NEW HAMPSHIRE SITE EVALUATION COMMITTEE PERMIT APPLICATION

New Hampshire Site Evaluation Committee – Docket No. 2008-04

SUPPLEMENTAL APPLICATION VOLUME 1-a

SUPPLEMENT TO APPLICATION OF GRANITE RELIABLE POWER, LLC FOR CERTIFICATE OF SITE AND FACILITY

Granite Reliable Power Windpark
Coos County, New Hampshire
February 2009

GRANITE RELIABLE POWER, LLC
8 Railroad Avenue, Essex, CT 06426
Phone: (860) 581-5010

THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-04

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR A CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

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NEW HAMPSHIRE
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DOCKET NO. 2008-04

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FOR A CERTIFICATE OF SITE AND FACILITY
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IN COOS COUNTY

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33e.	Energy Programs: NH Greenhouse Gas Registry. NH Department of Environmental Services. December 2005.
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Appendices Submitted Separately

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37.	Visual Assessment of Interconnection Line Visibility from Dummer Pond. Jean Vissering and Tom Kokx, Landscape Architects. September 16, 2008. (submitted to the SEC as Appendix 37 on October 6, 2008).
38.	Noble Environmental Power, Section 106 Consulting Party Process in New Hampshire. No date. (submitted to the SEC as Appendix 38 on October 6, 2008).
39.	Survey of Operational Sound Levels Noble Bliss Windpark: Summary of Results. Hessler Associates, Inc. September 18, 2008. (submitted to the SEC as Appendix 39 on October 9, 2008).
40.	Granite Reliable Power High Elevation Avoidance and Mitigation Plan. Noble Environmental Power. No Date. (submitted to the SEC on October 9, 2009).

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	46b. Letter from Hope Luhman to Edna Feighner. October 14, 2008.
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	46e. New Hampshire Division of Historical Resources Report Review and Concurrence. February 4, 2009.
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50.	Letter from Coös County Commissioner's Office to Commissioner Thomas S. Burack. September 10, 2008.
51.	Granite Reliable Power, LLC and Coös County, New Hampshire, Agreement for Payments in Lieu of Taxes.
52.	Coös County Unincorporated Places Master Plan. Adopted June 13, 2006.
53.	Draft Conditions to SEC Certificate to reflect agreement between Granite Reliable Power, LLC and Coös County

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54.	Status Report: Steady State System Impact Study for the Proposed Wind Project Queue # 166 Interconnecting to the 115 kV W179 Line in New Hampshire, Prepared for ISO-New England, Inc. February 10, 2009 (3rd Revision). Information redacted – confidential treatment requested.
55.	Visual Impact Documentation:
	55a. Proposed Vegetative Buffer along Interconnection Line West of Dummer Pond
	55b. Granite Reliable Windpark, A Comparative Visual Assessment of Alternative Turbine Locations. Jean Vissering and Thomas Kokx. December 1, 2008.
	55c. Coös Wind Project Initial Field Review Summary. Jean Vissering and Thomas Kokx. July 9, 2007.
	55d. Granite Reliable Power, Viewpoint 19: Lake Umbagog (Errol). October, 2008.
56.	Report on Economic Impacts of Proposed Facility. Dr. Ross Gittell and Matthew Magnusson, MBA.
57.	Granite Reliable Power, LLC, Site Plans. Please see attached Compact Disk.
58.	Letter from Pip Decker to Melissa Coppola. February 4, 2009.
59.	Letter from Pip Decker to Tara E. Bamford. February 6, 2009.
60.	Letters in Support Provided to the United States Army Corps of Engineers:
	60a. Letter from Executive Councilor Raymond S. Burton to Richard Roach. February 13, 2009.
	60b. Letter from Coos County Treasurer Frederick W. King to Richard Roach. February 16, 2009.
61.	Summary of Wetlands Impact Table, Granite Reliable Windpark. No Date. (submitted to the SEC on October 23, 2009).
62.	Granite Reliable Power Wetland Impacts Avoidance and Minimization Alternatives Analysis. No Date. (submitted to the SEC on October 23, 2009).

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63.	Additional Mitigation Plan Component: Vernal Pool Creation. No Date. (submitted to the SEC on October 23, 2009).
64.	Preliminary Geotechnical Investigation: Proposed Granite Reliable Wind Power Project. S.W. Cole. November 17, 2008.

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Supplement to Application
Information

SUPPLEMENT TO APPLICATION INFORMATION

The following information supplements and/or updates corresponding sections of the Application of Granite Reliable Power, LLC, contained in Volume 1 of the Application (July 2008).

Section B: Applicant Information

B(3) – The names and addresses of the applicant's parent company, association or corporation if the applicant is a subsidiary – p. 27.

Noble Environmental Power, LLC owns 75% of Granite Reliable Power; the remaining 25% is owned by Freshet Wind Energy LLC.

B(4)(c) – The names and addresses of its principle directors, officers, and stockholders – p. 28.

The following is an updated list of principal directors, officers and stockholders

President	Walter Q. Howard
Vice Presidents	Neil P. Dyment
	Christopher M. Lowe
	Daniel J. Mandli
	Thomas F. Swank
	Jeffrey T. Wood
	Kay Mann
Treasurer	Christopher M. Lowe

Section C: Site Information

C(6) – 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 the municipal governing boards – pp. 36-37.

GRP reached an agreement with the Town of Dummer, which is attached to the supplemental filings as Appendix 47. The agreement with the Town of Dummer is further described in the joint supplemental testimony of Mark Lyons and Pip Decker.

C(6) – Unincorporated Master Plan – p. 37.

The most recent Master Plan for the Unincorporated Places in Coos County dated June 13, 2006 reaffirms that the GRP Windpark is consistent with the planning goals of the region. Wind power development is highlighted in section (I) of the updated Master Plan, entitled "Energy Resources". This section of the Master Plan "encourage[s] the development of wind power projects and other alternative energy resources where these can be undertaken in an environmentally sound manner." This most recent Master Plan is attached to GRP's supplemental filings as Appendix 52 .

Section D: Other Required Applications and Permits

D(2) – Documentation that demonstrates compliance with the application requirements of such agencies – pp. 40-41.

Applications to the USACOE and FAA were submitted and permits were received from the FAA. The FAA permits are attached to GRP's supplemental filings as Appendix 41. The USACOE Public Notice is attached to GRP's supplemental filings as Appendix 43, and the permit application is attached as Appendix 42.

Section F: Renewable Energy Facility Information

F(3)(e) – Impact on system stability and reliability – pp. 43.

The Steady State System Impact Study Status Report is attached to GRP's supplemental filings as Appendix 54. This document is not yet public and therefore the applicant requests that it be treated confidentially.

F(5)(c) – Turbine installation– pp. 47-48.

As an alternative to the foundation described in the Application, GRP may elect to pursue engineered rock anchor foundations. Rock anchors are utilized where shallow soil cover over native rock strata provides conditions suitable for anchorage. The anchors are set in concrete foundations and are capable of withstanding the structural loads and movements associated with wind turbines. The length and number of epoxied steel anchors depends on geotechnical analysis and structural design at each wind turbine location. Use of the anchors is incorporated into the design and construction of a reinforced concrete mat foundation which has reduced mass and thickness compared to the foundation described in the Application due to the strength of the native rock. Design of the reinforced concrete tower base, which is attached to and bears on the foundation, is based on the available soil cover depth. Please see also Preliminary Geotechnical Investigation, attached to GRP's supplemental filings as Appendix 64.

F(5)(d) – Collection system installation – p. 49

Underground collection lines will be buried in a trench at least 3 feet deep.

F(5)(e) – Heavy/oversize trucking loads – p. 49.

Hauling of all turbine components will be conducted by Vestas North America. Vestas will be responsible for obtaining all permits from the New Hampshire Department of Transportation ("NHDOT") and is currently developing a hauling plan in consultation with NHDOT. Vestas will deliver all components to the proposed laydown yard; GRP will be responsible for handling components in the laydown yard and for their final assembly and installation.

F(6) – Project Decommissioning – p. 49.

Project Decommissioning is described further in the joint supplemental testimony of Mark Lyons and Pip Decker. The draft decommissioning plan is contained within Appendix 53 of GRP's supplemental filings.

Section H: Additional Information

H(1) – A description in detail of each major part of the proposed facility – p. 53.

Please replace the following sentence:

> "The wind turbines will be located within the boundaries of the unincorporated places of Dixville, Ervings Location, Millsfield, and Odell"

with:

> "The wind turbines **and associated electrical collection lines** will be located within the boundaries of the unincorporated places of Dixville, Ervings Location, Millsfield, and Odell."

H(4) - Water Quality – pp. 75-78.

Updated plans for addressing water quality issues are contained in Appendix 57 and summarized in Mr. LaFrance's supplemental prefiled testimony.

H(5) - Technical and Managerial Capability – pp. 62-64.

Since the filing of the Application, Noble has gained additional experience that enhances its technical and managerial capability to construct and operate the GRP Project. Noble currently operates 726 MW of wind capacity in New York and Texas, consisting of 7 separate projects with a total of 484 wind turbines that are monitored 24/7 from Noble's National Operations

Center in Plattsburgh, New York. Each of the windparks is operating efficiently and technician teams are performing scheduled services and turbine optimization processes to maximize safety and performance of the assets.

Section I: Potential Health and Environmental Effects and Mitigation Plans

I(1)(a) – Views from Federal and State Roads – p. 66.

In response to a request from Public Counsel, GRP has prepared a comparative visual assessment from Route 16 of the old proposed turbine locations on the western ridge. See Appendix 55 (b).

Views from Recreation Areas and Trails – p. 68.

Further analysis of views from Lake Umbagog has been conducted and such analysis demonstrates that it may be possible to view the turbines from some portions of the northern section of the Lake, but that given the distance of the Project from the Lake, the turbines would appear very small. Supplemental testimony by Jean Vissering explaining this analysis is attached. In addition, a visual simulation from the northern portion of Lake Umbagog is attached to GRP's supplemental filings as Appendix 55(d). In response to questions from the parties and the Town of Dummer, GRP has prepared a plan to mitigate views of the interconnection line from Dummer Pond. See Supplemental Prefiled Testimony of Jean Vissering and Appendix 55 (a).

I(2) – Historic Sites – pp. 72-73.

GRP has continued work with NHDHR, and additional information concerning any potential effects to archeology, historical and cultural resources is described in the supplemental testimony provided by Hope Luhman of The Louis Berger Group, Inc. In addition, the Phase IB Archeological Survey, and related documents are attached to GRP's supplemental filings as Appendices 46 (a) through 46 (d). NHDHR has recently provided written confirmation that it concurs with the recommendations contained in the Phase IB report, that the report is acceptable as written, and that no further survey is required. See Appendix 46 (e).

I(4) – Water Quality – pp. 75-78.

On February 10, 2009, the Department of Environmental Services issued and filed with the SEC proposed findings and conditions for GRP's Section 401 Water Quality certificate, Wetlands Permit and Alteration of Terrain Permit. Water quality issues are discussed in the supplemental prefiled testimony of Stephen LaFrance. Wetlands impacts are described in the supplemental prefiled testimony of Raymond Lobdell of Lobdell Associates. See also the Compensatory Wetland Mitigation Plan Analysis attached to GRP's supplemental filings as Appendix 45.

I(5)(a)- Plant Life - pp. 78-80.

GRP has reviewed and responded to the NHNHB's Progress Report dated November 12, 2008 to the Committee. A copy of GRP's letter to NHNHB is attached to GRP's supplemental filings as Appendix 58. In addition, since that letter was filed with NHNHB, GRP has reached an agreement in principle with the New Hampshire Fish and Game Department and Appalachian Mountain Club on a high elevation mitigation plan which GRP believes adequately addresses the concerns that NHNHB had previously expressed about the Project. Details about the high elevation mitigation plan will be filed with the SEC once they are finalized.

I(5)(b) – Wildlife – pp. 81-87.

GRP has reached an agreement in principle with the New Hampshire Fish and Game Department and Appalachian Mountain Club on a high elevation mitigation plan to address concerns raised by those entities concerning the Project's impact on wildlife and wildlife habitat. Details about the high elevation mitigation plan will be filed with the SEC once they are finalized.

I(6)(f) – Aviation safety risks – pp. 89-90.

GRP has received FAA permits for the 33 proposed turbines. The FAA made a Determination of No Hazard to Air Navigation for all 33 turbines. The permits are attached to GRP's supplemental filings as Appendix 41.

Section J: Effects on the Orderly Development of the Region

J(2)(a) – Economic effects of the Project pp. 97-98.

Further evidence concerning the economic effects of the Project is provided in a research report written by economist Ross Gittell and Matt Magnusson of the University of New Hampshire. His report is attached to GRP's supplemental filings as Appendix 56.

J(3) – Local Employment – pp. 99-100.

Further evidence concerning the local employment effects of the Project is provided in a research report written by economist Ross Gittell and Matt Magnusson of the University of New Hampshire. This report is attached to GRP's supplemental filings as Appendix 56.

Supplemental Testimony

(a)

THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-04

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

SUPPLEMENTAL TESTIMONY OF MARK LYONS AND PIP DECKER ON BEHALF OF GRANITE RELIABLE POWER. LLC

February 23, 2009

Qualifications of Mark Lyons

Q. Please state your name and business address.

A. My name is Mark Lyons. My client's business address is 8 Railroad Avenue, Essex, Connecticut 06426.

Q. Who is your current employer and what position do you hold?

A. I am employed as a consultant by Noble Environmental Power ("Noble"). I am responsible for the development of the Granite Reliable Power windpark.

Q. What are your background and qualifications?

A. I have a Bachelor of Arts degree, cum laude from Amherst College and a Juris Doctor degree from Albany Law School. Prior to joining Noble, I worked for several firms and many clients developing renewable energy and natural gas-fired energy generating facilities. A copy of my resume is attached.

Qualifications of Pip Decker

Q. Please state your name and business address.

A. My name is Pip Decker. My business address is 148 Main Street, Lancaster, New Hampshire 03584. My qualifications were included in the July 2008 prefiled testimony and have not changed. A copy of my resume is attached.

Purpose of Testimony and Update on the Project

Q. What is the purpose of your testimony?

A. The purpose of our testimony is to provide an update and supplement to the Application and prefiled testimony submitted in July 2008 with regard to the Granite Reliable Power, LLC ("GRP") wind project in Coos County (the "Project"). This testimony will discuss progress that has been made on a number of fronts with regard to the Application for the Project. Mark Lyons is replacing Charles Readling, who is no longer employed by Noble, and will adopt his portion of the prefiled testimony submitted in July of 2008.

Q. Are you familiar with the Project that is the subject of this Application?

A. Yes, we are. In our roles as Development Manager and Development Consultant we have been involved in the planning stage of this Project and in activities related to supporting the application through the Site Evaluation Committee process. On a going forward basis we will be involved in all aspects of the Project.

Q. Please provide an overview of developments since the July 2008 application was submitted.

A. Although the proposed project remains substantially the same as when the application was filed, as a result of discussions with intervenors and agencies, we have taken steps to further mitigate certain impacts from the project. These efforts are described in more detail in the supplemental testimony of other witnesses, including Adam Gravel and Steve Pelletier, Ray Lobdell and Steve LaFrance, Jean Vissering and Hope Luhman. One of the most significant steps is a proposed high elevation mitigation plan that was developed in cooperation with the New Hampshire Fish and Game Department, Appalachian Mountain Club and others, the details of which are being finalized at this time. Once the plan is finalized, we will submit it to the Committee.

Another development that has occurred since the application was filed is the change in financial markets. The impacts of this change on Noble and GRP are described in the supplemental testimony of Christopher Lowe and Jeffrey Wood.

Q. Do you have any comments on the recommendations for conditions submitted by the New Hampshire Department of Environmental Services on February 10, 2009?

A. We believe that the recommendations made by NH DES are reasonable and will work to address water quality monitoring in an efficient and cost effective manner.

Q. What steps have you taken since the Application was filed to meet with groups and individuals in Coos County?

A. The following is a partial list of such steps taken since July 2008:

We provided copies of the GRP application to the members of the Coos County Planning Board, the Town of Dummer, the Town of Colebrook, the Coos County Government office, and the Town of Lancaster.

We met with the Town of Dummer Selectmen and reached an agreement on proposed certificate conditions to address issues raised by the Town regarding the proposed project. See Appendices 47 and 48.

We met with the Colebrook Ski Bees and Groveton Trailblazers concerning potential project impacts to local snowmobiling and recreation.

We responded to questions about the proposed project from the Stark Selectman.

We hosted a tour of Noble Environmental Power's northern New York windparks for residents of Millsfield Pond, Coos County Legislators and Intervenors in the GRP proceeding.

We visited the Lempster Windpark in southern New Hampshire with Intervenors Wayne Urso, Sonja Sheldon and a third gentleman from Millsfield.

We provided the Coos County Commissioners with plans for decommissioning of the windpark. See Appendix 53.

We met with various local residents and business owners concerning the project to provide updates and answer questions.

We participated in the GreenPath Expo in Colebrook in support of renewable energy initiatives conducted on behalf of the Balsams Resort. Pip Decker was a panelist with Amy Ignatius, Director of the Governor's Office of Energy and Planning.

We delivered a presentation to the Lancaster Rotary Club about the GRP project.

And we attended meetings and technical sessions with parties to this docket to answer their questions and address their concerns.

Q. Please explain why the site proposed for this Project was selected.

A. As we noted in the July 2008 pre-filed testimony and in the Application, various sites were evaluated throughout New Hampshire. The ultimate site selection was based on the existence of key features required for successful wind energy project development, including: an electrical transmission infrastructure, a large amount of available land, and strong wind resources. Further description of our siting criteria is found in the Application. In addition, GRP is filing an analysis of alternative sites outside the project area, in compliance with the USACOE 404 process.

Q. Would it be possible to move forward with this Project if any of the proposed turbine locations were changed or eliminated?

A. No. The Project as proposed, with thirty-three (33) 3.0 MW wind turbines, is economically viable and cannot be further reduced in size without jeopardizing its financeability or requiring complete interconnection reprocessing by the New England Independent System Operator (ISO-NE). To summarize the information found in the GRP application, through onsite analysis, leasing additional land (the Bayroot Tract) to expand the wind profile of the project, we were able to maximize the available wind resource by increasing the size of the wind turbine generators to 3 MWs

from an originally proposed 1.5MW machine, which decreased the number of turbine foundations required to permit in connection with this project and further allowing us to minimize our impact of utilizing the western ridgelines of the Phillips Brook Tract.

Q. Do you believe this Project will have a positive impact on economic development in the region?

A. Yes, we do. We explained this positive impact to some degree in the Application, but in response to the Department of Resources and Economic Development comments on the Application (August 14, 2008 comment that the application was lacking in certain documentation which was referenced in the August 14, 2008 Order Accepting Application), and in response to discussions and questions we have had from intervenors and others during this proceeding, we decided that it would be useful to further quantify that impact. We are therefore including a report on these impacts by Dr. Ross Gittell and Matthew Magnusson, MBA of the Whittemore School of Business and Economics at the University of New Hampshire. Their report is attached as Appendix 56.

Q. Some intervenors have suggested that GRP should use a mix of wind turbine technologies within the GRP wind project. Can you respond to this suggestion?

A. For a project of this size, mixing turbine models would be equivalent to operating and maintaining two separate windparks – by necessitating the development and maintenance of two distinct technologies and their associated parts and maintenance inventories. This would undermine operations economies of scale and would be extremely costly, and therefore not economically feasible, for a project of this size.

Q. Noble was the subject of an inquiry by the New York Attorney General. Please provide an update on the status of that investigation.

A. On July 15th, 2008, Noble Environmental received a civil subpoena requesting information about wind development activities in New York, issued by the Attorney General of New York. Noble provided its response, fully cooperating with the inquiry. At this time Noble does not anticipate further activity relating to the subpoena.

Q. Please explain why Noble allowed its position in the ISO queue for another wind project in northern NH to expire and whether that decision has any impact on the project that is before the Committee in this proceeding.

A. In view of the uncertainties surrounding the timeframe for upgrading the North Country transmission system to provide the capacity for which Noble had applied (in connection with its second project), Noble determined that it was not economical to pay the $150,000 fee that was required to maintain this queue position. The decision to drop out of the queue has no effect on the GRP project that is subject of this proceeding.

Q. Have you obtained the System Impact Study from the ISO for this project ?

A. No. We have recently received revised draft reports, but have not yet received the final study. A copy of the Status Report is submitted herewith as Appendix 54, subject to a request for confidential treatment.

Q. Please provide an update on the US Army Corps of Engineers ("USACE") wetlands permit process.

A. The USACE process has been proceeding in parallel to the SEC process. A Section 404 Dredge and Fill application was submitted on August 6th, 2008. A copy is

submitted herewith as Appendix 42. The application contains, by reference, Volumes 1,2,3,4 & 5 of the GRP application submitted to the SEC. A joint hearing was held with the USACE and the SEC in October of 2008. The USACE has issued its public notice and the 30 day window for comment will conclude on February 27th. It is anticipated that a permit will be issued shortly after the SEC's decision in this docket.

Q. Have you been working with the Town of Dummer on issues that it has raised about the Application in this proceeding?

A. Yes. The Town of Dummer Selectmen raised a number of issues regarding our proposal and we have agreed to propose certificate conditions to address those issues. A description of these conditions is included in the supplement to the Application and in Appendix 47. These proposed conditions relate to limiting outdoor lighting at the proposed substation and switchyard, maintaining public access to land in the project area, providing that that these conditions would be enforceable upon any subsequent owner of GRP, and finally, providing that building permits would need to be obtained from the Town for any future expansion of the project or any additional project not currently under consideration. See also Appendix 48, letter from Town of Dummer.

Q. Does GRP have a decommissioning plan for this project? If so, please explain.

A. Yes. In cooperation with the Coos County Commissioners, we have developed a proposed plan for decommissioning the GRP wind energy project at the end of its useful life. This plan, a copy of which is submitted as Appendix 53, describes the work that would be involved in dismantling wind energy turbines and associated facilities, restoring the project site, and securing the costs of this work so that it can be

accomplished by GRP, a successor entity, or by the County in the case of insolvency of the project owner at the time decommissioning is required.

Q. Are you filing a supplement to the Application that provides an update to some of the information that was provided in July 2008 Application?

A. Yes. We are filing a supplement to the Application that includes information and documents that relate to the Application, most of which were developed subsequent to the filing of the Application. These supplemental filings document many events that have occurred since the time the Application was filed and that are relevant to this proceeding. Accordingly, we are making these filings to ensure that the Committee has a complete record upon which to make its decision.

Q. Does this conclude your supplemental pre-filed testimony?

A. Yes.

540203_1.DOC

PIP M. DECKER

EMAIL: PIP.DECKER@GMAIL.COM

200 Portland Street, Lancaster, NH 03584 work: 860-227-6138

EDUCATION

The College of William and Mary, Williamsburg, VA
B.A., Public Policy, May 2004

La Sorbonne, Paris, France
International Politics and French Culture. Intensive course in French language, Fall 2003

EXPERIENCE

Noble Environmental Power, Essex, CT
Development Manager March 2007-Present
Responsible for the origination and development of a $275MM windpower project in Coos County, New Hampshire. Manages all development activities including; obtaining necessary lease agreements, developing community support at town, county and state levels, completing all environmental and related impact evaluations, obtaining all required state and federal permits, directing all civil, electrical and geotechnical engineering, meteorological studies and logistics, in addition to the negotiation of all taxing agreements, third party contracts including EPC contracts, turbine supply agreements, and electrical sales contracts.

Development Associate March 2006-2007
Assisted in the development of over 500 Mega-Watts of wind power development in New York State. Responsible for completing lease agreements with landowners, developing community support, permitting of the windpark and origination of new projects. The completion of these windpower projects represents the successful development, financing, construction and operation over $1.2billion of renewable energy infrastructure. Founded in 2004, the company is currently the largest renewable energy producer in New York State.

Merrill Lynch, Williamsburg, VA
Head Intern Spring 2003/Spring 2004
Created and distributed materials encouraging prospective clients to meet with portfolio managers. Co-interviewed over 30 applicants and assisted in hiring decisions.

IBM, New York, NY
Intern sales specialist Summer 2003
Developed a business pipeline establishing relationships with private banks and investment companies. Reached out to existing clients and strengthened client relations in order to maximize sales.

Office of Congressman Sherwood Boehlert, Washington, D.C.
Intern Summer 2002
Liaison between Congressman Boehlert and the House Science Subcommittee on Energy. Identified issues that fell under the Department of Energy's jurisdiction in preparation for the final drafting of the House Energy Bill (HR-4). Attended committee lectures, markups, and hearings and reported findings to the congressman's Chief of Staff. Coordinated attendance and programming for the *Freedom Car Congress July 2002.*

LEADERSHIP

William and Mary Varsity Ice Hockey Team
Player 2000-2004
Team Captain 2002-2004
Transformed an existing club ice hockey team into a varsity team funded by the College of William and Mary and recognized as a Division III athletic program. Assisted in scheduling games, practices and team meetings. Led the team to a tournament championship.

ACTIVITIES

Blue Star Farm – Partner in a 10 acre organic farm operation in Stuyvesant, New York. Current
Ice Hockey in Harlem, Coach and teach inner city youths the fundamentals of ice hockey. 2004-2006

SKILLS

PowerPoint, Excel, HTML, SPSS, Quark, Photoshop, InDesign, Final Cut Pro. Fluent in French.

MARK H. LYONS
267 Cedar Swamp Road
Winthrop, Connecticut 06417

Cell phone: (860) 395-7334

e-mail: mhlyons@earthlink.net

Professional Experience

Twenty-eight years experience in developing alternative energy and independent power facilities.

Noble Environmental Power, LLC 2004 – 2008
Vice President and Senior Counsel
Essex, CT

Responsible for all development functions, including permitting, negotiating project agreements, scheduling, budgeting, managing consultants and outside counsel, agency relations, and providing legal support for development, construction, and finance functions within the company. Directed the successful development, in a tough permitting environment, of over 400 MW of wind energy projects now in operation.

Power Project Services 1996 - 2004
President
Winthrop, CT

This was my own consulting firm, through which I undertook the following assignments:

2002-2004
Various clients

Consulting assignments included advising a national electricity supplier in arbitration of a power sales contract dispute; providing development support for a natural gas-fired generating project in California; and assisting in the development of a corporate Board of Directors proposal to establish a sustainable energy business unit for a leading Connecticut renewable energy company.
Directed a Long Island fire district's participation in the state siting process for a 250 MW power plant, to ensure that the plant is constructed and operated in accordance with applicable public health and safety requirements. Negotiated an agreement for the plant developer to provide the district with training and equipment needed to respond to emergencies at the plant.

2001-2002
Calpeak, LLC
San Diego, CA

Director of Project Development
Directed the development of five (5) 50 MW FT-8 power plants (total 250 MW) throughout California. Assembled, and managed development team day-to-day. Oversaw permitting, community relations, interface with government, utilities,

and other project-related parties. Successfully permitted five projects, at a diverse range of sites, under CEQA and California Energy Commission processes.

1998-2001
PPL Global
Fairfax, VA

Project Development Manager, Kings Park Energy, LLC
Directed permitting and political strategy for a 300 MW LM6000 power plant on Long Island, New York for PPL Global.

Project Development Manager, Wallingford Energy, LLC
Directed the permitting and development of a 250 MW LM6000 power plant in Wallingford, Connecticut for PPL Global.

1996-1998
Zahren Alternative Power Corporation
Avon, CT

Negotiated a utility buyout of a power sales contract for a landfill methane electric generating facility. Developed a proposal to install a fuel cell at Newport Naval Station. Developed a business plan to re-power several landfill methane electric generating facilities on Long Island.

1996-1998
Constellation Energy
Baltimore, MD

Designed and directed a business plan for redeveloping several independent power generation facilities to position them for competition in a restructured electricity market in California. Work included studying the competitiveness of the facilities in the evolving open-access market, and renegotiating power facility contracts, including power sales and fuel agreements.

