GROTON WIND

New Hampshire Site Evaluation Committee

Permit Application

March 2010

Application of Groton Wind, LLC

Docket No. 2010 -

Application of Groton Wind, LLC for a Certificate of Site and Facility

Groton Wind Project; Groton, New Hampshire

Application Table of Contents

VOLUME IV

GROTON WIND

New Hampshire Site Evaluation Committee Permit Application

APPLICATION OF GROTON WIND, LLC

DOCKET NO. 2010-

Susan S. Geiger
Douglas L. Patch
Orr & Reno, P.A.
One Eagle Square
Concord, NH 03301
(603) 223-9154
sgeiger@orr-reno.com
dpatch@orr-reno.com

Table of Contents

List of Figures

Page

List of Tables

Page

List of Acronyms

ABPP:	Avian and Bat Protection Plan
ACI:	American Concrete Institute
AoT:	Alteration of Terrain
APE:	Area of Potential Effect
ATV:	all terrain vehicle
AWEA:	American Wind Energy Association
BLM:	Bureau of Land Management
BMP:	Best Management Practice
CPR:	Cardiopulmonary Resuscitation
CSI:	Construction Standards Institute
cu. yd.	cubic yard
dBA:	decibels A-weighted
DEM:	Digital Elevation Model
EDR:	Environmental Design and Research
EHS:	Environmental Health and Safety
FAA:	Federal Aviation Administration
FERC:	Federal Energy Regulatory Commission
GCEDC:	Grafton County Economic Development Council
GIS:	Geographic Information System
GPS:	Global Positioning System
GSU:	Generator Step-Up
HVAC:	Heating, Ventilating, and Air Conditioning
IRI:	Iberdrola Renewables, Inc.
IEEE:	Institute for Electrical and Electronic Engineers
ISO:	International Organization for Standardization
ISO-NE:	Independent System Operator – New England
km:	kilometer
kV:	kilovolt (one thousand volts)
kVA:	kilovolt-ampere
kWh:	kilowatt hour
LBG:	The Louis Berger Group
LLC:	Limited Liability Company
LSZ:	Landscape Similarity Zone
m/s:	meters per second
m:	meter
mph:	miles per hour
MW:	megawatt (one million watts)
MWh:	Megawatt hour
NCC:	North Country Council
NEC:	National Electric Code
NECA:	National Electrical Contractors Association
NFPA:	National Fire Protection Agency
NLRA:	Newfound Lake Region Association
NHDES:	New Hampshire Department of Environmental Services
NHDHR:	New Hampshire Division of Historical Resources
NHDOS:	New Hampshire Department of Safety
NHDOT:	New Hampshire Department of Transportation
NH F&G:	New Hampshire Fish and Game Department
NHNHB:	New Hampshire Natural Heritage Bureau
NHOEP:	New Hampshire Office of Energy and Planning
NHEC:	New Hampshire Electric Co-op
NHPA:	National Historic Preservation Act
NRHP:	National Register of Historic Places
NHSA:	New Hampshire Snowmobile Association
NHWAP:	New Hampshire Wildlife Action Plan
NWI:	National Wetlands Inventory
NWS:	National Weather Service
O&M:	Operations and Maintenance
OSHA:	Occupational Safety and Health Administration
PILOT:	Payments-in-lieu-of-Taxes
PPA:	Power Purchase Agreement
PREI:	Plymouth Renewable Energy Initiative
PSNH:	Public Service of New Hampshire
RGGI:	Regional Greenhouse Gas Initiative
ROW:	Right-of-way
rpm:	revolutions per minute
RPS:	Renewable Portfolio Standard
RTU:	Remote Terminal Unit
SCADA:	supervisory control and data acquisition
SEC:	Site Evaluation Committee
SPCC:	Spill Prevention, Control, and Countermeasure
SPNHF:	Society for the Protection of New Hampshire Forests
UNH:	University of New Hampshire
USACE:	U. S. Army Corps of Engineers
USDOE:	U.S. Department of Energy

USEPA:	U. S. Environmental Protection Agency
USFWS:	U. S. Fish and Wildlife Service
USGS:	U. S. Geological Survey
UWIG:	Utility Wind Integration Group
VHB:	Vanasse, Hangen, Brustlin, Inc.
VIA:	Visual Impact Assessment
WQV:	Water Quality Volume

A. Signature of Applicant

Certification of Applicant

In accordance with New Hampshire RSA 162-H:8, I, Rany Raviv, Vice President of Business Development, Iberdrola Renewables, Inc, hereby do swear and affirm that the information contained in this Application is true and accurate to the best of my knowledge and belief.

I also certify that, as an Applicant to the New Hampshire Site Evaluation Committee, Groton Wind LLC agrees to provide such information as the Committee shall require to carry out the purposes of RSA 162-H.

Groton Wind, LLC

_____

Name: Rany Raviv

Title: Vice President, Business Development, Iberdrola Renewables, Inc

Date: March XX, 2010

State of: Oregon

County of: Multnomah

On this day ____ of _____ 2010, personally appeared before me the above-named Rany Raviv, Vice President for Business Development, and swore and affirmed that the information contained in this Application is true and accurate to the best of his knowledge and belief.

_____

Notary Public

Commission expires on _____

This page intentionally left blank

B. Applicant Information

B.1. Name of Applicant

Groton Wind, LLC (referred to as Groton Wind" or "Applicant")

B.2. Applicant's mailing address, telephone and fax numbers, and e-mail address

Groton Wind, LLC
1125 NW Couch St., Suite 700
Portland, OR 97209
Telephone: 503-796-7000
Fax: 503-796-6909

Groton Wind, LLC c/o Iberdrola Renewables, Inc.
P.O. Box 326
Concord, NH 03302
Telephone: 603-440-3127
Email: echerian@iberdrolausa.com

B.3. The name and address of Applicant's parent company, association or corporation, if Applicant is a subsidiary

Applicant is a limited liability company which is 100% owned by and sole-member managed by

IBERDROLA RENEWABLES, INC.
1125 NW Couch St., Suite 700
Portland, OR 97209

B.4. If the Applicant is a corporation

B.4.(a) The state of incorporation

N/A (Applicant is NOT a corporation, it is a limited liability company)

B.4.(b) The corporation's principal place of business

N/A (See above)

B.4.(c) The names and addresses of its principal directors, officers and stockholders

N/A (No directors, officers, or stockholders; Applicant is a limited liability company, sole member-managed by IBERDROLA RENEWABLES, INC.

B.5. If the Applicant is an association, the names and addresses of the members of the association.

Applicant is not an association.

B.6. Whether Applicant is the owner, lessee of the site or facility or has some legal or business relationship to it

Groton Wind, LLC is the owner and developer of the Groton Wind Project (or "Project") that is the subject of this Application and, if the Project is certificated, will be the owner and operator of the Project. Groton Wind, LLC has leases with the owners of the land where the Project is proposed to be built.

B.7. Statement of Applicant's assets and liabilities

Please refer to Figure 1, which contains a copy of Iberdrola Renovables (parent company of Iberdrola Renewables, Inc) financial statement.

IBERDROLA RENOVABLES

Balance Sheet

No Audited

MM€	3Q 09	2008	Diff.
NON-CURRENT ASSETS	**19,368.4**	**18,072.6**	**+1,295.8**
Intangible Assets	4,471.2	4,492.9	-21.7
Tangible Fixed Assets	14,343.4	12,874.8	+1,468.6
Long-term Trade Receivables	17.9	20.3	-2.4
Financial Assets	243.8	320.9	-77.1
Deferred Asset Tax	292.2	363.8	-71.6
CURRENT ASSETS	**2,121.4**	**2,143.5**	**-22.1**
Inventories	177.3	221.0	-43.8
Trade receivables and current accounts	717.3	614.3	+103.0
Current financial assets	758.7	774.9	-16.2
Government administrations	217.0	246.4	-29.4
Cash and equivalents	251.1	286.9	-35.8
TOTAL ASSETS	**21,489.8**	**20,216.2**	**+1,273.6**

MM€	3Q 09	2008	Diff.
NET EQUITY	**11,415.4**	**11,188.3**	**+227.1**
Subscribed capital	2,112.0	2,112.0	-0.0
Issuance Premium	8,419.4	8,419.4	-0.0
Reserves and Others	623.3	353.4	+269.9
Forex translation differences	-12.1	-160.3	+148.2
Net income for the period	167.6	390.2	-222.6
Minority shareholders	105.1	73.5	+31.6
Capital instruments with debt like characteristics	**916.8**	**797.6**	**+119.2**
LONG-TERM LIABILITIES	**5,877.7**	**5,448.6**	**+429.1**
Deferred revenue	513.0	146.2	+366.8
Long-term provisions	227.7	109.2	+118.5
Long-term financial debt	781.2	911.8	-130.6
Interest expense	725.0	784.7	-59.7
Derivative financial instruments	56.2	127.0	-70.8
Other long-term accounts payable	2,312.1	2,325.6	-13.5
Long-term debt to group	2,157.4	2,154.2	+3.2
Deferred liability taxes	2,043.7	1,955.9	+87.8
SHORT-TERM LIABILITIES	**3,279.9**	**2,781.6**	**+498.3**
Short-term provisions	1.8	-	+1.8
Short-term interest expense	317.1	300.3	+16.8
Interest expense	120.6	119.4	+1.2
Derivative financial instruments	196.5	180.8	+15.7
Trade payables and other short-term A/P	2,961.0	2,481.3	+479.7
Short-term debt to group	1,092.7	461.8	+630.9
TOTAL SHAREHOLDERS' EQUITY AND LIABILITIES	**21,489.8**	**20,216.2**	**+1,273.6**

34 Nine months results 2009

Figure 1: Iberdrola Renovables Balance Sheet (figures are in Euros)

C. Site Information

C.1. Location and address of the site of the proposed facility

The proposed Groton Wind Project is situated along two ridge features in the town of Groton, New Hampshire in Grafton County. The Project area is bounded by Route 25 to the North, Tenney Mountain Ski Resort to the East, the Forest Society's Cockermouth Forest to the South, and Halls Brook Road to the West. The area consists of two distinct ridgeline features known as Tenney Mountain and Fletcher Mountain which are separated by a valley known as Groton Hollow. Both ridges are northeast/southwest oriented and range in peak elevation from 1,850 to 2,300 feet. A site area map can be found in Figure 2.

The Project consists of 24 modern 2.0 megawatt (MW) class wind turbines which will be situated along the ridge features described above. As indicated in Figure 3, twelve (12) turbines would be oriented generally in a north-south direction along the Tenney Ridge. Six (6) turbines would be similarly oriented on the southern knob of Fletcher Mountain and six (6) additional turbines on the northwest knob of Fletcher Mountain. The Project site would be accessible from the existing Groton Hollow Road. Access roads within the Project area will follow a central, existing logging road from Groton Hollow Road, and then would use other existing logging roads, skidder trails, and landings to the extent practical, and traverse the slopes to access turbine locations. An Operations and Maintenance (O&M) building and electrical switchyard are proposed to be located within the Project area, in a site located off the existing central logging road.

C.2. Site acreage, shown on an attached property map and located on a U.S. Geological Survey or GIS map

Figure 2, above, depicts the site acreage that Groton Wind has leased from three private landowners for this Project. The total amount of property leased by Groton Wind, LLC for construction of the Project is approximately 4,180 acres. As is the case with other wind projects, after construction, only a very small fraction of this total acreage will be retained for use by the Project. More specifically, it is estimated that after construction, only 3% of this acreage will be retained by Groton Wind under lease. This is similar to the Lempster Wind Project which leased approximately 1,600 acres from three landowners and, upon completion of construction, retained leases on only approximately 43 acres (i.e. approximately 2.68% of the initially leased acreage). Lempster Wind conducted a post-construction, certified survey to document the retained leasehold area, and Groton Wind intends to do the same for this Project.

The proposed wind turbine locations are separated from other nearby developments. The slopes of the Tenney Mountain Ski Resort are approximately 0.5 miles southeast of the Project area. The northern tip of Newfound Lake is approximately 3 miles south of the Project area. The closest residence owned by a party that has not entered into

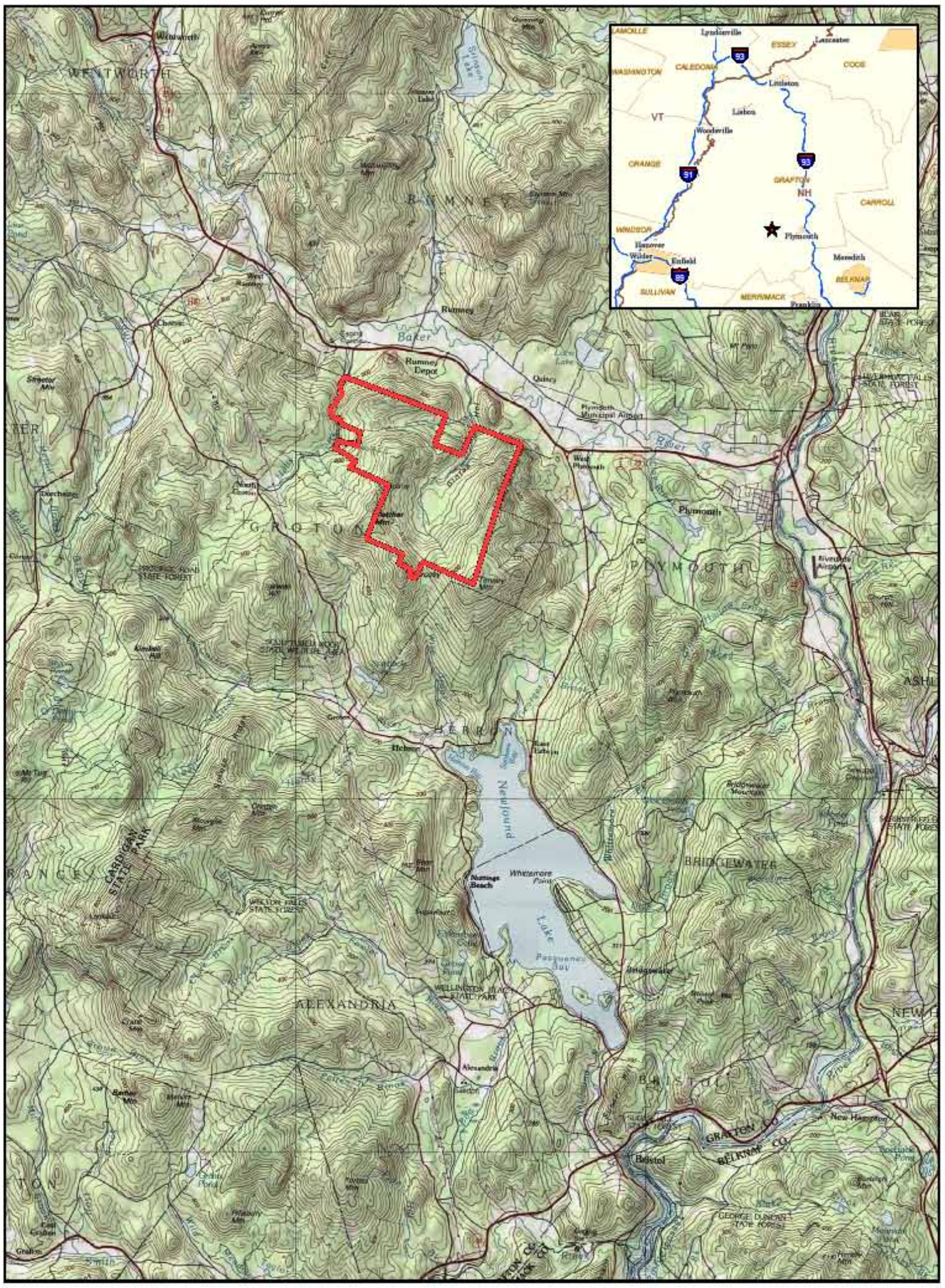

Figure 2: Map of Groton Wind Project Area

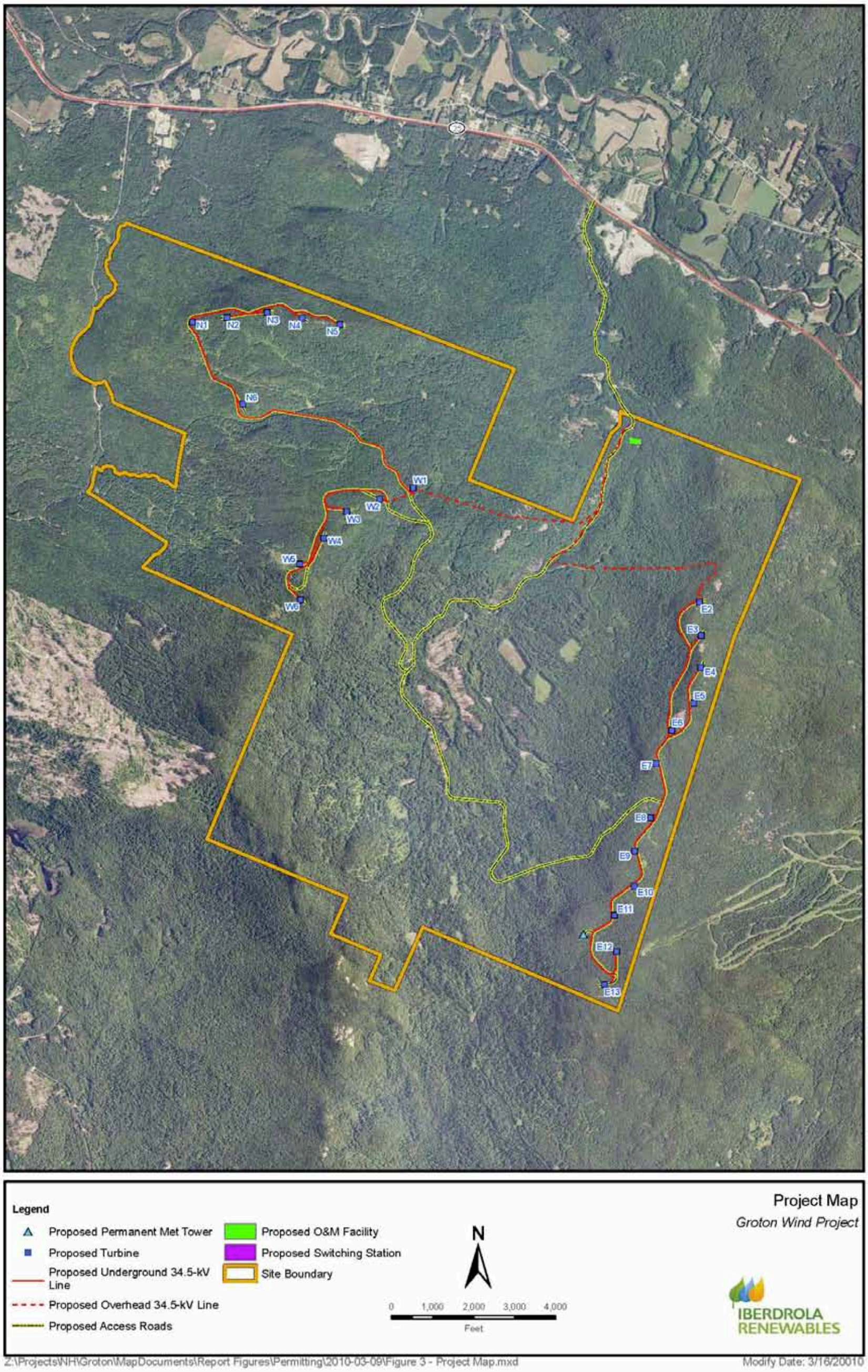

Figure 3: Groton Wind Project Map

an agreement with Groton Wind, LLC (i.e. a "non-participating residence") is due north of Turbines N-1 and N-2 and is approximately 2,700 feet away from the nearest turbine. Figure 4 illustrates structures and uses within and adjacent to the Project area.

C.3. Identification of wetlands and surface waters of the state within or adjacent to the site

The majority of the site is located within the watershed of the Baker River, and a small section is within the watershed of the Cockermouth River. Many intermittent and ephemeral streams flow to Clark Brook from the summits of the ridges, with some of these becoming perennial streams at lower elevations in the watershed. Wetlands on the Project site have been delineated by certified New Hampshire wetland scientists. Approximately 27 acres of wetlands were field delineated and another 12 acres were identified using National Wetlands Inventory (NWI) wetland mapping, for a total of 39 acres of wetlands within the boundaries of a 425 acre wetland study area. The majority of the wetlands are "forested," which is the most common wetland type in the northeast.

Wetlands and surface waters of the site are described in detail in the application forms, design plans, and maps provided in support of New Hampshire Department of Environmental Services (NHDES) Standard Dredge and Fill Permit Application, NHDES Alteration of Terrain Application, and NHDES Section 401 Water Quality Certification Request, all referenced in section D of this Application, and included as Appendices 1, 2 and 3.

C.4. Identification of natural and other resources within or adjacent to the site

The Project site is home to an active commercial forest and logging operation which is on-going. While portions of the site are undeveloped and primarily forested, the site has historically functioned as commercial woodland. Other than timber harvesting operation, the site does not contain commercial development and has considerable wildlife habitat which has been modified substantially by the timber harvesting operations that have occurred on this site since the 1940s and earlier. Evidence of well established wildlife trails indicates both historical and continuing moderate to heavy use by a variety of wildlife species. Both the logging roads and established trails provide travel corridors through the property's interior and to adjacent properties and their respective habitats.

Most of the adjoining land is also undeveloped which contributes to and increases the wildlife habitat value of the Project Site. Fragmented and on-going development areas are located at nearby Tenney Mountain ski area, to the north in the Town of Rumney, and to the east in the Town of Plymouth. The area's natural resources have been discussed with the applicable agencies. A description of these discussions/contacts is included in section H.4 of this Application. Sections I.5 and J of

this Application provide more specific information about the natural and other resources at the Project site and surrounding areas.

C.5. Information related to whether the proposed site and facility will unduly interfere with the orderly development of the region having given due consideration to the views of municipal and regional planning commissions and municipal governing boards

Groton Wind has carefully considered the views of local and regional planning and governing bodies in developing the Project in a manner that will not interfere with the orderly development of the region. Over the past two years, Groton Wind has proactively engaged in numerous discussions about the Project with municipal and regional planning commissions, municipal governing boards and other local and regional organizations, including those in the Towns of Groton, Rumney, Plymouth, and Hebron. Appendix 4 contains a list of the primary meetings and contacts made by the Applicant to discuss the Project with public officials and other organizations. One of the more significant meetings occurred on October 7, 2009 when Groton Wind held a public open house information session at the Groton Town House at which company representatives and Project consultants provided written and visual information to numerous attendees and answered questions about the Project. Groton Wind also hosted a bus tour of the Lempster Wind Farm, publicly noticed and available to all residents of the Town of Groton.

Agreement with Town of Groton

As the result of the numerous formal and informal meetings and discussions with the Groton Zoning Board of Adjustment, Groton Planning Board and the Groton Board of Selectmen, and in order to fully address and document measures in which the Town of Groton has an interest, Groton Wind has entered into an agreement with the Town concerning a wide variety of local issues that relate to the orderly development of the region. The issues include the use of roads, construction, decommissioning, emergency services coordination, site security, and others. The agreement is contained in Appendix 5 .The terms of this agreement were fully vetted at a publicly noticed meeting on December 16, 2009 which was conducted jointly by the Groton Board of Selectmen, Groton Planning Board, and the Groton Zoning Board of Adjustment. The Town's attorney, its Fire Chief and its Road Agent all attended this meeting. This agreement demonstrates that the Project and the Town have carefully considered and addressed potential issues of local concern. In addition, the agreement may be properly viewed as demonstrating that the Project is consistent with the orderly development of the region given that the Zoning Board's and Planning Board's participation in the development of the agreement effectively replicated the coordination and conditions that would occur through a standard zoning and planning review.

