DRAFT ENVIRONMENTAL IMPACT STATEMENT

FOR THE

COHOCTON WIND POWER PROJECT

Town of Cohocton, Steuben County, NY

Project Sponsor: Canandaigua Power Partners, LLC
100 Wells Avenue, Suite 201
Newton, Massachusetts 02459
Contact: Chris Swartley
Phone: (617) 964-3340

Lead Agency: Town of Cohocton Planning Board
P.O. Box 327
Cohocton, New York 14826-0327
Contact: Mr. Sandor Fox
Phone: (585) 384-5330

Prepared By: Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C. (EDR)
238 West Division Street
Syracuse, New York 13204
Contact: John Hecklau
Phone: (315) 471-0688

Date Submitted to Lead Agency: March 31, 2006

Date Accepted by Lead Agency:

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

COMMONLY USED ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
BBA	Breeding Bird Atlas (New York State)
BBS	North American Breeding Bird Survey
dBA	decibels, A-rated
CPP	Canandaigua Power Partners, LLC
DEIS	Draft Environmental Impact Statement
DPW	Department of Public Works
EAF	Environmental Assessment Form
EDR	Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C.
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
GIS	geographic information system
kV	kilovolt
kW	kilowatt
MW	megawatts
NAAQS	National Ambient Air Quality Standards
NHP	Natural Heritage Program (New York State)
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NYCRR	Official Compilation of Codes, Rules, and Regulations of the State of New York
NYISO	New York Independent Services Operators
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
NYSERDA	New York State Energy Research and Development Authority
NYSA&M	New York State Department of Agriculture and Markets
NYSDPS	New York State Department of Public Service
OPRHP	Office of Parks, Recreation & Historic Preservation (New York State)
OSHA	Occupational Safety and Health Administration
O&M	Operations and Maintenance
PSC	Public Service Commission (New York State)
PILOT	payment in lieu of tax

RPS	Renewable Portfolio Stanard
SEQRA	State Environmental Quality Review Act
SHPO	State Historic Preservation Office (New York)
SPDES	State Pollutant Discharge Elimination System
USACOE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
VIA	Visual Impact Assessment

FIRMS INVOLVED IN PREPARATION OF THE DEIS

Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C. (EDR) 238 West Division Street Syracuse, New York 13204 John Hecklau (315) 471-0688	**Canandaigua Power Partners, LLC** 100 Wells Avenue, Suite 201 Newton, Massachusetts 02459 Chris Swartley (617) 964-3340
Woodlot Alternatives, Inc. 30 Park Drive Topsham, Maine 04086 Robert D. Roy (207) 729-1199	**Comsearch** 19700 Janelia Farms Blvd. Ashburn, Virginia 20147 David Flagg (703) 726-5500
Haley & Aldrich of New York 200 Town Centre Drive, Suite 2 Rochester, New York 14623-4264 Robert J. Mahoney (585) 359-9000	**Public Archaeology Facility** Binghamton University P.O. Box 6000 Binghamton, New York 13902-6000 Samuel M. Kudrle (607) 777-4786
Hessler Associates, Inc. 3862 Clifton Manor Place Haymarket, Virginia 20169 David M. Hessler (703) 753-1602	**Wind Engineering, Inc.** 7660 Whitegate Avenue Riverside, California 92506 Arne Nielsen (909) 789-5281
Nixon Peabody, LLP Omni Plaza 30 South Pearl Street Albany, New York 12207 Richard Cogen (518) 427-2650	**Fisher Associates** 135 Calkins Road Rochester, New York 14623 Chris Smith (585) 334-1310

1.0 EXECUTIVE SUMMARY

This Draft Environmental Impact Statement (DEIS) is for a proposed action known as the Cohocton Wind Power Project (the Project). Provided below is a brief project description, along with summaries of the regulatory process; the Project's purpose, need, and benefit; its potential environmental impacts; and proposed mitigation measures. Alternatives to the Project and its effect on use and conservation of energy are also reviewed.

Project Description

Canandaigua Power Partners, LLC (CPP or the Applicant) a subsidiary of UPC Wind Partners, LLC (UPC Wind or UPC) is proposing to develop a wind-powered generating facility of approximately 41 turbines with a capacity of up to 82 megawatts (MW). The Project would meet the electrical needs of approximately 28,700 homes. In addition to the wind turbines, the Project will involve construction of four meteorological towers, a system of gravel access roads, an electrical collection system, an operations and maintenance building, a collector station, a 115 kV overhead transmission line, and an electrical substation.

The Project will be developed on leased private land, totaling approximately 5,755 acres, in the Town of Cohocton. It will be constructed in one continuous phase anticipated to commence in April 2007 and to finish in December 2007. Once built, the wind turbines and associated components will operate in almost completely automated fashion. The Project will, however, employ approximately six operations and maintenance personnel. The wind turbine currently proposed is the Gamesa Eolica G87 (or an equivalent machine), with a minimum wind speed of approximately 4 m/s (9 mph) required to generate electricity. This turbine's maximum rotational speed is 19 rpm, and high-speed shutdown occurs when constant wind velocity exceeds roughly 25 m/s (55 mph). Each wind turbine has a computer to control critical functions, monitor wind conditions, and report data.

Regulatory Process

This DEIS has been prepared by Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C. (EDR) of Syracuse, New York. The document is intended to facilitate the environmental review process and provide a basis for informed public comment and decision-making. This process is in accordance with the requirements of New York State's Environmental Quality Review Act (SEQRA). The Town of Cohocton Planning Board is acting as the lead agency under SEQRA.

Various plans and support studies have also been prepared in support of the Project, which provide detailed information on discrete topical areas in furtherance of the SEQRA evaluation. These studies include the following:

- Agricultural Protection Measures
- Groundwater Resources Report
- Cultural Resource Management Report
- Shadow Impact Assessment
- Transportation Study
- Off-Air Television Reception Analysis
- Licensed Microwave Search & Worst Case Fresnel Zone Study
- Spring 2005 Radar Survey of Bird Migration
- Spring and Fall 2005 Acoustic Survey of Bats
- Avian Risk Assessment
- Visual Impact Assessment
- Environmental Sound Survey and Noise Impact Assessment

Purpose, Need, and Benefit

The purpose of the proposed action is to create a wind-powered electrical-generating facility that will provide a significant source of renewable energy to the New York State power grid. The Project would facilitate compliance with the Public Service Commission (PSC) "Order Approving Renewable Portfolio Standard Policy", issued on September 24, 2004. This Order calls for an increase in renewable energy used in the state to increase to 25% (from the then level of 19%) by the year 2013. The Project responds to objectives identified in the 2002 New York State Energy Plan and Final Environmental Impact Statement (State Energy Plan) (New York State Energy Planning Board, 2002), and the Preliminary Investigation into Establishing a Renewable Portfolio Standard in New York (NYSERDA, 2003). These objectives include stimulating economic growth, increasing energy diversity, and promoting a cleaner and healthier environment. The benefits of the proposed action include positive impacts on socioeconomics (e.g., increased payment-in-lieu of tax [PILOT] revenues to local municipalities and lease revenues to participating landowners), air quality (through reduction of emissions from fossil-fuel-burning power plants), and climate (reduction of greenhouse gases that contribute to global warming).

Summary of Potential Impacts

In accordance with requirements of the SEQRA process, potential impacts arising from the proposed action were evaluated with respect to an array of environmental and cultural resources. The analysis of potential impacts is summarized below.

Environmental Factor	Potential Impacts
Physiography, Geology, and Soils	Soil disturbance Soil erosion Soil compaction Loss of agricultural land
Water Resources	Temporary disturbance Siltation/sedimentation Stream crossings Wetland filling
Biological Resources	Vegetation clearing/disturbance Incidental wildlife injury and mortality Loss or alteration of habitat
Climate and Air Quality	Construction vehicle emissions Dust during construction Reduced air pollutants and greenhouse gases
Aesthetic/Visual Resources	Visual change to the landscape Visual impact on sensitive sites/viewers Shadow-flicker impact on adjacent residents
Cultural Resources	Visual impacts on architectural resources Disturbance of archaeological resources
Sound	Construction noise Operational impacts on adjacent residents
Transportation	Road wear/damage Traffic congestion/delays Road system improvements/upgrades
Socioeconomic	Host community payment/PILOT Revenue to participating landowners Expenditures on goods and services Tourism Short-term and long-term employment
Public Safety	Construction concerns related to large equipment, falling objects, open

Environmental Factor	Potential Impacts
	excavations, electrocution Possible ice shedding concerns Project components catching fire
Communication Facilities	Temporary interference to communication signals Degraded reception to off-air television signals
Community Facilities and Services	Demands on police and emergency services Relocated utility distribution lines and poles
Land Use and Zoning	Adverse and beneficial impacts on farming Changes in community character and land use trends

Construction of the Project will result in disturbance of up to 245 acres of soil and 378 acres of vegetation, most of which is in agricultural fields. In addition, approximately 67 acres of forest and 2.9 acres of wetland could be disturbed by Project construction. However, most of this disturbance will be temporary. A total of approximately 36 acres of agricultural land will be converted to non-agricultural use/built facilities (e.g., roads, turbines, substation, etc.), and a total 42 acres of forest will be converted to early successional (shrub and sapling-dominated) communities (primarily on the transmission line right-of-way). Permanent wetland impacts are estimated to be less than 0.1 acre (transmission line poles). Project construction will also result in some level of temporary disturbance and congestion on area roadways.

Project operation is expected to result in some level of avian and bat collision mortality. Based on data from other comparable sites, bird mortality is expected to be in the range of 0-6 birds per turbine per year. The turbines will be visible from many locations within the surrounding area, but will also be fully or partially screened from viewers in many locations (e.g., the Village of Cohocton). The turbines will result in a perceived change in land use from some locations, but may actually help keep land in active agricultural use by supplementing farmer's income. Predicted noise and shadow flicker impacts are modest. Only one receptor has the potential to experience over 25 hours of shadow flicker annually, and turbine-related sound is only predicted to exceed 50 decibels at adjacent non-participating property lines in seven instances. In no instances will this sound level be experienced at a neighboring residence. The Project is expected to generate approximately $434,600 per year ($8.7 million over 20 years) in PILOT revenues to local taxing jurisdictions, while requiring very little in terms of municipal services.

Summary of Mitigation Measures

Various measures will be taken to avoid, minimize and/or mitigate potential environmental impacts. General mitigation measures will include adhering to requirements of various local, state, and federal ordinances and regulations. CPP will also employ environmental monitors to assure compliance with permit requirements and environmental protection commitments during construction. The proposed Project will result in significant environmental and economic benefits to the area. These benefits also serve to mitigate unavoidable adverse impacts associated with Project construction and operation.

Specific measures designed to mitigate or avoid adverse potential environmental impacts during Project construction or operation include:

- Siting the Project away from population centers and areas of residential development.
- Siting turbines primarily in open field areas to minimize required clearing of mature forest land to the extent practicable.
- Siting turbines and access roads so as to avoid impacts to wetlands and streams.
- Keeping turbines a minimum of 1,500 feet from nonparticipating residences to minimize noise, shadow flicker, and public safety concerns.
- Using existing roads for turbine access whenever possible to minimize disturbance to agricultural land.
- Utilizing construction techniques that minimize disturbance to vegetation, streams, and wetlands.
- Routing the overhead transmission line along existing railroad right of way, and other disturbed areas, to minimize impacts on wetlands.
- Implementing agricultural protection measures to avoid, minimize, or mitigate impacts on agricultural land and farm operations.
- Limiting turbine lighting to the minimum allowed by the Federal Aviation Administration (FAA) to reduce nighttime visual impacts, and following lighting guidelines to reduce the potential for bird collisions.
- Developing and implementing various plans to minimize adverse impacts to air, soil, and water resources, including a dust control plan, sediment and erosion control plan, and Spill Prevention, Control, and Countermeasure (SPCC) plan.

- Entering into a PILOT agreement with the local taxing jurisdictions to provide a significant predictable level of funding for the town, county, and school districts over the first 20 years of the Project's operations.
- Development of an emergency response plan with local first responders.

Alternatives

Alternatives to the proposed Project that were considered and evaluated include no action, alternative project siting, alternative project area, alternative project design/layout, alternate project scale and magnitude, and alternative technologies. Analysis of these alternatives revealed that both the size of the Project and the configuration of the turbines as currently proposed are necessary to produce a commercially feasible project that minimizes adverse impacts to the extent practicable. A smaller project would not fully capture the available wind resource and would not generate enough power to be economically viable given the project development and construction costs, including the expense of connecting to the power grid. A larger facility might theoretically provide more economic return, but it would force location of towers into areas with more marginal wind power resources and greater proximity to residents, steep slopes, and/or forested areas. This would result in more numerous potential adverse environmental impacts than currently anticipated. A larger number of smaller turbines, while perhaps reducing visibility from some areas, would not change the overall visual impact of the Project and would increase impacts associated with the more extensive road and interconnect systems required. Alternative technologies (e.g., different sources of generation) eliminate many of the environmental advantages associated with the proposed Project. In summary, the alternatives analysis concluded that the Project as proposed offers the optimum use of resources with the fewest potential adverse impacts.