Henwood Energy Services, Inc. 1993 -1996
Executive Consultant
Sacramento, CA; Centerbrook, CT

Advised owners and operators of electric generating facilities on business strategies in competitive electricity markets. Developed and directed negotiations of power sales agreements, including dispatch and curtailment agreements, and contract buyouts. Participated in dispatch, competitiveness, and valuation studies of electric generating facilities throughout the U.S.

This position provided an intensive exposure to the policy and technical issues involved in competitive electricity markets and industry restructuring.

Independent Power Corporation 1987 -1993
Principal
Oakland, CA

Negotiated security package contracts to support project financing of independent power facilities throughout the United States and overseas. Projects included a broad range of generator sizes and technologies, utilizing renewable and fossil fuel resources. Represented clients before public agencies on project-specific matters and in generic proceedings to develop and implement regulatory and legislative policies for independent power industry. Responsibilities included the design of power sales and regulatory strategies, and consulting to project lenders and investors on project valuation, risks and contracts. Conducted a pre-investment feasibility assessment of five (5) geothermal projects in the Philippines, focusing on legal, contractual, and financing barriers to BOT project development.

Ultrasystems Incorporated 1983 -1987
Director, Contracts
Irvine and San Francisco, CA

Represented one of the pioneer developers of independent power projects in creating the first deregulated electric marketplaces in the U.S. - in California, New York, Maine, and other states - as a negotiator in the Standard Offer #4 settlement process, and as corporate spokesman in regulatory proceedings. Negotiated power sales and other contracts for power generation facilities throughout the United States. Coordinated electrical interconnections with utilities, including contracts, scheduling, design and construction. Directed energy regulatory strategy for Ultrasystems and managed economics consultants and attorneys. Developed and directed federal legislative strategy to successfully preserve capital investment tax benefits for $208 million in new electric generating facilities. Testified before U.S. Senate Committee on Energy and Natural Resources on success of independent power generation regulatory programs in the U.S. Played a direct role in development of the first comprehensive state-level program (in California) for utility power purchases from independent power facilities under PURPA.

Resources for the Future, Center for Energy Policy Research 1982 -1983
Research Fellow
Washington, DC

Conducted research in U.S. regulatory policies for natural gas, electricity, renewable and alternative energy industries. Conducted an analysis of findings and recommendations of U.S. Department of Energy Electricity Policy Project.

Renewable Energy Institute 1981 -1982
Program Director and Legal Counsel
Washington, DC

Co-founded this institute to support the commercialization of renewable energy technologies. Established initial research funding program. Negotiated and drafted

Internal Revenue Code provision to support investments in renewable energy equipment, which was enacted as part of the Tax Reform Act of 1981.

Member of U.S. delegation to the United Nations Conference on New and Renewable Sources of Energy (UNCNRSE) in Nairobi, Kenya.

Federal Energy Regulatory Commission, Washington, DC 1979 -1980
Public Utilities Specialist
NPGA Compliance Division

Implemented regulations under Natural Gas Policy Act of 1978; gained working knowledge of FERC regulatory and procedures.

Education

Amherst College, B.A., *cum laude*, 1976.
Albany Law School of Union University, J.D., 1979.

Affiliations

Connecticut Bar
New York State Bar (resigned)
District of Columbia Bar
Independent Power Producers of New York (past Director)
Independent Energy Producers Association, California (past Director and Chairman)

THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-4

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

SUPPLEMENTAL TESTIMONY OF CHRISTOPHER LOWE
AND JEFFREY WOOD
ON BEHALF OF
GRANITE RELIABLE POWER, LLC

February 23, 2009

Qualifications of Jeffrey Wood

Q. Please state your name and business address.

A. My name is Jeffrey T. Wood. My business address is 8 Railroad Avenue, Essex, Connecticut 06426.

Q. Who is your current employer and what position do you hold?

A. I am employed by Noble Environmental Power, LLC ("Noble"). In my present position I am Senior Vice President, Project Finance. I am responsible for the financing of wind power projects for the company.

Q. What are your background and qualifications?

A. I have nearly 20 years of experience in the project finance and power generation sectors. I have been with Noble since December 2007. Prior to joining Noble, I was employed by Wachovia Capital Markets for a year and half, Societe Generale for 8 years and JP MorganChase for 8 years, all in their project finance groups.

I hold a degree in Mechanical Engineering from The University of Tennessee and an MBA from Duke University.

Qualifications of Christopher Lowe

Q. Please state your name and qualifications.

A. My name is Christopher Lowe. My position and qualifications were included in my July 2008 prefiled testimony, and have not changed.

Purpose of Testimony

Q. What is the purpose of your testimony?

A. The purpose of our testimony is to provide updated information on Granite Reliable Power, LLC's ("GRP") and Noble's financial capability to assure construction and operation of the Granite Reliable Power Windpark and the associated interconnection facilities ("the Project"), in continuing compliance with the terms and conditions of the certificate of site and facility. We also want to respond to questions that have been raised in the proceeding since the Application was filed and accepted by the Committee.

Q. Are you familiar with the Project that is the subject of this Application?

A. Yes, we are. We have both been involved in the planning stages of this Project. Going forward we will be involved in the financing of the Project.

Financial Capability to Construct and Operate the Project

Q. Please describe how Noble windparks are typically financed.

A. Each of Noble's seven (7) windparks have been "project financed", which means that the capital raised to finance the project only has recourse to the assets and operations of the project and not to any other entity, including the project's sponsors.

The financial arrangements are largely self-contained and independent of the economic condition of the sponsors. The windparks are separately financed in two portfolios of three windparks each and one individual financing. The revenue and production tax credits generated by the windparks cover their operating costs and then service principal and interest payments on project portfolio debt prior to making distributions to the tax equity and equity investors in the project. The windpark portfolios were initially financed with non-recourse construction loans that were, or will be, converted to a term loan on the completion of the project. Construction was also financed with an initial equity investment which is supplemented with a tax equity investment at completion of the project, the proceeds of which are used to repay in part the construction loan. In order to provide lenders and investors comfort about the stability of revenues, the two three-windpark portfolios have entered into energy hedge arrangements that reduce the project's exposure to changes in energy prices. The "project finance" methodology adopted by Noble is a tried and tested financing method which has been used to raise multiple billions of dollars of capital in the US power sector over the last 25 years. The discipline required by project finance investors and lenders often imposes some discipline on the projects' commercial arrangements (for example in the contractual arrangements surrounding the windparks).

Q. Please describe the financial capability of Noble and GRP as they relate to this Project.

A. Noble possesses substantial expertise and experience in the financing of wind energy projects. The Company has successfully financed and operates seven separate windparks, totaling 726 MW of capacity and has raised separate construction

loans in amounts of $485 million, $632 million and $100 million, as well as securing tax equity commitments of $220 million, $222 million, and $40 million. In the case of GRP, all foreseeable development costs have been or will be funded by the project sponsors, Noble Environmental Power, LLC and Freshet Wind Energy LLC. Funds have either been invested in GRP or will be invested as necessary. GRP intends to raise capital on a "project finance" basis, as described above, to fund the construction and operation of the windpark. The capital for construction will likely consist of equity invested in GRP and construction loan proceeds. The equity will likely be available to GRP from each of the Project Sponsors. We believe the Project would attract additional passive equity from third parties if we were to invite their participation.

The ability to raise construction debt capital will depend on both the windpark's commercial structure and the state of financial markets. The GRP Windpark has solid economic fundamentals, with a strong wind energy resource and strong market for renewable energy and capacity. GRP is currently in discussion with several prospective purchasers of the Project's output at prices that would support rates of return that appear reasonable in normal energy project finance markets. Similarly, GRP has engaged in discussions with construction contractors and turbine suppliers. The intent is to have a full commercial package to bring to the financial markets at a time when market conditions will be receptive. It is important to note that the source of repayment for construction financing is term debt and tax equity financing. Consequently, construction lenders expect commitments for this debt and tax equity to be in place at the start of construction and the project must have demonstrated long-term viability to those capital providers.

Q. Do the current financial markets present any particular challenges that change how Noble will finance the GRP Project?

A. The current financial markets present significant challenges to financing the GRP project. The global credit crisis has had a material impact on availability and price of capital, as well as the terms under which it is offered. Many traditional providers of tax equity, equity and debt are not currently participating in the market, while others are reassessing their appetite.

In our experience, financing projects in such disrupted markets requires significant forward planning and patience. By forward planning we mean being able to present to a group of financiers a comprehensive commercial plan: off take arrangements, permits, engineering and construction arrangements, turbine supply and operating arrangements. Not until all the elements are in place would financing be available in any market. By patience, we mean having resources and flexibility in arrangements which allow GRP to wait until the financial markets have stabilized before approaching a group of lenders and investors. This is an evolving situation and any expectation that project financing would be quick or easy is probably misguided.

Noble has had preliminary discussions with potential capital providers for the Project. They have recognized the fundamental strengths of the Project from the point of view of power markets, wind resource and location. As markets begin to stabilize we will formally approach a group of capital providers.

Our financing plan will likely have to be refined to address any components of the American Recovery and Reinvestment Act of 2009 (the "Act") which may impact the availability of tax credits for the Project, the ability to raise financing based on those tax

credits, and the potential for loans and grants for renewable energy projects from the Department of Energy and the Treasury. We are currently reviewing these components and awaiting further details of the legislation. However, our preliminary view is that this legislation may significantly and positively alter the availability of capital for the Project and we would note that this is exactly the type of stimulus through investment in renewable energy that the Act was intended to promote. The stimulus components of the Act that are focused on wind energy also recognize the current difficult market conditions in the project finance capital markets. It should further be noted that the act imposes certain timeframes within which projects intending to take advantage of these incentives must be undertaken. It is our understanding that a project must commence construction by December of 2010 to qualify for some of these incentives.

Q. Please describe what steps GRP intends to take to address these challenges as they relate to the Project that is the subject of this proceeding.

A. GRP will continue its efforts to ensure that the optimal commercial package for the Project (generally contractual arrangements around construction and operations) can be put in place for the financing markets (debt, tax equity, and equity). This includes pursuing revenue arrangements, construction contracts and completing the permitting of the Project. We will continue to actively monitor the financing markets and pursue providers of capital when we believe capital is available on economically viable terms. Further, we will actively engage in assessing the benefits of incentives available under the Act as we believe this could be a critical component of financing for the Project.

Q. What steps has GRP taken to try to secure a power sales agreement?

A. Noble has engaged in discussions with several New England utilities regarding sales of electricity and renewable energy credits from the Project. GRP is currently engaged in discussions regarding long-term purchase power agreements for the sale of energy and renewable energy credits, and, alternatively, a 10 year hedge agreement that would provide long-term price stability for the windpark's output. Contracted or hedged revenue streams are an essential component of the commercial package which will result in project financing. In addition, GRP has qualified and received a 5 year contract to sell capacity into ISO-NE's Forward Capacity Auction.

Q. Please provide your opinion on whether a substantial change in the proposed Project, e.g. elimination of any turbines, would affect the Project financing.

A. In our view elimination of any significant number of the generating facilities from the Project could have a substantially negative and possibly fatal impact on its economic and financial viability. Moreover, a major change in the Project would most likely constitute a "material modification" under ISO-NE rules, and require that the interconnection study process start all over from the beginning. This would mean that the Project would potentially forfeit its right to remain first in ISO-NE's interconnection queue for accessing the transmission system.

Q. Assuming that financing arrangements for the Project are not finalized at the close of the Committee's deliberations on the Application, what course of action would you propose?

A. The proposed GRP windpark can provide substantial benefits to the north country region and the state of New Hampshire, and significantly contribute to meeting the state's renewable energy goals. We recognize that the project finance market is facing extraordinary strains today and presents challenges to even the most economically robust projects. However, even when market conditions improve, it is clear that it will be considerably easier to finance this Project if it is certificated than if it is not certificated. We fully understand the Committee's concern that authority to commence construction activities should not be granted unless and until it is satisfied that the Applicant has all financial resources in place necessary to fulfill its certificate conditions. In this regard, we would be willing to accept a certificate condition that prohibits the commencement of construction until such time as all construction financing is in place. It is our experience that construction financing will only be available for a project if, and only if, the project can also demonstrate that term financing is also committed (i.e., a commitment is in place for long-term debt, tax equity and equity which will repay the construction loan on completion on the project). Consequently, this condition is equivalent to having a full long-term financing program in place for the Project. We believe that this is approach – of conditioning the certificate on financing – is prudent and will also enable the Project to pursue benefits that may be available to it under the Act.

Q. Please provide an update on the S-1 filing which you described in your July 2008 pre-filed testimony.

A. The S-1 was filed on May 8th, 2008. Various amendments to the S-1 and additional exhibits were filed through September 11th, 2008. Source: Securities and Exchange Commission. www.sec.gov ticker symbol: NEPI, (Noble Environmental Power)

These amendments were responsive to comments received from the Securities and Exchange Commission. In September of 2008, it became clear that the ability to successfully raise funds in an IPO was going to be limited due to the disruption in the global financing markets.

In fact, only one initial public offering ("IPO") in the United States has been successfully completed in the period from August 2008 to January 2009 raising $ 78.9 million for American Public Education, Inc. Source: http://finance.yahoo.com/news/First-IPO-Since-August-Gets-ibd-13642196.html S1 filing: http://idea.sec.gov/Archives/edgar/data/1201792/000095013307004456/w37769a6sv1za.htm#101

Our S-1 remains on file with SEC and we are still in the registration process. We anticipate that as global financial markets stabilize, the ability for companies to raise equity through an IPO will return. Noble will continue to assess the issuance of equity in a public offering as a financing alternative.

Q. Noble posted a net loss in its third quarter 2008 consolidated statement of operations. Could you please provide the Committee with an update?

A. Noble's consolidated financial statements for 2008 are not yet available. We anticipate that they will be available, in audited form, in April. These financial statements are prepared under Generally Accepted Accounting Principles ("GAAP"). It should be noted, however, that the reported net income does not accurately reflect the cash generation ability of the company. In particular, we are required to account for tax equity investments and our financial hedges (of both interest rates and commodities) in a manner which significantly complicates financial reporting in our income statement and balance sheet. In particular, changes in the mark-to-market value of the hedges flow through the income statement resulting in significant non-cash gains or charges to income. In layman's terms, this means that the income statement reflects the changes in "value" of the long-term hedges that we have in place. These changes in value are not necessarily equivalent to cash as we do not intend (and may not be able) to sell the hedges at those values.

Our consolidated statements reflect the balance sheet and results of operations of all of our operating, under construction and development windparks.

Q. Please explain whether there have been any changes in the management team at Noble since the filing of the Application.

A. There have been changes in the management team at Noble. These came about following the decision in September not to pursue an IPO at that time and to adapt our operating structure to what we correctly believed was going to be a period of significant instability in the financial markets. Our operating structure is now focused on

providing operating services to our operating windparks and developing a select number of windparks from our development pipeline. We have significantly downsized our employee base across all functions, except operations, and this also resulted in the departure of certain members of senior management. Noble's current senior management team is as follows:

Walter Q. Howard	CEO
Christopher M. Lowe	Executive Vice President and CFO
Neil P. Dyment	Senior Vice President (SVP), Accounting and Purchasing
Daniel J. Mandli	SVP, Operations
Thomas F. Swank	SVP and Chief Commercial Officer
Jeffrey T. Wood	SVP, Project Finance
Kay Mann	SVP and General Counsel

Q. Please describe whether there have been any changes in the ownership of Granite Reliable Power, LLC since the Application was filed in July 2008.

A. Granite Reliable Power, LLC is majority owned (75%) by Noble Granite Reliable Hold Co., LLC, which in turn is wholly owned by Noble Environmental Power, LLC. The remaining 25% of Granite Reliable Power, LLC is owned by Freshet Wind Energy LLC.

Q. Please provide an update on the other wind power projects that Noble owns, operates and maintains.

A. Noble currently owns and operates 726 MW of nameplate generation capacity as summarized in the table below

Project	Turbines	Capacity (MW)
New York 2007 Portfolio (NY07)		
Ellenburg, NY	54	81
Bliss, NY	67	100.5
Clinton, NY	67	100.5
New York 2008 Portfolio (NY08)		
Chateaugay, NY	71	106.5
Altona, NY	65	97.5
Wethersfield, NY	84	126
Texas		
Great Plains, TX	76	114
Total	484	726

The term financing for the NY07 portfolio and Great Plains is in place. We are currently working with our tax equity provider and lenders to ensure the term conversion of the NY08 portfolio, when the construction loan is replaced by term debt and tax equity.

We have no projects currently under construction other than the 14MW Bellmont project. Construction on that project was suspended in September 2008 as we could not resolve required amendments to the interconnection agreement with the New York Power Authority and NYISO and subsequent required approvals of existing lenders and tax equity providers in the NY07 portfolio prior to the end of the construction season when construction is not possible. Given the current state of the financial markets we have no clarity on the ability to finance this small add-on to the NY 07 portfolio, but remain hopeful that it can be financed in 2009.

Q. In your opinion does the Applicant have adequate financial capability to assure construction and operation of the facility in continuing compliance with the terms and conditions of a certificate ?

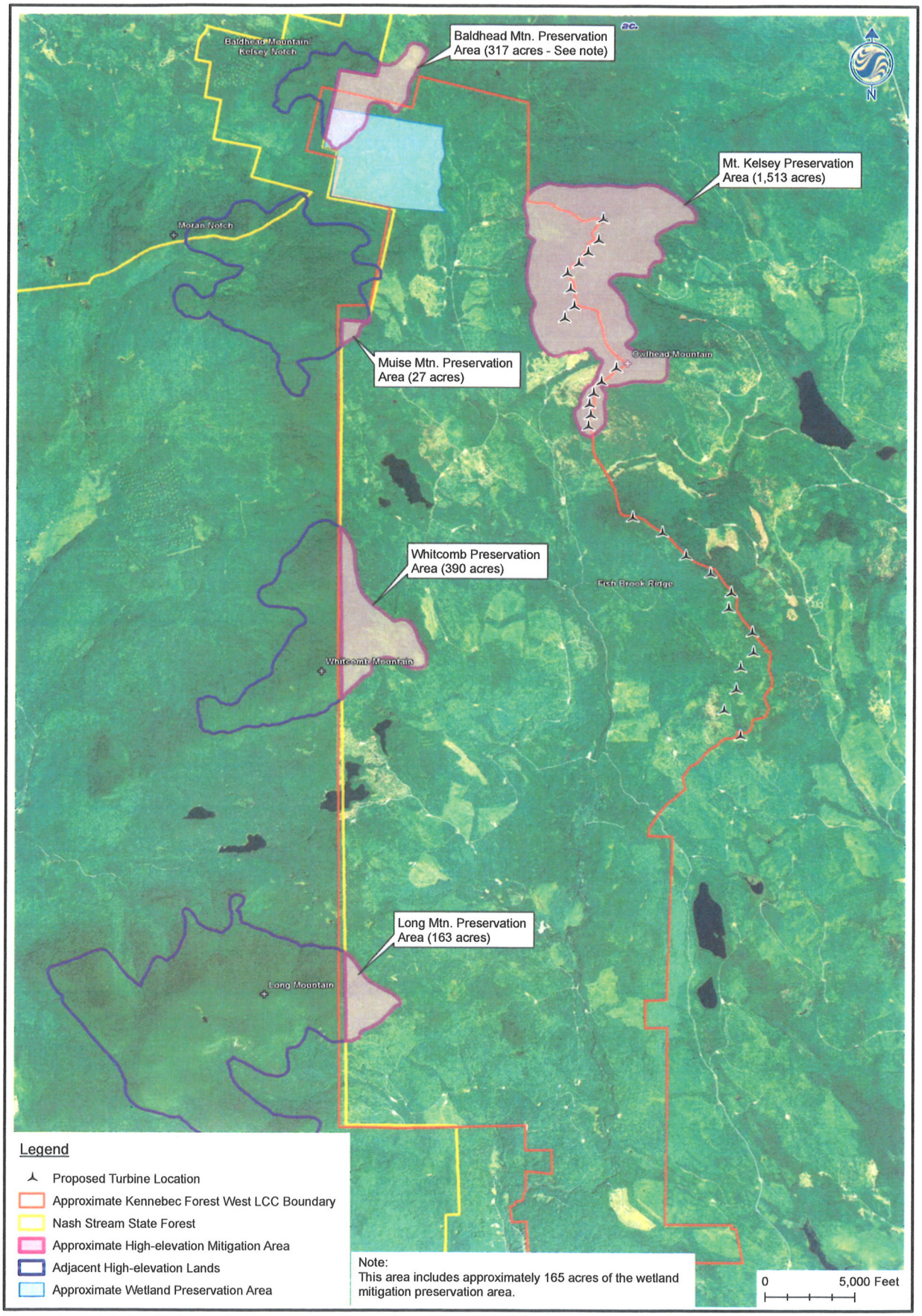
A. Yes.

Q. Are there any other comments you would like to make at this time?

A. No

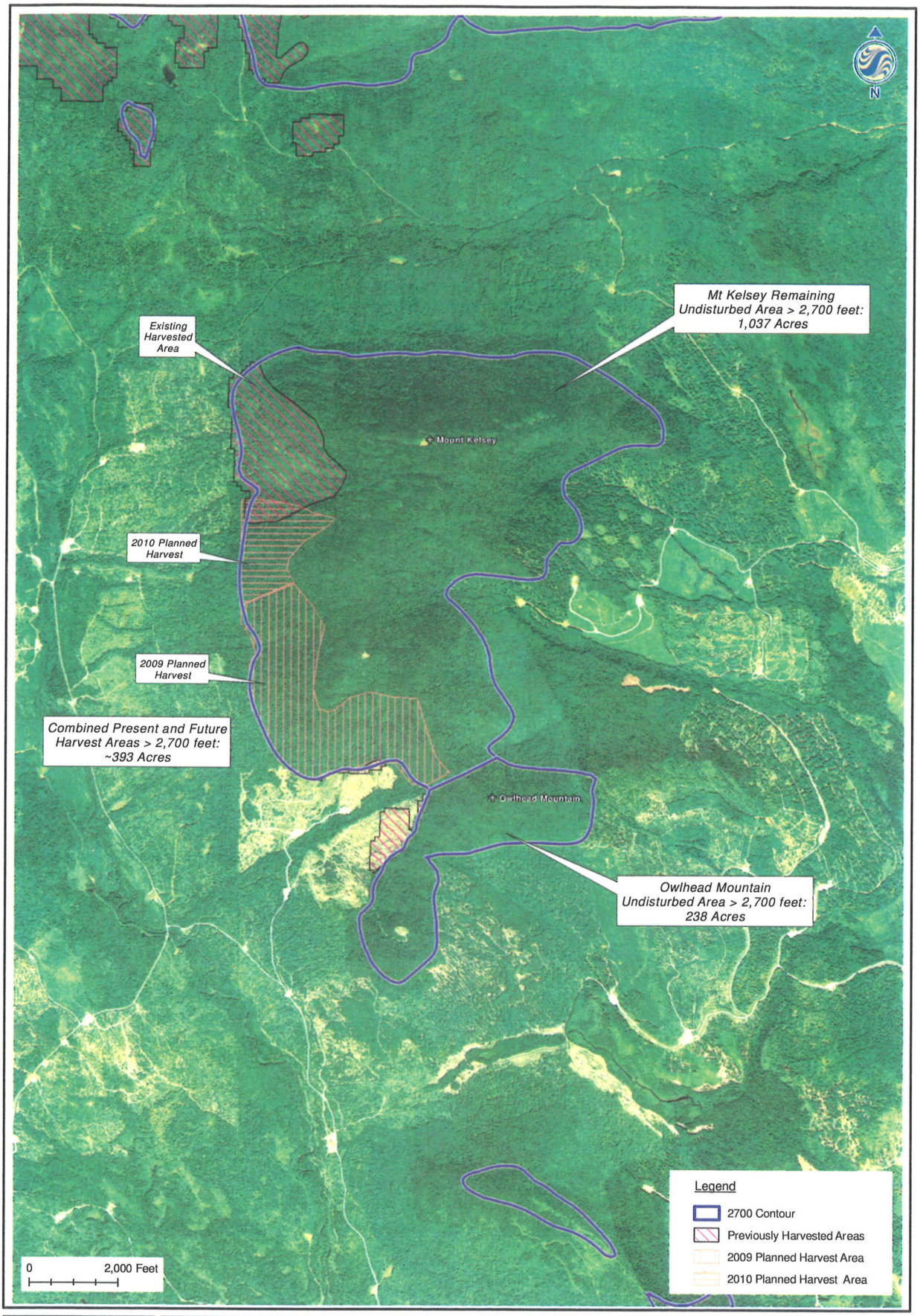
539963_1.DOC

Attachment 1



Prepared By: Stantec 00066-F002-HighHabMit.mxd	Project: Granite Reliable Power Windpark Proposed Project in Coos County, New Hampshire	Sheet Title: High Elevation Habitat Mitigation	Date: 02/19/2009 Scale: 1" = 5,000' Proj. No.: 195600066 Figure: 2

Attachment 2



Prepared By: Stantec

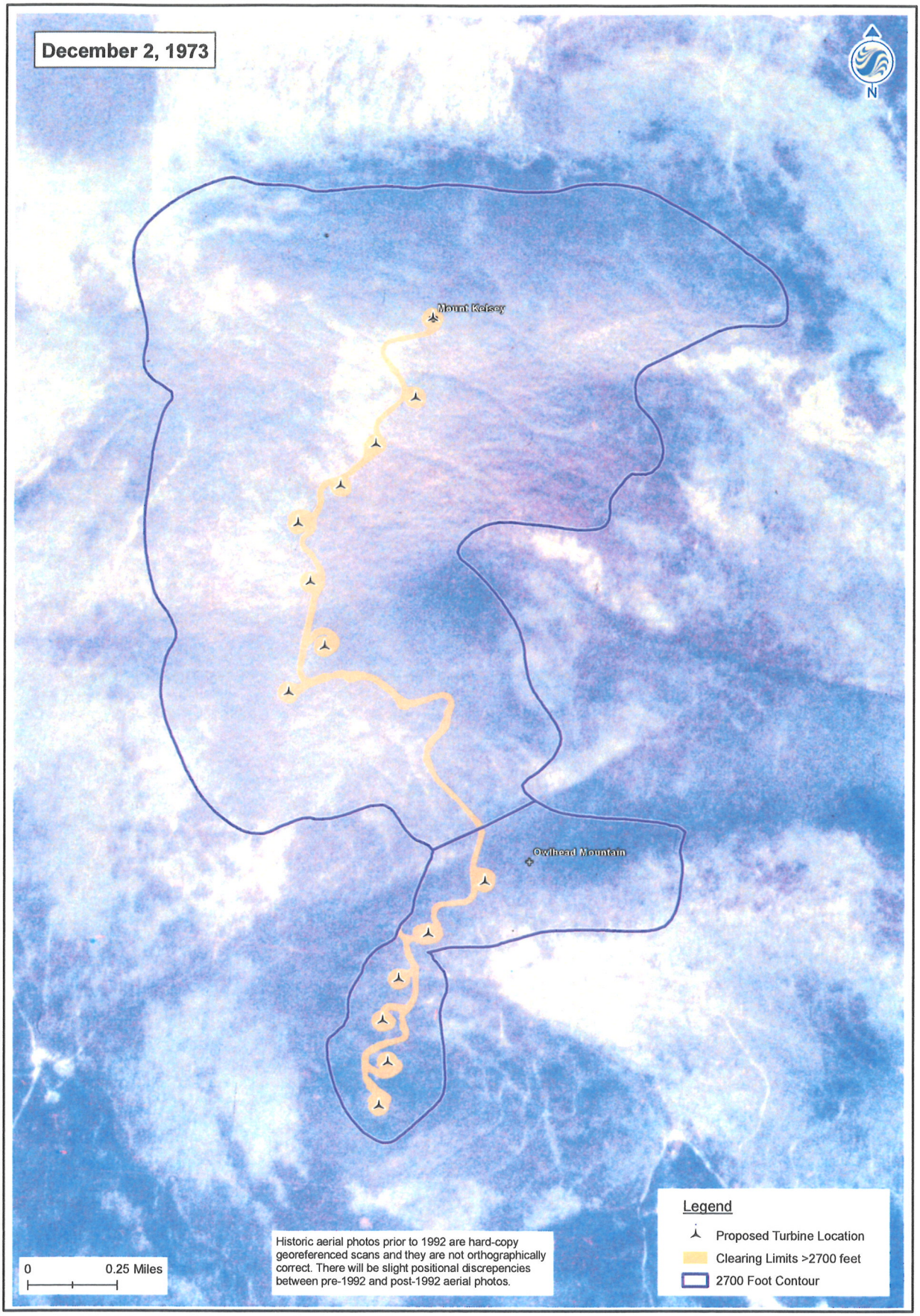
106195-F02-NHWAP_Data2_cutSchedule.mxd

Project: Granite Reliable Power Windpark
Proposed Project in Coos
County, New Hampshire