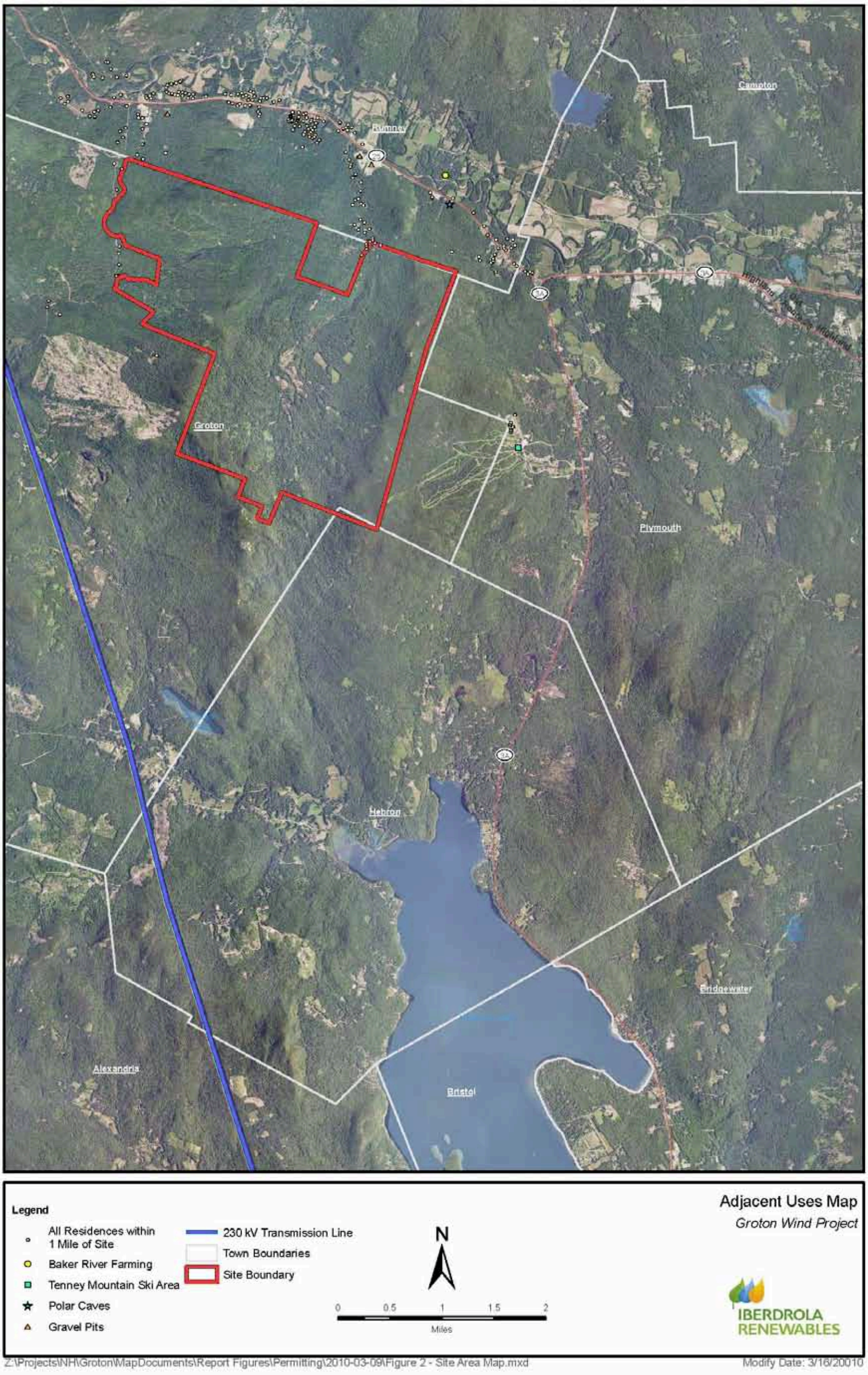

Figure 4: Map of Adjacent Land Uses

Consistency with Groton Master Plan

The Project is consistent with a number of the goals articulated in the Town of Groton Master Plan (or "Master Plan"). One of those goals is lessening the dependence on property tax revenue by recognizing environmentally sound and aesthetically unobtrusive commercial and industrial development. As an energy resource that will provide 100% renewable, emission-free electricity to the area, the Project is environmentally sound. Additional information relating to the environmental attributes and aesthetics of the Project are discussed elsewhere in this Application. The Project will provide an important new source of revenue for the Town, with very few, if any, new demands for town services. The commercial timber harvesting that has occurred within the Project area would be allowed to continue after completion of the Project. Thus, the Project meets the Master Plan's goal of promoting environmentally sound development which lessens the burden on property tax payers. Another goal of the Groton Master Plan is conservation. The Project will contribute to, and be compatible with conservation easements covering most of the land parcels that are part of the Project. The Project has been working with landowners and the Society for the Protection of New Hampshire Forests (SPNHF), and proposes to provide both technical and material assistance (such as survey and mapping data), to assist in the implementation of conservation easements over thousands of acres of land in Groton and other area towns. The combination of continued forestry and conservation easements ensures land protection while allowing for sustainable uses such as timber harvesting and wind power. All of the above-mentioned factors, when taken together, demonstrate the Project's consistency with the Master Plan and hence the orderly growth and development of the region.

Consistency with Regional Planning Initiatives

Groton Wind has met with and/or coordinated with the following regional organizations: Grafton County Economic Development Council (GCEDC); Newfound Lake Region Association (NLRA); Upper Valley Lake Sunapee Regional Planning Commission; North Country Council (NCC); and the Plymouth Renewable Energy Initiative (PREI). Groton Wind has coordinated with these local and regional planning organizations (in addition to others), by providing information and updates on the proposed Project, responding to questions, and reviewing planning documents.

The Project is consistent with and complementary to NCC planning documents, including the North Country Comprehensive Economic Development Strategy which was released in January 2009, and the NCC-supported "Economic Resurgence in the Northern Forest" which was prepared by the four-state Sustainable Economy Initiative. These regional planning documents are contained in Appendices 6 and 7. They highlight the opportunities for renewable energy in northern New Hampshire, and promote both new renewable energy developments and economic diversification. The Sustainable Economy Initiative includes planners and representatives from northern portions of New Hampshire, Vermont, Maine and New York. The Initiative's October 2008 report,

Economic Resurgence in the Northern Forest lists primary goals of the initiative and "ten recommendations for urgent action". These recommendations include:

> *Launch a four-state, Renewable Energy Initiative that encourages energy efficiency, increases public and private investment in a diversity of energy systems, maximizes community wealth and complements stewardship of the region's natural resources.*

One of the key actions recommended in the report is to expand enterprise, and development of renewable energy is described as an important element to promote growth. The report states the goal as "develop[ing] strategies and policies to transition the region to a significant four-state renewable energy economy, with an emphasis on enhancing affordable and local use of indigenous energy resources – wood, wind, water and solar."

The Groton Wind Project will clearly support these goals by making tangible progress towards economic development in the region, using in-state renewable energy resources, and at the same time, assisting in land conservation.

The Project is consistent with and complementary to the goals of the GCEDC, which seeks to encourage and support new business growth in Grafton County. The project will promote the goals of the GCEDC in a number of important ways.

§ *Development Phase*. During the development period of the Project, Groton Wind has made and will make significant expenditures within New Hampshire, employing New Hampshire personnel for civil engineering, legal, environmental, survey, site support, and field work. Groton Wind has expended more than $1,000,000 thus far in New Hampshire, contracting with in-state vendors.

§ *Construction Phase*. The construction and operation of the Groton Wind Project will bring much-needed economic benefits to the region. During construction, the Project is expected to spend approximately $24.5 million in the local area (Grafton, Belknap, Carroll, Coos, Merrimack, and Sullivan counties) economy for construction workers, materials, local vendors, restaurants and hotels, fuel, and other services. The construction work force at the Project is expected to be as high as 150 personnel at peak times. A significant portion of that labor is expected to be provided by New Hampshire companies.

§ *Operations*. During operations, the Project is expected to employ up to six full-time employees. It is expected that one or two senior, experienced wind technicians will be transferred from other projects, and that up to four new employees will be hired. Iberdrola Renewables operates its own wind farms, and hires, trains, and certifies employees. During operations, significant payments to the Town of Groton will greatly expand the town revenue base. The Project is discussing a Payment-in-lieu-of-Taxes (PILOT) agreement with the Town of Groton. Royalty payments to landowners will also provide economic benefits, as some of

the landowners are local, and all employ local land management/timber companies.

Orderly Development of Electric Infrastructure

Because the Project proposes to interconnect with the electrical grid by utilizing existing distribution system rights-of-way, the Project will support orderly development of the region through upgrades and improvements to the local electrical distribution infrastructure. Working with and through Public Service of New Hampshire (PSNH) and the New Hampshire Electric Co-op (NHEC), Groton Wind will upgrade or replace existing utility poles and replace and transfer wires. In some cases, existing poles are aged and do not meet current utility standards. These upgrades will improve and modernize the infrastructure and support the strength and reliability of the electrical system for many years. They will also support area economies and support future economic growth and service to new customers and businesses. Groton Wind will also fund tree trimming along the interconnection route to ensure that proper clearances are maintained.

All of the foregoing information demonstrates that the Project is consistent with the orderly development of the region and that due consideration to the views of municipal and regional planning commissions and municipal governing boards has been given.

D. Other Required Applications and Permits

D.1. Identification of all other federal and state government agencies having jurisdiction, under state or federal law, to regulate any aspect of the construction or operation of the proposed facility

- New Hampshire Department of Environmental Services, Water Division, Wetlands Bureau (authority under state and federal law over wetlands impacts)
- New Hampshire Department of Environmental Services, Water Division, Alteration of Terrain (AoT) Program (authority under state and federal law over alteration of terrain and pollutant discharge)
- New Hampshire Department of Environmental Services, Water Division, Water Management Program (authority under federal law related to U.S. Army Corps of Engineers (USACE) individual wetlands permit – water quality certification)
- New Hampshire Department of Transportation (NHDOT) (authority under state law over highway safety /transportation of oversized loads and driveway permits)
- New Hampshire Department of Safety (NHDOS) (blasting permit)
- New Hampshire Division of Historic Resources (NHDHR) (authority under federal and state law to consult with USACE regarding historic properties potentially affected by the Project)
- U.S. Army Corps of Engineers (authority under federal law to assess wetlands and other environmental impacts)
- Federal Aviation Administration (FAA) (regulation of turbine lighting in connection with determination of "no hazard" to air navigation)

D.2. Documentation that demonstrates compliance with the application requirements of such agencies

Information satisfying the application requirements of such agencies has been included within the agency application forms contained in the Appendices to this Application which are referenced in Section D. 3, below.

An application for a "Special Permit to Move a Load in Excess of Legal Limit" will be submitted to the NHDOT by the trucking contractor who will be responsible for transporting turbine equipment and other oversized loads. The contractor will be selected once the Project is certificated and turbine equipment is ordered.

Groton Wind will comply with all rules and permit requirements relative to blasting that may be necessary in the construction and decommissioning of the Project.

D.3. A copy of the completed application forms for each agency

Appendix 1: Joint USACE/NHDES Standard Dredge and Fill Permit Application

Appendix 2: NHDES Alteration of Terrain Permit Application

Appendix 3: NHDES Section 401 Water Quality Certification Request

Appendix 8: FAA 7460-1 determination applications

D.4. Identification of any requests for waivers from the information requirements of any state agency or department whether represented on the committee or not

The Applicant has requested waivers of certain newly-adopted NHDES rules that are not applicable to the Project. More specifically, waivers have been requested for the following rules, see Table 1.

Table 1: List of Requested Waivers from NHDES Rules

Rule	Which Seeks Information About
Env-Wq 1503.08 (m)	Supplementary floodplain information.
Env-Wq 1504.08 (b) (2) b	High Intensity Soil Mapping and/or Site Specific Soil Mapping.
Env-Wq 1504.08 (e)	Drainage Area Plan scale and contour intervals.
Env-Wq 1504.09	Calculation of Water Quality Volume (WQV).
Env-Wq 1504.12	Site Evaluation Report
Env-Wq 1507.04	Groundwater recharge requirements
Env-Wq 1508.19	Earthen terraced slopes or benching.

E. Energy Facility Information

The Applicant notes that the statutory definition of "Energy Facility" has recently been amended to include a "renewable energy facility." See RSA 162-H:2, VII. (f). However, the definition of "energy facility" contained in N.H. Admin. Rule Site 102.09 is based on an outdated statutory definition which does not apply to Groton Wind, LLC. Although it appears that the Applicant need not submit the information below (because Groton Wind, LLC does not meet the definition of "energy facility" contained in the Committee's rules), the Applicant is nonetheless completing this section of the Application in an effort to assist the Committee with its review of the Application.

E.1. The type of facility being proposed

Groton Wind, LLC proposes to construct and operate a wind energy facility.

E.2. A description of the process to extract, produce, manufacture, transport or refine the source of energy

The source of energy to be used by this facility to produce electricity is wind. Thus, there is no extraction, production, manufacture, transport or refinement of this clean, renewable energy source.

E.3. The facility's size and configuration

The facility's size in terms of its generating capacity is 48 MW. Its size in terms of overall leased acres via defined tax parcels is described above in Section C.2.

Facility size:

The facility's size in terms of its generating capacity is 48 MW. Its size in terms of overall leased acres via defined tax parcels is described above in Section C.2.

Project configuration:

The generating facility will be comprised of 24 wind turbines, each having a capacity of 2.0 MW. The turbines will be installed along two ridge features. As indicated in Figure 3, above, 12 turbines would be oriented in a north-south direction along the Tenney Mountain ridge, 6 turbines would be similarly oriented on the southern knob of Fletcher Mountain and 6 turbines would be situated on the northwest knob of Fletcher Mountain. In addition to the turbines, the Project will consist of access roads, an electrical collection system composed of underground and overhead power lines, an electrical switchyard, an O&M building, a single meteorological tower, and associated support facilities.

Turbine configuration:

Each wind turbine consists of three major components: the tower, the nacelle, and the rotor. The height of the tower, or "hub height" (height from the base of the tower to the center of the rotor hub on top of tower) will be approximately 256 feet. The nacelle sits atop the tower, and the rotor hub is mounted on a drive shaft that is connected to the gearbox and generator contained within the nacelle. The total

turbine height (i.e., height at the highest blade tip position) will be approximately 399 feet. Manufacturer's product brochures can be found in Appendix 9. More information about each component is described below.

Tower –The tubular towers proposed for Groton are conical steel structures manufactured in four sections, each of which is transported separately to the site. Tower sections are bolted together using internal flanges, and have a base diameter of approximately 15 feet and a top diameter of approximately 8 feet. Each tower has an access door, internal lighting, and an internal ladder to access the nacelle. The towers will be painted off-white to make the structure less visually obtrusive, and in accordance with FAA regulations.

Nacelle – The main mechanical and electrical components of the wind turbine are housed in the nacelle. The nacelle is mounted on a sliding ring that allows it to rotate or "yaw" into the wind to maximize energy capture. The nacelle components include the drive train, gearbox, and generator. The nacelle is housed in a steel reinforced fiberglass shell that protects internal machinery from the environment. The housing is designed to allow for adequate ventilation to cool internal machinery, and is approximately 28 feet long, 10 feet tall, and 11 feet wide. It is externally equipped with an anemometer and a wind vane to measure wind speed and direction. Attached to the top of some of the nacelles, per specifications of the FAA, will be a single, medium intensity aviation warning light. These will be red flashing red lights (L-864) and operated only at night. The FAA determines lighting specifications, and determines which turbines must be equipped with lights.

Rotor – A rotor assembly is mounted on the drive shaft, and operated upwind of the tower. Each rotor consists of three fiberglass composite blades approximately 139 feet in length (for a total rotor diameter of 285 feet). The rotor attaches to the drive shaft at the front of the nacelle. Electric motors within the rotor hub vary the pitch of each blade according to wind conditions to maximize turbine efficiency at varying wind speeds. The wind turbines begin generating energy at wind speeds as low as 4 meters per second (m/s) (8.9 mph) and automatically shut down at wind speeds above 25 m/s (55.9 mph). The usual rotor speed is approximately 15.0 revolutions per minute (rpm), with the maximum of approximately 19.5 rpm at peak winds.

E.4. The ability to increase the capacity of the facility in the future

At this time, Groton Wind has no plans to increase the capacity of the facility in the future. The interconnection line capacity limits future expansion without upgrading electrical cables. Potential technical improvements in the future are possible, including replacement blades and/or nacelles as turbine improvements are introduced. Such improvements would serve to increase the net capacity and power production of Groton Wind.

E.5. Raw materials used, as follows:

E.5.(a) An inventory, including amounts and specifications

Due to the unique nature of a wind farm, most details regarding specifications of raw materials used for construction are not known until a Balance of Plant construction contract is bid and awarded after the permitting process has been completed. However, Iberdrola Renewables has constructed multiple facilities across the country and can comment generally on the types of raw materials used to construct a wind facility.

The nacelle is made of a fiberglass exterior with structural steel framing to hold the internal components. The blades are made of glass fiber reinforced plastic and/or carbon fiber reinforced plastic. The blades are bolted to the cast aluminum hub. The tower is made of structural steel and is bolted to a concrete and steel foundation. A full description of the turbine and tower and components can be found in section E.3 and a description of the foundation can be found in section F.5.a. Other materials expected to be required include utility poles, electrical cable, fiber optic cable, stone aggregate, concrete, and rebar steel.

E.5.(b) A plan for procurement, describing sources and availability

Iberdrola Renewables has constructed 40 wind farms in 23 U.S. states, and has many existing procurement control mechanisms and vendors in place for such key materials as turbine components, electrical cable, fiber optic cable, and other electrical equipment. These long-term vendor relationships ensure availability of materials during construction. For Groton turbine components, Iberdrola Renewables has a framework agreement with Gamesa for provision and delivery of turbine components for a number of projects, including Groton. The primary turbine components (nacelles, rotors, blades) are expected to be constructed in Gamesa's manufacturing facilities in Fairless Hills, PA and Ebensburg, PA. Other materials, such as concrete, rebar, electrical materials, and utility poles are expected to be sourced locally, subject to bidding processes, using the Iberdrola Renewables' existing vendor database.

E.5.(c) A description of the means of transporting

All components will be transported to the site via truck or other vehicle as described in section F.5.e.

E.6. Production information, as follows:

E.6.(a) An inventory of products and waste streams

During construction small amounts of waste materials are generated. Typically these are limited to packaging materials, lumber used for forms, and general trash generated by workers. Groton Wind will contract with a local hauler

during construction for proper handling and removal of waste materials. During operation, there are no air or water waste streams generated by the Project.

E.6.(b) The quantities and specifications of hazardous materials

Although exact specifications are not yet fully quantified, during operations, the only potentially hazardous materials on the site include approximately 155 gallons of hydraulic and lubricating oils stored in the nacelle and approximately 116 gallons stored in the grounding transformer, oily rags, or similar wastes related to turbine lubrication, oils, and other maintenance activities. The containment of these oils will be prescribed in the Spill Prevention, Control and Countermeasure (SPCC) plan, which will be prepared prior to commercial operation. A copy of the Lempster Wind Farm SPCC Plan, which is similar to the one to be produced and implemented at the Groton Wind Project, can be found in Appendix 10. The SPCC plan outlines the procedures, methods and equipment used at the facility to comply with the U.S. Environmental Protection Agency's (USEPA) oil spill prevention, control, and countermeasures standards and must comply with the inspection, reporting, training and record keeping requirements. Among other things, the SPCC plan will note that gear boxes are equipped with low level alarms to detect leaks. Active containment measures will be employed upon discovery for small spills that may occur from the nacelle. In the event of a leak, the oil is contained inside the nacelle. The O&M facility will be equipped with spill response equipment for both large and small spills. Should a larger spill inside the nacelle occur, it will be contained by the closed tower base, as EPA recognized in federal SPCC regulations. 72 FR 58422 (Oct. 15, 2007& November 13, 2009). All oil-handling employees will be trained on such matters as the SPCC plan, laws and regulations regarding spills, releases and pollution control, and operation and maintenance of equipment to prevent discharges. If a spill were ever to contact soils, it would be remediated by qualified and properly licensed contractors. Iberdrola Renewables, Inc.'s Director of Environment Health and Safety oversees all programs to ensure environmental protection and full compliance with all applicable state and federal law. As previously mentioned, Iberdrola Renewables has 40 wind farms in 23 states, including New Hampshire and has safely and successfully managed all issues associated with SPCC plans at wind projects.

E.6.(c) Waste management plans

During construction, Groton Wind will contract with local waste haulers for removal of solid waste and construction debris. Any waste generated during construction will be transported and disposed of by licensed contractors. During operations, the facility SPCC directs waste management and ensures compliance with USEPA regulations. There are no wastewater emissions as a result of the Project.

F. Renewable Energy Facility Information

F.1. Make, model and manufacturer of the unit

Groton Wind proposes to install wind turbines manufactured by Gamesa Corporation. The turbine model type is G87. Blade length is 42.3 meters (139 feet). The G87 nacelle and blades are typically manufactured in Fairless Hills, PA and Ebensburg, PA. The turbines will be installed on a four-section tower with a 78 meter (256 feet) hub height.

F.2. Capacity in megawatts, as designed and intended for operation

The total nameplate capacity of the Groton Wind Project is proposed to be 48 MW.

F.3. Type of unit

Groton Wind proposes to install 24 Gamesa G87 turbines which are identical to those installed at the Lempster Wind Farm. Each of these state-of-the-art wind turbines will have a nameplate capacity of 2.0 MW. Details on the Gamesa G87 turbines are found in Appendix 11.

F.3.(a) Fuel utilized (Not Applicable)

The Groton Wind Project will use wind to produce electricity. The Project does not combust fossil or other fuels and therefore has no emissions and requires no pipelines or fuel deliveries.

F.3.(b) Method of cooling condenser discharge (Not Applicable)

Not applicable. No cooling water is required nor are there any discharges.

F.3.(c) Whether the unit will serve base, intermediate or peaking loads

The Project contributes to meeting demand for new energy sources in New England, and adds to the diversity of power generation sources in New Hampshire and the overall Independent System Operator – New England (ISO-NE) region. The Project is proposed to serve base loads. While wind farms do not operate continuously, and are by nature intermittent, they serve base load when operating and therefore offset power production from other sources, which are typically fossil fueled. Since the marginal cost of generation from the Project is very low due to zero cost of fuel, it is advantageous to utilize all the generation available from the Project when the wind is blowing. Therefore, wind is typically dispatched after must-take generation resources (such as nuclear plants) along with run-of-river hydro generation, followed by dispatchable hydro generation and then fossil-fueled generation.

Power from the Project would provide clean, renewable energy to utility customers through a power sales agreement or a wholesale market sale. Such agreements are often referred to as a power purchase agreement (PPA) and are entered into between the owner of the wind energy Project and a Federal Energy Regulatory Commission (FERC)-licensed wholesale power purchaser, such

as an energy company or an electric utility. Energy produced by the Project could be sold to utilities inside the state of New Hampshire or across the ISO-NE transmission region which serves customers in Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut.

Fuel for a wind farm project is renewable and free. In addition, the capital expenses and operation expenses are predictable for wind farms. Therefore, wind farm owners are able to offer stable, predictable energy prices for the long-term PPAs they sign with power purchasers. This is a significant advantage over most other long-term power purchase agreements from fuel-based generation, where the electricity price typically will vary significantly over time as the price of fuel changes. A PPA is typically entered into for a 10 to 25 year period, thereby ensuring the stability and longevity of the Project. The Project may also utilize shorter term sales for a portion of the power depending on market or customer demands.

F.3.(d) Unit efficiency

The process of designing a wind project and determining the expected net capacity factor is a long, iterative process which takes several years to complete. The meteorological data collection process takes several years and occurs throughout the life-cycle of the incipient wind project. The initial meteorological towers are strategically located throughout the project area to determine the scope and breadth of the wind resource in representative locations, not just the locations which are expected to have the strongest mean winds. This is done to estimate the production of typical wind turbines, not just the peak performing turbines. After at least a year of meteorological data collection, a turbine layout is designed by the lead meteorologist. The turbine layout is optimized for energy efficiency according to available land, wind direction, and wind speed. Stringent setbacks are applied to prevent detrimental wake effects on nearby turbines. The layout is optimized utilizing state of the art wind modeling computer software to obtain the highest possible energy yield while respecting the setbacks in place. Additional meteorological towers are then deployed to fill in holes within the high resolution monitoring network of towers to reduce uncertainty in the estimation of any turbines not immediately adjacent to an existing meteorological tower. Meteorological data from nearby airports is compared to the onsite data and weather model data to determine if the measured period of record onsite is representative of the long-term climate, to best estimate power production throughout the expected lifespan of the wind project. As additional data is compiled, the turbine layout is often adjusted to ensure the most energy efficient wind project possible.

The Project has collected on-site wind data since 2004 from a 50 meter meteorological tower, and since early 2009 from two additional 60 meter towers. Because the strength of the wind resource is strongly correlated with topographic elevation, Fletcher and Tenney Mountains enjoy some of the

greatest potential for cost-effective, emission-free wind-generated electricity in New Hampshire. With over 5 years of on-site wind resource data, Groton Wind is confident in the viability of the wind resources on the site. The turbines are sited to optimize exposure to wind from all directions, with emphasis on exposure to the prevailing wind direction in the Project area. Modern wind turbines are designed to operate efficiently, through the use of modeling software, meteorological data, topographic data, and tailored computer control programs. Groton Wind estimates that the Project will have an average annual net capacity factor of 33.0-36.0%.

