VERMONT
Agency of Natural Resources
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Endangered & Threatened Species Takings Permit

Statutory Authority: 10 VSA § 5408

1. Permittee

David Blittersdorf
Georgia Mountain Community Wind, LLC
129 Ted Road, Milton, VT 05468
94 Harvest Lane, Williston, VT 05495

2. Permit Period

Effective Date: 10/30/2013
Expiration Date: 12/31/2015
Authorization #: EH-2013-10
Amendment # 0

3. Principal Officer: David Blittersdorf

4. Subpermittee(s): Georgia Mountain Community Wind staff and contractors.

5. Authorized Species: Eastern small-footed bat (*Myotis leibii*), Little brown bat (*Myotis lucifugus*), Northern long-eared bat (*Myotis septentrionalis*), Tri-colored bat (*Perimyotis subflavus*), Eastern whip-poor-will (*Caprimulgus vociferus*), Common nighthawk (*Chordeiles minor*), Grasshopper sparrow (*Ammodramus savannarum*), Black tern (*Chlidonias niger*), Common tern (*Sterna hirundo*) and Upland sandpiper (*Bartramia longicauda*).

6. Authorized Activity: Incidental take resulting from the operation of a 4 turbine (10 MW) wind energy facility in Milton, VT.

7. Location Where Authorized Activity May Be Conducted: Milton, VT.

8. Findings

A. The Permittee applied for an Endangered and Threatened Species Takings Permit under 10 V.S.A. § 5408 to operate a 10 MW wind energy project in Milton, Vermont. The Project consists of 4 wind turbines of 2.5 MW each. The turbines have 100 meter tall masts and have a rotor diameter of 100 meters with a rotor-swept area of 7,846 meters squared. The Project lies on a forested ridge within the Champlain Valley.

B. The Vermont Public Service Board (PSB) issued a Certificate of Public Good (CPG) for the Project, in Board Docket 7508 on June 11, 2010. The Project must operate in accordance with the issued CPG. The CPG specifically requires that the Petitioner: file a plan to incorporate adjustments to the Project's operations, conduct two years of post-construction monitoring to ensure adjustments are working properly and inform the Vermont Agency of Natural Resources (VANR) whether additional adjustments are appropriate, and conduct three years of post-construction monitoring for the period June 1 to July 31.

C. The petition for a CPG for the Project was filed in March 2009, prior to the completion of the statewide evaluation by the Vermont Fish & Wildlife Department (VFWD) of the status of Vermont's cave bat populations as a result of White-nose Syndrome (WNS). The evaluation determined that the disease devastated populations of cave bat species, resulting in the listing of the little brown bat and northern long-eared bat in 2011 and the tri-colored bat in 2012.

D. The bat species listed in Section 5 hibernate in caves or mines during the winters, but emerge from hibernation between March and May and enter hibernation in October-November. The populations of each of the listed species is regional in nature, in that summer and winter populations migrate to and from adjoining states/provinces such as New York, New Hampshire, Massachusetts, and Quebec. During the non-hibernating period, these bats are active in flight in order to meet their biological needs. Bats in flight in proximity to wind turbines are vulnerable to mortality by collision with the blades and barotrauma caused by rapid changes in pressure when swept up into the rotors. (See http://www.esf.edu/aec/adks/mammals/littlebrownbat.htm).

E. Pre-construction surveys were conducted by WEST, Inc. to measure bat activity at the Project site from July 1 to October 31, 2008. Over the course of this period, 451 detector-nights of bat acoustic data were surveyed and 2,203 call sequences (4.9 calls per detector night) were recorded at numerous locations throughout the Project area. Approximately 86% of the calls were identified as High Frequency (i.e., > 35 kHz), a group that includes Myotids, red bats, and tri-colored bats.

F. In 2008, Arrowwood Environmental identified the presence of suitable roosting habitat for small-footed bats within a 3-mile radius of the project site.

