Supplemental Environmental Impact Statement

MARBLE RIVER WIND FARM
CLINTON AND ELLENBURG, NEW YORK

CO-LEAD AGENCIES
TOWN OF CLINTON & TOWN OF ELLENBURG

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Co-Lead Agencies
Town of Clinton
Town of Ellenburg

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1.0 INTRODUCTION

Marble River, LLC (the Applicant) has prepared this Supplemental Draft Environmental Impact Statement (SDEIS) for a proposed action known as the Marble River Wind Farm (the Project). The Project as originally proposed was described, and its impacts evaluated, in the Draft Environmental Impact Statement (DEIS) accepted by the Town of Clinton and Town of Ellenburg, April 6, 2006. Since completion of the DEIS, various public and agency comments have been received, the Project turbines and layout have been revised, and supplemental/revised studies and additional data collection have been conducted. This SDEIS describes the revised Project, presents the results of revised studies and supplemental data collection, and addresses certain issues raised during the public comment period on the DEIS. To minimize duplication and inconsistency, the SDEIS follows the same general format as the DEIS, and incorporates that document by reference. Only information that has changed or been added since preparation of the DEIS is addressed in this document. Where information is the same as described in the DEIS, it is so noted in the SDEIS. All references to sections, appendices and figures within this document pertain to this SDEIS unless noted otherwise. A brief summary of the modifications and supplemental information presented in this SDEIS is provided below.

Changes Between DEIS and SDEIS

1. Revised wind turbine locations

   Wind turbine locations were revised based on wind resource assessment, engineering considerations, environmental constraints, landowner preferences and on a review of the site's zoning constraints. Wind turbine locations are depicted in Figure S3, Revised Project Layout.

2. Revised allocation of wind turbines in Towns of Clinton and Ellenburg, NY

   The Applicant is proposing to develop a wind-powered electric generating facility of up to 109 turbines, each with a generating a capacity of 2.0 megawatts (MW). Eighty eight of the turbines are proposed to be located in the Town of Clinton, NY and 21 are proposed in the Town of Ellenburg, NY. This compares to the DEIS layout which proposed 89 turbines in the Town of Clinton, and 20 in the Town of Ellenburg. Wind turbine locations are depicted in Figure S3, Revised Project Layout.

3. Addition of 13 miles of overhead electrical collection system

   Power generated from the wind turbines will be transported via an underground and overhead electrical collection system. The overhead collection system is comprised of 13 miles of poles and line that run from the northeastern segment of the Project site to the substation. At the Project substation, the electrical power from the entire plant will run through a step-up transformer and be converted to 230 kV for interconnection with the existing NYPA transmission line. The overhead electrical collection system is depicted in Figure S3, Revised Project Layout.

4. The Project will utilize Gamesa Eólica G87 wind turbines

   Gamesa Eólica G87 wind turbines have been selected for use in the proposed Project. The change in wind turbine model is desirable from a visual impact perspective because the G87 tower height is shorter than the previously proposed G90 model, while still having a 2 MW per turbine generating capacity. In fact, the lower tower height of the G87 model will enable the Project to be in full compliance with local height restrictions in the Towns of Clinton and Ellenburg, NY. Turbine dimensions are depicted in Appendix A.

5. Revised underground electrical collection line configuration

   The location of underground collection cables was changed in order to maintain connectivity with revised turbine locations. The underground electrical collection system is depicted in Figure S3, Revised Project Layout.

6. Revised access road configuration

   Access road design was modified to facilitate the construction and maintenance of the revised wind turbine locations and the overhead electrical collection system. In addition, access roads were modified to minimize or avoid potential impacts to wetlands and cultural resources. Access roads are depicted in Figure S3, Revised Project Layout.

7. Removal of crane paths

   All crane paths have been removed from the current Project layout. All crane activity will be confined to the access roads. As such, the Crane Path figure has been removed (DEIS, Appendix A).

8. Revised substation location

   The substation location is now situated approximately 325 feet to the east of Patnode Road along the Town of Ellenburg/Clinton town line, adjacent to the existing New York Power Authority (NYPA) 230 kV electric transmission line. A collector and step-up substation, approximately 136 by 173 feet in area, will be built to the north east of the Point of Interconnect (POI) switchyard and will serve as the connection point for the underground and overhead 34.5 kV collection feeders. The substation is depicted in Figure S3 and Appendix A.

9. Addition of 3 permanent meteorological towers

   There are seven temporary meteorological towers with guy wires currently on the site that will be removed when Project construction is complete. Three permanent meteorological towers will be installed at locations, yet to be determined, on the western perimeter of the project site.

10. Supplemental visual impact assessment (SVIA) and shadow flicker study

    A SVIA and shadow flicker study were conducted in order to address potential impacts on historic sites, address agency concerns, and evaluate the potential impacts of the overhead electrical collection system, and modified wind turbine and substation locations. The SVIA and shadow flicker study may be referenced in Appendix K.

11. Revised noise modeling study

Additional noise modeling and analysis was performed in order to characterize the impacts of the modified wind turbine and substation locations. The updated noise modeling results may be referenced in Appendix L.

12. Revised wetlands delineation report

    Additional activities were undertaken to complete a US Army Corps of Engineers (USACE)/New York State Department of Environmental Conservation (NYSDEC) Joint Application for Permit based on the current Project layout. These activities included avoidance and minimization of impacts through Project design and layout modifications, delineation and documentation of existing wetlands resources, an assessment of wetlands functions and values, calculation of proposed impacts and development of a wetland mitigation plan. The revised wetland delineation report may be referenced in Appendix E.

13. Revised material and equipment delivery route assessment

    Additional transportation studies were conducted in order to determine the most effective transportation routes based on the revised turbine locations. The revised material and equipment delivery route may be referenced in Appendix H.

14. Additional cultural resources studies

    A Phase IB archeological survey was conducted in accordance with the New York State Historic Preservation Office Guidelines for Wind Farm Development Cultural Resources Survey Work (the SHPO Guidelines) to evaluate the potential effects of the Project. A historical architectural resources survey was also conducted to identify and document historically significant structures that may be located in the Project viewshed within five miles of the limits of the Project site. The additional cultural resource studies may be referenced in Appendix J.

15. Additional rare plant assessment report

    To determine what listed plant species or their habitat are present or are likely to be present in the Project site, a rare plant study was initiated and its first phase was completed. Field work to supplement and confirm the findings of the first phase will be completed by the fall of 2007. The rare plant assessment report may be referenced in Appendix F.

16. Additional avian and bat impact data

    Additional avian and bat data have been included to provide a comprehensive analysis of Project impacts and may be referenced in Section 3.3.

17. Construction of Project in 2 Phases

    The Applicant plans on constructing the Project in 2 phases with approximately 2/3 of the facilities constructed in 2008 upon receiving all necessary permits and the remaining facilities constructed in 2009. A revised construction milestone schedule may be referenced in Appendix A.

1.1 Project Description

Marble River, LLC (the Applicant) is proposing to develop a wind-powered electric generating facility of up to 109 turbines. The Project will utilize Gamesa Eólica G87 wind turbines which have a generating a capacity of approximately 2 megawatts (MW). The proposed Project is located in the Towns of Clinton and Ellenburg in Clinton County, New York. Eighty eight of the turbines are proposed to be located in the Town of Clinton and 21 in the Town of Ellenburg. In addition to the wind turbines, the Project will involve construction of approximately 48 miles of gravel access roads, approximately 55 miles of underground electric collection cable, approximately 13.6 miles of overhead collection line right of way, 3 permanent meteorological towers, an Operation and Maintenance (O&M) building, a collector and step-up substation, and a new POI switchyard to the north of Star Road at the Town of Ellenburg/Clinton town line adjacent to the existing NYPA 230 kV electric transmission line.

The Project will be developed on leased private land. Construction is scheduled to start in Spring 2008 and be completed by December 2009. Land clearing may start earlier, after all required permits and approvals are received, in order to commence road construction as early as possible after the 2008 spring thaw. Initial soil investigation to support the civil design is already underway and will be completed in 2007. A more comprehensive soil investigation program will be completed by the contractor in 2008.

Once built, the wind turbines and associated components operate in almost completely automated fashion. Approximately 20 on-site personnel will be required to operate and maintain the Project. Under normal conditions, wind turbines operate automatically at varying speeds up to 19 rpm.

1.2 Project Applicant

Marble River, LLC is the Applicant for the Project. The Project name is the Marble River Wind Farm. The Project's mailing address is:

Marble River, LLC
3 Columbia Place
Albany, New York 12207
(518) 426-1650

1.3 Summary of Project Purpose and Need

The purpose, need and benefit of the proposed action is as described in the DEIS.

1.4 Summary of Proposed Alternative

The Applicant is proposing a wind-powered electric generating Project in the Towns of Clinton and Ellenburg in Clinton County, New York. The Project will occur on approximately 18,520 acres of leased land located off of State Routes 11, 189, and 190, Gagnier Road, Clinton Mills Road, Campbell Road, Patnode Road, Lagree Road, Looby Road, Whalen Road, Merchia Road, Robare Pond Road, Liberty Pole Road, Soucia Road, Rogers Road, Number 5 Road, and Moore Road. The land is primarily forested and agricultural, but also includes significant wetland acreage. Farms and rural residences occur along the public roads within the Project site.

The Project will include up to 109 turbines, of which 88 are located in the Town of Clinton and 21 in the Town of Ellenburg. Each wind turbine will include a 87-meter (285-foot) diameter, three-bladed rotor mounted on a 78-meter (256-foot) tall steel pole tower [total maximum height not to exceed 122 meters (399 feet)]. Other Project components include approximately 48 miles of gravel access roads; approximately 55 miles of underground electric line; approximately 13.6 miles of overhead collection line right of way; 3 permanent meteorological towers; an O&M building; a collector and step-up substation; and a new POI switchyard to the north of Star Road at the Town of Ellenburg/Clinton town line adjacent to the existing NYPA 230 kV electric transmission line.

1.5 Summary of Environmental Effects

The summary of environmental effects is as described in the DEIS.

1.6 Summary of Alternatives Analysis

Alternatives to the Project as originally proposed were considered and evaluated in the DEIS. Alternatives to the currently proposed Project are discussed with additional detail regarding electrical collection system alternatives. Alternative routes that would reduce Project visibility or the extent of forest clearing were either not considered acceptable by participating landowners or would result in more significant wetland impacts. Placing the overhead collection line partially or fully underground was determined to be infeasible due to engineering constraints and excessive impact.

In regard to turbine selection, a 78 meter tower with an 87 meter-diameter rotor, as currently proposed, will ensure that the Project is in compliance with local height ordinances while still maximizing the generation potential of the site, thereby utilizing the fewest turbines possible to achieve the desired generating capacity.

1.7 List of Required Permits and Approvals – Proposed Alternative

The list of required permits and approvals – proposed alternative is as described in the DEIS with the following exceptions:

- Based on new Project layout and component specifications, no height or turbine setback distance waivers will be necessary from the Town of Clinton, NY.
- Based on new Project layout and component specifications, no height or turbine setback distance waivers will be necessary from the Town of Ellenburg, NY.

2.0 DESCRIPTION OF PROPOSED ACTION

This SDEIS is for a proposed action known as the Marble River Wind Farm. The proposed Project is described below in terms of the purpose, need and benefit, Project location, and layout. Construction, operation maintenance, and decommissioning are also described and a list of regulatory approvals provided.

2.1 Introduction

The Applicant is proposing to develop a wind-powered electric generating facility of up to 109 turbines each with a generating capacity of approximately 2 MW. The proposed Project is located in the Towns of Clinton and Ellenburg in Clinton County, New York. Eighty eight of the turbines are proposed to be located in the Town of Clinton and 21 in the Town of Ellenburg. The location of the Project's main electrical collector and step-up sub-station and POI switchyard is approximately one mile north of Star Road on the northern side of the Willis-Plattsburgh NYPA Transmission Line in the Town of Clinton. The wind turbines proposed are the G87 model manufactured by Gamesa Eólica (or equivalent machines). Each turbine consists of a 78-meter (256-foot) tall tubular steel tower; a 87-meter (285-foot) diameter rotor consisting of three 42.5-meter (139-foot) long composite blades; and a nacelle which houses the generator, gearbox, and power train. Each turbine has a maximum height of 121.5 meters (399 feet) with a rotor blade oriented straight up. A transformer located in the rear of each nacelle raises the voltage of the electricity produced by the turbine generator from 690 volts to 34.5 kV, which is the voltage level of the collection system. The tubular towers used for this Project are conical steel structures manufactured in multiple sections. The towers have a base diameter of approximately 15 feet and a top diameter of approximately 8 feet. Each tower will have an access door and an internal safety ladder to access the nacelle, and will be painted white per Federal Aviation Administration (FAA) requirements.

In addition to the wind turbines, the Project will involve construction of approximately 48 miles of gravel access roads, approximately 55 miles of underground electric collection cable, approximately 13.6 miles of overhead collection line right of way; 3 permanent meteorological towers; an O&M building; a collector and step-up substation; and a new POI switchyard located east of Patnode Road at the Town of Ellenburg/Clinton town line adjacent to the existing New York Power Authority (NYPA) 230 kV electric transmission line. The Project will be developed on leased private land. Construction is scheduled to start in Spring 2008 and be completed by the end of 2009. Land clearing may start earlier, after all required permits and approvals are received, in order to commence road construction as early as possible after the 2008 spring thaw. Initial soil investigation to support the civil design is underway and will be completed in 2007. A more comprehensive soil investigation program will be completed by the contractor in 2008; see section 2.6 for more construction details.

Once built, the wind turbines and associated components operate in almost completely automated fashion. Approximately 20 on-site personnel are required to operate and maintain the Project. Under normal conditions, wind turbines operate automatically at varying speeds up to 19 rpm.

2.2 Purpose and Scope of Environmental Impact Statement

Purpose and scope of environmental impact statement is as described in the DEIS.

2.3 Project Purpose, Public Need and Benefits

Project purpose, public need and benefits are as described in the DEIS.

2.4 Project Description and Location

The Project will be located in the Towns of Clinton and Ellenburg, Clinton County, New York. The regional location of the Project is depicted in Figure S1, Revised Project Area. The Project site is located on the Churubusco plateau generally around the northern and western regions of the Town of Clinton and the northwestern region of the Town of Ellenburg. The southern boundary of the Project site runs east to west one mile north of the village of Ellenburg Center in Ellenburg, NY. The northern boundary of the Project site runs east to west approximately one-half mile south of the Canadian border. The Project site extends from the Chateugay River to the west, to the Chazy River to the southeast. The bulk of the site (approximately 80 percent) occurs in the township of Clinton. The smaller portion (approximately 20 percent) occurs in the northwestern portion of the township of Ellenburg, north of the boundary that delineates the northern edge of the Adirondack Park. The site is located on a plateau with limited relief in topography. Site elevations range from 800 feet above mean sea level in the northern portion to 1,640 feet above mean sea level in the southern portion of the site. Brandy Brook, Crystal Creek, and the English River drain the eastern portion of the site. Tributaries to the Great Chazy River drain the southern portion of the site and Hinchinbrook, Dry Brook and the Marble River drain the western portion of the site.

Highways that bisect the Project site include US 11 and State Highways 189 and 190. Major local roads, including Frontier, Liberty Pole, Merchia, Whalen, Looby, Lagree, Campbell, Gagnier, Brandy Brook, Sancomb, Ryan Number 5, Bohon, Clinton Mills, and Jones, and seasonal use roads, including Soucia, Robare Pond, Patnode and Jones, occur within the Project site.

Project facilities will be located on individual leased-land parcels totaling approximately 18,520 acres. A total of 109 wind turbines will be constructed on 130 parcels of leased private land, 88 of which will be located in the Town of Clinton, and 21 in the Town of Ellenburg.

Land use in the Project site is predominantly agricultural, with farms and single-family rural residences occurring along road frontage. Significant acreage in the Project site is also used for hunting and logging.

2.4.1 Project Lease/Easements Terms and Conditions

There are approximately 76 different owners of the 130 land parcels that make up the Project site (see Figure S2, Participating Landowners and Neighbors). Each landowner is familiar with the proposed Project and has consented to participate in this process. Additionally, the Applicant will assure compliance with all town setbacks prior to commencement of construction. Wind leases provide the Applicant with exclusive rights to include the landowner's property in the studies, siting, construction, and operation and maintenance of a commercial-scale wind farm. The wind lease provides the landowner with an annual monetary consideration for hosting a wind turbine, access road, collection line, O&M building, or any other associated Project component. Significant terms within the wind lease include:

1. Annual payments to the participating landowner, based on signed acreage, during the development phase prior to construction;

2. Payments during the proposed construction period; and

3. Annual payments to the landowner from sales of power.

2.5 Proposed Facility Layout and Design

The following section describes the Project boundary and layout as shown in Figure S3, Revised Project Layout and provides a description of its major components.

The Project will consist of up to 109 wind turbines, approximately 48 miles of gravel access roads, approximately 55 miles of underground electric collection cable, 13.6 miles of overhead collection line right-of-way, 3 permanent meteorological towers; an O&M building; a collector and step-up substation; and a new POI switchyard to the north of Star Road at the Town of Ellenburg/Clinton town line adjacent to the existing NYPA 230 kV electric transmission line. The turbines will have a maximum height of 399 feet from ground level to the tip of the rotor blade at the uppermost position and a maximum rotor diameter of 87 meters (285 feet). There are seven temporary meteorological towers with guy wires currently on the site that will be removed when Project construction is complete. Existing roads will be used to the extent feasible to bring equipment and material to the site (as described in Section 3.4 Transportation/Traffic); new roads will be constructed to serve as access roads from the existing road network to the turbines and switchyard.

2.5.1 Wind Turbines

The wind turbines proposed for this Project are the 2 MW G87 manufactured by Gamesa Eólica. Additional information regarding the characteristics and general operation of these turbines is included in Appendix A. Each wind turbine consists of three major components, the tower, the nacelle, and the rotor. The height of the tower, or "hub height" (distance from foundation to top of tower) is approximately 78 meters (256 feet). The nacelle sits atop the tower, and the rotor is attached to the generator drive shaft located within the nacelle. The total turbine height (i.e., distance from the highest blade tip position to the ground) is 399 feet and the entire turbine weighs roughly 303 metric tons. Descriptions of each of the turbine components are provided below.

Tower: The tower is as described in the DEIS.

Nacelle: Nacelle is as described in DEIS.

Rotor Assembly: Rotor assembly is as described in DEIS.

2.5.2 Turbine Spacing

Turbine spacing is as described in DEIS.

Wind resource assessment: Wind resource assessment is as described in the DEIS.

Sufficient spacing: Sufficient spacing is as described in the DEIS.

Distance from residences: Distance from residences is as described in the DEIS.

Distance from non-participating land parcels: Distance from non-participating land parcels is as described in the DEIS.

Distance from roads: Distance from roads is as described in the DEIS.

Wetland Avoidance: Special consideration was given to siting Project facilities to avoid any wetlands within the Project site. A desktop analysis of the US Fish and Wildlife National Wetland Inventory Maps and NYSDEC Freshwater Wetlands Maps were reviewed and used to avoid and minimize any impacts associated with the Project layout. A more detailed discussion of the wetland features in the Project site is included in Section 3.2, Water Resources.

Environmental and Cultural Resources: Special consideration was given to siting Project facilities to avoid environmental and cultural resource impacts to the greatest extent possible. For a more detailed discussion of avoidance of environmental and cultural resources, refer to Section 3, Environmental Setting Impact Analysis and Mitigation Measures

Agricultural Protection Measures: During the siting process, agricultural protection measures developed by the New York State Department of Agriculture and Markets (NYSDAM) were used to the greatest extent practicable to minimize impacts agricultural fields. A representative of NYSDAM has toured the proposed project site and was consulted regarding the proposed layout. Structures and access roads were sited along field edges or existing farm lanes where possible to avoid dividing larger fields into smaller fields. To the extent possible, access roads that cross agricultural fields were sited along ridge tops to eliminate or reduce the need for cut and fill and to reduce changes in drainage patterns. Existing erosion control structures such as diversions, ditches, and tile lines have been avoided where possible. For a more detailed discussion of the Project's compatibility with agriculture, refer to Section 3.5, Land Use and Zoning.

Visual impacts: Special consideration was given to siting all turbines in order to minimize the potential visual impact on neighborhood landowners and residents. For more detailed discussion of the visual impact assessment, please refer to Section 3.8, Visual Resources.

2.5.3 Access Roads

Road access to the Project site is currently provided by a number of existing public roads, as described in Section 3.4, Transportation/Traffic. The Project road design has been prepared to minimize the footprint of overall disturbance. The Project site currently has an extensive network of existing state, county, and local roads and, wherever it is practical, existing roads will be utilized to minimize new ground disturbances. It is estimated that one existing public road will be improved during the process of Project construction. In addition to public roads, the Project will utilize existing and new private roads to access the turbines and other project components. The proposed design minimizes the construction of new private roads throughout the Project area. The proposed access road system is shown in Figures S3, Revised Project Layout. The Applicant will be responsible for all maintenance of any new private roads.