Based on this projected capacity factor, the Project is expected to produce approximately 144,375 to 157,680 Megawatt hours (MWh) of electricity per year. Translated to homes, the Project is expected to produce electricity, equal to the average annual consumption of approximately 19,000-21,000 NH homes, and would supply the needs of approximately 57,000 NH homes during periods of peak production. These estimates are based on data from a January 2009 report issued by the U.S Department of Energy (USDOE), Energy Information Administration, which states that electricity usage per year for the average New Hampshire home is 7,584 kilowatt hours (kWh).

F.3.(e) Impact on system stability and reliability

In general, wind power has been found to maintain the reliability and integrity of the electric system without impacting system operating costs. A comprehensive 2006 analysis released by the Utility Wind Integration Group (UWIG), Edison Electric Institute, American Public Power Association and National Rural Electric Cooperative Association found that there are no fundamental technical barriers to wind penetrations of up to 20 percent of the system peak demand. The analysis further stated that the consensus view is that wind power impacts can be managed with proper design and operation of the system (Appendix 12).

A Feasibility Study analysis has been performed by PSNH evaluating six (6) different interconnection alternatives. A copy of the Feasibility Study report is attached as Appendix 13. PSNH evaluated alternatives that would interconnect the Project into either the Ashland Substation, the Beebe River Substation, or both substations. The Feasibility Study was performed to determine the feasibility, maximum project size, and operating constraints for the various interconnection alternatives. For the Feasibility Study, PSNH performed steady state and transient analysis to verify the Project does not adversely impact the PSNH system. As part of the study process, the results were shared and reviewed with ISO-NE and NHEC.

Following completion of the Feasibility Study, the Project chose to proceed with an interconnection option which would interconnect the Project via 34.5 kV lines to the Beebe River Substation. This option will now undergo a detailed interconnection study, including stability, power flow and short circuit analysis.

The purpose of the detailed interconnection study is to determine the specific interconnection requirements to ensure the Project does not cause adverse impacts on the system stability and reliability of the electric grid. The detailed interconnection study is a standard portion of the interconnection process, and the study results will be reviewed by PSNH, NHEC, and ISO-NE. In addition, following this review, the study results will be reviewed by a larger peer group of New England utilities that review the results of each interconnection study performed within the New England region, with the directive to ensure the Project will not create adverse impacts on system stability and reliability. The Project will be required to comply with all study recommendations to ensure there are no adverse impacts on system stability and reliability. A copy of the final interconnection study will be provided to the Site Evaluation Committee (SEC).

Once the detailed interconnection study has been fully reviewed and completed, the Project will enter into an interconnection agreement. The interconnection agreement will document all the requirements the Project must follow to be allowed to interconnect with the electrical grid. Only after completion of these requirements to the satisfaction of PSNH, NHEC, and ISO-NE will the Project be allowed to interconnect, thus ensuring the Project will not adversely impact system stability and reliability.

F.4. Any associated new substations and transmission lines

The Project is not expected to not require any new substations or transmission lines. It will deliver electricity to the grid via standard distribution system level, three-phase power (34.5 kV) circuits, via an on-site project switchyard. The distribution line will be approximately 13.0 miles long, and will deliver the Project's output to PSNH's Beebe River substation.

This line will be routed in existing electrical rights-of-way, and wherever practical, co-locating with NHEC and/or PSNH facilities. The circuits are expected to be constructed utilizing covered conductor to allow for a more compact design.

F.5. Construction schedule, including start date and scheduled completion date

Construction of the Groton Wind Project will begin after all required approvals and permits have been obtained. Construction is currently planned to start in late 2010, depending on SEC certification. Depending on winter and mud season conditions, the expected Commercial Operation Date is December 2011.

Due to the large number of projects currently under construction and planned for construction (once approved), Iberdrola Renewables maintains a full-time scheduling staff to aid planning and implementation. Primavera is used as the scheduling tool to maintain consistency between projects. A "standard" scheduling template is utilized as the basis for a particular project schedule. In addition, high-level schedules are

maintained for future construction cycles to balance resources and anticipate wind turbine availabilities from manufacturers for allocation to particular projects.

A project schedule to establish milestone dates and track progress toward completion of the Groton Wind Project has been developed to aid during the construction process. This Project schedule is maintained in conjunction with other Iberdrola Renewables wind power projects to make adjustments as necessary to reflect present and projected development status, availability of resources, scheduled deliveries of major equipment, and the regional variability of climate, construction seasons, and labor resources.

The project-specific activities and the anticipated timeframe for each are established to create the Project schedule. The Project schedule for the proposed Groton Wind Project is attached as a Gantt Chart in Appendix 14.

F.5.(a) Construction process

Iberdrola Renewables, Inc. constructed 40 wind farms in the United States (13 in 2008 alone), and has a full in-house construction management staff, including Project Managers, Site Managers, Superintendents, and Quality Assurance inspectors. This level of experience and technical depth is supported by a number of standardized construction sequence plans to ensure efficiency, shorter timelines, and minimized disruption to area communities during construction. Using all of the data gathered for the Project (including geotechnical information, environmental conditions, site topography, logistics, etc.), Groton Wind has developed a set of site-specific construction specifications for the various components of the Project. The design specifications comply with construction standards established by various industry practice groups, including:

- American Concrete Institute (ACI)
- Institute for Electrical and Electronic Engineers (IEEE)
- National Electric Code (NEC)
- National Fire Protection Agency (NFPA)
- Construction Standards Institute (CSI)

The Project engineering team ensures that all aspects of the specifications, as well as the actual on-site construction, comply with all applicable federal, state, and local codes and good industry practice. The Project developer and/or contractor will coordinate directly with the local code enforcement officers in order to assure that all aspects of Project specifications/inspections are properly communicated and understood.

Initial field work

The initial field work during equipment mobilization is site flagging and marking to establish clearing areas, avoidance areas and buffer zones. Flagging using survey markers and an on-site Geographic Positioning System (GPS) base station

will guide subsequent logging and clearing. A licensed logging company will clear and remove large lumber and trees where necessary, to clear for staging areas (if any clearing is necessary), new or expanded road areas, and turbine locations. Coinciding with logging, initial road construction will begin.

Clearing and grading

Construction staging areas will be developed by stripping and stockpiling the topsoil, and grading and compacting the subsoil. A minimum of 8 inches of gravel will then be installed to create a level working yard. If there is a soil base, geotextile fabric may be used below the gravel. Electric and communication lines will be brought in from existing distribution poles to allow connection with construction trailers. At the end of construction, utilities, gravel, and any geotextile fabric will be removed (from staging areas that do not overlap with the proposed operations and maintenance facility) and the sites restored to their preconstruction condition.

In order to clear the construction area so that the land can be worked, vegetation is removed along the roads, collector system, and around turbine locations. For transport roadways, clearing is typically done to establish an approximately 30-foot corridor centered on the road alignment. Where the collection system does not follow the roads, clearing is done in a 25 foot corridor to allow equipment to dig trenches and install underground cable. The overhead portions of the collection system will require an approximately 40-foot corridor for installation of poles and wire. This corridor will also provide the necessary clearances during operation. For crane roads, an approximately 50-foot corridor is needed. In cases where large timber is present, local loggers will clear the area prior to mechanical clearing methods being employed. Clearing will be done by mechanical means, using heavy equipment to remove debris in the corridors so that the area is ready for road construction, collection system trenching or crane walking as needed. Typically, marketable logs are sold by the landowners, with smaller diameter trees and brush usually chipped and sold and/or chipped and used on site for stabilization. Topsoils are stockpiled and later used during reclamation, so that native, site soils (and the organic matter and seeds contained therein) are kept on the site.

Areas surrounding the turbine locations will be cleared of large trees to allow for construction of the foundation, crane pads and blade assembly, and to limit disruption in wind flow during turbine operation. Depending on vegetation at each turbine location, this work could potentially involve clearing approximately 18,500 square feet per turbine site. Depending on the terrain and density of vegetation much of the surface area could remain undisturbed. Beyond the immediate area of the turbine foundation and crane pads, stumps are typically left in place to minimize earth disturbance. Tree-tops and brush are windrowed along the outer perimeter of the cleared area, which provides habitat for small game.

Due to the shallow ledge that is predominant in New England, in many areas of the Project site blasting or use of a hoe ram will be necessary in order to construct roads and foundations. Any blasting is done in strict conformance with a project blasting plan, which is reviewed and provided to the Town of Groton, and which is reviewed and approved by the NHDOS (for any explosives storage). Blasting will be conducted by licensed contractors that offer experience and complete qualifications. Typical blasting plan provisions include advance notification through area newspapers and notices posted at the Town Hall. All blasting plans require a detailed site control plan to ensure that only licensed workers are in the vicinity, and to document safety and control measures tailored to the site. These measures include warning signs, warning sounds (air blasts), and physical site control, including in wooded areas, for an appropriate diameter around each blast site.

Grading and drainage

As part of the site design, the Project has produced a grading and drainage plan with details on approved construction measures and best management practices for controlling storm water and drainage for the site. A storm water pollution prevention plan will be prepared for this Project and submitted for review and approval with the NHDES and maintained onsite. Typically, culverts are constructed as part of road construction to maintain or improve the drainage of the area without increasing erosion of topsoil. Culverts, level spreaders and any additional retention areas that may be needed based on the Project's impacts would be maintained during operations in accordance with state and local requirements. Groton Wind has consulted with NHDES, and the USACE on site-specific drainage and stormwater control measures. During construction, the Project will install and maintain temporary sediment and stormwater control devices, as requested by NHDES, such as silt fences, hay bales, wood chips, swales, and/or water bars. In addition, the Project will re-seed and restore areas to ensure that exposed soils are not subject to erosion.

Road construction

Access roads will be constructed using the existing logging road at the end of Groton Hollow Road as depicted in Figure 3 and extending to the proposed Project staging area. Access roads have been designed in order to minimize impacts resulting from clearing as well as wetland/stream areas. This central logging road will be upgraded to support the Project, including improving the gravel surface, grading, and drainage. Other portions of the roads to access the turbines will be new construction. Access roads leading up to the turbine strings will be gravel surfaced, and 16 to 22 feet wide. During the construction period, some of the crane access roads along the ridge will be widened up to 38 feet to accommodate movement of the turbine erection cranes, which have a track width of approximately 32 feet. In steeper areas or in turns, the areas of disturbance may be wider due to required cuts and/or fills to achieve design

grades or to accommodate delivery truck turning radii. After completion of construction, those portions of roads that are 38 feet wide will reduced to approximately 16 feet in width, with the reclaimed shoulder areas restored and reseeded using approved New Hampshire native seed mixes. Groton Wind will maintain these roads year-round, including plowing, sanding, and grading as necessary. Typically a snow plow contract is entered into with a local vendor.

Road construction involves topsoil stripping and grubbing of stumps, as necessary. Stripped topsoil will be stockpiled along the road corridor for use in site restoration. Any grubbed stumps will be removed, chipped, or buried. New access roads during construction shall be constructed by grading and compaction to a depth of approximately 20 to 40 inches as necessary to meet the specifications required for construction equipment. In many areas, some cut and fill will be required so that the road can meet specifications.

If there is a soil base, a permeable, geotechnical fabric that acts as a barrier between the rock and soil, may be placed over the compacted area. Gravel is then spread to accommodate a width of approximately 16 to 22 feet and further compacted to provide a permanent gravel road. Typical gravel depths vary from 8 to 12 inches. Upkeep and maintenance will be performed, as needed, so that site access is maintained throughout the year.

Drainage ditches/swales, culverts, and appropriate sediment and erosion control measures (e.g., silt fencing) will be installed in the locations where access roads are adjacent to, or cross wetlands or streams. Culvert designs have been coordinated with NHDES and USACE. At some locations, there are existing culverts or drainage devices that have been installed by the landowners. These culverts will be replaced or upgraded to meet current NHDES standards.

Turbine foundation construction

The start of turbine foundation construction is expected to occur after initial portions of the access roads are completed. Foundation construction occurs in several stages including excavation, outer form setting, rebar and bolt cage assembly, casting and finishing of the concrete, backfilling, drilling and setting rock anchors, tensioning of the bolts and finally and site restoration. Similar to Lempster, rock anchor foundations will be utilized due to the shallow depth of bedrock along the ridgelines where the turbines will be located. Excavation and foundation construction will be conducted in a manner that will minimize the size and duration of excavated areas required to install foundations. Rock anchor foundations consist of a concrete and rebar cap that is secured to rock in the subgrade by 18 to 24 steel anchor bolts. The site is excavated and a level work surface is poured at the bottom of it so that the structure of the cap can be made. The cap consists of approximately 130 cubic yards (cu. yd.) of concrete, rebar and the bolt cage which connects the tower to the foundation. After the cap is poured, holes are drilled through conduit in the cap to a depth of 40 to

50 feet. The anchor bolts are grouted into place and all of the bolts are tensioned securing the cap to the rock below. Rock anchor foundations require maintenance to ensure that the rock anchor bolts are properly tensioned to the rock. Typically this is checked after installation of the turbine, at six months after completion of the Project and every two years through the life of the Project. Rock anchor foundations use considerably less concrete than traditional spread foot foundations and have a significantly smaller footprint.

The foundation will require an excavation approximately eight (8) feet in depth and 35 feet in diameter (compared to a ten (10) foot depth and 70 foot diameter for a spread foot foundation). Following excavation, the foundation is formed and reinforcing steel and anchor bolts are installed prior to pouring concrete. The finished concrete foundation will be approximately 24 feet in diameter (compared to a 55 to 60 foot diameter for a spread foot foundation). Once the foundation concrete is sufficiently cured, the excavated area around the foundation is carefully backfilled with the excavated on-site material. The tower is secured directly to the top of the foundation and the nominal 24 foot diameter cap that typically extends 6 to 12 inches above grade. The finished grade around the foundation pedestal and base of the tower will be surfaced with a graveled area approximately six (6) feet in width.

Crane pads

Crane pads will be installed adjacent to each turbine foundation to provide the main crane a stable, well compacted, level base from which to accomplish heavy lifting. Crane pad dimensions are typically 60 feet wide and 90 feet long. A crane pad is constructed in a manner similar to the construction of access roads. Trees, vegetation, and compressible, organic soils and topsoil are removed as part of initial site preparation. Following the initial site preparation, geotechnical filter fabric is installed if necessary, followed by successive layers (8 to 12 inches) of well compacted crushed aggregate. After the initial construction phase, the crane pads will only be used periodically during the operations phase of the facility. Nevertheless, leaving the crane pads intact will facilitate future operations and maintenance activities. Such activities could include replacement of a blade, maintenance tasks and equipment replacement, and post-construction environmental monitoring, which are facilitated by cleared areas around turbines.

Removal and disposal of construction debris

Debris will be removed from the site during construction by a local hauling company through the Project's general contractor. Typically, sites do not produce large amounts of waste during construction. Due to cut and fill methods and foundation excavation, some spoil piles may be made on site. In those instances, all spoil material will be natural to the site and provisions will be made for large organic material (such as stumps and logs) to be hauled away or

ground on site. These areas will be re-vegetated with native mix at the conclusion of Project construction.

Post construction and reclamation

At the conclusion of the construction phase of the Project, the areas that have been cleared and do not contain a permanent structure will be re-vegetated with native mix. This helps to reduce erosion and promotes the site's natural condition. Restored areas will include road edges, crane paths, temporary roads, and staging areas. This process will generally involve the following sequence of activities:

- Removal of gravel or other temporary fill.
- Decompaction of compacted sub-soils using a deep ripper.
- Disking and removal of stones from decompacted subsoil.
- Spreading of stockpiled topsoil over the decompacted subsoil, and reestablishing pre-construction contours to the extent practicable.
- Disking and removal of stones following the spreading of topsoil.
- Seeding with a native mix and mulching topsoil.

At the final conclusion of construction and restoration, silt fences and temporary sediment and erosion control measures will be removed as necessary, in accordance with all applicable permit conditions.

F.5.(b) Substation, switchyard, laydown yard, and maintenance building

A collection switchyard will be located near the O&M building, and will be the terminus of the Project electrical collector system. The Project does not require a substation. The switchyard will include switching equipment, protective relay and control equipment, transfer trip equipment, disturbance analyzer equipment, transducers, Remote Terminal Unit, and telemetry equipment, and meters. In addition, a grounding bank will be installed, in accordance with utility and National Electric Code standards. Dedicated phone and data lines will be included, for data and communications between local utility facilities, and Iberdrola Renewables, Inc.'s operations center in Portland, Oregon. The switchyard will be enclosed within a fenced area or may be pole-mounted, given the limited amount of equipment required.

A laydown yard will be located off of Groton Hollow Road approximately 2.5 miles south of the O&M facility. The laydown yard will consist of approximately 5 acres that will be graded and surfaced for use during the construction and commissioning of the project. The area would be used to accommodate construction trailers, storage containers, project components and parking for construction workers. The O&M facility will provide additional construction office,

material storage, and staging areas during construction. In addition, several staging areas for components are strategically located close to turbine locations.

An O&M facility will be constructed in the Project area on the location shown in Figure 3. This location provides for easy access to the site by operations personnel, as well as for access by utility personnel to the switchyard. The O&M facility will be comprised of a single story building suitable for operating personnel, operations and communication equipment, parts storage and maintenance activities. A vehicle parking area will be located in close proximity to the building. There will also be an area for outdoor storage of larger materials and equipment.

The O&M building will be approximately 4,000 square feet and will include offices and associated facilities (bathrooms, kitchen, storage) for technicians, a garage for spare parts and supplies, and a computer server room. The O&M building is expected to have a potable water well, sewage tank and either holding tank or leach field, hot water heater, HVAC, plumbing, electrical, computer, fiber optic, and telephone connections, and will be alarmed for fire, heat, and intrusion, in cooperation with local fire departments.

F.5.(c) Turbine installation

In addition to the tower sections, nacelle, and rotor blades, other smaller wind turbine components include: hubs, nose cones, cabling, control panels and internal facilities such as lighting, ladders, etc. All turbine components will be delivered to the Project site on flatbed transport trucks, and the main components will be off-loaded at each individual turbine site. Turbine erection is performed in multiple stages including erection of the tower sections, erection of the nacelle, assembly and erection of the rotor, connection and termination of the internal cables, and inspection and testing of the electrical system prior to energization.

Turbine assembly and erection mainly involves the use of large track mounted cranes, smaller rough terrain cranes, boom trucks, and rough terrain fork-lifts for loading and off-loading materials. The tower sections, rotor components, and nacelle for each turbine are delivered to each site by flatbed trucks and unloaded by crane. A large erection crane will set the tower segments on the foundation, place the nacelle on top of the tower, and after ground assembly, place the rotor onto the nacelle. In some turbine locations, due to space limitations, single blade erection may be required, whereby the hub is installed, and each of the three blades is individually hoisted and attached.

Where feasible by terrain and accessibility, the erection crane(s) will move from one tower to another along designated crane paths. The crane travel path will generally follow Project access roads where they follow contiguous strings of turbines. The crane paths in these areas will be established by constructing the

access roads to a 38 foot width and compacting the gravel to provide strength and stability for support of the crane. To relocate the crane between areas of the Project not connected by a crane path, the crane will be disassembled and transported by specialized flatbed tractor-trailers on Project access roads and public roads.

F.5.(d) Collection system installation

Underground Collection Lines

The individual turbines are connected to a 34.5 kilovolt (kV) collection system to form an integrated power collection system. The turbines operate in parallel. Each turbine is connected to a 2,350 kVA, 690-34,500 Volt Generator Step-Up (GSU) transformer and connection cabinet. Several turbines are loop connected through underground 34.5 kV collection circuits and then to 34.5 kV junction boxes to form a string loop. The junction boxes are then connected to the wind farm's switchyard via main-line collector circuit cables.

The installation of the underground collection system, including the accompanying fiber optic communications cable and plant grounding system, will be completed in accordance with prudent construction practices and in accordance with the contract specifications, drawings, and applicable industry standards.

Trenches for electrical cables and fiber optic cables will be installed on one side of the roads. The trench is typically excavated to a depth of approximately 4 feet and at least 8 inches of clean sand fill is used to line the trench bottom. After the cables are installed, another 8 inches of clean sand tops the cable. The remainder of the trench is backfilled with native soil.

The installed location and depth of the cables are verified and recorded. Utility markers are placed on each side of roadway crossings and at pipeline, telephone and communication easements. For continuous trench installations greater than 1000 feet in length, a marker is placed every 1000 feet or as shown on construction detail drawings.

Overhead Collection Lines

The underground collection system transitions to an overhead collection system for longer stretches through the site. The overhead collection lines run from the west and east ridges toward Groton Hollow Road in the center of the Project. The collection lines share poles down Groton Hollow Road, eventually terminating at the switchyard near the entrance of the Project.

The overhead collection lines will consist of approximately 68 wooden poles that are 40 feet high, with medium voltage spacer cable, and an optical ground wire for grounding and fiber optic communications. The poles will be freestanding except at some turns where guying will be used.

F.5.(e) Heavy/oversize trucking loads

Heavy/oversized trucking loads will follow routes approved by the NHDOT, and will be accomplished by licensed haulers experienced in wind turbine component transport. Typically, haulers perform route surveys and propose route(s) to NHDOT, which then confirms and/or modifies the routes prior to issuing permits. The permits identify the days of the week and hours of the day when hauling may occur. Typically there are multiple escort vehicles, including State Police, private oversized-load escorts, and county and/or local police as well.

For the Groton Project, there are 24 proposed turbines. Since each turbine is composed of 4 tower sections, 1 nacelle, and 3 blades, it is anticipated that there will be a total of 192 (24 x 8) oversized loads delivered to the site. However, transport vehicles typically deliver in "convoy" mode, whereby three or four vehicles travel together, to minimize disruption. In addition, in some cases multiple blades are carried on a single truck.

The identified likely transport route is not expected to cause undue delays or disruptions along local roads. A copy of the Route Survey can be found in Appendix 15. Groton Hollow Road is the only local road that will be used. All other transport routes will follow state roads. For the Lempster project, a number of local roads were used for transport, yet disruptions were minimal. Typical delays at corners or crossings were no longer than 10 minutes, and often only 1 to 2 minutes. There are very few exits or turns for the Groton transport route, including an exit from I-93, and a single turn from Route 25. No improvements or modifications to roads are anticipated as the result of this Project. During the Lempster project, Iberdrola Renewables, Inc. retained a New Hampshire registered Professional Engineer from a local firm to assess road conditions prior to and after all component delivery. There was no damage to any state or local roads. A route map is depicted in Figure 5.

F.6. Decommissioning

Modern wind turbine generators typically have a life expectancy of 20 to 25 years. The current trend in the wind energy industry has been to replace or "re-power" older wind energy projects by upgrading older equipment with more efficient turbines. However, if not upgraded or if the turbines are non-operational for an extended period of time (such that there is no expectation of their returning to operation), they will be decommissioned.

Decommissioning will consist of the following activities. Based on Iberdrola Renewables' experience, and consistent with its other projects, the decommissioning process for the Project would be as follows:

1. Prior to initiating decommissioning activities, provide decommissioning schedule to Town of Groton
2. Mobilize crane(s) to the site.

3. Dismantle and remove the rotor, nacelle and towers and transport entire Wind Turbine Generator off site.
4. Use an excavator to dig an 8-foot deep hole about 2/3 of the way around each foundation. Then with an air hammer or comparable equipment, the concrete foundations shall be removed to 18 inches below the surrounding grade in compliance with all applicable state and federal environmental regulations.
5. All the metal and cable shall be cut off below 18 inches at each foundation site so that there is nothing left in the ground above 18 inches below grade level. Where possible, the metal and cable items shall be separated and recycled.
6. Backfill the holes with the soil that was excavated and re-grade the foundation areas to as close as reasonably possible to the original ground contours. These areas shall be returned as close as reasonably possible to pre-construction conditions.
7. Remove all switchyard equipment from the site. Remove all concrete foundations, gravel and fencing, and re-grade area as close as reasonably possible to the original ground contours. Again, this area shall be returned as close as reasonably possible to pre-construction conditions.
8. Acquire approvals for transport of oversized/overweight loads from Project site. Coordinate with NHDOT prior to transport to confirm routes.

In addition to the foregoing, all decommissioned gearboxes, transformers, and hydraulic systems shall be drained of fluids and put into appropriate containers before tower dismantling, and shall be transported and disposed of in accordance with all state and federal environmental regulations. Moreover, to the extent that it is determined that it is more cost-effective to remove the turbine foundations using blasting techniques, a Blasting Plan shall be developed and prior approval shall be obtained from appropriate state and local regulators. Areas where subsurface components are removed will be graded to match adjacent contours, stabilized with an appropriate seed mix, and allowed to re-vegetate naturally. The Project has discussed agreements with the Town of Groton and the Town of Rumney, to address local concerns on road use, safety, emergency response, decommissioning, site access, and other issues. The Town of Groton agreement was the subject of a joint public hearing of the Zoning Board, Planning Board, and Board of Selectmen held December 16, 2009. The Groton Town Agreement is contained in Appendix 5.

