in this Order.

(8) The Petitioners must receive the necessary state and local permits for any public road or public facility improvements required by the project, as well as receive the necessary permits from the Vermont Agency of Transportation ("VTrans") for oversized vehicles.

(9) The Petitioners shall pay for any costs associated with road improvements or modifications necessary to transport the project components to the site.

(10) The Petitioners shall pay to repair any damage to roads caused by construction or other oversized vehicles.

(11) The Petitioners shall conduct a survey to document existing road conditions with VTrans and officials of each affected town prior to transport of project components. Any damage caused by the transport activities shall be measured against the pre-transport survey, and GMP will be responsible for paying to repair any damage identified.

(12) The Petitioners shall organize and conduct any necessary training for the area's first responders, and shall provide any and all specialized equipment needed for first responders to effectively provide their services prior to the start of any significant construction activities.

(13) Prior to commencement of construction, GMP shall file a proposed decommissioning plan that incorporates the decommissioning requirements of the Natural Resource MOU in addition to the details contained in its original proposed plan. The plan shall contain a detailed estimate of the costs of decommissioning, covering all of the activities specified in the decommissioning plan. The plan shall certify that the cost estimate has been prepared by a person(s) with appropriate knowledge and experience in wind generation projects and cost estimating. The decommissioning plan may allow GMP to contribute to the decommissioning fund as the construction process proceeds such that the funding level is commensurate with

the costs of removing infrastructure in place. The amount of the fund may not net out the projected salvage value of the infrastructure. GMP may utilize a letter of credit to secure the full amount of the fund, and must demonstrate that the fund will be managed independently and be creditor and bankruptcy remote in the event of GMP's insolvency or business failure. The letter of credit shall be issued by an A-rated financial institution, shall name the Board as the designated beneficiary, and shall be an "irrevocable standby" letter that includes an auto-extension provision (i.e., "evergreen clause"). The decommissioning plan shall also include a decommissioning review trigger whereby if actual production falls below 50% of projected production during any consecutive two-year period, a decommissioning review is initiated. GMP, at its option, may establish a separate fund, which also must be creditor and bankruptcy remote, in which it may place the funds from the accumulated depreciation charges associated with the proposed project. As the amount in this fund grows, GMP may reduce the balance of the letter of credit in like amount such that the letter of credit secures the amount of decommissioning costs that is not secured by the balance in this fund. Both the letter of credit, and the accumulated depreciation fund, should GMP opt to establish it, shall account for inflation over time. Parties with standing on this issue shall have two weeks from the date GMP files its decommissioning plan to file any comments in response. GMP may not commence construction of the proposed project until it has received Board approval of its decommissioning plan.

(14) GMP shall submit to the Board, for review and approval, any executed lease agreements with involved private landowners. Any such lease agreements may be redacted to protect confidential business information. At a minimum, such lease agreements shall contain provisions which ensure that decommissioning can effectively occur in the event of GMP's insolvency or dissolution, the revocation of any permit issued to GMP, GMP's breach of any lease, or an order of the Board requiring decommissioning, and allow access to the impacted land for purposes of fulfilling any CPG condition, including access by representatives of the Vermont Department of Public Service, the Board, and the Agency of Natural Resources. Upon approval by the Board, a notice of leasehold interest for each lease

agreement shall be recorded in the land records of the relevant municipality.

(15) GMP shall comply with all conditions and requirements set forth in the following agreements:

(a) The Memorandum of Understanding, dated February 24, 2011, between GMP and the Vermont Agency of Natural Resources ("Natural Resource MOU"), subject to the modifications described in this Order.

(b) The Memorandum of Understanding, dated October 22, 2010, between GMP and the Vermont Agency of Natural Resources.

(c) The Memorandum of Understanding, dated February 22, 2011, between GMP and the Vermont Department of Public Service, subject to the modifications described in this Order.

(d) The Memorandum of Understanding, dated January 14, 2011, between GMP and Central Vermont Public Service Corporation.

(16) GMP shall file its site restoration plan, non-native invasive species monitoring plan, ridgeline restoration monitoring and management plan, site access plan, management plans for Parcels 1, 2, 3 and 4, decommissioning revegetation plan, post-construction revegetation plan, stormwater features plan, and the invasive species management plan for review and approval by the Board. Parties with standing on the relevant issues shall have two weeks from the date GMP files each plan to file any comments in response. GMP may not commence construction until it has received Board approval of these plans.