2.5.4 Underground and Overhead Electrical Collection System

Power from the wind turbines will likely be generated at 690 volts and fed to a step-up transformer located at the Project substation which will increase the voltage to 34.5 kV. The power will be transported through underground and overhead cables. The underground collection cables will be installed at a depth of 36 inches or greater below the ground surface. The underground collection lines will connect either directly to the Project substation or they will run to an overhead collection line that will then connect to the Project substation.

The overhead collection line is approximately 13.6 miles in length and travels from the northeast portion of the Project site to the Project substation. This overhead line will operate at a maximum voltage of 34.5 kV. A second overhead line will be located within the same right-of-way (ROW) for approximately half its distance and terminate at the same Project substation. At the Project substation, the electrical power from the entire wind farm will pass through a step-up transformer and be converted to 230 kV before entering the POI substation and connecting to the existing NYPA 230 kV transmission line.

The proposed overhead collection system consists of 4 circuit segments of 34.5 kV line and poles with a total system corridor length of up to 13.6 miles. The primary overhead circuit (segment 1) consists of approximately 9.0 miles of double circuit 954 kcm (thousand circular mils) aluminum covered steel reinforced (ACSR) conductor carried on wood poles with cross arms from riser structures connecting the underground collector system at the north end of Soucia Road to the Project substation adjacent to Patnode Road. In addition, there are 2 alternate circuit segments designated in the northern portion of the site identified as segment 2 and segment 3. Segment 2 is approximately 1.2 miles long and travels from near the proposed location of wind turbine generator (WTG) 155 south to the northern end of Soucia Road. Segment 3 is approximately 3.4 miles in length and travels from near the proposed location of WTG 120 south along Wilkins Road to Clinton Mills and then southeast along the remnant railroad berm until it joins with the primary overhead circuit. These 2 segments are proposed to replace a portion of the underground collection system in that area. Both northerly segments would be a combination of single and double circuit 34.5 kV wood pole cross arm construction. The fourth segment of overhead collection line circuit (segment 4) will start adjacent to the O&M building east of State Route 189 and runs parallel to the primary circuit approximately 3 miles to the Project substation. This segment will also be a combination of both single and double circuit wood pole construction.

2.5.5 Substation and Interconnection Facilities

The interconnection facilities consist of a combined collector and step-up substation and a POI switchyard. These components function to step up the voltage, switch and meter the electricity delivered, and to protect the system (the wind turbines, the collection lines, and the transmission grid) so that the electricity can be reliably interconnected to the Willis-Plattsburg 230 kV transmission line owned by the NYPA.

The main elements of the collector and step-up sub-station are a control house, a power transformer, outdoor medium-voltage and high-voltage breakers, relaying and protection equipment, high-voltage bus work, steel support structures, overhead lightning suppression conductors, and a sub-surface grounding grid.

The main elements of the POI switchyard are a control house, utility-quality metering, outdoor high-voltage breakers, relaying equipment, 230 kV bus work, dead-end steel support structures, overhead lightning suppression conductors, and a sub-surface grounding grid.

All structural elements will be installed on concrete foundations. Each station consists of a graveled footprint area, a chain link perimeter fence, and an outdoor lighting system. Appendix A provides a schematic depicting the proposed Project substation facility layout. The design of the collector and step-up substation and the POI switchyard and attachment facilities to the 230 kV line will be finalized based on a facility study conducted by the NYPA and the New York Independent System Operator (NYISO) in accordance with the Federal Energy Regulatory Authority Tariff.

2.5.6 Operations and Maintenance Facility

The Applicant will construct an O&M facility to house operations and maintenance personnel, the Supervisory Control and Data Acquisition (SCADA) system, and all required tools and equipment. The facility will be located at 148 State Route 189 in the Town of Clinton on a 433 acre parcel that is controlled by the project sponsor. It is anticipated that the O&M facility will have a total of eight acres of permanent impact comprised of an access road, outdoor parking, an outdoor storage area and a building housing offices and garages for vehicles. Final designs for the facility are not yet complete, but the Applicant will design the building in a style that compliments the local or regional architecture.

2.6 Construction

Construction is as described in the DEIS, with the exception that Project construction is expected to occur in two phases over an approximate two-year period from the time of permit approval to commercial operation of Phase II, and will require the involvement of more than 250 personnel. Phase I construction of approximately 2/3 of the project facilities is planned for 2008 and Phase II construction of the remaining facilities is planned for 2009. The period of time of intensive construction activities from the beginning of access road construction to plant energization is typically six to nine months for each phase. It is worth noting that several of the milestone time durations listed below overlap. Attached in Appendix A is a level-one milestone construction schedule for the Project. The proposed Project construction schedule summary showing the major tasks and key milestones is included in Table 2.6-1 below, as well as the number of estimated on-site personnel to perform each of the key tasks.

Table 2.6-1: Major Construction Tasks and Manpower Requirements

	Task/Milestone	Duration (Weeks)	Approximate On-Site Manpower for Task
1	Engineering/Design/Specifications/Surveys	14	18
2	Order/Fabricate/Start Delivery of Turbines	26	0
3	Order/Fabricate/ Deliver Substation Transformer	30	0
4	Road Construction	23	30
5	Foundation Construction	23	60
6	Electrical Collection System Construction	23	40
7	Substation Construction	16	20
8	Wind Turbine Assembly and Erection	13	40
9	Plant Energizing and Commissioning	9	30
10	Substantial Plant Completion	0.5	0
11	Construction Punchlist Clean-Up	4.5	15
Total			**253**

The following construction procedures will be followed for the design and installation of the various Project facilities.

2.6.1 Engineering, Surveying, and Geotechnical Investigation

Engineering, surveying, and geotechnical investigation is as described in the DEIS, with the exception that trial test pits are also excavated using a back hoe and are generally one foot to 10 feet deep.

2.6.2 Design and Construction Specifications

Design and construction specifications is as described in the DEIS.

2.6.3 Access Road Installation

The Project will include approximately 48 miles of gravel access road construction. Wherever possible, existing roads and farm drives will be upgraded for use as Project access roads in order to minimize impacts to both active agricultural areas and wetland/stream areas. Where an existing road or farm drive is unavailable or unsuitable, new gravel-surfaced access roads will be constructed. Road construction will typically involve topsoil stripping and grubbing of stumps, as necessary. Stripped topsoil will be stockpiled along the road corridor for use in site restoration, so as to assure that the topsoil is not mixed unnecessarily with sub-soil or gravel. This practice has been developed to assure that the topsoil, when replaced, retains its unique characteristics. This procedure was developed during the construction of past wind projects in New York State and sanctioned as best practice by the New York State Department of Agriculture & Markets (NYSDA&M).

All access roads will be constructed to a width of between 16 to 34 feet. Associated disturbance to, or clearing of, vegetation could occur within a 75-foot wide corridor along the centerline of the proposed access roads. Any grubbed stumps or cleared trees will be chipped and properly spread on-site or hauled off site for disposal or further processing. Following removal of topsoil, subsoil will be graded, compacted, and surfaced with a minimum of 4 inches of gravel or crushed stone in accordance with the requirements of the wind turbine supplier and recommendations from the geotechnical engineer based upon the soil investigation (please see access road specifications in DEIS Appendix A). As required by design specifications, geotextile fabric or grid will be installed beneath the road surface to provide additional support. The typical access road will be 16 feet in width in active agricultural areas, with wider cross-sections at turning radii and for occasional wider pull-offs on narrow roads to accommodate passing vehicles. For purposes of the SDEIS, it is assumed that the permanent road width will be 34 feet in areas that are not active agricultural land (i.e. pre-existing logging roads, forest land, etc.) Appropriately sized culverts will be placed in any wetland/stream crossings in accordance with state and federal permit requirements. In other locations, culverts may also be used to assure that the roads do not impede cross drainage. Where access roads are adjacent to, or cross, wetlands, streams or drainage ditches/swales, appropriate sediment and erosion control measures (e.g., silt fence) will be installed.

Project road construction will involve the use of several pieces of heavy machinery, including bulldozers, track-hoe excavators, front end loaders, dump trucks, motor graders, water trucks, and rollers for compaction.

2.6.4 Foundation Construction

Foundation construction is as described in the DEIS.

2.6.5 Buried Cable Installation

Buried cable installation is as described in the DEIS with the exception that direct burial methods may result in clearing an area up to 35 feet wide centered on the cable path of tall-growing woody vegetation for equipment access and stockpiled brush.

2.6.6 Overhead Collection Line Installation

The majority of the overhead collection line will consist of wood poles with cross arm construction, and will be installed in augured holes utilizing typical truck mounted drilling equipment. Typical transmission pole models are depicted in Appendix A. At angle points the poles will be supported by guy wires and anchors. In certain locations the use of self supporting laminated wood or steel pole structures will be utilized. Laminated wood poles will be installed in augured holes similar to the standard wood pole construction. Self supporting steel poles will require concrete foundations; either caisson type or spread footing type. Large truck mounted drilling equipment or track mounted backhoes will be required for the foundation excavations. Conductor set up sites will be required in various locations. The conductor will be delivered on steel reels containing approximately 10,000 feet each allowing for a maximum pull distance of approximately 20,000 feet. There will be a fiber optic cable installed on the over head line which will be delivered on reels containing approximately 21,000 feet each. The fiber optic cable will require a splice box to be installed at each pulling location.

An access road will be constructed along the length of the overhead line to facilitate installation and maintenance of the line. In wetland locations a gravel pad will be required around each pole for access of equipment along with spur lines from the access road to the structure pads. The laydown yard will be utilized as a storage area and central point of operations for the overhead line work. Poles and structure material will be delivered to each pole site utilizing flat bed trailers and the established access roads. Structures will be framed on the ground at each location and set in the augured holes. Tag lines will be installed on each structure at time of set to facilitate pulling of conductor. After pulling sites have been established a cable reel trailer will be set up on one end of the pull section and pulling equipment will be set up at the other end. A rope line will be strung through each structure utilizing the tag lines previously installed at each pole and attached to the puller/tensioner. The hard line will then be pulled back through each structure to connect to the conductor and the conductor will then be pulled back through each structure. Temporary wood pole crossing structures or aerial equipment will be utilized at all road crossings during the pulling operation to protect traffic. After the conductor is pulled up to the design criteria the conductor will be clipped in at all structures utilizing truck mounted aerial equipment. The final step in the process will be removal of temporary structures and site restoration.

2.6.7 Wind Turbine Assembly and Erection

Wind turbine assembly and erection is as described in the DEIS.

2.6.8 Collector and Step-Up Substation/POI switchyard /Interconnection Facilities

A collector and step-up substation will be built to the north east of the POI switchyard, approximately 136 by 173 feet, to be the connection point for the underground 34.5 kV collection feeders. There will be a control house and parking area adjacent to the substation, which will be accessed from Star Road to the southeast via a new access road. A road gate to restrict public access will be installed in accordance with guidelines from the Department of Homeland Security and the road will turn 90 degrees near the end so as not to terminate directly at the station's perimeter fence or gate. A clear space of at least 10 feet will be maintained outside the fence. The substation will be monitored by intrusion alarms.

The POI switchyard will be approximately 200 by 350 feet and will be located adjacent to the north of the NYPA 230 kV transmission line ROW. The POI switchyard will connect to the New York Bulk Power System and will be in compliance with the Northeast Power Coordinating Council regulations. A continuous ground grid will be installed to cover both station yards and extend beyond the station fence. Both yards will be covered with crushed stone for weed control and to mitigate the step and touch potentials.

2.6.9 Project Construction Management

Project construction management is as described in the DEIS.

2.6.10 Field Site Management Team

Field site management team is as described in the DEIS.

2.6.11 BOP Contractor's Construction Management Team

BOP contractor's construction management team is as described in the DEIS.

2.6.12 Wind Turbine Supplier's Construction Management Team

Wind turbine supplier's construction management team is as described in the DEIS.

2.7 Operations and Maintenance

Upon the completion of construction and commencement of operations, the Project will be operated and maintained by a team of qualified locally based personnel consisting of the staff positions outlined in Table 2.7-1.

Table 2.7-1: Estimated Permanent Operation Personnel

Position	Estimated Number of Project Personnel (218 MW)
Owner's Representative	1 to 2
Service Manager	1
Service Supervisor	1 to 2
Turbine Technicians	14 to 16
Service Administrator	1 to 2
Total	18 to 23

Operation of the wind turbines and associated components is almost completely automated. However, the Project will employ a staff of approximately 18 to 23 administrative, operations, and maintenance personnel. As described earlier, under normal conditions, the proposed wind turbines "cut in" at wind speeds of 4 meters per second (m/s) (8.9 mph) and have a normal operational speed range of 9 to 19 rpm. The turbine blades will pitch, to regulate output when wind speeds exceed approximately 11 m/s (25 mph), and will turn 90 degrees to the wind and the generator will shutdown when wind speeds surpass 25 m/s (56 mph). The turbines are equipped with two fully independent braking systems that can stop the rotor blades from either acting together or independently. The braking system is designed to be fail-safe, allowing the rotor to be brought to a halt under all foreseeable conditions. The system consists of aerodynamic braking by the rotor blades and by a separate hydraulic-disc brake system. Both braking systems operate independently, such that if there is a fault with one, the other can still bring the turbine to a halt. Each wind turbine has a computer to control critical functions, monitor wind conditions, and report data back to the SCADA system. Each of the blades pitches independently representing three independent, fail-safe speed control systems. Note that the shaft brake is not intended to stop the turbine under full load without the assistance of at least one of the blades fully pitching.

The facility is expected to be generating power about 90 percent of the time, with a net average annual capacity of approximately 29-33 percent of name plate capacity, which is competitive for commercial wind farms in New York State. Total green electricity expected to be delivered to the grid is anticipated to be approximately 550,000 megawatt hours (MWhr) per annum or the equivalent annual consumption of approximately 67,000 homes.

The O&M team will staff the Project during core operating hours eight hours per day, five days per week, with weekend shifts and extended hours as required. The Project will be monitored remotely on a 24/7 basis by a centralized, off-site operations center. In the event of turbine or plant facility outages or any other requirement, on-call local technicians are dispatched. Operating technicians typically rotate the duty of being on call for outages. The Project will always have an on-call local technician who can respond quickly in the event of any emergency notification or critical outage. Operating technicians will rotate the duty of being on call for outages. The wind turbines have been chosen in part for their high functional reliability. Each wind turbine manufacturer studies and reports on the frequency of operation problems and malfunctions that arise when the turbines are generating electricity. The data on turbine reliability is summarized by the manufacturer in the turbine's availability rating, which estimates the percentage of time that the manufacturer's turbines will function successfully. Modern turbines typically have an availability rating of 97 percent or higher. For more detailed specifications on the wind turbines under consideration for the Project, please see Appendix A. Each wind turbine will receive scheduled preventative maintenance inspections during the first year of operation and at least twice per year in subsequent years. Given the high availability rating of the turbines, the Applicant estimates that once operational, individual wind turbines will require maintenance and repair calls an average of three to six times per year in addition to their scheduled inspections. Routine turbine maintenance and repair usually involves a two-person maintenance crew working eight-hour shifts for two days, for a total of 32 man-hours of repair. In certain circumstances, heavy maintenance equipment such as a lifting crane may need to be brought into the site to effectively repair any exposed turbine problems (such as, in rare instances, main component replacement).

A post-construction monitoring, O&M plan will be prepared prior to commencement of continuous operations. The goal of this plan is to set out guidelines to ensure that the Applicant monitors and maintains "best practices" to comply with local, state, and federal permits. The Project applicant has a proven operating track record in commercial-scale wind farms. The applicant's expertise and experience in operating commercial-scale wind farms should be considered as assurance that Project maintenance and repair work is completed as quickly and with as little impact to the surrounding community and landowners as possible.

2.8 Decommissioning

Decommissioning is as described in the DEIS.

2.8.1 Decommissioning Economics and Financial Surety

Decommissioning economics and financial surety is as described in DEIS.

2.9 Regulatory Approvals

Regulatory approvals are as listed in Table 2.9-1 in DEIS with the exception that based on current Project designs no turbine height waivers and no set back distance waivers are required from the Town of Clinton or the Town of Ellenburg.

2.10 Public and Agency Involvement

Public agency and involvement is as described in the DEIS.

3.0 ENVIRONMENTAL SETTING IMPACT ANALYSIS AND MITIGATION MEASURES

3.1 Physiography, Geology, and Soils

3.1.1 Existing Conditions

Information regarding the existing conditions of physiography, and geology is as described in the DEIS.

3.1.1.1 Physiography

Physiography is as described in the DEIS.

3.1.1.2 Bedrock Geology

Bedrock geology is as described in the DEIS.

3.1.1.3 Surficial Geology

Surficial geology is as described in the DEIS.

3.1.1.4 Soils

Soils are as described in the DEIS.

3.1.1.5 Unusual Landforms or Geologic Formations

Unusual landforms or geologic formation is as described in the DEIS.

3.1.2 Potential Impacts

As with the original Project layout described in the DEIS, Project components have been sited to avoid or minimize either temporary or permanent impacts to physiography, geology and soils. As stated in the DEIS, the Project will have no effect on area physiography, due to its dispersed layout and the return of surface topography generally to pre-existing grade following construction. Potential short-term, long-term, and cumulative impacts to soils and geology are described below.

The primary impact to the physical features of the Project site will be the disturbance of soils during installation of turbine foundations, underground 34.5 kV cable, overhead 34.5 kV collector line, and access roads. Based on the current Project design, potential soil impacts resulting from these activities could total approximately 845 acres. This compares to a total of 723 acres of soil disturbance for the original Project, as reported in the DEIS. The increase in soil impacts between the DEIS and SDEIS is due to changes in the Project layout, specifically the addition of the overhead electrical line and access road modifications.

As described in the DEIS, the actual impact of this work will be significantly less than these calculations indicate, due to the fact that proposed roads utilize existing farm lanes to access turbines sites, to the extent possible. Construction of the project will result in temporary and permanent disturbance of soils at the turbine footprint and gravel crane pad, access roads, staging and laydown areas, permanent meteorological towers, the O&M facility, storage area, substation and overhead collection line. Construction of the underground collection line will result in no permanent soil disturbance. As stated previously, crane paths have been removed from the current layout and crane transportation will be confined to access roads.

As indicated in the Transportation Assessment Report included as Appendix H, delivery of turbine components along proposed construction routes will require some level of improvement to 13 public road intersections and 7 culverts. These improvements would typically involve minor gravel widening, side slope re-grading, and resetting of guard rails, utility poles and signs. On any agricultural lands affected by these improvements, topsoil will be stripped and stockpiled in accordance with New York State Department of Agriculture and Markets (NYSA&M) Agricultural Protection Guidelines (see DEIS Appendix D). These improvements will result in no more than an additional 5 acres of Project-related soil disturbance. Soil disturbance from all anticipated construction activities will total approximately 845 acres. Of this total, approximately 167 acres will be converted to built facilities (roads, crane pads, structures), while the remaining disturbed areas will be restored and stabilized following completion of construction.

Impacts to hydric soils along the overhead collection line route will be minimized by spanning most areas of wetlands.

3.1.2.1 Potential Short-Term Impacts

Soils: Approximately 845 acres of surface soils will be disturbed during Project construction. Approximately 80 percent of this surface area (678 acres) will be stabilized, revegetated, and restored following construction. These impacts are based on actual Project designs provided by the Project civil engineers (URS).

Potential short-term impacts to soils due to Project construction include soil erosion, compaction, changes to soil drainage patterns through grading, mixing of agricultural topsoils and subsoils, siltation and sedimentation of downgradient wetlands and water bodies, and the potential release of oil or hazardous materials by heavy equipment.

Bedrock: Bedrock is as described in the DEIS.

Potential Releases of Oil and Hazardous Materials: Potential releases of oil and hazardous materials is as described in the DEIS.

3.1.2.2 Potential Long-Term Construction

Project long-term construction is as described in the DEIS with the exception that based on current Project design, approximately 167 acres of land surface will be permanently occupied by Project structures

3.1.3 Proposed Mitigation

Proposed measures to avoid, minimize, and mitigate impacts to topography and soils are as described in the DEIS. Additional measures and details include the following:

- Unless requested to do otherwise by the highway department having jurisdiction, all temporary widenings of public road intersections will be restored to their preconstruction condition. This will involve removal of gravel fill, reestablishment of preconstruction contours, and stabilization by seeding and mulching. Any agricultural areas affected by such activity will be restored in accordance with NYSA&M Guidelines.

- Erosion and sedimentation impacts during construction will be minimized by the implementation of an erosion and sedimentation control plan. Approximately 678 acres of temporarily disturbed soils will be restored following construction, including approximately 219 acres of agricultural land. As stated in the DEIS, mitigation measures to protect and restore agricultural soils include full restoration of temporarily disturbed agricultural land in accordance with NYSA&M Guidelines (see DEIS Appendix D).

3.1.3.1 Soil Erosion and Siltation

Soil erosion and siltation is as described in the DEIS.