Effects on Use and Conservation of Energy Resources

The proposed Project will have significant, long-term beneficial effects on the use and conservation of energy resources. Energy will be expended during the construction phases of the Project, as well as for the maintenance of the wind turbines and support facilities on-site. However, the operating Project will generate up to 82 MW of electricity without any fossil-fuel emissions. This greatly exceeds the energy required to construct and operate the Project, and the output is enough to power approximately 28,700 homes in New York State, (on an average annual basis). The Project will add to and diversify the state's sources of power generation, helping to stabilize power prices currently subject to spikes in fossil fuel prices. Over the long term, the Cohocton Project will displace some of the state's older, less efficient, and dirtier sources of power, and at a minimum will help to stave off the need to build some new fossil fuel plants. The principal, overriding benefits of the Project are in complete accordance with the 2002 State Energy Plan (New York State Energy Planning Board, 2002), namely:

- "Stimulating sustainable economic growth"
- "Increasing energy diversity…including renewable-based energy"
- "Promoting and achieving a cleaner and healthier environment"

2.0 DESCRIPTION OF PROPOSED ACTION

The subject of this Draft Environmental Impact Statement (DEIS) is a proposed action known as the Cohocton Wind Power Project (the Project). The Project is described below in terms of its components, location, construction, and operation. The Project's purpose, need, benefit, cost and funding, and the permits and approvals necessary to construct and operate the Project are discussed below, along with a description of the regulatory process and opportunities for public and agency involvement in that process.

2.1 INTRODUCTION

Canandaigua Power Partners, LLC (CPP), a wholly-owned subsidiary of UPC Wind Partners, LLC (UPC Wind) is proposing to develop an approximately 82 megawatt (MW) wind-powered generating facility in the Town of Cohocton, Steuben County New York (Figure 1). The Project is anticipated to include approximately 41 wind turbines, each with a generating capacity of 2.0 MW. For purposes of this DEIS, 48 potential turbine sites have been evaluated. The primary turbine array will be located on Pine Hill and Lent Hill northeast of the Village of Cohocton. Forty four of the potential turbine sites are located in this area. An additional four potential turbine sites are located on Brown Hill near the proposed point of interconnection with an existing New York State Electric and Gas (NYSEG) 230 kV transmission line. Each wind turbine will include an 87-meter (285 foot) diameter, three-bladed rotor mounted on a 78-meter (256 foot) tall tubular steel tower. Four meteorological towers will also be installed, along with an operations and maintenance (O&M) facility, a system of gravel access road, buried gathering lines (electrical interconnect), and an overhead transmission line that will connect a central collection station to a new substation adjacent to the existing transmission line.

The layout, location, and number of turbines evaluated in the DEIS represent a "worst case" scenario that overstates potential environmental impacts because the impacts are reviewed as if all 48 of the potential turbine sites will be utilized. The Project that will ultimately be built will utilize only 41 of the 48 turbine sites. CPP will make the final selection from among the 48 potential sites utilizing a number of factors, including wind resource optimization, availability of land rights and access routes, landowner preferences, and avoidance and minimization of environmental impacts. All of the potential turbine sites are located a minimum of 500 feet from the existing roads and at least 1,500 feet from nonparticipating neighboring residential structures, unless consent to a lesser distance has been obtained from neighboring land owners, in accordance with the Town of Cohocton Windmill Local Law

(Local Law No. 1 of 2006). Because of landowner decisions and potential unforeseen construction issues, all of the potential turbine locations remain subject to minor adjustments. However, any such adjustments will not change the affected resources, increase environmental impacts, or alter proposed mitigation, as described herein.

The Project is located in northern Steuben County, in the Appalachian Plateau and the Finger Lakes Highlands physiographic regions of New York State, approximately 2.2 miles south of the Village of Naples, 6.6 miles east of the Village of Wayland, and 5.1 miles north of the Village of Avoca (as measured from the closest proposed turbine). Located entirely within the Town of Cohocton, the Project will occur on approximately 5,755 acres of leased land (owned by 22 individual landowners) located off of Lyon Road, Pine Hill Road, Kirkwood-Lent Hill Road, Mattice Road, Rynders Road, Avery Hollow Road, Craig Road, Edmond Road, Cayward Road, Ryan Hollow Road, State Route 415, Jones Road, Wentworth Road, Brown Hill Road, Fairbrother Road, VanAucker Road, and Preston Road. This land is referenced to as the Project Site (Figure 2).

The Project Site is a mix of dissected plateaus and valleys with elevations ranging from 680 to 2,385 feet above mean sea level (amsl). The majority of the proposed turbine sites are located on a series of ridge tops (Pine Hill and Lent Hill) located northeast of the Village of Cohocton. This area is accessed by County and local highways, including Pine Hill Road, Kirkwood-Lent Hill Road, Mattice Road, Avery Hollow Road, Rynders Road and Craig Road. It is dominated by open crop fields (primarily hay and corn), with forested areas generally confined to small woodlots and steep slopes that descend to adjacent valley bottoms. The Project Site also includes successional old field, hedgerow, successional shrubland, yards, farms, small wetlands, and ponds. The proposed transmission line descends from the ridge top to the Cohocton River Valley to the south. It crosses the valley and follows an unnamed creek valley (generally along Fairbrother, Vanaucker, and Preston Roads) to the location of the remaining turbines and substation on Brown Hill. The Cohocton River Valley is characterized by broad flat agricultural fields and sizeable wetlands associated with the Cohocton River. The valley also includes Interstate Route 390, NYS Route 415, and the Livonia, Lakeville and Avon Railroad. Existing built features within the Project Site boundaries include roads single-family homes, barns, silos, and other agricultural buildings.

2.2 PROJECT DESCRIPTION

The Cohocton Wind Power Project will consist of 41 wind turbines, 13 miles of access roads, 27 miles of underground electrical lines, a collector station, a 9.4 mile long overhead 115 kV transmission line, a substation, construction staging area(s), and a centrally located O&M facility.

The proposed location and spacing of the wind turbines and support facilities was based on a wind resource assessment and review of the site's zoning constraints (see Section 3.13, Land Use and Zoning). Factors considered when siting the turbines included the following:

Wind resource assessment: Through the use of modeling software, meteorological data, and topographic data, the wind turbines are sited to optimize exposure to wind from all directions, with emphasis on exposure to the prevailing wind direction in the Project area.

Sufficient spacing: Siting turbines too close to one another can result in decreased electricity production due to the creation of wind turbulence between and among the turbines. Each operating wind turbine creates downwind turbulence in its wake. As the flow proceeds downwind, there is a spreading of the wake and recovery to free-stream wind conditions. The Project turbines are proposed to be sited with enough space between them to minimize wake losses and maximize the capture of wind energy.

Distance from residences: The turbine locations were selected to maintain a minimum setback of approximately 1,500 feet between the tower and the nearest occupied residence. This turbine setback complies with the Town of Cohocton Windmill Local Law, and minimizes the visual and sound effects of the turbines. All but a few of the turbine locations satisfy this setback criterion. For those that do not, CPP will obtain consents from the neighboring land owners.

Distance from Non-participating Land Parcels: The turbine locations have been selected to maintain a minimum setback of 500 feet from the boundary line (and an operating noise not exceeding 50 decibels at the line) of all non-participating local landowners, in accordance with the Town of Cohocton Windmill Local Law.

Distance from roads: The turbine locations were also selected to maintain a minimum setback of at least 500 feet from all town roads. This setback is in accordance with the wind turbine siting requirements of the Town of Cohocton Windmill Local Law.

The proposed layout of all Project components is illustrated in Figure 3. These components are described individually below.

2.2.1 Wind Turbines

The wind turbines proposed for this Project are the 2.0 MW G-87 manufactured by Gamesa-Eolica. Additional information regarding these turbines are included in Appendix A. Although CPP anticipates utilizing Gamesa G87 wind turbines for the Project, the wind turbine supply market in the United States is currently very tight. Turbine market conditions at the time of Project financing and construction will dictate the ultimate choice of turbines for the Project. CPP anticipates that any alternate wind turbine that it would select would have characteristics and environmental impacts substantially similar to those discussed in this DEIS. If a turbine with materially different environmental impacts were to be selected in the future, additional environmental impact review may be required.

Each wind turbine consists of three major components; the tower, the nacelle, and the rotor. The height of the tower, or “hub height” (height from foundation to top of tower) will be approximately 256 feet. The nacelle sits atop the tower, and the rotor hub is mounted to the nacelle. The total turbine height (i.e., height at the highest blade tip position) will be approximately 399 feet. Descriptions of each of the turbine components are provided below.

Tower: 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, internal lighting, and an internal ladder to access the nacelle. The towers will be painted off-white to make the structure less visually obtrusive. The towers and foundations are designed to withstand a wind gust (extreme 10 minute average wind speed) of up to 95 mph.

Nacelle: The main mechanical components of the wind turbine are housed in the nacelle. These components include the drive train, gearbox, and generator. The nacelle is housed by a steel reinforced fiberglass shell that protects internal machinery from the environment and dampens noise emissions. The housing is designed to allow for adequate ventilation to cool internal machinery, and is approximately 30 feet long, 12 feet tall, and 10 feet wide. It is externally equipped with an anemometer and a wind vane that signals wind speed and direction information to an electronic controller. Attached to the top of some of the nacelles, per specifications of the Federal Aviation Administration (FAA), will be a single, medium intensity aviation warning light. These lights will be flashing red strobes (L-864) and operated only at night. The nacelle is mounted on a sliding ring that allows it to rotate ("yaw") into the wind to maximize energy capture (see detail in Appendix A).

Rotor: A rotor assembly is mounted to the nacelle to operate upwind of the tower. Each rotor consists of three composite blades approximately 139 feet in length (total rotor diameter = 285 feet). The rotor attaches to the drive train at the front of the nacelle. Hydraulic motors within the rotor hub feather each blade according to wind conditions, which enables the turbine to operate efficiently at varying wind speeds. Also, the rotor can spin at varying speeds to operate more efficiently at lower wind speeds. The wind turbines begin generating energy at wind speeds as low as 4 meters per second (9 mph) and produce full power at wind speeds above 14 meters per second (31 mph). The maximum rotor speed is approximately 19 revolutions per minute (rpm).

2.2.2 Electrical System

The proposed Cohocton Project will have an electrical system that consists of four parts. These include 1) a system of buried 34.5 kilovolt (kV) shielded and insulated cables that will collect power from each wind turbine, 2) a central collection station within the turbine field on Lent Hill, 3) a 115 kV transmission line that will carry power from the collection station to a point of interconnection with the existing New York State Electric and Gas (NYSEG) 230 kV transmission line on Brown Hill, and 4) a substation that transfers the power from the 115 kV transmission line and the 34.5 kV cables from the Brown Hill turbines to the existing 230 kV transmission line and regional power grid. Each of these components is described below, with additional information included in Appendix A.

Collector System:

A transformer located in the nacelle will raise the voltage of electricity produced by each turbine generator up to the 34.5 kV voltage level of the collection system. From the transformer, cables located inside the tower will join the collector circuit and turbine communication cables (electrical interconnect), which will run underground (generally along Project access roads) and connect the individual turbines to either the collection station located off of Rynders Road or the substation on Brown Hill. The location of the proposed collection lines is indicated in Figure 3. Although not currently anticipated, short sections of overhead line could be utilized to avoid disturbing environmentally-sensitive sites such steep ravines and wetlands. The total length of buried cable carrying electricity to the collection station will be approximately 27 miles.

Collection Station:

The collection station will be located off of Rynders Road, near the intersection with Mclean Road. It is the terminus of the collection system, and will transform the voltage of this system from 34.5 kV to 115 kV. The station will be approximately 160 by 105 feet in size and will include 34.5 and 115 kV busses, a transformer, circuit breakers, towers, a control building, and related structures. The collection station will be enclosed by chain link fencing and will be accessed by a new gravel access road (see Appendix A).

115 kV Transmission Line:

A single circuit 115 kV transmission line will connect the collection station on Lent Hill with the proposed substation on Brown Hill (see Figure 2). It will cross the Cohocton River Valley and be approximately 9.4 miles in length. The line will be carried on treated wood pole structures that range in height from 50 to 70 feet above ground level, and will have an average span length of 450 feet. Pole heights for the section crossing Interstate Route 390 may be as tall as 100-120 feet.

Substation:

The substation will be located off of Preston Road on Brown Hill in the Town of Cohocton, adjacent to the NYSEG 230 kV transmission line. The substation will step up voltage from 115 kV and 34.5 kV to 230 kV to allow connection with the existing NYSEG transmission line. The substation will include 34.5, 115, and 230 kV busses, transformers, circuit breakers, towers, control houses, and related structures. It will be approximately 350 by 220 feet in size, and enclosed within a chain link fence. Access will be via a new gravel access road.

2.2.3 Access Roads

The Project will require the construction of new or improved access roads to provide access to the proposed turbines and collector station/substation sites. The proposed location of Project access roads is shown in Figure 3. The total length of access road required to service all proposed wind turbine locations is approximately 13 miles, the majority or which will be upgrades to existing farm lanes. The roads will be gravel-surfaced and typically 16 feet in width (however, for impact calculation purposes a maximum finished width of 20 feet is assumed).

2.2.4 Meteorological Towers

Four 60-meter (196-foot) tall meteorological towers will be installed to collect wind data and support performance testing of the Project. The towers will be galvanized tubular or lattice steel structures, and will include wind monitoring instruments. The towers are anticipated to be located off of Pine Hill Road, County Route 35, Rynders Road and VanAucker Road.

2.2.5 Staging Area

Construction of the Project will require the development of one or more construction staging areas. This site (or sites) will accommodate construction trailers, material storage, and parking for construction workers. The staging area is anticipated to total approximately 3 acres in size, and be located on agricultural land near the center of the Pine Hill/Lent Hill turbine custer. No fencing or lighting of the staging area is proposed (but could be added if vandalism or similar problems are experienced).

2.2.6 Operations and Maintenance Building

A roughly 6,000 square foot operations and maintenance (O&M) building, and associated 0.5 acre storage yard, will be constructed to house operations personnel, equipment and materials. The facility will also house the SCADA system. Although final plans have yet to be developed, the O&M building will either be a converted existing building or a new building, similar in style to those found throughout the Project Site. It is assumed that the O&M building and associated yard will be located on agricultural land in the Lent Hill/Pine Hill area.