(17) GMP shall secure prudent fragmentation-connectivity easements of adequate size and location, pursuant to the requirements of paragraph 3.2 of the Natural Resource MOU, and file them for Board approval, prior to commencing construction. Parties with standing on the issue shall have two weeks to file comments from the time any easements are filed.

(18) GMP shall file the revised management plan for the West Farman Hill Serpentine Outcrop for Board approval prior to commencing construction of the Transmission Component.

(19) Prior to construction the Petitioners shall submit to the Board and parties, the final System Impact Study ("SIS") for a final determination by the Board regarding

whether the SIS fully satisfies any remaining issues associated with system stability and reliability. Parties with standing on the issue will have two weeks to comment on the SIS and any required upgrades at that time. GMP, except as identified in the CVPS MOU, shall be responsible for all costs of system upgrades or changes necessary to ensure that the project does not cause adverse impacts to the transmission system. In addition, the Petitioners must obtain Board approval for any necessary upgrades identified in the SIS prior to construction of the project, including any Section 248 CPGs that may be required for the upgrades.

(20) The Petitioners shall implement all network upgrades recommended by the Feasibility Study for the project.

(21) Any revisions required to Attachment A of the MOU between the Department and GMP shall be filed with the Board and the Department for final determination that the interconnection option for the proposed project remains the least-cost option among alternatives.

(22) The construction of the proposed project shall not begin prior to Board issuance of a CPG approving the proposed VELCO Jay Tap Substation and an amended CPG approving the VEC Jay Tap Switching Station.

(23) The turbines shall be set back a distance of at least 60 meters from the nearest property line, measured from the base of the wind turbine(s).

(24) Signage shall be posted around the wind turbines to alert members of the public who are present in close proximity to the wind turbines to the potential danger from ice during winter operating conditions.

(25) Turbines for the proposed project shall meet International Electrotechnical Commission ("IEC") 61400-1 or IEC WT01:2001 certification requirements, including periodic testing of the turbines and blades.

(26) Prior to commencement of construction, Petitioners shall prepare a winter operating protocol, subject to review by the parties and approval by the Board, which shall require that the proposed turbines be placed in pause mode under any of the following circumstances: (a) installed ice monitoring device(s) or heated wind sensors (installation subject to reliability testing) detect if unsafe conditions are present due to

icing conditions; (b) ice accretion is recognized by the remote or on-site operator; (c) air temperature, relative humidity and other meteorological conditions at the site are conducive to ice formation; (d) air temperature is several degrees above 0 degrees Celsius after icing conditions; and, (e) any other weather conditions that may result in the unsafe operation of the turbines. The winter operating protocol shall include periodic testing to document protocol performance. Parties with standing on the issue will have two weeks to comment on the winter operating protocol from the time it is filed.

(27) GMP shall submit a plan for Board approval prior to commencing turbine installation, that details how GMP will employ best management practices related to the installation, maintenance, and eventual disposal of the SF6-containing circuit breakers in order to avoid or minimize SF6 emissions.

(28) When the Petitioners file the final design plans for the proposed project, they must demonstrate that remaining archeological studies are completed in accordance with the results of the Phase I studies and any needed Phase II study.

(29) The Petitioners must obtain the individual National Pollutant Discharge Elimination System construction phase discharge permit ("INDC") and the individual stormwater discharge permit ("INDS"). Petitioners shall file the INDC permit with the Board prior to commencing any earth-disturbing activity, and file the INDS permit prior to creating any impervious surface. If the construction measures and design plans approved in the INDC and INDS permits represent a substantial change from the plans and material representations previously submitted to the Board, parties will be given the opportunity to review the permits, file comments and to request a hearing. If a party requests the opportunity for a hearing, it must demonstrate why a hearing is necessary.

(30) The Petitioners shall file the new Erosion Prevention Sediment Control ("EPSC") and construction-phase stormwater permit prior to commencing the deep-ripping and scarifying phase of decommissioning. Parties with standing on this issue will be provided an opportunity to comment and request a hearing. If a party requests the opportunity for a hearing, it must demonstrate why a hearing is necessary.

(31) The Petitioners must provide sufficient mitigation for impacts to high-elevation wetlands. The Petitioners must file their proposed mitigation for impacts to high-elevation wetlands with the Board for approval prior to commencement of construction. Parties with standing will have two weeks, from the time the mitigation proposal is filed, to file comments and request a hearing. If a party requests the opportunity for a hearing, it must demonstrate why a hearing is necessary.