3.1.3.2 Soils in Agricultural Areas

Soils in agricultural areas is as described in the DEIS.

3.1.3.3 Blasting of Shallow Bedrock

Blasting of shallow bedrock is as described in the DEIS.

3.1.3.4 Management of Oil and Hazardous Materials

Management of oil and hazardous materials is as described in the DEIS.

3.2 Water Resources

3.2.1 Existing Conditions

Tetra Tech EC, Inc. (TtEC) has conducted extensive wetland surveys within the Project site, providing site-specific information regarding surface waters and wetlands. The DEIS included a March 2006 TtEC Wetland Delineation Report as DEIS Appendix E. Due to changes in the Project layout and site boundary, water resources within the Project site and the anticipated impacts to on-site wetlands and streams have changed somewhat. Additional field surveys conducted since the submittal of the DEIS have resulted in a more complete description of on-site water resources and potential impacts. This information is summarized below. Additional detail is provided in a June 2007 updated Wetland Delineation Report included as Appendix E.

3.2.1.1 Surface Waters

See discussion of existing surface waters within the Project site in Section 3.2.1.1 of the DEIS.

The on-site surface water survey undertaken by TtEC examined all areas that could potentially be impacted by the revised Project. The survey area increased from a 150 foot radius around proposed turbine sites in the DEIS to a 200 foot radius; from a 40 foot corridor for access roads in the DEIS to a 100 foot corridor; from a 3 foot corridor to a 50 foot corridor for underground collection lines, and a 200 foot corridor for the overhead collection line. The size of the proposed laydown areas have increased from 14.8 acres in the DEIS to 20.2 acres. Additionally, a 50-foot wide area was surveyed for all turnaround areas.

Within this updated survey area, TtEC identified 95 surface waterbody crossings within the revised Project site boundaries. These crossings consist of 61 streams (17 perennial and 44 intermittent), 14 stream crossings at existing culverts (2 perennial, 12 intermittent), 16 drainage ditches/swales, three ponds, and one intermittent pond outfall. The intermittent and perennial streams have depths ranging from 0.3 feet to 4.0 feet (although generally 1.0 foot or less), and widths ranging from 1.5 feet to 50.0 feet (although generally 5 feet or less). These streams range from moderate gradient pool and riffle streams with rocky substrate, to low gradient channels with slow moving water and mud/silt substrate.

No designated Wild, Scenic and Recreation Rivers occur in the survey area. State water quality classifications of watercourses within the survey area fall into two general categories: Class C, and Class D. Of the delineated waterbody crossings, 15 are Class D, 8 are Class DD, 1 is Class C(T), and the remaining 68 are not classified. Class D, Class DD and non-classified streams are not regulated by the NYSDEC. The only NYSDEC protected stream in the survey area is the English River, located in the northeastern portion of the site. The English River is classified as C(T), indicating that it supports a trout population.

Table 5.3 in the Wetland Delineation Report (Appendix E) provides further information on each delineated waterbody crossing, including NYSDEC classification, waterbody type, flow regime, flow direction, real-time velocity, width, depth, substrate, and wetland association. It also identifies the location within the Project site where each crossing occurs and which Project component crosses each waterbody.

3.2.1.2 Wetlands

Wetlands within the Project site have been examined through review of existing mapping, aerial photography interpretation, field reconnaissance, and on-site wetland inventory conducted by TtEC. The results of this data collection effort are summarized below, and described in detail in the Wetland Delineation Report (Appendix E).

Existing Information: The U.S. Fish & Wildlife Service (USFWS) National Wetlands Inventory (NWI) has mapped 822 wetlands polygons, totaling approximately 5,614 acres, within the Project site. The NWI indicates that a wide variety of palustrine forested, scrub-shrub, emergent and unconsolidated bottom wetlands with varying vegetation and hydrologic regimes are present. The most common wetland types at the Project site are: palustrine, scrub-shrub, broad-leaved deciduous, seasonally flooded/saturated (PSS1E); forested, broad-leaved deciduous, seasonally flooded/saturated (PFO1E); forested broad-leaved deciduous, saturated (PFO1B); forested, needle-leaved evergreen, seasonally flooded/saturated (PFO4E); and emergent, persistent, semi-permanently flooded, beaver (PEM1Eb).

Review of NYSDEC freshwater wetlands mapping indicates that 78 state-regulated wetland polygons, totaling approximately 7,666 acres, are located within the Project site. In many locations, the NWI mapped wetlands and the DEC mapped wetlands are overlapping features. Table 3.2.1.2-1 provides a summary of the state-regulated wetlands within the Project site.

Table 3.2.1.2-1: State-Regulated Wetlands within the Project Site

Wetland	Class[1]	Total Size (Acres)	Size Within Project Site (Acres)
CB-40	III	923.2	877.42
CB-41	III	184.6	176.01
CB-42	II	53.2	47.85
CB-43	III	88.5	81.48
CB-44	III	476.9	263.11
CB-45	III	632.3	497.49
CB-46	II	1001.3	546.25
CB-47	II	1662.6	962.97
CB-48	II	193.4	102.83
CB-49	III	863.1	322.17
CB-55	III	855.7	539.30
CB-57	III	31.2	10.76
CB-58	II	2806.8	877.96
CB-59	III	113.7	104.39
CB-60	II	24.9	19.65
CB-61	II	1330.4	472.44
CB-62	II	20.2	9.06
CB-63	II	2060.5	641.13
CB-64	II	361.9	139.57

Wetland	Class[1]	Total Size (Acres)	Size Within Project Site (Acres)
EC-10	II	120.0	32.49
EC-11	II	298.5	61.79
EC-6	II	225.0	89.51
EC-7	II	51.3	1.10
ED-68	II	71.0	0.09
ED-69	II	779.9	89.42
ED-76	III	685.3	633.77
ED-78	II	78.0	66.32
TOTAL		15993.4	7666.33

[1]NYS classification system. Four classes that rank wetlands according to their ability to provide functions and values (Class I having the highest rank, descending through Class IV).

A review of the New York portion of the National Hydric Soil List indicates that the Project site contains areas of hydric soils, as determined by the USDA Natural Resources Conservation Service (NRCS). Hydric soils are poorly drained, and their presence is also indicative of the likely occurrence of wetlands. A list of these hydric soils and their characteristics is provided in the Wetland Delineation Report (Appendix E). Hydric soils found in the Project site occur primarily within NYSDEC mapped wetlands.

Field Review: Field delineations were conducted in 2005 from September 19 through November 7, in 2006 from May 2 to December 21 and in 2007 from May 2 to June 1. All wetlands previously characterized by desktop review methods were field delineated during the spring of 2007. Wetland delineation methods followed the three-parameter approach as described in the U.S. Army Corps of Engineers (USACOE) Wetlands Delineation Manual (Environmental Laboratory, 1987) and the 1987 New York State Freshwater Wetlands Delineation Manual (Brown et al., 1995). This methodology uses vegetation, soils, and hydrology to determine the presence of wetlands and delineate their boundaries.

As with the surface water survey, the wetland survey area has increased from a 150 foot radius around proposed turbine sites in the DEIS to a 200 foot radius; from a 40 foot corridor for access roads in the DEIS to a 50 foot corridor; from a 3 foot corridor for interconnect lines to a 50 foot corridor for underground interconnect and a 200 foot corridor for the overhead collection line. The size of the proposed laydown areas have increased from 14.8 acres in the DEIS to 20.2 acres. A 50-foot wide area was surveyed for all turnaround areas. All NYSDEC mapped wetlands within 100 feet of the survey area were also delineated. In addition, any wetlands in the vicinity of proposed public road improvements (necessary to accommodate construction vehicles) were also delineated, as described below.

Public road improvements proposed as part of the Project include seven culvert replacements, 13 intersection improvements, and three road widenings. Culverts to be replaced are located on Bootleg Road (two culverts), Ryan Road (two culverts), Lagree Road (one culvert), Campbell Road (one culvert) and the intersection of Lagree Road and Route 189 (one culvert). Intersection improvements are proposed for the junctions of Merchia, Lagree and Liberty Pole Roads with Route 189; Patnode, Looby, Gagnier and Brandy Brook Roads with Route 11; Sancomb, Ryan and Brandy Brook Roads with Route 190; Route 11 and Route 189; Whalen and Looby Roads; and Campbell and Gagnier Roads. Road widenings include portions of Patnode Road (from Gangier Road south to Turbine 62 Access Road); Lagree Road (from Turbine 83 Access Road east to Turbine 42 Access Road); and Merchia Road (from Turbine 31 Access Road east to Turbine 208 Access Road).

Five of the seven culvert replacement locations were field surveyed for the presence of wetlands. These included the two located on Bootleg Road, the two located on Ryan Road, and the one at the intersection of Lagree Road and Route 189. The entire area (out to a 150-foot radius from the intersection) of five of the 13 intersection improvements, portions of two intersection areas, and the entire area associated with the three public road widenings, were surveyed for the presence of wetlands. Intersections field surveyed included Merchia Road and Route 189; Whalen and Looby Roads; Gagnier and Route 11; Sancomb Road and Route 190; and Campbell and Gagnier Roads. Intersections partially surveyed include Liberty Pole Road and Route 189 and Lagree Road and Route 189. Property access restrictions limited the survey at the culvert locations to within 20 feet of the road centerline. Where necessary, areas outside of this field survey area were desktop delineated to quantify wetland impacts.

TtEC delineated 158 acres of wetland in the potential impact area. This represents 2.8% of the total wetland acreage occurring within the Project site as indicated on the NWI maps. Delineated wetlands include 33 acres along access roads, 25 acres at proposed turbine sites, 16 acres along buried interconnect lines, 83 acres along overhead collection lines, 0.1 acre in the vicinity of public road improvements, and 1.0 acre at the proposed substation site. Only those portions of the wetland that occurred within a Project component footprint were tallied. By community type, the delineated wetlands include 78 acres of palustrine forested (PFO), 48 acres of palustrine scrub-shrub (PSS) and 32 acres of palustrine emergent (PEM) complexes, as defined by Cowardin et al (1979). Table 5.2 in the Wetland Delineation Report (Appendix E) provides further information on each delineated wetland crossing, including location, covertype, community, delineation method, and area.

Delineated wetlands that were located within the boundaries of NYSDEC mapped wetlands were designated as NYSDEC wetlands. A 100-foot adjacent area was generated for each wetland identified as a NYSDEC wetland. Overlapping adjacent areas from more than one wetland were "cut" and only tallied once, preventing a double counting of wetlands. NYSDEC wetlands comprise 110 acres of the 150 acres delineated, with an additional 180 acres delineated as NYSDEC adjacent wetlands.

Wetland Community Types: Wetlands delineated on the site consist of palustrine systems. Vegetative species composition was used to classify wetlands into communities as defined in *Ecological Communities of New York State* (Edinger et al 2002). The DEIS identified six wetland communities, including red maple hardwood swamp, shrub swamp, shallow emergent marsh, northern white cedar swamp, balsam flats, and open peatlands. The open peatland community type has been redefined in the Wetland Delineation Report (Appendix E) as a rich shrub fen, which is simply a more specific type of open peatland. The descriptions of these six community types, and the plants species occurring there, are as described in the DEIS.

Based on TtEC's additional survey efforts in 2006 and 2007, an additional 10 community types were documented in the delineated wetlands on site, including successional northern hardwoods, hemlock-hardwood swamp, black spruce-tamarack bog, red maple-tamarack peat swamp, spruce-fir swamp, cropland/row crops, cropland/field crops, pastureland, successional old field, and mowed lawn. Several community types typically classified as upland were used to describe wetland communities, since they provided the closest match in terms of species composition. TtEC's descriptions of each of these 10 new community types are presented below. Complete lists of plant species (including scientific names) found in wetlands and the adjacent uplands are provided in Appendix E, Tables 5.4 and 5.5, respectively.

Successional Northern Hardwoods

Successional northern hardwoods are hardwood or mixed forests that occur on sites that have been cleared or otherwise disturbed. Characteristic trees and saplings in these wetlands include gray birch, red maple, American elm, yellow birch, and aspen. Herbaceous species include sensitive fern, jewelweed, Canada mayflower, seges and mosses.

Hemlock-Hardwood Swamp

Hemlock-hardwood swamps are mixed swamps with a fairly closed canopy, sparse shrub layer, and low species diversity. Hemlock is typically co-dominated by yellow birch and red maple. The herbaceous layer includes sensitive fern, New York fern, and Northern bugleweed.

Black Spruce-Tamarack Bog

Black spruce-tamarack bogs are conifer forests that occur on acidic peatlands in cool, poorly drained depressions. Tamarack is the dominant tree species at this wetland; black spruce was not observed at the sample station but may occur elsewhere. The shrub and herb layers consist of low-growing evergreen, ericaceous shrubs and sphagnum mosses and include leatherleaf, bog labrador tea, bog rosemary, sheep laurel, and sphagnum moss.

Red Maple-Tamarack Peat Swamp

Red maple-tamarack peat swamps are mixed swamps that occur on organic soils in poorly drained depressions. Dominant trees are red maple and tamarack while the understory is dominated by highbush blueberry, mountain holly, and sphagnum moss.

Spruce-fir Swamp

Spruce-fir swamps are conifer swamps that typically occur in drainage basins, but can also occur at the edge of a lake or pond. In the Adirondacks, these swamps are often found in drainage basins occasionally flooded by beaver. At the Site, spruce-fir swamp communities were found at four delineated wetlands. The dominant tree is usually red spruce. Co-dominant trees include balsam fir and red maple, but gray birch was also found in the wetlands. Shrub layers include serviceberry and meadowsweet; herb layers include peat and club mosses, sheep laurel, soft rush, and sedge species.

Cropland/Row Crops

Cropland/row crops are agricultural fields planted in row crops (e.g. corn). Wetland plant species observed at these sites include bulrushes and reed canary grass.

Cropland/Field Crops

Cropland/field crops are agricultural fields planted in field crops (e.g. timothy) and include hayfields that are rotated to pasture. Dense herbaceous layers are dominated by vegetative species such as reed canary grass, timothy, sedge species, and fowl meadow grass.

Pastureland

Pastureland is defined as agricultural land permanently maintained (or recently abandoned) as a pasture area for livestock. Herbaceous species dominating these wetlands include various grass species, sedge species, green bulrush, soft rush, goldenrod species, aster species, and buttercup species.

Successional Old Field

Successional old fields are meadows dominated by forbs and grasses that occur on sites that have been cleared and plowed (e.g. for farming) and then abandoned. This community occurs in eight wetlands. Vegetative species dominating these wetlands include fowl mannagrass; sedge species including fringed, shallow and bladder sedges; aster species; purple-leaf willow-herb; bulrush species, Northern bugleweed; and goldenrod species.

Mowed Lawn

Mowed lawn is a terrestrial community type in which groundcover is dominated by clipped grasses which are maintained by mowing. Sedges and spike-rushes are among the herbaceous plants being mowed.

For a discussion of wetland functions and values, see Section 3.2.1.2 of the DEIS.

3.2.1.3 Groundwater

See discussion in Section 3.2.1.3 of the DEIS.

3.2.2 Potential Impacts

3.2.2.1 Construction

3.2.2.1.1 Surface Waters and Wetlands

As discussed in the DEIS, the Project was designed to avoid or minimize overall permanent impact on streams and wetland areas. As part of the avoidance and minimization effort, the layout was revised so that no turbine foundations are located within delineated wetlands. See Section 3.2.2.1.1 of the DEIS for specific design criteria used to minimize wetland impacts. Opportunities for additional wetland avoidance and impact minimization will be identified and evaluated during the state and federal wetland permitting process.

Permanent loss of surface water/wetland acreage will occur along proposed access roads, from 8-17 feet to either side of the centerline based on various road widths. Wetlands and surface waters occurring within a 50-foot radius of proposed wind turbines will also be permanently impacted due to the installation of wind turbine foundations and structural fill.

Based on the specific engineering site plans provided by URS Corporation, TtEC identified approximately 15.5 acres of wetlands that will be permanently impacted by Project construction. By community type, the permanently impacted wetland will include 10.15 acres of PFO, 2.39 acres of PSS, and 2.97 acres of PEM. Construction will also result in temporary impacts to approximately 68.45 acres of wetlands: 39.70 acres of PFO, 16.35 acres of PSS and 12.4 acres of PEM wetlands. The revised impacts are significantly higher than those indicated in the DEIS, primarily due to changes in the potential impact area, as described above. Approximately 82% of the estimated construction-related wetland impacts are temporary disturbances and will be restored following Project construction. Proposed wetland restoration areas are as described in the DEIS.

Additionally, TtEC identified 95 surface waterbody crossings within the revised Project site boundaries. Ninety-four of the 95 surface waterbody crossings within the potential impact area are not regulated by the state. The only NYSDEC protected stream that will be crossed is the English River, located in the northeastern portion of the site. The English River is classified as C(T), indicating that it supports a trout population.

The wetland impacts described above will be re-evaluated once all field delineations are complete, and addressed during the state and federal wetland permitting process. This process, referred to as the Joint Application process, was described in detail in the DEIS.

3.2.2.1.2 Groundwater

Construction impacts to groundwater are as described in the DEIS.

3.2.2.2 Operation

3.2.2.2.1 Surface Waters and Wetlands

See discussion in Section 3.2.2.2.1 of the DEIS.

Long-term impacts to wetlands will result from vegetation management activities in forested wetlands (e.g. periodic clearing of vegetation along overhead and buried electrical interconnect routes and selective tree clearing around tower sites). These activities will not result in a loss of wetland acreage, but will result in the conversion of forested wetlands to systems dominated by shrub and herbaceous vegetation (scrub-shrub/wet meadow/emergent). The proposed Project will not result in wide-scale conversion of land to built/impervious surfaces. The tower bases, crane pads, access roads, and O&M building in total will add approximately 167 acres of impervious/compacted surface to the 18,520 acre Project site (i.e., conversion of 0.9%). Consequently, no significant changes to stormwater runoff volumes are anticipated. However, installation of permanent Project components could result in localized changes to runoff/drainage patterns.

3.2.2.2.2 Groundwater

Operational impacts to groundwater are as described in the DEIS.

3.2.3 Proposed Mitigation

Proposed measures to avoid, minimize, and mitigate impacts to water resources are as described in the DEIS. Additional measures and details include the following:

- Disposing of excess concrete offsite (unless otherwise approved by the environmental monitor and the landowner). Under no circumstances shall excess concrete be buried or left on the surface in wetlands or surface waters.
- Washing of concrete trucks will be restricted to areas in locations approved by the environmental monitor, where slurry will not affect water resources.

Since the release of the DEIS, a proposed strategy for the mitigation of permanent and temporary wetland impacts has been developed. Mitigation goals and objectives have been based on total temporary and permanent impacts to wetlands and the results of the wetland functions and values evaluation. The goal of the proposed mitigation plan is to ensure 'no net loss' of wetland functions through the creation and restoration of self-sustaining, contiguous wetland systems capable of replacing wetland functions and values that will be affected by the construction of the Marble River Wind Farm. Based on a preliminary analysis, wildlife habitat is the most dominant function common to affected wetlands. Other principal functions of the affected wetlands include bank stabilization, floodflow retention, production export, and groundwater discharge.

Thus, the created or enhanced wetlands proposed as mitigation will primarily function as wildlife habitat, but will also replace the lost functions of suitability for bank stabilization, groundwater recharge/discharge, floodflow alteration, production export. In addition, created wetlands will provide enhanced functions and values such as sediment/toxicant retention, nutrient removal, and visual quality. To mitigate for temporary wetland impacts, a large, existing wetland system will be preserved and several small, impaired wetlands will be restored/enhanced. All mitigation areas will provide connectivity to larger NYSDEC and/or NWI wetland complexes.

The applicant conducted field consultations with Mr. Kevin Bruce of the USACOE and Mr. John O'Connor of NYSDEC regarding criteria for delineated wetland boundaries and potential mitigation sites.

Six properties within the Project have been identified as potential wetland mitigation sites. Four areas were identified as potential wetland creation sites, one area was identified as a potential wetland restoration site and one area was identified as a potential wetland preservation site. For the wetland preservation site, it is proposed that the site be purchased and the deed restricted to prevent future development of the site. Wetland creation will be conducted concurrently with Project construction. All mitigation areas will provide connectivity to larger NYSDEC and/or NWI wetland complexes. The final mitigation proposal will be determined in consultation with the agencies during wetland permitting.

To assure compliance with proposed mitigation measures during construction, the Applicant will provide the construction contractor copies of all NYSDEC (Article 24 and 15 [if applicable], Section 401 Water Quality Certification) and USCOE permits (Section 404), and site specific plans detailing construction methodologies, sediment and erosion control plans, and required natural resource protection measures. The contractor will adhere to any special conditions of permits issued by the NYSDEC and USACOE, which may include low impact stream crossing techniques, seasonal restrictions, and/or alternative stream crossing methods.

3.3 Ecological Resources

This section provides an updated description of ecological resources based on revised Project site boundaries and new information that has become available since completion of the DEIS. This information includes revised descriptions of vegetation and ecological communities, and an updated discussion of avian and bat studies and potential impacts on these species. In addition, a rare plant assessment report has been initiated and may be referenced in Appendix F.