2.3 PROJECT PURPOSE, NEED AND BENEFIT

The purpose of the proposed Project is to create a wind-powered electrical-generating facility that will provide a significant source of renewable energy to the New York power grid to:

- Meet regional energy needs in an efficient and environmentally sound manner;
- Reduce the price volatility of fossil-fuel electricity generation in the region;
- Realize the full potential of the wind resource on the lands under lease;

- Promote the long-term economic viability of agricultural areas in New York State's Southern Tier; and
- Assist New York State in meeting its proposed Renewable Portfolio Standard for the consumption of renewable energy in the State (see below).

The Project will facilitate compliance with Executive Order 111, issued by Governor George Pataki on June 10, 2001, which requires all New York State agencies to purchase 10% of their electricity from renewable energy sources by 2005 and 20% by 2010. The Project also responds to objectives identified in the 2002 State Energy Plan (New York State Energy Planning Board, 2002), and the Preliminary Investigation into Establishing a Renewable Portfolio Standard in New York (NYSERDA, 2003). The 2002 State Energy Plan required that the New York State Energy Research and Development Authority (NYSERDA) examine and report on the feasibility of establishing a renewable portfolio standard (RPS). NYSERDA's preliminary report found that an RPS can be implemented in a manner that is consistent with the wholesale and retail marketplace in New York and that an RPS has the potential to improve energy security and help diversify the state's electricity generation mix. The report also concluded that an RPS would likely spur increased economic development opportunities in the renewable energy industry, including the attraction of renewable technology manufacturers and installers to New York State. In September 2004, The Public Service Commission approved the RPS and identified a renewable energy policy, which calls for an increase in renewable energy used in the State to 25% by the year 2013. (PSC, 2004)

Implementation began in 2005. According to the Public Service Commission (PSC), implementation of the RPS is projected to reduce statewide annual air emissions of nitrogen oxide (NOx) by 6.8% (approximately 4,000 tons per year), sulfur dioxide (SO2) by 5.9% (approximately 10,000 tons per year), and carbon dioxide (CO2) by 7.7% (approximately 4,129,000 tons per year) (PSC, 2004a). In addition, as a result of the RPS, the PSC anticipates that wholesale energy prices are likely to decline by approximately $362 million in wholesale energy cost reductions as New York reduces its reliance upon fossil fuels (PSC, 2004).

Beyond meeting the goals of the Governor and the RPS, the benefits of the proposed action include positive impacts on socioeconomics (e.g., increased revenues to local municipalities and lease revenues to participating landowners short-term and long-term employment, and purchase of local goods and services), air quality (by off-setting generation from fossil-fuel-burning power plants), and climate (reduction of greenhouse gases that contribute to global warming). By eliminating pollutants and greenhouse gases, the Project will also benefit ecological and water resources as well as human health. Additional information on the socioeconomic and air quality benefits of the proposed Project are included in Sections 3.9 and 3.4.

2.4 PROJECT CONSTRUCTION

Project construction is anticipated to occur in a single phase. It is scheduled to start in the Spring of 2007 and be completed by December 31, 2007. Project construction will be performed in several stages and will include the following main elements and activities:

- Grading of the staging/field construction office area and substation areas
- Construction of access roads, crane pads and turn-around areas
- Construction of turbine tower foundations
- Installation of the underground electrical collection system
- Assemble and erection of the wind turbines
- Construction and installation of the substation
- Plant commissioning and energization

Prior to the initiation of construction, various environmental protection and control plans will be developed and shared with the Town. These will include a construction routing plan, road improvement plan, dust control plan, public safety plan, and complaint resolution procedures. These plans and procedures are described in greater detail in Section 3 of the DEIS. Actions included in these plans and procedures will be reviewed, coordinated and approved by the Town prior to implementation, to assure that the impacts of Project construction on local residents are avoided, minimized, or mitigated to the extent practicable. The following section describes the major activities that will occur as part of Project construction. Representative photographs of wind power project construction activities are included in Figure 4. Typical construction details are included in Appendix A.

2.4.1 Pre-construction Activities

Before construction commences, a site survey will be performed to stake out the location of the wind turbines, access roads, electrical cables, and substation areas. Once the surveys are complete, a geotechnical investigation will be performed to identify subsurface conditions and allow development of final design specifications for the access roads, foundations, underground trenching, and electrical grounding systems. The geotechnical investigation involves a drill rig obtaining borings (typically to 30-45 feet deep) to identify the subsurface soil and rock types and strength properties. Testing is also done to measure the soil's electrical properties to ensure proper grounding system design. A geotechnical investigation is generally performed at each turbine location, at substation locations, along the access roads, and at the O&M building site.

Using all of the data gathered for the Project (including geotechnical information, environmental conditions, site topography, etc.), CPP will develop a set of site-specific construction specifications for the various components of the Project. The specifications will comply with applicable codes and construction standards established by various industry practice groups such as:

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

CPP will also hire environmental monitors to oversee construction (and post-construction) activities. The environmental monitors will meet with Project contractors and subcontractors prior to the start of construction to assure that they are aware of all environmental protection commitments and permit conditions.

2.4.2 Staging Areas

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

2.4.3 Site Preparation

Actual Project construction will be initiated by clearing woody vegetation (as necessary) from tower sites, access roads, and interconnect routes. The work area will be cleared with a chainsaw or brush hog. Trees cleared from the work area will be cut into logs and removed, while limbs and brush will be chipped and spread onsite. For the purposes of this DEIS, it is assumed that a 200 foot radius will be cleared around each tower, a 75 foot-wide corridor will be cleared along access roads, and a 15 foot-wide corridor will be cleared along all underground electric interconnect routes. The 115 kV overhead transmission line right-of-way (ROW) will be cleared to a width of about 70 feet, with "danger trees" being removed beyond this width to ensure the reliability of the line.

2.4.4 Access Road Installation

Wherever possible, existing roads and farm drives will be upgraded for use as Project access roads in order to minimize impacts to 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 involve topsoil stripping and grubbing of stumps, as necessary. Stripped topsoil will be stockpiled along the road corridor for use in site restoration. Any grubbed stumps will be removed, chipped or buried. Following removal of topsoil, subsoil will be graded, compacted, and surfaced with 8-12 inches of gravel or crushed stone. A geotextile fabric or grid will be installed beneath the road surface, if necessary, to provide additional support. The typical access road will be 16 feet in width, with occasional wider pull-offs to accommodate passing vehicles. Maximum permanent road width will be 20 feet. Appropriately sized culverts (minimum 12 inch) 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.

During construction, access road installation and use could result in temporary disturbance of a maximum width of 40 feet, with temporary road corner radii of 200 feet. In agricultural areas, topsoil will be stripped and wind rowed along the access road to prevent construction vehicles from driving over undisturbed soil and adjacent fields. Where these roads will be used by the erection works crawler crane, an alternative would be to build a 35-40 foot wide road that is reduced to 16 feet in width following completion of construction. Once construction is complete, temporarily disturbed areas will be restored (including removal of excess road material, de-compaction, and rock removal in agricultural areas) and returned to their pre-construction contours. Typical access road details are included in Appendix A. Photos of access road construction are included in Figure 4.

2.4.5 Foundation Construction

Once the roads are complete for a particular group of turbine sites, turbine foundation construction will commence on that completed access road section. Foundation construction occurs in several stages including hole excavation, outer form setting, rebar and bolt cage assembly, casting and finishing of the concrete, removal of the forms, backfilling and compacting, and site restoration. Excavation and foundation construction will be conducted in a manner that will minimize the size and duration of excavated areas required to install foundations.

Initial activity at each tower site will involve stripping and stockpiling topsoil within a 200-foot radius around each tower (maximum area of disturbance = 2.9 acres). Following topsoil removal, backhoes will be used to excavate a foundation hole. In agricultural areas, excavated subsoil and rock will be segregated from stockpiled topsoil. If bedrock is encountered it is anticipated to be ripable, and will be excavated with a backhoe. If the bedrock is not ripable, it will be excavated by pneumatic jacking, hydraulic fracturing, or blasting. Blasting will be utilized only if the other potentially available methods of excavation are not practicable. CPP anticipates that few, if any, turbine sites will require blasting. If blasting is required, it will be conducted in compliance with a Blasting Plan, and in accordance with all applicable laws to avoid impacts to sensitive receptors. If blasting is proposed at a tower site, the nearest wells will be identified, and if necessary, pre- and post-blasting inspections of the wells will be conducted. If necessary, dewatering of foundation holes will involve pumping the water to a discharge point, which will include measures/devices to slow water velocities and trap any suspended sediment. Dewatering activities will not result in the direct discharge of water into any streams or wetlands.

The foundation is anticipated to be one of two designs; either a concrete caisson or a spread footer. It is currently anticipated that the spread foot foundation will be used. This foundation type is approximately 10 feet deep, approximately 50-60 feet in diameter, and requires approximately 300 cubic yards (cy) of concrete. Once the foundation concrete is sufficiently cured, the excavation area around and over it is backfilled with the excavated on-site material. The top of the foundation is a nominal 18-foot diameter pedestal that typically extends 6 to 8 inches above grade. A caisson footing would be placed in a nominal 22-foot diameter excavation to a depth of around 30 feet. At the base of each tower an area approximately 100 feet by 60 feet will be developed as a gravel crane pad.

2.4.6 Buried Cable Installation

As mentioned previously, electrical interconnects will generally follow Project access roads, but will also follow field edges and cut directly across fields in places. The proposed layout of the interconnect system is illustrated in Figure 3. Where buried cable is proposed to cross active agricultural fields, the location of any subsurface drainage (tile) lines will be determined (through consultation with the landowner), if possible, to avoid damaging these lines during cable installation. Direct burial methods via cable plow, rock saw and/or trencher will be used during the installation of underground interconnect lines whenever possible.

Direct burial via a cable plow will involve the installation of bundled cable (electrical and fiber optic bundles) directly into the ground via a "rip" created by the plow blade. The rip disturbs an area approximately 24 inches wide with bundled cable installed to a minimum depth of 36 inches (see photos in Figure 4 and typical detail in Appendix A). An area up to 15 feet wide must be cleared of tall-growing woody vegetation and will be disturbed by the tracks of the installation machinery. However, this disturbance does not involve excavation of the soil. Generally, no restoration of the rip is required, as it closes in on itself following installation. Similarly, surface disturbance associated with the passage of machinery is typically minimal. Should surface restoration be required, it will closely follow the installation via a restoration Bobcat or small bulldozer, which will ride over the rip, smoothing the area.

Direct burial via a trencher involves the installation of bundled cable in a similar fashion to cable plow installation. The trencher or rock saw uses a large blade or "saw" to excavate an open trench. A 24-inch-wide trench with a sidecast area immediately adjacent to the trench. Similar to cable plow, this direct burial method installs the cable a minimum of 36 inches deep (48 inches in active agricultural fields) and requires only minor clearing and surface disturbance (up to 15 feet wide for the installation machinery). In active agricultural land, up to two parallel cables can be installed by trenching without the need to strip and segregate topsoil (in accordance with NYS Department of Agriculture and Markets guidance). Sidecast material will be replaced via a Bobcat or small bulldozer. All areas will be returned to pre-construction grades, and restoration efforts will be as described above for cable plow installation. Where three or more cables run parallel through active agricultural fields, the topsoil will be stripped and stockpiled prior to cable installation, and replaced, regraded, and stabilized by seeding and mulching following installation. Any tile lines that are inadvertently cut or damaged during installation of the buried cable will be repaired as part of the restoration effort.

Installation of utility lines via an open trench will be used only in areas where the previously described direct burial methods are not practicable. At this time, no open trench installation is proposed unless conditions at the time of construction make direct burial infeasible. Areas appropriate for open trench installation will be determined at the time of construction and may include areas with unstable slopes, excessive unconsolidated rock, and standing or flowing water. Open trench installation will be performed with a backhoe and will generally result in a disturbed trench 36 inches wide and a minimum of 36 inches deep. The overall temporary footprint of vegetation and soil disturbance may be a maximum of 15 feet due to machinery dimensions and backfill/spoil pile placement during installation. In agricultural areas, all topsoil within the work area will be stripped and segregated from excavated subsoil. Replacement of spoil material will occur immediately after installation of the buried utility. Subgrade soil will be replaced around the cable, and topsoil will be replaced at the surface. Any damaged tile lines will be repaired, and all areas adjacent to the open trench will be restored to original grades and surface condition. Restoration of these areas will be completed through seeding and mulching of all exposed soils.

Although not currently anticipated, portions of the collector system could be installed above ground. This would be done in areas where below-ground installation was not feasible or could result in significant environmental impacts (e.g., crossing a buried gas line, a steep ravine or significant wetland). In these instances, the cables will be brought above ground and carried by electrical conductor suspended on treated wood poles (similar to existing roadside utility poles supporting distribution lines).

2.4.7 Wind Turbine Assembly and Erection

Beyond the tower, nacelle and rotor blades, other smaller wind turbine components include hubs, nose cones, cabling, control panels and internal facilities such as lighting, ladders, etc. All turbine components will be delivered to the Project Site on flatbed transport trucks, and the main components will be off-loaded at the individual turbine sites. Turbine erection is performed in multiple stages including: setting of the bus cabinet and ground control panels on the foundation, erection of the tower (usually in 3-4 sections), erection of the nacelle, assembly and erection of the rotor, connection and termination of the internal cables and inspection and testing of the electrical system prior to energization.

Turbine assembly and erection involves mainly the use of large track mounted cranes, smaller rough terrain cranes, boom trucks and rough terrain fork-lifts for loading and off-loading materials. The tower sections, rotor components, and nacelle for each turbine will then be delivered to each site by flatbed trucks and unloaded by crane. A large erection crane will set the tower segments on the foundation, place the nacelle on top of the tower, and following ground assembly, place the rotor onto the nacelle (see photos in Figure 4 and details in Appendix A).