G. During 2011 and 2012, the Vermont Fish and Wildlife Department (VFWD) collected and documented maternity colony information on little brown and big brown bats, the two species of bats that typically roost

during the summer in buildings and structures. To date, the VFWD has documented approximately 2200 adult females and juvenile little brown bats in 16 summer maternity colonies in Vermont, nearly all of which have been located in the Champlain Valley of western Vermont. While there are undocumented little brown bat maternity colonies remaining, current information suggests the distribution of Vermont's little brown bat population is heavily weighted to this region of the state.

H. In the summer of 2012, the VFWD counted 2,222 little brown bats in Vermont. In light of known population dynamics, this places the minimum known population of little brown bats in Vermont at approximately 3,200. The actual number is likely significantly larger due to the number bats that were not actually observed and counted by VFWD staff.

I. On May 31, 2013 a dead Eastern Whip-poor-will was recovered at the project site by the monitoring team. No other threatened or endangered species have been found through October 1, 2013. The project area is within the Champlain Valley proximal to Lake Champlain which is used during migration by birds, including those listed in Section 5 of this permit.

Takings

J. The Permittee has applied for an annual cumulative take of a maximum of 4 bats of the species Little brown, Northern long-eared, Tri-colored, and Eastern small-footed bats.

K. There is substantial evidence that the operation of turbines of the size utilized by the Project will result in the taking of the bat species listed in Section 5 of this permit. Fatalities of bats have been recorded at wind facilities worldwide (Erickson et al. 2002, Durr and Bach 2004, Kunz et al. 2007, Arnett et al. 2008). Bat fatalities at wind energy facilities are considered to be especially high at wind facilities on forested ridges in the eastern U.S. such as the Project (Arnett et al. 2008).

L. Evidence that turbine operation of the size utilized by the Project will result in the taking of the bird species listed in Section 5 of this permit is less substantial. The prevailing bird mortality evidence from similar wind power facilities does not indicate a likelihood of take of state or federally listed bird species. However, one dead Eastern Whip-poor-will was recovered at the Project site in 2013 (on May 31), and the evidence from other facilities is inconclusive as each facility has unique characteristics. Because the project area is within the Champlain Valley proximal to Lake Champlain, which is used during migration by birds, including those listed in Section 5 of this permit, the potential for taking warrants attention. The level of take of each species will vary based on both abundance and possible species-specific characteristics and habits that influence their vulnerability to collisions with wind turbines. Therefore a take limit of 3 specimens of any bird species is specified here and a structured, systematic post-construction mortality study for birds is required.

M. Small-footed bat fatalities from wind turbines have yet to be documented, but an evaluation of potential small-footed bat summer roosting habitat identified potential small-footed bat summer habitat near the project site. As a result, there is the possibility of the take of small-footed bats at this site.

N. Little brown bats have been killed at 19 of 20 wind energy facilities for which data is available in the Northeast. Little brown bats comprised approximately 15% of bat fatalities in the Northeast and 17% of observed bat fatalities at wind facilities in New England. Much of this data is derived from projects before White-nose Syndrome devastated cave bat populations in the Northeast. In 2012, there were no observed mortalities of listed bats at Vermont Wind's Sheffield facility during the first year of fatality monitoring under a regime of one-half the turbines curtailed at wind speeds less than 6 meters/second (m/s).

O. Information from little brown bat mortality data from three operating wind projects in New England (Mars Hill, ME; Stetson, ME; and Lempster, NH) between 2007 and 2010 indicates that approximately 0.43 little brown bats per turbine/per year were estimated to be taken by the three projects. This data was recorded from projects operating prior to the population-reducing effects of WNS. These projects did not operate under any curtailment procedures.