3.3.1 Existing Conditions

3.3.1.1 Vegetation

Plant species found within the Project site are as described in the DEIS. An updated plant species list will be included in the FEIS, once fieldwork for the ongoing rare plant survey has been completed (see discussion in Section 3.3.1.1.2).

3.3.1.1.1 Ecological Communities

Vegetative communities within the Project site are described in the DEIS. Due to slight changes in the Project site boundaries (resulting primarily from changes in participating landowners), the acreage of these communities has changed slightly. The Project site is now comprised of approximately 2,735 acres of agricultural land (15% of the site), 199 acres successional old field (1% of the site), 2,232 acres of successional shrubland (12% of the site), 12,840 acres of forest land (69% of the site), 166 acres of developed/disturbed lands, and 348 acres of open water (2% of the site).

3.3.1.1.2 Significant Natural Communities/Rare Plant Species

As stated in the DEIS, written requests for information regarding listed threatened and endangered plant species and unique or significant natural communities were sent to the United States Fish and Wildlife Service (USFWS) and the NYS Natural Heritage Program (NHP) on September 19, 2005. Results of these inquiries are as reported in the DEIS. Since then, additional requests for any updated information were sent to both these agencies. According to a January 30, 2007 response from the NHP, no state- or federally-listed threatened or endangered plant species, or unique/significant natural communities are known to exist within the revised Project site (see DEIS Appendix G). On March 14, 2007 a response was received from the USFWS, providing instructions for a new procedure for obtaining information from an agency website. The internet search indicated that no federally endangered plants are known to occur in Jefferson County. The USFWS response and search results are provided in Appendix G.

During wetland delineations conducted by TtEC in 2005 and 2006, and ecological field surveys conducted by EDR during the fall of 2005, two unique/unusual natural community types were observed within the study area. As noted in the DEIS, TtEC documented the presence of two open peatland wetlands in the northern portion of the Project site. In their updated 2007 Wetland Delineation Report (Appendix E), TtEC has refined the classification of the open peatlands to rich shrub fen, a specific type of open peatland (Reschke 1990). This community type has a state rarity ranking of S1, indicating that it is especially vulnerable to extirpation in New York State. EDR documented two sites within the northern portion of the Project site that displayed characteristics of sandstone pavement barrens, which also have a state rarity ranking of S1.

A rare plant survey is currently being conducted by TtEC to determine the presence of any listed rare plant species on site. A Rare Plant Assessment Report prepared by TtEC details the scope and plans for this survey, and is included in Appendix F. Based on correspondence with the NYSDEC and the USFWS, TtEC determined that there are 19 state-listed plants known to occur in Clinton County with potential habitat in the Project site. These include New England northern reed grass, northern reed grass, cloud sedge, ram's head ladyslipper, ovate spikerush, marsh horsetail, American shore-grass, riverweed, slender bulrush, veiny meadow-rue, Houghton's sedge, prairie redroot, golden corydalis, northern wild comfrey, northern tansy mustard, clustered sedge, spurred gentian, and melic-oats. More information on these species is included in Appendix F, including scientific names, habitat, plant associations, state status, and regional wetland indicator status. Field surveys during the 2007 growing season will target areas of appropriate habitat that could potentially be impacted by project construction and operation. Results of this survey will be reported in the FEIS.

3.3.1.2 Fish and Wildlife

Fish and wildlife resources within the Project site are described in the DEIS. Newly available information on avian and bat species in the Project site is presented below.

3.3.1.2.1 Birds

Since the DEIS was released, the results of avian surveys conducted at three nearby Noble wind power project sites have been made public. Results of those surveys have been included in this SDEIS due to the proximity of the Marble River Project site.

Breeding Birds: Breeding Bird Atlas (BBA) and Breeding Bird Survey (BBS) results for the Project site are as discussed in the DEIS. The breeding bird field survey conducted by Woodlot in the central portion of the Project area in June 2005 documented 53 species. Breeding bird work conducted in spring 2005 at Noble's Clinton, Ellenburg, and Altona sites documented similar results. During these point counts, 56 different species were observed at the point count locations, with an additional 41 species documented between locations (Ecology and Environment, 2006a).

Three state-listed species were documented at the Clinton site: the northern harrier, the pied-billed grebe, and the sedge wren (Ecology and Environment 2006b). Northern harrier was observed on at least three occasions within the Ellenburg, Clinton and Altona project areas in 2005, and was categorized as a possible breeder in two additional subsections (Ecology and Environment 2006a). There is some evidence to indicate that northern harrier is fairly common in suitable habitat in northern New York (Peterson 2005). Breeding bird surveys were also conducted at Noble's Chateaugay site; no state listed species were observed there. Based on these survey results, it appears that the Marble River Project area, as a whole, supports a similar assemblage of species as documented within the adjacent Noble Project areas.

These data confirm conclusions in the DEIS that the Project site has a diverse breeding bird community made up of mainly common species of field, transitional, and woodland habitats. The most common field species are song sparrow, red-winged blackbird, American robin, and bobolink, while the most common woodland species are white-throated sparrow, black-capped chickadee, black-and-white warbler, veery, and yellow warbler (Woodlot Alternatives 2005b). A pre-construction breeding bird survey focusing on the northeastern and southern portions of the Project site is being conducted during May and June 2007. The results of this survey will be presented in the FEIS.

Migrating Raptors: Results of the raptor migration survey conducted by Woodlot in 2005 are reported in the DEIS. The spring survey revealed a total of 170 raptors (representing 11 species) and a passage rate of 2.83 birds per hour, while the fall survey revealed a total of 217 raptors (representing 15 species) and a passage rate of 3.62 birds per hour. These passage rates are low relative to other sites in the region, and an order of magnitude lower than at significant hawk watch sites. At the well known Derby Hill hawk watch site, located near Lake Ontario in Mexico, New York, approximately 220 km (136 miles) southeast of the Marble River Project area, a passage rate of 61.1 birds per hour was documented there in the spring of 2005. At the Eagle Crossing hawk watch site in Sainte Stanislas de Kostka, Quebec, approximately 40 km (25 miles) north of the Marble River Project site, 28.9 birds per hour were documented in the spring of 2005. The magnitude of difference between the

Derby Hill and Eagle Crossing passage rates and those for Marble River may indicate that the Marble River region does not represent a major flyway for raptor migration. This is further supported by the surveys conducted for Noble's Ellenburg, Clinton, and Altona Projects. Raptor migration was not concentrated in either the Noble or Marble River surveys, and flight pathways did not appear to be correlated with physiographic or vegetative conditions on the ground.

Table 3.3.1.2.1-1 has been updated to include additional data published since the release of the DEIS.

Table 3.3.1.2.1-1: Comparison of Hawk Migration Counts at the Marble River Site, with Data from Hawk Migration Sites in Pennsylvania and New York State[1].

Site	Season	Year	Numbers of Hawks Counted[1]	Hawks Per Hour
Marble River, NY	Spring	2005	170	2.8
Marble River, NY	Fall	2005	217	3.6
Derby Hill, NY	Spring	2005	23,626	61.1
Braddock Bay, NY	Spring	2005	30,793	68.8
Hamburg, NY	Spring	2005	13,141	33.2
Hawk Mountain, PA	Spring	2005	1,049	4.3
Franklin Mountain, NY	Fall	2005	4,297	8.1
Summitville, NY	Fall	2005	1,518	19.7
Second Mountain, PA	Fall	2005	6,899	10.3
Hawk Mountain, PA	Fall	2005	18,428	16.4
Little Gap, PA	Fall	2005	15,863	28.2

[1]Source: www.hawkcount.org (2005)

Migrating Songbirds: Results of the nocturnal radar surveys conducted by Woodlot in the spring and fall of 2005 are reported in the DEIS. These data indicated that passage rates ranged from 3 avian targets/kilometer/hour (t/km/hr) to 728 t/km/hr, with a mean nightly passage rate of 254 t/km/hr. Based on ceilometer surveys, almost all of these radar targets are assumed to be night-migrating songbirds. The average nightly flight altitude ranged from 172 meters (564 feet) to 831 meters (2,726 feet), with a mean flight altitude of 432 meters (1,417 feet). The seasonal average percentage of avian targets flying below 120 meters (approximate height of the proposed turbines) was 11%. Based upon survey results, spring songbird migration was characterized as broad front, and in general, the flight direction was to the northeast.

Fall passage rates ranged from 9 t/km/hr to 429 t/km/hr, with a mean nightly passage rate of 152 t/km/hr. The average nightly flight altitude ranged from 259 meters (850 feet) to 704 meters (2,309 feet), with a mean flight altitude of 438 meters (1,437 feet). The seasonal average percentage of avian targets flying below 120 meters was 5%. As in the spring, avian migration during the fall survey was characterized as broad front. The flight direction was generally to the south.

Table 3.3.1.2.1-2 has been updated to include data from the many additional studies published since the DEIS was released. These studies from throughout the Northeast provide an opportunity to compare the results from the Marble River site to other areas of New York, New England, and the central Appalachian states. It should be noted that here are limitations in comparing data from previous years with data from 2005, as year-to-year variation in continental bird populations and weather patterns may effect how many birds migrate through an area or region. Additionally, differences in site characteristics, particularly the landscape and vegetation surrounding a radar site, can play a significant role in the ability to detect targets in all directions, and the subsequent calculation of passage rate. Despite these limitations, a coarse comparison can be made which shows that both spring and fall data for the Project site are consistent with results from other sites in the region.

General comparisons can be made between the data from Marble River and Noble's Clinton County Wind Parks and Chateaugay Wind Park. During the spring and fall of 2005, the Marble River and Noble's Clinton County Wind Park radar survey sites were within 5 miles of each other. During the spring 2005 survey at Marble River, the mean passage rate was 254 targets per kilometer per hour (t/km/hr) and ranged from 3 to 728 t/km/hr. The average flight height was 422 m with approximately 11% of targets documented below maximum turbine height. In comparison, at Noble's Clinton County site, the mean passage rate was 110 t/km/hr and the nightly average ranged from 0 to 721 t/km/hr. The average flight height was 338 m with 20% of targets documented below turbine height.

During the fall 2005 survey at Marble River, the mean passage rate was 152 t/km/hr and the nightly average ranged from 9 to 429 t/km/hr. Average flight height was 438 m with 5% of targets documented below the turbine height. During this same fall period, the mean passage rate at Clinton County was 197 t/km/hr and the nightly average ranged from 23 to 1,404 t/km/hr. The average flight height was 333 m with 12% of targets documented below maximum turbine height. Overall, the passage rates, flight heights, and flight direction between Marble River and Noble's Clinton County Windparks were fairly similar with both project areas characterized by similar habitats and elevations.

A more recent radar survey was conducted at Noble's Chateaugay Wind Park in Chateaugay, New York during the spring and fall seasons of 2006. This site had a spring 2006 mean passage rate of 360 t/km/hr (ranging from 54 to 892 t/km/hr) and an average flight height of 409m, with 18% of targets flying below turbine height. During the fall of 2006, the mean passage rate was 643t/km/hr (ranging from 38 to 1373 t/km/hr) and an average flight height of 431m, with 8% of targets below turbine height. These passage rates were greater but flight heights were similar to those observed during the radar studies conducted at Marble River.

Table 3.3.1.2.1-2: Summary of Migration Characteristics at the Marble River Site and Other Regional Sites.

Spring	Year of Study	Targets Per Kilometer Per Hour	Mean Altitude of Flight	Percent Targets Lower than ~125m	Mean Direction of Flight	Citation
Marble River, NY	2005	254	422 m/1,384 ft	11%	40°	Woodlot 2005a
Chateaugay, NY	2006	360	409 m/1,341 ft	18%	48°	Woodlot 2006e
Chautauqua, NY	2004	395	528 m/1,732 ft	4%	29°	Cooper *et al* 2004a
Fairfield, NY	2005	509	419 m/ 1375 ft	20%	44°	Woodlot 2005c
Jordanville, NY	2005	409	371 m/1217 ft	21%	40°	Woodlot 2005d
Clinton Co, NY	2005	110	338 m/1109 ft	20%	30°	Mabee et al 2006
Dairy Hills, NY	2005	117	397 m/1302 ft	15%	14°	ED & R 2006b
Cohocton, NY	2005	371	609 m/1998 ft	12%	28°	ED & R 2006a
Prattsburgh, NY	2005	277	370 m/1214 ft	16%	22°	Woodlot 2005e
Sheldon, NY	2005	112	418 m/ 1371 ft	6%	25°	Woodlot 2006a
Munnsville, NY	2005	160	291 m/955 ft	25%	31°	Woodlot 2005f
Clayton, NY	2005	450	443 m/1453 ft	14%	30°	Woodlot 2005g
Deerfield, VT	2005	404	523 m/1716 ft	4%	69°	Woodlot 2005h
Sheffield, VT	2005	208	522 m/1713 ft	6%	40°	Woodlot 2006b
Liberty Gap, WV	2005	457	492 m/1614 ft	11%	53°	Woodlot 2005i
Fall	**Year of Study**	**Targets Per Kilometer Per Hour**	**Mean Altitude of Flight**	**Percent Targets Lower than ~125m**	**Mean Direction of Flight**	**Citation**
Marble River, NY	2005	152	438 m/1,437 ft	5%	193°	Woodlot 2005 b
Chateaugay, NY	2006	643	431 m/1,414 ft	8%	212°	Woodlot 2006f
Chautauqua, NY	2004	238	532 m/1,745 ft	4%	199°	Cooper *et al* 2004b
Flat Rock, NY	2005	158	415 m/1,361 ft	8%	184°	Mabee *et al* 2005
Prattsburgh, NY	2005	200	365 m/1,197 ft	9%	177°	Mabee *et al* 2005
Clinton Co, NY	2005	197	333 m/1093 ft	12%	162°	Mabee et al 2006
Dairy Hills, NY	2005	94	466 m/1529 ft	10%	180°	Young 2006
Fairfield, NY	2005	691	516 m/1693 ft	4%	198°	Woodlot 2005j
Howard, NY	2005	481	491 m/1611 ft	5%	185°	Woodlot 2005k
Sheldon, NY	2005	197	422 m/1385 ft	3%	213°	Woodlot 2005l
Jordanville, NY	2005	380	440 m/1444 ft	6%	208°	Woodlot 2005m
Munnsville, NY	2005	732	644 m/2113 ft	2%	223°	Woodlot 2005n
Clayton, NY	2005	418	475 m/1558 ft	10%	168°	Woodlot 2005o
Deerfield, VT	2005	559	395 m/1296 ft	13%	221°	Woodlot 2005p
Mars Hill, ME	2005	512	424 m/1391 ft	8%	228°	Woodlot 2006c
Kibby, ME	2005	565	370 m/1214 ft	16%	167°	Woodlot 2006d

A more comprehensive summary of available avian radar survey results is included in Appendix F.

Migrating Waterbirds: Use of the Project site by wintering birds is as described in the DEIS. None of the water bodies in the Project site are large enough or productive enough to attract significant numbers of waterbirds (ducks, geese, rails, shorebirds, etc.) during fall and spring migration. However, the Project area does provide habitat for the pied-billed grebe, a state-listed threatened species. Appropriate pied-billed grebe nesting and/or migration stopover habitat appears to be present in the northeastern section of the proposed Marble River Project site. These wetlands support dense emergent vegetation with nearby open water (usually greater than 25 cm deep) and an abundant aquatic invertebrate prey base, indicators of suitable pied-billed grebe habitat (Muller and Storer 1999). In addition, pied-billed grebes were heard during spring 2007 breeding bird surveys conducted by Woodlot biologists. Other adjacent wetlands and watercourses may provide suitable habitat for migrant waterbirds, although the value of this habitat to migrants for stopover or staging is likely negligible.

Wintering Birds: Use of the Project site by wintering birds is as described in the DEIS. A low diversity and density of wintering birds would be expected in and around the Project site.

3.3.1.2.2 Mammals

Mammalian species occurring on the Project site are as described in the DEIS.

However, since the release of the DEIS, additional data on local bats have been made public. In 2005, Ecological Specialties LLC conducted acoustic monitoring for bats at the Noble wind power sites in the Towns of Clinton, Ellenburg, and Altona (Ecology and Environment, 2006b), Chateaugay, and Brandon (Woodlot 2006f). At the Clinton/Ellenburg site, 497 bat call sequences were recorded, while 1,031 bat call sequences were recorded at the Altona site during the spring (April 20th to June 13th) and fall (August 15th to October 9th). At both sites, a greater number of detections were recorded at the 100 foot detector compared to the 50 foot detector. Most of the bat call sequences at the Clinton/Ellenburg site were identified as big brown bats (n=270) and little brown bats (n = 33). At the Altona site, the upper detector also recorded the majority of call sequences (n = 730). The eastern red bat accounted for 575 of these call sequences, while the hoary bat accounted for 22 call sequences. The lower detector had fewer calls (n=301) and only identified one bat species, the little brown bat (n=134). Two bat detectors were deployed in the Town of Brandon, NY from July 25 to October 4, 2006. A total of 1,751 bat call sequences were recorded. The mean detection rate was 13.1 call sequences per detector-night. This detection rate was generally higher than other recent fall surveys in New York. At Chateaugay, two detectors were deployed during the period of time as Brandon. A total of 518 bat call sequences were recorded with a mean detection rate of 5.1 call sequences per detector-night.

Bat call sequences were lower at Marble River than the Clinton/Ellenburg, Altona, Brandon, and Chateaugay sites. Similar to the Clinton/Ellenburg and Altona sites, a greater number of bats were detected at the higher detector at Marble River. However, it should be noted that the number of recorded call sequences at a given Anabat detector may not be indicative of the relative abundance of that species. For example, if 20 call sequences are recorded in a give evening this may represent the activity of a single bat, or a larger group. The Anabat data does provide a good estimate of general levels of activity but does not necessarily provide exact population estimates of bats within the given study area.

No endangered Indiana bats were documented at any of the sites, although their calls are difficult to distinguish from other Myotid species.

3.3.1.2.3 Reptiles and Amphibians

Amphibian and reptilian species are as described in the DEIS.

3.3.1.2.4 Fish

The occurrence of fish species is as described in the DEIS.

3.3.1.2.5 Wildlife Habitat

Wildlife habitat is as described in the DEIS.

3.3.1.3 Threatened and Endangered Wildlife Species

As described in the DEIS, written requests for information regarding listed threatened and endangered wildlife species were sent to the USFWS and the NHP on September 19, 2005. Results of these inquiries are as reported in the DEIS. Since then, additional requests for information were sent to the agencies. A January 30, 2007 response from the NHP indicates the occurrences of the same species already addressed in the DEIS, with the addition of Bicknell's thrush, which is a state-listed species of special concern. It is worth noting that the closest boundary for the Town of Dannemora, where Bicknell's thrush was recorded, is more than 7 miles from the nearest proposed turbine.

Since the release of the DEIS, the USFWS has changed their reporting policy for occurrences of federally listed threatened and endangered species. The new web search procedure reports species records by county, as opposed to specifically in the vicinity of the Project site. A March 14, 2007 search revealed the presence of the federally threatened bald eagle and the federally endangered Indiana bat in Clinton County. Both these species were addressed in Section 3.3.1.3 of the DEIS. Bald eagles were observed on site during 2005 raptor migration surveys, but do not appear to be nesting on-site. The potential for Indiana bat to be found on-site is low, considering the distance of the Project site from the nearest known hibernanculum. The potential for Indiana bat occurrences described in the DEIS.

As noted above, avian and bat studies conducted at the nearby Noble wind power project sites documented several state listed threatened species, including the northern harrier, the pied-billed grebe, and the sedge wren. The occurrence of any listed threatened and endangered wildlife species documented during the 2007 on-site breeding bird survey will be reported in the Project FEIS.

3.3.2 Potential Impacts

3.3.2.1 Construction

3.3.2.1.1 Vegetation

Project construction will result in temporary and permanent impacts to vegetation within the Project site. However, no plant species occurring in the Project site will be extirpated or significantly reduced in abundance as a result of construction activities.

The anticipated types of Project-related impact to vegetation are as described in the DEIS. Due to changes in Project layout, the anticipated impacts to specific community types have changed somewhat. The currently proposed Project will result in disturbance to approximately 266 acres of agricultural land, 5 acres of successional old field, 73 acres of successional shrubland, and 484 acres of forest. This compares to disturbance estimates of 243 acres of agricultural land, 11 acres of successional old-field, 87 acres of successional shrubland, and 479 acres of forest for Project construction as described in the DEIS. As indicated in Table 3.3.2.1.1-1, the majority of the calculated impacts will be temporary, and native vegetation will be allowed to regenerate following restoration of areas disturbed during construction. Construction-related impacts to wetlands were previously discussed in Section 3.2.

Table 3.3.2.1.1-1: Impacts to Vegetative Communities

Community	Total Disturbance	Temporary Disturbance	Permanent Loss
Agricultural Land	266	219	47
Successional Old Field	5	4	1
Successional Shrubland	73	60	13
Forestland	484	381	103[1]
Disturbed/Developed	15	13	2
TOTAL	843	677	166

[1] Does not include permanent conversion to a scrub-shrub community within the overhead collection line ROW. See discussion in Section 3.3.2.2.1.