The erection crane(s) will move from one tower to another along a designated crane path. For the purposes of this DEIS, it is assumed that this path will follow existing public roads and Project access roads. Cranes will only traverse open fields without any permanent roads if conditions allow such movement without creating significant soil disturbance. In such instances, a proof roller will be used to test soil stability and level and compact the soil prior to crane passage. In some places, the crane will be partially disassembled and carried from one tower site to another by a specialized flatbed tractor-trailer (see Appendix A). This mode of crane transport will not require a 40-foot-wide travel surface, but could require some additional clearing and grading adjacent to the roads to accommodate the width of the crane tracks (which will extend well beyond the edges of the trailer).

Upon departure of the crane from each tower site, all required site restoration activities will be undertaken. Restoration of crane paths will include removal of all temporary fill/road materials. In agricultural fields, restoration will also include subsoil de-compaction (as necessary) and reestablishing pre-construction contours. Exposed soils at restored tower sites and along roads and crane paths will be stabilized by seeding and/or mulching.

2.4.8 115 kV Transmission Line

The ROW will be clear cut to a width of 70 feet, with additional "danger trees" being removed as appropriate. Wooden poles will be delivered from the staging area(s) and will be installed in augured holes, backfilled with gravel, guyed and anchored. It is assumed that no concrete foundations will be required, and that no permanent access roads will be built on the ROW. However, during construction, it is assumed that vehicular activity will disturb a corridor up to 20 feet wide within the ROW (although where the line parallels the railroad, materials delivery and vehicular activity should be largely confined to the existing railroad grade). Conductors will be strong in sections of about 1-mile in length. Miscellaneous hardware (ground rods, line vibration dampers, etc.) will be installed to complete the line construction.

2.4.9 Collection Station and Substation

Collection station and substation construction will begin with clearing each site and stockpiling topsoil for later use in site restoration. Sites will be graded, and a laydown area for construction trailers, equipment, materials, and parking will be prepared. Concrete foundations for major equipment and structural supports will be poured, followed by the installation of various conduits, cable trenches, and grounding grid conductors. Above-ground construction will involve the installation of structural steel, bus conductors and insulators, switches, circuit breakers, transformers, control buildings, etc. The final steps involve laying down crushed stone across the stations, erecting the chain link fence, connecting the high voltage links, and testing the control systems.

Table 1. Impact Assumptions and Calculations

Project Components	Typical Area of Vegetation Clearing	Area of Total Soil Disturbance (temporary and permanent)	Area of Permanent (fill/structures) Disturbance
Wind Turbines and Workspaces	200’ radius per turbine	200’ radius per turbine	0.2 acre (pedestal plus crane pad)
Access Roads	75’ wide per linear foot of road	40’ wide per linear foot of road	20’ wide per linear foot of road
Buried Electrical Interconnects	15’ wide per linear foot of cable	15’ wide per linear foot of cable	none
Meteorological Towers	1 acre per tower	1 acre per tower	0.1 acre per tower
O&M Building (6,000 sf) and associated storage yard	2 acres	2 acres	1 acre
Staging Areas	3 acres	3 acres	none
Substation	5 acres	5 acres	2 acres
Collection Station	1 acre	1 acre	0.5 acre

Project Components	Typical Area of Vegetation Clearing	Area of Total Soil Disturbance (temporary and permanent)	Area of Permanent (fill/structures) Disturbance
115 kV Transmission Line	70' wide ROW plus per linear foot, danger trees	20' wide per linear foot	0.1 acre

2.5 OPERATIONS AND MAINTENANCE

Operation of the wind turbines and associated components is almost completely automated. However, the Project is anticipated to employ a staff of approximately six O&M staff (four wind technicians, a project manager and an administrative support person). For the wind turbines anticipated for the Cohocton Project, a minimum wind speed of approximately 9 mph is required to initiate generation. High-speed shutdown occurs at around 55 mph (25 meters/second). The turbines are equipped with two fully independent braking systems that allow 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 a supervisory control and data acquisition (SCADA) system.

Operations and maintenance staff will be on duty during core operating hours (eight hours a day, five days per week) with weekend shifts and extended hours as required. In the event of turbine or facility outages, the SCADA system will send alarm messages to on-call technicians via pager or cell phone to notify them of the outage. The Project will have an on-call local technician who can respond quickly in the event of an emergency. The wind turbines selected for the Cohocton Project 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. Data on the turbines' reliability is summarized by the manufacturer in the turbine's availability rating, which estimates the percentage of time that the turbine will function. Wind turbines at other UPC Wind projects have an availability rating of 98.5%. More detailed specifications on the wind turbines being proposed for the Project are included in Appendix A.

Each wind turbine will receive scheduled preventive maintenance inspections during the first year of operation and twice a year in subsequent years. Given the high availability rating of the turbines, CPP 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. In certain circumstances, heavy maintenance equipment, such as a lifting crane, may need to be brought in to repair turbine problems (such as nacelle component replacement).

UPC Wind has a proven track record in operating commercial scale wind farms. This should provide assurance that Project maintenance and repair work will be completed quickly and with as little impact to the surrounding community and landowners as possible.

The Cohocton Wind Power Project is expected to be generating power about 70% of the time, with an average annual capacity of approximately 30%, which is comparable to other commercial wind farms in New York State. Total net generation delivered to NYSEG's high-voltage grid is expected to be 220,000 MWh, which is the average annual consumption of approximately 28,700 homes. (By way of comparison, the 2000 census indicated a total of 46,132 housing units within Steuben County).

2.6 DECOMMISSIONING

Prior to the start of construction, a financial instrument (e.g., a reserve account) will be in place to ensure that sufficient funds are available for removal of the wind turbines and associated equipment at the end of the Project's operational life. Megawatt-scale wind turbine generators typically have a life expectancy of 20-25 years. The current trend in the wind energy industry has been to replace or “re-power” older wind energy projects by upgrading older equipment with more efficient turbines. However, if not upgraded, or if the turbines are non-operational for more than one year, they will be decommissioned, in accordance with the Town of Cohocton Windmill Local Law. Decommissioning would consist of the following elements: all turbines, including the blades, nacelles and towers will be disassembled, and transported off site for reclamation and sale. The transformers will also be transported off-site for reuse or reclamation. The overhead transmission line will be removed and reclaimed, and the poles will be cut off at grade. All underground infrastructure at depths less than 36 inches below grade will be removed. All underground infrastructure at depths greater than 36 inches below finished grade (including the subsurface collection conductors, and foundations) will be abandoned in place. Areas where subsurface components are removed will be graded to match adjacent contours, stabilized with an appropriate seed mix, and allowed to re-vegetate naturally. All road materials will be allowed to remain in place.

As per the interconnection rules of the NYISO, the Project sub-station reverts to the ownership of the transmission owner and thus CPP does not have the authority to plan for the decommissioning of the substation.

2.7 PROJECT COST AND FUNDING

The costs of developing/permitting the Project have been provided by its sponsors. The New York State Electric Research and Development Authority (NYSERDA) has also provided a $200,000 development grant to the Project. UPC Wind is currently developing approximately 2,500 MW of wind power in the U.S. (primarily in the Northeast, on the West Coast, and Hawaii). UPC Wind has also developed 30 operating wind power projects in Europe. The Cohocton Project will be funded as a commercial, for-profit enterprise with the expected $120 million capital cost supplied by private lenders and investors. CPP intends to own and operate the Project.

2.8 PERMITS AND APPROVALS REQUIRED

Implementation of the Project will require certain permits and/or approvals from local, state, and federal agencies. The permits and approvals that are expected to be required are listed in Table 2.

Table 2. Permits and Approvals for the Cohocton Wind Power Project

Agency	Description of Permit or Approval Required
Towns	
Town of Cohocton Planning Board	Issuance of Special Use Permit. Acceptance of DEIS, FEIS, and issuance of findings (as Lead Agency under SEQRA).
Town of Cohocton Departments (Public Works, Codes, etc.)	Issuance of building permits. Review and approval of highway work permits.
Steuben County	
Department of Public Works	Highway work permits.
Steuben County Planning Board	Approval pursuant to General Municipal Law 239-m.
New York State	
Department of Environmental Conservation	Article 24 Permit for disturbances to state jurisdictional wetlands. Article 15 Permit for disturbance of protected streams. SPDES General Permit. Section 401 Water Quality Certification. Issuance of SEQRA findings.
Department of Transportation	Special Use Permit for oversize/overweight vehicles. Highway work permit. Use and occupancy permit.
Department of Agriculture & Markets	Review Notice of Intent for work in an Ag. District.
Public Service Commission	Section 68 Certificate. Issuance of SEQRA findings.
Federal	
U.S. Army Corps of Engineers	Section 404 Nationwide Permit for placement of fill in federal jurisdictional wetlands/waters of the U.S. NEPA compliance.
Federal Avian Administration	Approval of Obstruction Lighting Plan

2.9 PUBLIC AND AGENCY INVOLVEMENT

Extensive agency interaction and public outreach has preceded the formal submittal of this DEIS. CPP held numerous informational sessions, meetings, and discussions with the Town of Cohocton regarding the Project since October 2002. During that 3+ year period, several formal and informal meetings have been held with the Town Board and Town Planning Board. In addition, CPP met with the Steuben County Industrial Development Agency (SCIDA). The first meetings with local residents were held in August 2003, and three public information sessions regarding the proposed Project were held between October 2003 and October 2005. Members of the Town Board and Planning Board were hosted by the Project sponsors on a visit to the Fenner (NY) wind power project on October 22, 2005.

CPP has also had numerous meetings with participating landowners and Project neighbors, and the Project has also been covered by articles in local newspapers. A website (www.cohoctonwind.com) has been set up to facilitate the sharing of information throughout project development and construction. The DEIS will be posted to this website to facilitate public review and comment on the document.

2.9.1 SEQRA Process

On December 19, 2005 a Full Environmental Assessment Form (EAF) addressing the proposed wind power project was submitted by CPP to the Town of Cohocton Planning Board pursuant to SEQRA. The formal submittal of the EAF initiated the SEQRA process for the subject action. Also in January of 2006, a solicitation of Lead Agency status was forwarded to involved SEQRA agencies by the Cohocton Planning Board, along with a copy of the EAF document. No agency objected to the Planning Board's assuming the role of Lead Agency. On March 2, 2006 the Cohocton Planning Board formally assumed the role of Lead Agency, and, in that role, issued a positive declaration, requiring the preparation of this DEIS (see Appendix B for a compilation of agency correspondence.)

This document has been prepared to comply with the requirements of SEQRA (6 NYCRR Part 617). The purpose of the DEIS is to assess the environmental impacts associated with construction of the Project. The SEQRA process for the Project will include the following actions:

- DEIS accepted by lead agency (Cohocton Planning Board).
- File notice of completion of DEIS and notice of public hearing and comment period.
- Public hearing on DEIS (must be held at least 14 days after public notice is published).
- Public comment period on the DEIS.
- Preparation and acceptance of Final EIS (FEIS), including response to comments.
- Notice of completion of Final EIS.
- 10-day public consideration period.
- SEQRA Findings Statement issued by Planning Board as Lead Agency, completing the SEQRA process.
- Involved agencies issue Findings Statements.

This DEIS, along with a copy of the public notice, will be distributed for review and comment to the public and to the agencies and parties listed in Table 3.

2.9.2 Agency and Public Review

Opportunities for detailed agency and public review will continue to be provided throughout the SEQRA process, as well as in conjunction with the review of applications for the permits and approvals needed for the Project. With respect to the completion of the SEQRA process, the DEIS will be available for public review and agency comment as outlined above. In addition to a public comment period (during which time written comments will be accepted), a duly noticed public hearing concerning the DEIS will be organized and held, in accordance with SEQRA requirements.

This DEIS, along with a copy of the public notice, will be distributed for review and comment to the public and to the parties identified in Table 3.

Table 3. Involved and Interested Agencies and Public DEIS Repositories

Cohocton	
Town of Cohocton Planning Board Post Office Box 327 Cohocton, New York 14826	Town of Cohocton Highway Department Post Office Box 327 Cohocton, New York 14826
Cohocton Town Clerk Post Office Box 327 Cohocton, New York 14826	Town of Cohocton Public Library 15 South Main Street Cohocton, New York 14826
Steuben County	
Steuben Co. Industrial Development Agency Attention: Mr. James Sherron Executive Director 7234 Route 54 Bath, New York 14810-0393	Steuben County Planning Department 3 East Pulteney Square Bath, New York 14810
Steuben County Highway Department 3 East Pulteney Square Bath, New York 14810	
New York State	
NYS Dept. of Environmental Conservation Attn: Mr. Kevin Kispert 635 Broadway Albany, New York 12233-1011	NYS Department of Public Service Three Empire State Plaza Albany, New York 12223-1350
NYS Dept. of Environmental Conservation Region 8 Attn: Regional Permit Administrator 6274 East Avon-Lima Road Avon, New York 14414	NYS Department of Transportation 50 Wolf Road 6^{th} Floor Albany, New York 12232
NYS Department of Agriculture and Markets 10 b Airline Drive Albany, New York 12235	NYS Energy Research and Development Authority Corporate Plaza West 286 Washington Ave. Ext. Albany, New York 12203-6399
NYS Department of Transportation Region 6 107 Broadway Hornell, New York 14843	NYS Office of Parks, Recreation and Historic Preservation Field Services Unit Peebles Island Waterford, New York 12118

3.0 ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND PROPOSED MITIGATION

3.1 GEOLOGY, SOILS, AND TOPOGRAPHY

3.1.1 Existing Conditions

Information regarding topography, geology, and soils was obtained from onsite observations, hydrogeologic investigations by Haley and Aldrich of New York (Appendix C), and existing published sources, including the Steuben County Soil Survey (U.S. Department of Agriculture [USDA], 1978), U.S. Geological Survey (USGS) topographic mapping, New York State surficial geology mapping (NYS Museum/NYS Geological Survey, 1999a), and statewide bedrock geology mapping (NYS Museum/NYS Geological Survey, 1999b).