P. Evidence from recent research on the use of the operational adjustments to reduce bat fatalities indicate that operational adjustments such as those described in Section 11 below result in an estimated 44% to 93% reduction in bat fatalities (Arnett et al. 2010). As a result, the Project's estimated take of 0.43 little brown bats/turbine/year may be reduced by at least 50%, yielding a calculated estimated potential take of 0.215 little brown bats per turbine, per year. By deriving an estimated take of little brown bats from fatality data collected prior to WNS and by applying only a 50% reduction in bat fatalities from operational adjustments, the estimated take of 0.215 little brown bats/turbine/year for this facility is extremely conservative.

Q. Other threats to the listed bat species, including the little brown bat, include loss of summer and winter roosts, pesticides, and persecution (Kunz & Fenton 2003). From January through August 2012, there were nine reported takings of little brown bats in Vermont residences as a result of exposure, or potential exposure, to rabies. WNS has become the most significant threat to bat species, particularly the little brown bat (Frick et al. 2010).

R. The Permittee will conduct bird and bat fatality monitoring for the period April 15 to October 15 as prescribed in *Bird and Bat Post-Construction Monitoring Plan – Year 1. S*earches will be conducted on a three-day interval for the period April 15 to October 15 for two years, and for the period June 1 to July 31 for the third year. The bird and bat fatality monitoring will provide information on the take of listed bat species and estimates of bird and bat fatality rates. See Condition 11.B. below.

Economic Impact

S. The PSB found that, "wind generation facilities provide a benefit to Vermont by providing renewable generation (a state policy goal), a potentially stably priced power resource, and increased jobs and tax revenues." The PSB also recognized "the Project provides generation in an area of the state that has not constructed a generation unit of any significant size since the McNeil Power Plant was approved in 1981." PSB Docket 7508, Order of 6/11/2010.

T. In order to avoid all takings of listed species, the facility could not operate during the times when the listed bat species are active, from ½ hour before sunset to sunrise, April 1 through October 30.

U. The Permittee states that curtailment of such duration would result in a loss of 39% of the annual energy production with a 53% loss in gross revenues.

Avoidance and Minimization

V. Results from recent studies in Pennsylvania (Arnett et al. 2010), Canada (Baerwald 2008, Baerwald et al. 2009), and in Germany (O. Behr, University of University of Erlangen, unpublished data) indicate that changing the turbine "cut-in speed" (i.e., wind speed at which wind generated electricity enters the power grid) from the normal to higher cut-in speeds (between 5 and 6.5 m/s) resulted in substantial reduction in bat fatalities compared to normally operating turbines (44–93% reduction in fatality among studies to date).

W. In February 2012, the Permittee submitted an Operating Protocol for Bats to the Public Service Board for the implementation of operational adjustments during the period of July 1 through September 30 to reduce fatalities of listed bat species. The Permittee proposes to curtail operations during the period of July 1 through September 30 when wind speeds are below 5 m/s (11.2 mph) and ambient temperatures at hub height are greater than 49 degrees Fahrenheit. The protocol also proposed curtailment during the time when bats are active – the period between 30 minutes before sunset and 30 minutes after sunrise. The Board subsequently imposed curtailment for the period between 30 minutes before sunset and 30 minutes before sunrise.

X. The specific turbines at this Project will not rotate at increasing speeds as wind speed approaches the curtailment cut-in speed. Instead, rotors will typically approximate 1 RPM or less (~ 11.5 mph), thereby reducing bat fatalities below cut-in speed.

Y. The Permittee and VFWD will review the results of the fatality monitoring to determine the most effective means of limiting bat mortality and whether changes to the operational adjustments are appropriate.

Mitigation

Z. The VFWD has conducted an evaluation of mitigation alternatives to offset the expected take of listed bats and determined that, with the exception of WNS, the greatest threat to remaining populations of listed bats is the disturbance of maternity colonies. With the average little brown bat colony size of over 125 bats, the impact of the loss of a single colony greatly exceeds the estimated take of little brown bats at this wind facility.