3.3.2.1.2 Fish and Wildlife

Potential construction-related impacts to wildlife are described in the DEIS.

3.3.2.1.3 Threatened and Endangered Species/Unique Natural Communities

Currently, no rare plant species are known to occur within the Project site. Therefore, impacts to listed threatened and endangered plant species are not anticipated. Potential impacts to rare plant species will be determined based on the results of the ongoing rare plant survey. Any such impacts will be reported in the FEIS. Potential impacts to listed wildlife species are as described in the DEIS.

As described in Section 3.3.1.1.2 of the DEIS, two unique natural communities (rich shrub fen and sandstone pavement barrens) do occur within the Project site and could be subject to disturbance during construction. Proposed means of avoiding impacts to these communities are described in Section 3.3.2.1.3 of the DEIS.

3.3.2.2 Operation

3.3.2.2.1 Vegetation

As indicated in Table 3.3.2.1.1-1, Project construction will result in permanent conversion of approximately 166 acres of vegetated land to unvegetated/built facilities (access roads, turbines, crane pads, substation, O&M building, etc.) within the Project site. This total will include approximately 47 acres of agricultural land, 1 acre of successional old-field, 13 acres of successional shrubland, and 103 acres of forest. Permanent impacts to wetlands were previously discussed in Section 3.2.2. It should be noted that for forest vegetation, permanent impact will also occur through conversion of one vegetative community to another (i.e., forest to successional shrubland or old field). This conversion will occur within the cleared ROW for the overhead collection lines. A total of 136 acres of forestland will be converted to successional communities for the duration of Project operation. Aside from the minor disturbance associated with routine maintenance and occasional repair activities, other disturbance to plants and vegetative communities are not anticipated as a result of Project operation.

3.3.2.2.2 Wildlife

Operational impacts to wildlife are as described in the DEIS.

Habitat Loss: Based on the revised Project site and current construction plans, a total of 167 acres of wildlife habitat will be permanently lost from the Project site (i.e., converted to built facilities). As mentioned in the previous section, the majority of this loss (approximately 103 acres) will occur in forest land. In addition, approximately 136 additional acres of forest habitat will be maintained as a successional community (old field, shrubland, or saplings) for the life of the Project. As mentioned in the DEIS, much of this habitat was already disturbed due to agricultural and forest management (logging) activities, and therefore is of somewhat limited value. In addition, the total of 163 acres of wildlife habitat that will be lost due to Project development are not significant from a local or regional perspective.

Forest Fragmentation: As mentioned in the discussion of construction-related impacts, the proposed Project will result in permanent loss or conversion of 103 acres of forest habitat. The forested habitat being impacted by the Marble River Project is generally young/successional, and/or already disturbed by logging activities. In such places, it is questionable as to whether forest interior conditions exist. In addition, in most places the proposed turbines and access roads are utilizing existing clearings (e.g., woods roads, skid trails, and log landings), which will minimize additional fragmentation of the forest. However, the forests located along portions of the proposed overhead collection lines are more or less contiguous and intact, and therefore may be utilized by forest interior songbird species. These areas will be fragmented to some extent by the proposed Project, which could have an adverse effect on forest nesting interior bird species.

Disturbance/Displacement: Anticipated disturbance/displacement impacts on wildlife are as described in the DEIS.

Collision: Information regarding anticipated collision impacts on wildlife can be found in section 3.2.2.2.2 of the DEIS.

Since completion of the DEIS, a recent post-construction mortality monitoring study conducted from June 17th to November 15th 2006 at the Maple Ridge Wind Power Project in Lewis County, New York has been released. The study monitored 50 out of 120 operational turbines for a 5-month period, and documented 128 bird fatalities, representing 28 different bird species (Curry and Kerlinger 2007). Carcass removal and searcher efficiency trials were conducted within one, three, and seven day search cycles. They calculated a mortality rate for each of the different search periods (one day, three day, and seven day). The mortality estimates for birds were 5.75 incidents/MW (9.48 incidents/turbine), 2.53 incidents/MW (4.17 incidents/turbine), and 1.87 incidents/MW (3.10 incidents/turbine) respectively. Approximately 82% of the birds found were nocturnal migrants representing 29 species. Golden crowned kinglets and red-eyed vireos were the most common species found during surveys. Most of the collisions occurring during the fall migration period, and only a single raptor fatality, an American kestrel, was documented during this study. The bird mortality rates at Maple Ridge were similar to the mortality rates observed at forested wind power sites in West Virginia and Tennessee. These results suggest that avian collision mortality at Marble River is likely to be similar to, or slightly higher than, that predicted in the DEIS (up to 7 birds per turbine per year).

The Maple Ridge post-construction mortality study also documented bat fatalities, including the hoary bat, the eastern red bat, the silver-haired bat, the little brown bat, and the big brown bat (Curry and Kerlinger 2007). The mortality rates for bats were 12.31 incidents/MW (20.31 incidents/turbine), 10.82 incidents/MW (17.85 incidents/turbine), and 6.90 incidents/MW (11.39 incidents/turbine) for the one day, three day, and seven day search periods, respectively. Most bat mortality occurred during the fall migration period, with 70% of bat carcasses found between July 1st and August 31st, 2006. This suggests that the distribution of bat fatalities is seasonal. The mortality rates observed at Maple Ridge are consistent with or lower than those reported in the DEIS, which were based on results of other wind turbine fatality studies conducted in the United States.

Overhead collection lines and poles can also pose a potential threat to migrating birds and bats as they are relatively tall structures and have long lines of cable that are difficult to see, especially at night. To minimize impacts to wildlife, the majority of the electrical collection system will be buried. Of the 66 miles of the electrical collection system, approximately 53 miles will be buried and approximately 13.6 miles will be overhead.

3.3.2.2.3 Threatened and Endangered Species

Potential operational impacts to listed threatened and endangered wildlife species are as described in the DEIS. It is worth noting that northern Clinton County does not provide any significant topographic features that might concentrate raptor migration in the region, such as lake shores, mountains, high relief ridges or substantial watercourses. Therefore any potential impacts on listed migrant raptors (i.e., bald eagle and peregrine falcon) is likely to be negligible. Due to the abundance of suitable foraging and breeding habitat in northern Clinton County, any potential disturbance of resident northern harriers that could potentially occur as result of the Marble River Project would likely be minimal. Studies conducted at the Buffalo Ridge wind facility in Minnesota, where northern harrier are relatively common, indicate a low potential for mortality based on correlation analyses conducted on habitat use and mortality events. Despite good habitat and relatively high northern harrier use, no mortalities have been documented at Buffalo Ridge (Erickson *et al.* 2002).

3.3.3 Proposed Mitigation

See discussion in Section 3.3.3 of the DEIS.

3.3.3.1 Vegetation

Mitigation of impacts to vegetation is as described in the DEIS.

3.3.3.2 Fish and Wildlife

Mitigation of impacts to fish and wildlife is as described in the DEIS. To minimize wildlife impacts associated with the proposed overhead collection line, the ROW will be managed in accordance with a ROW management plan designed to encourage the development of diverse shrub-dominated habitat in formerly forested areas. In addition, the line itself will be designed in accordance with Avian Powerline Committee (APLC) guidelines for insulation and spacing. All study protocols for post-construction monitoring of avian impacts will be developed in consultation with the NYSDEC and USFWS.

3.3.3.3 Threatened and Endangered Species

Consistent with the recommendations in the DEIS, a rare plant and community survey is being conducted during 2007 to assure that impacts to rare plants and unique natural communities will be avoided. This survey will involve investigation of all proposed areas of Project-related disturbance. If rare plants or unique natural communities are identified as a result of this survey, impacts will be avoided or minimized to the extent practicable. The results of this survey and any necessary mitigation will be decribed in the FEIS for the Marble River Project.

As mentioned previously, the 2007 on-site breeding bird survey will document and characterize breeding bird assemblages, and targeted area searches will focus on the identification of listed species. If northern harriers, or other listed threatened or endangered species, are found to be nesting within or adjacent to proposed areas of disturbance, those areas will be avoided by construction-related activities until after the nesting season, to the extent practicable.

3.4 Traffic and Transportation

Since the completion of the DEIS, a supplemental Material and Equipment Delivery Route Assessment Report was prepared by URS Corporation (URS). The purpose for this study is to identify and evaluate preferred delivery routes for WTG components and other associated materials and equipment necessary for construction and operation of the Project. The report also includes an estimate of the number of vehicle trips that will be required by the WTG component and construction material delivery vehicles, and lists safety issues related to these deliveries.

As described in the DEIS, Clinton County is served by a network of state, county, and local highways and roads in the Project site range from two-lane highways to gravel roads. The New York State Highway System in and adjacent to the Project site includes NYS Route 190, NYS Route 189 and U.S. Route 11. The existence of the extensive road network provides advantages to siting a wind farm in the Towns of Ellenburg and Clinton in terms of site access and equipment and material transport to the site. The following section describes the proposed Project's effects on the local road network, including oversize/overweight (OS/OW) vehicle use, potential impacts, and planned mitigation strategies. Two specific routes outside the Project site were analyzed in the DEIS and presented in the Transportation Assessment Report in DEIS Appendix H. Based on the current Project layout, a revised Material and Equipment Delivery Route Assessment Report has been included in Appendix H.

3.4.1 Existing Conditions

3.4.1.1 Transportation Routes Outside the Project Area

Existing conditions of transportation routes outside the Project site are as described in the DEIS.

3.4.1.1.1 Oversize/Overweight Truck Route No.1

Oversize / Overweight Truck Route No. 1 is as described in the DEIS.

3.4.1.1.2 Oversize/Overweight Truck Route No. 2

Oversize / Overweight Truck Route No. 2 is as described in the DEIS.

3.4.1.2 Transportation Routes Within the Project Area

Existing conditions of transportation routes inside the Project site are as described in the DEIS.

3.4.1.3 School Bus Routes

School bus routes are as described in the DEIS.

3.4.2 Potential Impacts

3.4.2.1 Transportation Routes Outside the Project Area

Potential impacts of transportation routes outside the project site are as described in the DEIS.

3.4.2.2 Transportation Routes Within the Project Area

The Applicant investigated several routes throughout the Project site that could be used for delivery of WECS components and construction materials. The WECS component delivery vehicles will be of an OS/OW type, requiring modification to intersections on the preferred routes. Therefore, routes investigated were evaluated for possible intersection impacts, road type, surface condition, intersection geometry and proximity to the road of structures and sensitive properties. It is expected that delivery of WECS components and materials will come from the east or west along NYS Route 11. From NYS Route 11, five north-south delivery routes have been established into the Project site. The WECS access roads will be accessed directly from one of these north-south routes or continue from these primary routes to secondary routes intersecting the WECS access roads.

As stated in the DEIS, the roads within the Project site vary in surface type between gravel and asphalt. It was determined that the majority of the roads had an overall condition of fair with areas of good pavement or gravel, while other areas had very poor surface conditions, which consisted of severe cracking, potholes and rippling for the asphalt roads, and potholes and rippling on the gravel roads.

As a result of the preceding investigation, the Applicant concluded that not all of the roads in the Project site will require modification. The following roads were considered in acceptable condition to handle the turbine component deliveries: NYS Route 11, NYS Route 189, NYS Route 190, Clinton Mills Road, and Brandy Brook Road.

The remainder of the roads may require some type of modification to allow them to be used for WTG component and construction material delivery. These modifications will include gravel overlay to reduce rippling and smooth grade changes, raising the profile of the road to provide additional structural capacity and sufficient surface drainage; adding larger culverts to smooth grade changes; and, though not currently anticipated by the Applicant, possible road widening.

It should be noted that Liberty Pole Road, Lagree Road, and Patnode Road are not wide enough to allow vehicles traveling in opposite directions to easily pass each other. Consequently, though not currently anticipated, it may prove necessary to widen these roads to accommodate delivery trucks. The Applicant will determine whether or not to widen these roads on a road-by-road basis and this information will be presented in the FEIS.

Soucia Road, located off of Clinton Mills Road, is the only road being considered for widening at this time. Currently, this road is less than 20 feet wide. This is not wide enough to allow vehicles traveling in opposite directions to easily pass each other. Should widening be required, it would be done using gravel to increase the width of the road to approximately 20 feet, providing two ten-foot travel lanes. Additional gravel will be used to create two-foot shoulders for the roads.

Other narrow roads within the Project site are Liberty Pole Road, Lagree Road and the seasonal portion of Patnode Road. However, it is anticipated that these roads will be used for one-way traffic and will not require widening. The exact requirements will be determined after a topographic survey has been performed to determine the exact grade changes in the area and this information will be presented in the FEIS.

The lengths of the turbine component delivery vehicles dictate that delivery route intersections will require modification. The existing intersection geometry is insufficient to accommodate the large turning radii of these vehicles, and the majority of the intersection approach roads vary in width from 18 to 20 feet. The exceptions are NYS Route 11 (which is 24 feet away from intersections and wider where there are turning lanes); and at Lagree Road and Patnode Road (which are seasonal roads and have widths of approximately ten feet to 15 feet).

Modifications to the intersections will include increasing the corner radii, adding road width upstream of the intersection, adding road width downstream of the intersection, or some combination of all three. Houses, bridges, or culverts located in proximity to the intersections will limit the amount the corner radii can be enlarged, making it necessary to increase the road width either upstream or downstream of the intersection. Intersection modifications may require the acquisition of additional property and, in some cases, relocation of utility poles and/or guide rails. Where there are culverts or ditches crossing under the existing intersection, the culverts will have to be extended. If ditches run along the intersection, culverts for these ditches will need to be added or new ditches have to be created along the edge of the new road to maintain proper drainage.

All intersections were evaluated using a maximum truck turning radius of 145 feet, which will be the turning radius of the truck carrying the turbine blades. Figures showing the modifications at each intersection can be found in the Materials and Equipment Delivery Route Report in Appendix H.

The materials used for construction of this Project, because of its size, will be obtained from many locations. The material will include gravel, concrete, reinforcing bar, electrical materials, and miscellaneous materials. The volume of material needed may require stockpiling some material at the laydown area located off of NYS Route 189. There will also be a need to set up of a concrete batching plant at the laydown area because of the amount of concrete needed for each turbine foundation (approximately 330 cubic yards).

Vehicles used for delivery of material to the Project will be of a standard type that normally used the roads within the Project site. These vehicles include dump trucks; 18-wheel tractor-trailers, which will include flatbed and dump types; and concrete trucks. Since these vehicles are standard, the routes will, in most cases, follow the preferred routes established for delivery of the turbine components. However, since these vehicles are standard sizes some deviation from these routes may be made. An example of this deviation will be at the intersection of NYS Route 189 and Looby Road/Clinton Mills Road.

The Applicant does not anticipate any adverse safety impacts to the area due to material delivery vehicles. Vehicles of similar types were observed using the local road network during the investigations for this report and other elements of the Project. Although there will be a significant number of vehicles in the area during construction activities, Project safety features will be implemented to reduce the potential for adverse traffic conditions, the most significant safety measure being a Project speed limit.

Nine vehicles will be required for component delivery to each turbine site. This will result in 18 trips (in and out) for each turbine, and overall approximately 2,000 delivery trips for delivery of all turbine components.

The number of material delivery vehicles will be fairly large. It is estimated that 35 to 40 concrete trucks will be required for each turbine foundation. This will result in 70 to 80 delivery trips for each wind turbine or approximately 9,000 trips over the duration of Project construction. In addition, material delivery will include gravel for the construction of access roads, road improvements, and intersection modifications, as well as reinforcing bar, electrical equipment, and materials for each wind turbine and the Project transmission system. The total number of material delivery trips will be approximately 17,000 trips throughout of the construction period.

3.4.2.3 School Bus Traffic

School bus traffic is as described in the DEIS.

3.4.3 Proposed Mitigation

Project delivery routes have been selected to minimize impacts to the local roads and communities. The number of roads used for these deliveries has been minimized and steps will be taking during construction to make certain that safety is a priority along the routes. Material delivery routes in most cases will follow the routes established for WECS component delivery. However, because these are typical construction or delivery vehicles, standard intersection configuration can be used resulting in the combination of some routes. These vehicles will be similar in nature to vehicles currently using the local road network and will require no special safety measures.

As NYS Route 11 is the preferred access road into the region, the Applicant selected several north-south delivery routes intersecting NYS Route 11 to gain access into the site. These delivery routes were selected to reach the largest number of access road entrances possible while impacting the least amount of road. For those access roads that did not intersect the primary routes, secondary east-west routes were selected.

The delivery routes can be found in the revised Material and Equipment Delivery Route Assessment Report on Maps 1 and 2 in Appendix H and are described in more detail below.

- **Delivery Route No. 1** will deliver WECS components to access roads intersecting NYS Route 189 and the laydown area. It will follow NYS Route 189 northbound and intersect Access Roads 8, 13, 21, 22, 23, 24, 30, 34, 35, and 36.
- **Delivery Route No. 2** will use NYS Route 189 as the primary north-south route. The route will follow NYS Route 189 northbound to Liberty Pole Road, and then follow Liberty Pole Road eastbound to Access Roads 37, 38, 40, 41, and 42.
- **Delivery Route No. 3** will also use NYS Route 189 as the primary north-south route. The route will follow NYS Route 189 northbound to Frontier Road, and then follow Frontier Road westbound to Access Road 33.
- **Delivery Route No. 4** will use NYS Route 189 as the primary north-south route. The route will follow NYS Route 189 northbound to Merchia Road, and then follow Merchia Road westbound to Access Roads 28, 31, and 32.
- **Delivery Route No. 5**, like routes 1 through 4, will use NYS Route 189 as the primary north-south route. The route will follow NYS Route 189 northbound to LaGree Road, and then follow LaGree Road westbound to access roads 19, 20, and 25. In addition, this route will be an alternate to providing access to Access Road 29 located off of Looby Road.
- **Delivery Route No. 6** will use Looby Road as the primary north-south route. The route will follow Looby Road northbound intersecting Access Road 29. It will continue on Looby Road to Whalen Road; at this point Looby Road turns east-west. The route will continue eastbound on Looby Road to Access Roads 26. The route will continue eastbound and cross NYS Route 189. At NYS Route 189, Looby Road becomes Clinton Mills Road. The route continues eastbound on Clinton Mills Road to Access Roads 39, 43 (by way of Rogers Road), 44 (by way of Access Roadds 45, and 46). A short stub of Route No. 6 will follow Whalen Road northbound to Access Road 27.
- **Delivery Route No. 7** will use Brandy Brook Road as the primary north-south route. The route will follow Brandy Brook Road southbound and intersect Access Road 12. It will continue southbound on Brandy Brook Road to NYS Route 190, and then follow NYS Route 190 to Access Roads 3, 4, 6, and 7. A stub of Route No. 7 will follow Sancomb Road southbound from NYS Route 190. Access Road 5 is located off of Sancomb Road. This route will also be used for delivery of the substation equipment using Access Road 10. Delivery Route No. 7 will continue past Access Road 4 to Ryan Road. It will turn north on Ryan Road to Access Road 1 and 2.

- **Delivery Route No. 8** will use Patnode Road as the primary north-south route. The route will follow Patnode Road southbound, where it will intersect Access Roads 14 and 15, and cross Gagnier Road to the season/gravel section of Patnode Road, where it will intersect Access Roads 8 and 9.

- **Delivery Route No. 9** will follow Gagnier Road westbound from NYS Route 11, to Access Road 11 and 16. It will continue westbound to Campbell Road then turn northbound on Campbell Road to Access Road 17.

The above selected delivery routes are the preferred routes based on extensive field surveys and conversation with local residents and officials within the Clinton County Highway Department. They were selected to minimize the number of roads being used for delivery as well as to minimize the required improvements to individual roads.

The Applicant will obtain all the necessary permits from the town and county highway departments and from NYSDOT to operate OS/OW vehicles on the highways. The Applicant will also coordinate and consult with Town Highway Departments and school districts regarding final routing plans on local roads that will be used to bring equipment and material to the construction sites. A road improvement plan will be developed for each town that defines the various upgrades required to accommodate construction vehicles. Any necessary improvements or repairs will be completed at the Applicant's expense. Confining vehicles to only "approved" roads will minimize transportation impacts.

Anticipated improvements may include shoring up abutments, adding steel plates or gravel road surfaces, widening roads, and reconfiguring intersection geometry to accommodate the turning radius of large construction vehicles. The following are some of the mitigating measures that may be applied to avoid or minimize impacts related to transportation and/or to provide long-term improvement to the local road system:

- Road widening or adding turning radii;
- Adding cover over structures;
- Reinforcing or bracing;
- Using bridge jumpers to clear structures;
- Replacing structures prior to construction or after if damaged;
- Rerouting traffic;
- Replacing of inadequate bridge components; and
- Reinforcing of existing bridges.

The final improvement plan will identify specific locations where certain improvements will be made.