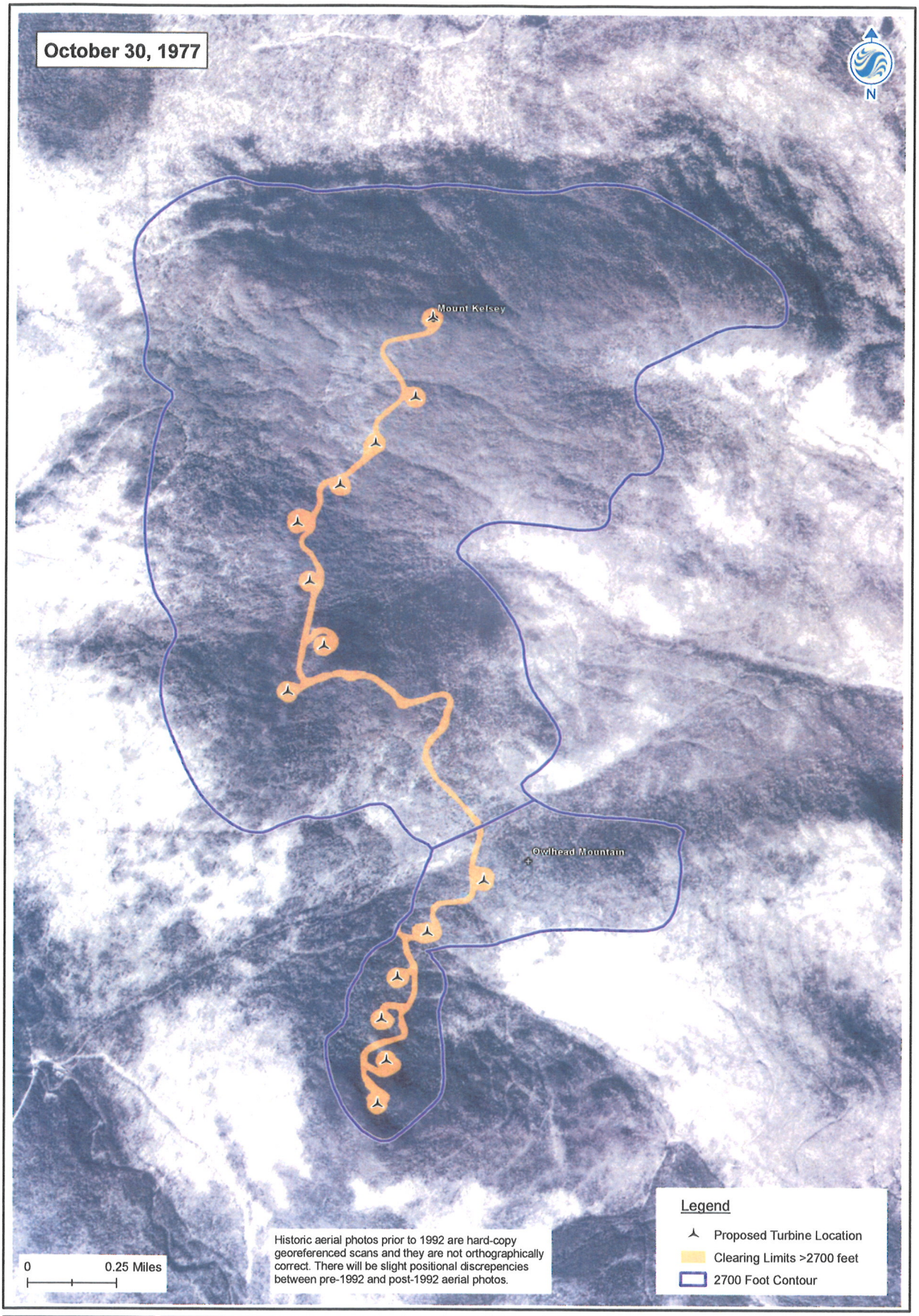
Sheet Title: Mount Kelsey and Owlheand Mountain
No-Project Map

Date: 1/27/2009
Scale: As Shown
Proj. No.: 195600056
Figure:

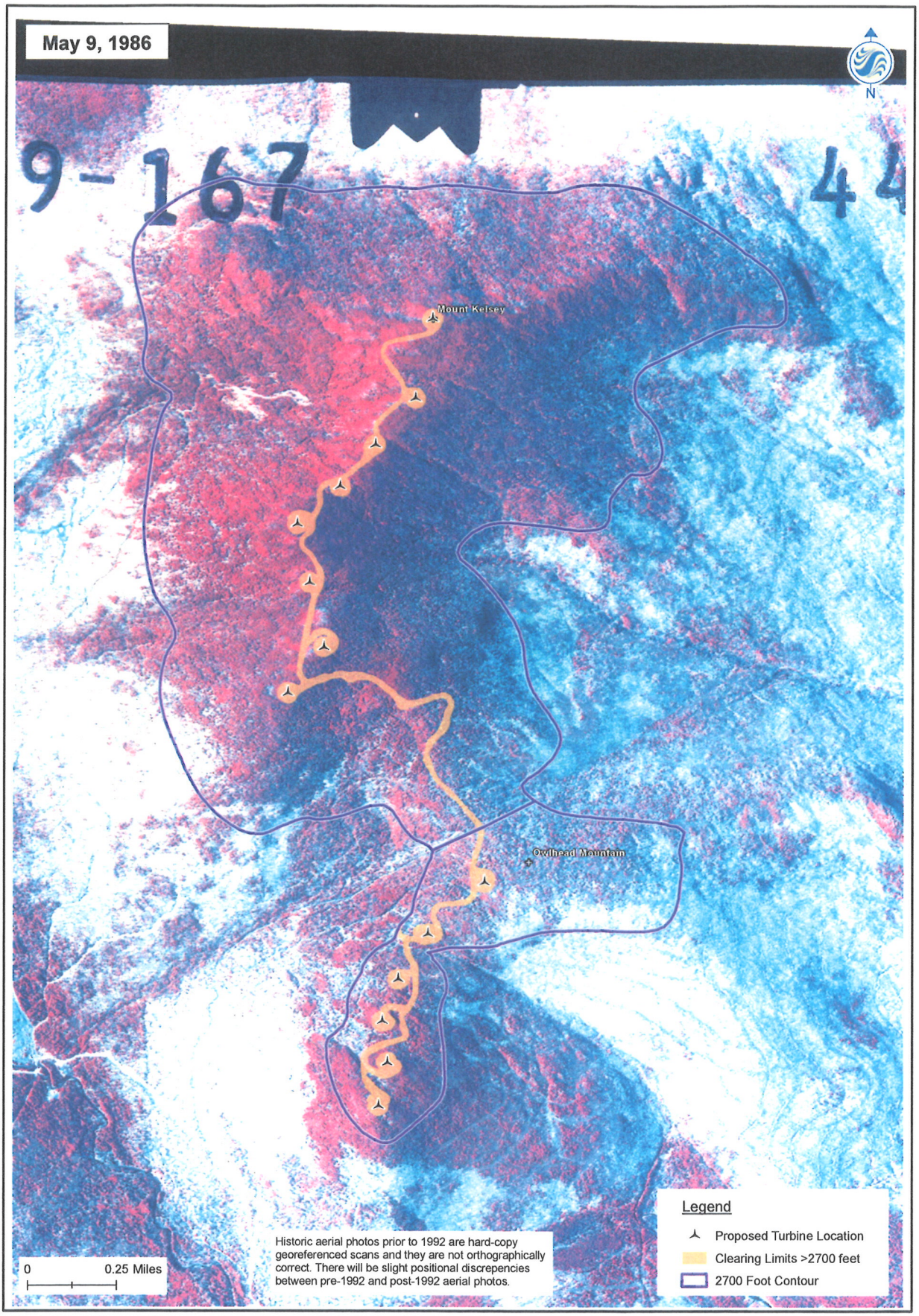
Attachment 3



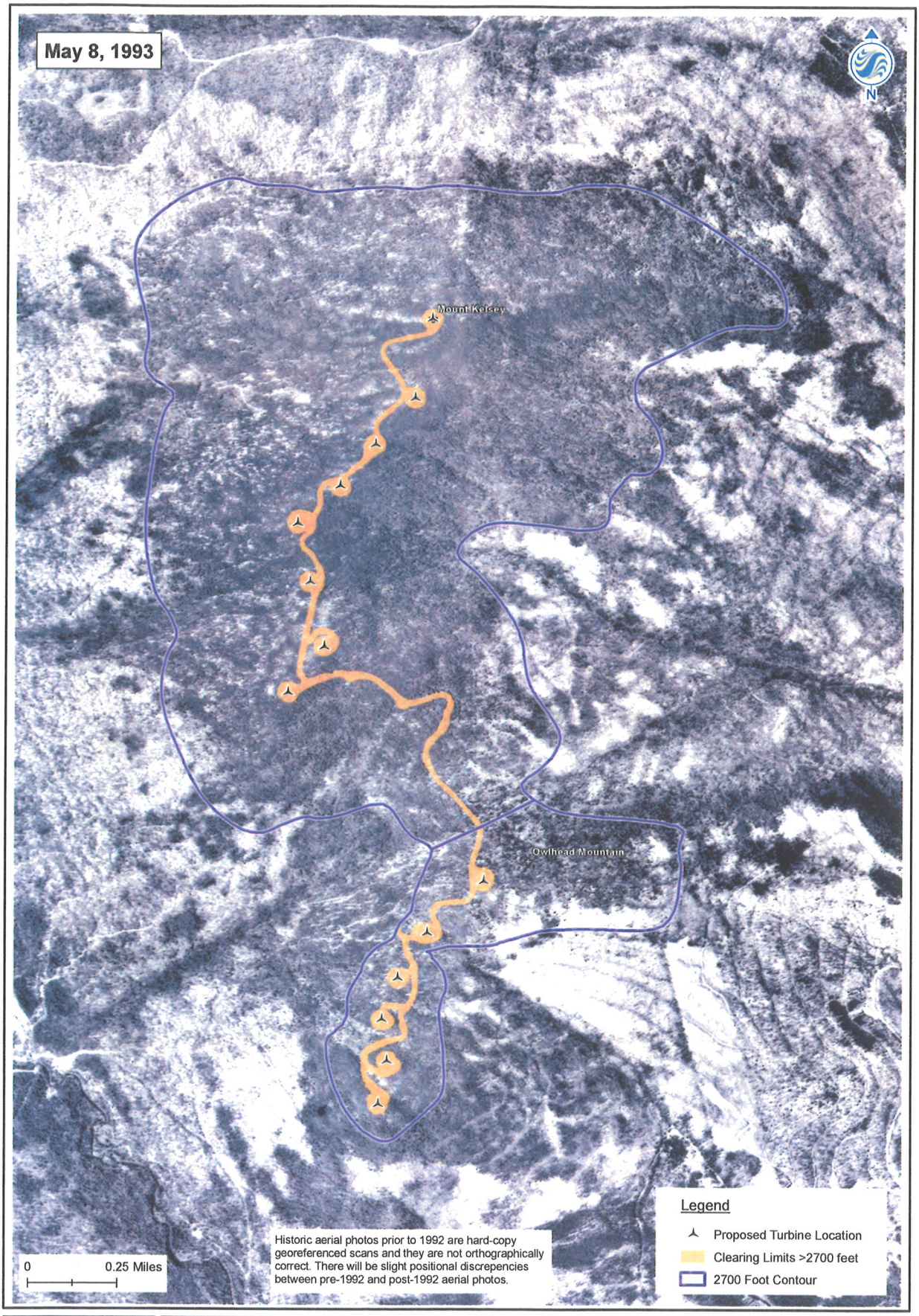
Prepared By: Stantec 00066-F001-1973_Aerials.mxd	Project: Granite Reliable Power Windpark Proposed Project in Coos County, New Hampshire	Sheet Title: Landscape History of Mount Kelsey and Owlhead Mountain December 2, 1973	Date: 2/18/2009 Scale: As Shown Proj. No.: 195600066 Figure: 1



Prepared By: Stantec 00066-F002-1977_Aerials.mxd	Project: Granite Reliable Power Windpark Proposed Project in Coos County, New Hampshire	Sheet Title: Landscape History of Mount Kelsey and Owlhead Mountain October 30, 1977	Date: 2/18/2009 Scale: As Shown Proj. No.: 195600066 Figure: 2

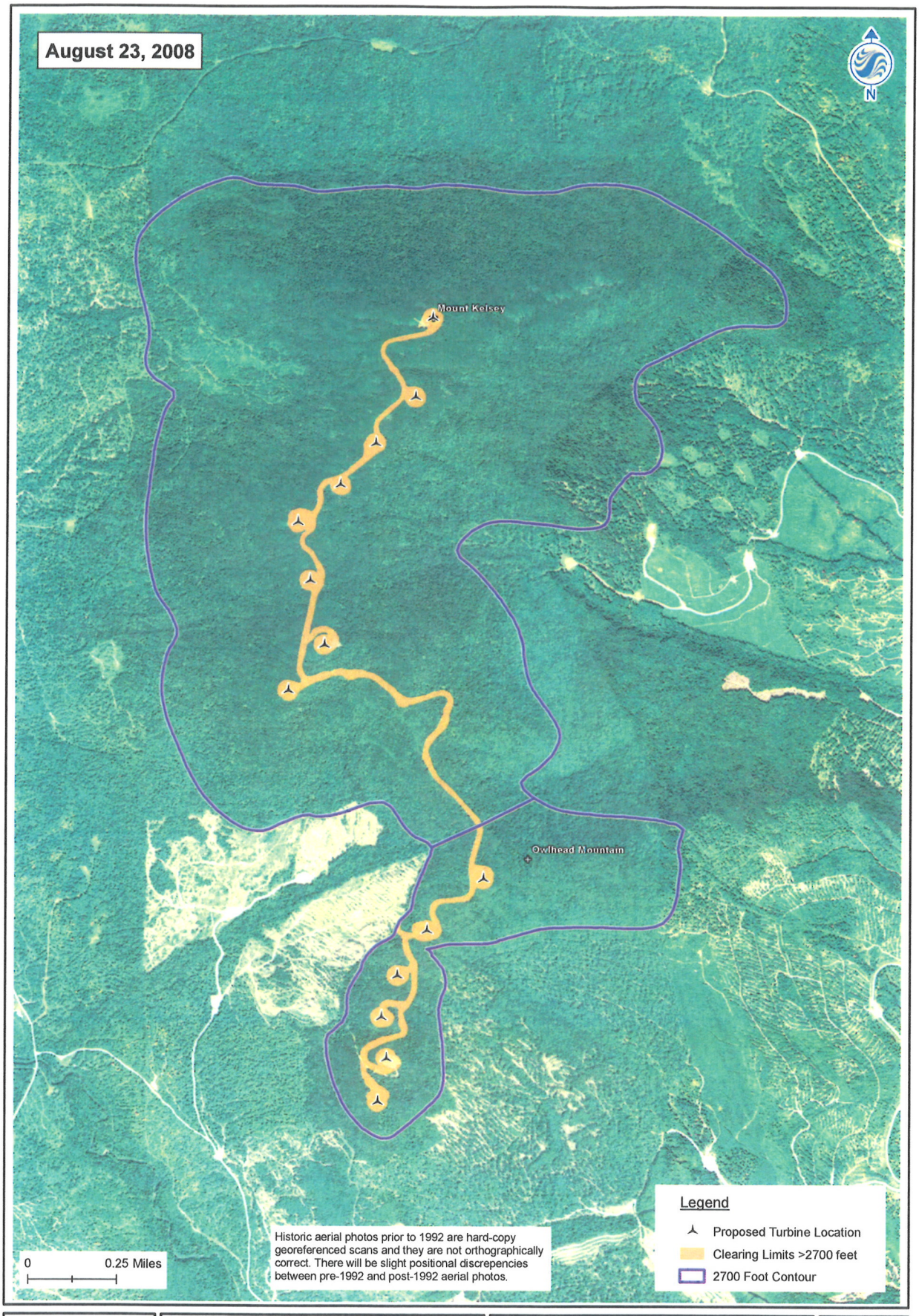


Prepared By: Stantec 00066-F003-1986_Aerials.mxd	Project: Granite Reliable Power Windpark Proposed Project in Coos County, New Hampshire	Sheet Title: Landscape History of Mount Kelsey and Owlhead Mountain May 9, 1986	Date: 2/18/2009 Scale: As Shown Proj. No.: 195600066 Figure: 3



Prepared By: Stantec 00066-P004-1993_Aerials.mxd	Project: Granite Reliable Power Windpark Proposed Project in Coos County, New Hampshire	Sheet Title: Landscape History of Mount Kelsey and Owlhead Mountain May 8, 1993	Date: 2/18/2009 Scale: As Shown Proj. No.: 195600066 Figure: 4

Prepared By: Stantec 00066-F005-2007_Aerials.mxd	Project: Granite Reliable Power Windpark Proposed Project in Coos County, New Hampshire	Sheet Title: Landscape History of Mount Kelsey and Owlhead Mountain Spring 2007	Date: 2/18/2009 Scale: As Shown Proj. No.: 195600066 Figure: 5



Prepared By: Stantec 00066-F006-2008_Aerials.mxd	Project: Granite Reliable Power Windpark Proposed Project in Coos County, New Hampshire	Sheet Title: Landscape History of Mount Kelsey and Owlhead Mountain August 23, 2008	Date: 2/18/2009 Scale: As Shown Proj. No.: 195600066 Figure: 6

Attachment 4

Summary of publicly available raptor survey results for wind projects

Year	Season	Project Site	State	Landscape	Survey Period	# Survey Days	# Survey Hours	# Birds Observed	# Species Observed	Passage Rate (b/hr)	% Below Turbine Height	Citation
1996	Fall	Searsburg, Bennington County	VT	Forested ridge	9/11-11/13	20	80	430	12	5.4	n/a	Kerlinger 1996
1998	Fall	Harrisburg, Lewis County	NY	Great Lakes plain	9/2-10/1	13	68	554	12	8.1	n/a (47 m mean flight height)	Cooper & Mabee 2000
1998	Fall	Wethersfield, Wyoming County	NY	Agricultural plateau	9/2-10/1	24	107	256	12	2.4	n/a (48 m mean flight height)	Cooper & Mabee 2000
2004	Fall	Prattsburgh, Steuben County	NY	Agricultural plateau	9/2-10/28	13	73	220	10	3.0	(125 m) 62%	Woodlot 2005b
2004	Fall	Cohocton, Steuben County	NY	Agricultural plateau	9/2-10/28	8	41	128	8	3.1	(125 m) 80%	Woodlot 2005u
2004	Fall	Deerfield, Bennington County	VT	Forested ridge	9/2-10/31	10	60	147	11 for sites combined	2.5	(100 m) 9% for sites combined	Woodlot 2005c
2004	Fall	Deerfield, Bennington County	VT	Forested ridge	9/2-10/31	10	57	725	11 for sites combined	12.7	(100 m) 9% for sites combined	Woodlot 2005c
2004	Fall	Sheffield, Caledonia County	VT	Forested ridge	9/11-10/14	10	60	193	10	3.2	(125 m) 31%	Woodlot 2006a
2005	Fall	Cohocton, Steuben County	NY	Agricultural plateau	9/7-10/1	7	40	131	10	3.3	(125) 63%	Woodlot 2005u
2005	Fall	Churubusco, Clinton County	NY	Great Lakes plain	10/6-10/22	10	60	217	15	3.6	(120 m) 69%	Woodlot 2005l
2005	Fall	Dairy Hills, Clinton County	NY	Great Lakes Shore	9/11-10/10	4	16	48	7	3.0	n/a	Young et al. 2006
2005	Fall	Howard, Steuben County	NY	Agricultural plateau	9/1-10/28	10	57	206	12	3.6	(91 m) 65%	Woodlot 2005o
2005	Fall	Munnsville, Madison County	NY	Agricultural plateau	9/6-10/31	11	65	369	14	5.7	(118 m) 51%	Woodlot 2005r
2005	Fall	Mars Hill, Aroostook County	ME	Forested ridge	9/9-10/13	8	43	115	13	1.5	(120 m) 42%	Woodlot 2005t
2005	Fall	Lempster, Sullivan County	NH	Forested ridge	Fall	10	80	264	10	3.3	(125 m) 40%	Woodlot 2007c
2005	Fall	Clayton, Jefferson County	NY	Agricultural plateau	9/9-10/16	11	64	575	13	9.1	(150 m) 89%	Woodlot 2005m
2006	Fall	Stetson, Penobscot County	ME	Forested ridge	9/14-10/26	7	42	86	11	2.1	(125 m) 63%	Woodlot 2007b
1999	Spring	Wethersfield, Wyoming County	NY	Agricultural plateau	4/20-5/24	24	97	348	12	3.6	n/a (23 m mean flight height)	Cooper and Mabee 2000
2003	Spring	Westfield, Chautaugua	NY	Great Lakes shore	4/16-5/15	50	101	2578	17	25.6	n/a (278 m mean flight height)	Cooper et al.2004
2005	Spring	Churubusco, Clinton County	NY	Great Lakes plain	Spring	10	60	170	11	2.8	(120 m) 69%	Woodlot 2005a
2005	Spring	Dairy Hills, Clinton County	NY	Great Lakes Shore	4/15-4/26	5	20	50	7	3.0	n/a	ED&R 2006b
2005	Spring	Clayton, Jefferson County	NY	Agricultural plateau	3/30-5/7	10	58	700	14	12.1	(150 m) 61%	Woodlot 2005b
2005	Spring	Prattsburgh, Steuben County	NY	Agricultural plateau	Spring	10	60	314	15	5.2	(125 m) 83%	Woodlot 2005v

Summary of publicly available raptor survey results for wind projects

Year	Season	Project Site	State	Landscape	Survey Period	# Survey Days	# Survey Hours	# Birds Observed	# Species Observed	Passage Rate (b/hr)	% Below Turbine Height	Citation
2005	Spring	Cohocton, Steuben County	NY	Agricultural plateau	Spring	10	60	164	11	2.7	(125 m) 77%	Woodlot 2005v
2005	Spring	Munnsville, Madison County	NY	Agricultural plateau	4/5-5/16	10	60	375	12	6.3	(118 m) 78%	Woodlot 2005d
2005	Spring	Sheffield, Caledonia County	VT	Forested ridge	April - May	10	60	98	10	1.6	(125 m) 69%	Woodlot 2006b
2005	Spring	Deerfield, Bennington County	VT	Forested ridge	4/9-4/29	7	42	44	11 (for both sites combined)	1.1	(125 m) 83% (at both sites combined)	Woodlot 2005g
2005	Spring	Deerfield, Bennington County	VT	Forested ridge	4/9-4/29	7	42	38	11 (for both sites combined)	0.9	(125 m) 83% (at both sites combined)	Woodlot 2005g
2006	Spring	Lempster, Sullivan County	NH	Forested ridge	Spring	10	78	102	n/a	1.3	125 m (18%)	Woodlot 2007c
2006	Spring	Howard, Steuben County	NY	Agricultural plateau	4/3-5/19	9	53	260	11	5.0	(125 m) 64%	Woodlot 2006d
2006	Spring	Mars Hill, Aroostook County	ME	Forested ridge	4/12-5/18	10	60	64	9	1.1	(120 m) 48%	Woodlot 2006g

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Attachment 5

Summary of available avian radar survey results									
Project Site	**Number of Survey Nights**	**Number of Survey Hours**	**Landscape**	**Average Passage Rate (t/km/hr)**	**Range in Nightly Passage Rates**	**Average Flight Direction**	**Average Flight Height (m)**	**(Turbine Ht) % Targets Below Turbine Height**	**Citation**
Fall 1998									
Harrisburg, NY	35	n/a	Great Lakes plain/ADK foothills	122	n/a	181	182	45	Cooper and Mabee 2000
Wethersfield, Wyoming Cty, NY	35	n/a	Agricultural plateau	168	n/a	179	154	57	Cooper and Mabee 2000
Spring 2003									
Westfield Chautauqua Cty, NY	30	150	Great Lakes Shore	395	15-1702	29	528	(125 m) 4%	Cooper *et al.*2004a
Fall 2003									
Westfield Chautauqua Cty, NY	30	180	Great Lakes shore	238	10-905	199	532	(125 m) 4 %	Cooper *et al.* 2004c
Mt. Storm, Grant Cty, WV	45	270	Forested ridge	241	8-852	184	410	n/a	Cooper *et al.* 2004b
Fall 2004									
Franklin, Pendleton Cty, WV	34	349	Forested ridge	229	18-643	175	583	(125 m) 8%	Woodlot 2005a
Prattsburgh, Steuben Cty, NY	30	315	Agricultural plateau	193	12-474	188	516	(125 m) 3%	Woodlot 2005b
Prattsburgh, Steuben Cty, NY	45	292.5	Agricultural plateau	200	18-863	177	365	(125 m) 9.2%	Mabee *et al.* 2005a
Martindale, Lancaster, Cty, PA	n/a	n/a	Reclaimed minelands	187	n/a	188	436	(n/a) 8%	Young 2006
Casselman, Somerset Cty, PA	n/a	n/a	Reclaimed minelands	174	n/a	219	448	(n/a) 7%	Young 2006
Deerfield, Bennington Cty, VT (Existing Facility)	28	300	Forested ridge	175	7-519	194	438	(100 m) <1%	Woodlot 2005c
Deerfield, Bennington Cty, VT (Western Expansion)	14	159	Forested ridge	193	8-1121	223	624	(100 m) 5%	Woodlot 2005c
Deerfield, Bennington Cty, VT (Valley Site)	13	136	Forested ridge	150	58-404	214	503	(100 m) < 1%	Woodlot 2005c
Deerfield, Bennington Cty, VT (3 sites combined)	28	595	Forested ridge	178	7-1121	212	611	(100 m) 3%	Woodlot 2005c
Sheffield, Caledonia Cty, VT	18	176	Forested ridge	114	19-320	200	566	(125 m) 1%	Woodlot 2006a
Flat Rock, Lewis Cty, NY	n/a	n/a	Great Lakes plain/ADK foothills	158	n/a	184	415	(n/a) 8%	ED&R 2006a
Spring 2005									
Churubusco, Clinton Cty, NY	39	310	Great Lakes plain/ADK foothills	254	3-728	40	422	(120 m) 11%	Woodlot 2005d
Ellenberg, Clinton Cty, NY	n/a	n/a	Great Lakes plain/ADK foothills	110	n/a	30	338	(n/a) 20%	Mabee *et al.* 2006a
Dairy Hills, Clinton Cty, NY	n/a	n/a	Great Lakes shore	117	n/a	14	397	(n/a) 15%	ED&R 2006a
Clayton, Jefferson Cty, NY	36	303	Agricultural plateau	450	71-1769	30	443	(150 m) 14%	Woodlot 2005e
Sheldon, Wyoming Cty, NY	38	272	Agricultural plateau	112	6-558	25	418	(120 m) 6%	Woodlot 2006b
Prattsburgh, Steuben Cty, NY	20	183	Agricultural plateau	277	70-621	22	370	(125 m) 16%	Woodlot 2005f
Prattsburgh, Steuben Cty, NY	30	270	Agricultural plateau	170	3-844	18	319	(125 m) 18%	Mabee *et al.* 2005a
Cohocton, Steuben Cty, NY	3	29	Agricultural plateau	371	133-773	28	609	(125 m) 12%	ED&R 2006b
Munnsville, Madison Cty, NY	41	388	Agricultural plateau	160	6-1065	31	291	(118 m) 25%	Woodlot 2005g
Fairfield, Herkimer Cty, NY	40	369	Agricultural plateau/ADK foothills	509	80-1175	44	419	(125 m) 20%	Woodlot 2005h
Jordanville, Herkimer Cty, NY	40	364	Agricultural plateau	409	26-1410	40	371	(125 m) 21%	Woodlot 2005i
Sheffield, Caledonia Cty, VT	20	179	Forested ridge	208	11-439	40	522	(125 m) 6%	Woodlot 2006a
Deerfield, Bennington Cty, VT	20	183	Forested ridge	404	74-973	69	523	(125 m) 4%	Woodlot 2005j
Franklin, Pendleton Cty, WV	23	204	Forested ridge	457	34-240	53	492	(125 m) 11%	Woodlot 2005k

