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

DOCKET NO. 2010-01

APPLICATION OF GROTON WIND, LLC
FOR A CERTIFICATE OF SITE AND FACILITY

SECOND SUPPLEMENTAL PREFILED TESTIMONY OF JOHN D. HECKLAU ON BEHALF OF GROTON WIND, LLC

December 30, 2010

Qualifications

Q. Please state your name, business address and qualifications.

A. My name is John D. Hecklau. My business address is Environmental Design and Research, P.C. ("edr"), 217 Montgomery Street, Suite 1000, Syracuse, New York 13202. My qualifications are stated in my prefiled direct testimony that was submitted with the Groton Wind, LLC Application filed on March 26, 2010 and have not changed since that time.

Purpose of Testimony

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

A. The purpose of this testimony is to provide information regarding the impacts on aesthetics of the voltage step-up and other facilities that will be needed to interconnect the 34.5 kV line bringing power from the Groton Wind Project ("the Project") with the regional power grid. These facilities are proposed to be located in Holderness and are described in the Third Supplemental Prefiled Testimony of Edward Cherian.

Q. Have you conducted any visual studies of the above-referenced interconnection facilities?

A.. Yes. At the request of Groton Wind, LLC, the **edr** Companies (**edr**) conducted supplemental studies to evaluate the potential visibility and visual impact of a proposed interconnection facility (substation) located within a 25 acre site east of State Route 175 in Holderness, New Hampshire.

Q. Please describe the methodology used in the visual studies.

A. Visual analysis of the proposed interconnection facility included a site visit, photo documentation of publicly available views toward the site, and preparation of one photographic rendering of the proposed facility. All photos were obtained using a digital SLR camera (Nikon D200) with a focal length of approximately 35 mm (equivalent to 50 mm on a standard 35 mm camera). This focal length most closely approximates normal human eyesight relative to scale. The photographic rendering was prepared by using site information provided by Groton Wind and a 3D computer model of a substation similar to the one proposed for use on the Groton Wind Project. *See* Figure 2 attached hereto. This model was prepared for Iberdrola by **edr** for use on the Hardscrabble Wind Project in Herkimer County, New York. AutoCAD® and 3D Studio Max® software were used to accurately incorporate this model into the photo obtained during fieldwork. Details regarding this methodology are included in the original Visual Impact Assessment (VIA) prepared for the Groton Wind Project and summarized in my pre-filed direct testimony. The completed rendering depicts the potential visibility of the proposed facility from

the most open available view documented during fieldwork. This viewpoint is approximately 1,070 feet west of the proposed substation site on New Hampshire State Route 175.

Q. Please describe the fieldwork you conducted.

A. edr conducted a site visit to assess potential visibility of the interconnection facilities on December 17, 2010. Weather conditions were partly cloudy with temperatures between 20 and 30 degrees Fahrenheit. The site visit included a reconnaissance of the site and documentation of views toward the site from publicly accessible locations in the immediate vicinity (within approximately 0.5 mile). Photographs were taken from 20 representative viewpoints. Viewpoint locations were recorded using hand-held global positioning system (GPS) units and aerial photographs. The time, location, and orientation of view of each photo were noted on data sheets. The locations of all viewpoints are depicted on the Viewpoint Location Map in Figure 3 which is attached hereto. Representative photographs from each viewpoint are included in the Photo Log attached hereto.

Q. Please describe the results of your studies on the above-referenced interconnection facilities?

A. A report of edr's assessment is attached to this prefiled testimony. The existing visual character of the area surrounding the Project site includes fragmented mixed deciduous and coniferous forest, industrial sites, and residential areas. *See* Figure 4 attached hereto. Other than private residences, the only potentially significant public resource identified in the vicinity of the Project site is Livermore Falls (on the Pemigewasset River). The view toward the Project

from the parking area and trailhead to the falls (located on Livermore Road approximately 1,580 feet from the Project site) is to the east, down Falls Road. *See* Photo Log, Viewpoint 9. The view of the Project site from this location is screened by residences located along Falls Road and vegetation on the east side of State Route 175. The falls themselves are located within a gorge that can only be accessed by a foot trail that proceeds west from the parking lot. Steep topography completely obstructs views toward the proposed facility from within the gorge and at the falls.

Views into the site from State Route 175 and nearby side streets (Falls Road, Short Street, Easy Street, Trapper Brown Drive) are for the most part screened by vegetation located along the east side of State Route 175. From both the northbound and southbound approaches on State Route 175, views of the Project site will be completely screened by roadside vegetation, with the exception of the area located directly west of the site. *See* Photo Log, Viewpoints 7 and 11 and additional discussion below. Recent disturbance in the area between the Project site and the highway include timber harvesting, topsoil stripping, and some sand/gravel quarrying. A cleared access road runs along the southern part of the parcel and proceeds east from Route 175 toward the substation site. *See* Photo Log, Viewpoints 6, 13, and 14. Trees, 20-30 feet tall, between the proposed substation site and the highway, screen most views into the site. *See* Photo Log,Viewpoints 7, 8, and 12.