The Applicant will also consult with the local highway and public safety agencies regarding the need to prepare a traffic management plan to manage the flow of traffic on transportation routes. In an effort to minimize potential impacts to school bus traffic, the Applicant will make efforts to avoid scheduling component deliveries during stated school bus hours. In addition, when necessary the Applicant will provide notice of deliveries to Northern Adirondack School Committee officials.

3.5 Land Use and Zoning

Land use and zoning in the Project site was determined through review of local town codes, tax parcel maps, aerial photographs, and field review conducted during 2005. No significant changes have occurred since that time, other than slight modification of the Project site boundary.

3.5.1 Existing Conditions

3.5.1.1 Regional Land Use Patterns

Regional land use patterns are as described in the DEIS.

3.5.1.2 Project Area Land Use and Zoning

Land use and zoning within the Project site is as described in the DEIS.

- Based on the new Project layout and component specifications, no height or turbine setback distance waivers will be necessary from the Town of Clinton, NY.
- Based on new Project layout and component specifications, no height or turbine setback distance waivers will be necessary from the town of Ellenburg, NY.

3.5.1.3 Agricultural Land

Clinton County has a total of 14 designated agricultural districts, and portions of four districts (Districts 00, 03, 10, and 66) occur within the revised Project site boundary. Approximately 56% of the Project site (including significant areas of managed forest land) is located within these districts. Agricultural land use is a significant component of the Project site with approximately 2,735 acres of the 18,520-acre area (15%) in row crops, field crops, or pastureland.

There were two errors in Section 3.5.1.3 of the DEIS. It was originally reported that there are 11 designated agricultural districts in Clinton County, when in fact there are 14. Additionally, it was erroneously stated that portions of District 08 occured within the Project site; this is incorrect. District 08 lies entirely to the east of the Marble River Project site.

3.5.1.4 Future Land Use

As stated in the DEIS, aside from the proposed Project, and other proposed wind power projects, future land use patterns in Clinton County are anticipated to remain largely unchanged for the foreseeable future.

3.5.2 Potential Impacts

The proposed Project will be in conformance with local zoning, but will have impacts on land use. These will include temporary, construction-related impacts, as well as permanent impacts (operation related). These impacts are summarized below.

3.5.2.1 Construction

Construction-related disturbance to agricultural land will total approximately 266 acres (of which 219 acres will be restored to agricultural use). Along with this direct impact to agricultural land, movement of equipment and material could result in damage to growing crops, damage to fences and gates, damage to subsurface drainage systems (tile lines), and temporary blockage of farmers' access to agricultural fields. However, wind turbines and associated facilities have been located so as to minimize loss of active agricultural land and interference with agricultural operations.

Construction activities could have a similar temporary impact on forest management/timber harvest activities, as described in the DEIS. In addition, construction will result in clearing of approximately 484 acres of forestland. Construction impacts to forestland have also been minimized by siting turbines in previously disturbed areas and using the existing network of forest roads, log landings, and skid trails to accommodate proposed access road and interconnect routes. Improvements to existing roads to accommodate construction activity will ultimately enhance access to these properties for future forest management activities.

3.5.2.2 Operation

At the time of the DEIS, it was anticipated that the Applicant would request a variance from the Town of Clinton to exceed the maximum allowable structure height of 400 feet. However, the currently proposed Gamesa G87 turbine is smaller than the previously proposed G-90, and conforms to the existing ordinance (i.e., maximum height is 399 feet).

Only minor changes in land use within the Project site are anticipated as a result of Project operation. The 109 turbine sites, substation, and other ancillary facilities represent the cumulative conversion of approximately 163 acres of land from agricultural land, meadow/brushland, or forest land to developed land use. Only 15 acres of developed land will be impacted by the Project, but these impacts will be confined to the properties of participating landowners, and largely temporary in nature (construction activity).

See discussion in Section 3.5.2.2 of the DEIS for additional information on operational impacts to land use.

3.5.3 Proposed Mitigation

Mitigation for impact to land use and zoning is as described in the DEIS.

3.6 Community Facilities and Services

Community facilities and services are as described in the DEIS

3.6.1 Existing Conditions

3.6.1.1 Community Facilities and Services

Existing conditions of community facilities and services is as described in the DEIS.

3.6.2 Potential Impacts

3.6.2.1 Community Facilities and Services

Potential impacts to community facilities and services is as described in the DEIS.

3.6.3 Proposed Mitigation

Proposed mitigation to community facilities and services is as described in the DEIS.

3.7 Archaeological Resources and Historic Architectural Structures

As described in the DEIS, John Milner Associates, Inc (JMA), located in Croton-on-Hudson, New York conducted a Phase 1A cultural resources survey which evaluated the potential for previously recorded and unrecorded archeological or historic resources to be present within the areas that will be potentially affected by the Project.

Since the DEIS filing, JMA has conducted a Phase 1B Archaeological Survey and a Historic Architectural Resources Survey of the Project area and vicinity. The studies were undertaken to assess the potential impacts of the Project on archaeological and historic architectural resources within the Project's Area of Potential Effect (APEs) for ground disturbance, noise, and visual effects.

Methodology and results of JMA's studies are detailed in the two supplemental cultural resource management reports, which are included in Appendix J, and are summarized in the sections below:

- *Phase 1B Archeological Survey: Marble River Wind Farm, Towns of Clinton and Ellenburg, Clinton County, New York*, dated April 2007 (Heaton, 2007); and
- *Historic Architectural Resources Survey; Marble River Wind Farm Project, Towns of Altona, Clinton, Ellenburg, and Mooers, Clinton County, New York, and Towns of Bellmont, Chateaugay, and Village of Chateaugay, Franklin County, New York,* dated April 2007 (Traum and Klein, 2007).

The cultural resources studies are intended to assist the Towns of Clinton and Ellenburg in evaluating the potential effects of the Project on archeological sites and/or historic properties in accordance with their obligations under SEQRA. Consultation about the Project was initiated with SHPO at a January 17, 2006 meeting at the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP). Consultation with the USACOE is also anticipated under Section 106 of the National Historic Preservation Act of 1966, as amended.

The studies were conducted in compliance with the New York Archaeological Council (NYAC) *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (NYAC, 1994) and the New York State Historic Preservation Office's (SHPO's) *Guidelines* *for Wind Farm Development Cultural Resources Work* issued in January 2006. The studies were also conducted to assist in compliance with Section with Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended. The reports were submitted to SHPO by letter dated June 26, 2007 (see Appendix G) and are currently under review.

3.7.1 Existing Conditions

Based on the recommendations of JMA and the NYSOPRHP, the Applicant submitted a Phase 1B Archeological Survey and a Historic Architectural Resources Survey on June 26, 2007. The purpose of the Phase 1B survey is to locate previously unrecorded archeological sites that may be present in the Project's APE, and determine if any such sites could be affected by Project-related construction or operation. In addition, a Historic Architectural Resources Survey was prepared to identify architecturally and historically significant properties that might be affected by construction and operation of the Project and evaluate the possible impacts.

For purposes of the supplemental studies, the overall Project site was considered to be located on 130 parcels of leased private land totaling 18,520 acres of farmland and forest areas, although the actual APE for direct ground disturbing activities will be only 328.5 acres. The APE for direct, ground-disturbing activities includes the proposed locations of wind turbines, the substation, staging areas, access roads, overhead electric line right-of-way, and buried electrical interconnects. For the architectural survey and visual impact assessment purposes, a Study Area was established within a five-mile radius of the perimeter of the Project site within the United States.

The Phase IB Survey included a combination of pedestrian surface surveys in cultivated areas and the excavation of shovel tests in wooded or idle areas. In order to determine the appropriate level of effort (LOE), JMA conducted a detailed examination of 2003 Digital Ortho Quadrangle Quarters (DOQQs), to identify existing conditions within the Project site and these findings were verified through field reconnaissance efforts. In addition, per the SHPO Guidelines, a GIS based landscape classification analysis was conducted in order to identify and appropriately sample different environmental zones. Based on these results, JMA determined that a LOE consisting of 3,912 shovel tests (equivalent to approximately 244.5 acres) and a pedestrian surface survey of approximately 84 acres would be appropriate.

The Historic Architectural Resources Survey included a determination of the Project viewshed by utilizing USGS digital elevation model (DEM) data (7.5 minute series) and the ArcView Spatial Analyst computer program. Actual visibility was evaluated in the field by means of a balloon test. Helium-filled balloons were raised to a height of 410 feet at four of proposed turbine locations, thereby providing a location and scale reference for verification of turbine visibility and to obtain photographs used in the development of visual simulations. JMA also conducted in-field architectural surveys to identify potentially significant architectural and historic properties within the Project's APE that have not been previously identified, verify the current condition of previously recorded NRHP/SRHP and NRHP/SRHP-eligible properties, and evaluate previously recorded but unevaluated properties.

3.7.1.1 History of the Project Area

History of the Project site is as described in the DEIS.

3.7.1.2 Previously Recorded Cultural Resources

Previously recorded cultural resources is as described in the DEIS.

3.7.1.3 Sensitivity Assessment and Recommendations

No Native American prehistoric sites were identified within the Project site during the Phase 1B archeological survey. However, the Phase 1B archeological survey resulted in the identification of thirteen historic archeological sites that are located within the Project site. Of these, JMA determined three sites that have the potential to be impacted by Project components (see below).

JMA also documented ten historic archeological sites that are located within the Project site, but are not located in the immediate vicinity of any proposed Project components and/or will not be impacted by Project components. These sites are all foundation remains of nineteenth-century farms, houses, or commercial structures that are depicted on historic atlases of the area. The Project layout will not result in impacts to any of these sites.

The Historic Architectural Resources Survey identified seventy three historic properties within the Project's 5-mile viewshed (Appendix J, Table 2, Figure 1). Of these properties, twenty eight were located within 2 miles from a Project facility, seventeen were located between 2 and 3.7 miles of a Project facility, and the remaining twenty eight were located more than 3.7 miles from a Project facility. These properties consisted of NRHP/SRHP-listed properties, properties previously determined by OPRHP to meet NRHP/SRHP eligibility criteria, or properties inventoried and/or evaluated by JMA which in the opinion of JMA, satisfy NRHP/SRHP eligibility criteria,

3.7.2 Potential Impacts

The Phase IB Archeological Survey identified three sites which have potential to be impacted by the Project. These include:

1. The Clinton Mills Site is located north of Clinton Mills Road approximately two miles east of Churubusco. Project components in the vicinity of this site include the use of Rogers Road (an existing gravel-paved road) as an access road and the overhead electrical line running parallel to (west of) Rogers Road.

2. The former route of the Ogdensburg & Lake Champlain railroad traverses the Project site west-to-east on the north side of Clinton Mills Road, and turns southeast at Clinton Mills/Rogers Road and crosses to the south side of Clinton Mills Road. The layout for the Project includes the use of approximately 6,715 feet along the former railroad route extending southeast from Clinton Mills for the route of the overhead electrical line.

3. The Merchia Road Site includes a cellar hole/house foundation, stone-lines well, and barn foundation with an additional attached well. A proposed access road to a wind turbine generator (WTG 172) passes approximately 30-feet east if the cellar hole and well. No archeological features or notable concentrations of artifacts were documents within the route of the proposed access road.

Results from The Historic Architectural Resources Survey indicate that after taking into account moderating effects of distance, seasonality of views, and observer orientation in relation to the affected property, fifteen identified properties will incur significant adverse impacts visual impacts (i.e. likely to have some portion of their visual context affected on a year-round basis). An additional thirty four properties will be adversely affected to a lesser extent (e.g. effects will be moderated by distances, and/or the presence of intervening forest cover, and/or landscaping and/or structures), and twenty four will not be adversely affected because views of these properties from public rights-of-way will not include views of the Project.

Views of and from the one NRHP/SRHP listed property within the study area (portions of the Adirondack Forest Preserve) will not be affected by the Project.

3.7.3 Proposed Mitigation

As a result of Project layout changes and additions that occurred subsequent to the Phase 1B survey fieldwork, the revised archeological APE for the final Project layout is larger (367.5 acres) than the level of effort expended during the Phase 1B survey (equivalent to 328.5 acres). JMA recommends that a supplemental Phase 1B archeological survey be conducted to assess the additional area of the APE, which would be equivalent to a supplemental level of effort of approximately 624 shovel tests. This study is ongoing and results will be submitted as part of the Final Environmental Impact Study (FEIS).

JMA recommends that the majority of supplemental field work be conducted in areas within the overhead electrical right-of-way. Specifically, they recommend supplemental Phase 1B archeological fieldwork be conducted within the portions of the Clinton Mills Site where Project facilities are proposed to be located to better document the presence of foundations and other features associated with the site and determine whether subsurface archeological deposits are present. JMA recommends that the construction of the overhead electrical line should include measures to avoid permanent demolition or obstruction of the Ogdensburgh & Lake Champlain Roailroad and provisions to restore and maintain the present condition of the former route. In addition, based on guidance from JMA, the developer (Marble River LLC) has redesigned the proposed access road in the vicinity of the Merchia Road site 50 feet to the east in order to avoid foundation remains.

In order to mitigate the Project's adverse impacts to historic properties, the applicant will evaluate the following actions:

1. Identify an existing building within the study area which does not presently meet NRHP/SRHP eligibility ands restore it in accordance with the Secretary of the Interior's Standards, and use it as a Project office and/or visitor center.

2. Directly undertake or provide financial support for the restoration/maintenance of local historic cemetery(s)

3. Conduct historical research, and prepare an NRHP nomination for the immaculate Heart of Mary Catholic Church.

4. Undertake comprehensive property inventories for the Towns of Clinton and the Towns of Ellenburg, expanding on recent surveys and analyses conducted for this project and others.

5. Prepare local history/archeology curriculum modules for use by local schools.

6. Prepare local history exhibits for display in libraries or other public buildings.

7. Prepare a Cultural Resources Management Plan for the Towns of Clinton and Ellenburg.

3.8 Visual Resources

Since completion of the DEIS, a supplemental Visual Impact Assessment (SVIA) was prepared by EDR (see Appendix K). The SVIA evaluates potential visibility of the currently proposed turbines and their visual impact relative to the originally proposed Project. The SVIA also addresses the visibility and visual impact of the proposed 34.5 kV overhead collection line and the substation, and includes supplemental simulations to address visual impact on historic resources and other concerns.

3.8.1 Existing Conditions

Existing visual and aesthetic resources within the 5-mile radius visual study area were identified as part of the original VIA conducted by EDR (DEIS Appendix K). Existing visual/aesthetic components of the visual study area are as described in the original VIA and DEIS, except as noted below.

3.8.1.1 Landscape Similarity Zones

Three distinct landscape similarity zones (LSZ) were defined in the original VIA. These included the Rural/Agricultural Zone, Village/Hamlet Zone, and Forestland Zone. The general landscape character of these zones is as described in the DEIS. However, the SVIA defines a fourth LSZ (Water/Waterfront Zone) which is described below:

The Water/Waterfront LSZ includes Lower Chateaugay Lake, the Chateaugay River, Lake Roxanne, and areas of open water (ponds and wetlands) in the northeastern portion of the Project site. This zone includes the shorelines of these waterbodies, as well as the open water itself. The character-defining component of this LSZ is the presence of open water as a dominant foreground element in the view. The open water provides interest to views in this zone also provides opportunities for unobstructed views of midground and background features of the surrounding landscape. The recreational use some of these water bodies receive makes sensitivity to visual quality and visual changes in this zone generally high. However, views of the proposed Project will be very limited from these areas due to their valley location, the screening provided by surrounding hills and trees, and/or their distance from the Project.

The approximate location of the four landscape similarity zones has been mapped within the U.S. portion of the 5-mile radius study area, and is presented in Figure 4 of the SVIA (Appendix K).

3.8.1.2 Viewer/User Groups

Viewer/user groups identified and described in the original VIA and DEIS included Local Residents, Commuters/Through Travelers, and Tourists/Vacationers. No addition viewer groups were identified in the SVIA.

3.8.1.3 Visually Sensitive Resources

Scenic resources of statewide and local significance are described in the original VIA. Visually sensitive resources not described in the original VIA (because they were not known at the time that study was prepared) include the following:

Sites eligible for listing on the National or State Register of Historic Places Along with the single Register-listed site described in the original VIA (the Adirondack Park), an architectural survey conducted by John Milner Associates (JMA) identified an additional 72 sites within the 5 mile radius topographic viewshed of the Project that could be considered eligible for listing on the National Register of Historic Places (Traum and Klein, 2007). One of these is the railroad berm of the former Ogdensburg & Lake Champlain Railroad. Of the remaining 71 properties, 22 are part of concentrations that are, in the opinion of JMA, potential historic districts. These concentrations occur in the hamlets of Frontier and Ellenburg Depot, and in small potential rural historic districts along Sancomb Road in the Town of Chateugay and Green Valley Road in the Town of Mooers. The locations of these sites are shown in Figure 6 of the Architectural Survey Report (Appendix J).

The locations of visually sensitive resources within the visual study area are illustrated in Figure S24 and in large-scale viewshed maps included as Appendix B to the SVIA (Appendix K).

3.8.2 Potential Impacts

3.8.2.1 Construction

Visual impacts during construction will be as described in the DEIS. Forest clearing for the 34.5 kV overhead collection line ROW will be visible from sections of Clinton Mills Road, Route 189, Route 11, LaFrancis Road, and Gagnier Road. Temporary wood pole crossing structures (“rider poles”) may be installed at the overhead line crossings of Clinton Mills Road, Route 11, Gagnier Road and LaFrancis Road. However, the patchwork of fields, woodlots, and hedgerows that characterize the study area will minimize the visual impact of the ROW clearing. Clearing, earthwork, and other activity associated with construction of the substation will be visible from Patnode Road at the location of the existing NYPA 230 kV transmission line crossing. As with the visual impact of turbine construction, these impacts will be temporary.

3.8.2.2 Operation

Impacts to visual resources resulting from Project operation were evaluated primarily through the SVIA prepared by EDR (see Appendix K).

The VIA procedures utilized in this study were similar to those used in the original VIA and described in the DEIS. The only differences in methodology were 1) additional viewshed analysis (including preparation of a turbine count viewshed, vegetation viewshed, cumulative wind power Project viewshed and overhead collection line viewshed), 2) the addition of animation to show the appearance of the turning rotor in two simulations, and 3) preparation of overhead collection line and substation simulations. Descriptions of the techniques used in the preparation of these components of the study are summarized in the discussion below and presented in detail in Appendix F of the SVIA.

3.8.2.2.1 Viewshed Analysis

Revised topographic viewshed maps for the Project were prepared based on the revised turbine layout and dimensions (399 foot maximum height rather than 410 feet). Two 10-mile radius topographic viewsheds were mapped, one to illustrate "worst case" daytime visibility (based on a maximum blade tip height of 399 feet above existing grade) and the other to illustrate potential visibility of turbine lights (based on a nacelle height of 262 feet above existing grade). Methodology for these analyses were as described in the original VIA and DEIS.

In addition, a turbine count analysis was performed to better identify how many wind turbines are potentially visible from a given point within the viewshed study area. This analysis was based on blade tip height and utilizes the same topographic viewshed analysis methodology described in the original VIA.

A vegetation viewshed map (based on a blade tip height of 399 feet) was also prepared to better illustrate the potential screening effect of forest vegetation. The vegetation viewshed analysis involved adding a base vegetation layer, (with an assumed elevation of 40 feet) to the digital elevation model and re-running the analysis as described in the SVIA (Appendix K).

To address concerns regarding the potential cumulative visual impact of multiple wind power projects, a cumulative viewshed analysis was prepared. To accomplish this, the 10-mile radius Marble River topographic and vegetation analyses (based on maximum blade tip height) were overlaid on the same viewshed analyses prepared for the proposed Noble wind power projects in the Towns of Clinton and Ellenburg. The viewsheds for the three projects were then plotted on a base map and areas of viewshed overlap identified.

Two separate viewshed analyses of the proposed 34.5 kV overhead collection line were also prepared (one based on topography only, the other based on topography and vegetation) using the average proposed height and specific location of poles, as provided by the Project electrical engineers (TRC). These structures range in height from 50 to 75 feet, but because design of the entire line had not been finalized, an average pole height of 55 feet was used for the viewshed analysis. Visibility within a one mile radius of the transmission line was evaluated using the same techniques described above.

Within a 5 and 10 mile radius, topographic viewshed analysis of the revised Project turbines/layout indicates that potential visibility is almost identical to that described in the DEIS. The Project now has the potential to be visible in approximately 89% of the 5-mile radius study area (as compared to 90% in the original VIA), and 81% of the 10-mile radius visual study area, disregarding the screening effect of vegetation and structures. As with the viewshed analysis included in the original VIA, areas completely screened by topography alone include the northeastern portion of the study area and valley areas around the Chateaugay River and Lower Chateaugay Lake.