(*continued*)

Summary of available avian radar survey results (*continued*)									
Project Site	**Number of Survey Nights**	**Number of Survey Hours**	**Landscape**	**Average Passage Rate (t/km/hr)**	**Range in Nightly Passage Rates**	**Average Flight Direction**	**Average Flight Height (m)**	**(Turbine Ht) % Targets Below Turbine Height**	**Citation**
Fall 2005									
Churubusco, Clinton Cty, NY	38	414	Great Lakes plain/ADK foothills	152	9-429	193	438	(120 m) 5%	Woodlot 2005l
Ellenberg, Clinton Cty, NY	n/a	n/a	Great Lakes plain/ADK foothills	197	n/a	162	333	(n/a) 12%	Mabee *et al.* 2006a
Dairy Hills, Clinton Cty, NY	n/a	n/a	Agricultural plateau	94	n/a	180	466	(n/a) 10%	Young et al. 2006
Clayton, Jefferson Cty, NY	37	385	Agricultural plateau	418	83-877	168	475	(150 m) 10%	Woodlot 2005m
Bliss, Wyoming Cty, NY	8	n/a	Agricultural plateau	440	52-1392	n/a	411	(125 m) 13%	Young 2006
Perry, Wyoming Cty, NY	n/a	n/a	Agricultural plateau	64	n/a	180	466	(125 m) 10%	Young 2006
Sheldon, Wyoming Cty, NY	36	347	Agricultural plateau	197	43-529	213	422	(120 m) 3%	Woodlot 2005n
Howard, Steuben Cty, NY	39	405	Agricultural plateau	481	18-1434	185	491	(125 m) 5%	Woodlot 2005o
Fairfield, Herkimer Cty, NY	38	423	Agricultural plateau	691	116-1351	198	516	(125 m) 4%	Woodlot 2005p
Jordanville, Herkimer Cty, NY	38	404	Agricultural plateau	380	26-1019	208	440	(125 m) 6%	Woodlot 2005q
Munnsville, Madison Cty, NY	31	292	Agricultural plateau	732	15-1671	223	644	(118 m) 2%	Woodlot 2005r
Deerfield, Bennington Cty, VT	32	324	Forested ridge	559	3-1736	221	395	(100 m) 13%	Woodlot 2005s
Kibby, Franklin Cty, ME (Mountain)	12	115	Forested ridge	565	109-1107	167	370	(125 m) 16%	Woodlot 2006d
Kibby, Franklin Cty, ME (Range 1)	12	101	Forested ridge	201	12-783	196	352	(125 m) 12%	Woodlot 2006d
Kibby, Franklin Cty, ME (Valley Site)	5	13	Forested valley	452	52-995	193	391	(125 m) 16%	Woodlot 2006d
Mars Hill, Aroostook Cty, ME	18	117	Forested ridge	512	60-1092	228	424	(120 m) 8%	Woodlot 2005t
Spring 2006									
Chateaugay, Franklin Cty, NY	35	300	Agricultural plateau	360	54-892	48	409	(120 m) 18%	Woodlot 2006e
Wethersfield, Wyoming Cty, NY	44	n/a	Agricultural plateau	324	41-907	12	355	(125 m) 19%	Mabee et al. 2006b
Centerville, Allegany Cty, NY	42	n/a	Agricultural plateau	290	25-1140	22	351	(125 m) 16%	Mabee et al. 2006b
Howard, Steuben Cty, NY	42	440	Agricultural plateau	440	35-2270	27	426	(125 m) 13%	Woodlot 2006f
Deerfield, Bennington Cty, VT	26	236	Forested ridge	263	5-934	58	435	(100 m) 11%	Woodlot 2006g
Kibby, Franklin Cty, ME (Mountain)	6	33	Forested ridge	456	88-1500	67	368	(120 m) 14%	Woodlot 2006h
Kibby, Franklin Cty, ME (Range 1)	10	80	Forested ridge	197	6-471	50	412	(120 m) 22%	Woodlot 2006h
Kibby, Franklin Cty, ME (Range 2)	7	57	Forested ridge	512	18-757	86	378	(120 m) 25%	Woodlot 2006h
Kibby, Franklin Cty, ME (Valley Site)	2	14	Forested valley	443	45-1242	61	334	(120 m) n/a	Woodlot 2006h
Mars Hill, Aroostook Cty, ME	15	85	Forested ridge	338	76-674	58	384	(120 m) 14%	Woodlot 2006i
Fall 2006									
Chateaugay, Franklin Cty, NY	35	327	Agricultural plateau	643	38-1373	212	431	(120 m) 8%	Woodlot 2006j
Wethersfield, Wyoming Cty, NY	56	n/a	Agricultural plateau	256	31-701	208	344	(125 m) 11%	Mabee et al. 2006c
Centerville, Allegany Cty, NY	57	n/a	Agricultural plateau	259	12-877	208	350	(125 m) 12%	Mabee et al. 2006c
Lempster, Sullivan Cty, NH	32	290	Forested ridge	620	133-1609	206	387	(125 m) 8%	Woodlot 2007a
Stetson, Penobscot Cty, ME	12	77	Forested ridge	476	131-1192	227	378	(125 m) 13%	Woodlot 2007b
Cape Vincent, Jefferson Cty, NY	63	508	Great Lakes plain	346	n/a	209	490	(125 m) 8%	WEST 2007
Spring 2007									
Lempster, Sullivan Cty, NH	30	277	Forested ridge	542	49-1094	49	358	(125 m) 18%	Woodlot 2007c
Coos County, NH	30	212	Forested ridge	342	2 to 870	76	332	(125 m) 14%	Stantec Consulting 2007a
Stetson, Washington Cty, ME	21	138	Forested ridge	147	3-434	55	210	(120 m) 22%	Woodlot 2007d
Laurel Mountain, VA	20	197	Forested ridge	277	13-646	27	533	(130 m) 3%	Woodlot 2007e
Cape Vincent, Jefferson Cty, NY	50	300	Great Lakes plain	166	n/a	34	441	(125 m) 14%	WEST 2007
Fall 2007									
Coos County, NH	29	232	Forested ridge	366	54 to 1234	223	343	(125 m) 15%	Stantec 2007b

Wolfe Island, Ontario, Canada*	n/a	n/a	Interior Lake Island	n/a	n/a	95	233	(125m) 23%	EchoTrack 2008
Laurel Mountain, VA	20	212	Forested ridge	321	76-513	209	533	(130 m) 6%	Woodlot 2007f

*Certain pieces of information are not available for comparison due to differences in survey methodology and design.

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Attachment 6

Summary of available bat detector survey results			
Project Site	**Landscape**	**Calls Per Detector Night**	**Citation**
Fall 2004			
Prattsburgh, Steuben County, NY	Agricultural plateau	2.22	Woodlot 2005b
Cohocton, Steuben County, NY	Agricultural plateau	2.00	Woodlot 2005b
Sheffield, Caledonia County, VT	Forested ridge	1.76	Woodlot 2006a
Franklin, Pendleton County, WV	Forested ridge	9.24	Woodlot 2005a
Spring 2005			
Churubusco, Clinton County, NY	Great Lakes plain/ADK foothills	0.26	Woodlot 2005d
Clayton, Jefferson County, NY	Agricultural plateau	0.90	Woodlot 2005e
Sheldon, Wyoming County, NY	Agricultural plateau	0.17	Woodlot 2006b
Prattsburgh, Steuben County, NY	Agricultural plateau	0.28	Woodlot 2005f
Cohocton, Steuben County, NY	Agricultural plateau	0.72	Woodlot 2006c
Munnsville, Madison County, NY	Agricultural plateau	0.27	Woodlot 2005g
Jordanville, Herkimer County, NY	Agricultural plateau	0.50	Woodlot 2005i
Sheffield, Caledonia County, VT	Forested ridge	0.17	Woodlot 2006c
Deerfield, Bennington County, VT	Forested ridge	0.07	Woodlot 2005j
Franklin, Pendleton County, WV	Forested ridge	0.50	Woodlot 2005k
Fall 2005			
Churubusco, Clinton County, NY	Great Lakes plain/ADK foothills	5.56	Woodlot 2005l
Clayton, Jefferson County, NY	Agricultural plateau	4.70	Woodlot 2005m
Sheldon, Wyoming County, NY	Agricultural plateau	34.92	Woodlot 2005n
Howard, Steuben County, NY	Agricultural plateau	31.06	Woodlot 2006o
Cohocton, Steuben County, NY	Agricultural plateau	1.57	Woodlot 2006c
Fairfield, Herkimer County, NY	Agricultural plateau	1.70	Woodlot 2005p
Jordanville, Herkimer County, NY	Agricultural plateau	4.79	Woodlot 2005q
Munnsville, Madison County, NY	Agricultural plateau	2.32	Woodlot 2005r
Sheffield, Caledonia County, VT	Forested ridge	1.18	Woodlot 2006a
Deerfield, Bennington County, VT	Forested ridge	0.52	Woodlot 2005s
Redington, Franklin County, ME	Forested ridge	4.20	Woodlot 2005u
Mars Hill, Aroostook County, ME	Forested ridge	0.83	Woodlot 2005t
Spring 2006			
Chateaugay, Franklin County, NY	Agricultural plateau	2.00	Woodlot 2006e
Brandon, Franklin County, NY	Agricultural plateau	13.00	Woodlot 2006e
Wethersfield, Wyoming County, NY	Agricultural plateau	1.50	Woodlot 2006k
Centerville, Allegany County, NY	Agricultural plateau	2.10	Woodlot 2006k
Howard, Steuben County, NY	Agricultural plateau	0.40	Woodlot 2006f
Sheffield, Caledonia County, VT	Forested ridge	7.90	Woodlot 2006a
Deerfield, Bennington County, VT	Forested ridge	0.10	Woodlot 2006g
Kibby, Franklin County, ME	Forested ridge	0.30	Woodlot 2006h
Fall 2006			
Chateaugay, Clinton County, NY	Agricultural plateau	5.10	Woodlot 2006j
Brandon, Franklin County, NY	Agricultural plateau	13.10	Woodlot 2006j
Wethersfield, Wyoming County, NY	Agricultural plateau	0.30	Woodlot 2006l
Centerville, Allegany County, NY	Agricultural plateau	0.06	Woodlot 2006l
Sheffield, Caledonia County, VT	Forested ridge	1.10	Woodlot 2006a
Lempster, Sullivan County, NH	Forested ridge	3.47	Woodlot 2007a
Kibby, Franklin County, ME	Forested ridge	0.20	Woodlot 2006m
Stetson, Penobscot County, ME	Forested ridge	2.60	Woodlot 2007b
Spring 2007			
Coos County, NH	Forested ridge	0.30	Stantec Consulting 2007a
Fall 2007			
Coos County, NH	Forested ridge	0.60	Stantec 2007b

Literature Cited in Publicly Available Survey Tables (Exhibit 7)

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Attachment 7

Stantec

September 16, 2008

Vernon Lang
US Fish and Wildlife Service
New England Filed Office
70 Commercial St, Suite 300
Concord, NH 03301

Vern,

This letter is prepared on behalf of Granite Reliable Power by Stantec Consulting the primary environmental consultant for the Granite Reliable Power Windpark in Coos County, NH in response to your comments on the first technical session from your April 23, 2008 letter regarding the avian and bat field studies conducted by Stantec at the proposed Granite Reliable Wind Project (GRP), in Coos County New Hampshire. The USFWS expressed concerns regarding methods and results of the nocturnal radar studies, acoustic bat detector surveys, raptor surveys, and breeding bird surveys that were conducted over the past two years at the project site. The following provides Stantec's and Granite Reliable Power's responses to USFWS comments.

The USFWS commented that that radar surveys should have been conducted from Dixville Peak or Mt Kelsey and not just Owlhead Mountain to identify the spatial and temporal distribution of flying vertebrates. Mr. Lang also felt that 3 years of radar data would be needed to understand year to year variability in the magnitude of migration over the project site. In addition, Mr. Lang felt that target verification should have been done with infrared, acoustic, or night vision equipment, and that weather information should be collected from within rotor heights of the proposed turbines.

Stantec has substantial experience conducting radar surveys in the northeast. Based on our firm's experience and the results of over 69 publicly available radar surveys conducted over the past four years at other proposed wind projects, it is reasonable to conclude that the radar surveys conducted at the project site were sufficient for the purposes of the project, to identify potential avian risks and that further surveys would not provide any significant additions to the data already accumulated.

Nocturnal radar surveys can provide valuable information on the movement of nocturnal passerines, including the magnitude, flight height, and direction. However, the ability to accurately determine the number of potential collisions or a mortality rate is limited by the type of information that can be obtained through the use of current marine radar technology. There have been over 100 pre-construction radar studies (of which 69 publicly available) conducted throughout the northeast covering a variety of habitats and elevations in the region. All show similar migratory trends, and results do not differ by orders of magnitude. It is not clear how gathering more seasons of radar surveys at the GRP site would provide the USFWS with any more meaningful information about project specific avian risks, especially in the absence of correlative mortality data. The radar ***Survey Work Completed on Owlhead Mountain and Adjacent location*** provided an accurate representation of varying elevations in the project area. Additionally, the spring and fall 2007 surveys conducted on Owlhead Mountain provided two seasons of data from a single central location within the project site during the same year that can be evenly compared to each other. If surveys occurred on different ridges each season or year, even comparisons

could not be made for data collected within the project site due to varying locations and consequently radar views. By sampling in one location, more accurate analyses can be made to discuss potential variations such as those caused by varying weather conditions observed night to night and season to season.

The results of both of these survey locations showed similar results and were not indicative of any concentrated migratory areas. Most importantly, the mean flight heights, as observed from the three seasons of radar surveys, showed that migrants were traveling high above ground level. The study illustrates that the average flight heights over the lower elevation radar were recorded at higher elevations than the Owlhead Mountain radar site. This indicates that birds are neither concentrating in the valley nor are they changing flight altitudes as they pass through the project site. Table 1 (below) shows a comparison between the data gained from the three radar survey locations within the GRP project site over a year and a half period. As observed in all three surveys, the majority of migrants are flying well above the height of the proposed turbines (125 m).

Table 1. Comparison of results from three seasons of radar surveys conducted at the GRP site.

	Location	Elevation	Passage Rate (t/km/hr) with range	Flight Direction	Flight Height (m)	% Below 125 meters
Fall 2006	2 miles East of Mt. Kelsey	2000' (610 m)	469 (2 to 1098)	223°	455 (310 to 638)	1%
Spring 2007	Owlhead Mountain	2800' (853 m)	342 (2 to 870)	76°	332 (81 to 583)	14%
Fall 2007	Owlhead Mountain	2800' (853 m)	366 (54 to 1234)	223°	343 (179 to 636)	15%

Flight heights shown represent the mean flight height for the season and the range of mean flight heights by night.

The conclusions drawn from this data are further enhanced as a result of a data sharing agreement with a nearby project currently under study. Using the same methodology, Stantec conducted radar surveys in the fall of 2006 and spring of 2007 with The North Country Wind Project (NCWP) approximately 5 miles north of the GRP project in Dixville, NH. Despite some differences in the levels of effort between the two projects, radar surveys were coordinated so as to ensure radar equipment was operating simultaneously at both sites on most nights. The NCWP radar survey location was located in the saddle between Sanguinary Mountain and Mud Pond Ridge at an elevation of 2800' (853 m), the same elevation as the GRP Owlhead Mountain radar site. Flight Directions, flight heights, and passage rates were shown to be similar between sites and seasons (Table 2). Using this data, it is concluded that nocturnal migrants are not channeling to any part of this area of New Hampshire, and are passing at high flight altitudes prior to reaching the NCWP or GRP site, and remaining at these altitudes as they travel in their migratory direction (northeast in spring and southwest in fall).

Table 2. Summary of two seasons of radar survey results at the proposed Granite Reliable Power Wind Project and the North Country Wind Project - Coos County, New Hampshire								
	Passage Rate (t/km/hr) with range		Flight height (m) with range		Flight Direction		% Below Turbine height	
Season	GRP	NCWP	GRP	NCWP	GRP	NCWP	GRP (125 m)	NCWP (120 m)
Fall 2006	469 (2 to 1098)	505 (153 to 906)	455 (310 to 638)	361 (225 to 495)	223°	208°	1%	8%
Spring 2007	342 (2 to 870)	187 (24 to 387)	332 (81 to 583)	290 (145 to 515)	76°	92	14%	12%

As noted above, over 100 radar surveys have been conducted since 2004 on mountain tops throughout the northeast (Stantec has conducted surveys from West Virginia to Maine) all showing similar results. Of the 69 publicly available radar surveys, season and nightly mean flights heights have consistently shown that the majority of nocturnal migrants are flying between 300m and 600m above ground level. Additionally, season mean flight directions at almost all sites are consistently northeast in the spring and southwest in the fall. Both indicating that nocturnal migrants are unaffected by topography, and that the majority of migration is broad-front. A summary of these studies has been provided in the pre-file testimony of Adam Gravel and Steve Pelletier in the NH SEC application and attached to this document for your reference. For these reasons and in response to the data collected in connection with the project, Stantec believes that three years of radar surveys at the GRP site would not provide any additional information beyond what is already known about migratory passage rates, and certainly would not provide any more indication of potential collision risk.

The USFWS also commented that target verification should have been conducted through the use of infrared, acoustic, or night vision equipment and that weather information be collected from within rotor heights of the proposed turbines.

As described and summarized in Appendix A, Table 5 in each of the three radar survey reports, attempts were made at target verification on an hourly basis each night using ceilometer or moon watching methods. Both of these methods are capable of target verification to a coarse level (i.e., bird, bat, or insect). Through years of professional experience conducting radar surveys, Stantec has developed quality radar target interpretation by verifying targets during daylight hours of different species of birds or flocks of birds and cross-referencing those observations with their respective representations on the radar screen. This approach has provided valuable information to conclude that radar is incapable of determining species of birds using target size as shown on the radar. This is because, depending on the angle at which the bird flies through the radar beam, the same target could appear as different sizes on the radar screen. As a result, the ceilometers and moon watching methods are a more accurate methodological approach to these kinds of surveys.

It is important to note that night time target verification is only valid to determine whether the target observed is a bird, bat, or insect and is not capable of distinguishing to species. Also, these types of surveys often result in very few observations because the maximum range of these methods do not cover the height at which most migrants have been documented to fly, even though they do cover the height of the proposed wind turbines.

In response to the USFWS's request for weather condition data, current weather conditions were also recorded hourly and nightly for each of the three seasons of radar surveys using the on-site met tower at the 50 meter anemometers. If that met-tower data was un-available, data was collected from the top of the radar tower, at or below tree height, using a hand held anemometer and thermometer. All of this data was included in Appendix A, Table 5 in each of the three survey reports. Current technology does not allow for wind data measurement in remote areas on forested mountain tops at the heights requested by USFWS. The only current technology capable of measuring weather data at these heights is SODAR technology, which is a 5' by 8' trailer sized unit that would require road access and land clearing to deliver the instrument to the summit.

The USFWS commented that the coverage of the project site with bat acoustic detectors was also inadequate and that they should be deployed on other met towers in addition to their locations on the summit of Owlhead Mountain and in the met tower near Trio Ponds. They also commented that there was a need for data in favorable habitat conditions for bats, such as the adjacent valleys and streams to determine if a reservoir of bats or bat activity exists near the project site. They also expressed concern for the lack of surveys investigating potential small-footed bat roost sites on the west side of Mt. Kelsey.

Due to the location of the detectors the acoustic bat surveys were not inadequate relative to the project and the duration of the study. One full year of bats surveys were conducted within the project site with particular focus paid to the two major habitat types characteristic of the entire project site. The Owlhead Mountain site was at a higher elevation and located within a relatively undisturbed spruce/fir forest. The Trio Pond site was located adjacent to Trio Ponds and was within a relatively disturbed area due to forest harvesting activities and consisted of regenerating hardwood species. The Trio Ponds location provided a better sampling of habitats thought to be more suitable for foraging bats. Additionally, met towers were used at both sites to gain information of bat activity levels at heights near the proposed rotor zone during the spring and fall migration periods as well as the summer foraging and pup rearing months.

In addition to the data collected within the GRP site, bat detector surveys were also occurring simultaneously with the NCWP site approximately 5 miles north of the GRP site during the spring 2007. Both the number of calls and detection rates observed at the two sites were low and very similar (Table 3). Similar to radar information, it is still unknown whether bat activity levels as recorded during acoustic bat surveys translate into number of fatalities once a project is developed. It is also difficult to determine if the number of calls actually represents the number of individuals flying by the detector, especially during summer foraging months when it would be possible for an individual bat to fly past the detector multiple times in one night. Overall, the bat activity levels recorded at both of these sites were low compared to other studies conducted at proposed wind power sites in the northeast. This is probably due to the northerly latitude of the project site and shorter growing season that keeps temperatures below 50 degrees for most of the year.

Table 3. Comparison of results of the spring 2007 simultaneous bat detector surveys conducted at the two projects					
Granite Reliable Wind Project					
Location	**Dates**	**# Detector Nights**	**# Recorded Sequences**	**Detection Rate**	**Maximum Number of Calls Recorded**
Owlhead High	4/26-6/1	37	8	0.2	5
Owlhead Low	4/30-6/1	19	5	0.3	2
Trio Ponds High	4/28-6/1	35	8	0.2	3
Trio Ponds Low	4/28-6/1	35	12	0.3	2
Overall Results		**126**	**33**	**0.3**	--
North Country Wind Project					
Location	**Dates**	**# Detector Nights**	**# Recorded Sequences**	**Detection Rate**	**Maximum Number of Calls Recorded**
Met Tower High	4/26-6/11	47	25	0.5	18
Met Tower Low	4/13-6/11	60	25	0.4	11
Overall Results		**107**	**50**	**0.5**	--

It is unclear of the location of Wells and Watkins Brooks or the caves associated with them as referenced in the USFWS letter. Both Stantec biologists as well as the wetland scientists from another consulting company that delineated the property are unaware of these brooks or the referenced caves. As part of initial consultations with the New Hampshire Fish and Game Department (NHFGD), USFWS, and New Hampshire Natural Heritage Bureau (NHNHB) these features did not come up as being significant habitat for the state endangered small-footed bat. The closest known occurrence of the eastern small-footed bat to the project area is approximately 21 miles south at the Mascot Lead Mine in Gorham, NH, where 9 individuals were documented by NHFGD in 2004.

The USFWS commented that the Raptor surveys conducted at the GRP site should be conducted during both spring and fall from vantage points on the prominent ridges and mountain tops within the project site and not just Owlhead Mountain. They also commented that hawk watch data exists from Weeks State Park from 1998-2000 and also 2002 and should have been used for comparison to the project. Concern was also expressed that the results of the fall 2007 raptor survey at the GRP site was did not compare well to the Weeks Park data.

Stantec does not feel that the fall 2007 raptor surveys were inadequate nor does a spring survey need to occur. Based on known raptor mortality as observed at developed wind projects in the U.S., raptor collision is of the lowest reported fatalities caused from collision with wind turbines. Direct observations of raptors at operating wind projects in the northeast documented that most raptors are aware of the

turbines and avoid them. Stantec's direct experience conducting similar surveys at an existing facility in southern Vermont supports this observation. Over the course of two seasons, raptors were repeatedly observed soaring near turbines and lifting up over the spinning turbine blades. These observations made it evident that the birds were aware of the presence and movement of the turbine blades. Furthermore, considering their daytime habits and the limited movement of migrating raptors during inclement weather, potential interactions between raptors and wind turbines can be expected to be low. Through recorded observations on site, knowledge of publicly available data information from operating windparks, and characteristics migratory birds, all support that additional surveys at the Project site would not yield substantive changes in the overall conclusions made to date.

Stantec also feels that it is inappropriate for data collected during the fall 2007 at the project site to be compared to data collected 6-10 years ago at Weeks State Park. It is more important to compare data from the same days of survey at the project to an established hawk watch site located within a known migration flyway for raptors. Using this approach shows that far fewer raptors migrate through the project site relative to an established hawk watch site in New England in addition, it uses current data that reflects the latest conditions in the Project Site. Additionally, we do not feel that the location of the raptor survey should have been changed. The location atop of the radar tower at the summit of Owlhead Mountain afforded views 360 degrees around it and all but Dixville Peak could be monitored from this location. By surveying multiple locations as suggested by USFWS, you further weaken the surveys comparability to other sites in the region because established hawk watch sites are surveyed during an entire migration season from a single location.

The USFWS commented that because of the status and presence of the state listed species of special concern, the Bicknell's thrush, potentially suitable habitat for this species within the project site should be mapped. They also commented that the breeding bird surveys conducted by NH Audubon only covered the spine of the mountains within the project site and did not extend down slope enough.

At the technical meeting on March 27, 2008, which described the results of the natural community characterization, we demonstrated that all habitats were mapped within the project site and was focused toward high elevation spruce/fir habitat known to be suitable for Bicknell's thrush, as well as the state listed endangered American marten. In addition to the habitat mapping conducted by Stantec, NH Audubon also conducted breeding bird surveys at all proposed turbine locations within the habitat that would be impacted by the project that appeared to be suitable breeding habitat for Bicknell's thrush. Overall, low numbers of Bicknell's thrush were observed during the two breeding bird surveys conducted by NH Audubon. Additional breeding bird surveys or habitat mapping is not needed in the project site.

Based on over two years of intensive survey, it our conclusion that the studies completed on the Project site provide an accurate description of migratory trends, habitat, and known species. The data support the conclusion that migratory levels are low by comparison to other studies conducted across the nation, and that passage rates are well above the height of the wind turbines, mitigating risk of collision and severe threat to airborne species. Using the observed data and comparing it to nearby studies conducted by Stantec further support that the radar study for birds, bats and other species conducted at Owlhead Mountain and adjacent sites are consistent and require no further study. It is our conclusion that additional studies will be unable to yield more information until the windpark becomes operational. At such point, we believe the incidences of both bird and bat mortality will be low and this is supported by the available studies contained within Granite Reliable Power's windpark application.

Sincerely,

Adam Gravel
Project Manager / Wildlife Biologist
Stantec Consulting- Formerly Woodlot Alternatives

Pip Decker
Development Project Manager
Noble Environmental Power

Joshua Brown
Environmental Project Manager
Noble Environmental Power

CC:
Maria Tur
Richard Roach
Mark Kern
Timothy Timmermann
Craig Rennie
Lori Sommer
Michael Marchand
William Statts
Jillian Kelly
Kim Tuttle
Doug Patch
Susan Geiger
Sandy Sayyeau

(c)

THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-4

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

SUPPLEMENTAL TESTIMONY OF DANIEL MANDLI
ON BEHALF OF
GRANITE RELIABLE POWER, LLC

February 23, 2009

Qualifications

Q. Please state your name and business address.

A. My name is Daniel Mandli. My business address is 8 Railroad Avenue, Essex, Connecticut 06426. My position and qualifications have not changed from what was described in my July 2008 pre-filed testimony.

Purpose of Supplemental Testimony

Q. What is the purpose of your supplemental testimony?

A. The purpose of my supplemental testimony is to provide the Committee with an update on Granite Reliable Power, LLC's ("GRP") technical and managerial capability to assure the operation and maintenance of the Granite Reliable Windpark and the associated interconnection facilities ("the Project") in continuing compliance with the terms and conditions of its certificate of site and facility.