Field review also included visiting the residential neighborhood and golf-club community located southwest of the site. *See* Photo Log, Viewpoints 17-20. No open publicly-accessible views toward the site were documented from Stone Point Road, Oak Hill Road, Fairway Drive, and Muirfield Lane. However, the houses and townhouses located along these roads are sited

along a ridgeline to enjoy views of the mountains across the Pemigewasset River Valley to the west. Although, yard vegetation and woodlots between residences generally screen views of the valley from the road, the Project may be visible from the rear (west-facing) sides of some of these residences. The proposed substation would be located at the base of the slope to the west of these homes, approximately 0.5 mile to the northwest. The facility could thus be visible from these homes, but would be at least partially screened by intervening vegetation, and would not obstruct or impair views of the mountains across the valley. In addition, any view of the proposed substation would already include the existing 115 kV transmission line that occurs between these residences and the Project site.

Q. Please describe the potential visibility and appearance of the interconnection facilities.

A. The most open available view into the substation site is from State Route 175 near the intersection with Short Road. *See* Photo Log, Viewpoint 12. From this location, a break in the vegetation on the east side of the highway provides views into the parcel toward the site. The proposed facilities would be located approximately 1,070 feet east of Viewpoint 12. The view from this location will be framed by mature, mixed deciduous and evergreen trees. A few clumps of trees and shrubs also remain within the interior of the parcel (these are easier to see in the view to the west – toward the highway – from within the Project parcel.) *See* Photo Log, Viewpoint 3. The open areas between clumps of existing vegetation create a relatively narrow line of sight into the parcel toward the proposed substation site. *See* Photo Log, Viewpoint 12. This line of sight is also apparent from within the parcel, where the large apartment building at

the western end of Short Road and Falls Road is visible through gaps in the tree branches. *See* Photo Log, Viewpoint 2.

An approximation of the potential visibility and appearance of the Project from Viewpoint 12 is depicted in the photographic rendering in Figure 4, attached hereto. As illustrated in the photo rendering, with the proposed Project in place, a portion of the substation can be seen from Route 175 through a gap in the trees. The foreground vegetation provides substantial screening of the majority of the proposed facility, even in a "leaf-off" condition. This screening would be even more complete during the growing season. The unscreened portion of the substation is clearly visible in the center of the view. Its man-made character and gray color contrast with the natural vegetation on-site. However, its vertical lines and the height of its tallest components are consistent with the surrounding trees. Because the land continues to rise to the east, the facility is not viewed against an open sky. The forested backdrop helps obscure the facility and minimizes its visual contrast. Line, scale, and texture contrast are also reduced by the distance at which the facility is viewed (over 1,000 feet). Although not illustrated in the photo rendering, land use contrast is limited due to the commercial and industrial land uses that occur in the surrounding area (e.g., transmission line, sand and gravel quarry, and commercial buildings).

Q. In your opinion, will the above-referenced interconnection facilities have an unreasonable adverse effect on aesthetics?

A. The interconnection facilities will not have an unreasonable adverse impact on aesthetics. Overall, the area immediately surrounding the site does not possess notable aesthetic

or scenic qualities. The site is located on a previously disturbed parcel, much of which was recently cleared and excavated. Adjacent land uses include a sand quarry, light industrial facilities, forested areas, and trailer parks (on the west side of State Route 175). The Project will not affect views from the nearest potentially significant public resource (Livermore Falls) and will be at least partially screened from higher elevation residences to the east that already have views of the existing 115 kV transmission line. An open view of the proposed interconnection facility will only be available at one location along State Route 175. *See* Figure 4 attached hereto. Even in this most open view, the Project's visual impact will be mitigated by the significant tree screening anticipated to remain in place and the distance of the substation from the road (over 1,000 feet). Elsewhere along Route 175, views of the facility should be substantially of fully screened by existing trees and shrub vegetation along the east side of the highway.

Q. Does this complete your testimony?

A. Yes it does.

edr
COMPANIES

December 28, 2010

Ms. Kristen Goland
Iberdrola Renewables, Inc.
1125 NW Couch Street
Portland, OR 97209

RE: Supplemental Visibility Assessment – Proposed Interconnection Facility
Groton Wind Project
edr Project No. 09048

Dear Kristen:

At the request of Groton Wind LLC, the **edr** Companies (**edr**) conducted an assessment of the visibility of an interconnection facility (substation) that is proposed to connect the Groton Wind Power Project with the regional transmission grid. The proposed substation site is an approximately 5 acre area adjacent to the existing National Grid 115 kV transmission line in the Town of Holderness, New Hampshire. The site is located on the east side of a 25 acre parcel of land east of State Route 175, immediately south of Trapper Brown Drive (see Figure 1).