3.1.1.1 Topography

The Project Site is located within the Southern New York Section of the Appalachian Uplands physiographic province of New York State (USGS, 2003). Topography in the area is consistent with that of a mature, eroded plateau (see Figure 2). It is characterized by rolling uplands and flat-topped hills, which are dissected by steep ravines and the broad valley of the Cohocton River. Many ravines in the Project Site vicinity are associated with tributaries of the Cohocton River including Kirkwood Creek, Twelve Mile Creek and Neil Creek. Ravines in the northeast portion of the Project Site are associated with Elpot Creek and Reservoir Creek, tributaries of the West River. Slopes are generally in the range of 3-20% but in some ravine areas nearly vertical slopes can be found. Elevations in the Project Site range from approximately 1,250 feet above mean sea level (amsl) in the Cohocton River Valley to 2,100 feet amsl on Lent Hill.

3.1.1.2 Geology

The bedrock within the Project Site is composed of sandstone, shale and siltstone sedimentary rocks of Upper Devonian Age. Major bedrock formations in the Project Site include the Wiscoy Formation of the Java Group, the Nunda, West Hill, and Gardeau Formations of the West Falls Group, and the Machias Formation of the Canadaway Group. Depth to bedrock in the Project Site is variable, with some exposed bedrock observed throughout the area. Very shallow or outcropping rock appears more prevalent in the Lent Hill and Dutch Hill areas but may occur in other upland areas as well (Appendix C). Outcrops are most likely to be found on steep slopes and within ravine areas, which were avoided in the siting of the proposed wind turbines, access roads and interconnects. Surface geological materials within the Project Site include glacial till, kame and kame moraines, glacial outwash, and recent alluvial deposits.

3.1.1.3 Soils

The Steuben County Soil Survey (USDA, 1978) has mapped general soil associations and soil types within the Project Site (see Figure 5). Soils are variable, but the majority of the area is characterized by deep silt loams and gravelly loams that formed in glacial till or outwash. Three soil associations and approximately 25 soils series were identified within the Project Site. Of these, Bath, Howard, Lordstown, Lordstown-Arnot, and Mardin are the dominant soil series. Table 4 lists the soil associations found within the Project Site and their characteristics. Table 5 summarizes the characteristics of the dominant soil series found within the Project Site.

Table 4. Soil Associations Within the Project Area.

Soil Association	Main Characteristics
Lordstown - Arnot	• Well drained • Moderately deep and shallow soils overlying hard sandstone bedrock
Bath - Lordstown	• Well drained • Deep soils with a fragipan and moderately deep soils overlying hard sandstone bedrock
Howard - Chenango - Middlebury	• Somewhat excessively drained to somewhat poorly drained • Deep soils formed in outwash in valleys or formed in recent alluvium on floodplains

Table 5. Dominant Soil Series Within the Project Area.

Soil Series	Main Characteristics
Bath Series	• Well drained • Formed in glacial till derived mainly from sandstone and siltstone • Gently sloping to steep • Very firm, brittle fragipan • Depth to bedrock is greater than 60 inches • Erosion hazard is slight to moderate • Equipment limitation is slight to severe
Howard Series	• Well drained to somewhat excessively drained • Formed in glacial outwash derived from limestone, sandstone, and shale • Nearly level to steep • Depth to bedrock is greater than 60 inches • Erosion hazard is slight • Equipment limitation is slight to moderate
Lordstown Series	• Well drained • Formed in glacial till • Depth to bedrock ranges from 20 to 40 inches • Erosion hazard is slight • Equipment limitation is slight to moderate
Lordstown-Arnot Series	• Well drained • Formed in glacial till • Depth to bedrock ranges from 10 to 20 inches • Erosion hazard is slight to moderate • Equipment limitation is moderate to severe
Mardin Series	• Moderately well drained • Formed in glacial till derived mainly from sandstone and shale • Well expressed fragipan • Depth to bedrock is greater than 60 inches • Erosion hazard is slight • Equipment limitation is slight to moderate

The Project Site contains significant tracts of prime farmland soils as listed by the New York State Department of Agriculture and Markets. Bath channery silt loam (map unit BaB) and Mardin channery silt loam (map unit MdB) are dominant soil types within the upland portions of the Project Site that are considered prime farmland soils. The portion of the Project Site (transmission line corridor) that runs through the Cohocton River Valley contains additional prime farmland soils, including Howard gravelly loam (map units HoA and HoB) and Chenango channery silt loam (map unit Ch).

The Steuben County Soil Survey has classified the erosion hazard for each soil type as slight, moderate, or severe. The majority of the Project Site has a slight erosion hazard (USDA, 1978). However, some soils with a moderate erosion hazard classification occur within the Project Site, including Bath soils (steep, map unit BBE), Lordstown-Arnot association (very steep, map unit LRF), and Volusia channery silt loam (15-20% slopes, map unit VoD). These soils occur almost exclusively in ravine areas. Soil drainage characteristics are variable but outside of the Cohocton River Valley are dominantly well drained.

3.1.2 Potential Impacts

3.1.2.1 Construction

Project components have been sited to avoid or minimize either temporary or permanent impacts to physiography, geology and soils. Construction on steep slopes (i.e., in excess of 15%) primarily occur along the overhead transmission line route, as it traverses the walls of the Cohocton River Valley. Additionally, the substation is sited on a slope greater than 15% along an intermittent tributary to Neil's Creek.

The Project is not anticipated to result in any significant impacts to geology, but depth to bedrock in the Project Site is variable and it is possible that some turbine foundations will be set into bedrock. If bedrock is encountered it is anticipated to be ripable, and will be excavated with backhoe. If the bedrock is not ripable, it will be excavated by pneumatic jacking or hydraulic fracturing. Blasting is not anticipated to be necessary. If blasting is required for some foundations, given the proposed turbines' distance from adjacent development (each turbine is at least 1,500 feet from the nearest residence), there should be no significant blasting-related impacts on wells, foundations, etc. Only temporary, minor impacts to physiography and geology are expected as a result of construction activities. For example, some cut and fill or addition of fill will be required at some turbine sites and along some access roads; however, the impact to overall topography will be minor.

The primary impact to the physical features of the Project Site will be the disturbance of soils during installation of foundations, underground 34.5 kV cable, and access roads. Based on the assumptions outlined in Section 2.0, these activities will disturb approximately 245 acres of ground. The majority of this disturbance is associated with access road construction. The actual impact of this work will be significantly less than these calculations indicate, due to the proposed use/upgrade of existing farm lanes to access most turbines sites. Construction of temporary staging areas will disturb approximately 3 acres of soil. Construction of met towers, the O&M building, the collection station and substation will disturb approximately 11 acres of soil. Construction of the overhead 115 kV transmission line could result in approximately 20 acres of soil disturbance. Crane paths on this Project are anticipated to follow access roads and existing town roads, and thus will not add to the acreage of soil disturbance. Soil disturbance from all anticipated construction activities will total approximately 279 acres. Of this total, approximately 44 will be converted to built facilities (roads, cranepads, structures), while the remaining will be restored and stabilized following completion of construction.

Soils at the proposed access road and turbine locations generally do not present significant engineering or development constraints. However, correspondence with Jeffrey Parker of the Steuben County Soil and Water Conservation District revealed a concern regarding potential soil drainage impacts (Appendix B). Soils in the area typically have a fragipan layer, which inhibits vertical infiltration of water, resulting in predominantly lateral subsurface drainage. Therefore, existing flow patterns can be disrupted/impeded by construction activities. Where subsurface drainage follows construction trench-lines, this disruption can create wet areas. Where access roads divert drainage to existing roadways, the disruption can create excess run-off to town and county road systems. Parker stated that previous access road construction in the area has caused excessive road ditch erosion or culvert over-topping due to increased runoff.

Additionally, earth moving and general soil disturbance will increase the potential for wind/water erosion and sedimentation into surface waters. There will be some impacts to soils that are classified as moderately erodable by the Steuben Soil Survey along the overhead transmission line corridor through the Cohocton River Valley and at the proposed substation location, although such soils have generally been avoided. Construction activity also has the potential to impact soil in agricultural fields through rutting, mixing of topsoil and subsoil, and soil compaction, including some soils classified as prime farmland soils by the New York State Department of Agriculture and Markets (NYSA & M).

The area of disturbance calculations presented above assume that significant soil disturbance will occur in all areas in which construction occurs. This assumption is very conservative. Actual disturbance will be highly variable based on the specific construction activity, the construction techniques employed, and soil/weather conditions at the time of construction. For instance, in many locations installation of the buried electrical interconnects will involve relatively minor soil disturbance, restricted to a 2-3 foot wide trench when utilizing a rock saw or cable plow. However, because use of a backhoe and soil segregation cannot be precluded, a 15 foot wide corridor of disturbance is assumed along all interconnect routes.

3.1.2.2 Operation

As mentioned previously, the Project will result in permanent conversion of approximately 44 acres of land into built facilities (0.2 acre of crane pad and foundation at each tower site, 0.1 acre pad at each met tower, maximum 20-foot-wide permanent access roads, a 1.0-acre O&M building, a 0.5-acre collection station, and a 2.0-acre substation). Beyond occasional soil disturbance associated with Project maintenance and repair, the impacts of Project operation on physiology, geography, and soils are expected to be minimal.

3.1.3 Proposed Mitigation

Impacts to physiography or geology have been largely avoided by siting Project components so as to avoid major disturbances to steep slopes, sensitive soils, and bedrock. Nevertheless, geotechnical investigations will be conducted before construction to verify depth to bedrock and to perform a pre-construction evaluation of surficial and bedrock/geology. In the event that blasting is employed for tower foundations, mitigation measures will include the development of a blasting plan that limits offsite impacts. This plan will address blast size, timing, and sequencing to focus force within the area of excavation. All necessary blasting will receive oversight by an environmental monitor. In addition, pre-notification signs and warnings to affected landowners, use of best management practices, and compliance with applicable permit requirements will be instituted as mitigation measures.

Additional potential impacts associated with soil disturbance (erosion, sedimentation, compaction) have been minimized by siting turbines in relatively level locations and using existing roads for turbine access wherever possible. Impacts to soils will be further minimized by the following means:

- In areas where steep slopes are traversed by transmission lines, the lines will be run overhead as opposed to underground to reduce soil disturbance in erosion-prone areas.

- Low permeability breakers will be installed along buried electrical interconnect trench-lines to inhibit the migration of subsurface water.
- Public road ditches and other locations where runoff is concentrated will be armored with rip-rap to dissipate the energy of flowing water and to hold the soils in place.
- Prior to commencing construction activities, erosion control devices will be installed between the work areas and downslope surface waters or wetlands, to reduce the risk of soil erosion and siltation.
- During construction activities, hay bales, silt fence, or other appropriate erosion control measures will be placed as needed around disturbed areas and stockpiled soils.
- Following construction, all temporarily disturbed areas will be stabilized and restored.

Impacts to soil resources will be minimized by adherence to “best management practices” that are designed to avoid or control erosion and sedimentation, stabilize disturbed areas, and prevent the potential for spills of fuels or lubricants. In general, erosion and sedimentation impacts during construction will be minimized by the implementation of an erosion and sedimentation control plan developed as part of the SPDES General Permit for the Project. (Additional measures are described in Section 3.2).

Mitigation measures to protect and restore agricultural soils will be undertaken during and after construction. These will include full restoration of temporarily disturbed agricultural land in accordance with NYSA&M Agricultural Protection Guidelines (see Appendix D). For example, topsoil will not be stripped and cranes will not cross fields during saturated conditions when such actions would damage agricultural soils. Existing access roads will be used for access to farmland to the extent practicable. However, for any required new access roads, topsoil in the work area will be stripped and stockpiled outside the area of disturbance, but on the property from which it was removed. All vehicular movements and construction activity will be restricted to areas where topsoil has been removed. Approximately 216 acres of temporarily disturbed soils will be restored following construction, including approximately 176 acres of agricultural land. Restored areas will include tower sites, road edges, crane paths, temporary roads, and staging areas. This process will generally involve the following sequence of activities:

1. Removal of gravel or other temporary fill.

2. Decompaction of compacted subsoils using a deep ripper.

3. Disking and removal of stones from decompacted subsoil.

4. Spreading of stockpiled topsoil over decompacted subsoil. Respreading of topsoil so as to reestablish pre-construction contours to the extent practicable.

5. Disking and removal of stones from respread topsoil.

6. Seeding and mulching topsoil. Seed selection in agricultural fields will be based on guidance provided by the landowner and the NYSA&M.

Additional detail regarding proposed agricultural soil protection measures are included in Appendix D.

Soil impacts during construction will also be minimized by providing the contractor and all subcontractors copies of the final construction documentation and plans, which will contain all applicable soil protection erosion control and soil restoration measures. One or more pre-construction meetings will be held with the contractor and a representative of the NYSA&M, and, during construction, the environmental monitors will assure compliance with the construction plans and soil protection measures described above and included in Appendix D.

3.2 WATER RESOURCES

3.2.1 Existing Conditions

3.2.1.1 <u>Surface Waters</u>

As illustrated in Figures 6 and 7, the Project Site includes the headwaters of several perennial and intermittent streams, some small ponds, and the Cohocton River. The Project Site is almost entirely within the Cohocton River watershed, except the extreme northern portion, which is in the West River watershed. The western portion of the Site drains to Twelve Mile Creek, which flows into the Cohocton River south of the Project Site. The eastern and southern portions of the Project Site drain into the Cohocton River via Kirkwood Creek, Reynold's Creek, Neil Creek, and several unnamed tributaries. Unnamed streams in the extreme northern portion of the Project Site drain north via Reservoir Creek, Eelpot Creek, and Naples Creek to the West River.