Managerial and Technical Capability

Q. Has Noble and GRP's managerial capability to operate and maintain a windpower project changed since you submitted your pre-filed testimony in July of 2008 ?

A. At the time my initial pre-filed testimony was submitted, Noble Environmental Power had approximately 300 MW of wind energy capacity operating in New York. Noble currently operates 726 MW of wind capacity in New York and Texas consisting of seven separate projects, a total of 484 wind turbines, each of which contains a switchyard and associated transmission peripherals. We monitor each of the operating wind plants 24/7 from our National Operations Center in Plattsburgh, New York. This center also serves as the conduit to the respective transmission owners on each project to handle required switching and plant control during transmission emergencies or curtailment situations. Thus, since my initial pre-filed testimony was submitted, Noble has gained substantial operational experience that enhances its managerial capability to operate and maintain a windpower project such as the proposed GRP facility.

Q. Is there anything you want to add to your description of Noble and GRP's technical capability to run a windpower project?

A. Each of Noble's wind plants is operating efficiently since start-up and technician teams are performing scheduled services and turbine optimization processes to maximize the safety and performance of its wind assets. The NY07 projects, which include the Bliss, Clinton and Ellenburg projects, are operating at availability levels in the high 90 percentile.

Q. Have the resources and qualifications of the personnel available to Noble to operate and maintain its wind power projects changed since July of 2008?

A. The Noble Operations team is currently made up of 60 wind professionals located in New York, Connecticut, and Texas. There has been an increase in enrollment since July of 2008 to handle the increase in projects on line. The NY08 projects officially began coming on line in December of 2008.

Q. Are you still operating the windparks that were described in your July 2008 pre-filed testimony?

A. Yes.

Q. Have GRP's plans for staffing the Coos County wind power Project changed since July 2008?

A. There has been no change in staffing plans for the GRP project.

Q. Does this conclude your testimony?

A. Yes.

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THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-4

**APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY**

**SUPPLEMENTAL TESTIMONY OF
STEPHEN LAFRANCE
ON BEHALF OF
GRANITE RELIABLE POWER, LLC**

February 23, 2009

Q. Please state your name and business address.

A. My name is Stephen LaFrance. My business address is Horizons Engineering, L.L.C., 34 School Street, Littleton, NH, 03561.

Q. Who is your current employer and what position do you hold?

A. I am employed by Horizons Engineering, L.L.C. ("Horizons") and I am the president of the company.

Q. What are your background and qualifications?

A. I have more than 25 years of experience in the civil engineering field and am currently a licensed professional engineer in the States of New Hampshire, Vermont, and Maine. I hold a B.S. with Distinction in Civil Engineering from Worcester Polytechnic Institute.

Q. What is the purpose of your supplemental testimony?

A. The purpose of my supplemental testimony is to provide an update on the design and construction of Granite Reliable Power, LLC's ("GRP") wind power project in Coos County ("the Project"), including the Project's impacts on water quality and the proposed mitigation of those impacts. I also want to update the discussion of the Project's impacts on public health and safety during the construction phase. In addition, I want to respond to pre-filed testimony that has been submitted by Public Counsel and the Intervenors in this docket and to respond to the agency reports that have been filed with the Committee. Lastly, I am adopting the pre-filed testimony submitted by Phillip Beaulieu in July 2008 in this docket. I am Mr. Beaulieu's supervisor and I helped him prepare the July 2008 testimony.

Q. Have the plans for this Project changed since the July 2008 Application was filed ?

A. Yes. We have made plan revisions since the July 2008 application in response to review comments from the New Hampshire Department of Environmental Services ("NHDES") and the Intervenors. A copy of the revised plans are included as Appendix 57 to the Supplement to the Application. The changes that have been made to the project are summarized as follows:

1.) Jurisdictional wetland boundaries have been field checked, surveyed, and revised as necessary to reflect actual conditions.

2.) Adjustments to the proposed road alignments, power pole locations, and grading plan have been made to further minimize wetland impacts. Some proposed impacts have been reduced and some have been

eliminated (e.g. Sheet 106-15, 16, and 17). The total proposed wetland impact has been reduced from approximately 14.8 acres to 13.5 acres.

3.) Erosion control measures have been added to the plans including rubber diverters.

4.) We have modified stone armored slopes in critical areas to vegetated stone armored slopes to enhance regeneration and wildlife passage (e.g. Mt. Kelsey, Sheet 105, Impact Site 105-3).

5.) We have modified Sheet 143 "Erosion Control Notes, Details, and Construction Sequence" to include a detail for a "rock sandwich" as suggested by Dr. David Publicover at the December 19, 2008 technical session. Although we had intended to utilize blast rock for fill areas, this detail is intended to address Intervenor concerns about the maintenance of shallow subsurface drainage paths through wetland impact areas. We also added a detail for slope drains to convey water across and down newly constructed slopes in a non-erosive manner.

6.) We have modified the seed specification from the NRCS Conservation Mix to a mix that contains seeds (e.g. Aroostook Rye) suitable for rapid stabilization of disturbed soils in colder climates and bridging vegetation (fescues) that will not compete with the germination of native woody species.

7.) We have refined specifications on fertilizer use to indicate the application of phosphorus, nitrogen and lime at agronomic rates based upon soil samples taken from the site.

8.) We have proposed restricted use of herbicides to only those areas around electrical substations

Q. Please provide an overview of your work with state and federal agencies since the Project Application was submitted in July of 2008.

A. We have worked closely with the New Hampshire Department of Environmental Services, the U.S. Army Corps of Engineers, the EPA, U.S. Fish & Wildlife, and the Natural Heritage Bureau since the application was submitted to answer questions and address concerns as they have been raised. The NHDES has issued proposed findings and conditions for Section 401 Water Quality Certification (WQC#2008-004) for the project that includes proposed findings and conditions based on recommendations and agreed upon actions to be taken by the Applicant before, during, and after construction to ensure that water quality is maintained. The NHDES has also issued its proposed findings and conditions for the Wetlands Bureau Dredge & Fill Permit and the Alteration of Terrain Permit.

Q. Have you reviewed the pre-filed testimony submitted in this docket by witnesses for Public Counsel and other Intervenors ?

A. Yes.

Q. Please comment on the prefiled testimony submitted by witnesses for Public Counsel.

With regard to Dr. Gary Sanford's testimony I offer the following: On Lines 19-21 of Page 10 of his testimony Dr. Sanford states that "A hydrogeologic evaluation of the nearby wetlands is required to assess the potential for this type of [blasting] impact and should be conducted for each instance where blasting is proposed."

I disagree with this opinion. The Applicant does not know, and will not know until construction begins, each instance where blasting is proposed. Because of the remote nature and lack of access to many areas of the project site, geotechnical investigations to determine depths to ledge, soil conditions, and subsurface geology and hydrologic conditions cannot be determined without an exorbitant and unreasonable expenditure of time and money. Even if the Applicant were to fly in drill rigs to conduct a soil boring program, the ability to realistically and adequately access subsurface geology and the effect of blasting is highly questionable. I believe that effects on bedrock geology by blasting (e.g. fracturing) may enhance as many seeps, wetlands, and vernal pools as it harms.

On Lines 8 and 9 of Page 14, Dr. Sanford states "I recommend that detailed inventories be made of each wetland impact area in order to assess loss of habitat characteristics." I disagree with this approach. There are approximately 600 individual wetland impacts associated with this project. To ask the Applicant to complete a detailed inventory of each, especially in light of the fact that many are similar (e.g. human-created wetlands that have developed in roadside ditches), is an unreasonable burden. Moreover, NHDES, the wetlands permitting agency for the State of New Hampshire, has not required this of the Applicant.

With regard to Dr. David Publicover's testimony I offer the following: On Pages 15 and 16 of his testimony Dr. Publicover states that "minimizing impacts requires a high level of expertise and understanding of the particular challenges of high elevation environments." He goes on to quote Maine State Soil Scientist David Rocque regarding the difficulties with construction in areas of steep slopes, (shallow) depth to

bedrock, shallow water table, etc. We stand by our position that designing the roads for this project does not differ substantially from many other projects with which we have been involved. We regularly encounter and adequately address ledge, shallow depths to groundwater, wetlands, and steep slopes. Anyone who has travelled over the Kancamagus Pass on Route 112, the Jefferson Notch Road, or visited the summit of Mt. Washington by automobile has travelled well above 2,700 feet and probably didn't (save the view) give it much thought.

Q. Do you have any comments on the proposed findings and conditions for the NHDES permits for this Project that were submitted by them on February 10, 2009 ?

A. We have reviewed the NHDES proposed findings and conditions for all three permits, find them to be reasonable, and have every intention of accepting and following them through construction. We believe that the issuance of these proposed findings and conditions by the NHDES is evidence of the Department's comfort with the application as prepared and revised.

Q. Please provide a description of the steps GRP is intending to take to address water quality and how that has changed since the Application was submitted in July 2008.

A. There have been few changes made to the design with respect to water quality issues since the July 2008 application date, and certain elements have been detailed on the plans to better depict and convey the principles behind the measures that will be used onsite to protect water quality. We recognized early on in the design process that water quality concerns would be important and from the onset planned measures to

be employed both during and after construction to protect water quality. These measures include both temporary and permanent erosion control measures, frequent culvert spacing to disperse runoff, the use of coarse road base material, grass treatment swales, replacement of existing culverts, culvert outlet plunge pools, rubber flow diverters, stone lined slopes and ditches where necessary, etc. We have also proposed to prepare a turbidity sampling plan to confirm that erosion control methods and measures are effective and to provide site monitoring and reporting by a Certified Professional In Erosion and Sediment Control. A Spill Prevention, Control, and Countermeasures Plan (SPCC) will also be prepared and submitted to NHDES at least 90 days prior to the installation of the first turbine.

Q. Has your opinion as to whether this Project will have an unreasonable adverse effect on water quality changed since your July 2008 pre-filed testimony was submitted ?

A. No. I was comfortable with the design as proposed in our July 2008 submittal and that comfort level has increased with the changes we have made since that time.

Q. Please describe any changes in the construction phase of the project.

GRP has revised the construction schedule since the project was first envisioned. Initially, all work was planned to be completed in 2009. The schedule was revised to address Fish and Game and USFWS concerns about construction during certain breeding seasons and now calls for work to begin in May 2009 and to proceed through 2010.

In response to concerns raised by Drs. Sanford and Mariani regarding minimization of high elevation wetland impacts, we have agreed that during construction we will review available site specific geotechnical analyses and amend the construction plans to further minimize wetland impacts through the use of stone retaining walls and ledge cut faces. These measures shall be used where the project engineer has determined that conditions are suitable and no hazard to health and safety exists.

Q. Has your opinion of whether this Project will have an unreasonable adverse effect on public health and safety, particularly during the construction phase, changed since July 2008 ?

A. No. The location of the project site, limited public access, and the measures proposed by the Applicant, its consultants, its contractor(s) and NHDES will adequately protect public health and safety.

Q. Does this conclude your supplemental pre-filed testimony?

A. Yes.

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THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-04

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR A CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

SUPPLEMENTAL TESTIMONY OF RAYMOND LOBDELL ON BEHALF OF GRANITE RELIABLE POWER, LLC

February 23, 2009

Q. Please state your name and business address.

A. My name is Raymond Lobdell. My business address is Lobdell Associates Inc., 88 Gale Chandler Road, Landaff, New Hampshire, 03585.

Q. Are you the same Ray Lobdell who prefiled testimony in this docket in July, 2008?

A. Yes.

Q. What is the purpose of your supplemental prefiled testimony?

A. The purpose of this testimony is to provide updated information concerning the potential impacts of the Granite Reliable Power, LLC ("GRP") wind power project ("the Project") on wetlands and the proposed plan for mitigating those potential impacts.

Q. Please describe any changes to the Project's plans as they impact wetlands that have occurred since July 2008.

A. The plans have been revised by Horizons Engineering. As shown in the revised Summary of Wetland Impacts Table filed with the Request for More Information response to the NH Wetlands Bureau, the project will now require a total of 13.5 acres of unavoidable wetland impacts at 532 impact sites. Of these, about 50% are less than 500 square feet and only 4% are greater than 5,000 square feet. About 55% of the impact sites are stream or ditch-related, with 50% of the impact sites related to upgrading existing roads. Other wetland impacts are primarily to forested wetlands in the new sections of road and at tower sites.

Q. Please describe the Project's proposed plan for mitigating the Project's impacts on wetlands.

A. GRP proposes to mitigate 13.5 acres of wetland impact primarily by upland buffer preservation, by vernal pool creation, and by restoration of perennial and seasonal stream crossings.

The proposed Phillips Brook Mitigation Area consists of approximately 620 acres located within the Town of Columbia and unincorporated Ervings Location as shown in Figure 1 of the report, "Revised Draft Management & Stewardship Plan-Compensatory Wetland Mitigation Area Granite Reliable Power Wind Park, Phillips Brook Headwaters" by Lobdell Associates Inc, submitted in February, 2009 as part of the Request for More Information response to the NH Wetlands Bureau and included herein as Attachment 1. The area buffers Phillips Brook on the east border and the Nash Stream State Forest on

the west and south borders. Elevations range from 2,100 feet at the southeast corner, where Phillips Brook flows off site, to about 2,900 feet at a ridge top at the northwest corner of the site. Approximately 150 acres is above 2700 feet in elevation. Seventy five percent of the mitigation land is in the headwaters of the Philips Brook watershed, identified by the Northern Forest Alliance as one of its priority areas for conservation in its FY07 Strategic Conservation Opportunities Report, provided as Attachment 2. The remaining 25% is in the headwaters of Simms Brook which is part of the Nash Stream watershed. Much of the area is considered high value wildlife habitat based on the NH Fish and Game Department's ("NHFGD") Wildlife Action Plan. To further enhance the mitigation area, an existing five foot diameter culvert located in Annis Brook along an old logging road will be removed, and the stream channel and banks naturalized, resulting in restoration of 75 linear feet of stream and the elimination of a restriction in this perennial stream that affects the stream's hydrology and aquatic habitat.

The proposed high elevation habitat mitigation area consists of 1600 acres of upland and wetland along the Mt. Kelsey and Owlhead range, which has been identified by NHFGD as unique and high ranking habitat. The high elevation spruce/fir forest would be preserved in perpetuity with no cutting allowed. The boundaries of the mitigation area have been prepared in consultation with NHFGD and relate to high elevation mitigation for spruce/fir forest and wildlife species of concern: Bicknell's Thrush, American Pine Marten, and Three-toed Woodpecker.

Both the wetlands and the high elevation mitigation areas will be protected through a conservation easement and managed according to a stewardship plan.

Proposed conservation restrictions include no further subdivision, no structures, no ATVs or motorized vehicles, and no commercial logging.

Additional wetlands mitigation includes the creation of vernal pools. Vernal pools will be created in the Phillips Brook mitigation area as well as the 1600 acre high elevation habitat mitigation area. They will mitigate the impacts to 3,454 square feet of vernal pool disturbance caused by road construction. Exact location, numbers, and size of vernal pools will be determined in the spring of 2009, when conditions allow.

The restoration component of the mitigation plan includes the removal of 17 existing culverts in perennial streams on existing logging roads within the project area. They will be replaced by box culverts and bridges and the stream channels will be restored. Also, approximately 100 existing logging road culverts in seasonal streams will be replaced and upgraded, thereby enhancing stream hydrology and quality. This will restore over 2600 linear feet of stream channels and banks, or 0.31 acres of jurisdictional area. Additionally, 2.5 acres of upland and wetland will be restored; this area is currently a logging yard and will serve temporarily as the Mt. Kelsey staging area.

Although not credited as part of the mitigation plan, many wet ditches will be created as part of the upgrading of the existing logging roads. These will replace existing wet ditches that are being impacted and replace the limited wetland functions and values they are currently providing.

Q. Have you read the prefiled testimony of Dr. Gary R. Sanford submitted in this docket on behalf of Counsel for the Public?

A. Yes.

Q. Do you agree with all of the information and/or conclusions contained in Dr. Sanford's prefiled testimony relating to the issues of the Project's wetlands impacts and/or wetlands mitigation?

A. No.

Q. Please describe the areas of Dr. Sanford's prefiled testimony with which you disagree and explain the reasons for your disagreement.

A. I disagree with Dr. Sanford's position that the project design does not avoid and minimize wetland impacts whenever possible. Methods used to avoid and minimize wetland impacts include: utilizing existing logging and skidder roads whenever possible; aligning new roads to minimize impacts; siting of towers to avoid wetlands; locating transmission line poles out of wetlands; conducting alternatives analysis for the siting of laydown and switchyards; keeping road widths at the minimum possible to allow specialized equipment to operate; maintaining the steepest road grades possible that will allow specialized equipment to operate; keeping side slopes of new road sections steeper than the usual 2:1, which reduces the wetland impacts; and the installation of box culverts or bridges over perennial and large seasonal stream crossings.

I disagree with Dr. Sanford's statement that the proposed mitigation plan does not provide adequate functional mitigation for wetlands' losses. Commonly accepted mitigation measures include restoring former wetlands, enhancing the functions of degraded wetlands, creating new wetlands in uplands, and preserving wetland buffers through the use of conservation easements. The proposed project will use preservation to protect important functions and ecological resources in what is now a threatened environment. The plan also includes creation and restoration components. In New

Hampshire, over 95 percent of the compensatory mitigation is accomplished by upland buffer preservation, according to the NH Wetlands Bureau.

For this project, the accepted mitigation sequence has been followed. First, wetland impacts have been avoided whenever possible. Secondly, where impacts are necessary they have been minimized through project design and engineering. Finally, unavoidable wetland impacts have been mitigated to result in "no net loss" of wetland functions based on a wetlands mitigation alternatives analysis. Required state and recommended federal mitigation ratios have been exceeded using acceptable methods of mitigation.

I disagree with Dr. Sanford's statement that there is also a strong likelihood that significant additional secondary impacts to wetlands may occur because of potential alterations to wetland hydrology. Secondary wetland hydrologic impacts will be minimized by the installation of rock sandwiches under wetland crossings on new road sections and higher elevation roads. This construction technique will allow water to pass freely from wetlands above the road to wetlands below, and will maintain hydrologic continuity between wetlands. This best management practice, plus the installation of bridges, box culverts, and culverts for stream crossings, will minimize secondary impacts to wetlands below the project. Additionally, permanent and temporary stormwater and erosion control practices will be utilized to minimize sediment entering nearby wetlands during construction.

I disagree with Dr. Sanford's statement that the project does not provide adequate functional mitigation for wetland losses. The compensatory wetland mitigation plan proposed substantially exceeds the New Hampshire Wetlands Bureau mitigation

requirements, the purpose of which, per Env-Wt 800, are "...to compensate for the loss of wetland functions and values". The plan also exceeds recommended compensatory mitigation ratios of the United States Army Corps of Engineers ("USACE") (Addendum to New England District Compensatory Mitigation Guidance: Compensation for Impacted Aquatic Resource Functions-12/18/07) for wetland functions and values. More specifically, the NH Wetlands Bureau requires a minimum mitigation ratio of 10:1 to mitigate the loss of forested wetland functions and values. This means that for every one acre of wetland lost, 10 acres of upland buffer must be preserved to compensate for the loss of wetland functions and values. The USACE recommended ratio is 15:1. Considering just the 620 acre Phillips Brook preservation area, the ratio of preserved area to wetland impacts is 46:1 (620 acres preserved to 13.5 acres impacted), which is 3 times greater than the USACE ratio. If we consider all of 2,200 acres of preservation land, vernal pool creation, and restoration, the overall mitigation plan represents a mitigation ratio 10 times greater than the minimum compensatory requirement. Importantly, in its February 10, 2009 proposed findings and conditions filed with the Site Evaluation Committee in this docket, the NH Wetlands Bureau stated that the wetlands mitigation plan "meets the ratios as outlined in Chapter 800 of the Mitigation Rules". Wetlands Bureau Conditions, Findings (Feb. 10, 2009).

Lastly, I disagree with Dr. Stanford's statement that there will be a net loss of wetland wildlife habitat. The proposed mitigation plan preserves 2,200 acres of high value wetland and upland buffer that is currently in commercial forestry. The revised draft stewardship plan for the Phillips Brook mitigation area, submitted in February, 2009 as part of the "Request for More Information " response to the NH Wetlands

Bureau, states that the site "...will be primarily managed for wildlife and low impact recreation with outdoor education/research a secondary use. Wildlife habitat enhancement is encouraged ..." (page 14). Commercial logging will be forever banned on the 2200 acres, which will have significant positive impact on wetland wildlife habitat and will be more than adequate to mitigate wetland wildlife habitat loss.

Q. Have you read the prefiled testimony of Dr. George Mariani submitted in this docket on behalf of Counsel for the Public?

A. Yes.

Q. Do you agree with all of the information and/or conclusions contained in Dr. Mariani's prefiled testimony relating to the issues of the Project's wetlands impacts and/or wetlands mitigation?

A. No.

Q. Please describe the areas of Dr. Mariani's prefiled testimony with which you disagree and explain the reasons for your disagreement.

A. For the same reasons as those set forth above in response to the same question about Dr. Sanford's prefiled testimony, I disagree with Dr. Mariani's conclusion that the project does not provide adequate mitigation for wetland impacts and I disagree with Dr. Mariani's statement that the project does not provide adequate functional mitigation for wetland losses.

Q. Do you have any additional information that you wish to provide on the issue of the Project's impacts on wetlands and/or the Project's proposed plan for mitigating those impacts?

A. No

Q. Does this conclude your prefiled testimony?

A. Yes.

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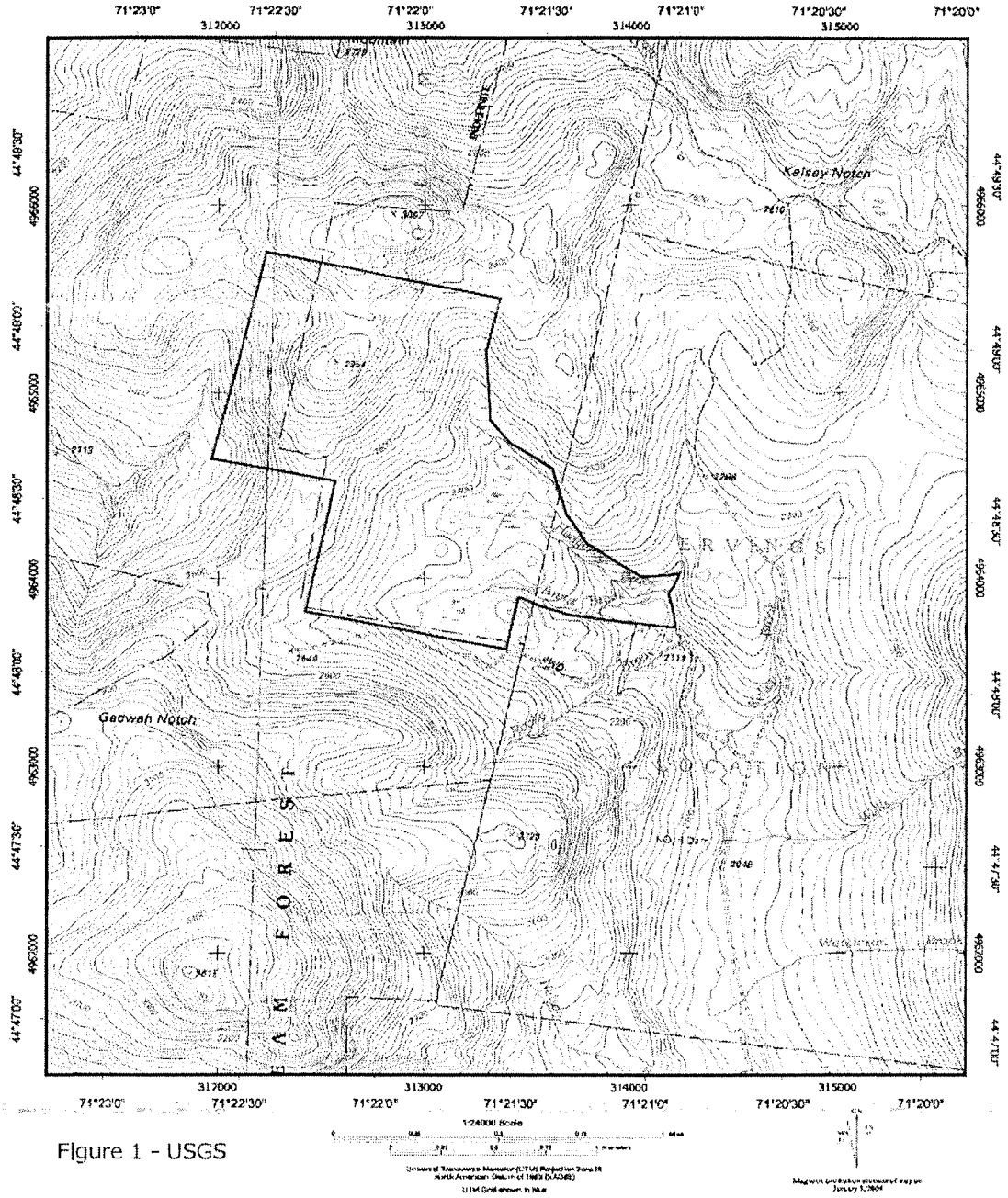

Figure 1 - USGS

Attachment 1 Phillips Brook Mitigation Area (from "Revised Draft Management & Stewardship Plan…" February, 2009).

Attachment 2 (from "FY07 Strategic Conservation Opportunities"; Northern Forest Alliance. Stowe, VT.

Grafton Notch, Maine

The Grafton Notch project – top ranked in the nation for FY07 – will facilitate state acquisition of 3,688 acres on the slopes of 4180-foot Old Speck, one of Maine's highest peaks. This critical parcel adjoins rugged Mahoosuc Notch, the most challenging and famed section of the Appalachian Trail, and will protect 9 miles of the newly created Grafton Loop Trail. The project has clear national significance for its recreational value.

Mahoosuc Notch hiker

The Grafton Notch parcel is also an area of great ecological value and economic benefit to local communities. It contains a number of rare natural communities and shelters headwater streams that feed the Bear River and Sunday River. Grafton Notch is also a valuable timber resource area, and will remain open for timber harvest once it becomes part of Maine's multiple-use Bureau of Public Lands holdings.

PROJECT DETAILS

Size: 3,688 acres
Type: Fee acquisition
FY07 Forest Legacy Request: $2 Million
Total Project Cost: $2.85 Million
Project Sponsor: Trust for Public Land

Phillips Brook, New Hampshire

Phillips Brook Forest is a 23,781 acre keystone in a 180,000 acre forest block–third largest in the state. The surrounding area includes past Forest Legacy projects such as the Nash Stream Forest, Bunnell Tract, and Connecticut Lakes Headwaters projects. It is also very near the White Mountain National Forest and Lake Umbagog National Wildlife Refuge. This elongated parcel has incredible strategic conservation value and will link together and leverage past federal investments.

The project would place a conservation easement over 78% of the ecologically rich watershed of Phillips Brook, protecting important habitat for key wildlife species including bear, moose, fisher, and marten. The project area also contains 38 miles of streams with potential for designation under the NH Wild Trout program. The property will remain in active timber management, supplying much needed pulp and timber to existing mills in the region. Public access to this popular area for hiking, hunting, fishing, and snowmobling will be assured.

Base of Phillips Pond

PROJECT DETAILS

Size: 23,781 acres
Type: Conservation easement
Forest Legacy Request: $3.5 Million
Total Project Cost: $4.7 Million
Project Sponsor: Society for the Protection of New Hampshire Forests

The Northern Forest | 7

THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-04

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

SUPPLEMENTAL TESTIMONY OF ADAM J. GRAVEL
AND STEVEN K. PELLETIER
ON BEHALF OF
GRANITE RELIABLE POWER, LLC

February 23, 2009

Qualifications

Q. Please state your name and business address.

A. Adam Gravel. My address, position and qualifications have not changed from what was described in our July 2008 pre-filed testimony.