PROJECT DESCRIPTION

The proposed interconnection facility will be constructed at the point where the overhead electrical line from the proposed Groton Wind Project connects with the National Grid 115 kV transmission line. The substation will step up voltage from 34.5 kV to 115 kV, and will include buses, transformers, circuit breakers, take-off structures, a control house, and related structures. It will be approximately 2.5 acres in size, enclosed by a chain link fence, and accessed by a new gravel service road. Design of the facility is not yet finalized, but it is anticipated to be similar, if not identical to, the substation used at Iberdrola's Hardscrabble Wind Project in Herkimer County, New York (see Figure 2). Components within the substation are anticipated to be gray/galvanized in color, with a maximum height of approximately 60 feet.

The proposed Project site is located on the east side of a 25 acre parcel, approximately 1,070 feet east of State Route 175. The parcel, formerly a mix of forest and early successional vegetation, is highly disturbed by relatively recent timber harvesting, topsoil stripping, and sand/gravel quarrying. A cleared access road runs along the southern portion of the parcel and proceeds east from Route 175 to the proposed substation site. Most of the remaining vegetation on-site consists of 20-30 foot tall trees located within approximately 500 feet of the highway (see Photos 6-8 and 11-14 in the attached Photo Log).

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N 43° 02' 56", W 76° 08' 56"

METHODOLOGY

To evaluate potential visibility of the proposed substation, **edr** conducted a site visit, and evaluated existing views of the proposed Project site on December 17, 2010. The site visit included a reconnaissance of the Project site and documentation of views toward the site from publicly-accessible locations in the immediate vicinity (within approximately 0.5 mile). Photographs were taken from 20 representative viewpoints using a digital SLR camera (Nikon D200) with a focal length of approximately 35 mm (equivalent to 50 mm on a standard 25 mm camera). This focal length most closely approximates normal human eyesight relative to scale.

edr also prepared a photographic rendering of the proposed substation from the most open view documented during fieldwork. This rendering was used to show what the facility would look like and evaluate its potential visual impact. The photographic rendering was prepared by using site information provided by Groton Wind and a 3D computer model of a substation similar to the one proposed for use on the Groton Wind Project. This model was prepared for Iberdrola by **edr** for use on the Hardscrabble Wind Project in Herkimer County, New York. AutoCAD® and 3D Studio Max® software were used to accurately incorporate this model into the photo obtained during fieldwork. Details regarding this methodology are included in the original Visual Impact Assessment (VIA) prepared for the Groton Wind Project.

RESULTS

Fieldwork documented that the existing visual character of the area surrounding the proposed substation site includes fragmented mixed deciduous and coniferous forest, industrial sites, and residential areas. Other than private residences, the only potentially significant public resource identified in the vicinity of the Project site is Livermore Falls (on the Pemigewasset River). The view toward the Project from the parking area and trailhead to the falls (located on Livermore Road approximately 1,580 feet from the Project site) is to the east, down Falls Road (see Viewpoint 9 in the attached Photo Log). The view of the Project site from this location is screened by residences located along Falls Road and vegetation on the east side of State Route 175. The falls themselves are located within a gorge that can only be accessed by a foot trail that proceeds west from the parking lot. Steep topography completely obstruct views toward the proposed facility from within the gorge and at the falls.

Views into the Project site from State Route 175 and nearby side streets (Falls Road, Short Street, Easy Street, Trapper Brown Drive) are for the most part screened by vegetation located along the east side of State Route 175. From both the northbound and southbound approaches on State Route 175, views of the Project site will be completely screened by roadside vegetation, with the exception of the area located directly west of the Project site (see Photo Log, Viewpoints 7 and 11; and additional discussion below). Trees, 20-30 feet tall, located between the proposed substation site and the highway, screen most views into the site (see Photo Log, Viewpoints 6- 8, and 12-14).

Field review also included visiting the residential neighborhood and golf-club community located southwest of the Project site (see Photo Log, Viewpoints 17-20). No open publicly-accessible views toward the Project site were documented from Stone Point Road, Oak Hill Road, Fairway Drive, and Muirfield Lane. However, the houses and townhouses located along these roads are sited along a ridgeline to enjoy views of the mountains across the Pemigewasset River Valley to the west. Although, yard vegetation and woodlots between residences generally screen views of the valley from the road, the Project may be visible from the rear (west-facing) sides of some of these residences. The proposed substation would be located at the base of the slope to the west of these homes, approximately 0.5 mile to the northeast. The facility could thus be visible from these homes, but would be at least partially screened by intervening vegetation, and would not obstruct or impair views of the mountains across the valley. In addition, any view of the proposed substation would already include the existing 115 kV transmission line that occurs between these residences and the Project site.