This page intentionally left blank

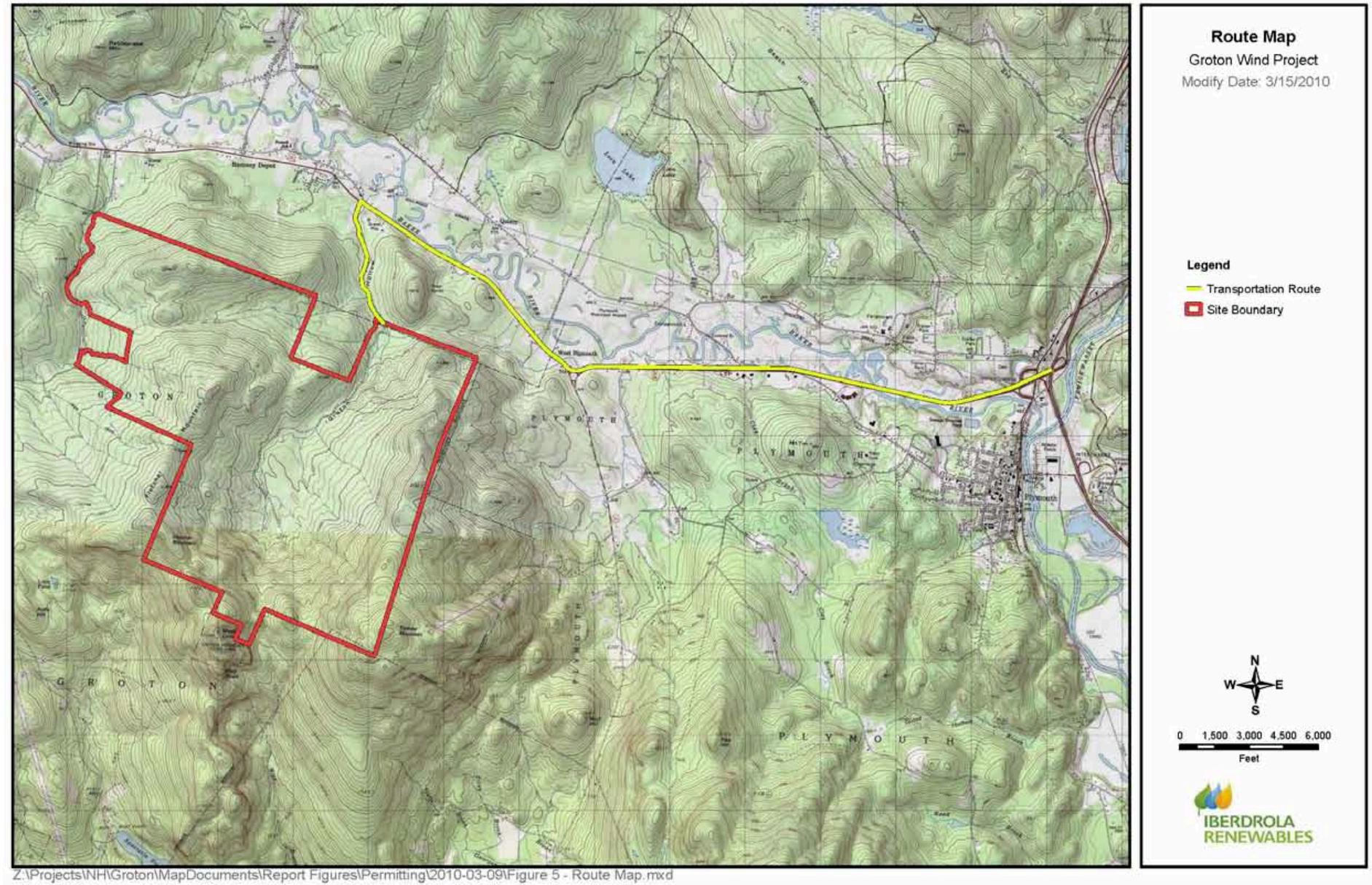

Figure 5: Groton Wind Route Map

G. Electrical Interconnection Line Information

The Groton Wind Project does not require an electric transmission line (as that term is used in RSA 162-H, i.e. a line of design rating of 100 kilovolts or more). Rather, the Project will interconnect with the PSNH Beebe River Substation. This line will be a dedicated 34.5 kV circuits that will run from the Project along the existing distribution system of the NHEC. Existing poles will be used where permissible under local utility standards. Otherwise, for those poles that PSNH or the NHEC indicate require replacement due to age or inadequacy (such as insufficient height), new poles will be installed and old ones removed after completion of line transfers. The standard pole height in New Hampshire for a 34.5 kV line varies from 45 to 55 feet, depending on the location and attachments.

G.1. Location shown on U.S. Geological Survey Map

Please see Figure 6.

G.2. Corridor width

G.2.(a) New route

Not applicable. The 34.5 kV line will follow existing distribution line routes.

G.2.(b) Widening along existing route

It is not expected that existing utility corridors and rights of way will require widening. Tree trimming to accommodate larger poles and meet current tree trimming standards is expected in some areas. These determinations will be made by PSNH and the NHEC.

G.3. Length of line

The interconnection line is approximately 13.0 miles long.

G.4. Distance along new route

Not applicable. The interconnection line is expected to run entirely on existing routes.

G.5. Distance along existing route

The interconnection line is approximately 13.0 miles long.

G.6. Voltage (design rating)

The interconnection line will be standard distribution level three-phase lines (34.5 kV). Bracket design and conductor design will be completed by NHEC according to their standards.

G.7. Any associated new generating unit or units

The generation units consist of 24 2MW wind turbines described in detail in sections E.3, F.1 and F.3.

G.8. Type of construction (described in detail)

The type of construction will be pole-mounted overhead line, at 34.5 kV rating, using conductor sizes as determined by NHEC. Line work, pole installation and removal, and line transfers are expected to be directed by local utilities, and paid for by the Project.

G.9. Construction schedule

G.9.(a) Anticipated start date

Interconnection line construction is planned to commence in late 2010, pending receipt of all necessary regulatory approvals.

G.9.(b) Scheduled completion date

Interconnection line construction is planned to be completed by Fall of 2011, depending on weather. Inclement weather and/or winter ice storms that call for utility crews to respond can affect the construction schedule.

G.10. Impact on system stability and reliability

Please see section F.3.e.

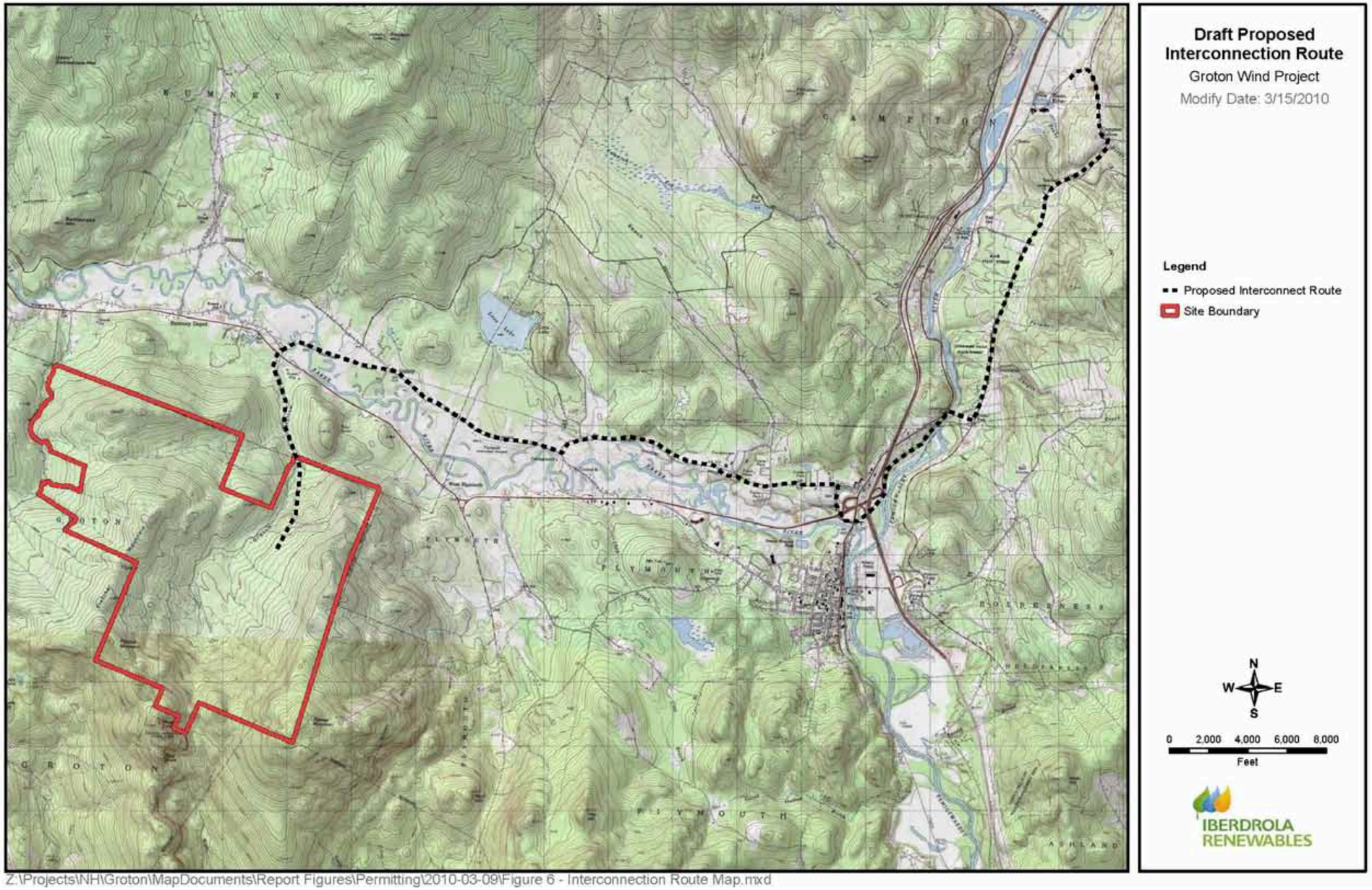

Figure 6: Proposed Interconnection Route Map

H. Additional Information

H.1. Description in detail of the type and size of each major part of the proposed facility

Access roads

Access roads will be constructed using the existing logging road at the end of Groton Hollow Road as depicted in Figure 3 and extending to the proposed Project staging area. This central logging road will be upgraded to support the project, including improving the gravel surface, grading, and drainage. Other portions of the roads to access the turbines will be new construction. Approximately 2.4 miles of existing roads will be upgraded and approximately 9.3 miles of new roads will be constructed.

Access roads leading up to the turbine strings will be gravel surfaced, and up to 22 feet wide. During the construction period, some of the access roads along the ridge will be widened up to 38 feet to accommodate movement of the turbine erection cranes. In steeper areas or in turns, the areas of disturbance may be wider due to required cuts and/or fills to achieve design grades or to accommodate delivery truck turning radii. After completion of construction, those portions of roads that are up to 38 feet in width will reduced to approximately 16 feet in width, with the reclaimed shoulder areas restored and reseeded using approved New Hampshire native seed mixes.

Turbines

The Project will consist of 24 wind turbines, each having a generating capacity of 2 MW. The height of each turbine from the base of the tower to the center of the rotor hub on top of the tower will be approximately 256 feet. The total turbine height measured from the tower base to the tip of the blade at its highest position will be approximately 399 feet. Additional information about the turbines is found in sections E.3 and F.1, F.2 and F.3 of this Application.

Crane pads

Crane pads will be installed adjacent to each turbine foundation and are typically 60 feet wide by 90 feet long. Although the pads will be primarily used during construction, they will be left intact for periodic post-construction use which may include maintenance, blade replacement and environmental monitoring activities.

Electrical collection system

The individual turbines are connected to a 34.5 kV collection system to form an integrated power collection system. The turbines operate in parallel. Each turbine is connected to a 2,350 kVA, 690-34,500 Volt GSU transformer and connection cabinet. Several turbines are loop connected through underground 34.5 kV collection circuits and then to 34.5 kV junction boxes to form a string loop. The junction boxes are then connected to the wind farm's switchyard via main-line collector circuit cables.

The electrical collection system will utilize both underground cable and overhead cable between the main-line collection circuits and the individual turbine locations. The collection system will generally be routed to follow the access roads developed for the Project, where practical. Electrical lines are designed to have as direct a route as possible. Underground cables will be installed in a trench approximately 4 feet in depth and will be accompanied by a fiber-optic cable for communication purposes. Overhead cable will be installed on single poles approximately 40 feet in height.

Junction boxes will be installed to connect portions of the electrical collection system and to make connections to the main-line collection circuits. Pull-boxes will be located along the roadway, to allow for installation of the fiber optic network, and to allow for maintenance.

A collection switchyard, located near the O&M building, will be the terminus of the Project electrical collector system, and will include required switching equipment, meters, and other equipment. The switchyard may be pole-mounted, given the limited amount of equipment required. The Project does not require a substation. The switchyard will include protective relay and control equipment, transfer trip equipment, disturbance analyzer equipment, transducers, remote terminal unit (RTU), and telemetry equipment, and meters. In addition, a grounding bank will be installed, in accordance with utility and NEC standards. Dedicated phone and data lines will be included, for data and communications between local utility facilities, and Iberdrola Renewables, Inc.'s operations center in Portland, Oregon.

Operations and maintenance building

An O&M building will be constructed within the Project area as depicted in Figure 3. This location provides for easy access to the site by operations personnel, as well as for access by utility personnel to the switchyard. The O&M building will be comprised of a single story building, approximately 4,000 square feet, suitable for operating personnel, operations and communication equipment, parts storage and maintenance activities. A vehicle parking area approximately50 by 75 feet will also be located near the O&M building. An area for outdoor storage of larger materials and equipment will also be included. The building will include offices and associated facilities (bathroom, kitchen, storage, HVAC) for wind farm technicians, a garage for spare parts and supplies, and a computer server room. The O&M building is expected to have a potable water well, sewage tank and leach field, hot water heater, HVAC, plumbing, electrical, computer, fiber optic, and telephone connections, and will be alarmed for fire, heat, and intrusion, in cooperation with the Groton and Rumney Fire departments.

Construction Laydown Yard

A laydown yard will be located off of Groton Hollow Road approximately 2 ½ miles south of the O&M facility. The laydown yard will consist of approximately 5 acres that will be graded and surfaced for use during the construction and commissioning of the project. The area would be used to accommodate construction trailers, storage

containers, project components and parking for construction workers. The O&M facility will provide additional construction office, material storage, and staging areas during construction. In addition, several staging areas for components are strategically located close to turbine locations.

Permanent meteorological tower

A permanent meteorological tower will be installed to obtain unobstructed wind data for wind turbine performance management. This tower will be self-supporting and approximately 80 meters (262 feet) in height. It will replace the existing temporary meteorological towers on the site.

H.2. Identification of the Applicant's preferred location and any other options for the site of each major part of the proposed facility

Iberdrola's senior management team has extensive experience developing wind projects throughout the United States, Europe, and Central America. Based on this experience, in combination with guidelines established by the National Wind Coordinating Committee, the American Wind Energy Association and the European Wind Energy Association, Iberdrola has developed a comprehensive and practical methodology for selecting wind project sites. In applying this methodology in the northeastern United States, Iberdrola's and Groton Wind's main selection criteria are as follows:

Adequate Wind Resources – Adequacy of wind is a detailed, iterative process that includes evaluation of wind maps, detailed modeling, and on-site data generated from meteorological towers. Adequacy of wind is not merely a function of wind speeds, but also of wind speed stability and consistency, wind direction and directional variability, seasonal and daily variability, wind shear, and turbulence potentially imparted by topographical features. Many areas that exhibit adequate wind speeds (quantity) prove to be inadequate due to the quality of the wind resource.

The process of evaluating a potential site and determining the expected net capacity factor of a wind project is a long process which often takes several years to complete. The meteorological data collection process takes several years and occurs throughout the life-cycle of the incipient wind project. The initial meteorological towers are strategically located in the project area to determine the scope and breadth of the wind resource throughout the area in representative locations, not just the locations which are expected to have the strongest mean winds. This is done to estimate the production of typical wind turbines, not just the peak performing turbines. After at least a year of meteorological data collection, a turbine layout is designed by the lead meteorologist. The turbine layout is optimized for energy efficiency according to available land, wind direction, and wind speed. Stringent setbacks are applied to prevent detrimental wake effects on nearby turbines. The layout is optimized utilizing state of the art wind modeling computer software to obtain the highest possible energy yield while respecting appropriate setbacks.

The strength of the wind resource is strongly correlated with topographic elevation. Thus, Fletcher and Tenney Mountains were selected as the proposed location for a wind project because they enjoy excellent potential for the cost-effective generation of emission-free wind- generated electricity in New Hampshire.

Environmental appropriateness – A wind project should fit into the entire local environment. The project location should be consistent with existing land uses on the prospective site as well as on neighboring lands; it should not compromise sensitive conservation lands or unique wildlife habitats. The project should seriously and carefully consider potential effects on local wildlife and vegetation, as well as on the region's scenic and recreational resources.

Community acceptance – Community support for the project is very important. The active participation of the local community in the development process is essential for a successful wind project. Community outreach is necessary to explain a proposed project, respond to questions, and engage in a conversation about wind power in general, and with respect to a particular site.

Grid-interconnection – Wind farms generally need to be sited in reasonably close proximity to the grid (utility transmission lines and/or 3-phase utility distribution lines), and preferably not on the periphery of the grid where local voltage stability can be a problem (e.g., at the end of smaller radial distribution circuits). It is also preferable to be close to an existing substation, which could simplify the grid-interconnection.

Transmission access – As part of the site selection process, Groton Wind performed background transmission and load-impact modeling in order to determine the feasibility of a grid interconnection at the proposed project location. Groton Wind utilized various models and analytical methods to assess impacts to utility transmission and distribution systems.

During the subsequent engineering and design phase, Groton Wind will contract with the host utility to perform more detailed load-flow, impact, and stability studies. The host utility will then, in cooperation with Groton Wind and its consultants, complete the design engineering needed to interconnect the Project into the transmission or distribution system. The final design must comply with the respective host utility requirements and other applicable IEEE, National Electrical Contractors Association (NECA), and Occupational Safety and Health Administration (OSHA) requirements.

Accessibility – The site must be accessible to construction equipment and heavy machinery, such as 400 ton-cranes, and the special-purpose trailers which transport tower sections, nacelles and other components. In order to limit the construction of new roads, and to minimize environmental impacts, sites with good existing road access are usually favored.

Competitive economics – Competitive project economics will be achieved with sites that have the best combination of key attributes such as a strong wind resource, which

is a requirement. Economic feasibility also depends on the presence of interested landowners who are willing to provide rights to both the site and the interconnection right-of-way (ROW) at reasonable costs. In addition, suitable soil conditions - and in some cases the potential for expansion - are among other considerations. There are a number of fixed costs for a wind farm that do not vary with size, i.e. whether there are 10 turbines or 100 turbines, some costs remain the same for both small and large projects. Such costs include most of the baseline environmental surveys, interconnection filing fees and studies, foundation design, and project engineering. Accordingly, projects must be sized appropriately to spread these fixed costs over a large enough number of turbines to make the project economic.

Other factors that Iberdrola Renewables and Groton Wind considered during preliminary and final Project placement/configuration include the following:

Distance from residences – The turbine locations maintain a minimum setback of approximately 2,700 feet between the tower and the nearest non-participating residence. This turbine setback minimizes potential visual and sound effects of the turbines on Project neighbors.

Distance from roads – The turbine locations will also maintain a minimum setback of at least 2,400 feet from public roads.

Wetlands and waterbodies – Project structures including the O&M Facility, temporary construction staging area, substation, and turbine foundations have been configured so as to avoid delineated federal jurisdictional or state regulated freshwater wetlands. In areas where this is not possible, all efforts to minimize the impact have been taken. Groton Wind has worked actively with the USACE and NHDES to minimize wetland impacts.

Communication interference– Turbines are sited outside of known microwave pathways and Fresnel zones (area around a line-of-site used to determine obstruction loss to communication signals) to minimize the effect that they may have on local communications.

Cultural resources – All Project components will be sited and Project construction will be conducted in such a way that does not cause any adverse physical effects on prehistoric or historic archeological resources, as recommended by the Project's Cultural Resources Specialists.

Wildlife habitat – During final turbine siting, Groton Wind worked to avoid critical wildlife habitat to the maximum extent practicable and works closely with the U.S. Fish and Wildlife Service (USFWS), New Hampshire Fish and Game (NH F&G), and other appropriate agencies and entities to minimize the effect the Project may have on critical habitats through minimization, avoidance and/or mitigation measures. The Applicant has consulted with the New Hampshire Natural Heritage Bureau (NHNHB) and has determined that there are no critical habitats within the Project area.

H.2.(a) Alternatives analysis

In addition to the above-mentioned factors that influenced the selection of the Groton Project site, the Applicant considered the impacts on wetlands that result from the construction of roadways to access ridgelines, installation of foundations, and erection of turbines. The specific methods and measures discussed below were used to avoid wetland impacts where possible, and to minimize these impacts where avoidance was determined to be infeasible.

On-site alternatives considered

On-site alternatives included a number of different potential turbine layouts, road configurations, electrical collector system designs, wind turbine types, and various potential locations for the O&M building, switchyard, and construction staging areas.

Alternative 1 – Larger project size

One alternative that was carefully considered was a larger project, potentially up to 80 MW in size, in which more turbines would be placed along Fletcher Mountain, and linked to additional potential land parcels to create a larger project. Groton Wind had brief discussions with other landowners to explore this alternative, and performed a desktop evaluation of wind resources. This alternative was ruled out due to very difficult engineering for road access for some portions of a larger project, a much greater length of road required, and a landowner who became disinterested in the Project. In addition, an 80 MW project would require a different approach for interconnection, and early analysis indicated that the potential options for a larger project would be very limited and very expensive. Groton Wind desired to keep the project at a level that would permit interconnection via the local electrical distribution system (i.e. 34.5 kV), and the larger project size would not have allowed that.

Alternative 2 – Different interconnection points

Groton Wind considered interconnection points at other locations, through internal analysis and discussions with ISO-NE, National Grid, PSNH, and NHEC. A key early alternative evaluated was interconnection into the 230 kV lines that transit Groton, just west of the proposed site. In working with ISO-NE and National Grid, it was determined that the relatively small size of the wind farm would not economically support construction of a new substation to step-up voltage to interconnect at the 230 kV lines; the costs estimated by National Grid were prohibitively high.

Discussions with NHEC determined that the existing Rumney Substation does not have adequate capacity for interconnection, and that a substantial upgrade of the substation would likely not resolve the issue, due to inadequate local load serviced from that substation.

Alternative 3 – Different turbine types

A number of modern wind turbine models and manufacturers were evaluated before selecting the Gamesa G87 model proposed for this Project. Alternative turbine models were evaluated for efficiency, reliability, cost, ease and cost of transport, and construction requirements. Groton Wind considered Mitsubishi, Suzlon, and General Electric wind turbines. The primary criterion for the evaluation was unit efficiency. Different wind turbines perform differently depending on the wind regime (speed, variability, wind shear, temperature and humidity). Groton Wind modeling of on-site wind data indicated that the Gamesa G87 would be the most efficient wind turbine for this site. In addition, the company's depth of experience in constructing and operating Gamesa turbines was judged to be a benefit, as was the use of identical turbines at the Lempster Wind Farm, because operations and maintenance can be more efficient when maintaining and operating the same type of turbine at different projects in relatively close proximity to one another.

Alternative 4 – Alternative layouts

A number of possible road configurations were evaluated for constructability, with the goals of minimizing wetland impacts, reducing cut/fill, meeting maximum allowable grades, minimizing total road linear feet, and making optimum use of the many logging roads, skidder trails, and landings that have already been constructed on the site. In order to understand the possible alternative configurations of the roadways, it is important to consider the engineering criteria required for the Project to be constructed and operated. The following lists the basic engineering design criteria applied to the development of the site plan:

ENGINEERING CRITERIA SUMMARY

Access Roads (Non-Crane Roads): "Access Roads" are used to bring construction equipment to the ridgelines. Because of the size of the trailers needed to transport wind turbine components these roads must adhere to specific requirements regarding their horizontal and vertical geometry:

- Finished gravel roads must be 16 feet wide with an additional 6 feet per collector system circuit on one side.
- Straight roads must have a maximum grade of 12 percent.
- Horizontal curves must have a maximum grade of 5 percent.
- Centerline turning radius of horizontal curves shall be 170 feet or more. Radii less than 170 feet may be allowed, but only in special cases. In these special cases, the road grade must typically be reduced below 5 percent and the road may need to be widened beyond 16 feet.
- The distance between horizontal curves must not be less than 150 feet.