Q. Please state your name and business address.

A. Steven Pelletier. My address, position and qualifications have not changed from what was described in our July 2008 pre-filed testimony.

Purpose of Supplemental Testimony

Q. What is the purpose of your supplemental testimony?

A. The purpose of our supplemental testimony is to summarize activities with regard to the Granite Reliable Power Project ("GRP Project") in Coos County, New Hampshire that have taken place since our July 2008 pre-filed testimony was submitted. In this testimony, we rebut the following intervenor contentions:

1. The proposed mitigation package is not adequate to compensate for the loss of high elevation habitats;
2. The proposed windpark will result in undue adverse impacts to sensitive species of wildlife such as American marten (*Martes americana*), Bicknell's thrush (*Catharus bicknelli*), three-toed woodpecker (*Picoides tridactylus*), and Canada lynx (*Lynx canadensis*);
3. The proposed windpark will have an unreasonable adverse impact on high elevation natural communities; and
4. The field assessments completed by Stantec relative to migrating raptors, nocturnally migrating songbirds, and bats were not sufficient.

Q. Please provide the Committee with an overview of what activities have taken place with regard to this project since July of 2008.

A. Since July 2008 Stantec, acting as a Project consultant, has been serving as Granite Reliable Power's (GRP) expert witness related to wildlife and wildlife habitat impacts from the proposed project. On behalf of GRP, we have attended the public hearing on October 2, 2008 in Groveton, NH, responded to several rounds of intervenor data requests, reviewed intervenor pre-filed testimonies, attended four technical sessions, and attended several meetings with the New Hampshire Fish and Game Department ("NHFG")and other intervenors regarding mitigation options for the proposed project.

Q. Please identify the pre-filed testimonies that you have reviewed.

A. We have reviewed the pre-filed testimonies of Dr. David Publicover of the Appalachian Mountain Club (AMC), Mr. William Staats and Ms. Jillian Kelly of the NHFG, Dr. Gary Sanford of Sanford Environmental, Dr. George Mariani of Sanford

Environmental Services, Mr. Trevor Lloyd-Evans of Manomet Center for Conservation Sciences, Ms. Kathlyn Keene, and Ms. Lisa Linowes of the Industrial Wind Action Group. We have also reviewed each of the intervenor and state agency responses to GRP's first set of data requests.

Q. Please summarize GRP's proposed plan for mitigating the Project's impacts on sensitive species of wildlife and high elevation habitats.

A. As detailed below, our proposed plan to mitigate impacts on sensitive species and high elevation forest habitat entails the creation of conservation easements on approximately 2300 acres of relatively undisturbed forest land at or above 2700 feet in elevation on Kelsey Peak, Baldhead Mountain, Muise Mountain, Whitcomb Mountain, and Long Mountain, as well as providing funding for NHFG to monitor these easements and conduct impact studies on species of concern in the project area following the construction and operation of the project. The estimated cost of this plan totals about $2.4 million.

Q. Has GRP discussed with any of the parties an enhancement to the proposed high elevation mitigation plan described above?

A. Yes. The mitigation plan was developed in cooperation with NHFG and AMC and responds to comments submitted in pre-filed testimony by intervenors and state agencies relative to the compensation for habitat impacts as a result of the proposed windpark. The mitigation plan, which has been tentatively agreed upon by GRP, NHFG and AMC, includes the following components:

1. GRP will preserve all of the approximately 1600 acres of high elevation habitat (i.e., areas above 2,700 feet in elevation) beyond the development footprint on Mt. Kelsey.
2. In addition, GRP will preserve approximately 732 acres of high elevation habitat along the western ridges in the project area that are adjacent to Nash Stream State Forest. These areas include Long Mountain (approximately 163 acres), Whitcomb Mountain (approximately 390 acres), Baldhead Mountain (approximately 152 acres), and Muise Mountain (approximately 27 acres). Attachment 1 shows the areas proposed for conservation under this revised mitigation plan.
3. The terms of the easement will not allow timber harvesting within the above mentioned parcels except for the sole purpose of wildlife habitat enhancement or maintenance, subject to prior approval from NHFG.
4. The easement areas will be closed to motorized recreational vehicles, but will be open to the public for foot traffic only, for hunting, trapping, and other non-motorized recreational activities.
5. No permanent development of any kind will occur within the easement areas.
6. An additional 550 acres will be preserved on Hedgehog and Phillips Brook for the purposes of wetland mitigation. Of note is that this preservation area includes an additional 165 acres of high elevation habitat on Baldhead Mountain beyond the 152 acres needed for wetland mitigation. This easement will be governed by the same conditions included in the high elevation mitigation plan.

7. GRP will provide $200,000 of support funding for conducting studies to assess potential impacts, if any, of the development on habitat use of the area by American marten, Bicknell's thrush, and/or other wildlife species of concern. These studies will be designed and conducted by NHFG, or by other parties as designated by NHFG.
8. GRP will provide $250,000 of additional investment funding to NHFG for lands outside of the project area to be used for conservation of comparable high elevation habitat for American marten or other species of conservation concern.

Q. Do you believe this revised mitigation plan is adequate with regards to compensating for potential impacts to wildlife species and sensitive habitats?

A. Yes. this mitigation plan will result in a definitive improvement to the current, unprotected *status quo* of the project area relative to wildlife species and their associated habitats by preserving high elevation habitats at a compensation ratio of greater than 30:1. Field reconnaissance and aerial photo interpretations of Mt. Kelsey and western ridges have indicated that much of the higher elevation forests are intact with limited evidence of past timber harvests. However, the high elevation habitats on the west side of Mt. Kelsey are presently under pressure from encroaching timber harvests. A plan to harvest an approximately 223-acre area of high elevation forest above 2,700 feet in elevation by Kennebec West Forest, LLC has recently been approved by the Coos County Planning Board. This timber harvest is slated to begin in 2009. However, because this area is located within the proposed easement acreage, Kennebec West Forest, LLC has suspended harvest plans pending the outcome of the windpark project's permitted processes. In the absence of the proposed windpark and the accompanying

mitigation plan, timber harvests will be conducted on the west side of Mt. Kelsey. Attachment 2 details the permitted and planned harvest areas that Kennebec West Forest, LLC anticipates cutting on Mt. Kelsey during 2009 and 2010.

In addition, Stantec obtained a series of aerial photographs of Mt. Kelsey taken from 1973 to 2008 (Attachment 3). An examination of these photos indicates that much of the southern portion and northwestern portion of Mt. Kelsey has been historically harvested for timber. These photos demonstrate that portions of Mt. Kelsey have been harvested nearly to the ridgeline in the vicinity of the northern and southern summits. However, much of the eastern and northern slopes of the mountain remain intact with limited to no visible evidence of past timber harvests based on the aerial photo review. Furthermore, the North Country Timber Harvest Trends Study (Sundquist and Birnie 2008) identified that approximately 27% or 6,100 acres of private land above 2,700 feet in elevation in New Hampshire has been harvested since 1988.

The above data demonstrate that the high elevation habitats on Mt. Kelsey and the western ridges are presently threatened by timber harvests. In the absence of the proposed mitigation plan, timber harvests will continue to change the functions and overall landscape viability of the high elevation habitats on Mt. Kelsey and the western ridges, and in turn the associated species of high elevation wildlife including marten, Bicknell's thrush, and three-toed woodpecker.

The proposed preservation of high elevation habitat on Mt. Kelsey and the western ridges as part of the revised mitigation plan will provide a high level of assurance that a large and contiguous block of high elevation forest habitat on this mountain is forever protected from development and timber harvests. These large blocks of intact

forest will also continue to provide and support the natural vagaries and ecological processes that are unique to mature and late successional high elevation forests, including windthrow gaps, natural dieback, and succession. These habitat conditions have been identified in testimony by Stantec, Dr. Publicover, the NHFG, and other parties as being valuable for sensitive species such as marten, Bicknell's thrush, and three-toed woodpecker. With the proposed conservation of this high elevation habitat around the Mt. Kelsey turbine strings, habitat for these sensitive species of wildlife will be maintained in perpetuity. In addition, the preservation of the high elevation habitat on the western ridges expands and adds continuity to the high elevation habitats that are currently protected in the Nash Stream State Forest. The proposed mitigation plan thereby improves the currently threatened *status quo* of the project area by maintaining large landscape-level blocks of intact high elevation forest habitat in perpetuity as opposed to the continued encroaching impacts and fragmenting effects of commercial timber harvests that will continue to occur to these habitats in the absence of the proposed project.

Q. Do you have any comments regarding pre-filed testimonies submitted by intervenors and state agencies with respect to adverse impacts to sensitive species of wildlife such as marten, Bicknell's thrush, three-toed woodpecker, and lynx?

A. Yes. We recognize that in the absence of appropriate mitigation, the impacts associated with the proposed windpark in conjunction with continued timber harvests in high elevation forests may have an adverse effect on sensitive species such as marten, Bicknell's thrush, three-toed woodpecker, and lynx. The following presents data

supporting our conclusions that the project and associated mitigation plan will not result in an unreasonable adverse impact to these sensitive species of wildlife.

Marten

We believe the mitigation plan appropriately addresses the initial concerns presented by Dr. Publicover and the NHFG in their prefiled testimonies relative to the impacts that the proposed project will have on marten. For example, initially, NHFG stated on page 19 of their pre-filed testimony that the "project has the potential to render unsuitable much, if not all, of the best marten habitat on the project area." While we recognize that there will be a loss of physical marten habitat as a result of the turbine string development on the Mt. Kelsey and Dixville Peak ridgelines, we strongly believe that the revised mitigation plan as described above will provide a net benefit to marten within the project area as compared to what would happen in the absence of this project. We discuss our reasoning below.

It is well documented that marten are sensitive to low levels of fragmentation and certain levels of timber harvests such as clear cutting (Fuller and Harrison 2005, Hargis et al. 1999, Gosse et al. 2005, Payer and Harrison 2000, Kelly 2005). To this end, the proposed acreage of intact and contiguous high elevation forest habitat that will be preserved around the turbine string on Mt. Kelsey will maintain key anchoring habitat connectivity and travel corridors within mature high elevation interior forest. Furthermore, the additional acreage of high elevation habitat on the western ridgelines expands upon the already protected high elevation forest habitats in the Nash Stream State Forest. These easement areas will be protected from future timber harvests and other anthropogenic disturbances, while on-going natural processes such as windthrow,

dieback, and succession will continue to maintain the high quality core marten habitat within the project area.

Kelly (2005) documented that cumulative and large scale forest harvesting as a result of salvage operations, subsequent hurricanes, and spruce budworm outbreaks dramatically shifted the amount of available coniferous cover in the northern NH landscape over the last several decades. These activities, and the subsequent lack of large coniferous forest stands, likely contributed to the limited ability of marten to successfully expand and recolonize the northern NH region. Kelley (2005) also identifies large intact forest blocks as important for marten recovery in NH. The proposed 2,245 acre easement areas within the project area will directly support marten recovery through the preservation of continuous, maturing, and largely intact interior coniferous forested habitat. In the absence of the project, timber harvests will continue in the high elevation habitats on Mt. Kelsey and the western ridges, which in turn will remove coniferous cover and reduce the size of mature forest habitat on the mountain, thereby impacting the quality and quantity of available marten habitat on the landscape. We believe it is the impacts from encroaching timber harvests, not the proposed windpark, that has the highest potential to impact martens on the landscape within the project area through the direct removal of appropriate cover and structural forest diversity. The mitigation plan provides a high level of assurance that core marten habitat will be maintained on a landscape level within the Project area.

The turbine strings along Mt. Kelsey and Dixville Peak ridgelines will not represent a physical barrier to marten movement on the mountains. Subsequent to vegetation clearing, the access road along the ridgeline will be revegetated to allow for a

12-foot wide roadbed. The road will be infrequently traveled and restricted to authorized motorized vehicle traffic only. Further, these roads will not be maintained during winter months. We do not believe that marten will avoid crossing the access road along the ridgelines in order to access suitable habitat on the opposite side of the ridge. Logging roads are common within marten home ranges in northern Maine (Chaplin et al. 1998). Further, Chaplin et al. (1998) concludes that marten respond more strongly to fragmentation effects from clearcut logging than they do to the proximity of forest roads. DeGraaf and Yamasaki (2001) report that a marten home range in Maine is 5.2 km^2 (1,285 acres) for males and 2.8km^2 (629 acres) for females. The proposed project will impact approximately 77[1] acres of high elevation habitat, or 8% of the home range of a female marten. Conversely, the easement area on Mt. Kelsey alone will protect the equivalent of 2.5 female marten home ranges and 1.25 male marten home ranges. Furthermore, Potvin et al. (2000) identified the importance of maintaining at least 50% of a 10km^2 block as uncut forest for the protection and improvement of marten habitat on the landscape. The acres proposed for preservation on Mt. Kelsey will be maintaining over 60% of a 10km^2 block thereby directly supporting management objectives for maintaining marten habitat protection within the regional landscape. Finally, the pre- and post-construction monitoring of marten that is proposed as part of the revised mitigation will provide valuable insight into the behavior of marten relative to the windpark.

Bicknell's thrush

We acknowledge that the proposed project will impact Bicknell's thrush habitat. However, GRP has taken several measures to minimize and mitigate impacts to a great

[1] The impacts acres to high elevation habitat as reported in our July testimony has been revised to 77 acres from 58 acres as a result of changes in road design.

extent by taking into consideration some of the management recommendations presented in Rimmer et al. (2005). These include minimizing clearing impacts above 2700 feet in elevation as a result of road and turbine construction by revegetating these cleared areas with balsam fir, and preserving acres of high elevation forest habitat which includes west facing slopes, the northern ridge of Mt. Kelsey, and numerous fir regeneration gaps and small fir waves on the western and northern slopes of Mt. Kelsey. The additional acres of high elevation habitat on the western ridges likely also provide suitable Bicknell's thrush habitat that will be protected from future development or timber harvest impacts. In our opinion, Dr. Publicover's pre-filed testimony overstates the anticipated impacts of the proposed development. Based on field surveys by Stantec, much of the Mt. Kesley and Dixville Peak ridgeline is not considered suitable Bicknell's thrush habitat due to the maturing forest conditions. It is well reported in Rimmer et al. (2005) and references therein, that Bicknell's thrush prefer young, dense, regenerating patches of spruce and fir in subalpine areas. Such areas are frequently associated with windthrow gaps and fir waves. Much of the Mt. Kelsey ridgeline is not characterized as preferred Bicknell's thrush habitat. Stantec's natural community characterization, testimony from Dr. Publicover based on his site walk along Mt. Kelsey, and a progress report prepared by the New Hampshire Natural Heritage Bureau ("NHNHB") dated November 12, 2008 based on an October 6, 2008 site visit to Mt. Kelsey with Stantec, all describe similar conditions along the Mt. Kelsey ridgeline as being mature fir and spruce-fir high elevation forests. NHNHB notes trees 15 to 18 inches in diameter. Dr. Publicover restates these conditions on page 4 of his pre-filed testimony. Forests with large diameter trees are not

characteristic of high quality Bicknell's thrush habitat. Similarly, much of the Dixville Peak ridgeline contains larger diameter spruce and fir trees.

Based on Stantec's natural community characterization, the northern portion of Mt. Kelsey includes some of the better Bicknell's thrush habitat on the mountain. The forests around the southern summit have a much smaller amount of suitable Bicknell's thrush habitat. The suitable habitat at the northern summit on Mt. Kelsey extends considerably down the western and northern slope as well as along a ridge extending east of the summit. Forest harvests along the western slope up to the ridgeline near the northern summit have created gaps that have subsequently become colonized by regenerating balsam fir, thereby creating preferred Bicknell's thrush habitat conditions. Similar gap and regenerating conditions exist along the northern slope and eastern ridge of the mountain. However, these habitats appear to have been naturally created as a result of blowdown gaps. The southern summit of Dixville Peak also contains suitable Bicknell's thrush habitat based on the presence of dense and stunted balsam fir. Such conditions continue down the western, southern, and eastern slopes of the summit. The proposed high elevation easement area on Mt. Kelsey will preserve a large amount of the suitable Bicknell's thrush habitat on Mt. Kelsey, including the western and northern slopes and the eastern ridge off of the northern summit. Natural processes such as blowdown gaps and balsam fir regeneration will continue to occur within these areas and thus continue to support high quality Bicknell's thrush habitats. In addition, the preservation of high elevation habitat on the western ridges will also likely provide Bicknell's thrush habitat. We believe that GRP has taken reasonable steps to avoid and minimize impacts to Bicknell's thrush habitat within the project area and the proposed

mitigation package effectively compensates for Bicknell's thrush habitat loss through the preservation of a large area of high quality Bicknell's thrush habitat on Mt. Kelsey as well as additional potential high elevation habitat along the western ridges. Further, we continue to assert that Bicknell's thrush may in time utilize the forest edges around the turbine locations and access roads, similar to the use of ski trail edges as reported by Rimmer (2004). We recognized Dr. Publicover's comment on page 10-11 of his testimony regarding the caveat presented by Rimmer et al. (2004), however, Rimmer et al. (2004) continue to state: "We reemphasize that no data exist to support the possibility that ski trail development might enhance Bicknell's Thrush habitat, *but the possibility can not be discounted*" (italics added for emphasis). Regardless of whether or not the vegetation clearing may enhance Bicknell's thrush habitat along the ridgelines, the data supports conclusions that Bicknell's thrush successfully use anthropogenic edges in suitable high elevation habitats.

We strongly believe that the minimization measures in conjunction with the large-scale landscape habitat preservation will effectively compensate for potential impacts to Bicknell's thrush habitats.

Three-toed woodpecker

It is widely reported that three-toed woodpecker prefer intact mature and overmature to old-growth boreal forests (Imbeau and Desrochers 2002a, Imbeau and Desrochers 2002b, Gagne et al. 2007). Further, all these studies in addition to the New Hampshire Wildlife Action Plan, cite the loss of old growth and mature forests from encroaching timber harvests as potential threats to three-toed woodpeckers. While the proposed turbine string along the Mt. Kelsey ridgeline will eliminate some suitable mature boreal forested

habitat, the threat of habitat loss is far greater from the potential timber harvests in the high elevation forests on the west side of Mt. Kelsey that will occur in the absence of the proposed windpark and accompanying mitigation plan. The preservation of high elevation forest around Mt. Kelsey and the western ridges will directly contribute to management objectives for three-toed woodpecker by maintaining large blocks of mature and late successional high elevation forest. Through natural processes such as dieback and succession, snags and the structural diversity that are characteristic of maturing forests will be retained throughout the forest, and in turn continue to support important foraging and nesting habitat for three-toed woodpeckers. Therefore, the 77 acres of direct, high elevation habitat impacts associated with the ridgeline development are far outweighed by the benefits of preserving mature high elevation forests, including the preservation of a contiguous block of high elevation habitat on Mt. Kelsey from the encroachment of adjacent timber harvests. To this end, we again conclude that unreasonable adverse impacts to three-toed woodpecker are not expected.

Lynx

We do not agree with testimony submitted by the NHFG that the project will displace lynx or adversely influence the ability of the ridgeline to function as travel corridors for lynx (page 19 of the NHFG testimony) for several reasons, and as described below.

Stantec completed a winter track survey in 2007 and a natural community classification during snow covered conditions in Spring 2008. While lynx were not directly targeted during the natural community surveys, Stantec was cognizant of their potential presence in the project area and recorded observations of all wildlife species

encountered. Lynx or signs of lynx were not observed during Stantec field investigations in 2007 and 2008.

Lynx prey principally on snowshoe hare. As such, lynx populations fluctuate both spatially and temporally with snowshoe hare abundance and distribution (DeGraaf and Yamasaki 2001; Vic and Boutin 2008). Snowshoe hare will feed on a variety of herbaceous and woody vegetation including grasses, ferns, and other herbaceous species as well as twigs, buds, and bark of small woody vegetation such as alder, raspberries, maples, and balsam fir (DeGraaf and Yamasaki 2001; Hodges 2000). Such vegetation characteristics are frequently associated with early successional stands of regenerating spruce, fir, and poplar. Within the project area, such stands are readily present within the surrounding lower elevation areas. Furthermore, the high elevation areas (i.e., habitats above 2,700' elevation) typically lack a diverse herbaceous stratum and therefore are considered to have lower habitat quality for snowshoe hares than lower elevation areas. Lynx and snowshoe hare habitat is dynamic and constantly changing as a result of forest succession. Past forestry practices within the project area and the surrounding region have created favorable conditions through the regeneration of softwood dominated stands in several locations. At present, such suitable habitat conditions are principally located on the mid and lower slopes of Mt. Kelsey and Dixville Peak. It is also reported that lynx will use a variety of stand types in the landscape for denning provided that there is dense cover such as abundant blowdowns and understory regeneration (Organ *et al.* 2008). As such, suitable denning habitat is readily available throughout the project area.

The proposed project is not expected to result in adverse impacts to lynx for several reasons:

1. Lynx have not been documented within the project area.
2. On-going forest management practices have created favorable lynx and snowshoe hare habitat opportunities by enhancing softwood-dominated stand conditions across the landscape. Such activities are expected to continue within the surrounding landscape subsequent to this project, thereby maintaining the shifting dynamics of lynx and snowshoe hare habitat across the landscape.
3. The proposed project will not result in a measurable increase in vehicular traffic subsequent to construction activities. Although the construction of the windpark will result in a temporary increase in vehicle traffic, mortality impacts during this time are very unlikely as the narrow, winding, non-paved nature of the roads within the project area limit traffic speeds, thereby limiting opportunities for collisions with lynx. Drivers should have sufficient time to react to a lynx crossing the roadway. Additionally, the project roadways are not anticipated to be significantly different from the logging road networks that currently exist within the area, and once constructed are expected to have lower vehicle traffic.
4. The high elevation habitats on Mt. Kelsey and Dixville Peak ridgelines do not provide preferred snowshoe hare habitat conditions based on the limited herbaceous plant diversity available for snowshoe hare foraging. Although snowshoe hare presence was documented along the ridgelines during the winter 2007 track surveys, it is expected that hare density is much greater at the lower elevations where timber harvesting activities have occurred. Therefore, it is expected that potential lynx utilization of the higher elevation habitats would be minimal.

5. Lynx are wide ranging species. The reported home range for a female lynx in Maine is 25.7 km^2 (or 6,350 acres) during snow-covered conditions and 14.3 km^2 (or 3,533 acres) during snow-free conditions and 53.6 km2 (or 13,244 acres) for male lynx (Vashon *et al.* 2008). The potential impacts from the project will be further mitigated through the conservation of approximately 2300 acres of forest, which equates to over 36 percent of a female lynx home range and over 17 percent of a male lynx home range.
6. Lynx will not be impacted as a result of forest fragmentation. Throughout the lynx distribution in New England, habitats are characterized by numerous logging roads, on-going commercial forestry operations, and a shifting diversity of forest stands that have all been created and/or impacted from past and present forest management. The proposed wind farm will not present a barrier to movement or limit lynx dispersal throughout the landscape.
7. The transmission lines constructed in association with the project will maintain open corridors which are expected to be recolonized and maintained by shrubby vegetation which in turn will provide suitable snowshoe hare habitat through suitable cover and food availability. Such conditions could in turn increase foraging opportunities for lynx within the landscape.

The proposed conservation easement area in concert with the known lynx habitat preferences support our conclusions that the proposed windpark will not result in adverse impacts to lynx.

Q. Do you have any comments regarding pre-filed testimony field by intervenors and state agencies regarding unreasonable adverse impacts from forest fragmentation as a result of the proposed windpark?

A. Yes. Testimony from Dr. Publicover, the NHFG, and Ms. Linowes assert that the proposed project will result in unreasonable adverse impacts as a result of forest and habitat fragmentation. We do not agree with these assertions. We recognize that the proposed project will intersect, and to some degree fragment, forests and habitats that are presently contiguous along the ridgelines of Mt. Kelsey and Dixville Peak. However, we continue to assert that the scale of these impacts must be examined within the broader landscape context. As described in detail in our previous responses, the high elevation habitats within the project area are in fact under current pressure from encroaching timber harvests. It has been demonstrated in our previous responses that high elevation harvests have occurred within the past and will continue into the future within this region. We contend that the fragmenting impacts from encroaching timber harvest would have a greater impact on sensitive species of wildlife and their associated habitats than the development along the ridgelines that this project will have. It is cited by Kelly (2005) as well as the New Hampshire Wildlife Action Plan (WAP) that loss of habitat, including high elevation forest habitat, through timber harvests has contributed to the decline of marten in the state. Furthermore, the WAP states that habitat loss through logging operations has also contributed to the rarity of the three-toed woodpecker in the region. Imbeau and Desrocheres (2002a, 2002b) also reach similar conclusions regarding the effects of timber harvests on habitat availability for three-toed woodpeckers.

The approximately 77 acres of high elevation habitat that will be directly impacted as a result of the proposed project are minimal when compared to the several hundred acres of forest habitat that would be impacted as a result of timber harvests. As detailed in our previous responses, the project provides a special opportunity to forever preserve acres of high elevation habitat including acres of intact and contiguous high elevation forests on Mt. Kelsey. This large habitat block, in addition to the expanded acreage of high elevation habitat adjacent to the Nash Stream State Forest, will provide a high level of assurance that populations of marten, three-toed woodpecker, Bicknell's thrush as well as all the more common species associated with these habitats will persist within the landscape.

Furthermore, GRP has taken appropriate measures to further minimize fragmentation impacts along the high elevation ridgelines. The cleared limits of the access road along the ridgelines will be revegetated with endemic tree species in order to maintain only a 12-foot wide road width along the ridgeline, as opposed to a "2-lane highway" as characterized by Dr. Publicover on page 9 of his pre-filed testimony. The indirect impacts as a result of the proposed vegetation clearing for the access roads and turbine pads along the ridgeline are also incorrectly characterized in pre-filed testimony by Dr. Publicover and the NHFG. On page 9 of his testimony, and in his response to GRP's data request 1-28, Dr. Publicover describes the expected indirect impacts that occur as a result of an unnatural edge created from the road corridor along the high elevation ridgelines. Dr. Publicover discusses how blowdowns "may propagate for a considerable distance due to high winds in this environment." He also discusses an associated impact from blowdowns as being increased soil exposure, thereby reducing

soil moisture and moss cover, which in turn will adversely impact the ability of spruce and fir to regenerate. Dr. Publicover fails to acknowledge that similar, if not more dramatic, impacts would occur as a result of high elevation timber harvests. These high elevation harvests would similarly remove canopy cover, thereby increasing soil exposure to sun and wind resulting in moisture loss. In fact, such high elevation timber harvests would impact a much higher acreage of forest than will be impacted by the proposed project. In addition, the steep slopes that would be harvested are more susceptible to erosion than is the ridgeline, where effective erosion and sedimentation controls will be implemented in constructing the proposed project.

Further, the propagating effect of blowdows moving away from the forest edge as described by Dr. Publicover is analogous to the phenomena of fir waves. In summary, fir waves are occasionally present on some of the higher elevation balsam fir forests in New England and New York. Fir waves likely initially develop from a windthrow gap in the forest canopy. The gap exposes trees around the edge of the gap to increased wind exposure which in turn results in a greater exposure to rime ice build-up and impacts from desiccation. These factors contribute to the dieback of trees along the edge of the clearing. As the trees die along the edge of the gap, additional trees are subsequently exposed to increased wind. As the canopy dies, the understory begins to regenerate and in time matures to replace the gap in the forest. The result is a cyclical pattern of dieback and subsequent regeneration that moves like a wave along the mountain. It has been demonstrated that these fir waves move primarily in the direction of the prevailing winds, which in the northeast are largely westerly (Sprugel 1976). Sprugel (1976) describes this phenomena in detail based on studies in the northeast US. Of particular interest in

Sprugel's study is the fact that once fir waves pass out of the fetch of the prevailing winds on the opposite side of the ridgetop, the waves stop moving and disappear through understory regeneration.