Streams in the area, both named and unnamed, are highly variable, ranging from steep-gradient streams in deeply cut ravines to low-gradient drainage channels that run through wetlands and along the edge of agricultural fields. With the exception of the Cohocton River, all of these streams are less than 15 feet wide, and most are intermittent. Substrate ranges from bedrock to silt/mud, and aquatic vegetation is typically lacking. Water depths are typically 2 to 8 inches, with maximum depths of 2 to 3 feet. Most of the streams have well-defined and abrupt banks, although several occur within corridors of floodplain or wetland. The Cohocton River and Twelve Mile Creek occur in broad, nearly flat-bottomed valleys with portions mapped as FEMA 100-year floodplains. Within the Project Site, the Cohocton River is approximately 20-30 feet wide and 2-3 feet deep. It has a moderate gradient and a cobble and gravel substrate. The river has well-defined banks, but is bordered by several large state and federally protected wetlands. Some stream segments within the Project Site are also protected under Article 15 of the Environmental Conservation Law. The Cohocton River and a tributary of Elpot Creek are classified as C(t) trout streams and Kirkwood Creek and a tributary to the Cohocton River are classified as a C(ts) trout-spawning streams (Figure 6).

Figure 7 illustrates the variety of hydrologic and morphologic characteristics displayed by streams within the Project Site.

A few farm ponds are also found within the Project Site. Generally, they are found in open field settings or adjacent to houses and barns. Typically, these ponds are excavated or diked, and range in size from 0.2 to 2.6 acres. Shorelines are well-defined and water depths are typically 4 feet or more.

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. The results of this data collection effort are described below.

3.2.1.2.1 Existing Information

Review of NYSDEC freshwater wetlands mapping indicates that there are a number of wetlands located in the valleys within and adjacent to the Project Site that are regulated under Article 24 of the Environmental Conservation Law. The state-regulated wetlands are identified in Figure 8. These are associated with Twelve Mile Creek (located immediately east of the Project Site) and the Cohocton River. State-regulated wetland AV-1, associated with the Cohocton River is designated as a Class I wetland by the DEC, which is the highest rank in the state classification system. Wetland AV-1 contains deciduous swamp, shrub swamp and wet meadow cover types. It was assigned a Class I designation pursuant to §664.5(a)(7) because it displayed four or more Class II characteristics. AV-1 was found to display the following five Class II characteristics: two or more structural groups; associated with a C(t) or higher stream; tributary to a body of water that could subject a developed or agricultural area to significant flood damage should the wetland be modified, filled, or drained; it is one of the three largest wetlands within the town; and it is within a publicly owned recreation area (NYSDEC, Unpubl.). While this wetland totals 407.2 acres in size, only 6.6 acres occur within the Project Site (i.e., within the proposed transmission line ROW).

Review of National Wetland Inventory (NWI) mapping indicates that there are also a number of federally-mapped wetlands located within and adjacent to the Project Site. The federally mapped wetlands are identified in Figure 9. While the majority of these wetlands occur in floodplain settings associated with Twelve Mile Creek and the Cohocton River (i.e., the same wetlands mapped by the NYSDEC), a few of these mapped wetlands are located within the upland portions of the Project Site. The NWI maps indicate that impoundments with unconsolidated bottoms (PUBHh and PUBFh – farm ponds) are the most common wetland type in the uplands of the Project Site, although deciduous forest/emergent (PFO1/EM1E), forested evergreen (PFO4E), and emergent impoundment (PEM1Fh) are also represented. The dominant wetland type in the valley portion of the Project Site is persistent emergent/deciduous scrub-shrub (PEM1/SS1E). Forested evergreen (PFO4E), deciduous forest (PFO1E), scrub-shrub (PSS1E), scrub-shrub/deciduous forest (PSS1/FO1E), and an unconsolidated bottom impoundment (PUBHh) are also present in the valley.

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, 2005). Hydric soils are poorly drained, and their presence is also indicative of the likely occurrence of wetlands. Hydric soils found in the Project Site include Atherton silt loam, Chippewa channery silt loam, Fluvaquents and ochrepts (not a soil type, but a soil subgroup), and Wayland silt loam. These soils occur primarily in the Cohocton River Valley and along Kirkwood Creek with a few areas of hydric soil in the uplands, generally in the same locations as NWI-mapped upland wetlands.

3.2.1.2.2 Field Review and Wetland Community Types

Wetlands within the Project Site were identified during field surveys conducted by EDR during the fall of 2005. These surveys involved field reconnaissance and documentation of existing vegetation and hydrologic conditions (with photographs and field notes). Formal delineation of all wetlands that could be impacted by Project construction will be undertaken during the spring of 2006.

Field surveys undertaken to date revealed that wetlands within the turbine arrays (Pine Hill, Lent Hill, and Brown Hill) are very limited, and generally consist of agricultural swales, farm ponds, and the intermittent headwaters of stream channels. The only significant wetlands within the Project Site occur along the proposed transmission line route. In this area, wetland boundaries were flagged and mapped using Global Positioning System (GPS) units with sub-meter accuracy (Trimble GPS Pathfinder® Pro). Wetland types identified through field review are described below and illustrated with representative photos in Figure 10.

<u>Agricultural Swales</u> – In several locations on Pine Hill and Lent Hill man-made swales have been created between sloping agricultural fields to capture and divert surface water run-off. In some of these swales, water is present consistently enough that wetland vegetation has developed. Dominant species in these areas include cattails, sedges, rushes, spotted jewelweed, and willows. It is worth noting that these areas may not qualify as jurisdictional wetlands because they were created in upland areas, and are subject to periodic maintenance by the landowners to keep them functioning properly.

<u>Farm Ponds/Emergent Marsh</u> – On Pine Hill and Lent Hill, a few emergent marshes/old farm ponds were observed. These wetlands appear to correspond to NWI mapping, and are typically small (<1 acre) and dominated by cattails, sedges, reed canary grass, scattered silky dogwood and willow shrubs , and other emergent herbaceous species. In one case, the wetland included a significant open water component.

<u>Intermittent Headwaters</u> – The tops of ravines and valleys on Pine Hill and Lent Hill typically include intermittent stream channels. At the time of field review (October, 2005), all of these channels were dry, but displayed evidence of periodic heavy flows. The channels are typically deeply incised and scoured, with a steep gradient and rocky substrate. Vegetation of any type is typically lacking.

Stream Channels – Perennial streams were observed in a few locations on Pine Hill and Lent Hill, as well as along the proposed transmission line route. These ranged from small headwater streams to the Cohocton River. The former are characterized by narrow (<10 feet wide) channels, well-defined banks, and rocky substrate. They are typically moderate gradient streams within forested ravines/valleys, that have shallow (0 to 6 inch deep) flowing water. As described previously, the Cohocton River is a 20-30 foot wide, moderate gradient stream with a substrate that includes cobbles, gravel, and silt. The river is characterized by numerous meanders/oxbows, and is typically lined by wetlands and agricultural fields.

Scrub-Shrub Wetlands – Wetlands that border the Cohocton River are primarily scrub-shrub communities dominated by speckled alder, silky dogwood, and willows. This wetland community also has some emergent and forested components, which include species such as reed canary grass, sensitive fern, late goldenrod, sedges, eastern cottonwood, green ash, and red maple. These areas are characterized by periodic inundation/saturation (through river flooding, surface runoff, and seasonal high groundwater) and deep alluvial soils. They correspond with the major mapped NWI and NYSDEC (AV-1) wetlands described previously, and are the largest/most significant wetlands in the Project Site.

Wet Meadow – The transmission line route also crosses an area of wet meadow associated with an unnamed tributary to the Cohocton River along Fairbrother Road. This area is currently an active pasture. It includes two channels of the stream (excavated/ditched), shallow depressional areas, and seeps that are dominated by herbaceous species including rushes, sedges, and grasses. Upland herbaceous species, including thistles and common plantain, also occur in this community, along with scattered upland and wetland shrubs, including willows, elderberry, and multiflora rose.

Most of the wetlands in the Project Site provide limited functions and values due to 1) their small size, 2) location within agricultural fields, 3) lack of structural diversity and 4) past or on-going physical disturbance (e.g., agriculture, road/trail development, and dumping). The highest-value wetlands are the larger, more diverse wetlands associated with the Cohocton River. These wetlands have a sizable watershed, and provide significant flood storage, fish and wildlife habitat, water quality, and groundwater benefits.

3.2.1.3 Groundwater

Haley & Aldrich of New York conducted a study of groundwater resources within the project area (see report in Appendix C). This study identified three water bearing units within the area, the most significant being the valley fill aquifer (Figure 11). The valley fill deposits underlying the Cohocton River, Twelve Mile Creek, and the lower reaches of several unnamed tributaries to these water courses have collectively been designated a "Primary Aquifer" as defined by NYSDEC regulations. This designation indicates that the aquifer yields enough groundwater to be used as a major municipal water supply, which is the case for the Villages of Cohocton and Avoca and the Hamlet of North Cohocton. Although the quality of the water in this aquifer is generally good, the Environmental Protection Agency's (EPA) Safe Drinking Water Information System has a record of nitrate health-based violations for the Village of Cohocton and the North Cohocton water district and a coliform bacteria violation for the Village of Avoca (EPA, 2005). Haley & Aldrich report high salt content at significant depths and the presence of sulfates and iron in some areas, particularly in darker shale units. Municipal well data indicate yields from this aquifer in the range of 200-300 gpm. Haley & Aldrich describe this aquifer as very prolific and subject to significant ongoing recharge across most of the study area. Additionally, this valley fill aquifer is continuous with the valley fill aquifer in Wayland Township, which has been designated a Critical Environmental Area by the Town of Wayland because it is a primary source of drinking water.

As shown in Figure 11, none of the proposed turbine sites are located over the area designated as a Primary Aquifer. A portion of the transmission line route traverses over the area so designated.

Other water bearing units identified by Haley & Aldrich are hill slopes and upland area soil deposits and bedrock. Hill slopes and upland area soil deposits are not considered significant water-bearing units but may be sufficient for domestic use in some areas. The bedrock aquifer is expected to be the source of water for the majority of the drilled wells on hill slopes and in the upland portions of the Project Site. Groundwater flow and yield within the bedrock is generally controlled by fractures in the rock. Rock formations that typify the Project Site generally have low permeability and therefore low yields. Refer to Appendix C for further information on groundwater resources within the Project area.

3.2.2 Potential Impacts

3.2.2.1 <u>Construction</u>

3.2.2.1.1 Surface Waters and Wetlands

Due to the general lack of wetlands and surface water resources within the Project Site, construction-related impacts are anticipated to be very minor. To avoid or minimize the impacts on streams and wetlands, Project design was guided by the following siting criteria:

- Large built components of the Project, including staging areas, wind turbines, the collector station, and the substation, will be located in upland areas and will completely avoid wetlands.

- Wetland impacts due to access road crossings will be avoided by routing around wetlands and utilizing existing farm lanes.

- Buried electric interconnect lines will be routed to avoid crossing wetlands and streams whenever possible. Where necessary, narrow and/or previously disturbed crossing locations will be utilized.

- To minimize impacts to wetlands in the Cohocton River valley, the transmission line will be installed above ground, along the Livonia, Lakeville, and Avon Railroad ROW.

Wetlands that could be impacted during construction were inventoried by EDR during the fall of 2004 (see Figure 12). Wetland impacts anticipated to occur in these areas during construction of the Project will be limited to the following:

- Temporary disturbance of an 11 foot wide intermittent stream along the interconnect route between Turbines 10 and 12. The area of disturbance will be less than 0.02 acre in size, and will occur in the location of an existing snowmobile/ATV trail crossing.

- Crossing of the Cohocton River and associated wetlands by the proposed overhead transmission line. Although final design of the line is not yet complete, the route is proposed to utilize previously disturbed areas, including a rudimentary road, a junkyard, and the existing railroad ROW through Wetland AV-1. The Cohocton

River will be spanned, and will not be disturbed during construction. The proposed alignment will cross approximately 2,380 linear feet of wetland, and 1,450 linear feet of state regulated adjacent area (100 foot buffer). However, construction impacts will be limited to selective tree clearing within the 70-foot wide ROW and placement of treated wood poles (by auguring) primarily along the toe of the elevated railroad grade. It is anticipated most of this work will be performed from the railroad grade, but for the purposes of this DEIS, it is assumed that a 20 foot wide corridor of disturbance will occur within the wetland during Project construction.

- Approximately 540 linear feet of wet meadow (and two streams) along Fairbrother Road will also be crossed by the overhead line. Although final design is not yet complete, it is likely that this area will be spanned and that no disturbance will be required. No clearing of trees is required in this pasture area, but for the purposes of this DEIS it is assumed that temporary soil disturbance could occur within a 20-foot wide corridor through this wetland.

During construction, direct impact to wetlands/streams is anticipated to total no more than 2.9 acres. This impact will be limited to minor and temporary vegetation and soil disturbance associated with clearing of vegetation and the placement of transmission poles in the wetland. Indirect impacts such as sedimentation/siltation and incidental spills are also possible. Permanent impacts will be limited to placement of transmission poles in Wetland AV 1. Placement of the poles in the wetland and its regulated adjacent area likely will require an Article 24 permit from the NYSDEC and a Section 404 permit from the U.S. Army Corps of Engineers (USACOE). The construction of turbines, access roads, and the possible upgrade of local public roads, are not anticipated to result in either temporary or permanent impacts to wetlands and streams.

3.2.2.1.2 Groundwater

Haley & Aldrich conducted an assessment of the potential impacts the Project could have on groundwater resources. As stated in their report: "The construction techniques employed for wind power project development are conventional methods that involve relatively shallow excavation that generally does not involve groundwater. As a result, the expected impacts from wind power projects on groundwater resources are inconsequential." However, they did identify five potential impacts to groundwater and assessed the potential for each impact based on site-specific resources and construction plans. Potentially-negative impacts to groundwater include:

- Localized lowering of the water table;
- Localized disruption of groundwater flows down-gradient of proposed turbine foundations;
- Modification to surface runoff or stream-flow, thereby affecting groundwater recharge characteristics;
- Alteration of groundwater chemical quality; and
- Impacts to groundwater recharge areas (wetlands).