- Vertical curves must be limited to a K value greater than 12.5 (i.e., be relatively flat).
- Vertical curves are not allowed in horizontal curves.

Ridge Roads (Crane Roads): These roads are constructed along the ridgelines to allow equipment to travel between turbine sites, including the fully assembled crane. Because of the size of the assembled crane, the ridge road must adhere to all of the criteria listed above, but must be wider than the access roads.

- Gravel roads must be 16 feet wide with an additional 22 feet cleared and compacted (no aggregate) on one side and 6 feet per collector system circuit.
- Width of clearing shall 4 feet beyond the limits of disturbance as described above. Area for drainage and stormwater shall be in addition to the dimensions identified above.
- Crane Pads: At each turbine location, a proper surface for the construction of the turbine towers must be created. These crane pads are intended to provide a stable base from which the construction crane can operate. In order to serve this purpose, the crane pads must adhere to the following criteria:
- Crane pads must be approximately 60 feet by 90 feet.
- The turbine foundation should be level with the crane pad, but can be no lower than 3 feet below the crane pad.
- Crane pad length must be parallel to access road direction of travel. Rotor clearing area must be located on the same side of the road as the crane pad.
- For crane pads at the end of a road, the pad length shall be parallel to access road or spur road direction of travel. Crane pad centerline and road centerline must match.

Alternative access road layouts

The criteria above were used by Project engineers to develop the design plans for the Project. Several different alternatives were considered in arriving at the proposed Project design as described below.

Access to the West Ridge from Halls Brook Road

Groton Wind evaluated an access approach whereby the eastern turbines located on Tenney Mountain would be accessed via Groton Hollow Road and the primary log access road, and western turbines (Fletcher) would be accessed via Halls Brook Road, upgrading existing rough haul roads and constructing a new road.

A concept drawing of two potential alternative alignments for access from Halls Brook Road is presented in Figure 7. This is also included as Figure 13 of the wetland permit application in Appendix 1. However, these alternatives were ruled out for the following reasons:

Halls Brook Road is excessively narrow and has low-radius curves which would have required reconstruction in order to allow construction equipment to safely navigate the road. It was determined that a significant upgrade to Halls Brook Road would have been required, which would have had an adverse effect on Halls Brook.

These alternatives did not meet engineering specifications due to excessive steep grades on the western slope of Fletcher Mountain, which would result in the need to lengthen the access road and result in overall higher project costs and environmental impacts.

In addition, under this alternative, potential logistical challenges would arise from having split access to the facility, including turbine component delivery, construction materials, and spreading construction traffic across more local roads.

Access to the East Ridge via Tenney Mountain

Located on the eastern slope of Tenney Mountain is an existing ski area. Roadway infrastructure is already in place to allow access to Tenney Mountain from NH Route 3A. However, the study ruled out this alternative in favor of access from Groton Hollow Road for the following reasons:

The existing access road from NH Route 3A has grades from 12 percent to as much as 18 percent. While these grades are manageable for vehicles attempting to access the ski area, they are too steep for the transporting of the wind turbine components.

The use of the ski area access road could create traffic and safety conflicts between the users of the ski area and wind farm construction and maintenance traffic.

In addition, under this alternative, potential logistical challenges would arise from having split access to the facility, including turbine component delivery, construction materials, and spreading construction traffic across more local roads.

Alternative Access Roadway Alignments from Groton Hollow Road

As discussed above, the design of the Project followed an iterative process. The early stages of the process involved development of base drawings to include site specific topographic mapping where available, delineated wetland locations, stream locations, and property boundaries for the Project Site. Conceptual designs were developed that took these factors into account; as many as seven (7) major alternative route alignments were developed during the process of arriving at the proposed Project layout. Figure 8 shows some of the

major preliminary alternatives that were considered through a systematic review of the alternatives. Figure 8 is also included as Figure 14 in the wetland permit application (Appendix 1). A brief summary of the major preliminary alternatives for each of the three ridges involved in the Project follows.

East Ridge Access

ALTERNATIVE E-1

This alternative diverges from Groton Hollow Road approximately 4,250 feet beyond the Project Site property line. Some of the reasons this route was rejected include:

- A new bridge would be required to cross the stream adjacent to Groton Hollow Road;
- The road is +/-11,700 feet long which is much longer than the selected road and therefore poses greater environmental impacts and cost to the Project;
- Profile of alignment reveals a +/-30 foot cut at bottom of hill, and substantial fill sections (+/-70 feet); and
- This alternative impacts an additional property (Lot 9-8).

ALTERNATIVE E-2

Crosses Groton Hollow Road stream at same point as E-1, and so has some similar issues, which eventually led to its dismissal:

- A new bridge would be required for stream crossing;
- Profile of current alignment reveals substantial cuts (+/-80 feet) along lower portions of road;
- Existing grades north of Turbine E1 are too steep for this approach to be feasible; and This alternative impacts an additional property (Lot 9-10).

ALTERNATIVE E-3 (PROPOSED ALIGNMENT)

This alignment utilizes the existing Groton Hollow Road stream crossing and elevation to its fullest. Eventually, this alternative was selected for further engineering and became the proposed alignment for access to the East Ridge. Figure 8 shows some of the adjustments to the original alignment that were made to minimize environmental impacts and optimize the road grades. Some of the reasons this alternative was chosen include:

- It uses an existing bridge across Clark Brook;
- It minimizes the number of stream crossings relative to Alternative E-4;
- Beginning at +/-El. 1,250 feet, it allows for shortest route to midpoint of East Ridge Crane Road;
- The road length is +/-8,400 feet (requires +/-8,000 linear feet upgrade to Groton Hollow Road); and

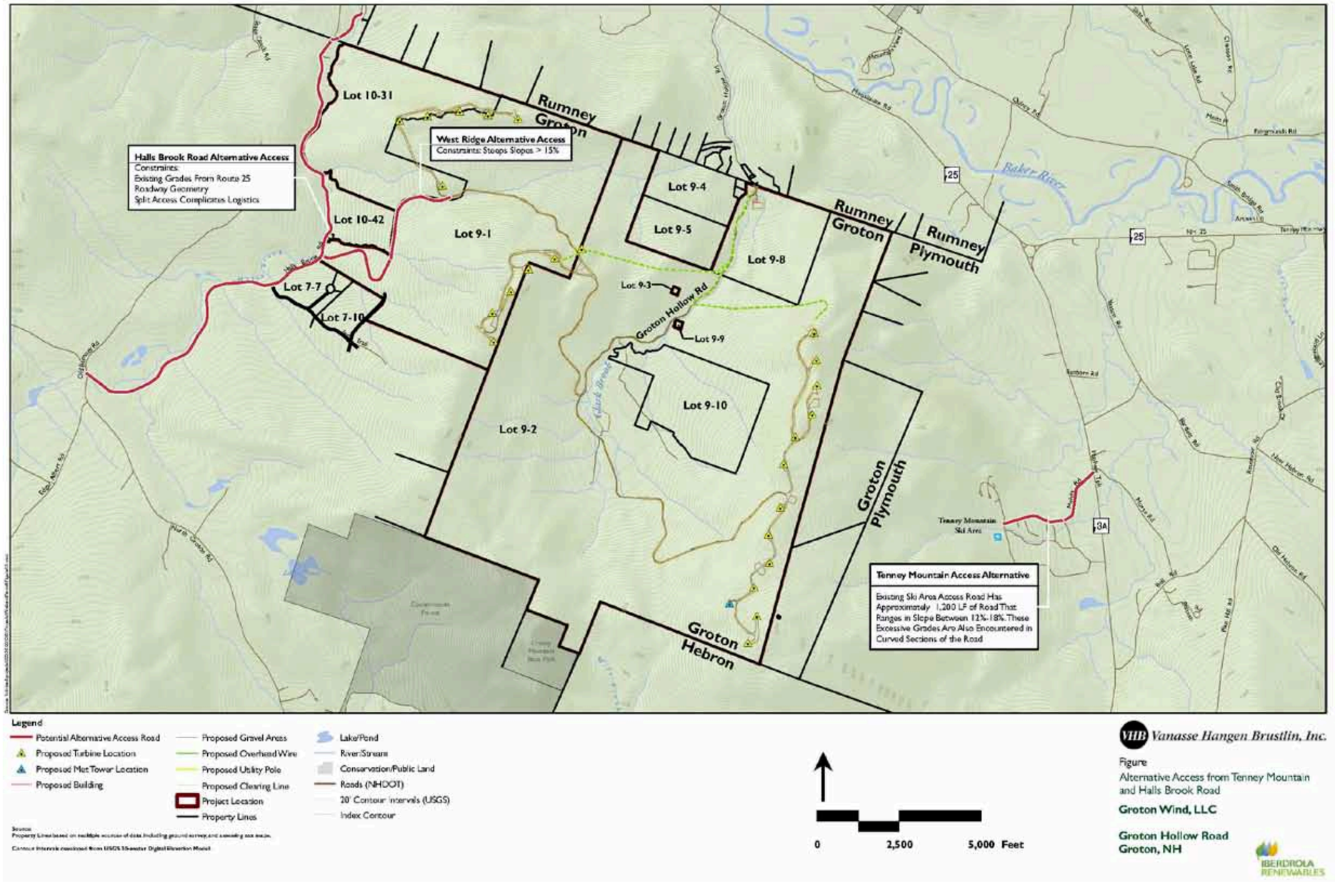

Figure 7: Alternative Access from Tenney Mountain and Halls Brook Road Map.

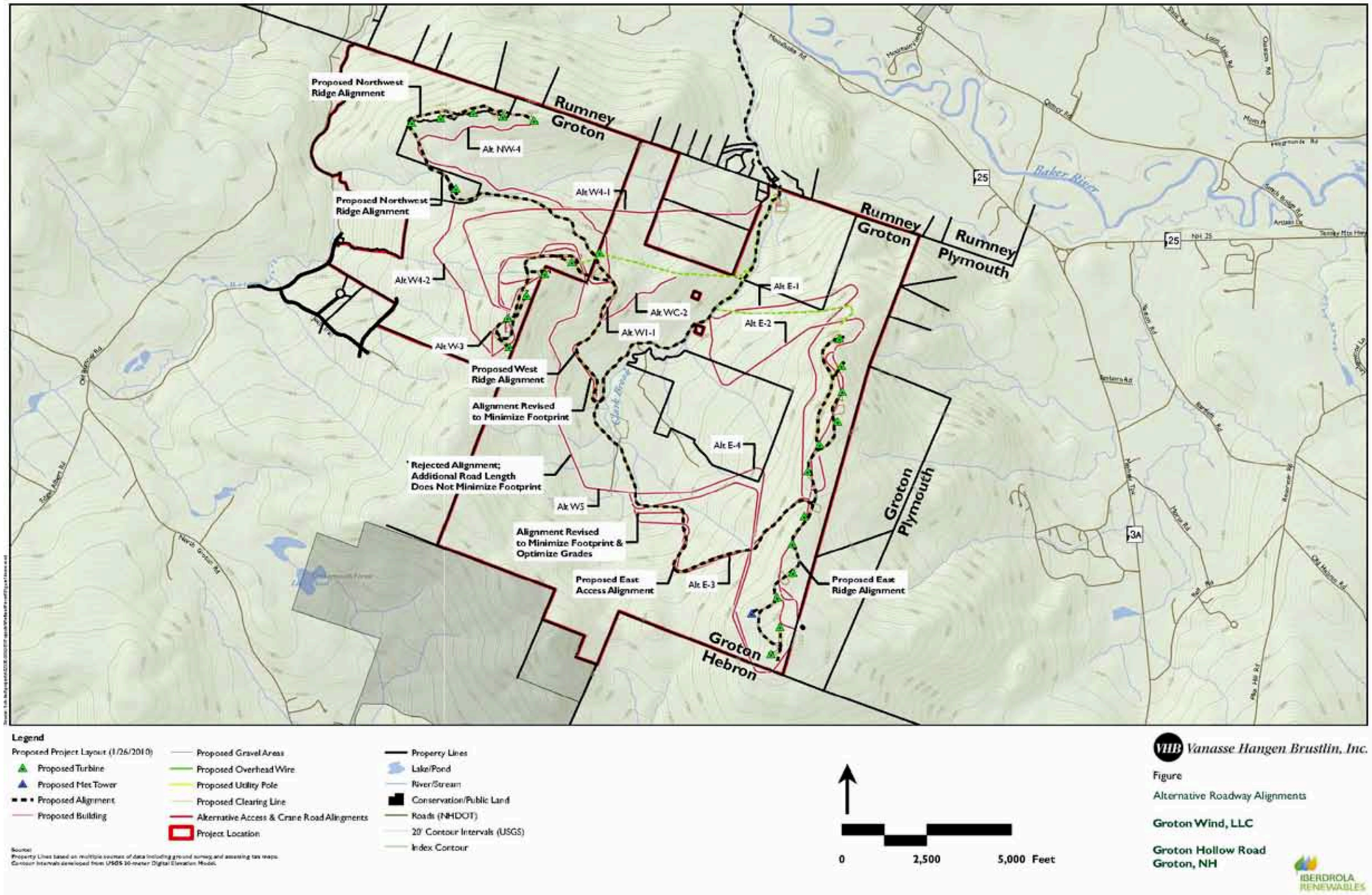

Figure 8: Alternative Roadway Alignments Map

- It minimizes cuts relative to other potential alignments; fill sections were minimized by iterative adjustments to alignment.

ALTERNATIVE E-4

This alignment uses the same end point of Groton Hollow Road as a starting point, so it also takes advantage of the elevation of Groton Hollow Road as well as the existing bridge crossing of the brook. However, this alternative was eventually rejected in favor of Alternative E-3 for the following reasons:

- The alignment required encroachment on two property boundaries to the south and east of the Project site;
- Due to grade issues, this road would need to be longer than Alternative E-3. At +/10,400 linear feet, the road would be about 2,000 feet longer and would therefore require more clearing and grading; and
- Profile of existing alignment reveals substantial cuts/fills.

West Ridge Access

ALTERNATIVE W-1-1 (PROPOSED ALIGNMENT)

This alternative diverges from Groton Hollow Road approximately 1.8 miles from the northern property line, and turns sharply to the southwest to begin climbing the west ridge. This route was eventually selected over other alternatives for further engineering and became the proposed alternative. Among the reasons for its selection:

- At +/-9,800 linear feet, it is the shortest feasible route from Groton Hollow Road to the West Ridge;
- It avoids stream crossings that are associated with other routes (e.g., Alternative W-5); and
- It minimizes grading requirements.

ALTERNATIVE W-2 (NOT SHOWN)

This alignment utilizes the same access point off Groton Hollow Road as W-1-1, but attempts to shorten the ascent to the crane road by ascending from the south end of the steep east face. This Alternative was eventually rejected because the conceptual profile revealed a substantial cut (+/-90 feet) approximately half way up the road, with even larger cuts at the top. It was concluded that ascending the top of the west ridge from its east side is not feasible for an access road.

ALTERNATIVE W-4-1

This alignment follows an existing woods road known as “Coursey Lane” entering from Groton Hollow Road further to north than any of the other alignments. It was developed to take advantage of the existing road footprint and to try to access both the west and northwest ridges from a single road, but was eventually rejected for the following reasons:

- The road is long (+/-12,900 linear feet) and appears to end +/-90 feet short in elevation, requiring an additional +/-1,000 feet of roadway;
- Profile of current alignment reveals substantial cut and fill sections (+/-80 feet) along the bottom as well as near top of the alignment;
- The alignment crosses three perennial streams;
- It impacts two additional properties (Lots 9-4 and 9-5);
- The existing drive off of Groton Hollow Road would require regrading to meet slope requirements, and would potentially have a significant impact on the small house lots at the northeast corner of Lot 9-4.

ALTERNATIVE W-4-2

This alignment uses the same existing driveway as W-4-1, but stays on the existing woods road longer before making a climb to the west ridge. It has several of the same issues as Alternative W-4-1, and therefore was rejected for similar reasons.

ALTERNATIVE W-5

This alignment uses the end of Groton Hollow Road as a starting point. This is also a potential staging area/starting point for the East Ridge access road. Beginning at the highest elevation on Groton Hollow Road, it has the shortest vertical climb. But, this alignment was rejected because it requires +/-12,800 linear feet of new road which does not minimize the amount of clearing and grading nor wetland impacts; it would require up to four new stream crossings.

H.2.(b) A description in detail of the impact of each major part of the proposed facility on the environment for each site proposed

Groton Wind has designed the Project to avoid environmental impacts where possible. A full description of studies conducted to assess impacts and minimize potential negative impacts is discussed in sections H.4 and I.1-5. Access roads were sited to maximize to the extent practical the use of existing areas that have been cleared in connection with current logging activities. In some instances clearing for new roads is necessary to minimize other environmental impacts including avoidance of wetlands and vernal pools. Turbine areas will also require some tree clearing and were also sited to avoid wetland and vernal pool impact to the extent practical. Further information and specific details are contained in the Joint USACE/NHDES Standard Dredge and Fill Permit Application and Alteration of Terrain Permit Application found in Appendices 1 and 2, respectively.

H.3. A description in detail of the Applicant's proposals for studying and solving environmental problems

Iberdrola Renewables has implemented a corporate Avian and Bat Protection Plan (ABPP), which is attached in Appendix 16. This is the wind industry's first and only company-wide Avian and Bat Protection Plan and was released in conjunction with the

USFWS in October 2008. Iberdrola Renewables' ABPP plan is modeled in part after the 2005 Avian Protection Plan template developed by approximately 30 electric utility companies, numerous electric cooperatives and rural utilities, and the USFWS to address impacts of transmission and distribution lines on birds. The Iberdrola Renewables ABPP applies those principles to its wind fleet and also addresses bats as well as birds. It contains a corporate policy concerning wildlife protection and establishes a process for early consultation with agencies for project evaluation. It also establishes internal policies for pre- and post-construction monitoring and proper site design, impact assessment, permit compliance, nest management, training, mortality reduction measures and mitigation. The ABPP press release includes then USFWS Director H. Dale Hall's statement that "The U.S. Fish and Wildlife Service commends Iberdrola Renewables for seeking ways to minimize bird and bat deaths at their wind turbine facilities while pursuing renewable energy development in an environmentally responsible way. Through their avian and bat protection plan, drafted in consultation with the Service, Iberdrola Renewables is the first wind energy company to incorporate a voluntary set of principles in a formal plan to reduce wildlife impacts. The plan's principles, similar to ones originally developed by the electric utility industry to minimize bird electrocutions and power line collisions, will reduce risk to birds and liability under the Migratory Bird Treaty Act."

With this USFWS-approved framework in mind, Groton Wind created a Proposed Work Plan for Avian and Bat Studies, Appendix 17. This was shared with both the USFWS and NH F&G and discussed with both agencies in detail on March 4, 2009. At that meeting, both agencies made suggestions which are captured in Meeting notes (See Appendix 18). NH F&G followed up with an e-mail suggesting additional studies for deer, potential Blanding's turtles, and brook trout which were also implemented in 2009. Additionally, as requested, Groton Wind followed up with agencies on requested study designs. At the request of NH F&G, a meeting between Groton Wind, its consultant, Stantec, New Hampshire Audubon, and NH F&G was held on April 15, 2009 to initiate development of the work plan for the state listed Peregrine Falcon. A work plan was approved by Audubon on June 3, 2009 and later discussed with NH F&G. All of these correspondences can be found in Appendix 19. Completed studies were submitted to both USFWS and NH F&G for their review no later than January 11, 2010.

In addition to the Avian and Bat studies, Groton Wind discussed wetland delineations and vernal pool mapping with NH F&G at the March 4, 2009 meeting. Per NH F&G recommendations, these activities commenced soon after.

In June 2009, a database inquiry of the NHNHB's online "DataCheck Tool" indicated that the Project site had the potential for rare species. On June 23, 2009, a request for a file review was submitted to the NHNHB. The NHNHB provided the results of its review on the following day, June 24, 2009. The NHNHB review indicated that there are no known state or federally listed species within the Project limits, nor are there any exemplary natural communities occurring within or in close proximity to the Project

area. However, the NHNHB data did indicate there are populations of the wood turtle (*Glyptemys insculpta*) and the peregrine falcon (*Falco peregrines*) in the vicinity of the site. In addition to these two species of concern, coordination with the NH F&G identified the potential for a native population of brook trout in Clark Brook as well as the potential for deer wintering habitat ("deer yards") on the Project site as potential concerns.

In response to these concerns, Groton Wind conducted a Wildlife Habitat Assessment on the Project site in the spring, summer and fall of 2009. This assessment is provided as Appendix 20, and is discussed in Section 1.5.b.iii below.

Groton Wind met with the USACE, New England District, to review the Project and regarding guidance for avoiding wetlands. Meetings occurred on August 25, 2009, October 15, 2009, and a site tour to Groton was held on October 21, 2009. Additionally, wetlands information was discussed with the NHDES, NH F&G, USFWS, and USEPA in early October 2009. A copy of the minutes of those meetings is found in Appendix 21. These consultations have provided valuable information for Project layout optimization, impact minimization and mitigation.

Groton Wind met with staff of the NHDHR in mid October 2009 to introduce the Project and discuss federal agency involvement. At this meeting, NHDHR assigned review number R&C #1422 to the Project which initiated review. Per NHDHR's request, the Project met with USACE in late October 2009 to discuss the Project area in relation to cultural and historic resources.

Additionally, Groton Wind has hired an accomplished landscape architect firm and acoustic engineering firm to conduct visual and sound monitoring. Preliminary results were shared with the Town of Groton and members of the public at the open house on October 7, 2009. Groton wind received valuable comments from area residents on suggested visual location points, points of interest, and map clarifications. This information was also provided to USACE in 2009 at their request.

Section I. contains additional information regarding the Applicant's proposals for studying and solving environmental problems.

H.4. A description in detail of the Applicant's financial, technical and managerial capability to construct and operate the proposed facility

Groton Wind, LLC is a limited liability company organized for the development and ownership of this Project. It is 100% owned by Iberdrola Renewables, Inc. (IBR). IBR's parent company is Iberdrola Renovables, a publicly traded company on the Madrid stock exchange and the largest owner and operator of renewable energy projects in the world. Iberdrola Renovables is, in turn, 80% owned by Iberdrola, SA, the second largest integrated utility company in Spain engaged in the generation, transmission, distribution and marketing of electricity and natural gas.

H.5. Description in detail of the applicant's financial, technical and managerial capability to construct and operate the proposed facility

H.5.(a) Applicant's financial capability

As the owner of Groton Wind, LLC, Iberdrola Renewables, Inc. finances the construction costs of its wind farms through equity investments provided by Iberdrola S.A. Iberdrola S.A. maintains a corporate bond rating of A- from Standard and Poor's and A3 from Moody's. Iberdrola Renewables, Inc. has the capability to provide adequate assurances, guarantees, financing and insurance for the Project's development, construction and operation. Iberdrola Renewables, Inc. currently funds all development activities for the Project, and, through Iberdrola S.A., will arrange for the capital needed for construction finance, equipment orders, and long-term investment in the Project.

H.5.(b) Applicant's technical and managerial capability

Iberdrola, SA is based in Madrid, Spain, operates in more than 40 countries and has over 45,000 MW of installed capacity, including the wind generation capacity of Iberdrola Renovables.

As of February 2010, Iberdrola Renovables had 10,700 MW of installed wind capacity worldwide, with 3,591 MW of that capacity in the United States. Forty-nine percent of Iberdrola Renovables' installed capacity is in Spain, with the rest located in the United States, the UK and other countries in the European Union. This represents 1/12 of the total world's wind capacity. Iberdrola Renovables also maintains the world's largest development pipeline, with over 57,000 MW of sites in various stages of development.

Iberdrola Renewables, Inc. has successfully financed, constructed and operates 40 wind energy facilities in the United States including the Lempster Wind Project in New Hampshire. Appendix 22 is a full list of Iberdrola Renewables, Inc. owned and operated projects in the United States. Iberdrola Renewables maintains world-leading expertise in managerial and technical capabilities related to wind power projects. Iberdrola Renewables has a full in-house construction management staff, including Project Managers, Site Managers, Superintendents, and Quality Assurance inspectors. This level of experience and technical depth is supported by a number of standardized construction sequence plans to ensure efficiency, shorter timelines, and minimized disruption to area communities during construction.

Groton Wind will construct and operate the Project consistent with Iberdrola Renewables' corporate commitment to meeting all applicable state and Federal OSHA safety regulations. Each turbine and all electrical equipment will be inspected under rigorous commissioning procedures. In addition, the interconnecting utility will also perform and require inspections, testing, and commissioning documentation for grid and system safety, prior to line activation.

Once turbines are commissioned, qualified personnel will routinely inspect and repair them as necessary pursuant to preventive maintenance schedules.