AA. The VFWD provides all operating wind energy facilities in Vermont with a proposed mitigation strategy that fully funds a Bat Maternity Colony Technical Assistance Program through annual contributions by these facilities based on their proportion of operating turbines within the state.

Advice of the Endangered Species Committee

BB. On April 29, 2013, the Secretary received the advice of the Endangered Species Committee (ESC). That advice has been considered and fully incorporated into this permit. In addition, the Applicant, ESC representatives and ANR staff met on July 3, 2013 and discussed and resolved all concerns expressed by the ESC.

9. Statutory Determination

A. 10 V.S.A. § 5408(a) provides: "[A]fter obtaining the advice of the Endangered Species Committee, the Secretary may permit, under such terms and conditions as the Secretary may prescribe by rule any act otherwise prohibited by this chapter if done for any of the following purposes: scientific purposes; to enhance the propagation or survival of a species; economic hardship; zoological exhibition, educational purposes; or special purposes consistent with the purposes of the federal Endangered Species Act."

B. The Permittee requests an Endangered & Threatened Species Takings Permit for the purpose of Economic Hardship.

C. The state of Vermont recognizes the value which plants, fish and wildlife in their natural environment have for public enjoyment, ecological balance, and scientific study. *See* 1981, No. 188 (Adj. Sess.), § 1(a).

D. The state of Vermont recognizes the need for protection and preservation of these plants, fish and wildlife in their natural environment. *Id*.

E. The General Assembly of Vermont intends that the species of wildlife and wild plants normally occurring within this state which may be found to be threatened or endangered within the state should be accorded protection as necessary to maintain and enhance their numbers. *Id.* at § 1(b).

F. The General Assembly of Vermont intends that the state should assist in the protection of species of wildlife and wild plants which are determined to be threatened or endangered elsewhere pursuant to the federal Endangered Species Act. *Id.*

G. The General Assembly intends to allow for the orderly development of the state without undue economic hardship being caused by the provisions of this act.

H. 10 V.S.A. § 5408(a) authorizes the Secretary to permit the taking of a listed species to lessen economic hardship.

I. In this case, to determine whether there is sufficient "economic hardship," the Secretary examined the nature and size of hardship, whether the economic activity associated with the Project has a public benefit and the impact of the taking on the state's population of the species listed in Section 5.

J. The Secretary weighed the takings against the economic hardship imposed by restricting the operation of the wind generation facility to times that would ensure that no listed bat species would be taken. In this instance, for the Project to ensure that there would be no takings of endangered bats the turbines would have to be immobilized from April to October from ½ hour before sunset to sunrise. The Permittee proffers, under the pains of perjury, that an operation regime of that design would result in a 39% loss of the annual energy production with a 53% loss in gross revenues which presents an economic hardship to the project that would make it uneconomical to operate over the long-term (see Section 8, Economic Impact subsection). The Agency agrees that this meets the "economic hardship" standard. *See* 10 V.S.A. § 5408(a).

K. In examining whether the Project has a public benefit, the Secretary determined that this question has been decided by the Public Service Board and affirmed in their Certificate of Public Good.

L. In examining the impact of the proposed takings, the Secretary considered the opinions of the Agency's bat biologist and bird biologist that a take of this magnitude will not be biologically significant over time if sufficient minimization and mitigation is undertaken. If the Project takes no more than the maximum number of little brown bats authorized under this permit, it will likely represent no more than approximately 0.1% of the population of little brown bats in Vermont (see Section 8, Takings subsection).

M. In reviewing whether the Mitigation is sufficient to offset the takings, the Secretary considers whether such mitigation will be "in the best interest of the species." 10 V.S.A. § 5408 (f)(1)(B). Here, the Permittee states that the operational adjustments to reduce the number of fatalities and the monitoring to determine how many bats and birds are killed are sufficient mitigation, but is also offering to contribute $3,500 per year for the duration of the permit to implement a Bat Maternity Colony Technical Assistance Program conducted by the Vermont Fish and Wildlife Department. These funds represent this facility's pro-rated share (based on the number of operating wind turbines in Vermont) of the full cost of implementing this Program.