In most areas where potential visibility is indicated, the turbine count analysis of the topographic viewshed suggests that views to multiple turbines could be available. In approximately 46% of the 5-mile radius study area and 40% of the 10-mile radius study area, between 76 and 109 turbines are potentially visible. Sites with potential views of the most turbines are typically concentrated in the central portion of the 5-mile radius study area and in two broad northeast-southwest oriented bands within the 5-10 mile ring. Views from valley bottoms, ravines, and the backsides of hills and ridges (11% of the 5-mile radius area and 19% of the 10-mile radius visual study area) are indicated as being fully screened by topography (i.e., no turbines are visible).

Areas of potential nighttime visibility (assuming all turbines are lighted) cover approximately 86% of the 5-mile radius study area (as compared to 85% in the original VIA), and 77% of the 10-mile radius visual study area. Potential nighttime visibility occurs in the same general areas where potential daytime visibility is indicated.

Factoring vegetation into the viewshed analysis significantly reduces potential Project visibility. Within the 5-mile radius study area (excluding Canada), vegetation, in combination with topography, will serve to screen the Project from approximately 69% of the area (i.e., potential visibility is limited to 31% of the area). Within the 10-mile radius study area vegetation and topography will block views from 83% of the area (i.e., 17% potentially visible). Visibility will essentially be restricted to open field and wetland areas, which are concentrated in the immediate vicinity of the turbines, as well as a northeast-southwest oriented band on the east side of the study area (from south of Ellenburg Center to north of Ellenburg Depot) and some sizeable areas east of Route 374 in the western portion of the study area. Almost the entire 5 to 10 mile ring (95%) is shown as being screened from view of the Project by vegetation and topography. Most of the sensitive sites within 5 miles of the Project are indicated as being screened from view by vegetation and topography, except the hamlets of Churubusco, Ellenburg Corners, and Ellenburg Center, Roxanne Lake, isolated State Forest Preserve parcels, and significant portions of Routes 11 and 189. Sensitive sites within 10 miles, including all Forest Preserve land in the Adirondack Park are indicated as being fully screened from view by vegetation and topography.

The cumulative topographic viewshed analysis of the proposed Marble River and Noble projects indicates that within the area of overlapping 10-mile radius viewsheds, approximately 69% of the area has the potential to see one or more turbines from each Project. Areas completely screened from views of all turbines by topography alone are limited to the valleys and backside of hills in the southwestern portion of the overlapping study areas (in the Adirondack Park) and the backside of a major ridge in the Canadian portion of the study area to the northeast. Steep ravines and river valleys in the western portion of the study area are also indicated as being fully screened from view by topography. Factoring vegetation into this analysis reduces potential cumulative visibility (i.e., areas where at least one turbine from each project can be seen) to 9% of the overlapping 10-mile study areas. These areas of potential cumulative visibility are concentrated in open fields and wetlands in close proximity to the projects, and in some broader open areas to the northwest and southeast (similar to the results of the vegetation viewshed for the Marble River Project alone). In addition, the Project sponsor anticipates that less than 50 of the 109 turbines will need to have FAA obstruction warning lights. This being the case, and because the screening effect of forest vegetation was not considered in the nighttime viewshed analysis, nighttime visibility is also anticipated to be significantly less than indicated by the viewshed analysis.

Areas of actual visibility within the visual study area are anticipated to be much more limited than indicated by the viewshed analyses. This is due to the slender profile of the turbines (especially the blades, which make up the top 139 feet of the turbine), their light color, and screening provided by structures, street trees, and hedgerows, which are not considered in the viewshed analyses.

Topographic viewshed analysis of the overhead collection line poles indicates that almost the entire area within one-mile of the line (i.e., 97%) could have views of one or more of the proposed poles. The only areas excluded from this viewshed are the back side of some hills/ridges along the Canadian border. Vegetation viewshed analysis of the overhead collection line poles indicates that forest vegetation will decrease areas of potential visibility to approximately 38% of the area within a mile of the proposed line (i.e., within a 2-mile wide study corridor). These areas are typically open agricultural fields and wetlands that are interspersed with forest throughout the entire corridor.

3.8.2.2.2 Cross Section Analysis

Four representative line-of-sight cross sections were cut through the study area to further evaluate potential visibility of the revised layout and currently proposed turbines. Revised cross section analysis is generally consistent with the results presented in the original VIA. Section A-A' is the most different, due to the loss of two turbines along this line. The result is that potential visibility from Jones Road and the hamlet of Churubusco is somewhat reduced. Slight turbine shifts along cross sections B-B' and C-C' do not significantly change visibility as described in the original VIA, and cross section D-D' is completely unchanged. Between 67% (Section C-C') and 94% (Section D-D') of each section shows ground level views being screened by topography, vegetation or structures. Potential Project visibility from sensitive sites along the section lines is as described in the original VIA and DEIS.

3.8.2.2.3 Field Verification

No additional ballooning was conducted for the revised Project layout. Results of the original ballooning exercise remain valid since most of the turbines are in roughly the same locations, and only 10 feet shorter than the height to which the balloons were raised. Because they included a known location and scale reference (the balloons) the photographs obtained during the original ballooning exercise were suitable for use in the development of revised visual simulations.

Supplemental field review was conducted on March 21, 2007 to obtain photographs and GPS coordinates from areas with potential views of the overhead transmission line and substation, as well as from additional sites of concern identified during the public comment period or by the Project cultural resource consultants. The purpose of this exercise was to evaluate potential Project visibility from these sites, and obtain data necessary for the subsequent development of photo simulations/renderings. The techniques utilized to obtain this data were described in the original VIA and DEIS.

Based on the results of supplemental field review it appears the views of the Project from these sites will be highly variable. Field review of the Gulf State Unique Area confirmed that views of the proposed Project will almost always be screened by topography and/or forest vegetation. The only exception would be from the very edge of this area where it borders the Project site. However, even in this location trees provide partial screening, and lack of public trails or roads limit viewing opportunities.

Views from several locations in the historic Clinton Mills area were also essentially restricted to the open Clinton Mills Road corridor. The same was the case for views from the historic communities of Frontier, Ellenburg Depot, and the potential rural historic districts in the Towns of Mooers and Belmont. Views from several historic structures identified by JMA were found to be significantly screened.

Sensitive sites with clear views of the Project include Lyon Mountain, portions of the Clinton Mills area (including the Ogdensburg and Lake Champlain Railroad), and portions of

Ellenburg Center. It is worth noting that unobscured views toward the Project site from Lyon Mountain are only available from elevated areas such as the fire tower and large boulder outcrops. The majority of the views to the north from this site are screened by dense conifers.

Field review also indicated that views of the proposed overhead collection line and substation will generally be limited to those locations described in Section 3.8.2.1.

3.8.2.2.4 Visual Simulations

The 10 viewpoints selected to show representative views of the Project in the original VIA were also used to illustrate the revised Project. In addition, several new viewpoints were selected to address concerns regarding visual impact on historic structures, and to illustrate and evaluate the proposed overhead collection line and substation. Views from the newly-defined water/waterfront LSZ were not simulated because views of the Project from publicly-accessible sites within this zone are extremely limited. Locational information for these new viewpoints, and the reasons for their selection, are described below.

Viewpoint 26 - View from the intersection of Carlson Road and Hill Road in the hamlet of Ellenburg Center. Closest open view in the vicinity of the historic Ellenburg Town Hall.

Viewpoint 36 - View from Ryan Road near the intersection with State Route 190 (Star Road). In the vicinity of three identified historic properties in the Town of Ellenburg. An open view that will include foreground and background turbines.

Viewpoint 196 - View to the north from the fire tower on Lyon Mountain in the Adirondack Park. Replaces the “virtual view” included in the original VIA and responds to requests from the NYS Department of Environmental Conservation and NYS Department of Public service to include an open view from the Park, and Lyon Mountain in particular.

Viewpoint 203 - View of the proposed overhead collection line from Clinton Mills Road. The Clinton Mills area has been identified as a potentially Register-eligible historic district by JMA.

Viewpoint 205 - Former Ogdensburg & Lake Champlain (O&LC) Railroad, where it intersects Clinton Mills Road. Register-eligible historic site in the Clinton Mills area.

Viewpoint 207 - View from Frontier Road in the Town of Clinton. Typical view toward the Project site from the historic hamlet of Frontier.

Viewpoint 210 - View from Route 189 in the Town of Clinton. View will include foreground views of a turbine and the overhead collection line.

Viewpoint 212 - Proposed location of the overhead collection line crossing of Route 11. Foreground view from the Military Trail Scenic Byway.

Viewpoint 217 - View toward the proposed substation site from Patnode Road in the Town of Ellenburg. Closest, most open publicly available view of the substation. View will also include foreground and background turbines.

As in the original VIA, Viewpoints 8, 34, and 74 were chosen for development of cumulative simulations, because they will have views of turbines from both the Marble River Project and the proposed Noble wind power projects in the Towns of Clinton and Ellenburg. Revised cumulative simulations were prepared for each of these viewpoints. In addition, the view from Lyon Mountain (Viewpoint 196) was used for development of a long-distance cumulative simulation from the Adirondack Park, in accordance with agency requests, and animation was added to the simulations from Viewpoints 3 and 36 to illustrate the motion of the turning rotor.

The techniques used in preparing the simulations are as described in the DEIS, except that the modeled turbine is the Gamesa G87, rather than the Gamesa G90. Simulations of other Project components that have been defined since completion of the original VIA (i.e., overhead collection line and collection substation) were prepared using photographs and GPS coordinates collected in the field, along with locational and dimensional data/specifications provided by the Project electrical engineer. Specific assumptions, techniques and computer software used, are as described in the original VIA.

Revised simulations from each of the original 10 viewpoints as well as the supplemental viewpoints described above are shown as Figures 10-31 in Appendix K. A representative subset of these images is illustrated in Figure S25.

3.8.2.2.5 Visual Impact Evaluation

The same in-house panel of three landscape architects that evaluated the Project in the original VIA was asked to evaluate the revised and supplemental simulations prepared for the SVIA. For the 10 viewpoints that were evaluated in the original VIA, the panel was asked to compare the revised simulations with those prepared for the VIA to determine if Project changes altered their previous conclusions. For new viewpoints that were not addressed in the original VIA, the panel compared simulations of the currently proposed facilities (turbines, overhead collection line and substation) with photos showing the existing view for each viewpoint. The purpose of this evaluation was 1) to determine if the revised turbine layout changed their previous assessment of impact from viewpoints evaluated in the VIA, 2) describe the type and extent of visual impact likely to result from construction of the proposed overhead collection line and substation, and 3) evaluate the type and extent of visual impact that will occur at newly identified sites within the visual study area. Details of the visual impact assessment procedures and results are included in Appendix K.

Composite scores for the revised simulations ranged from 1.0 to 3.79, with eight of the 10 original viewpoints (80%) having a composite score below the midpoint of 3.0 on the scale of 1 to 5. With the exception of Viewpoints 81 and 179, where contrast ratings went down significantly due to removal of foreground turbines from the view, scores for the revised simulations are very similar to those from the original VIA, and generally indicated a continued low to moderate level of visual contrast.

The new turbine simulations prepared for this SVIA also indicate a high degree of variability in potential visual contrast/impact. Composite ratings for these viewpoints ranged from 1.0 to 3.79. The lowest rating was received by Viewpoint 207, and is attributable to the significant tree screening that almost fully blocked views of turbines from this location. The highest rating was received by Viewpoint 36, due to the combination of foreground turbines, numerous turbines across the full field of view, lack of other vertical or man-made elements in the view, and lack of any foreground screening.

Revised and new cumulative simulations showed a similarly high degree of variability (see Table 4). Views with a limited number of visible turbines (Viewpoint 74) or where the turbines were viewed at great distance (Viewpoint 196) received low contrast ratings. Conversely, viewpoints that included numerous turbines at foreground and mid-ground distances (Viewpoints 8 and 34) received high contrast ratings. The cumulative simulation from Viewpoint 34 received a high contrast score due to the number of turbines visible, their relative proximity and expanse across the view, in combination with superior viewer perspective and complete lack of foreground screening.

Contrast ratings for the overhead collection line and substation views indicate that the overhead collection line, on its own, will have low to moderate visual impact. The higher contrast rating received by Viewpoint 210 (see Table 5) relates primarily to the presence of a new foreground turbine in the view. The relatively modest height of the poles and their natural color minimize contrast with existing landform, vegetation, and roadside utility lines. The patchwork of fields, woodlots and hedgerows that characterize the study area minimize the impact of ROW clearing. Forest vegetation and level topography also limit the availability of long distance views of the line or the cleared ROW corridor. The substation, on the other hand, represents a significant visual change. It presents strong contrast in line, color, texture, form and scale with existing features of the landscape. The extent of the visual impact directly relates to the proximity of the proposed substation to the viewer and the lack of foreground screening to block the view. However, this impact is limited by the fact that the simulation represents essentially the only open, publicly available view of the substation, and is located on a lightly used seasonal Town road.

The panel's review of the animated simulations from Viewpoints 3 and 36 indicate that movement of the rotor blades did not significantly change the contrast rating received by these simulations. However, their motion, in combination with their scale, did increase the visual impact of foreground turbines in these views.

3.8.2.2.6 Assessment of Shadow Flicker

In addition to the SVIA prepared by EDR, a revised assessment of shadow flicker was conducted by TRC (see Appendix K). As in the original analysis, this assessment was conducted using the WindPRO Version 2.5 model. TRC used the following data to evaluate potential impacts related to shadow flicker:

- Turbine locations (X, Y and Z coordinates)
- Location, elevation and orientation of shadow flicker receptor (residences)
- USGS Digital Elevation Model (DEM) terrain data (height contours)
- Turbine rotor diameter
- Turbine hub height
- Wind direction frequency distribution
- Monthly sunshine frequency
- Solar angle model to accurately calculate angle of the sun throughout the day

An initial screening of the turbines and receptors was performed to determine the distance between each receptor and each wind turbine. Potential receptors that were beyond 1,000 meters of any turbine were omitted from the analysis because there would not be any perceptible effect at those receptors. Conversely, turbines that were not within 1,000 meters of any potential receptor were omitted from the analysis because there would not be any perceptible effect created by those turbines. A total of 87 wind turbines and associated potential receptors were grouped into four clusters to facilitate modeling.

Based on the WindPRO modeling results, it was determined that a total of 11 receptors could potentially experience shadow flicker more than 25 hours per year, with a maximum of 37 hours per year at one receptor. These receptors are predominantly located along Route 189 between proposed wind turbine locations to the east and west, along Merchia road near wind turbines to the south, and at several individual receptors along Looby Road, Campbell Road, and Patnode Road. A map depicting these 11 receptor locations is included as Figure 3 in the Shadow Flicker Modeling Report in Appendix K.

Model assumptions and factors that would further reduce/mitigate potential shadow flicker impacts at receptor sites are as described in the DEIS.

3.8.3 Mitigation

Visual mitigation measures that have been incorporated into the Project, or otherwise committed to, are as described in the DEIS. As stated in that document, mitigation options are limited, given the nature of the Project and its siting criteria. In accordance with DEC Program Policy, (NYSDEC, 2000) various mitigation measures were evaluated in the original VIA and DEIS. Beyond those, other proposed mitigation measures include the following:

A. Color. The feasibility of using of naturally weathering Corten steel structures in the substation will be evaluated. These would match the proposed treated wood collection line poles and blend better with the forest vegetation that provides a backdrop in views of the substation.

B. Screening. The feasibility of installing screen plantings to minimize the visibility and visual impact of the substation will be evaluated. Because the existing NYPA 230 kV transmission line may limit the placement and height of any vegetative screening, plantings of low-growing trees along the road edge would be most effective in screening views.

C. Relocation. As indicated by the rating panel's overall reaction to the revised simulations, turbine relocation did not significantly alter the visual impact of the Project as a whole.

D. Nonspecular Materials. Non-specular conductor will be used on the overhead collection line. Galvanized steel utilized for the meteorological towers and substation equipment will rapidly weather to a non-reflective gray color.

E. Lighting. The Applicants proposed lighting plan calls for fewer than 50 of the 109 turbines to be lighted. In addition, the feasibility of a shading device for the FAA warning lights on the turbines will be examined. If it does not compromise safety, lights at the substation will be turned on only as needed (i.e., by switch and/or motion detector).

F. Off-sets. In accordance with the recommendations of the Project cultural resources consultant, off-set type mitigation for potential visual impacts on historic sites will be explored. Such mitigation could include the following:

   - Identify an existing historic building within the study area which does not presently meet National Register eligibility because it has lost integrity, restore it in accordance with the Secretary of the Interior's Standards, and use it as a Project office and/or visitor center.

   - Directly undertake or provide financial support for the restoration/maintenance of local historic cemeteries.

G. Shadow Flicker. Further evaluation of the 11 receptors that could receive more than 25 hours of shadow flicker annually will be undertaken to determine whether mitigating circumstances are present at these specific locations. A case-by-case evaluation will include, but not be limited to, determination of the nature receptor itself (i.e., is the receptor an inhabited residence or a generally vacant structure), an assessment of vegetation and intervening obstacles that may block the impact, and the orientation and location of windows relative to the turbines.

3.9 Climate and Air Quality

Climate and air quality are as described in the DEIS.

3.9.1 Climatic Conditions

Climatic conditions are as described in the DEIS.

3.9.2 Air Quality

Air quality is as described in the DEIS.

3.9.3 Potential Impacts

Potential impacts to climate and air quality are as described in the DEIS.

3.9.3.1 Potential Short-Term Impacts

Potential short-term impacts to climate and air quality are as described in the DEIS.

3.9.3.2 Potential-Long Term Impacts

Potential long-term impacts to climate and air quality are as described in the DEIS.

3.9.4 Proposed Mitigation

Proposed mitigation is as described in the DEIS.

3.10 Noise

3.10.1 Existing Conditions

Existing conditions of noise is as described in the DEIS.

3.10.1.1 Background Sound Level Survey

Background sound level survey is as described in the DEIS.

3.10.1.2 Site Description and Sound Level Measurement

Site description and sound level measurement is as described in the DEIS.

3.10.1.3 Background Measurement Results

Background measurement results are as described in the DEIS.

3.10.2 Potential Construction Impacts

Potential construction noise impacts are as described in the DEIS.

3.10.3 Potential Operational Impacts

Potential operational impacts of noise are as described in the DEIS.

3.10.3.1 Turbine Noise Level

Turbine noise level is as described in the DEIS.

3.10.3.2 Assessment Criteria

Assessment criteria is as described in the DEIS.

3.10.3.3 Noise Modeling

Subsequent to the DEIS, an updated noise modeling study was performed based on current turbine locations and the revised substation location.

3.10.3.4 Modeling Results

Because there are numerous residences within the 45 dBA contour, particularly in the western part of the site along Route 189, Route 11, Star Road, and other smaller roads, a Second Level Noise Impact Evaluation is required as outlined in the NYSDEC guidance document.

The Second Level noise model considers the actual circumstances of the site including any attenuation that might be afforded by such factors as terrain, vegetation, or man-made barriers. In this case, the only additional propagation loss factor that is warranted is the inclusion of ground absorption. The site terrain is sufficiently flat that it has no features that would appreciably influence sound propagation, so no terrain effects have been considered in the model. Additionally, wooded areas were neglected, even though they are fairly extensive.

The results of the Second Level noise model are shown in Plot 1 of Appendix L. The condition shown is for an omnidirectional 8 m/s wind, which is associated with the maximum turbine sound power level. As described in the DEIS, a residual background sound level of 40 dBA can be expected during such a wind condition. Given this background level, the NYSDEC 6 dBA cumulative increase threshold for Project noise would be 45 dBA. Therefore, the 45 dBA sound contour defines the area of concern that potentially might be impacted.

This plot represents a more realistic, but conservative, view of what can be expected with all turbines operating at their maximum noise point and shows that the areas above 45 dBA are much more localized around the turbines and are non-continuous. Plots 2A through 2C in Appendix L are enlargements showing all residences believed to be within the 45 dBA to 47 dBA contour lines. Plots 1A and 1B show 24 residences where sound levels could be 45 to 47 dBA. Table 3.10.2.4-1 shows these locations. Of these, most are located on or just inside of the 45-dBA contour line where the turbine noise above normal background levels is unlikely to be particularly noticeable. Only four residences, 02 and 27 in Plot 1A and 11 and 12 in

Plot 1B, are located in areas where their theoretical exposure is 48 dBA or greater. It is important to note that all four of these properties are Project participants. It is likely that sound from the nearest turbine will be audible when outside these homes and when wind and atmospheric conditions favor noise propagation from that turbine towards the house. However, continuous audibility seems unlikely given the conservative assumptions inherent in the model. In addition, because noise reduction afforded by any common residence is at least 15 to 20 dB with the windows closed, operational sounds from the Project would be inconsequential, if not completely inaudible, inside any residence in the site area. The local ordinance limit of 50 dBA will not be exceeded at any residence and therefore the Project will be compliant with the noise provision of the Local Laws.