The Project will be operated and maintained by a team of approximately 5 to 6 full-time, locally-based O&M personnel. The O&M team will staff the Project during normal working hours, with weekend shifts and extended hours as required to maintain operations. Iberdrola Renewables, Inc. operates its wind farms with its own employees, and trains all employees in safety regulations and procedures, operational standards, and applicable staff certifications.

The Project's central supervisory, control and data acquisition (SCADA) system provides remote operation of the wind turbines and collects operating and performance data 24 hours per day. In the event of turbine or plant facility outage, the SCADA system sends alarm messages to on-call technicians via pager or cell phone to notify them of the outage. The Project will have an on-call local technician who can respond quickly in the event of emergency notification or critical outage. Wind farm turbines are managed via computer controllers installed in each unit. In the event of a unit trip (caused by electrical error, high winds, icing, etc.), the turbines automatically are tripped via computer. Re-starts require personnel to go the specific turbine site.

In addition to local staff, Iberdrola Renewables, Inc. has a control center located in Portland, Oregon (the IBR Operations Center) that is staffed 24 hours a day, 7 days a week. Along with Iberdrola Renewables' other projects located throughout the country, the IBR Operations Center will continuously monitor and control the Groton Wind Project.

H.6. A statement of assets and liabilities of the applicant

Please refer to Figure 1 which contains a redacted copy of Groton Wind, LLC's financial statement. An unredacted copy of this document will be filed with the Site Evaluation Committee with a Motion for Protective Order.

H.7. Documentation that written notification of the proposed project, including appropriate copies of the application, has been given to the governing body of each community in which the facility is proposed to be located

The Town of Groton Board of Selectmen will be provided a copy of this Application at the time it is filed with the Site Evaluation Committee. The Applicant will file a copy of the return receipt or other documentation of receipt with the Site Evaluation Committee and has reserved Appendix 23 for this documentation.

H.8. Consistency with state energy policies

The Project is consistent with and promotes several important public policy goals. For example, the Project will assist the state in meeting the requirement in RSA 362-F, New Hampshire's renewable portfolio standard (RPS) law, that 25% of the electricity sold

by retail suppliers in New Hampshire come from renewable sources by 2025. The Project is consistent with the purpose of the RPS statute articulated in RSA 362-F:1: it provides fuel diversity to the state and the region's generation supply through the use of a local renewable resource that is completely emission-free (i.e. the wind) which can displace and lower regional dependence on fossil fuels, thereby stabilizing volatile energy costs; the Project will aid the local and state economy; and because it will emit no air pollutants, it will help to reduce the amount of greenhouse gases, nitrogen oxides and particulate matter emissions generated in the state, thereby improving air quality, public health, and mitigating against the risks of climate change.

In addition to promoting the public policy goals embodied in the RPS statute noted above, the Project will assist in addressing the issue of climate change which the New Hampshire Legislature has determined is a significant environmental problem that can be addressed through reducing greenhouse gases such as carbon dioxide, which is produced by electricity generators. See RSA 125-O:19 et seq. Because the Project will produce electricity without producing greenhouse gases, it is therefore consistent with and complimentary to the Regional Greenhouse Gas Initiative (RGGI) which is aimed at reducing greenhouse gas emissions resulting from energy use in New Hampshire and other northeastern states. By generating electricity without using fossil fuels, the Project will assist in addressing the important issue of climate change.

I. Potential Effects and Mitigation Plans

I.1. Aesthetics

I.1.(a) Visual impact

A Visual Impact Assessment (VIA) was prepared by Environmental Design and Research (EDR) for the proposed Project and can be found in Appendix 24 of this application.

The visual study area for the Groton Wind Power Project was defined as the area within a 10-mile radius of each of the proposed turbines. This study area totals approximately 400 square miles in Grafton County and includes all or portions of the Towns of Groton, Plymouth, Alexandria, Bridgewater, Rumney, Wentworth, Campton, Ellsworth, Dorchester, Warren, Thornton, Bristol, Holderness, Orange, Ashland, Canaan, Danbury, Hebron, and New Hampton. This area includes 15 sites or districts listed on the National Register of Historic Places, three state parks, nine state forests, five state wildlife management areas, the White Mountain National Forest, two designated scenic byways, several major water bodies, and several designated trails.

Land use within the 10-mile radius visual study area is dominated by forest land. However, in many areas the forest is interspersed with rural residences, including frontage development along the existing roads and rural subdivisions. Farms are relatively uncommon and largely restricted to the Baker River Valley. Small areas of agricultural land are located west of Bristol, on the outskirts of Hebron, and in other locations scattered throughout the study area. Higher density residential and commercial development is concentrated in the village areas of Plymouth, Bristol and Ashland, and several smaller settlements, such as the hamlet areas of Rumney, Hebron, and Dorchester. Nine distinct Landscape Similarity Zones (LSZ's) within the visual study area were established as well as viewer/user groups.

The topographic viewshed analysis was created which utilized U.S. Geological Survey (USGS) digital elevation model (DEM) data, the height of the proposed turbines, and a computer program (ArcView® with the Spatial Analyst extension) to determine locations where the Project would be potentially visible (ignoring the screening effect of trees and structures). Potential daytime visibility was based on a blade tip height of 399 feet, while potential night time visibility was based on the FAA obstruction warning light height of 259 feet (only for those turbines proposed to be lighted).

To more accurately account for the screening effect of forest vegetation, a vegetation viewshed analysis was also prepared for the proposed turbines. The vegetation viewshed analysis involved creation of a vegetation layer based on the location of mapped forest vegetation as indicated in the USGS National Land Cover Dataset. Based on standard visual assessment practice, this

vegetation layer was assigned a conservative height of 40 feet, (even through much of the forest within the study area exceeds this height) and added to the digital elevation model to produce a base layer for the viewshed analysis, as described above. Once the viewshed analysis was completed, the areas covered by the forest vegetation layer were designated as "not visible" on the resulting data layer to reflect the fact that views from within forested areas will be generally well screened by the overhead tree canopy during both the growing season and the "leafs off" season.

To further illustrate the screening effect of vegetation and structures within the study area, four line-of-sight cross sections (ranging from 13.4 to 18.2 miles long) were cut through the visual study area. Cross-section locations were selected to allow evaluation of potential Project visibility from public resources such as trails, water bodies, historic sites, residential areas, recreational areas, and areas of intense land use.

To more accurately evaluate potential visibility of the proposed Project, areas within a 10-mile radius of the turbines were visited in the field. Photo documentation of potential Project visibility was obtained from 180 representative viewpoints within the study area. Existing communication and meteorological towers on the Project site were used as locational and scale references when verifying potential Project visibility in the field.

From the 180 viewpoints documented during field review, photos from 11 viewpoints were selected for use in the development of visual simulations. Viewpoints were selected because they provided open views of the turbines from identified aesthetic resources, and/or were representative of the viewer/user groups and LSZs within the study area that are most likely to have views of the proposed Project. To illustrate the anticipated visual changes associated with the proposed Project, digital models of the proposed turbines were prepared based on Project plans and specifications. The models were used to create realistic photographic simulations of the completed Project (24 turbines and associated vegetation clearing) from each of the selected viewpoints using AutoCAD® and 3D Studio Max® software.

The visual impact assessment methodology utilized on this Project involved completion of a simple visual contrast rating form developed by EDR. This form is based on a visual contrast methodology developed by the U.S. Department of the Interior Bureau of Land Management (BLM), and has proven effective in the evaluation of the visual impact of commercial wind power projects in the state of New York. The form provides for the description of existing scenic quality, viewer sensitivity, and variable effects such as viewing angles and atmospheric conditions, in addition to the actual rating of contrast between the proposed Project and the existing view. The procedure involves using a numerical contrast rating system to compare representative views with, and without, the proposed

Project in place and quantifying visual impact. Registered landscape architects (from EDR's staff) evaluated the visual impact of the proposed Project using the simplified BLM methodology. The VIA evaluation involved viewing and rating 11"x17" color prints of the views with and without the Project in place from each of the selected representative viewpoints.

Based on the results of the analyses described above, the VIA concluded that the proposed Project is likely to be visible from only a small portion of the visual study area. However, it will be visible from several identified public resources, and is likely to have an effect on the visual/aesthetic character of some mid-ground views within the study area.

Field review confirmed the results of the vegetation viewshed analysis and cross section analysis, and revealed that views of the proposed Project site are largely restricted to open road corridors, agricultural fields, water bodies, areas of exposed rock, and the cleared yards of some rural homes. From the north, views of the Project site were available from several locations on Routes 25 and 3A (River Heritage Trail Scenic Byway) between West Rumney and Plymouth. Views were also available from other roads in the Baker River valley, including Quincy Road and Fairgrounds Road. Other locations north of the Project site where open views were documented included Rattlesnake Mountain, the hamlet area of Rumney, a short stretch of Stinson Lake Road (near Stone Hill Road), and a few open sites along Rumney Road. Although the actual shoreline could not be accessed, field review indicated that views of the Project from the north shore of Loon Lake are also likely.

Open views to the east were available from portions of Interstate Route 93, portions of Route 3A near Tenney Mountain, and a small section of Route 175 between Holderness and Plymouth (Lakes Tour Scenic Byway). Views were also available from some homes with open yards on local roads in the Towns of Plymouth and the Town of Holderness. No open views toward the site were documented in the town center/village areas of Plymouth or Ashland. Views from the south were available from the southern and western shores of Newfound Lake including Wellington State Park, some roads through agricultural areas west of the village area of Bristol, and on the outskirts of the hamlet area of Hebron. Views from the west of the Project site, including the Town of Groton, were essentially non-existent.

Visual simulations prepared from selected public resources and representative landscape settings within the study area showed a range of Project visibility and visual contrast with the line, form, color, texture, and scale of the existing elements of the landscape (e.g., vegetation, land form, land use, etc.). Evaluation of these simulations by a licensed EDR landscape architect indicated that the Project's overall contrast with the visual/aesthetic character of the area will generally be moderate. Six of the 11 simulations received a contrast rating

of less than 2.0 on a scale of 0 (insignificant) to 4 (strong). However, appreciable contrast was noted in near mid-ground views (i.e., under 2.0 miles), where substantial numbers of turbines span the field of view, and/or where the turbines appear out of context/character with the landscape (i.e., in undeveloped forested areas). Based on experience with currently operating wind power projects elsewhere, public reaction to the Project is likely to be highly variable based on viewer proximity to the turbines, the affected landscape, and the viewer's personal attitude regarding wind power.

Mitigation

The following measures have been incorporated into the Project design to limit visual impact:

- The Project will be located in a remote forested area that essentially eliminates the opportunity for foreground views from public vantage points.
- The white color of the turbines generally blends well with the sky at the horizon.
- All turbines will have uniform design, speed, height, and rotor diameter.
- Towers will include no exterior ladders or catwalks.
- New road construction will be minimized by utilizing existing forest roads whenever possible.
- Forest clearing along access roads and at turbine sites will be minimized to the extent practicable.
- The placement of any advertising devices on the turbines will be prohibited.
- The proposed switchyard and O&M facility will be located on a lightly used private road that is well removed from any sensitive aesthetic resources.
- To provide connection with the grid, an existing overhead electrical distribution line will be upgraded, rather than building a new line.

I.1.(b) Shadow flicker

Predicted shadow flicker impacts of the Project were calculated using WindPRO 2.6 Basis software (WindPro), and associated shadow module. A copy of the analysis can be found in Appendix 25. The software and shadow module is a widely accepted modeling software package developed specifically for the design and evaluation of wind power projects. This was used to calculate the theoretical number of hours per year that shadow flicker would occur at any given location in the vicinity of the proposed Project.

The modeling program and input data used in the analysis predict shadow flicker under a "worst case" scenario. A worst case scenario would occur only when there are no clouds or fog, wind conditions allow continuous turbine operation, and the turbine rotor is continuously perpendicular to the sun and between the observer/residence and the sun. This analysis is thus very conservative, as this worst case condition is not what residents would actually experience. In addition, daily and seasonal variations in sunlight conditions, seasonal variation in sun intensity and duration, and obstacles that block shadows (terrain, vegetation and buildings) are not considered in the analysis. In addition, it should be noted that at a distance beyond 10 rotor diameters (maximum of 870 meters or 2,854 feet for this Project), shadow flicker effects are essentially undetectable. Therefore, the shadow flicker analysis provides a conservative prediction of the shadow flicker effects of the proposed Project.

The analysis described above determined that of the 207 structures identified within 1.0 mile of a turbine, and evaluated in this study:

- 204 (98.5%) will experience no shadow flicker
- 1 (.5%) may be affected less than 1 hr/yr
- 2 (1%) may be affected 1-3 hrs/yr
- none will be affected more than 3 hrs/yr

Thus, the foregoing demonstrates that the shadow flicker impact for this Project is almost non-existent. This can be attributed to the fact the shadow receptors are, for the most part, quite distant from the proposed wind turbines, and shadows are often blocked by the mountainous terrain. It should also be reiterated that these calculations do not take into account any screening effects associated with existing site-specific conditions such as vegetation and/or buildings. Furthermore, this analysis assumes that there are windows on every side of the identified structures, and all identified structures are receptors/residences. Therefore, although already very low, the predicted levels of shadow flicker at these three receptors are almost certainly higher than the actual level that may be experienced.

I.1.(c) Wind turbine safety lighting

The VIA analysis discussed in section I.1.a and found in Appendix 24 also evaluated the visual effect of lighting. The white color of the turbines generally blends well with the sky at the horizon, and eliminates the need for daytime FAA warning lights. The FAA's guidance (DOT/FAA/AR-TN05/50 dated 11/05) on standards for obstruction lighting for wind turbine farms requires lighting the Project as one large obstruction with lights spaced approximately 3,000 feet apart, rather than lighting every structure over 200 feet in height. As a result, wind farms are lit with synchronized red pulsing lights at night and only a subset

of the turbines are lit. It is proposed that FAA lights will be placed on 11 of the 24 turbines. The proposed lighting map can be found in Figure 9.

Based upon nighttime observations of existing wind power projects, the red pulsing lights on the turbines may result in a nighttime visual impact on certain viewers. The actual significance of this impact from a given viewpoint will depend on the exact number of lights visible, what other sources of lighting are present in the view, the extent of screening provided by structures and trees, and nighttime viewer activity/sensitivity. It is possible that the synchronized pulsing of the red FAA warning lights on the turbines (where visible) could have an adverse effect on rural residents and vacationers that currently experience very dark nighttime skies in the immediate Project area. It should be noted, however, that nighttime visibility/visual impact will be limited by the abundance of mature trees that screen the Project from many homes, and the concentration of residences in town centers and along highways where existing lights already compromise dark skies and compete for viewer attention. In addition there are existing, lighted communications towers in the area and a new cell tower proposed in Groton.

Mitigation

To mitigate for any potential visual affect, Groton Wind will use lights that pulse 20 times per minute and have a vertical beam spread of 3 degrees, which is the lowest amount allowed by the FAA. This means that there will be more "dark space" between flashes and per minute and less ground scatter or "light noise" because less of the light from the beam reaches the ground.

I.2. Historic sites

As noted, the Project will require review by the USACE for wetland impacts. For the purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. § 470), the USACE is acting as the lead federal agency for the Project and will take into account any possible impacts of the Project on historic properties and will consult with the NHDHR regarding effects on properties that are listed, or eligible for listing, in the National Register of Historic Places (NRHP).

Groton Wind met with NHDHR in October of 2009 to initiate Project review. At this meeting, NHDHR assigned project number R&C# 1422 to the Project. A Phase IA archaeological survey which has been produced by The Louis Berger Group (LBG) of Albany, NY provides an initial review of the Project to assess areas of archaeological sensitivity and potential resource management issues. A copy of this report can be found in Appendix 26. This report has been completed and will be reviewed by the USACE and the NHDHR. For the architectural survey, the USACE is consulting with the NHDHR on an appropriate area of potential effects (APE) and scope of work for any architectural field survey within the APE.

The historic architectural survey has identified those historic properties listed on the NRHP and the New Hampshire State Register of Historic Places within a 3-mile APE for visual effects or viewshed. For this Project and in consideration of the proposed turbine height, an APE of three (3) miles has been proposed for the study area in which the proposed Project has the potential to insert visual effects that could diminish the setting of an historic property where the property's setting is a central feature of NRHP eligibility. As part of the work, a site file check was conducted at the NHDHR to research previously identified historic properties listed and/or eligible for listing on the National Register and New Hampshire State Register within the APE.

The preliminary perspective of the historic architectural survey suggests that a number of National Register-eligible properties may be located in the Project's APE (defined by the three-mile viewshed). Thus, the nature and extent of potential visual impacts of the proposed Project on historic buildings, structures and/or districts is still under review. The review of any potential visual impacts will continue by the USACE, in consultation with the NHDHR. It is important to note that no buildings or structures will be acquired or physically altered or removed by the Project, and thus impacts, if any, would be limited to those resulting from the visibility of the Project from the historic property.

Based on the findings of the Phase IA archaeological survey, a Phase IB archaeological survey of the area associated with ground disturbance is recommended to identify archaeological resources that could be affected by project construction. It is proposed that this work will be conducted during spring/summer 2010 in consultation with the USACE and the NHDHR and that the Applicant will provide information as to whether archaeological sites are present within the archaeological APE or the area associated with any proposed ground disturbance once the Phase IB survey is complete. Such information will provide the basis for determining the need for further work or mitigation (e.g., Phase II/site evaluation investigation, Phase III/data recovery excavation).

Based on the preliminary survey findings, this Project is not expected to have an unreasonable adverse effect on historic properties. No historic structures will be physically impacted, and at present it appears unlikely that the visibility of the Project would demonstrably diminish any aspects of setting that might contribute to the significance of such historic properties. In addition, the proposed Project is unlikely to have an unreasonable adverse effect on any significant archaeological resources as any resource will be identified and avoided.

I.3. Air quality

The Groton Wind Project will not combust any fuels to produce electricity and therefore will not create any air emissions or have an adverse impact on air quality. Moreover, as a source of clean, renewable energy, the Project will add a new power supply to the region without adding any new air pollutant or greenhouse gas emissions. It will positively contribute to regional air quality during those times when its

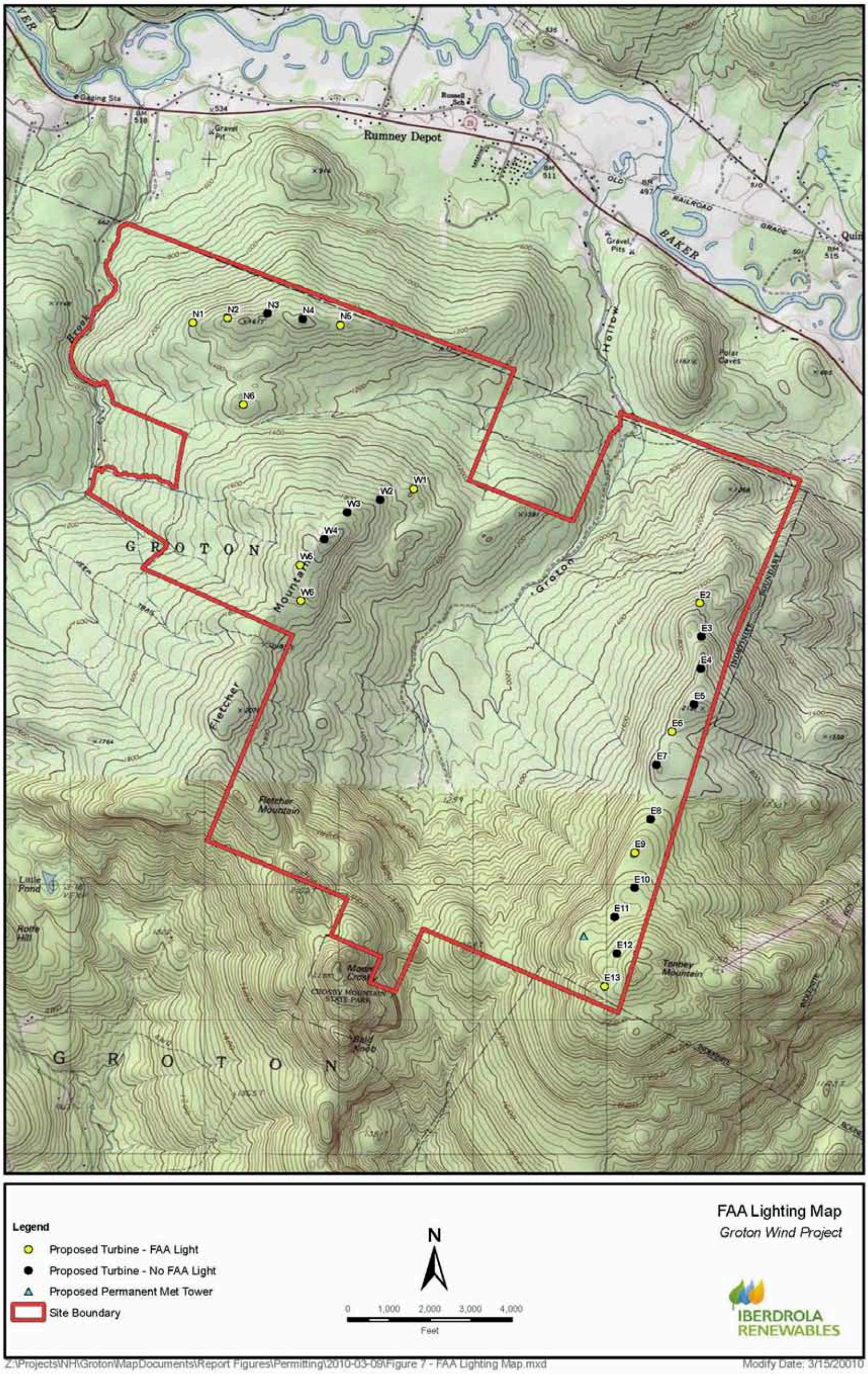

Figure 9: FAA Lighting Map

operation is displacing generation from fossil fuel electricity plants. Over the course of 20 years, the Project will generate the equivalent amount of electricity as is produced by combusting 700,000 tons of coal or 2.2 million barrels of oil. A document produced by the American Wind Energy Association entitled Comparative Air Emissions of Wind and Other Fuels which is submitted with this Application as Appendix 27 contains more details and statistics about the clean air effects of wind as compared with other energy sources.

The long-term environmental and public health problems associated with fossil-fueled power plant air emissions are severe and the statistics are compelling. Wind energy does not add to those problems and, in fact, can be a significant part of the solution. The Project's positive effects with respect to air quality should therefore be given significant consideration when balancing the issues of new facility siting, environmental protection and public health.

I.4. Water quality

I.4.(a) Surface water quality

Background & potential effects

Impacts on surface water quality from the Project include potential stormwater runoff and erosion from Project roads and facilities as discussed above. Total suspended soils are the potential pollutant of concern that must be addressed in both cases. To a lesser extent, gear and transformer oil are other potential pollutants as they are contained within the turbines and substations. Containment mechanisms, however, are incorporated into the design of each and these oils are therefore of much lower risk in terms of release to the environment. Surface water potentially impacted by the Project include wetlands, intermittent streams and small perennial streams. Streams are the primary surface water resource within the 4,180 acre study area (Figure 1 and Figure 10).

Study & mitigation

Many of the small headwater streams that will be crossed by the Project are intermittent and/or ephemeral in nature and have minimal water levels and thevalues of these water bodies are generally associated with support of aquatic life, wildlife, and limited recreational uses. Aquatic life and wildlife uses could be impacted in the immediate area of the culvert placement at each stream due to the altered nature of the new environment (i.e. within the culvert).

A culvert is a modified environment that may limit stream usage by some aquatic and wildlife species; however a culvert may create habitat for other species. Recreational uses will not be affected because the property is privately owned and because the small headwater streams do not offer much recreational opportunity. The Project should have no long term adverse effect on the water quality of these streams and may result in some improvements where a more stable road base and well designed culvert replace existing skidder trails.

There are no named lakes or ponds within this 4,180 acre study area. Within the valley and running in a parallel, albeit slightly sinuous, course along Groton Hollow Road is Clark Brook. Clark Brook is the only named brook and is the most significant surface water resource in the study area. Cark Brook is a high energy perennial stream with many large boulders, pools, riffles and waterfalls of small drops in elevation. Clear, cold and rapid waters provide habitat for the brook trout which inhabit these waters. Groton Hollow Road runs roughly parallel to the stream valley for its entire length within the Project site. Within the Project site many other tributaries flow into Clark Brook along Groton Hollow Road several of which are perennial and of importance to the water quality of Clark Brook. Proposed road improvements to Groton Hollow Road will have an impact on Clark Brook in locations where stream crossings will be upgraded and/or where the alteration of terrain is within close proximity to the Brook. In some locations, those impacts may be positive, through the upgrading of current culverts to meet newer DES standards. The design plans for road improvements along Groton Hollow Road were developed with the goal of minimizing any removal of the existing riparian buffer on the Brook side of Groton Hollow Road and locating any of the road improvements as far away from the Brook as possible. There should be no long term impacts to water quality and/or temperature in Clark Brook as a result of the Project. Short term effects due to alteration of terrain have been minimized throughout the design of the project and are detailed in the Project design plans and the Alteration of Terrain Application (Appendix 2).