N. Pursuant to 10 V.S.A. § 5408(a), the ANR Secretary hereby determines, based upon the findings detailed above and after receiving advice from the Endangered Species Committee, that the proposed activity is consistent the purposes of the 10 V.S.A. chapter 123. An Endangered and Threatened Species Takings Permit is authorized, as conditioned below.

10. General Conditions & Authorizations

A. General conditions set out in 10 V.S.A. chapter 123 are hereby made a part of this permit. All activities authorized herein must be carried out in accord with and for the purposes described in the application submitted. Continued validity or renewal of this permit is subject to complete and timely compliance with all applicable conditions, including the filing of all required information and reports.

B. The validity of this permit is expressly conditioned upon compliance with all applicable federal and state laws, regulations and permits.

C. This permit does not confer upon the Permittee the authority to conduct research without the acquiring necessary landowner permission including, but not limited to, state lands.

D. By acceptance of this permit, the Permittee and its heirs, successors and assigns agree to provide the Agency of Natural Resources with unrestricted access, at reasonable times to the animal or plant specimens and/or animal or plant parts collected under this permit, collection and monitoring records, and access to the premises as necessary to ensure compliance with this permit.

E. The Agency maintains continuing jurisdiction over this activity, and may, at any time, order the Permittee to undertake remedial measures if necessary to ensure the protection and conservation of listed species.

F. This permit is not valid for state and federally listed endangered and threatened species not identified in section 5. A federal endangered species permit may also be required for federally listed species.

G. The permit is valid for use by the named Permittee and subpermittees(s) only and may be revoked by the Secretary at any time for cause, or for violations of any terms or conditions of this permit or state wildlife law.

H. The Permittee and subpermittee(s) shall carry a copy of this permit whenever performing authorized activities.

I. Pursuant 10 V.S.A. § 5410, and the terms of this permit, the locations of listed species shall be kept confidential.

11. Specific Conditions & Authorizations

Minimization

A. The Permittee shall fully feather the blades of all 4 wind turbines for the period July 1 to September 30 when wind speeds are equal to or below 5 m/s (11.2 mph) based on a 10-minute average wind speed and temperatures are above 49 degrees Fahrenheit. The increased cut-in wind speed provides greater protection of state-endangered little brown bats concentrated in the Champlain Valley. In addition, the Permittee shall curtail the wind turbines as set forth in this paragraph daily for a period starting 30 minutes before sunset until sunrise the next day, from July 1 to September 30.

Monitoring Take

B. The Permittee shall implement monitoring of bird and bat fatalities to estimate fatality rates consistent with the research design as detailed in "*Bird and Bat Post-Construction Monitoring Plan – Year 1*," dated July 2012 and in Threatened & Endangered Species Takings permit ER-2013-20 authorizing bird and bat fatality monitoring issued to David Blittersdorf, Georgia Mountain Community Wind on May 22, 2013.

C. The Permittee shall hire a qualified consultant to conduct fatality monitoring through 3-day search intervals for the period April 15 to October 15 for the first two years of the permit, and from June 1 to July 31 during the third year of the permit. After analyzing 2013 and 2014 monitoring data, the Secretary may require that the 2015 monitoring season be extended to October 15 as well.

D. ANR staff shall be granted full access to the study site to conduct observations of the methodology and the implementation of the study protocols.