The most open available view into the Project site is from State Route 175 near the intersection with Short Road (Viewpoint 12). From this location, a break in the vegetation on the east side of the highway provides views into the parcel toward the Project site. The proposed Project would be located approximately 1,070 feet east of Viewpoint 12. The view of the Project from this location will be framed by mature, mixed deciduous and evergreen trees. A few clumps of trees and shrubs also remain within the interior of the parcel (these are easier to see in the view to the west – toward the highway – from within the Project parcel see Photo Log, Viewpoint 3). The open areas between clumps of existing vegetation create a relatively narrow line of sight into the parcel toward the proposed substation site. This line of sight is also apparent from within the Project parcel, where the large apartment building at the western end of Short Road and Falls Road is visible through gaps in the tree branches (see Photo Log, Viewpoint 2).

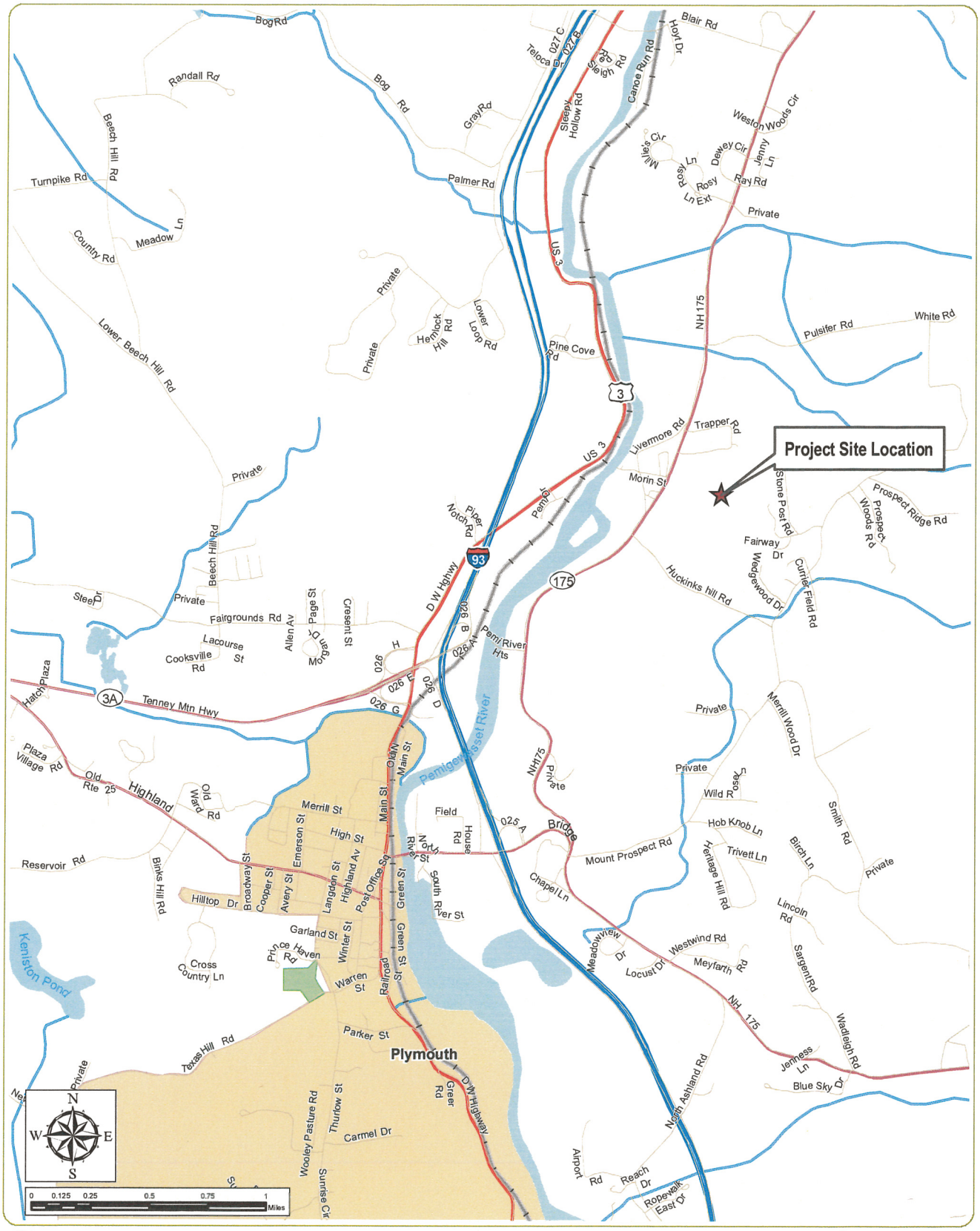
An approximation of the potential visibility and appearance of the Project from Viewpoint 12 is depicted in the photographic rendering included as Figure 4. As illustrated in the photo rendering, with the proposed Project in place, a portion of the substation can be seen from Route 175 through a gap in the trees. The foreground vegetation provides substantial screening of the majority of the proposed facility, even in a "leaf-off" condition. This screening would be even more complete during the growing season. The unscreened portion of the substation is clearly visible in the center of the view. Its man-made character and gray color contrast with the natural vegetation on-site. However, its vertical lines and the height of its tallest components are consistent with the surrounding trees. Because the land continues to rise to the east, the facility is not viewed against an open sky. The forested backdrop helps obscure the facility and minimizes its visual contrast. Line, scale, and texture contrast are also reduced by the distance at which the facility is viewed (over 1,000 feet). Although not illustrated in the photo rendering, land use contrast is limited due to the commercial and industrial land uses that occur in the surrounding area (e.g., transmission line, sand and gravel quarry, commercial buildings).