Table 3.10.3.4-1: Residences Where Project Sound Levels May be above 45 dBA

Identification Number	Address/Location	Project Participant Status
01	52 Nichols Road, Clinton, NY	Yes
02	AES-EHN NY Windpower, Route 189, Churubusco, NY	Owned by Project
03	6649 Route 11, Clinton, NY	Yes
04	Gagnier Road, Churubusco, NY	Yes
05	228 Route 189, Churubusco, NY	Yes
07	Patnode and Gagnier Road, Churubusco, NY	Yes
08	Campbell Road, Churubusco, NY	Yes
09	7909 Starr Road, Churubusco, NY	No
10	Star Road, Ellenburg NY	Yes
11	876 Route 198, Clinton, NY	Yes
12	238 Liberty Pole Road, Clinton, NY	Yes
13	Patnode Road, Churubusco, NY	No
14	Liberty Pole Road, Churubusco, NY	Yes
15	6977 Route 11, Clinton, NY	No
16	6985 Route 11, Clinton, NY	Yes
17	157 Route 189, Clinton, NY	No
18	206 Route 189, Clinton, NY	Yes
19	Route 189, Clinton, NY	Yes
20	Route 11, Clinton, NY	Yes
22	238 Liberty Pole Road, Clinton, NY	Yes
25	6922 Route 11, Clinton, NY	No
26	293 Gagnier Road, Clinton, NY	Yes
27	327 Gagnier Road, Clinton, NY	Yes
28	444 Gagnier Road, Clinton, NY	No

3.10.3.5 Potential Transformer Noise Impacts

Since the DEIS, the location of the Project substation was moved to a remote area approximately 325 feet east of Patnode Road directly adjacent to the northern boundary of the New York Power Authority 230 kV Willis-Plattsburgh transmission line right of way.

The most notable source of noise within the substation is a single 34.5–230 kV step-up transformer. The noise produced by the step-up transformer was modeled in the updated Noise Modeling Study (Appendix L) which determined that the change in substation location has had no affect on potential noise impacts. Therefore no adverse noise effects are expected.

3.10.3.6 Noise Impacts to Historic Places

Ambient noise levels were found to be generally consistent throughout the Project vicinity and the developed residual macro-area ambient level representative for the entire Marble River area is estimated to be 40 db(A) when the wind speed is 8 m/s^3. JMA reports that none of the historic structures, districts, or potential districts in the Project site are expected to exceed ambient levels by more than 5 db(A) and therefore, noise impacts at historic places will be negligible.

3.10.4 Proposed Mitigation

Proposed noise mitigation is as described in the DEIS.

3.10.4.1 Turbine Operation

Turbine operation is as described in the DEIS.

3.10.4.2 Transformer Operation

Transformer operation is as described in the DEIS.

3.10.4.3 Construction

Construction is as described in the DEIS.

3.11 Socioeconomics

Socioeconomics are as described in the DEIS.

3.11.1 Population

Population is as described in the DEIS.

3.11.2 Economy and Employment

Economy and employment is as described in the DEIS.

3.11.3 Municipal Budget and Taxes

Municipal budget and taxes are as described in the DEIS.

3.11.4 Potential Impacts

Potential impacts are as described in the DEIS.

3.11.4.1 Population and Housing

Population and housing is as described in the DEIS.

3.11.4.2 Employment and Income

Employment and income are as described in the DEIS.

3.11.4.3 Municipal Reserves

Municipal reserves are as described in the DEIS.

3.11.5 Proposed Mitigation

Proposed mitigation is as described in the DEIS.

3.12 Telecommunications

As described in the DEIS, the potential for the Project to impact existing telecommunication signals was evaluated by Brian Webster Consulting (BWC). These studies included 1) a microwave path analysis, 2) a 100-mile television station search, and 3) a television broadcast off-air reception measurement analysis. In addition, Comsearch was contracted to conduct a cellular/PCS telephone analysis, a land mobile radio (LMR) analysis, and to notify the National Telecommunications and Information Administration regarding the proposed Project (see Appendix N of the DEIS).

3.12.1 Existing Conditions

3.12.1.1 Microwave Analysis

As described in the DEIS, BWC identified one microwave path that intersects the Project site (see Appendix N of the DEIS). Marble River LLC is currently in discussions with NYPA to determine the location of future microwave paths between substations.

3.12.1.2 Television Analysis

Television analysis is as described in the DEIS.

3.12.1.3 AM Radio Analysis

AM radio analysis is as described in the DEIS.

3.12.1.4 Cellular/PCS Telephone Analysis

Cellular/PCS telephone analysis is as described in the DEIS.

3.12.1.5 Land Mobile Radio Analysis

Land mobile radio analysis is as described in the DEIS.

3.12.1.6 National Telecommunications and Information Administration Notification

Marble River, LLC has directed telecommunications consultant Comsearch to proceed with a supplemental notification of the National Telecommunications and Information Administration of the revised turbine locations so that the Interdepartmental Radio Advisory Committee can determine whether there is still no obstruction or interference to federal government links and radars. A reply is expected by August 2007 and will be provided for review as a supplement to the FEIS.

3.12.2 Potential Impacts

3.12.2.1 Construction

Temporary communication interference as a result of Project construction is as described in the DEIS.

3.12.2.2 Operation

The revised Project layout has been prepared with an understanding of the location and dimensions of the identified microwave path that passes through the Project site. Marble River, LLC has determined that the revised turbine locations will not interfere with this path. The Applicant is coordinating with NYPA to ensure that future microwave paths linking NYPA substations will not be obstructed by the proposed turbines. All other potential impacts are as described in Section 3.12.2.2 of the DEIS.

3.12.3 Proposed Mitigation

3.12.3.1 Construction

Mitigation for construction-related impacts to communications is as described in the DEIS.

3.12.3.2 Operation

3.12.3.2.1 Microwave Communication Systems

As mentioned above, the Project as currently proposed, will not impact existing or proposed microwave communications. If future Project layout revisions are necessary, the microwave path siting guidelines described in Section 3.12.2.2.1 of the DEIS will be adhered to. Beyond this, additional mitigation is not necessary.

3.12.3.2.2 Television Communication Systems

If Project operation results in any impacts to existing off-air television coverage, the developer/operator will address and resolve each individual problem as necessary. See discussion in Section 3.12.3.2.2 of the DEIS, and Appendix C of the DEIS for the proposed Complaint Resolution Procedure.

3.12.3.2.3 AM Radio Analysis

The Project, as currently proposed, will not impact existing AM radio transmissions, therefore no mitigation is necessary. See discussion in Section 3.12.3.2.3 of the DEIS.

3.12.3.2.4 Cellular, PCS, and LMR Systems

If a cellular or PCS company were to claim that their coverage has been compromised by the presence of the proposed Project, coverage could be restored by installing an additional cell or an additional sector antenna on an existing cell for the affected area. See discussion in Section 3.12.3.2.4 of the DEIS.

3.13 Safety and Security

Background information on public health and safety issues associated with wind energy projects are fully described in the DEIS. In response to public comments, additional information regarding potential ice shed impacts has been added to Section 3.13.2.2.1.

3.13.1 Background Information

3.13.1.1 Ice Shedding

Ice shedding is as described in the DEIS.

3.13.1.2 Tower Collapse/Blade Throw

Tower collapse/blade throw is as described in the DEIS.

3.13.1.3 Stray Voltage

Stray voltage is as described in the DEIS.

3.13.1.4 Fire

Fire is as described in the DEIS.

3.13.1.5 Lightning Strikes

Lightning strikes are as described in the DEIS.

3.13.2 Potential Impacts

3.13.2.1 Construction

Potential impacts of construction is as described in the DEIS.

3.13.2.2 Operation

3.13.2.2.1 Ice Shedding

Operation impacts associated with ice shedding and ice throw are as described in the DEIS. Additional information on the mechanisms by which ice forms on wind turbines, and by which it may be shed is presented below.

The principal mechanisms of ice removal from wind turbines following an icing event include melting, shedding, and sublimation. The removal mechanism for any given icing event will vary with weather conditions (temperature, wind speed, solar radiation, humidity) and with the operational status of the turbines. Industry experience indicates that, for the large majority of icing events, ice removal will result from gravitational shedding due to partial melting, whereby the ice falls off the tower and blades directly to the ground below. Only in rare cases is there the potential for accumulated ice to be thrown a significant distance from a turbine by a rotating blade. This is because 1) icing deposits will rarely be heavy enough to be thrown; 2) significant icing will cause the blades to be inefficient airfoils, reducing their ability to operate, and likely causing the wind turbine to automatically shutdown; and 3) ice deposited in thin sheets (as on broad blade surfaces) is usually brittle, easily shattered, and has poor trajectory properties.

The risk of an ice throw is therefore a function of multiple variables, including:

- The probability of ice build-up on the blades.
- The probability of ice fragments being detached from a blade during operation.
- The wind and weather conditions existing at the time.
- The operational status of the turbine (a function of turbine control strategies and alarms, wind speed, and grid availability).

Should there be an ice throw event, the risk of a person being hit and injured by an ice fragment thrown from an operating wind turbine also depends on a variety of factors, including:

- The point where the detached ice fragment lands (function of wind speed and direction, rotor speed, radial position on blade, blade azimuth, etc.).
- The mass, shape, and speed of the fragment.
- The structural integrity of the fragment (i.e., will it break up in flight?).
- The probability of a person being at the exact point of landfall at the time that a fragment hits the ground.

A comprehensive study of ice shedding and human strike probabilities from wind turbines was prepared by the consulting firm Garrad Hassan and Partners, Ltd. in conjunction with the Finnish Meteorological Institute and Deutches Windenergie-Institute as part of a research project on the application of wind energy in cold climates (Morgan et al., 1998). The Garrad Hassan study was cited in the DEIS, and has been added to Appendix O of this document.

The Garrad Hassan study confirms the points made above regarding principal ice shedding mechanisms and ice throw risk factors. It relied on numerous field observations, which indicated that most ice shedding consists of ice fragments being dropped off, rather than thrown from, the rotor. This study also included an assessment of potential ice throw distances during exceptional events and the probabilities of a person being struck by an ice fragment under specific operational conditions. For a moderate icing location, such as the Marble River site, the maximum achievable distance (i.e., worst case scenario) for ice to be thrown was conservatively estimated to be approximately 350 m (1,150 ft). If a person is always present within proximity of the turbine during icing conditions, and no control method is incorporated into a wind turbine's control logic to prevent an ice throw, the risk of that person being struck by an ice fragment is estimated to be greater than one in 1 million. This risk is less than the risk of a person being struck by lighting.

A variety of mechanisms designed to reduce the potential risk of ice throw events from wind turbines are available, such as improvements in blade design, turbine controls, operator intervention, and the establishment of safety zones (NYSERDA website, FAQs 2007). The implementation of these safety measures will dramatically reduce the probability of ice fragments falling a significant distance from a turbine. Likewise, a recent, world-wide survey of wind farm insurance underwriters did not identify one liability claim due to injury from ice throw (NYSERDA website, Energy Insurance Brokers Correspondence 2004).

3.13.2.2.2 Tower Collapse/Blade Throw

The risks of tower collapse or blade throw are as described in the DEIS.

3.13.2.2.3 Stray Voltage

The potential for stray voltage impacts is as described in the DEIS.

3.13.2.2.4 Fire

The potential for a turbine fire and the likely response to such an occurrence are as described in the DEIS. It is worth noting that, other than relatively small quantities of oil and hydraulic fluid, the nacelle includes few flammable components.

3.13.2.2.5 Lightning Strikes

The potential for lightning strikes, and the type of damage such strikes typically cause are described in the DEIS. If lightning strikes result in damage at all, it is typically surface damage to the blade tips or edges, rather than a fire in the nacelle. It is worth nothing that the Madison (NY) Wind Power Project, which has been in operation since 2000, has never experienced a turbine shut down or serious damage due to lightning strikes (S. Alexander, pers. commun. 2006). It is also worth noting that because of their height, to the extent that turbines attract lighting, they will reduce the potential for strikes on nearby structures, trees, and vehicles.

3.13.3 Proposed Mitigation

3.13.3.1 Construction

Proposed mitigation measures to assure public safety during Project construction are as described in the DEIS.

3.13.3.2 Operation

Proposed mitigation measures that could reduce public safety risks associated with ice shedding, tower collapse, blade throw, stray voltage, fire, lightning strikes, extreme weather abnormalities, and facility blackout are as described in the DEIS.

3.13.3.3 Lightning Strikes

Proposed mitigation measures to assure public safety during lightning strikes are as described in the DEIS.

3.13.3.4 Extreme Weather Abnormalities

Proposed mitigation measures to assure public safety during extreme weather abnormalities are as described in the DEIS.

3.13.3.5 Facility Blackout

Proposed mitigation measures to assure public safety during facility blackouts are as described in the DEIS.

4.0 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

Unavoidable adverse environmental impacts are as described in the DEIS.

4.1 General Mitigation Measures

General mitigation measures are as described in the DEIS.

4.2 Specific Mitigation Measures

Specific mitigation measures are as described in the DEIS.

4.3 Environmental Compliance and Monitoring Program

Environmental compliance and monitoring plan is as described in the DEIS.

5.0 CUMULATIVE AND GROWTH INDUCING IMPACTS

5.1 Growth Inducing Impacts

Growth Inducing Impacts are as described in the DEIS.

5.2 Cumulative Impacts

5.2.1 Transportation

Cumulative transportation impacts are as described in the DEIS.

5.2.2 Visual

To address concerns regarding the potential cumulative visual impact of multiple wind power projects, a cumulative viewshed analysis was prepared. To accomplish this, the 10-mile radius Marble River topographic and vegetation analyses (based on maximum blade tip height) were overlaid on the same viewshed analyses prepared for the proposed Noble wind power projects in the Towns of Clinton and Ellenburg. The viewsheds for the three projects were then plotted on a base map and areas of viewshed overlap identified.

The cumulative topographic viewshed analysis of the proposed Marble River and Noble projects indicates that within the area of overlapping 10-mile radius viewsheds, approximately 69% of the area has the potential to see one or more turbines from each project. Areas completely screened from views of all turbines by topography alone are limited to the valleys and backside of hills in the southwestern portion of the overlapping study areas (in the Adirondack Park) and the backside of a major ridge in the Canadian portion of the study area to the northeast. Steep ravines and river valleys in the western portion of the study area are also indicated as being fully screened from view by topography. Factoring vegetation into this analysis reduces potential cumulative visibility (i.e., areas where at least one turbine from each project can be seen) to 9% of the overlapping 10-mile study areas. These areas of potential cumulative visibility are concentrated in open fields and wetlands in close proximity to the projects, and in some broader open areas to the northwest and southeast (similar to the results of the vegetation viewshed for the Marble River Project alone). In addition, the Project sponsor anticipates that less than 50 of the 109 turbines will need to have FAA obstruction warning lights. This being the case, and because the screening effect of forest vegetation was not considered in the nighttime viewshed analysis, nighttime visibility is also anticipated to be significantly less than indicated by the viewshed analysis.

5.2.3 Air Quality

Cumulative air quality impacts are as described in the DEIS.

5.2.4 Noise

The operational noise of the Marble River Wind Farm and adjacent Noble projects were evaluated to determine the magnitude of any cumulative effects. The Noble turbines are located generally to the west and south of the Marble River Wind Farm Project site. The Marble River Wind Farm and Noble projects occupy contiguous areas that in Clinton are separated by one or two miles while in some areas of Ellenburg, such as the vicinity of the intersection of Route 190 (Star Road) and Bohen Road, turbines from both projects are intermingled.

Additional noise modeling was conducted to evaluate any potential noise impacts on residents in the area due to the cumulative noise of both projects. The most current coordinates for the Noble turbines from the applications and the Marble River Wind Farm turbines were used in the model. Plot 2 in Appendix L shows the sound levels out to the 45-dBA "threshold" for both projects. The Noble turbine information indicated that General Electric's Model 1.5sle wind turbines on 80-meter towers are currently planned. Published information by General Electric indicates these wind turbines have a maximum sound power level of 104 dBA re 1 pW. Plot 2 shows that the two projects are sufficiently separated in most areas that they are acoustically independent; i.e. the sound levels produced by one project's turbines have no appreciable effect on the sound levels near the other project's units. Intermixture and cumulative sound levels only occur in the southern part of the Project site and in one small area a few miles west of Churubusco. These areas are shown in greater detail in Plots 2A and 2B.

Modeling results indicate that noise impacts from the Noble turbines are insignificant for the vast majority of homes within the Marble River Project (i.e, cumulative increases in noise as a result of the Noble project would be a rare occurrence). Receptors 09 and 10 prove to be the exception due to their southerly location and proximity to Noble turbines.

The residence labeled Receptor 09 (7909 Starr Road, Ellenburg, NY) in Plot 2A may experience some effects from cumulative noise. The maximum predicted noise level at this residence from the Marble River Wind Farm alone is slightly above the threshold level at 46 dBA. If a number of Noble units (shown in yellow) are erected in the high-density pattern that can be anticipated from the provided coordinates, the total sound noise level at this location could increase to about 48dBA

Similarly the residence labeled Receptor 10 (Starr Road, Ellenburg, NY) in Plot 2A may experience some effects from cumulative noise. The maximum predicted noise level at this residence from the Marble River Wind Farm alone is at the threshold level of 45 dBA. If a number of Noble units (shown in yellow) are erected in the high-density pattern that can be anticipated from the provided coordinates, the total sound noise level at this location could increase to about 47 dBA.

None of the remaining receptors identified as being possibly affected by Marble River Wind Farm noise (see Plots 2A and 2B in Appendix L) is expected to see any significant difference in sound level due to the cumulative effect of the additional turbines proposed for the Noble project.

5.2.5 Socioeconomics

Cumulative socioeconomic impacts are as described in the DEIS.

6.0 COMMITMENT OF RESOURCES

Commitment of Resources is as described in the DEIS.

7.0 EFFECTS ON THE USE AND CONSERVATION OF ENERGY

Effects on the use and Conservation of Energy is as described in the DEIS.

8.0 ALTERNATIVES

Project Alternatives are described in the DEIS. The current project is comprised of the same total number of wind turbine generators in the Towns of Clinton and Ellenburg, NY and will result in similar community benefits and environmental impacts. In most instances, modifications to the Project layout have been developed in order to avoid or further minimize potential impacts as more detailed information became available during the continuing design of the project and the course of developing the SDEIS. Therefore, the current project layout as presented in this SDEIS, although modified does not constitute a new alternative or alternative project design.

8.1 Geographic Scope

Geographic scope of alternatives is as described in the DEIS.

8.2 Assessment of Alternate Wind Turbines

The assessment of alternate wind turbines is as described in the DEIS.

8.3 No Action

The no action alternative is as described in the DEIS.

8.4 Alternative Project Site Analysis

The alternative project site analysis is as described in the DEIS.

8.4.1 Alternative Project Scale and Magnitude

Alternative project scale and magnitude is as described in the DEIS.

8.4.2 Alternative Project Design

Alternative project design is as described in the DEIS.

8.4.3 Alternative Technologies

Alternative technologies is as described in the DEIS.

8.5 Cumulative Alternatives

Cumulative alternatives are as described in the DEIS.

8.5.1 Joint Project

The joint project alternative is as described in the DEIS.

8.5.2 Mutual Limited Project Size

Mutual limited project size is as described in the DEIS.

8.5.3 Joint Project Components

Joint project components is as described in the DEIS.

9.0 PUBLIC INVOLVEMENT

Public Involvement is as described in the DEIS.

10.0 LIST OF PREPARERS

This SDEIS document has been developed under the direction of the Applicant with input from the following list of preparers. The Applicant's lead consultants, ESS and EDR, were responsible for the majority of the SEQRA required elements of the document.

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12.0 ACRONYMS AND ABBREVIATIONS

APA .... Adirondack Park Agency
ARA .... Avian Risk Assessment
BBA .... Breeding Bird Atlas (New York State)
BBS .... Breeding Bat Survey (North American)
BMP...................... Best Management Practice(s)
dBa....................... Decibels, A-weighted
DEIS .... Draft Environmental Impact Statement
FAA .... Federal Aviation Administration
FEIS .... Final Environmental Impact Statement
IDA....................... Industrial Development Authority
kV .... kilovolt
kW .... kilowatt
m/s....................... Meters per Second
MW....................... Megawatt
NAAQS.................. National Ambient Air Quality Standards
NRCS .... Natural Resources Conservation Service
NWI...................... National Wetlands Inventory
NYS .... New York State
NYSDA&M .... New York State Department of Agriculture & Markets
NYSDEC .... New York State Department of Environmental Conservation
NYSDOT................ New York State Department of Transportation
NYSERDA .... New York State Energy Research and Development Authority
NYSDPS .... New York State Department of Public Service
NYSOPRHP .... New York State Office of Parks, Recreation and Historic Preservation
OS/OW .... Oversize/Overweight
PILOT .... Payment in Lieu of Taxes
QA/QC .... Quality Assurance/Quality Control
SEQRA .... State Environmental Quality Review Act
SHPO.................... State Historic Preservation Office
USACOE................ United States Army Corps of Engineers
USDA.................... United States Department of Agriculture
USFWS.................. United States Fish & Wildlife Service
USGS .... United States Geological Survey
VIA....................... Visual Impact Assessment
WECS .... Wind Energy Conversion System