E. Following completion of the monitoring and evaluation of the efficacy of operational adjustments on reducing bird and bat fatalities after year 1, the Permittee shall work with the ANR to determine if fatality rates of listed birds and bats require or allow for changes to the operational adjustments regime to mitigate the take of state listed bat species. Such changes shall require approval of the Secretary of the Agency of Natural Resources and shall be prescribed in a document *Bird and Bat Post-Construction Monitoring Plan – Year 2.*

Mitigation

F. The Permittee shall submit three annual contributions of $3,500 to the Bat Maternity Colony Technical Assistance Program established by the VT Agency of Natural Resources, beginning within 45 days of the granting of the

permit, and by April 1 of each of the ensuing calendar years for the duration of this permit. This payment represents a pro-rated share of operating turbines in the state that are likely to take listed bats and serves as full and sufficient mitigation for the annual take of up to 4 listed bats as provided for in this permit. No mitigation fee is required for the take of listed birds at this time.

Authorizations

G. This permit allows the annual cumulative take of up to 4 bats of the species Little brown, Northern long-eared, Tri-colored, and Eastern small-footed and the annual cumulative take of up to three birds of the species Eastern Whip-poor-will, Common nighthawk, Grasshopper sparrow, Black tern, Common tern, Upland sandpiper.

H. Each take of any listed species shall be reported to the Secretary of the Agency of Natural Resources (with a copy to VFWD Permits Specialist) within 72 hours of each occurrence. Should the take exceed the annual take limit established in this permit, the Secretary of the Agency of Natural Resources may require the implementation of additional strategies to reduce take of listed species, up to, and including, the cessation of operation of the Project ½ hour before sunset to sunrise April 1 through October 30, all dates inclusive.

12. Reporting Requirements

A. Any mortality of a listed species related to the activities authorized under this permit shall be reported in writing to the Secretary of the Agency of Natural Resources (with a copy to VFWD Permits Specialist) within 72 hours of each occurrence.

B. The Permittee shall report the takings of any bird or bat species (listed and unlisted) during the monitoring surveys on a monthly basis to the Agency bat specialist, or any other designee of the Secretary, with a copy to the VFWD Permit Specialist. The report may be submitted by email and shall list taking by species.

C. An annual report, due by December 31 of each year of the permit term, unless an extension is specifically requested and granted, shall be submitted to the Secretary (with a copy to the VFWD Permits Specialist). At a minimum the reports shall:

i. Detail all bird and bat fatalities for the year specifying date, turbine, species and gender.

ii. Estimate bird and bat fatality rates for the year.

iii. Provide documentation sufficient to assess the degree to which each turbine was operated consistent with the curtailment conditions of this permit. This documentation may be in the form of reports to the Public Service Board or ISO, provided they are in a format that can evaluate the operation of each turbine during the period June 1 to September 30.

D. The Permittee shall accommodate requests by Agency staff for additional information from collection activities (e.g., copies of original field sheets, computerized data in usable format). Reports of results of any subsequent analyses and copies of subsequent publications resulting from the collections made under this permit shall be forwarded to the Vermont Fish & Wildlife Department within 30 days of publication.

Issued by: _____ Date: 10-29-13

Deb Markowitz, Secretary, Agency of Natural Resources

Right to Appeal to Public Service Board

If this decision relates to a renewable energy plant for which a certificate of public good is required under 30 V.S.A. §248, any appeal of this decision must be filed with the Vermont Public Service Board pursuant to 10 V.S.A. §8506. This section does not apply to a facility that is subject to 10 V.S.A. §1004 (dams before the Federal Energy Regulatory Commission), 10 V.S.A. §1006 (certification of hydroelectric projects) or 10 V.S.A. Chapter 43 (dams). Any appeal under this section must be filed with the Clerk of the Public Service Board within 30 days of the date of this decision; the appellant must file with the Clerk an original and six copies of its appeal. The appellant shall provide notice of the filing of an appeal in accordance with 10 V.S.A. 8504(c)(2), and shall also serve a copy of the Notice of Appeal on the Vermont Department of Public Service. For further information, see the Rules and General Orders of the Public Service Board, available on line at www.psb.vermont.gov. The address for the Public Service Board is 112 State Street, Montpelier, Vermont, 05620-2701 (Tel. # 802-828-2358).