Dr. Publicover's assertion that the blowdowns that result from the newly created edge along the ridgeline "may propagate for a considerable distance due to high winds in this environment" is misleading. While we recognize that blowdowns may increase along the eastern edge of the ridgeline clearing as a result of increased exposure to wind and rime ice, we do not believe that they will propagate a "considerable" distance away from this edge as the turbines and access roads are primarily in the vicinity of the ridgetops. Once the trees are out of the fetch of the prevailing westerly winds (i.e., on the east side of the ridge), we expect the blowdowns to stop. We also expect a cyclical pattern of blowdown and regeneration may continue along this edge for a short distance, similar to a fir wave. Mt. Kelsey presently includes similar areas of blowdowns and subsequent regeneration, particularly along the northern portion of the mountain. As such, the habitat conditions that may be created as a result of increased blowdowns along the access road and turbine string will not be substantially different from the habitat conditions that presently occur under natural conditions on both Mt. Kelsey and Dixville Peak. Furthermore, such habitat conditions will continue to provide usable habitat for sensitive species such as Bicknell's thrush and marten.

In his testimony, Dr. Publicover further fails to recognize or account for potential fir wave effects as a consequence of high elevation timber harvests. Planned timber harvests on Mt. Kelsey would occur over a several hundred acre area on the west slope, largely between elevations of 2,700 and 3,100 feet. These timber harvests would also

create unnatural edges and gaps in the forest canopy, subsequently exposing trees along the eastern edges of the cut areas to the prevailing westerly winds. It can be reasonably expected through the mechanism of fir wave propagation as described above that a wave-like pattern of blowdowns and subsequent regeneration would propagate easterly up the western slope to the ridgeline. This wave phenomenon from high elevation timber harvests would occur over, and impact, a much larger area and move for a greater distance all the way to the ridgeline in contrast to a wave that originates at the crest of the ridgeline as a result of the proposed project corridor clearing.

It is our conclusion that the fragmenting and indirect impacts as a result of high elevation timber harvests would have a greater degree of fragmenting and indirect impacts to high elevation habitats than the proposed windpark will have. The preservation of much of the western slope of Mt. Kelsey will limit indirect impacts of adjacent timber harvests from spreading to and cumulating within high elevation habitats. As described in our previous responses, this preservation will maintain intact and contiguous forested habitat for many sensitive species such as marten, Bicknell's thrush, lynx, and three-toed woodpecker.

Q. Do you have any comments on what intervenors have said about old-growth forest on Mt. Kesley?

A. Yes. In principle, we do not disagree with Dr. Publicover that portions of the Mt. Kelsey ridgeline could accurately be characterized as old growth and primary forest based on the definitions provided in his pre-filed testimony and responses to GRP's data requests. Admittedly, the proposed project will result in impacts to some of the old growth and primary forests on Mt. Kelsey. However, we examine these impacts on the

landscape scale through the evaluation of the present risks to the forests as a result of and in the absence of the proposed project, compared to the current landscape conditions. In summary, we strongly believe that the preservation of contiguous high elevation forest, which almost certainly includes additional old growth forest, provides a greater overall landscape benefit relative to wildlife habitat than the continued degradation through timber harvests in the absence of the project. We elaborate on these evaluations below. Attachment 3 includes a sequence of aerial photos taken of Mt. Kelsey between 1973 to 2008. In the photos from 1973, 1977, and 1986, it is very evident that much of the western slope in the vicinity of the northern summit has been harvested nearly to the ridgeline of Mt. Kelsey. These photos, particularly the 1986 photo, clearly show skidder trails leading down slope in the vicinity of the northern summit to a prominent log landing. Furthermore, these photos show that timber harvests have taken place on the southern portion of the ridgeline in the saddle between Owlhead Mountain and leading up to the vicinity of southern-most summit on Mt. Kelsey. Based on this evidence, the areas at the northern and southern summit of Mt. Kelsey would not generally be considered old growth or primary forest. The sequence of aerial photos does not indicate that timber harvests have occurred along the interior of the Mt. Kelsey ridgeline, the northern slope, the ridge running east of the northern summit, and much of the higher elevations along the eastern slope of the mountain. Based on the analyses of these photos, it can be reasonably concluded that old growth and primary forests likely exist beyond the footprint of the project area on areas such as the north slope of Mt. Kelsey, the eastern ridge off of the northern summit, and the eastern slope. Such areas will be included within the proposed protected easement area around Mt. Kelsey.

As described in detail above, the high elevation forests of Mt. Kelsey are threatened from future timber harvests. The known harvest plans, as well as additional future harvest plans, would likely include areas of old growth or at least late successional high elevation forests. In response to GRP's data request 1-19, Dr. Publicover states "However, given the poor quality of the timber, the extremely difficult operating conditions, and the lack of previous harvesting, I doubt that much, if any, of the forest on the ridgeline of concern would be considered merchantable under current conditions." We do not agree with this assessment. It has been demonstrated that the ridgeline on Mt. Kelsey includes trees upwards of 18 inches in diameter in both testimony submitted by Dr. Publicover and the November 12, 2008 progress report from NHNHB. Furthermore, the permit recently issued by the Coos County Planning Board for Kennebec West Forest, LLC to harvest 223 acres of high elevation forest on Mt. Kelsey includes conditions that spruce and fir trees of 8 inches may be harvested along with hardwood trees up to 10 inches. We note too the continued advancement of forest biomass technologies that involve expanded utilization of smaller diameter woody species, and include not only energy generation but also a variety of commercial products as well. Clearly, the Mt. Kelsey ridgeline contains merchantable timber if 8-inch diameter trees are currently allowed to be harvested. Moreover, the northern portion and southern portion of the ridgelines have been harvested in the past. Therefore, it is not unreasonable to conclude that much of the remaining ridgeline could potentially be harvested in the future.

The proposed easement area on Mt. Kelsey will provide assurance that timber harvests will no longer occur, thereby maintaining a large block of intact and mature forest, as well as portions of old growth and primary high elevation forest in the landscape.

Furthermore, the additional acres of preserved area on the western ridges will expand the amount of intact and contiguous high elevation habitat within the landscape. In the absence of such mitigation, timber harvest will continue to degrade the amount and quality of the remaining old growth forest left on Mt. Kelsey as well as high elevation forests along the western ridges. From an ecological perspective, the conservation of large contiguous blocks will provide a greater benefit to wildlife species, particularly to rare or sensitive species, than the uncertainty surrounding the fate and extent of old growth forest along the ridgeline in the absence of the proposed project.

As presented in testimony from the NHFG, two limited levels of protection are currently afforded to high elevation habitats. These include regulation by the Coos County Unincorporated Towns Planning Board and a voluntary High Elevation Memorandum of Understanding (MOU) that has been subscribed to by several large landowners. Of particular note is that the MOU is voluntary. Moreover, permits continue to be issued by the Coos County Planning Board to harvest high elevation habitats. As such, the existing regulatory mechanisms for high elevation forest protection provide limited levels of assurance that such habitats will be protected. In contrast, the proposed easement area provides definite assurances towards the permanent protection of these areas.

It is our conclusion that the impacts to a limited area of old growth forest along the Mt. Kelsey ridgeline as a result of the windpark are far outweighed by the ecological benefits of permanently preserving intact high elevation forested habitat on Mt. Kelsey and the surrounding landscape, particularly as these areas also contain mature late successional forests, as well as additional suspected areas of old growth and primary forest.

Q. Do you have any comments relative to intervenor testimony that the proposed project will adversely affect the high elevation forests to function as ecological refugia?

A. Yes. Dr. Publicover testifies to the importance of high elevation forests for their function as ecological refugia during changing climatic episodes (pages 7 and 8 of his pre-filed testimony). We no not dispute this. We strongly believe that the proposed project will directly support this function in 2 principal ways: 1) the wind power that is generated can help reduce greenhouse gas emissions that directly contribute to climate change; and 2) the proposed project will permanently protect acres of intact high elevation forest. As we have noted above, the threat of timber harvests to these high elevation forests will diminish the overall habitat value and availability, thereby reducing their functional capacity as an ecological refugia during climate change. Dr. Publicover testifies to intact mountain ridges as "islands in the sky" on page 8 of his pre-filed testimony. The uncertainty surrounding future timber harvests in this region will reduce the overall size and therefore the carrying capacity of these high elevation forests, in essence leaving behind smaller and even more isolated "islands in the sky". While the proposed project will eliminate some high elevation habitat, the impacts are far outweighed by the scale of the land preservation which will assure that Mt. Kelsey and the additional western ridges will continue over time to provide ecological refugia in high elevation habitats during changing climates.

Q. Do you have any comments relative to Ms. Linowe's testimony that the pre-construction surveys conducted at the Project fell short of the U.S. Fish and

Wildlife Service ("USFWS") *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines*?

A. Yes. Ms. Linowes repeatedly suggests in her pre-filed testimony as well as at several technical sessions that the pre-construction surveys fall short of the USFWS *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* ("USFWS Interim Guidelines")[2]. In these guidelines, the USFWS recommends "three years" of pre-construction surveys for migrating birds at wind project sites, but clearly states on page 1, paragraph 2 that the guidelines "are voluntary and interim in nature." This is further clarified in the USFWS director's memorandum of April 26, 2004[3]: "the Interim Guidelines are not to be construed as rigid requirements, which are applicable to every situation, nor should they be read literally. Recommendations made under the Interim Guidelines should be based on locally applicable scientific data, local knowledge and expertise, technological feasibility, and a reasonable interpretation of the available information. The teams of professionals recommended for pre-development site evaluations should make recommendations on site selection, predevelopment data collection, site design, and post-construction monitoring based on local conditions, using the Interim Guidelines as a general guide."

It is clear that the USFWS Interim Guidelines are not ***requirements***; rather they are voluntary ***guidelines*** to be used as guidance for wind power project developers as they select sites and conduct biological surveys. In this case, GRP has hired Stantec and NH Audubon, both familiar with the USFWS Interim Guidelines, to conduct in-depth field assessments of the local, site-specific conditions at the proposed Project site. As

[2] http://www.fws.gov/habitatconservation/wind.pdf
[3] http://www.osti.gov/bridge/servlets/purl/837481-2JBKG4/native/837481.pdf

part of this process, they undertook a comprehensive review of existing local scientific knowledge and data, and utilized established scientific practices that have been or are being used for other wind power projects in the northeast United States in order to determine the most appropriate survey protocols for the GRP Project site. Furthermore, the number of ecological and biological studies conducted at the site in most cases exceeds those that have been conducted at other proposed wind projects in the northeast.

Specific to pre-construction migratory bird surveys, the USFWS Director's memorandum of April 2004 goes on to state:

> "Where information is considered insufficient to make informed decisions about development of a site, recommendations for collection of additional information should be based on the local situation. As an example, the guidance recommends 3 years of data as a standard for determining the presence and/or magnitude of bird and bat migration in areas of high seasonal concentrations. This recommendation is not intended to be a strict requirement for all areas, or if a shorter collection period can be expected to yield sufficient data. Likewise, recommending the use of acoustic, radar, and infrared detection equipment as mentioned in the guidance is not a strict requirement at all locations and under all conditions. However, where risk is considered sufficiently high, and available data and/or local knowledge indicate that weather variations, changing flight paths, or variable timing of migration warrant it, 3 years of data collection using the most appropriate tools available should remain the standard. The guidance states that the intended time frame for post-construction monitoring (recommended at all sites) is not expected to exceed 3 years. This does not mean

that 3 years of monitoring should be recommended at all sites. A single year of monitoring through all seasons may indicate that 1 year is sufficient, or that additional monitoring is needed. Again, professional evaluation of the local situation is required."

We have evaluated the local situation at the GRP site, including all scientific information available. We have also evaluated other sites that have been surveyed pre and post-construction. Examinations performed at this site indicate that risk to migrants at the proposed GRP site would be similar or lower than those at other projects at other sites. Based on our experience to date conducting pre-construction surveys at over 100 proposed and operational (combined) wind projects, and the methods and results of the studies conducted at the GRP site, it is our professional opinion that the data collected are appropriate and sufficient to properly evaluate the proposed project's risk to migratory birds.

Q. Do you have any comments relative to intervenor's testimony that the diurnal raptor surveys conducted by Stantec in the fall of 2007 were inadequate?

A. Yes. Testimony from Ms. Linowes and Mr. Lloyd-Evans assert that the number of survey days and seasons surveyed were inadequate for determining risk to migrating raptors. It is true that the sole use of pre-construction survey data by itself yields limited information about the collision risk to migrating raptors from wind energy projects. Currently, there is no information that correlates pre-construction raptor counts to post construction mortality. However, several post-construction mortality studies have been conducted at developed wind projects in the United States, some of which have conducted pre-construction raptor surveys similar to those conducted at the GRP

site. This information was not mentioned by Ms. Linowes and Mr. Lloyd-Evans during their analyses of the diurnal survey and data collected at the GRP site. In our opinion, post-construction information combined with data collected from pre-construction surveys will provide more useful information about potential collision risk than any pre-construction survey alone. For example, please refer to Table 1, and Attachment 4 for the results of the Mars Hill Wind Project in northern Maine. During pre-construction surveys at this site, eight days of raptor surveys were conducted during the fall migration season and 10 days during the spring migration season. Overall, a total of 115 and 116 raptors were observed, respectively, during the pre-construction surveys. During these pre-construction surveys, a number of raptors were observed within the rotor zone of the proposed turbines: 42 % of raptors were observed below 120m during the fall 2005 season, and 48 % were observed during the spring 2005 surveys. See Attachment 4 for additional information on survey effort and results of publicly available raptor surveys conducted at other proposed wind projects in the northeast.

The number of raptors observed during pre-construction surveys at Mars Hill during the fall season was greater than that observed at the GRP site. However, despite the observed pre-construction raptor flights within the proposed rotor zones (Table 1), no hawk, falcon, or eagle mortalities were documented during fatality searches conducted during the 2007 or 2008 spring and fall migration seasons at Mars Hill. In fact, only a single raptor, a barred owl, was found early in the spring survey period. This species was not observed during any of the pre-construction surveys.

Furthermore, based on publicly available post construction survey data from surveys conducted over the course of nearly 15 years of surveys at 13 different projects in

the U.S., only 22 raptor fatalities were documented (Table1). The species included were those common to the area and the fatalities occurred during both the migratory and breeding seasons.

Table 1. Available raptor mortality data reported at wind farms in the U.S. (outside of California) from 1994-2008

Location	Study period	Number of fatalities and species	Dates of carcass discovery	Reference
Buffalo Ridge, MN	1994-1995	0	n/a	Osborn *et al.* 2000
Buffalo Ridge, MN	1996-1999	1 red-tailed hawk	no data	Johnson *et al*. 2002
Searsburg, VT	1997	0	n/a	Kerlinger 2002
Foote Creek Rim, WY	1998-2002	1 Northern harrier, 3 American kestrel, 1 short-eared owl	Northern harrier (4/19/99); American kestrel (5/12/99, 10/12/99, 7/19/00); short-eared owl (09/28/00)	Young *et al.* 2003
Vansycle, OR	1999	0	n/a	Erickson *et al.* 2000
Somerset County, PA	2000	0	n/a	Kerlinger 2006
Nine Canyon, WA	2002-2003	1 American kestrel, 1 short-eared owl	American kestrel (11/18/02), short-eared owl (4/7/03)	Erickson *et al.* 2003
Klondike, OR	2002-2003	0	n/a	Johnson et al. 2003
Mountaineer, WV	2003	1 red-tailed hawk, 2 turkey vultures	n/a	Kerns and Kerlinger 2004
Mountaineer, WV	2004	1 sharp-shinned hawk, 1 turkey vulture	both between 07/31/04 - 09/11/04	Arnett *et al* 2005
Meyersdale, PA	2004	0	n/a	Arnett *et al.* 2005
Top of Iowa, Iowa	2004	1 red-tailed hawk	red-tailed hawk (4/01/04 - 12/10/04)	Koford *et al*. 2005
Buffalo Mountain, TN	2005	0	n/a	Fiedler *et al*. 2007
Maple Ridge, NY	2006	1 American kestrel	American kestrel (7/06)	Jain *et al*. 2007
Maple Ridge, NY	2007	1 sharp-shinned hawk, 5 red-tailed hawk	red-tailed hawk (1found 8/07, 2 found 9/07 and 1 sharp-shinned hawk and 2 red-tailed hawk dates not reported)	Jain et al. 2008
Mars Hill, ME	2007	0	n/a	Stantec 2008
Mars Hill, ME	2008	1 barred owl	barred owl (4/11/08)	Stantec 2009

Some raptor mortality at existing facilities in the U.S. has been associated with raptor abundance and prey availability at a site (Smallwood and Thelander 2005 and NRC 2007). Although some studies have suggested that fatalities at Altamont Pass, CA involved resident birds; Smallwood and Thelander (2007) noted that the available fatality data can not differentiate between local birds and birds passing through the area based on the timing of fatalities, due to the overlap in seasonal occurrence of resident and migrant birds at sites. This is one example of why it is important to recognize the limitations of pre-construction surveys in determining risk of collision from a wind energy project. The fact that post-construction studies have shown very few raptors are being killed by turbines, and that fatalities are distributed between the breeding and migration seasons, demonstrates the difficulty in determining what exact factors (flight behaviors, other seasonal behaviors, weather conditions, etc.) may cause raptors to collide with wind turbines at a given site. It is clear that prey abundance and raptor density are known

factors contributing to increased raptor mortality at the Altamont Pass, CA (Smallwood and Thelander 2005, NRC 2007). Based on our observations, we do not believe these conditions exist at the GRP site. Other factors, such as turbine design and layout features and specific landscape characteristics were associated with raptor mortality at Altamont Pass (Smallwood and Thelander 2005). However, these factors are specific to that site and are not relevant to design or layout features or other project conditions at the proposed GRP site.

While it is not well known what factors may cause raptor collisions with wind turbines, it may be more apparent why they are generally avoiding turbines. Raptor mortality from operational wind facilities in the United States may be low due to the life history characteristics of raptors. In the northeast, migrating raptor species (not including owls) are diurnal animals, they are active almost entirely during daylight hours. Occasionally, with favorable conditions they will migrate at night (Wheeler 2003). Their preferred prey species are generally small to medium-sized mammals, fish, and birds, which are hunted from hundreds of feet away. It requires excellent vision to hunt and capture small prey at these distances. As explained in our pre-filed testimony, it is thought that raptors day-time habits and good vision allow them to see turbines and avoid them (Chamberlain 2006). Direct observations of raptors at some operating wind projects in the U.S. indicate that most raptors appear to be aware of turbines and avoid them (Chamberlain 2006, [Buffalo Ridge, MN]). Our own direct experience conducting similar surveys at an existing facility in southern Vermont and in Northern Maine supports this observation (Stantec 2009, Woodlot 2005c and 2005g in Attachment 4). Over the course of two seasons in Vermont and one season in northern Maine, raptors

were repeatedly observed soaring or traveling near turbines and lifting up over the spinning turbine blades, or flying high over spinning blades so that no alterations to their flight paths were needed to avoid the turbines. These observations indicated that the birds were aware of the presence and movement of the turbine blades. Considering their predominantly diurnal behavior and the very limited movement of migrating raptors during inclement weather, close interactions between raptors and wind turbines are expected to be low.

As previously discussed, there is no clear relationship between pre-construction surveys and post-construction mortality that can be used to accurately predict raptor mortality at a given site. Therefore, we would anticipate that an additional season of raptor surveys at the Project area would not yield better information or substantive changes in our overall conclusions about raptor collision risk at the proposed project. We agree with Ms. Linowes and Mr. Lloyd-Evans that if the purpose of a study is to census the migrating population of raptors over the site during the fall migration season, 11 survey days may not be adequate. However, it is important to note the difference between the objectives of a population census study and the biological and behavioral sampling studies that are regularly conducted during pre-construction surveys at proposed wind projects across the country. As explained on page one of the fall 2007 survey report, the purpose of the surveys was not to document the entire migratory population, but to sample diurnal passage rates and species composition during the fall migration season in order to provide baseline pre-construction data to compare to other studies. Furthermore, sampling was targeted over 11 days during peak migration and only during optimal weather conditions. This sampling effort is consistent with sampling efforts used

at other studies in the eastern U.S. in recent years (Attachment 4). The raptor surveys conducted during the fall 2007 migration season at the GRP site did follow HMANA protocols for daily sampling. Sampling efforts conducted at the GRP site targeted the period that is considered peak migration and days that would be considered optimal for migration. The period of peak fall migration in the region is considered to be the first two weeks in September for broad-winged hawks and several other species of raptor (Wheeler 2003). Optimal migration days are generally clear days with either light winds or steady tail winds. During fall migration, optimal winds would include those from a northerly direction.

The sampling effort consisted of a targeted survey with focus on the peak migration period and optimal weather days. HMANA protocols were followed during each survey which included the use of HMANA data sheets and documentation of all raptors seen migrating near or over the observation site between 9:00 am to 4:00 pm each day of survey. This survey effort was consistent with other fall raptor migration surveys conducted at proposed wind projects in New England (Attachment 4).

We disagree with Ms. Linowes and Mr. Lloyd-Evans that the fall raptor migration study are grossly inadequate and should be expanded for more days and multiple years before any conclusions can be drawn. As described in detail previously, even if these studies were expanded it is not appropriate to assume that the type of data that would be collected would be any more useful in determining risk of collision by migrating raptors. Based on the fact that the observed passage rates documented at the GRP site were low based on similar survey efforts conducted at other similar studies in the region, and that overall raptor mortality has been very low at other operational wind projects in the United

States outside of California, it is our professional opinion that additional surveys at the site would not change our overall conclusion that collision risk at the GRP site is anticipated to be low.

Q. Ms. Linowes also raised in her pre-filed testimony issues about the Project's potential impact to nocturnal migrant bats and birds, based on her own assessment of the surveillance radar surveys performed by Stantec. Please comment on the accuracy of these remarks.

A. Ms. Linowes' conclusions about nocturnal radar surveys conducted for the proposed project appear to be based on less than half of the data presented in the GRP application. She also appears to contradict herself at times, perhaps because of her apparent lack of experience with biological sampling techniques and nocturnal radar surveys. For example, on page 5, lines 10 through 13 of her prefiled testimony, she states that "Conducting different levels of effort from one season to the next and on different survey days makes it difficult to draw any meaningful conclusions. It should be noted that 30 days or less represents half the number of days of a realistic migration period, which extends through mid-August through at least the end of October". Ms. Linowes later states on the same page lines 26 through 28 that "Given the variation year-to-year, and what appears to be a notably high passage rate for the site in 2006 compared to other survey sites we do not understand Stantec's statement that which appears more arbitrary than informative". To assume that radar surveys would only be comparable season to season if surveys were conducted on the same days each season is inaccurate. This assumption implies that all factors that influence nocturnal migration (wind speed, wind direction, percent cloud cover, etc.) are identical or at least similar on the same days, year to year. In the above statements Ms. Linowes also references the fall 2006 survey data to

have a notably high passage rate and makes judgments on risk based solely on this one study period. This conclusion is also inappropriate as these data were not collected on the proposed ridgelines and there are additional data collected from the project site that should be considered before making judgments about risk. When comparing the data collected from the summit of Owlhead Mountain during the spring and fall 2007, passage rates and flight heights were observed to be at the middle of the range of other publicly available studies and well above the height of the proposed turbines (Attachment 5). Furthermore, the radar sampling provided adequate coverage of nocturnal migration, with the majority of effort targeted for September. September is known to be peak migration in the northeast.

In summary, Ms. Linowes' conclusion that the project will pose high risk to nocturnal migrants ignores half of the data provided in GRP's application. Her review of the Application and conclusion about the project's risk to noctural migrants did not consider all three seasons of pre-construction radar surveys conducted at the site, or the two seasons of data collected at the NCWP site just 4 miles north of the proposed project, or other publicly available pre and post-construction survey data from other projects, including projects involving higher elevation forested ridgelines and summits.

Q. Do you have any comments relative to Ms. Linowes' testimony that the nocturnal radar surveys conducted by Stantec were inadequate?

A. Yes. As mentioned previously, Ms. Linowes draws a number of conclusions and states a number of opinions about the radar surveys conducted at the site that are not accurate and based on an incomplete review of the data included as part of GRP's application. Additionally, it is important to note that the majority of Ms. Linowes

conclusions regarding survey length and number of seasons relied heavily on the USFWS Interim Guidelines, which we have explained previously as being voluntary and interim in nature.

Radar survey data were collected at the GRP site during 30 nights and two seasons, fall 2006 and spring 2007. During the third season, fall 2007, 29 nights of surveys were conducted due to prolonged periods of rain. No such surveys were conducted during 2005 as Ms. Linowes indicates on page 5, lines 22 and 23 of her pre-filed testimony. The number of seasons of survey alone is more than most other pre-construction radar surveys conducted in the northeast. The number of nights surveyed in each season is also consistent with other pre-construction radar surveys conducted in the northeast (Attachment 5). Furthermore, based on a re-analysis of several surveys conducted by Stantec in New York, there was no statistical difference observed between radar survey results from 20 nights of survey and 60 nights of survey. This re-analysis included the full analysis of 60 nights of survey compared to a randomly selected, 45, 30, and 20 night subsets. The statistical difference becomes greater once the number of survey nights drops below 20 (Stantec, *unpublished data*). Based on this analysis, it is appropriate to conclude that 30 nights of survey within each migration period is more than adequate and meets, and in some cases exceeds, what has been conducted for surveys at other proposed wind projects (Attachment 5). For example, the Vermont Agency of Natural Resources Draft Wind Power Guidelines[4] recommends 15 nights of radar surveys in the spring and 20 nights of surveys in the fall for proposed wind projects in Vermont.

[4] http://www.anr.state.vt.us/site/html/RMAR.htm

To further supplement the data collected at the GRP site and support our conclusion that the radar surveys were adequate, the radar survey data collected at the NCWP during the fall 2006 and spring 2007 was shared with GRP. This data was referenced in our pre-filed testimony and attached to GRP's application as Appendix 22 and, like the data collected during the spring 2007 radar surveys, was not used in Ms. Linowes' analysis. This data provided information from an even greater range than just the project site, and was conducted simultaneously on many of the same nights as the surveys conducted at the GRP site. This data, combined with the three seasons of data collected at the GRP site, far exceeds the pre-construction radar survey efforts conducted at other proposed wind projects in New England. As shown in Appendix 22 of the GRP Application, comparisons of the documented results from the NCWP showed trends similar to those at the GRP site. In fact, one night's data of simultaneous operations at the two sites, flight heights, passage rates, and flight directions were consistently similar. The results of the radar surveys are representative of avian migration activity through the area and suggest relatively high flight altitudes (i.e., relative to turbine height) and a broad front migration pattern. The proximity of the NCWP provided a unique opportunity to examine migration characteristics at a larger landscape level within Coos County, NH. It is important to note that all data collected at the GRP site and North Country Wind Project, as well as data collected at other proposed wind projects throughout the eastern United States, are considered together in drawing any substantive conclusions. If information is available, it is also valuable to compare pre and post-construction survey results from operational sites to pre-construction results from a proposed project. This is explained in more detail in the following responses.

Q. Do you have any comments relative to Ms. Linowes' testimony that the passage rates of nocturnal migrants were higher than other pre-construction radar studies conducted on forested ridgelines and therefore indicate higher risk of impact?