CONCLUSIONS

Based on the results of fieldwork and the photo rendering, it appears that views of the proposed facility will generally be well screened, and will not have a significant adverse effect on sensitive resources or receptors. Overall, the area immediately surrounding the Project site does not possess notable aesthetic or scenic qualities. The Project site is located on a previously disturbed parcel, much of which was recently cleared and excavated. Adjacent land uses include a sand quarry, light industrial facilities, forested areas, and trailer parks (on the west side of State Route 175). The Project will not affect views from the nearest potentially significant public resource (Livermore Falls) and will be at least partially screened from adjacent residences, including higher elevation homes to the east that already have views of the existing 115 kV transmission line. An open view of the proposed interconnection facility will only be available at one location along State Route 175. Even in this most open view, the Project's visual impact will be mitigated by the significant tree screening anticipated to remain in place and the distance of the substation from the road (over 1,000 feet). Elsewhere along Route 175, views of the facility should be substantially of fully screened by existing trees and shrub vegetation that occurs along the east side of the highway.

Sincerely,
edr Environmental Services, LLC

John D. Hecklau
Executive Vice President



Groton Wind Farm

Town of Groton - Grafton County, New Hampshire

Figure 1: Project Location Map

December 2010

Notes: Base Map: 1:100,000 USGS Lake Winnipesaukee and Rutland quadrangles.

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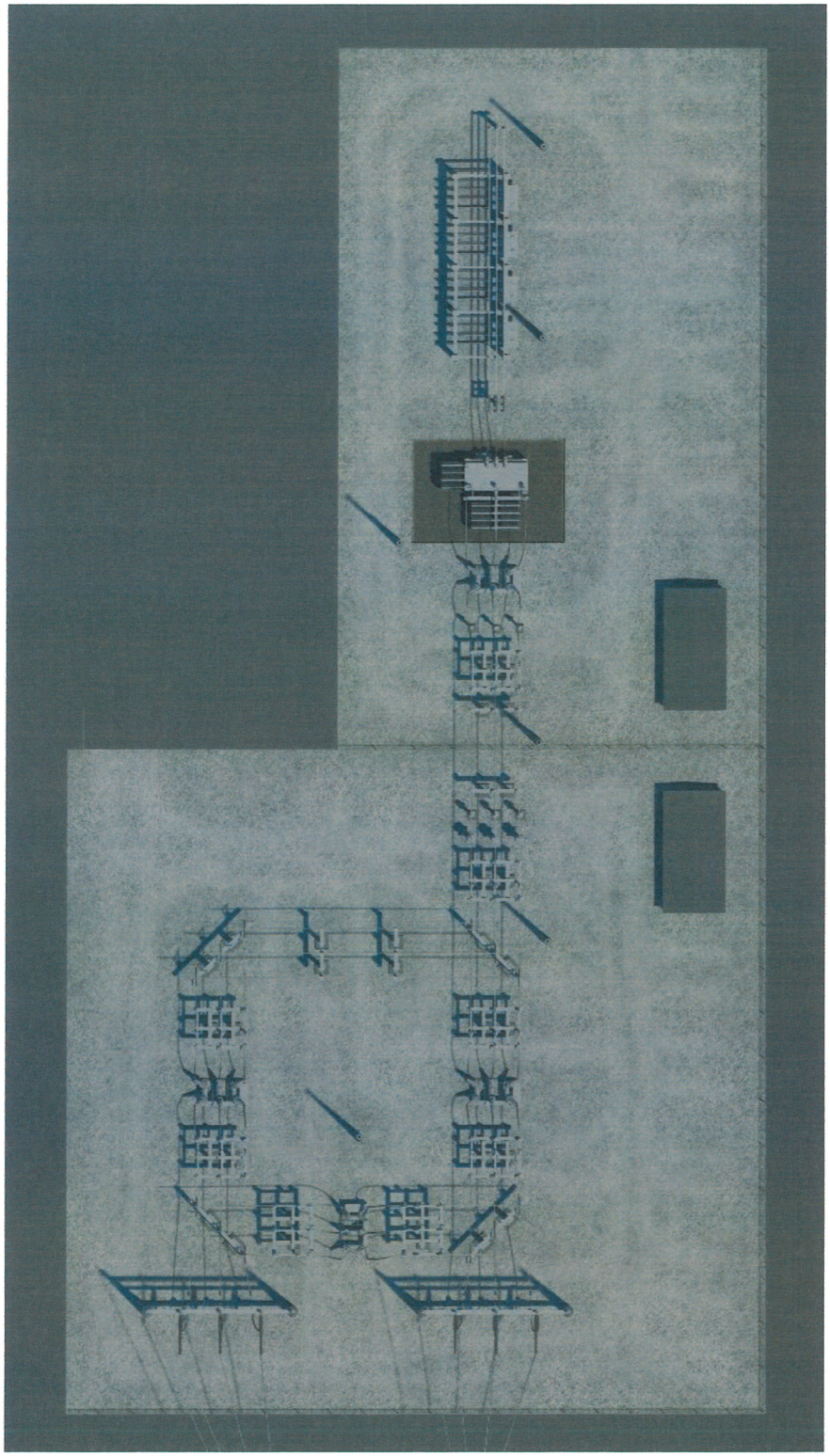