The NHDES impaired waters database was analyzed to determine if impaired waters occurred within one mile of the Project area. While Clark Brook is not an impaired water body, it flows into the Baker River, which is listed in the impaired waters database. However, it is not anticipated that this Project will have an adverse impact on the impaired waters of the Baker River.

There are a number of parameters listed for which the Baker River is impaired. Two occurrences of Escherichia coli are listed as having High Importance but for which the source is unknown. Other parameters for which the Baker River is listed as impaired are: dissolved oxygen saturation; dissolved oxygen; pH; chloride; fishes bioassessments; benthic bioassessments and mercury. The mercury is due to atmospheric deposits. The proposed Groton Wind Project is not expected to be a source of E. coli, mercury or any other pollutant, and therefore will not unreasonably affect water quality in that regard. Moreover, a greater reliance on wind energy has the positive, long-term potential to assist in improving water quality by reducing the reliance on energy sources that release mercury into the atmosphere.

The design plan set for the Project incorporates best management practices (BMP's) which will be employed prior to and during construction to limit the mobilization of total suspended solid from disturbed terrain. BMP's are

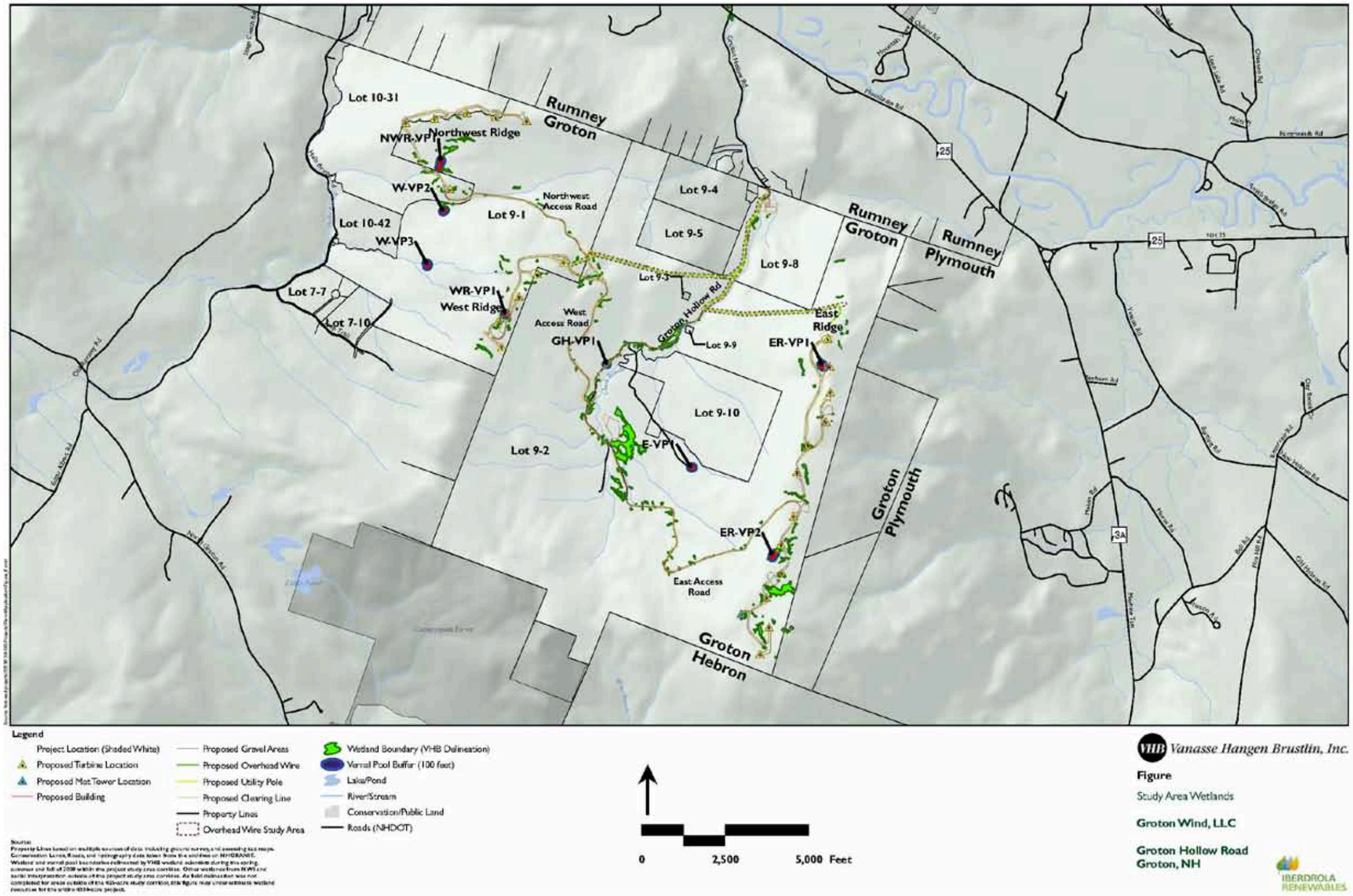

Figure 10: Groton Wind Study Area Wetlands Map

discussed in the above section on sediment and erosion control as well as in the Alteration of Terrain Permit Application (Appendix 2). All proposed measures were selected for their ability to be successful in projects characterized by steep terrain, shallow depth to bedrock and short growing seasons. Frequent monitoring of the performance of such devices will occur and corrective actions will be employed if necessary.

I.4.(b) Stormwater, soil erosion and sediment control

Background & Potential Effects

The Project will involve construction of approximately 9.3 miles of new gravel road and improvements to approximately 2.4 miles of existing gravel road, as well as the construction of the infrastructure for the support of the Project (turbine foundations, crane pads, material storage areas and operation & maintenance facilities) on an area that will occupy and disturb approximately 116 acres. During construction, the potential for erosion and sedimentation of waterbodies is increased as a result of alteration of the terrain. As described below the Project has been designed to minimize changes to natural flow paths so as to minimize impacts on the existing hydrology patterns, minimize erosive forces and retain favorable conditions for localized treatment of any stormwater that is generated on the site. Post-construction impacts are generally related to the intensity of use and thus the very low intensity of use of the proposed features (travel by maintenance personnel), combined with low generation of surface water runoff, is anticipated to have minimal adverse effect on receiving waters.

Study & mitigation

Stormwater runoff and erosion and sediment control have been addressed in NHDES Alteration of Terrain Application (Appendix 2) and summarized in the NHDES/USACE Wetland Permit Application (Appendix 1). The Alteration of Terrain Application contains a detailed set of Project plans for civil engineering measures to minimize and mitigate for any soil erosion due to stormwater generated by the Project. The Project will not significantly change the peak stormwater runoff discharge rates between the pre and post development conditions for the 2, 10, and 50 year storm events. The Project has been designed to minimize surface water and stormwater runoff impacts by maintaining natural drainage patters where possible through the use of culverts and subsurface stone drainage ways (stone mattresses). Design measures to protect surface water quality during construction of the Project have focused on control of erosion during construction through use of sediment barriers (such as siltsock and other permeable barriers consisting of bark mulch and stump grinding) and the use of soil stabilization measures including erosion control blankets, spray-on polymer emulsions, and prompt stabilization of exposed surfaces. Riprap aprons will be installed at the outlet end of proposed circular culverts to minimize the potential for erosion.

I.4.(c) Wetlands

Background and potential effects

Wetlands within a 425 acre study area along the proposed corridor alignment were delineated by NH Certified Wetland Scientists. Despite the size and the linear nature of the Project, only 1.63 acres of wetlands are expected to be impacted. Delineated wetlands for the Groton Wind Project are dominated by Palustrine forested wetlands, seasonal intermittent streams and small perennial streams. Historically, a large percentage of the delineated wetlands have been impacted by logging, including the construction of haul roads and log yards, and log skidder operations. Many of the wetlands to be impacted are on sloping basal glacial till or bedrock landscapes with low vegetative interspersion. A qualitative assessment of 13 wetland functions and values on wetlands on the Project site found that many of the wetlands on site have limited functions due to their small size and disturbed nature. However, even the small wetlands provide for some functions such as wildlife habitat and sediment retention.

Study and mitigation

The Project will result in unavoidable permanent impacts to approximately 1.63 acres of wetlands and streams and 0.33 acres of temporary impacts. The details of these impacts are reported in the wetlands permit application, which is included in Appendix 1 to this application. Nearly all of the wetland impacts, which range in size from a few square feet to just over 5,500 square feet, are related to the construction of the access roads to and along the ridgelines. About 0.3 acre of impact will result from the upgrading of the private portion of Groton Hollow Road. No wetlands will be impacted by the O&M facility, the switchyard or the overhead lines. Many of the wetland impacts involve filling a very small portion of a small wetland. One of the most common impacts involves crossings of the numerous narrow forested drainages on the side slopes of Tenney and Fletcher Mountains. In these cases, the engineers have incorporated either small culverts or "stone mattress" structures into the roadway which will allow water to continue to flow down the drainage as it currently does. This will help to minimize the potential effect on downslope wetlands.

The first step in mitigating impacts is to avoid and minimize impacts and this has been a key component of the design for this Project. The Project has worked with its engineers to make design changes to avoid proposed wetland impacts where possible. In addition, the Project has developed a mitigation plan for addressing unavoidable wetland impacts. For this Project, collaboration between the wetland scientists, the design engineers and other civil engineers was an ongoing and integral part of the design and helped to achieve dual Project goals, that of optimizing the roadway alignments and cross-sections to limit wetland impacts to the absolute minimum while maximizing adherence to the Applicant's design constraints and criteria.

The initial roadway was laid out conceptually by using NWI, USGS topography, aerial orthophotos and other Geographic Information System (GIS) based data. The proposed location of the turbines on ridge lines avoids impacts to some of the larger forested wetland complexes and perennial streams located in the valleys, which are some of the most ecologically important wetlands on the Project site. As Project wetland scientists gained new information about wetlands through field studies, project engineers made dozens of changes and refinements to the Project layout to further avoid and minimize impacts. New access roads have been located to avoid wetlands entirely or to cross wetlands at or near their narrowest points if they cannot be avoided. The width of access roads has been limited to the minimum required for construction access and safety. The roadway design uses sideslopes of 1:2 in rock cuts and 1.5:1 constructed stone slopes to further minimize slope impacts (1.5:1 slopes are the steepest non-mechanically stabilized earth slopes practical).

Given that the Project will occupy approximately 116 acres within the 4,180-acre Project area, and taking into consideration the type and scope of the Project, the permanent wetland impact of 1.63 acres is relatively minor and represents less than 1% of the wetlands within the Project area and less than .1% of the total Project area.

Because the Project involves greater than 10,000 square feet of permanent impacts to wetlands, NHDES rules state that compensatory mitigation is required to offset these impacts. A mitigation assessment plan was prepared in consultation and conceptual discussions with representatives of NHDES, NH F&G, USEPA, USFWS, and USACE.

The central feature of the mitigation proposal is the Applicant's collaboration with the Society for the Protection of NH Forests (the Forest Society) to assist in their effort to protect up to 6,578 acres owned by Green Acres Woodlands, a private timberland company, in Groton, Hebron, Rumney, Dorchester and Plymouth. Under a proposed conservation easement, the land would continue to be privately owned and managed for forest products, but could never be subdivided or developed. The Project proposes to provide technical and other assistance to the Forest Society, including detailed land survey data, GIS data layers, and a contribution to support the conservation easement stewardship fund. In addition to the conservation easement project, mitigation measures include upgrading a number of stream crossings along Groton Hollow Road which will benefit riparian conditions in the Clark Brook watershed. There are more than two dozen existing culverts along the road, many of which do not meet current guidelines for stream crossings advocated by NHDES and the NH F&G. The existing undersized stream culverts have an impact on the stream hydrology because their small size increases the likelihood of ponding upstream and erosion and sedimentation downstream. In some cases, undersized culverts or sub-standard installations can create barriers to the passage of stream

organisms, including fish. These new crossings will be appropriately sized to accommodate flow patterns for their drainage area, will be more consistent with natural physical stream processes and will help to improve the connectivity of the riparian habitat associated with Clark Brook.

I.4.(d) Mitigation plans

In designing the Project, the Applicant has worked to avoid and minimize water quality and wetlands impacts associated with the Project. The layout of the access roads and turbines has been continuously refined in an effort to avoid wetlands or cross them at or near their narrowest points if they could not be avoided. Roadways were designed such that an existing road will be used for access to the Project and existing undersized culverts will be upgraded. New roadways will be constructed at the minimum widths required to provide safe and adequate access during the construction phase and will be allowed to re-vegetate post-construction to reduce those widths. Appropriate stormwater pollution prevention and erosion control measures will be employed. Lastly, as compensatory mitigation for its unavoidable impacts to wetlands, the Applicant will assist the Society for the Protection of New Hampshire Forests in its efforts to protect up to 6,578 acres of land in Groton, Hebron, Rumney, Dorchester and Plymouth through a conservation easement that will be held by the State of New Hampshire. Significantly, this proposed conservation area includes wetland complexes and all of the headwater tributaries to Clark Brook. The Project's wetlands mitigation assessment plan was prepared in consultation with representatives of NHDES, NH F&G, USEPA, USFWS and USACE. The mitigation plan meets or exceeds applicable federal and state standards.

I.5. Natural environment

As noted in section H.4 of this application, the Applicant has met with both USFWS and NH F&G to discuss pre-construction studies applicable to the Project site. Feedback was received from both agencies and incorporated into study design. Groton Wind consulted with Stantec Consulting, VHB, and New Hampshire Audubon to complete requested surveys. All reports, with the exception of ongoing efforts, were delivered to USFWS, NH F&G and USACE by early January 2010. Ongoing studies will be delivered to the agencies upon study completion.

I.5.(a) Plants and trees

Based on aerial imagery it is evident that, even with extensive logging, the site remains primarily forested. However, due to the ongoing commercial logging, the pattern of forest canopy is continuously changing.

Plant community types were identified using data associated with the NH F&G 2006 Wildlife Action Plan (NHWAP). Five communities are located within the Project boundary: Northern Hardwood Conifer Forests; Wet Meadow-Shrub Wetlands; Rocky Ridges & Talus Slopes; Lowland Spruce-Fir Forests; and

Hemlock-Hardwood-Pine Forests. Approximate acreages of these habitat types within the Project site are summarized below.

Of the 4,180 acres on the Project Site, NHWAP estimated that approximately 4,165 acres (99 percent) was upland, with about 12 acres (<< 1 percent) mapped as wetland. Actual extent of wetlands is much greater than estimated by NHWAP. Within the 425 acre study corridor there are an additional 27 acres of wetland as well as a high potential for other wetlands in the areas outside the study corridor. This is because the NHWAP forest cover types may contain inclusions of forested wetlands. Thus totals shown in the table below are for planning uses and are best validated by field studies such as those completed for the Project.

Table 2: Plant Community Cover Types (from NHWAP)

Community Type	Site Acreage
Hemlock-Hardwood-Pine Forest	1,735
Northern Hardwood–Conifer Forest	1,485
Lowland Spruce-Fir Forest	943
Wet Meadow-Shrub Wetland	12
Rocky Ridge –Talus Slopes	2
Other (non-habitat)	3

Source: NHWAP GIS database provided by NH F&G.

I.5.(b) Wildlife

1.5.(b)i Birds

A variety of bird field surveys were conducted within the Project area over the course of three years: 2006, 2008, and 2009, primarily by Stantec Consulting. Following the completion of field surveys, a bird and bat risk assessment was prepared using the results of on-site field surveys, information from literature review, agency consultation, regional surveys and databases. This risk assessment sought to characterize use of the Project area and assess potential risk presented by the Project to raptors, nocturnally migrating passerines, breeding birds, and bats. The risk assessment is attached as Appendix 28 to this application. The methods and results of the underlying field surveys are described in detail within five separate reports and are attached as appendices to this application. These reports include:

- Appendix 29: 2006 Summer and Fall Wildlife Survey Letter Report;
- Appendix 30: Spring 2008 Radar Survey Report;
- Appendix 31: Fall 2008 Radar Survey report;
- Appendix 32: 2009 Spring, Summer, and Fall Avian and Bat Survey Report; and

§ Appendix 33: 2009 Summer and Early-Fall Peregrine Falcon Use Survey Report;

All of these surveys were conducted to inform Groton Wind of potential risks to birds as a result of the construction and operation of the Project so that the Project could be designed in a manner that would minimize potential impacts to birds. Data collected during these surveys was used in combination with information gained through literature review in the risk assessment to provide insight for the Project's potential impacts on birds.

Rare, threatened, or endangered bird species that were documented in the Project area during these surveys include peregrine falcon (state- listed threatened), bald eagle (state- listed threatened), and common loon (state-listed threatened). No federally-listed threatened or endangered birds were observed during any of the field surveys.

Nocturnal migration

Overall, results of radar surveys suggest that migration patterns of nocturnal migrants are similar between fall and spring, and that flight height is particularly consistent. Furthermore, the pre-construction radar survey results at the Project were very similar to the only operational project in New Hampshire, the Lempster Wind Project.

During fall 2006 and spring 2007, Stantec conducted nocturnal radar surveys at the Lempster Wind Project on 32 nights and 30 nights, respectively. Comparing the spring migration seasons, passage rates were consistently higher at the Lempster Wind Project than the Groton Wind Project, but the more significant result of the comparison is that the trends in flight heights between sites were nearly identical for a spring migration season. The fall migration season results also were similar in passage rate and in flight heights. Post construction monitoring studies conducted at the Lempster Wind Project in 2009 showed very low mortality for nocturnally migrating birds. The report is in draft form but will be available April 2010.

Literature review also suggests that, while impacts to nocturnally migrating birds occur at most wind energy facilities, very small numbers of birds have collided with turbines relative to the large numbers of nocturnally migrating songbirds. The results of the Bird and Bat Risk Assessment, which followed a standardized weight of evidence approach and included a detailed information review as well as incorporated the results of on-site field surveys, predicted a low magnitude of potential impact to nocturnal migrants.

Breeding birds

In general, species documented in the Project area were typical of the moderate elevation northern hardwood forests that dominate the Project

area. Among the most common species were the ovenbird (*Seiurus aurocapillus*), black-throated blue warbler (*Dendroica caerulescens*), hermit thrush (*Catharus guttatus*), and dark-eyed junco (*Junco hyemalis*). No state or federally- listed species were observed during the breeding bird surveys.

Generally, direct and indirect impacts to breeding birds at the Project are expected to be limited to a small amount of collision mortality and slight shifts in the distribution of breeding bird species within the Project area. Because many of the common species in the Project area are edge-associated species that typically inhabit areas with human activity, many breeding bird species are expected to become habituated to the presence of the turbines, thereby minimizing displacement and other indirect impacts.

The results of the Bird and Bat Risk Assessment, which followed a standardized weight of evidence approach and included a detailed information review as well as incorporated the results of on-site field surveys, predicted a low magnitude of potential impact to breeding birds.

Raptor migration

Species observed most frequently during the spring and fall migration surveys included broad-winged hawk, red-tailed hawk, and turkey vulture. Turkey vultures and red-tailed hawks accounted for 57 and 19 percent of observations during spring migration surveys respectively. Broad-winged hawks and red-tailed hawks accounted for 47 and 14 percent of all observations during fall migration surveys respectively. Two state-endangered raptor species were observed during the 2009 field surveys: golden eagle and northern harrier, however, neither occurred in the Project area. Two state- threatened raptor species were observed: peregrine falcon and bald eagle, both of which were observed in the Project area at some point during the survey. An additional observation of a common loon (state-threatened) also occurred within the Project area on one occasion during the spring migration season.

Although difficult to compare due to varying levels of survey effort and design, the Groton Wind Project documented passage rates and species composition similar to pre-construction raptor surveys conducted at the now operational Lempster Wind Project. During the first year of post-construction monitoring studies at Lempster in 2009, no raptor fatalities were documented. The results of the Bird and Bat Risk Assessment, which followed a standardized weight of evidence approach and included a detailed information review as well as incorporated the results of on-site field surveys, predicted a low magnitude of potential impact to raptors.

Peregrine use

The 2006 peregrine falcon surveys were conducted from Rattlesnake Mountain where the peregrine falcon nest failed that year. In 2009, the study design was enhanced and peregrine use surveys were designed and conducted collectively with NH Audubon. Over the course of the surveys, only four peregrine falcons were observed within the Project area with three of four the peregrine falcons observed flying within the Project boundary.

There has been low documented peregrine falcon mortality at wind projects. The summer/early fall peregrine falcon surveys also documented low to moderate numbers of seasonally local and migrant raptors at locations above the Project area, and relatively high percentages of raptors flying below the height of the proposed turbines. While pre-construction surveys do not necessarily provide sufficient information to predict risk of collision mortality, field surveys do indicate the potential for exposure of raptors to wind turbines at the Project. The Bird and Bat Risk Assessment predicted a low magnitude of potential impact to raptors, including peregrine falcon.

1.5.(b)ii Bats

On-site field surveys designed to assess bat presence and activity in the Project area consisted of two seasons of summer/fall acoustic monitoring in 2006 and 2009. As noted in section 1.5.b.i, these can be found in Appendices 29 and 32. Additional spring and summer acoustic bat surveys are currently planned for spring and summer 2010. Acoustic surveys conducted in 2006 and again in 2009 documented relatively low bat activity levels at the Project site.

In comparison to similar studies conducted at other proposed wind projects in the northeast—including those that are currently operational—bat activity levels recorded within the Project area were generally low. Potential impacts are expected to vary by season, following patterns observed at other operational wind facilities, with impacts being greatest during the fall migration period, particularly in mid to late August. Fatality rates are expected to be more similar to those found during post- constructions studies at Projects in the northeast than those in mid-Atlantic states and likely more similar to the now operational Lempster Wind Project. For example, pre-construction studies conducted at the Lempster Wind Project documented similar species composition and detection rates despite varying levels of effort and survey design. Post-construction studies conducted in 2009 at the Lempster site documented only one little brown bat fatality.

Indirect impacts to bats are expected to be minor at the Project, given the relatively small amount of anticipated clearing and the currently disturbed nature of many habitats within the Project area.

1.5.(b)iii Avian and bat mitigation

After the Project commences operations, Groton Wind will commit to one year of formal post-construction monitoring similar to efforts currently underway at the Lempster project including searcher efficiency, scavenging removal rates, and habitat analysis. The study will be performed by a qualified third party consultant with experience conducting transect based post-construction studies at wind facilities. The study will cover both spring and fall migration seasons for both birds and bats. This report will be made available to USFWS and NH F&G. If, after one year of study, the Project's mortality rates are lower or within the range of other Northern Forested wind project locations, Groton Wind will immediately implement yearly monitoring for the life of the Project as described in the Iberdrola Renewables Avian and Bat Protection Plan discussed in Section H.4. This includes training operations staff on a Wildlife Reporting and Handling System for avian and bat casualties or injured wildlife found by Project personnel throughout the life of the Project. If, after the first year of study, Groton Wind's mortality rates exceed the most current established threshold ranges for mortality at wind projects on northern forested ridges, Groton Wind will conduct a second year of post-construction monitoring similar to the first but with an emphasis on determining why mortality rates have exceeded estimated thresholds. This report will also be made available to USFWS and NH F&G.

I.5.(b).iv. Other wildlife

A Wildlife Habitat Assessment was conducted on the Project site to address non-avian wildlife habitat issues, including questions relative to the wood turtle, native brook trout and deer wintering yards (Appendix 20).

In general, the Assessment found that the Project site provides wildlife habitat for a number of species, albeit modified substantially by the timber harvesting operations that have occurred on this site since the 1940s and earlier. Moose and bear sign (sighting, tracks and scats) were observed on site, especially in areas previously disturbed by logging. Evidence of well-established wildlife trails indicates both historical and continuing moderate to heavy use by a variety of wildlife species. Both the logging roads and established trails provide travel corridors through the property's interior and to adjacent properties and their respective habitats. However, the timber harvesting has also had an impact on the habitat present at the site. For example, as observed during the field investigations, several areas of the Lowland Spruce-Fir forest have been disturbed by heavy cutting and no longer provide cover for deer. Other conifer stands were also observed, and thinning from logging has lowered or eliminated the potential value of the deer wintering yards.

Because the Groton Wind Project will introduce new disturbance and permanent structures to the site, some level of impact to wildlife habitat would likely occur. However, because the Project does not involve any development that will significantly increase traffic to the area or increase use by humans, habitat fragmentation will be relatively minor, and there should not be a substantial change in the patterns of wildlife habitat use and movement around the site.