Installation of turbine foundations has the greatest potential for impacts to groundwater. If blasting is necessary, it can generate ground vibration, fracture bedrock, and impact groundwater levels. However, based on the depth and extent of excavation proposed, and the distance of the excavations from local wells, these risks are considered minimal and unlikely to have an affect on surrounding residences. Construction could also impact groundwater flow paths in areas where excavation or blasting occur below the water table. However, water is anticipated to flow around the disturbance and resume its original flow direction down gradient of the disturbance. Groundwater that infiltrates into the excavation may require removal by pumping, which could have an effect on the elevation of the water table. However, this water will be pumped to the surface and allowed to infiltrate back into the aquifer with negligible loss of volume due to evaporation. Therefore, any effect will be very localized and temporary. Additionally, installation of the concrete foundations may cause a temporary, localized increase in groundwater pH during the curing process. This effect will not extend beyond the immediate area of the foundation and will not adversely affect ground water quality.

In addition to impacts to groundwater due to turbine foundation installation, minor impacts could result from other Project activities. Construction of access roads will result in minor increase in storm water runoff that otherwise would have infiltrated into the ground at the road locations. However, this impact will be minor, given that most of the proposed access roads are utilizing existing farm roads. Buried transmission lines may facilitate groundwater migration along trench backfill in areas of shallow groundwater. Overhead transmission lines will generally have no effect on groundwater, except perhaps in wetlands in the Cohocton River Valley. In these areas of shallow groundwater, the preservative-treated wooden poles may be installed below the water table. Under these circumstances, there will be a localized loss of polynuclear aromatic hydrocarbon (PAH) compounds to the soils immediately surrounding the poles. However, these compounds are not readily dissolved into groundwater and would not be present in quantities that could adversely affect human health or the environment.

A final potential impact to groundwater is the introduction of pollutants to groundwater from the discharge of petroleum or other chemicals during construction. Such discharges could occur in the form of minor leaks from fuel and hydraulic systems, as well as more substantial spills that could occur during refueling or due to mechanical failures and other accidents.

Given the location of the majority of the proposed project components, and the practices to be followed during construction, none of the potential impacts listed above will have a significant impact on the valley fill aquifer.

3.2.2.2 Operation

3.2.2.2.1 Surface Waters and Wetlands

Operation and maintenance of the constructed facility is not anticipated to have significant adverse impacts to wetlands, streams, or ponds within the Project Site. The only predictable operational impact is periodic vegetation management (i.e., tall tree removal) along the transmission line ROW where it crosses wetlands in the Cohocton River valley. However, this activity will not result in the loss of wetland acreage, and because these wetlands are primarily scrub-shrub and emergent communities, will not result in permanent wetland conversion (i.e., from a forested to non-forested community). Minor and isolated incidences of wetland/stream impact could also occur in association with infrequent events such as repair of buried electrical interconnects, access road washouts, or accidental fuel/chemical spills.

The proposed Project will not result in wide-scale conversion of land to built/impervious surfaces. Tower bases, crane pads, access roads, and the substation in total will add approximately 44 acres of impervious surface to the 5,755-acre Project Site (i.e., conversion of less than 1%). Consequently, no significant changes to the rate or volume of stormwater runoff are anticipated. However, installation of permanent Project components could result in localized changes to runoff/drainage patterns.

3.2.2.2.2 Groundwater

Any impacts to groundwater will occur during construction only. Over the long term, addition of small areas of impervious surface to the Project Site in the form of permanent access roads, crane pads, substations, and the O&M building will have a minimal effect on groundwater recharge. Turbine foundations installed below the water table and migration of groundwater along buried interconnect trenches could have a minor effects on groundwater flow paths, and a continued risk of chemical spills exists during operation. However, as stated by Haley and Aldrich: "Wind farm projects typically do not have demonstrable impacts to groundwater resources. They do not utilize groundwater for generating energy. They do not require the use or storage of fuels or other chemicals for operation, thus the potential release of such materials and resulting negative impacts to groundwater quality are not an issue."

3.2.3 Proposed Mitigation

To verify and refine wetland information included in the DEIS, a formal delineation of all areas subject to disturbance will be conducted during the spring of 2006. The delineation will be used to refine Project layout (if necessary) and will be included in the Joint Application for Permit that will be submitted to the NYSDEC and the USACOE. Because permanent wetland and stream impacts (beyond placement of poles) are not anticipated, no compensatory wetland mitigation project is proposed. However, if wetland mitigation is required by the agencies, a mitigation plan will be developed in consultation with the NYSDEC and USACOE during the wetland permitting process.

No mitigation for indirect or temporary impacts to wetlands or streams is proposed, given the fact that these impacts will not result in any loss of wetland acreage. However, temporary impacts to wetlands/streams will be minimized during construction as discussed below:

The direct impacts to wetlands and streams will be minimized by utilizing existing or narrow crossing locations and previously disturbed areas whenever possible. The proposed use of the existing railroad grade to access and construct the transmission line through Wetland AV-1 will minimize impacts to previously undisturbed portions of this wetland, and could reduce the extent of temporary impacts by almost half (i.e., half of the transmission line ROW may overlap with the existing railroad grade). Special crossing techniques, equipment restrictions, herbicide use restrictions, and erosion and sedimentation control measures will also be utilized to reduce impacts to water quality, surface water hydrology, and aquatic organisms. In addition, clearing of vegetation in wetland areas will be kept to an absolute minimum.

Where crossings of surface waters and wetlands are required, the Applicant will employ the Best Management Practices associated with particular, applicable streamside and wetland activities, as recommended by the NYSDEC and the USACOE, and required by the issued wetland/waters permits. Specific mitigation measures for protecting wetlands and surface water resources will include the following:

- No Equipment Access Areas. Wetlands, streams, waterbodies will be designated "No Equipment Access," thus prohibiting the use of motorized equipment in these areas.
- Restricted Activities Area. A buffer zone of 100 feet, referred to as "Restricted Activities Area", will be established where Project construction traverses streams, wetland and other bodies of water. Restrictions will include:
    - No deposition of slash within or adjacent to a waterbody;
    - No accumulation of construction debris within the area;
    - Herbicide restrictions within 100 feet of a stream or wetland (or as required per manufacturer's instructions);
    - No degradation of stream banks;
    - No equipment washing or refueling within the area; and
    - No storage of any petroleum or chemical material.
- Access Through Wetlands - When crossing wetlands, routing around edges, utilizing disturbed areas, and crossing the narrowest portion of the wetland will be the preferred crossing options. Wherever feasible, low impact crossing methods will be used such as timber mats or similar materials.
- Sediment and Siltation Control – A soil erosion and sedimentation control plan will be developed and implemented as part of the State Pollutant Discharge Elimination System (SPDES) General Permit for the Project. To protect surface waters, wetlands, groundwater and stormwater quality, silt fence, hay bales, and temporary siltation basins will be installed and maintained throughout Project development. The location of these features will be indicated on construction drawings and reviewed by the contractor and environmental monitor prior to construction. The environmental monitor will also inspect these features to assure that they function properly

throughout the period of construction, and until completion of all restoration work (final grading and seeding).

To enhance compliance with proposed mitigation measures during construction, CPP will provide the construction contractor with copies of applicable NYSDEC (Article 24 and Section 401 Water Quality Certification) and USACOE permits (Section 404) and site specific plans detailing construction methodologies, sediment and erosion control plans, and required natural resource protection measures. The on-site environmental monitor will ensure compliance with resource protection plans and permit conditions. Wetlands temporarily disturbed during construction will be restored to their original grade. This will allow wetland areas to redevelop naturally following construction.

Any increase in stormwater runoff will be negligible, as Project construction will result in limited addition of impervious surface. Nevertheless, specific means of avoiding or minimizing stormwater-related adverse impacts during construction and operation of the Project include adhering to a detailed soil erosion and sedimentation control plan, as described previously. Additionally, a Spill Prevention, Containment, and Countermeasure (SPCC) Plan that outlines procedures to be implemented to prevent the release of hazardous substances into the environment will be developed and implemented. This plan will not allow refueling of construction equipment within 100 feet of any stream or wetland, and all contractors will be required to keep materials on hand to control and contain a petroleum spill. These materials will include a shovel, tank patch kit, and oil-absorbent materials. Any spills will be reported in accordance with NYSDEC regulations. Contractors will be responsible for ensuring responsible action on the part of construction personnel.

If blasting is necessary for construction of any wind turbine foundations, blasting will be done in compliance with a blasting plan designed with appropriate charge weights and delays to localize bedrock fracturing to the proposed foundation area, minimizing the already unlikely chance of impacting water levels in residential wells. However, as stated in Section 2, CPP does not currently expect that blasting will be required.

Long-term vegetative management on the transmission line ROW within wetlands will be accomplished in a manner that does not require the use of vehicular equipment or the application of herbicides.

3.3 BIOLOGICAL RESOURCES

3.3.1 Existing Conditions

3.3.1.1 Vegetation

Plant species and communities found within the Project Site were identified and characterized during field surveys conducted by EDR during the fall of 2005. A total of 61 plant species were documented within the Project Site during these field surveys. A list of these species, as well as others likely to occur in the area, (including scientific names) is included in Appendix E. All of the plant species identified during the course of field surveys are common to the region and the state.

3.3.1.1.1 Ecological Communities

Vegetative communities within the Project Site were mapped based on interpretation of aerial photography and field verification. Community boundaries were then digitized, and approximate acreages were calculated through the use of Geographic Information System (GIS) analysis. All identified ecological communities within the Project Site are depicted on Figure 13. Inventoried wetlands within the Project Site have been quantified and described separately (see Section 3.2).

All of the major plant communities found within the Project Site are common to New York State. Agricultural fields and forestland are the dominant community types within the Project Site, while successional lands (shrub/scrub and old field), open water, and developed/disturbed communities occur to a lesser extent. Brief descriptions of these ecological community types, as classified and described in Ecological Communities of New York State (Reschke, 1990), are provided below. Representative photos are included in Figure 14.

Agricultural Land constitutes the largest community within the Project Site, with approximately 3,583 acres (62.3%) of the land in row crops, field crops, or pastureland. Corn is the primary row crop, while other crops include alfalfa, oats, wheat and potatoes. Hayfields are typically rotated into (and out of) row crop production (typically corn), and less often into pastureland. Consequently, the percentage in each agricultural type is constantly changing. Pastureland is used for the grazing of livestock and is typically characterized by mixed grasses and broad-leafed herbaceous species, including clovers, plantains, and dandelion.

Successional Old Field constitutes approximately 52 acres (0.9%) of the Project Site, and is defined by Reschke (1990) as "a meadow dominated by forbs and grasses that occurs on sites that have been cleared and plowed (for farming or development), and then abandoned." This ecological community is scattered throughout the Project Site, primarily along field edges or in the form of abandoned agricultural fields. Species found in these areas include typical old-field grasses such as orchard grass, timothy, and perennial rye. Broad-leaved herbaceous species found in old fields include goldenrods, red and white clover, milkweed, thistles, asters, Queen Anne's lace, and burdock. Shrubs (including honeysuckle, raspberry, gray dogwood, and brambles) and saplings from adjacent forestland, are also typically components of this community, but represent less than 50% of total vegetative cover. Areas of emergent marsh and wet meadow that are dominated by herbaceous vegetation also occur within the Project Site. These communities were described in Section 3.2.

Successional Shrubland occurs on approximately 149 acres (2.6%) within the Project Site, and is frequently associated with old fields and young forestland on the periphery of agricultural areas. Shrubland areas are commonly found in poorly drained areas, on steep slopes, or other areas that limit agricultural production. Areas of young trees and shrubs are also intermixed with some forested areas. Herbaceous species similar to those found in successional old fields occur in this community. However, shrub species such as honeysuckle, raspberry, multiflora rose, gray dogwood, hawthorn, and wild grape dominate this community. Shrub-dominated wetlands (interspersed with some upland successional shrubland) occur along the Cohocton River. These areas were described in Section 3.2, and are dominated by species such as speckled alder, willow, Eastern cottonwood, and silky dogwood.

Forest totals approximately 1,893 acres (32.9%) of the Project Site. Hardwood forests within the Project Site resemble the Appalachian oak-hickory forest and the hemlock-northern hardwood communities described by Reschke (1990). Forests within the Project Site occur on steep valley walls, in ravines, and as relatively small woodlots. Tree species vary based on the orientation of the slope, but dominant or codominant species in most locations include white oak, northern red oak, white ash, basswood, sugar maple, and red maple. On north-facing slopes and in narrow wooded ravines Eastern hemlock is often the dominant tree species, along with red maple, yellow birch, black cherry, white pine, American beech and sugar maple. The forest understory ranges from sparse to very dense, with common species including saplings of the overstory trees, along with hophornbeam, striped maple, lowbush blueberry, maple-leafed viburnum, asters, goldenrod, beech drops, brambles, and ferns such as bracken fern and wood fern.

Also included within the Forest ecological community are some conifer plantations that are located in the Project area. These plantations are stands of coniferous softwoods planted for the cultivation and harvest of timber products, or to provide wildlife habitat, soil erosion control, windbreaks, or Christmas tree production. Plantations typically occur as either a monoculture or a mixed stand with two or more codominant species, such as Norway spruce, Scotch pine, Douglas fir, red pine, white pine, and European larch. Plantations within the Project area are typically mature stands (over 60 years old). Ground layer vegetation in the more mature plantations is sparse, and typically consists of mosses, ground pine, and various ferns.

Open Water accounts for approximately 6 acres, (0.1%) of the Project Site. Surface water features are fully described in Section 3.2 (Water Resources). The major surface water feature in the area is the Cohocton River. The remainder are relatively small man-made excavations or impoundments (i.e., farm ponds).