Substation - Plan View

Groton Wind Project

Town of Groton - Grafton County, New Hampshire

Figure 2: Computer Model of Proposed Substation

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Groton Wind Farm

Town of Groton - Grafton County, New Hampshire

Figure 3: Viewpoint Location Map

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Notes: Base Map: 1-Meter resolution orthoimagery, 2008.

Viewpoint

Project Site

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Groton Wind Project
Town of Groton - Grafton County, New Hampshire

Figure 4: Viewpoint 12 -Original View

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Groton Wind Project
Town of Groton - Grafton County, New Hampshire

Figure 4: Viewpoint 12 -Proposed Substation Photo Rendering

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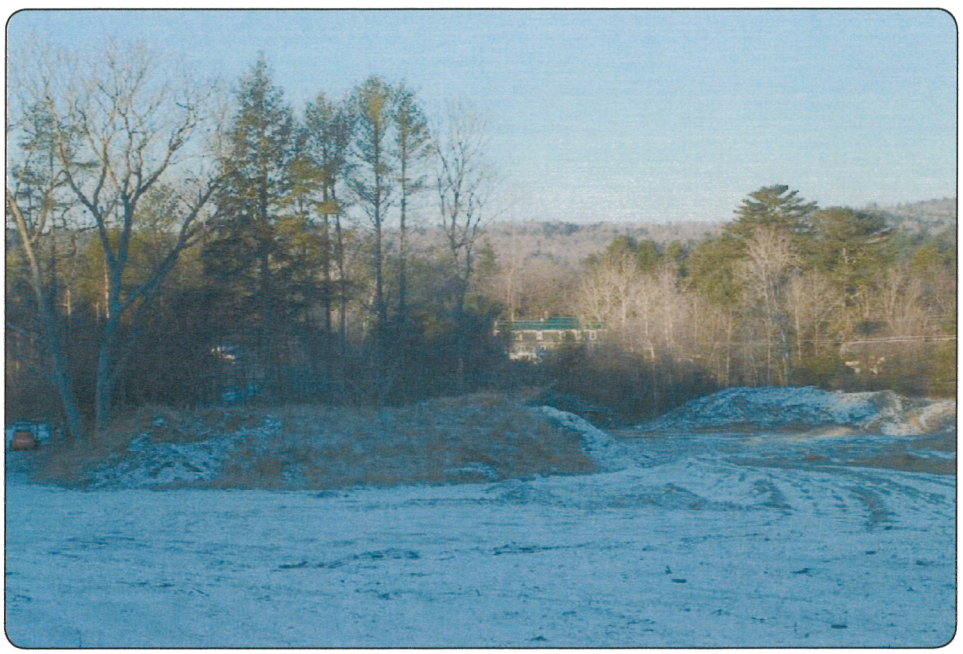
VIEWPOINT 01:



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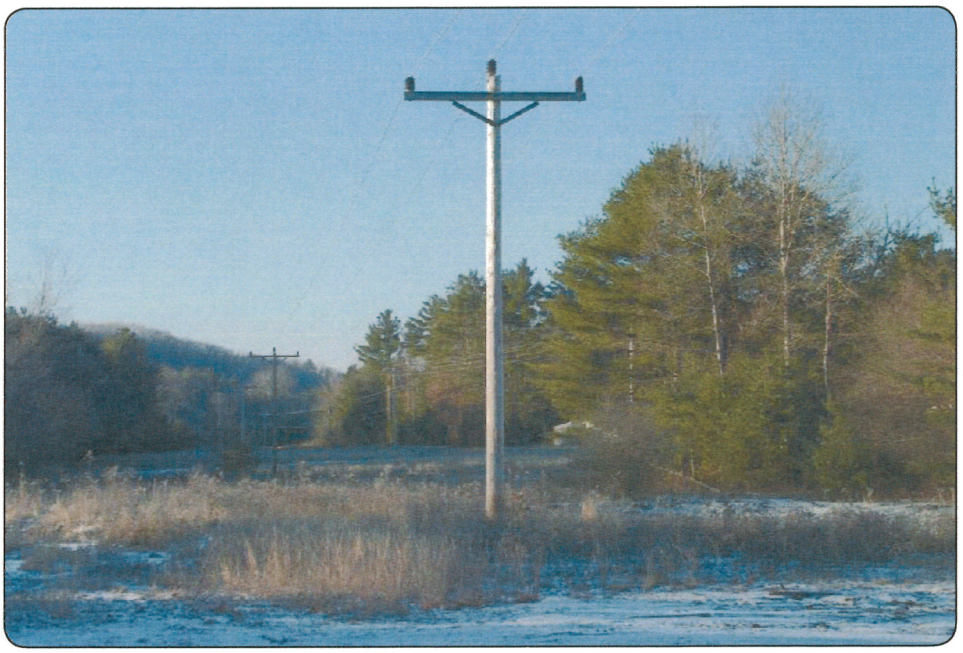

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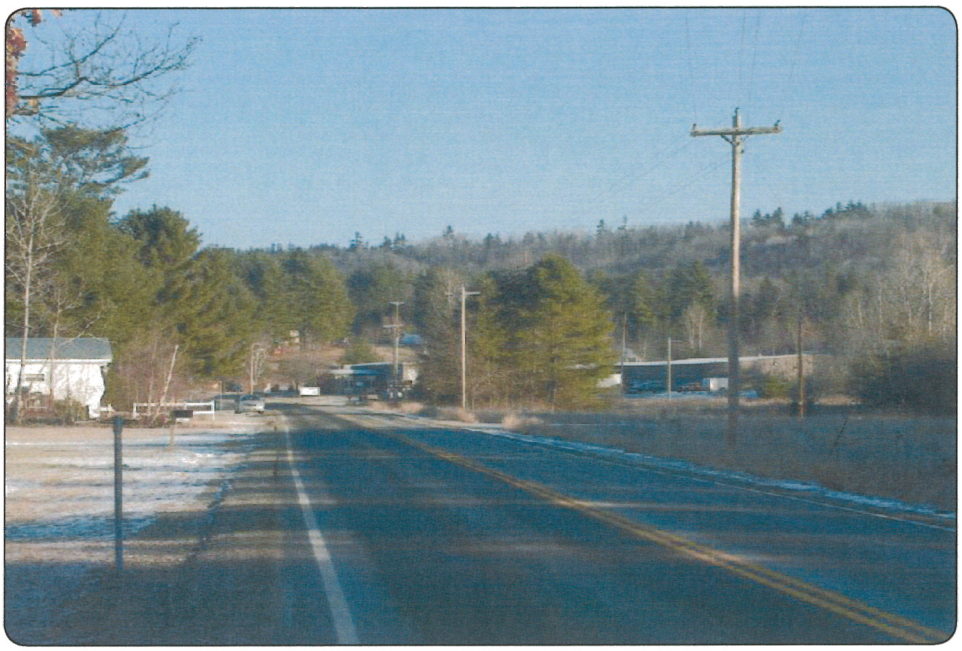

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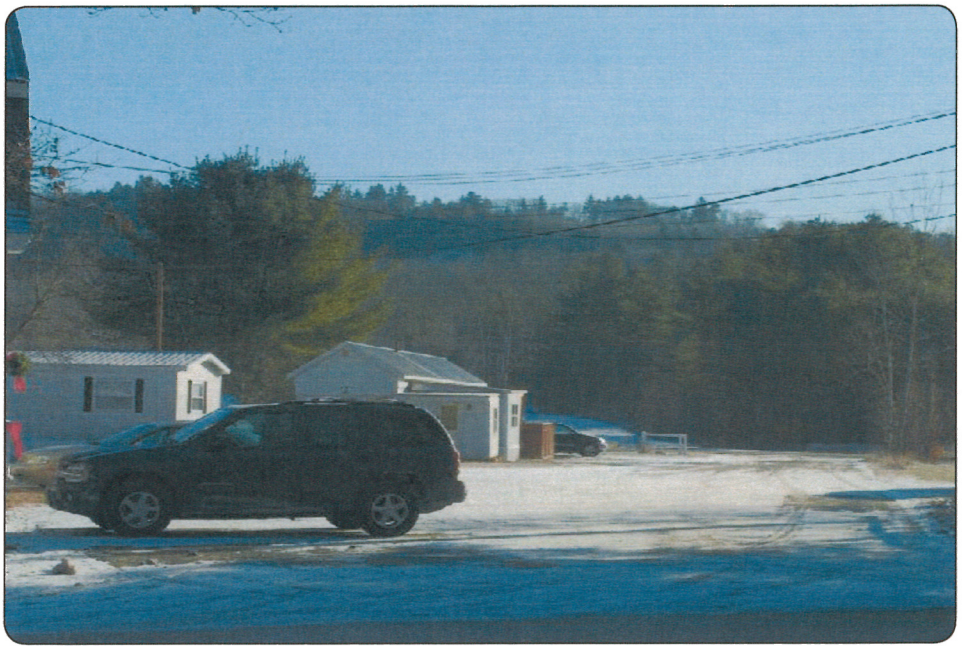