(32) The Petitioners must obtain and file with the Board their Army Corps of Engineers Section 404 permit and state Section 401 Water Quality Certification, and the State Conditional Use Determination.

(33) The Petitioners shall develop erosion prevention and sediment control plans for the entire proposed project, including the Transmission Component, for approval by ANR and the Board. The plans must include plans specific to any shoreline crossings to ensure that shoreline banks will be stabilized.

(34) The Petitioners shall apply for and take all reasonable steps to obtain approval of the Object Collision Avoidance System ("OCAS"), and shall install the OCAS promptly should it obtain approval. If the Petitioners are unable to obtain approval of the OCAS, they shall submit for review by the Department and approval by the Board an alternative Lighting Mitigation Plan, within 3 months of notification of disapproval of the OCAS. Parties with standing on the issue shall have two weeks to file comments from the time any alternative Lighting Mitigation Plan is filed.

(35) Blasting associated with construction of the proposed project shall be minimized to the extent practicable and performed only during the hours of 9:00 AM-5:00 PM Monday-Friday, with the exception of State holidays.

(36) All blasting shall be carried out by licensed and certified blasting technicians. All blasting will be performed in accordance with any and all applicable laws and regulations, including, but not limited to, U.S. Department of Interior Rules 816.61-68 and 817.61-68 and the Blasting Guidance Manual, Office of Surface Mining, Reclamation and Enforcement, U.S. Department of Interior to limit peak particle velocity and ground vibration to safe levels. Noise and air blast effects shall be limited through application of proper techniques and blasting mats will be used where needed

to limit the occurrence of flyrock.

(37) Prior to performing any blasting for the proposed project, the Petitioners shall develop and file for Board approval, a blasting plan that includes a pre-construction survey of any residential or agricultural water sources within one-half mile of any proposed blasting site, and will arrange for a public information session with surrounding landowners to address concerns related to blasting. Parties with standing on this issue will have two weeks, from the date this plan is filed with the Board, to comment on the plan. The Petitioners cannot commence any blasting activities until the plan is approved.

(38) In the event surrounding landowners express concern regarding the impacts of blasting on wells or other structures on their property, the Petitioners shall perform evaluations to determine if any damage has occurred as a result of blasting activities and, if so, remediate any such damage.

(39) The Petitioners shall construct and operate the proposed project so that the turbines emit no prominent discrete tones pursuant to American National Standards Institute ("ANSI") standards at the receptor locations; and project-related sound levels at any existing surrounding residences do not exceed 45 dBA(exterior)(Leq)(1 hr) or 30 dBA (interior bedrooms)(Leq)(1 hr).

(40) In the event noise from operation of the proposed project exceeds the maximum allowable levels, the Petitioners shall take all remedial steps necessary to bring the sound levels produced by the turbine(s) into compliance with allowable levels, including modification or cessation of turbine(s) operation.

(41) Prior to commencement of construction, Petitioners shall prepare a Noise Monitoring Plan, subject to review by the parties and approval by the Board, which is consistent with the Plan recently approved by the Board in Docket 7156, but which extends from construction through the first two years of operations and includes: (a) monitoring for low frequency sound with the same regularity as monitoring for climactic conditions compliance with the maximum allowable sound levels described above; (c) a means for ensuring that noise monitoring events shall be timed to coincide with those time periods when Petitioners' modeling indicates the likelihood that NRO

mode will be triggered; (d) monitoring reports that document every instance when NRO mode is triggered, with a description of how NRO affected operations; (e) at the request of a homeowner, monitoring to ensure compliance with the interior noise standard; and (f) a process for complaint resolution shall be established for the entire life of the project.

(42) For proposed project substations, new power transformers shall comply with sound emissions at least 5 dBA NEMA TR-1 standards, unless the Petitioners can demonstrate, subject to Board review and approval, that these transformers are not cost-effective.

2. GMP's agreement with the Town of Lowell is approved.

3. The Good Neighbor Fund is approved.

Dated at Montpelier, Vermont, this 31st day of May, 2011.

s/ David C. Coen)
) PUBLIC SERVICE
)
) BOARD
)
) OF VERMONT
s/ John D. Burke)

OFFICE OF THE CLERK

FILED: May 31, 2011

ATTEST: s/ Susan M. Hudson
Clerk of the Board

NOTICE TO READERS: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: psb.clerk@state.vt.us)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Board within thirty days. Appeal will not stay the effect of this Order, absent further Order by this Board or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Board within ten days of the date of this decision and order.