Per written correspondence received from the NH Natural Heritage Bureau there are no known state or federally-listed species within the Project limits, nor are there any exemplary natural communities occurring within or in close proximity to the Project area. However, the Natural Heritage Bureau data does indicate there are populations of the wood turtle (*Glyptemys insculpta*) and the peregrine falcon (*Falco peregrines*) in the vicinity of the site. A summary of study of the peregrine falcon is provided in Section 1.5.b.i above, while the potential occurrence of wood turtle on the Project site is discussed below.

In addition to these two species of concern, and based on verbal communication with the NH F&G, concerns were raised regarding the potential for a native population of brook trout in Clark Brook as well as the potential for deer wintering habitat ("deer yards") on the Project site.

Wood turtle

The potential for the occurrence of wood turtle was discussed in the VHB Wildlife Habitat Assessment submitted as part of this application. Given the observations presented in the Assessment, it seems unlikely that any resident population of wood turtle exists on the site and it is concluded that the risk to this species from this Project is negligible.

Deer wintering habitat

Potential Impacts to deer wintering habitat were also addressed in the Wildlife Habitat Assessment. In general, the Project crosses three potential deer yard areas. However, field assessment provided strong evidence that only one of the three areas is actually used as a yard.

One potential deer yard, consisting of an eastern hemlock spruce cover type, is located on the east side of Groton Hollow Road. The majority of this area is situated between Clark Brook and a large northern hardwood plant community. A smaller section of this area extends across the brook and adjacent road. Within this stand, several eastern hemlock sapling stems had been stripped by deer. Extensive balsam fir and hardwood browsing were observed along the perimeter of surrounding hardwood cover type. There was good crown closure and nearby rushing water.

It appears that some deer are utilizing this area periodically as a winter yard. Moose sign was also evident suggesting possible co-usage by this mammal during the later winter months. This deer yard's proximity to Groton Hollow Road and orientation on a south east slope (i.e., colder temperatures) may constrain overall yarding activity. Due to this yard's position in the lower valley and away from the proposed wind turbines, it is not expected that this seasonal usage by resident deer will be impacted.

Eastern brook trout

Clark Brook and its associated tributaries provide habitat which can support native brook trout including clear and cold water temperatures, riffles, deep pools, a forested canopy, and associated feed sources. Biologists observed brook trout within the Clark Brook mainstem.

Stream sedimentation, if not properly controlled, could impact brook trout habitat during construction. Erosion and stream sedimentation is a risk associated with the Project, especially given the rugged terrain and numerous high energy streams within the Project area. However, as part of this Application, the Project has submitted a plan for temporary and permanent erosion control in connection with the NH Alteration of Terrain permit application (Appendix 2). Thus, the risk of substantial erosion and sedimentation will be minimized.

The proposed gravel access roads and ridgeline roads are also designed to minimize impacts. In many cases, these alignments follow existing logging and/or skidder roads that are currently an ongoing source of sediments to Clark Brook and its tributaries. In these cases, the proposed access roads will represent an improvement over the existing road drainage. Additionally, a large number of sub-standard culverts along Groton Hollow Road will be replaced with new culverts consistent with recently released guidance from the NHDES on stream crossings. These new crossings will restore stream connectivity in a number of locations which is expected to benefit the cold water fishery.

Vernal pools

Vernal pool delineations and assessments were conducted in the field by VHB scientists during the spring of 2009 in accordance with the procedures outlined in the Identification and Documentation of Vernal Pools in New Hampshire, 2nd Ed. 2009, published by the New Hampshire Fish and Game Department.

During field investigations of the Project site, eleven (11) vernal pools were identified, delineated and documented. Another six (6) wetlands that have the potential to be vernal pools were identified. The Project has been designed to avoid direct impact to vernal pools. There are three (3) cases

where there are indirect impacts to documented vernal pools. In two cases, the construction of the wind farm would remove some of the forested upland buffer to documented vernal pools. In one case, fill will be placed within a wetland for road improvements but will not directly impact the vernal pool breeding habitat located within the same wetland.

I.6. Public health and safety

Iberdrola Renewables is a responsible renewable energy developer and owner and works very hard to prevent any negative environmental, health or safety impacts to the communities and residents where it constructs and operates its wind plants. Iberdrola Renewables strives to proactively deal with all concerns during the development, siting, permitting and construction process. The company also operates its wind facilities under prudent wind practices. Iberdrola Renewables has received many accolades from communities around the country recognizing Iberdrola Renewables' good working relationships with these communities and residents to develop, construct, and operate wind plants, and its responsiveness to concerns.

Iberdrola Renewables holds itself and its employees to a very high standard of safety, and all construction general contractors are required to meet strict safety qualifications. The company has a very good environmental, health and safety (EHS) record. With its underlying supporting EHS and training programs, Iberdrola Renewables approach and culture is captured by the title of its EHS Policy: "People & the Environment First"(Appendix 34). As an example of the Iberdrola Renewables' safety record through 2008, Iberdrola Renewables and its predecessor PPM Energy, Inc. (PPM) had just 1 employee "lost time accident" for all company operations in the United States and Canada over the past 8 years. All Iberdrola Renewables' wind technicians receive training on technical qualifications for their jobs and are well prepared for emergencies. All technicians are trained in tower rescue, First Aid and CPR. Crews are equipped with tower rescue equipment, first aid kits, automatic external defibrillators, and company vehicles are equipped with fire extinguishers. Iberdrola Renewables has enjoyed excellent relationships with local emergency services personnel, and periodically meets with them to be proactive on safety issues and to inform them about the wind business and safety hazards associated with electricity. Iberdrola Renewables also ensures that its landowners are educated on safety issues related to the wind plant and construction, and all plants are constructed in accordance with applicable standards. The Company Safety Director, Gary LeMoine, has served as the Vice Chairman of the American Wind Energy Association (AWEA) Safety Committee for 3 years, and has presented numerous times at conferences on safety in the wind industry, including emergency preparedness and public safety. He recently received the AWEA Operations Award at the National Wind Power Conference for his leadership for safety in the Wind Industry.

Groton Wind will work with local fire departments to notify them of construction plans, provide site visits to review the location of and access to Project facilities and emergency response procedures, and mutual assistance in the case of fire or other

emergency in or around the Project area. Typically, projects establish a 911 address during construction, and work with local responders to identify access points, and Groton Wind intends to do this. In addition, Groton Wind has an agreement with the Town of Groton that addresses issues related to public health and safety(Appendix 5).

I.6.(a) Ice shed

Icing conditions have been known to occur during certain winter conditions of temperature and precipitation. On all Iberdrola Renewables turbines sited in cold weather climates, nacelle-mounted anemometers are heated and provide accurate wind speed information during all weather conditions. Ice build-up on the blades degrades the airfoil profile and causes a reduction in aerodynamic lift, and thus, a reduction in power. Continued ice build-up further disrupts airfoil performance and eventually leads to minimal or no power production, even in adequate wind conditions. The turbine power curve program identifies an inconsistency between the wind speed, expected power production and RPMs, and automatically switches the turbine into standby mode when the generator falls below 850 rpm.

Project access roads will have visible signs warning of the danger of potential falling ice.

I.6.(b) Lightning strikes

Due to the height of the turbines and their metal/carbon components, lightning strikes can occur. The Gamesa G87 turbines proposed for the Groton Wind Project include lightning protection systems which protect against blade damage. These systems rely on lightning receptors and diverter strips in the blade to provide a path for the lightning strike to follow to the grounded tower. The turbine monitoring system provides documentation of all critical lightning events and if a problem is detected, the turbine will shut down automatically or, at a minimum, be inspected to assure that damage has not occurred.

Iberdrola Renewables has an extensive grounding system that includes copper rods. The grounding system typically includes an embedded copper ring as the base. Upon completion, there will be an underground collector system that serves to dissipate the effects of lightning.

I.6.(c) Tower collapse/blade throw

Groton Wind will construct and operate the Project consistent with its corporate commitment to meeting all applicable state and Federal OSHA safety regulations. In addition to compliance with the design specifications and construction standards noted in section F.5.a, each turbine is certified according to international engineering standards. All electrical equipment will be inspected by Iberdrola Renewables under rigorous commissioning procedures, as well as by the local utilities (for grid and system safety), prior to being brought on line. Once turbines are commissioned, qualified personnel routinely inspect and repair

them as necessary pursuant to preventive maintenance schedules. The G-87 turbines proposed for the Groton Wind Project have state of the art braking systems, pitch controls, sensors and speed controls that operate to reduce the risk of overspin which can lead to blade and or tower failure. Additionally, the turbines cease operation if significant vibrations or rotor blade stress is sensed by the blade monitoring system. In the unlikely event that tower collapse or blade failure occur, site personnel would immediately call appropriate local emergency response personnel.

In normal operating conditions, the wind turbine uses the blades as an aerodynamic brake when it is necessary to stop rotation. The pitch control system makes the blade turn around its longitudinal axis in order to adjust the blade's angle of attack to the wind. The system operates as the primary brake system by turning the blades to a 90º position. The control system only applies the mechanical brake when the rotor has stopped.

The mechanical brake consists of a disc brake, which is mounted on the high-speed shaft of the gearbox and brakes using three hydraulic calipers, powered by the main hydraulic unit. The fundamental function of the brake is to serve as a parking brake, being applied once the machine has been brought to a halt by the aerodynamic brake.

I.6.(d) Stray voltage

While it concerns of stray voltage are legitimate, it is important to note that it stray voltage is largely preventable with proper electrical and grounding practices. A grounding study as well as step and touch calculations will be conducted. The Groton Wind Project's collection system will be properly grounded and will not be connected to the local electrical distribution lines that provide electrical service to local residences. In addition, because interconnection lines and switchyards are designed in accordance with local utility regulations, it is unlikely that the Project poses any risk to the public's health or safety as the result of stray voltage.

I.6.(e) Fire

The on-site Operations and Maintenance Building staff is described in section H.5.b. In addition to the on-site staff, the Project is continually monitored 24 hours a day 7 days a week by the Iberdrola Renewables Operations Center located in Portland, Oregon.

Prior to operation, each turbine and all electrical equipment will be inspected under rigorous commissioning procedures, as well as by the utilities (for grid connection and protection system safety). During operations, qualified personnel will routinely inspect equipment in accordance with preventive maintenance schedules. Built-in safety and design systems minimize the chance of fire

occurring in the turbines or electrical equipment. For example, turbines have high temperature sensors and automatically shut down if they begin to overheat.

Although an extremely unlikely event, if a fire were to occur inside the nacelle it would be detected by the SCADA system which would 1) automatically shutdown the turbine, and 2) report the problem to both the O&M Building and the Operations Center in Portland Oregon. Project maintenance personnel would immediately notify local officials and respond as appropriate, pursuant to Groton Wind's detailed emergency procedures that address response to fire or other emergency situations. Power to the section of the Project with the turbine fire would be disconnected.

Other applicable fire laws and regulations will be followed in accordance with state and local requirements.

I.6.(f) Aviation safety

Groton Wind will comply with all applicable FAA requirements. Preliminary turbine layouts were submitted to the FAA in June of 2009 for a determination if the proposed turbines will cause a hazard to aviation or infringe on federally-protected airspace. In December of 2009, Groton Wind received FAA study notification on all preliminary turbine locations. It was found that 3 or 4 of the then-proposed turbine locations could create a hazard to aviation safety. As a result, Groton Wind has shifted turbine locations and removed a turbine from the Project. These new turbine locations were submitted in February 2010. The studies can be found in Appendix 8.

As mitigation for any risk the Project poses to aviation, and in accordance with federal regulations, Groton Wind will illuminate some of the turbines to meet the FAA requirements for obstruction lighting or marking of structures over 200 feet above ground surface (US DOT FAA Advisory Circular 70/7460-l K dated 2/1/2007).

The FAA's guidance (DOT/FAA/AR-TN05/50 dated 11/05) on standards for obstruction lighting for wind turbine farms requires lighting the Project as one large obstruction with lights spaced approximately 3,000 feet apart, rather than lighting every structure over 200 feet in height. The FAA has determined that the standard turbine color is sufficient daylight marking and white strobe lights will not be utilized. As a result, wind farms are lit with synchronized red flashing lights at night and only a subset of the turbines are lit. As preliminarily designed, approximately 11 of the turbines will be lit. The proposed lighting map is contained in Figure 9. Permanent meteorological towers will also be lit in accordance with FAA guidance.

I.6.(g) Noise

Groton Wind conducted a sound level assessment which included a sound-monitoring program to determine existing sound levels in the vicinity of the Project, computer modeling to predict future sound levels when the wind turbines are installed and operating, and a comparison of the worst-case operational sound levels associated with the wind turbines to accepted criteria. A copy of this analysis is included as Appendix 35.

The ambient sound level survey was conducted at six (6) representative locations to characterize the current acoustical environment under varying wind conditions at the properties. Current noise sources at the properties included: noise from wind blowing through vegetation, aircraft, running water from brooks, birds, insects, boats on Newfound Lake (near Audubon Society site), and vehicular traffic (for some locations). The ambient sound measurement occurred for two weeks in late summer from August 6 through August 21, 2009. Because wind speed can have a strong influence on ambient sound levels, sound levels were measured at a height of five feet above the ground at locations where there were no large reflective surfaces to affect the measured levels. Ground-level wind speeds were continuously measured and logged at two sound monitoring locations. Additionally, meteorological data was used from a 58-meter-tall meteorological tower located on the Tenney Mountain Ridge as well as meteorological data from the nearby National Weather Service (NWS) station in Plymouth, New Hampshire.

The noise impacts associated with the proposed wind turbine generators were predicted using the Cadna/A noise calculation software (DataKustik Corporation, 2005). This software uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation). Worst-case future sound levels from operation of the entire wind farm were calculated at all residences within at least one mile of every wind turbine. Sound levels due to operation of all of the originally proposed twenty-five wind turbines were modeled as well as at the six background measurement locations. Additionally, sound levels were modeled throughout a large grid of receptor points, each spaced 20 meters apart which makes it possible to create sound level "contours" for the wind farm as a whole. Sound levels were computed assuming that the receptors are always located directly downwind from all turbines simultaneously. Although, this is a physical impossibility, it provides conservative results resulting in a "worst-case" scenario.

Based on this analysis, sound levels due to wind turbine operation are expected to be less than 45 dBA at all participating and non-participating residences. The predicted sound level at the two closest participating residences along Groton Hollow Road will be approximately 41 dBA. These locations are southeast of wind turbine W1. The closest non-participating residence is located due north of turbines N1 and N2. Worst-case sound levels at this location are predicted to

be 41 dBA. All other residences will be less than 40 dBA under worst-case operating conditions. These sound levels will meet the noise conditions that the SEC imposed on the Lempster Wind Project.

I.6.(h) Mitigation

Setbacks/gates/signage

The Groton Wind Project has been designed such that its setbacks from residences, roads, and utilities will protect the public's health and safety by allowing ample space for the safe construction and operation of the facility. The equipment proposed is proven reliable and held to the highest international standards of quality, and will be operated and maintained by a highly trained locally based operations team. As discussed above, the design and installation of the equipment, as well as the overall configuration of the Project facilities, guards against danger to the public from ice shedding, lighting, tower collapse, blade throw, stray voltage, fire, aviation and noise. In addition, Groton Wind's agreement with the Town of Groton provides additional assurances that the public's health and safety will not be unreasonably adversely affected during the construction and operation of the Project. Construction and operation of the Project will have minimal impacts on the public health and safety of the local populace.

As previously noted, the entire Project is located on private land. There will be no public access to the site. Access roads going into the Project site at the end of Groton Hollow Road will be gated and locked (as they currently are). Additionally, gates will be installed where the access road crosses the abandoned coach road in the northwest portion of the Project area which, although on private land, may be used for recreational purposes. As discussed in section J there is limited snowmobile and ATV use in the area as permitted by the current landowners. These activities would not be allowed to occur directly within the Project footprint. The former coach road is currently used for recreation, principally snowmobiling, and has been used as an access road for logging. The nearest non-participating residence is 2,700 feet from a turbine. The nearest non-participating parcel boundary is 460 feet from a turbine and the nearest public ROW (Groton Hollow Road; Halls Brook Road) is 2,400 feet from the nearest turbine.

Agreement with Town of Groton

Appendix 5 to the Application contains the Applicant's agreement with the Town of Groton. As the agreement indicates, among the steps that the Project will take to address the Town's health and safety concerns are site security and access limitations, communications and reports to the Town, emergency response and coordination, use of public roads, construction period protocols, sound restrictions, setbacks, and decommissioning.

J. Effects of the Facility on the Orderly Development of the Region; Estimate of Impacts of Construction and Operation of the Facility Local Land Use

J.1. Local land use

The Project's impacts on local land use during construction and operation of the Project are expected to be minimal. The Project Site is used primarily for timber harvesting. Other uses in the nearby area include skiing (at Tenney Mountain Resort); sand and gravel excavation, seasonal camping, tourism, wood products (chips, pellets, logs); commercial enterprises along NH Route 25, some scattered agricultural activity, residential areas, and undeveloped forest.

J.1.(a) Commercial timber

The site is privately owned by forest product companies and is primarily undeveloped. It is home to an on-going commercial timber harvesting operation. The area has been actively harvested for timber since the 1800's, and commercial timber operations have owned the parcel continuously since the 1940s. Given that the Society for the Protection of NH Forests is working to place a majority of the Project site into a conservation easement, this existing use is expected to continue indefinitely.

J.1.(b) Outdoor recreation

The site is privately owned and public access is by written permission of the landowner. Gates restrict public access to the site at Groton Hollow Road. Some recreational activity occurs on the property at the discretion of the landowner. This includes hunting, off-road vehicle riding, and snowmobiling. The proposed Project will not have any effect on the manner in which the landowner allows public access to the site, except for safety limitations on public access to wind turbine facilities.

J.1.(c) Motorized trail

There are several unmapped woods roads on the site as well. Groton Hollow Road runs north south and provides access from NH Route 25. "Old Stage Coach Road" runs primarily east west through the Project site, connecting the lower portion of Groton Hollow Road to Halls Brook Road. Portions of these roads are used for motorized recreational vehicles at the invitation of the landowner. The NH Snowmobile Association (NHSA) has identified two official snowmobile trails on the property including NH Snowmobile Corridor 11 (known locally as the Tenney Pasture Trail) and NHSA Primary Route 153 which pass through the property.

J.1.(d) Non-motorized trail

There are a number of informal non-motorized trails within the Project area which are used for hiking and horseback riding. Such use is at the discretion and

permission of the landowners. No portion of the site is mapped for recreational hiking trails by the Appalachian Mountain Club or other local outdoor recreational organizations.

J.2. Local economy

J.2.(a) Economic effects

Groton Wind commissioned a study on the economic impact of the Project. This study was conducted by Professor Ross Gittell of the UNH Whittemore School of Business and Economics and can be found in Appendix 36. The Project is estimated to have an estimated regional economic benefit of approximately $81.5 million over 20 years. The study estimates that during construction, the Project will provide $24.5 million in local area benefits.

The Lempster Wind Project construction and operations have demonstrated the economic benefits of wind farms can bring to New Hampshire. Many local businesses in the Lempster, Goshen, and Newport area reported that during construction of the Lempster Project they enjoyed substantial increases in sales as a result of wind farm construction labor and materials. From local restaurants and hotels, to labor and materials, the Lempster Project injected substantial amounts of money into the local economy. The Lempster Wind Farm is also a significant source of local revenue to landowners and to the Town of Lempster, providing a substantial amount of the Town's total revenues. Letters from area business discussing economic effects of the Lempster Wind Farm are included in Appendix 36.

J.2.(b) Property values

The economic impact study discussed in section J.2.a also examined literature on property values. Additionally, multiple real estate studies found no evidence that the presence of wind farms has a negative effect on residential property values. According to the most recent and exhaustive study done at the Bard Center for Environmental Policy and updated in 2009 by the Lawrence Berkley Laboratory attached in Appendix 37, there was an absence of measurable effects of wind farm visibility on property transaction values. The study is the most exhaustive in the country documenting over 7,500 individual home sale transactions over an 11 year period consisting of 24 different wind projects. The report finds that, on average, that there are no measurable effects on property values due to the view of and distance from turbine characteristics. This finding holds both temporally and spatially. In other words, homes that were sold in the year particular wind projects were announced and constructed, and that had a clear view of the turbines, were not affected. In addition, no measurable financial effect is found for homes located within a mile of the facility. Given the results of studies conducted at existing wind farms across the country, it is reasonable to assume that the Groton Wind Project will not have an adverse impact on local property values.

J.2.(c) Tourism

There is no empirical basis for a significant adjustment – positive or negative – to likely tourism visitation or expenditures as a result of the Groton Wind Project. While there are no empirical studies of which the Project is aware which measure regional tourism expenditures before and after a wind farm development, there is considerable evidence that wind farms in a number of U.S. and international sites have become tourism draws, including the Lempster Wind Project and the Green Mountain Power facility in Searsburg, Vermont. A report issued by Renewable Energy Vermont states that "[t]he Mt. Snow Haystack Regional Chamber of Commerce reported that of those who made inquiries, about 10% asked for information about the turbines in Searsburg."[1] Many other wind farm sites are listed as local "tourist attractions."[2] Some sites plan for and encourage tourism, with visitor centers, educational and informational programs, the opportunity to climb wind towers to enjoy the "spectacular views,"[3] and even "the unique experience of staying overnight [at] an operating wind farm" at one Minnesota facility.[4] Anecdotal information obtained as the result of Iberdrola's presence in Lempster suggests that the Lempster Wind Farm has contributed to an increase in tourism in the area, and has increased the level of interest in the Town. Town officials and some area businesses report increased numbers of visitors, and many requests for information about the wind farm. Lempster Wind produced a brochure on area attractions which includes basic facts about the wind farm. These brochures have been in high demand, as both the Town of Lempster and the nearby general store have asked for additional copies a few different times. In addition, Lempster Town Hall employees have commented that they receive many inquiries regarding the wind turbines and that people perceive the wind farm to be an area attraction.

J.3. Local employment

The Economic Impact study noted above in section J.2.a estimates a total of 229 total local jobs (including direct employment, indirect jobs, and induced jobs) will be created as a result of the Groton Wind Project. These economic benefits include direct expenditures on labor, materials, and services during construction and operations, payments to landowners, and payments to the Town of Groton and State of New Hampshire.

---

[1] See *The Economic Benefits of Wind Farm Development in Vermont*, Renewable Energy Vermont report by Douglas Hoffer, available at http://www.revermont.org/windfarm_benefits.pdf

[2] See, for example, the Green Mountain Wind Farm near Garrett, PA, as listed in the local public library page: www.meyesdalelibrary.com/tgreen.html

[3] As reported at the Swaffham, Norfolk (UK) wind farm, where "over 50,000 tourists have climbed the wind turbine tower." See: http://yes2wind.com/tourism_debunk.html, December 19, 2005

[4] The Buffalo Ridge Wind Towers are listed as a tourist attraction in the Hendricks, MN area, and offer overnight stays. For more information, see: www.hendricksmn.com/wind_towers.html

Thus, the above information establishes that the Project will not have an unreasonable adverse impact on the orderly development of the region insofar as local land use, the local economy and local employment are concerned. Moreover, information presented in Professor Gittell's report demonstrates that the Project will have substantial positive effects upon the region's development.

K. Prefiled testimony and exhibits supporting application

Prefiled Testimony of the following persons in support of this application is submitted by the following persons:

1. Edward Cherian addressing: Background information about the Applicant and the Project; alternatives to the Project that were considered; the Project's consistency with the orderly development of the region; consideration of the views of municipal and regional planning commissions and Groton Board of Selectmen; the Project's anticipated impacts on local land use, the local economy and local employment; the Project's consistency with the objectives of RSA 162-H and other public policies; and the Project's impacts on air quality. In addition, to the extent that any information in the Application is not specifically addressed or supported by other witnesses, Mr. Cherian's testimony is intended to support and sponsor that information.
2. Pablo Canales addressing: The Applicant's financial capability to assure construction and operation of the facility in continuing compliance with a certificate of site and facility.
3. John D. Hecklau addressing: The Project's visual impacts (i.e. aesthetics and shadow flicker.)
4. Hope E. Luhman addressing: The Project's impacts on historic resources.
5. Nancy B. Rendall addressing: The Project's impacts on the natural environment (wetlands and wildlife habitat).
6. Adam J. Gravel addressing: The Project's impacts on avian, bat and other wildlife species.
7. Michael J. Leo addressing: The Project's impacts on water quality and on public health and safety during construction.
8. Robert D. O'Neal addressing: The Project's effect on public health and safety
9. Kevin A. Devlin addressing: The Applicant's technical and managerial capabilities to assure the construction and operation of the Project with a certificate of site and facility, and public health and safety issues.