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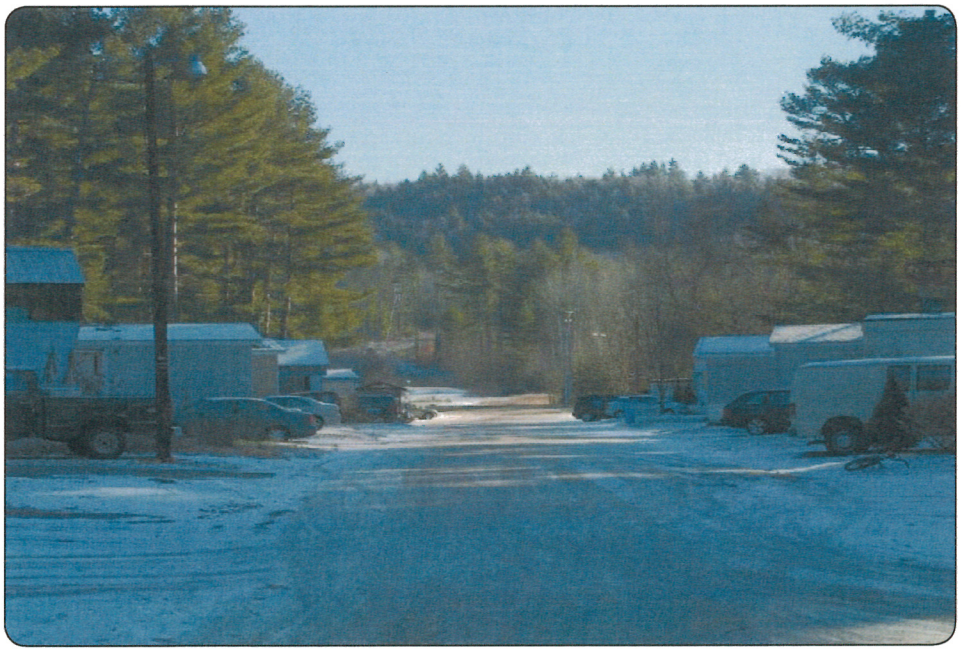

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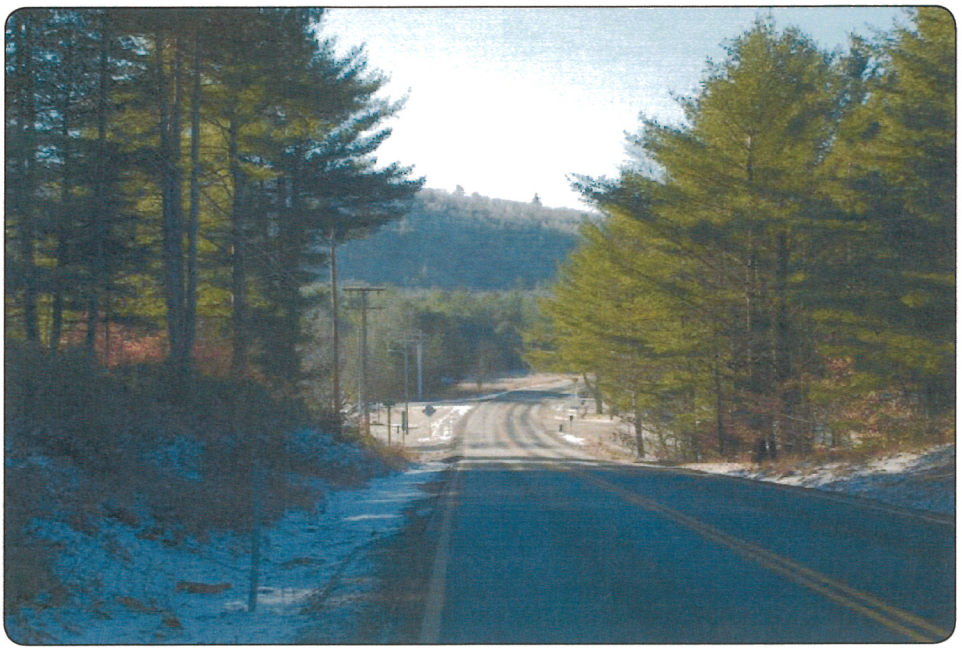

VIEWPOINT 11:

VIEWPOINT 12:

VIEWPOINT 13:

VIEWPOINT 14:

VIEWPOINT 15:

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