XIII. CONCURRING OPINION OF JAMES VOLZ

I do not join in my fellow Board members' decision to require that the Petitioners provide compensation to adjoining property owners who can demonstrate that noise from the project will prevent otherwise-allowable residential development on their property because of potential health concerns. I agree that there is the potential for the project's noise to preclude residential development on neighboring properties in close proximity to the turbines. I also agree that the affected property owners would bear a disproportionate share of the project's noise impacts. Where I depart from my fellow Board members is in their conclusion that this Board has the authority to order compensation for such loss of development rights. While I appreciate that the majority have crafted a very narrow decision on this issue, I nonetheless believe that their decision goes beyond the Board's proper authority.

It is well-settled law that the Board:

> has only such powers as are expressly conferred upon it by the Legislature, together with such incidental powers expressly granted or necessarily implied as are necessary to the full exercise of those granted, and it is merely an administrative board created by the State for carrying into effect the will of the State as expressed.

Trybulski v. Bellows Falls Hydro-Electric Corp., 112 Vt. 1, 7, 20 A.2d 117, 120 (1941)(citations omitted). Our authority with respect to the case before us is set forth in 30 V.S.A. § 248, which requires the Board to determine whether the proposed project promotes the general good of the state. Section 248 further requires that the Board assess the project's compliance with certain specified statutory criteria. Nowhere in those criteria, nor elsewhere in Section 248, has the legislature authorized the Board to order compensation for a project's impacts on individual property rights.[228] If a project promotes the public good and complies with those criteria that the legislature has set forth in Section 248, it is the Board's duty to issue a CPG, notwithstanding impacts on neighboring properties. While those impacts can appropriately be considered in

228. To the extent that a project would require the sponsoring utility to take necessary property rights through condemnation, the utility's authority to do so and the Board's authority to authorize the condemnation and award compensation for the property owner are provided in the condemnation statute. The present proceeding does not involve a condemnation, and therefore the Board's power to award condemnation damages is not implicated.

evaluating a project's compliance with the Section 248 criteria, to the extent that they are relevant to the criteria, they cannot skew the fundamental public-good focus of the Section 248 inquiry.

In fact, the Vermont Supreme Court has firmly and unmistakably held that individual property rights are not relevant in a Section 248 proceeding. In *Bandel*, the Court concluded that the Board's limited Section 248 jurisdiction dictates that we must consider the public good, and not private property rights, in deciding whether to issue a CPG. To compensate neighboring property owners for the project's impacts on their development rights runs squarely against the Supreme Court's holding in *Bandel*. This the Board cannot do. We must adhere to the Supreme Court's determinations, just as we must fully respect the limited scope of authority that the legislature has granted us.

Furthermore, to require compensation for neighboring property owners could have significant adverse implications for future proposed renewable generation facilities. In particular, this may make it much less feasible to locate wind generation facilities close to load, given that load centers are associated with more densely developed areas of the state.

I acknowledge that the majority is justified in feeling that something should be done on behalf of neighbors who may bear disproportionate noise impacts from the project. However, just as with other major public construction projects such as highways, major utility infrastructure projects may adversely affect the value of some nearby properties. Under current law, such impacts are not compensated. Whether to provide compensation for the owners of those properties is a matter that this Board is without authority to address. Moreover, balancing the state's renewable energy goals with the impacts on surrounding property owners is a broad public-policy decision that should be made by the legislature, not this Board.

Although I would not condition the project's CPG as the majority has done, I would strongly urge the Petitioners to voluntarily develop such a compensation plan for adjoining property owners. The Petitioners, to their credit, have created a Good Neighbor fund to provide payment to surrounding communities, in recognition that nearby towns outside the host community may bear negative impacts without receiving project-related property tax revenues (or payments in lieu of taxes). Similar reasoning should lead the Petitioners to create of their own volition a plan very similar to the one that the majority has mandated. However, for the reasons

set forth above, I conclude that the Board is without authority to impose that mandate, and therefore I respectfully disagree with my colleagues.

In all other respects, I join in the majority's opinion.

Dated at Montpelier, Vermont, this 31st day of May, 2011.

s/ James Volz
James Volz, Chairman

OFFICE OF THE CLERK

FILED: May 31, 2011

ATTEST: s/ Susan M. Hudson
Clerk of the Board