A. Yes. Ms. Linowes asserts that passage rates at the GRP site were nearly the highest compared to other publicly available radar survey results. This statement is not accurate. In fact the mean passage rates documented at the GRP site were at the middle of the range of other publicly available radar survey results (Attachment 5). We also note that passage rates alone are not sufficient to predict risk. For example, pre-construction radar surveys conducted at the Mars Hill Wind Project documented a higher fall passage rate than both fall seasons conducted at the GRP site and a very similar passage rate for the spring season. The season mean passage rate, flight height, flight direction, and percent below turbine height during the fall 2005 survey was 512 t/km/hr, 424 m, 228 degrees, and 8% respectively. The spring 2006 surveys documented a passage rate of 338 t/km/hr, flight height of 384 m, flight direction of 58 degrees, and percent below turbine height of 14%. Compared to the Mars Hill data, the GRP site documented lower passage rates, very similar flight heights and percent below turbine height, and similar flight directions. However, during post-construction weekly mortality surveys conducted at Mars Hill, 22 birds and 24 bats were found during the entire 2007 survey year. With adjustments made for searcher efficiency and scavenger removal rates in 2007, these numbers are equivalent to 0.44 birds/turbine/study year and 0.43 bats/turbine/study year. In the 2008 survey year, a total of 21 birds and 5 bats were found during standardized searches. With adjustments made for searcher efficiency and

scavenger removal rates in 2008, these numbers are equivalent to 2.04 birds/turbine/ study year and 0.68 bats/turbine/ study year. Based on the comparison of pre-construction survey results at the GRP site and those conducted at Mars Hill, as well as what was learned during post construction surveys at Mars Hill, it seems fair to expect bird and bat mortality to be similar to the Mars Hill project, which was found to be quite low. Therefore, it is our professional opinion that the proposed project will not have an unreasonable adverse impact on nocturnal migrants. Finally, as mentioned previously, GRP has agreed to conduct a post-construction mortality survey.

Q. Do you have any comments relative to Ms. Linowes' testimony that nocturnal radar surveys should have been supplemented with acoustic bird surveys to determine species composition?

A. Yes. Acoustic surveys have far more limitations than radar surveys and do not provide enough additional information to better predict collision risk to nocturnal migrants. Some migratory species do not emit flight calls during migration, and so these species would not be detected by acoustic survey. Additionally, some species do not emit calls constantly as they migrate. The typical acoustic equipment used for these surveys has a maximum height detection range of 300 meters for warblers and sparrows and, at this maximum height, it has a horizontal detection range of 250 m. If you consider the average flight speed of passerines is approximately 9 m/s, you would have a 28 second window to detect a bird at the maximum height of the detection range. This also implies that if the same bird were flying at 100 meters, which is closer to the maximum height of the proposed turbines, you would have a horizontal detection distance of only 83 meters.

This further decreases your chances of detecting the bird because it would pass through this detection range in only 9 seconds.

Furthermore, it is very difficult to accurately determine the height at which migrants are flying by using acoustic detectors because the migrants could be anywhere in between the actual detector and the maximum height of its detection range. Given the above mentioned factors, there is a good chance that these birds will not be detected. It would likely be coincidental that the detector picks these species up and detection could only occur if the bird emitted a call at the same exact time it flew over the microphone. These results could actually cause a level of bias due to the fact that some species do not even emit flight calls, some species can only be detected at lower heights (i.e., warblers and sparrows), some species can be detected up to greater heights (i.e., thrushes), and that it would be by chance that they call over relatively small window of detection.

Acoustic surveys may provide more species specific information, however radar surveys provide a much larger airspace area coverage, and also include flight height data. Particularly in respect to projected turbine heights. Regarding risk of collision during migration, all migrating birds should be considered rather than any one species alone as they are all equally protected under the Migratory Bird Treaty Act (MBTA).

Furthermore, data correlation of direct observations made during breeding bird surveys allows for some level of confirmation of species assumed to be migrating through an area. Although some species such as waterfowl would not be detected at the site during breeding bird surveys - directly resulting from a lack of habitat at the site - collision related mortalities of these species are documented to be generally low, especially in the eastern United States. It is our professional opinion that additional

acoustic surveys at the site would not change our overall conclusion that collision risk at the GRP site is anticipated to be low.

Q. Do you have any comments relative to Ms. Linowes' testimony that Stantec does not understand the value of weather information with respect to nocturnal migration?

A. Yes. Ms. Linowes makes several unsupported statements about nocturnal migration. For example, on page 6 lines 14-16 of her testimony she states "It is important to note that reports of large mortality events associated with tall structures usually involve periods of severe weather and low cloud ceiling. Unfortunately, radar equipment is shut down during these same time periods". This statement is not true. The radar surveys are only shut down during periods of steady rain; during all other conditions (i.e., fog and low clouds), radar surveys continue. The fog and low cloud conditions are not detectable by the radar and consequently do not cause "ground clutter interference" as rain does. Furthermore, although the radar is not operated during periods of steady rain, some nights were still sampled in between passing showers. This allowed for some sampling to occur on nights without optimal migration conditions, which included inclement weather.

It is also critical to note that the magnitude of avian migration is very low and sometimes non-existent on nights with severe inclement weather, as these conditions are sub-optimal for migration. Birds that migrate long distances at night do so in order to take advantage of stable atmospheric conditions, and to maintain energy reserves for long distance travel. It is not beneficial for nocturnal migrants to be traveling in inclement weather that is not optimal for migration as it is energetically expensive for them to do

so. Therefore, the three seasons of radar surveys conducted at the site were representative of most weather conditions and seasons that could occur during a typical migration season.

In terms of mortality events being associated with periods of severe weather and low cloud ceiling, Ms. Linowes is correct in part. However, she does not take into consideration the other variables that could influence collisions at tall structures. Additionally, Ms. Linowes' reference to tall structures raises a number of other non-comparable variables. Large mortality events have occurred with communication towers, sky scrapers, and smoke stacks, and were most likely a result of a combination of artificial lighting, foggy conditions, and the structure itself. Guy lines on tall towers and windows in sky scrapers have also been documented to increase the probability of collision by nocturnal migrants due to the disruptive effects of lighting, and the difficulty in identifying guy lines or windows from the air. Although artificial lighting has been thought to influence rates of bird collision at guyed communication towers, buildings, and other tall structures; the slow flashing, red FAA lights typically installed on wind turbines do not appear to influence rates of collision (NRC 2007). Jain *et al* 2007 found no significant correlation between mortality rates of nocturnally migrating birds at lit versus unlit turbines at Maple Ridge, NY (Jain *et al.* 2007). This lack of correlation has also been documented at other operational wind facilities (NRC 2007). Kerns and Kerlinger (2004) documented no differences in rates of collision between lit and unlit turbines at the Mountaineer facility in West Virginia, the largest single mortality event documented in their study (33 passerines in one night) was thought to be due to a combination of foggy conditions and bright sodium vapor lighting at a substation within

the facility, and not related to the FAA-required lighting on the turbines themselves (NRC 2007).

The peak in bird density in the sky at night generally occurs before midnight (Farnsworth 2004, Zimmerman 1998) and gradually decreases until sunrise (Zimmerman1998). Most migrants typically fly at high altitudes, possibly to take advantage of favorable following winds, to prevent overheating, to navigate over landscape features, to fly over fog or clouds, or to avoid physical barriers (Zimmerman 1998). Some birds, including waterfowl and shorebirds, are known to fly at elevations greater than 6,000 m (20,000') (Zimmerman 1998, Sibley 2001). Whereas previous studies suggested that most small birds migrate at altitudes between 150 and 300 m (Zimmerman 1998) and that the majority of passerines migrate at altitudes between 90 and 610 m (Kerlinger 1995 cited in NRC 2007), numerous radar surveys conducted in recent years at proposed wind projects suggest that flight height of nocturnally migrating passerines is relatively constant, and takes place at high altitudes, with mean values for flight heights generally ranging between 300 m and 600 m (~1000' to ~2000') above ground level for entire survey periods (Attachment 5). Recent radar studies also indicate that approximately 10 percent of migrants fly below 125 m, which is the typical maximum height of most modern wind turbines (NRC 2007). Long-distance migrants typically migrate at higher elevations than short-distance migrants.

Overall, avian mortality at wind farms in the U.S. represents a relatively low impact to birds when considering the hundreds of millions of birds that die as a result of collisions with buildings and windows, predation by house cats, collisions with

communication towers, and other sources of human-induced mortality in the U.S. each year (Erickson *et al.* 2005).

Q. Do you have any comments relative to intervenor's testimony that the radar's visible airspace was not quantified and therefore the results of the radar surveys can not be used to determine broad front migration versus a channeled migration?

A. Yes. In general, migrants were not observed to be concentrated in any part of the Project area, and on most nights there were not a significant number of targets flying below the height of the proposed turbines. Ms. Linowes states in her pre-filed testimony on page 6, lines 21-29, that the conclusion that migrants were observed migrating in a broad-front, rather than concentrated to any part of the project site, can not be reached without fully understanding the volume of airspace detected by the radar.

Such a determination is extremely difficult to quantify. However Stantec has conducted several experiments using small bird carcasses attached to helium balloons to help quantify the airspace around a radar site. These results have shown that raising the antenna to the height of the surrounding tree heights will maximize the detectable volume of the radar. Certain topographic features can also cause ground clutter, but if these areas are known and birds are observed flying into and out of those areas then that airspace is considered visible.

Great efforts are taken to get the radar antenna at heights even with the surrounding trees in order to maximize the radar's view of the surrounding airspace. As explained on Page 7 in the methods of the radar survey sections (Appendices 20 and 21 of GRP's Application), the radar was set up at a height even with the surrounding tree

tops and afforded views of targets on all areas of the radar screen. This process was used at the radar sites during all three seasons of survey. In addition, targets were observed evenly distributed around the radar location during nights of peak migration activity. This clearly demonstrates a lack of concentration to any part of the project ridgeline, and supports the conclusion that migrants are flying in a broad-front pattern over the project site. This type of migration has been observed at all other publicly available radar surveys (Attachment 5). Additionally, this conclusion has been supported by other radar studies conducted in the Northeast and was recently confirmed by .....

It has been well documented that most species travel along 'broad fronts' during migration in the region. The width of many species' migration corridors may be similar to the width of their breeding range (typically over 3219 km [2,000 mi] east to west) (Zimmerman 1998). A recent European study suggests that species with a broad east-to-west breeding range will cross all topographical features during migration including lakes, river valleys, and mountains (NRC 2007). Many waterfowl follow interior migration paths across North America as they travel to their wintering grounds along the Atlantic Coast from their breeding grounds in Canada. Some waterfowl travel southeast from central Canada, crossing the Great Lakes, New York, and Pennsylvania before reaching their coastal destinations. Certain species travel to and from breeding grounds along elliptical or circular migration routes, potentially to take advantage of seasonal wind conditions (Zimmerman 1998). For example, some species may occur along the eastern coast in the fall and then within the interior during migration in the spring.

Q. Do you have any comments relative to Mr. Lloyd-Evans' testimony that the breeding bird surveys did not provide adequate coverage of the turbine locations?

A. Yes. Although point counts conducted by NH Audubon were not located at every proposed turbine location, these points were distributed along all ridges proposed. Furthermore, these points were close enough to one another that habitat conditions did not change significantly between points on these ridges. The points sampled all areas proposed for development and covered all habitats characteristic of the project area. Limited data suggest that roughly half the fatalities at existing wind facilities represent migrant species, while the other half represent resident species (NRC 2007). However, overall bird mortality at existing wind farms appears to be of passerines which are the most abundant terrestrial bird group. The factors that influence increased risk of collision appear to be a combination of overall abundance, as well as species-specific flight behaviors. Mortality associated with collisions with modern wind turbine models in the U.S. have not been known to result in a significant population level impact to any one species, mainly because the species with relatively high collision mortality are regionally abundant. Collision mortality at GRP is expected to be within the range of mortality observed at existing facilities in the east. A population level impact for any single species is not anticipated to result from collision mortality during migration or the breeding season.

Habitat impact information is more limited for existing wind facilities in the east. Breeding bird surveys were conducted prior to construction, during construction, and after construction at the Green Mountain Power Corporation's Wind Power Facility in

Searsburg, Vermont. The same diversity of species was detected during the three survey periods; however, the abundance and frequency of species at study sample sites changed over the three periods. Four of the most abundant species prior to construction, Swainson's thrush, white-throated sparrow, ovenbird, and red-eyed vireo, experienced declines in abundance during post-construction surveys. The decline was believed to be a result of the creation of forest edge as these birds are primarily forest interior species (Kerlinger 2002). Some species including blackpoll warbler, magnolia warbler, and dark-eyed junco remained unchanged. Yellow-rumped warbler and a couple of edge species, American robin, and blue jay increased in abundance. The edge effect on interior forest breeding birds at the GRP site will be effectively mitigated with the permanent protection of similar habitats above 2700 feet in elevation that will not be harvested. This will provide more suitable interior habitat for these species than if these lands were subject to future timber harvests.

Overall, literature review on the likelihood of indirect impacts to breeding birds suggests that some indirect impacts will likely occur as a result of the project, but that the magnitude of these impacts will be minor, and will be more than adequately protected with the mitigation plan that involves permanent preservation of high elevation habitat.

Q. Do you wish to respond to Ms. Linowes' testimony and USFWS comments that the acoustic bat surveys conducted at the GRP Project were inadequate?

A. Yes. Ms. Linowes appears to base her statements regarding the acoustic bat surveys conducted at the GRP site largely on correspondence with USFWS staff. The letter that she refers to from the USFWS has been addressed by GRP in a response letter

dated September 16, 2008. See Attachment 7. The USFWS and Ms. Linowes commented that the coverage of the project site with bat acoustic detectors was inadequate and that the detectors should be deployed on other met towers in addition to their locations on the summit of Owlhead Mountain and in the met tower near Trio Ponds. They also commented that there was a need for data in favorable habitat conditions for bats, such as the adjacent valleys and streams to determine if a reservoir of bats or bat activity exists near the project site. They also expressed concern for the lack of surveys investigating potential small-footed bat roost sites on the west side of Mt. Kelsey.

We disagree with Ms. Linowes and USFWS in this regard. One full year of bat surveys were conducted within the project site, with particular focus paid to the two major habitat types characteristic of the entire project site. The Owlhead Mountain site was at a higher elevation and located within a relatively undisturbed spruce/fir forest. The Trio Ponds site was located adjacent to Trio Ponds and was within a relatively disturbed area due to forest harvesting activities and consisted of regenerating hardwood species. The Trio Ponds location provided a better sampling of habitats thought to be more suitable for foraging bats. Additionally, meteorological towers were used at both sites to gain information of bat activity levels at heights near the proposed rotor zone during the spring and fall migration periods, as well as the summer foraging and pup-rearing months.

In addition to the data collected within the GRP site, bat detector surveys were also occurring simultaneously with the NCWP site approximately 4 miles north of the GRP site during the spring of 2007. Both the number of calls and detection rates

observed at the two sites were low and very similar (Table 2). Similar to radar information, it is still unknown whether bat activity levels as recorded during acoustic bat surveys translate into number of fatalities once a project is developed. It is also difficult to determine if the number of calls actually represents the number of individuals flying by the detector, especially during summer foraging months when it would be possible for an individual bat to fly past the detector multiple times in one night. Overall, the bat activity levels recorded at both of these sites were low compared to other studies conducted at proposed wind power sites in the northeast (Attachment 6). This is probably due to the northerly latitude of the project site and shorter growing season that keeps temperatures below 50 degrees for most of the year.

Table 3. Comparison of results of the spring 2007 simultaneous bat detector surveys conducted at the two projects

Granite Reliable Wind Project					
Location	**Dates**	**# Detector Nights**	**# Recorded Sequences**	**Detection Rate**	**Maximum Number of Calls Recorded**
Owlhead High	4/26-6/1	37	8	0.2	5
Owlhead Low	4/30-6/1	19	5	0.3	2
Trio Ponds High	4/28-6/1	35	8	0.2	3
Trio Ponds Low	4/28-6/1	35	12	0.3	2
Overall Results		**126**	**33**	**0.3**	--
North Country Wind Project					
Location	**Dates**	**# Detector Nights**	**# Recorded Sequences**	**Detection Rate**	**Maximum Number of Calls Recorded**
Met Tower High	4/26-6/11	47	25	0.5	18
Met Tower Low	4/13-6/11	60	25	0.4	11
Overall Results		**107**	**50**	**0.5**	--

Wirth respect to known small-footed bat habitat, initial consultations with the NHFG, USFWS, and NHNHB, did not show these features as being significant habitat for the state-endangered small-footed bat. Based on these consultations and a review of the NH Wildlife Action Plan, the closest known occurrence of the eastern small-footed bat to the project area is approximately 21 miles south at the Mascot Lead Mine in Gorham, NH, where 9 individuals were documented by NHFG in 2004.

Furthermore, compared to the Mars Hill project in Northern Maine where pre-construction acoustic bat surveys (Attachment 6) were also conducted, the GRP site showed lower detection rates. Post construction mortality searches conducted at Mars Hill (a 28 turbine project) in 2007 and 2008 also found low bat mortality rates, with a total of 24 bat mortalities documented during 2007 and five mortalities during 2008. As explained in previous responses, pre-construction data alone is limited in determining risk. However, when compared to post construction data such as the data from Mars Hill, it appears that risk to bats from the GRP site will be low. An unreasonable adverse impact to bats as a result of the GRP project is not anticipated.

Q. Are there any other comments you would like to make at this time?

A. No

Q. Does this conclude your prefiled testimony?

A. Yes.

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THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-4

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

SUPPLEMENTAL TESTIMONY OF JEAN VISSERING ON BEHALF OF GRANITE RELIABLE POWER, LLC

February 23, 2009

Q. Please state your name and business address.

A. My name is Jean Vissering. My business address is 3700 North Street, Montpelier, Vermont, 05602. My employment and qualifications are described in my July 2008 pre-field testimony and have not changed since then.

Q. What is the purpose of your supplemental testimony?

A. The purpose of my supplemental testimony is to provide the Committee with more information about the aesthetic impacts of Granite Reliable Power, LLC's ("GRP") Project in Coos County and whether this Project will unduly interfere with the orderly development of the region as a result of further discussions and meetings with the Applicant and parties to this proceeding.

Q. Has the Applicant prepared a plan for mitigation of views of the interconnection line from Dummer Pond ?

A. Yes. In response to questions from the parties and the town of Dummer, GRP has prepared a plan to mitigate views of the interconnection line from Dummer Pond. My office prepared a study of the potential views toward the interconnection line. The study indicated that portions of several poles could be visible. Since the poles would be seen against a backdrop of Dummer Ridge, the impacts would be substantially reduced. Later we submitted recommendations for further mitigating these views which included establishing a 100 foot buffer east of the cleared right-of-way for 12 poles that would be located west of the pond. Due to topography, providing screening close to the poles would be most effective. The road would run within this buffer area, but sufficient screening would occur especially since the line corridor is already set back from the road. The landowner that currently manages the land where the 115kv lines will be located, Bayroot, is evaluating the vegetative screening that I have suggested as part of their long term plan See Appendix 55-a to the Supplement to the Application (Attachment B to the response to TS 2-3). In addition, much of the timber between the Pond and the Lines is subject to harvesting restrictions stemming from the Basal Area Law (RSA 227-J:9), Comprehensive Shoreland Protection Act (RSA 483-B), and standard Best Management Practices for activities near a body of water. Bayroot is operating under the stringent sustainable forestry standards of the Sustainable Forestry Initiative and Forest Stewardship Council. Under these restrictions, it is reasonable to expect that a natural vegetated area would remain along the banks of Dummer Pond.

Q. Did you conduct a viewshed analysis from Route 16 of the old proposed wind sites on the western ridges ?

A. Yes. I prepared a comparative visual assessment in response to a request from Public Counsel at the second technical session (Attachment C, response to TS 2-4). A copy of this analysis is included as Appendix 55-b to the Supplement to the Application.

Q. Did you do an initial field review for Noble as part of its preliminary analysis of possible alternative sites for the wind turbines ?

A. Yes. We prepared an Initial Field Summary dated July 9, 2007, a copy of which was provided to the parties in response to TS 2-6 (Attachment D). A copy has been provided as Appendix 55-c to the Supplement to the Application.

Q. Please describe your visual impacts analysis as it relates to considering alternative locations.

A. A number of alternative sites were considered in the initial stages of the project. They involved numerous smaller ridges west of the existing proposed project ridge. Also considered was a ridge immediately west of Dummer Pond and south of the currently proposed project. The visual impacts of these alternative locations would have been less from some locations and greater from others with no significant visual advantages or disadvantages of the alternative sites. For example, turbines on Dummer Pond ridge would be more visible from Route 16 and the Androscoggin River than the current proposal. Turbines on Baldhead Mountain would be slightly less visible from Route 26, but more prominent from the Cilley Hill area in Columbia. In general the alternative locations would have been closer to the Nash Stream Forest and visible from

some ponds within the Forest including Little Bog and Lower Trio Ponds. I do not believe the current proposal would have unreasonable adverse effects on aesthetics or interfere with the orderly growth of the region. Also, I did not find that the alternative sites created any significant advantages from the standpoint of visual impacts.

Q. Have you done any additional photo simulations since the Application was filed in July of 2008 ?

A. Yes. In response to a data request from Public Counsel (PC 2-46) we prepared a photo simulation from Lake Umbagog which is being included as Appendix 55-d to the supplement to the Application.

Due to the significant distance of the project from Lake Umbagog (10-15 miles) the turbines would appear very small. Turbines would be visible only in the northern portion of the lake with approximately 15 turbines potentially visible along Dixville Peak and Mt. Kelsey. The project ridges occupy only a very small portion of views around the lake and are not focal points within the view. The views to the south toward the Mahoosucs and the White Mountains are the most dramatic with numerous foreground ridges having greater prominence.

Q. Have either this new viewshed analysis or these new photographic simulations changed your opinion of the visual impact this Project will have ?

A. No. Public Counsel's data requests have been reasonable and useful, and they have confirmed my earlier opinions.

Q. Has your opinion of whether this Project have an unreasonable adverse effect on aesthetics changed since your July 2008 pre-filed testimony ?

A. No. This Project would not have an unreasonable adverse effect on aesthetics, for the reasons summarized above and described in detail in my report and July testimony.

Q. Has your opinion as to whether this Project will unduly interfere with the orderly development of the region changed ?

A. No. Having reviewed planning documents related to the growth and development of the region, including the North Country Council's Coos Economic Action Plan (September 2008) including reports by Technical Review Committees on Energy and Tourism, I have not seen any statements indicating that the proposed project would interfere with the orderly development of the region. I have also reviewed local planning documents for surrounding towns but have not found any language which would suggest that the project would interfere with the orderly development of any towns or locations within the area on or surrounding the Granite Reliable Wind Project.

Q. Does this conclude your supplemental prefiled testimony?

A. Yes.

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THE STATE OF NEW HAMPSHIRE
BEFORE THE
NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2008-4

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE POWER WINDPARK
IN COOS COUNTY

SUPPLEMENTAL TESTIMONY OF HOPE LUHMAN ON BEHALF OF GRANITE RELIABLE POWER, LLC

February 23, 2009

Qualifications

Q. Please state your name and business address.

A. My name is Hope Luhman. My business address and qualifications have not changed from what was described in my July 2008 pre-filed testimony.

Purpose of Supplemental Testimony

Q. What is the purpose of your supplemental testimony?

A. The purpose of my supplemental testimony is to provide an update on Granite Reliable Power, LLC's ("GRP") Project in Coos County and any impact this Project may have on historic sites.

Impact on Historic Sites

Q. Has there been any additional work on the impact this Project will have on historic sites?

A. Yes, the Phase IA report was completed, submitted and accepted by the New Hampshire Division of Historical Resources ("NH DHR"). The Phase IB fieldwork was completed. An end-of-field ("EOF") letter was submitted to the NH DHR on October 14, 2008, and the NH DHR concurred that the fieldwork was completed as agreed on November 12, 2008. The Phase IB report was submitted on February 3, 2009. The EOF letter, the correspondence received from the NH DHR, and the Phase IB report are included as Appendix 46 to the Supplement to the Application.

Q. Please describe the Phase IB report.

A. After completing a Phase IA survey of the project area in 2007, The Louis Berger Group, Inc. ("Berger"), identified a number of locations within the area of potential effects ("APE") as archaeologically sensitive and warranting further investigation ("Phase IB"). The NH DHR approved the testing strategy as outlined in the Phase IA archaeological survey report. The objective of the Phase IB survey was to identify any archaeological resources within areas of the APE determined to be sensitive. Berger investigated all sensitive areas identified in the Phase IA study and also surveyed additional sensitive areas located during the Phase IB field investigation. Although the majority of the APE consisted of rugged and sloped terrain as well as shallow and frequently saturated soils with exposed bedrock, shovel testing was conducted at the majority of the areas indicated in the Phase IA study. Areas that were not shovel tested were those found not to be archaeologically sensitive because of factors such as excessive slope, disturbed contexts, and location within wetlands or in areas of exposed bedrock. Based on the findings of the Phase IB archaeological survey, it is Berger's opinion that no further work is warranted for the project as presently proposed.

Q. Have you had any meetings with state or federal agencies since July of 2008 ?

A. Yes. On January 27, a meeting of the U.S. Army Corps of Engineers ("USACE"), NH DHR, GRP, and Berger was held at the NH DHR in Concord to discuss potential effects of the Coös County Wind Park Project for eight (8) National Register-eligible properties located within the APE. Consultation during this meeting reached the following effects determinations:

- COL00026 (1594 NH Route 26) – No Effect
- COL00027 (1761 NH Route 26) – No Effect
- DIX0002 (3 Valley Road) – No Effect
- DIX0003 (2 Valley Road) – No Effect

Preliminary effects determinations (noted below in brackets) were made for the remaining properties. To finalize those determinations, a site visit was deemed necessary and has been scheduled for February 25, 2009.

- MLS0001 (1372 Millsfield Pond Road) – [No Effect]
- MLS0002 (87 Pond Outlet Road) – [No Adverse Effect]
- ODL0001 (Philips Pond) – [No Effect]
- COL00028 (Panorama Golf Course) – [No Adverse Effect]

Q. Has Granite Reliable Power, LLC taken any additional steps to insure that the impact of the Project on historic sites will be mitigated ?

A. Yes, as discussed in the preceding question, GRP has continued consultation with the NH DHR and the USACE regarding the historic properties identified by the architectural survey in addition to completing the archaeological survey.

Q. Has your opinion of that this Project will not have an unreasonable adverse effect on historic sites changed since you filed your July 2008 pre-filed testimony ?

A. No.

Q. Does this conclude your supplemental testimony?

A. Yes.

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THE STATE OF NEW HAMPSHIRE
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DOCKET NO. 2008-4

APPLICATION OF GRANITE RELIABLE POWER, LLC
FOR CERTIFICATE OF SITE AND FACILITY
FOR GRANITE RELIABLE WINDPARK
IN COOS COUNTY

February 23, 2009

REVISED PROPOSED EXHIBIT LIST

1. Application
2. Supplement to Application Information
3. Prefiled Testimony of Charles Readling and Pip Decker
4. Supplemental Prefiled Testimony of Pip Decker and Mark Lyons
5. Prefiled Testimony of Christopher Lowe
6. Supplemental Prefiled Testimony of Christopher Lowe and Jeffrey Wood
7. Prefiled Testimony of Daniel Mandli
8. Supplemental Prefiled Testimony of Daniel Mandli
9. Prefiled Testimony of Phillip Beaulieu
10. Supplemental Prefiled Testimony of Stephen LaFrance
11. Prefiled Testimony of Raymond Lobdell
12. Supplemental Prefiled Testimony of Raymond Lobdell
13. Prefiled Testimony of Steven Pelletier and Adam Gravel
14. Supplemental Prefiled Testimony of Steven Pelletier and Adam Gravel
15. Prefiled Testimony of Jean Vissering
16. Supplemental Prefiled Testimony of Jean Vissering
17. Prefiled Testimony of Hope Luhman
18. Supplemental Prefiled Testimony of Hope Luhman
19. Prefiled Testimony of David Hessler
20. Prefiled Testimony of Matthew Borkowski
21. Application Volume 2 (Appendix 1 and Appendices 4-20)

22. Application Volume 3 (Appendices 21-35)

23. Application Volume 4 (Appendix 2) – Standard Dredge and Fill Permit Application

24. Application Volume 5 (Appendix 3) – Site Specific Terrain Alteration Permit

25. Appendices 36-38 (provided on October 6, 2008)

26. Appendices 39 and 40 (provided on October 9, 2008)

27. Application Volume 6 (Appendices 41-64)

This proposed exhibit list is being submitted to conform with the requirements of RSA 162-H:6-a,I and Site 301.03(k) and as an update to the proposed exhibit list provide with the Application as Appendix 34, to reflect the Supplement to the Application and supplemental testimonies.

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