The Project Site also includes approximately 72 acres (1.3%) of Disturbed/Developed land. This community is a combination of several "cultural communities" defined by Reschke (1990), and is characterized by the presence of buildings, paved areas, and lawns. It includes residential yards, farmyards, storage yards, and roads.

3.3.1.1.2 Significant Natural Communities/Rare Plant Species

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. According to a response from NYSDEC, the NHP database indicates that no state- or federally-listed threatened or endangered plant species, or unique significant natural communities have been documented within the vicinity of the Project Site. To date, no response to the written request for information has been received from the USFWS (see Appendix B for Agency Correspondence). Field review by EDR confirmed that the Project Site is dominated by common ecological communities. No listed threatened and endangered plant species, or unique or significant natural communities were observed on the Project Site during the field review. Further, although the timing of the surveys (late fall) did not allow for identification of all plant species, typical indicators or possible rare plant occurrence (e.g., rich woodlands, prairie remnants, limestone outcrops, fens, etc.) were not observed.

3.3.1.2 Fish and Wildlife

Fish and wildlife resources within the Project Site were identified through analysis of existing data sources, on-site field surveys, correspondence received from the NHP, an avian and bat information summary and risk assessment prepared by Woodlot Alternatives, Inc. (Woodlot, 2005a, Appendix E).

A total of 24 wildlife species (or sign of these species, such as identifiable tracks and/or scat) were observed within the Project Site during on-site field surveys conducted during 2004 and 2005. In addition, based on existing data sources and observed habitat conditions, it is estimated that approximately 233 different species could potentially be found at some time within the Project Site. These species of wildlife, including scientific names, are listed in Appendix E. More specific information regarding birds, mammals, herptifauna (reptiles and amphibians), listed threatened and endangered species, and wildlife habitat within the Project area is presented below.

3.3.1.2.1 Birds

To determine the type and number of bird species present within the Project area, existing data sources were consulted and on-site field surveys were conducted. Sources of information included the following:

- NYS Breeding Bird Atlas (BBS).
- USGS Breeding Bird Survey (BBS).
- On-site raptor migration surveys conducted by Woodlot during 2004 and 2005 (Appendix E).
- A brief radar survey conducted by Woodlot during the spring of 2005 (Appendix E).
- Radar data from migration studies conducted in the Town of Prattsburgh during 2004 (Mabee, et al., 2005).
- Raptor migration and radar survey data from studies conducted by Woodlot in Prattsburgh during 2004 and 2005 (Woodlot, 2005 b and c).
- On-site observations by EDR ecologists during the fall of 2005.

Based on the results of these investigations, it appears as if approximately 151 avian species could use the Project Site at some time throughout a given year (Appendix E). Details on the site's avian community are presented below:

Breeding Birds

The BBS, which is directed by the USGS, is a long-term avian monitoring program that tracks the status and distribution of North American avian populations. There are four BBS survey routes within approximately 20 miles of the Project Site (Sauer, 2005). BBS survey data from 1966 to 2004 were analyzed by Woodlot to determine likely breeding birds within the Project area. BBS survey data documented between 99 and 118 species of bird likely breeding in the vicinity of the Project Site. The most commonly observed species included European starling, red-winged blackbird, American robin, common grackle, American crow, song sparrow, house sparrow, barn swallow, American goldfinch, and yellow warbler. State-listed species observed during these surveys included northern harrier (threatened), Cooper's hawk (special concern), sharp-shinned hawk (special concern), horned lark (special concern), Henslow's sparrow (threatened), grasshopper sparrow (special concern), and vesper sparrow (special concern). Of these only northern harrier was observed on site (during EDR's fall field surveys). The species data reflect the habitat conditions within the Cohocton area, which include agricultural fields, early successional shrubland, and young forest.

The BBA is a comprehensive, statewide survey that indicates the distribution of breeding birds in New York State. BBA survey block, (2971D), which covers much of the Cohocton Project Site, was analyzed by Woodlot. This block totaled 92 species, of which, 47 were confirmed as breeding birds, five were recorded as probable breeding birds, and 40 were recorded as possible breeding birds (Appendix E). The species composition indicated by the BBA is very similar to that indicated by the BBS, with the majority of the species being typical of the agricultural and mixed agricultural/forest habitat that dominates the Project area. Listed species documented in the area by the BBA included Cooper's hawk and horned lark.

While on-site breeding bird surveys have not yet been conducted within the Project Site, incidental observations made during the course of other field investigations (such as raptor surveys conducted in the late spring) indicate that the common species are similar to those documented by BBS and BBA data.

Migrating Raptors

Diurnal raptor migration surveys in the Cohocton Project Site were conducted by Woodlot during the fall of 2004 and the spring and fall of 2005. Surveys were typically conducted from approximately 9:00 am to 3:00 pm each day. All raptors observed were recorded. and attempts were made to distinguish between migrating and resident birds. In addition, concurrent raptor surveys were conducted during the fall of 2004 and the spring of 2005 at another proposed wind power site in the Town of Prattsburgh, approximately three miles to the east.

These surveys identified from 8 to 15 different migrating raptor species, the most common of which were turkey vultures and red-tailed hawks. At both sites, the majority of raptors observed were flying below the rotor-swept area of the proposed turbines (<125m, or 410 feet). According to the Woodlot report, the total number of raptors observed (and the observation rates) are very low compared to those seen at other sites in the region, which include observation rates 3 to 15 times greater then those reported at the Cohocton site (Woodlot, 2005a).

Migrating Songbirds

Woodlot conducted three nights (May 10 through 12) of on-site nocturnal radar surveys during the spring of 2005 to characterize songbird migration. This data set was intended to supplement and verify radar data being collected concurrently at a site in Prattsburgh, located approximately 6 miles to the northeast. The Prattsburgh survey was being conducted over the entire spring season (20 nights of radar), and the Cohocton effort was essentially designed to verify that data obtained from Prattsburgh would apply to Cohocton. Identical radar systems and identical sampling methods (horizontal and vertical radar antenna orientation) were used at both sites. In addition, the results of a second (30 night) radar study in Prattsburgh (Mabee, *et al*., 2005) were also available for comparison.

Results of these surveys revealed that nightly mean passage rates at Cohocton varied from 133 targets/kilometer/hour (t/km/hr) to 773 t/km/hr, with an overall mean of 371 t/km/hr, while passage rates at Prattsburgh were slightly lower, varying from 70 to 621 t/km/hr with an overall nightly mean of 292 t/km/hr (Woodlot 2005a). Mean flight height of targets at Cohocton ranged from 518 m (1,699 feet) to 745 m (2,444 feet), and were considerably higher than those seen at Prattsburgh. The percent of targets flying below 125 m (i.e., the height of the proposed turbines) varied from 4-20%, with a three-night mean of 12%. Mean flight direction at both sites was to the northeast. These results indicate that nighttime migration characteristics at the two sites are very similar. Data from both sites show high flight heights relative to the proposed turbines and natural landscape features as well as uniform movement across the radar display. This indicates that migration over the Project Sites is likely to occur as a broad front movement and that landscape features are not causing night-migrating birds to concentrate at any specific locations in the Project Sites.

Radar survey results from a fall 2004 study conducted by Alaska Biological Research, Inc. (ABR) at one of the proposed wind power developments in Prattsburgh (Mabee *et al.,* 2005) are similar to those obtained by Woodlot at Cohocton and the other Prattsburgh project (Woodlot 2005b). The similarity in results again indicates that nighttime bird migration over the Project Site is likely to be broad front, with similar movement patterns over the broad geographic scale of west-central New York. More importantly, this similarity indicates that the data collected for these nearby projects are representative of migration over the Cohocton study area.

The results presented above are of sites in proximity to each other and indicate that nighttime bird migration over the two locations is likely to be similar. When compared to other Northeastern studies using similar methods, these results fall within the range of those other studies (Table 6).

Table 6. Summary of Passage Rates from Other Radar Studies

Year	Location	Passage Rate (t/km/hr)	Reference
Fall			
1994	Western Maine	551	ND&T, 1995a
1994	Copenhagen, NY	341	Cooper *et al*., 1995
1994	Martinsburg, NY	661	Cooper *et al*., 1995
1998	Harrisburg, NY	336	Cooper and Mabee, 1999
1998	Wethersfield, NY	466	Cooper and Mabee, 1999
2003	Chautauqua, NY	235	Cooper *et al*., 2004a
2003	Mt. Storm, WV	241	Cooper *et al*., 2004b
2004	Prattsburgh, NY	200	Mabee *et al*., 2005
2004	Prattsburgh, NY	193	Woodlot, 2005b
Spring			
1994	Western Maine	99	ND&T, 1995b
1994	Carthage, NY	159	Cooper *et al.,* 2004c
1999	Weathersfield, NY	41	Cooper *et al.,* 2004c
2003	Chautauqua, NY	395	Cooper *et al.,* 2004c
2005	Cohocton, NY*	371	This report
2005	Prattsburgh, NY	277	Woodlot, 2005a

* This study was calculated with only three nights of radar sampling.

<u>Waterbirds</u>

Waterfowl and wading birds are not well represented in the BBS or BBA data collected within or adjacent to the Project Site. The Project Site is not located adjacent to any large bodies of water (including large marshes and rivers) that would be expected to attract high numbers of migrating waterbirds. The nearest large water bodies are Keuka Lake and Canandaigua Lake (located approximately 12 miles to the east and 7 miles to the north, respectively), which NYSDEC correspondence indicates are winter concentration areas for waterfowl (Ketcham, pers. comm.). While available literature (such as Drennan [1980]) does not reference significant waterbird migration through this region, Bellrose (1976) suggests that there are minor migration corridors for ducks and Canada geese through Central New York. However, these corridors are approximately 60 to 70 miles wide, which suggests rather broad front migration of ducks and Canada geese through the area. NHP data indicates the occurrence of a great blue heron rookery off of Salmon Creek Road in the Town of Wheler, but this site is well outside the Project Site. It should also be noted that, during the fall migration, large numbers of Canada geese forage in harvested corn fields, which are common within the Project Site.

3.3.1.2.2 Mammals

Due to a lack of existing data regarding mammals within the Project Site, the occurrence of mammalian species was documented entirely through on-site field surveys and evaluation of available habitat. This effort suggests that up to 39 species of mammal could occur in this area. Fall 2005 field surveys conducted by EDR documented the presence of eight species (or sign of their occurrence) within the Project Site. These species included whitetail deer, eastern cottontail, eastern chipmunk, coyote, red fox, raccoon, opossum, woodchuck, and gray squirrel. Species not observed, but likely to occur in the area, include striped skunk, beaver, muskrat, mink, weasels, and a variety of small mammals (mice and shrews). All of the observed species are common and widely distributed throughout New York State.

To characterize and document bat activity within the Project Site, Woodlot conducted acoustic bat surveys using Anabat II detectors, which record bat vocalizations. These surveys were conducted during the fall of 2004 and the spring and fall of 2005, and included one night of mobile (active) Anabat survey and a total of 105 nights of stationary (passive) Anabat survey.

A total of 484 bat call sequences were recorded during the three season of survey. Of the 191 bat call sequences recorded during the fall 2005 survey (the longest survey season), 149 (78%) were identified to species, or to the genus *Myotis*. Calls within *Myotis* were not identified to species, due to similarity of calls between species and the lack of a reference database (Robbins and Britzke 1999). However, all of the *Myotis* call sequences recorded at the Cohocton site most closely resembled those of the little brown bat. In addition to myotids, big brown bat, eastern red bat, hoary bat, and silver-haired bat, were also recorded, and big brown bats and myotids were the most common bats detected.

Summer 2004 bat surveys were conducted by Bat Conservation and Management, Inc. (BCM) at one of the proposed wind power sites in Prattsburgh (BCM 2004). Mist netting was conducted at five sites in the area of that proposed project in early July and late August of 2004. Detector surveys were also conducted at each of the five sites. A total of 101 bats were documented during the mist-netting surveys. Little brown bats were the most abundant species netted, accounting for 75 percent of the collected animals. This was followed by the northern long-eared bat (15%), big brown bat (6%), eastern red bat (2), and hoary and silver-haired bats (1% each). The detector surveys documented 2,209 bat calls. Big brown bats accounted for the greatest percentage of calls recorded (47%), followed closely by little brown bats (42%). Other species recorded included northern long-eared bats, eastern red bats, hoary bats, silver-haired bats, and eastern pipistrelles. No rare species of bats were documented during the field surveys.

3.3.1.2.3 Reptiles and Amphibians

Reptile and amphibian presence within the Project Site was determined through field survey and review of the New York State Amphibian and Reptile Atlas. The Atlas Project was a ten-year survey (1990 through 1999) designed to document the geographic distribution of the state's herptofauna. Atlas data was collected and organized according to USGS 7.5-minute quadrangles (NYSDEC, 2006). Based on this data, along with documented species ranges and existing habitat conditions, it is estimated that over 30 reptile and amphibian species could occur in the area (Appendix E). However, due to the time of year at which field surveys were conducted (late fall), only three of these species were actually documented on site (green frog, American toad, and eastern garter snake). Species not observed, but likely to occur in the Project Site based on existing habitat conditions, include red-backed salamander, painted turtle, northern water snake, bullfrog, and spring peeper. All of these species are common and widely distributed throughout New York State.

According to the data obtained from the NYS Amphibian and Reptile Atlas, one state-listed species has been documented within the Project area (Jefferson salamander), which is a species of special concern.

3.3.1.2.4 Fish

Ponds and streams within and adjacent to the Project Site likely support both warm water and cold water fish populations (some native and some stocked). Although no fisheries data has been obtained or field surveys conducted, fish species such as brown trout, brook trout, largemouth bass, small mouth bass, sunfish, creek chub, shiners, and dace most likely occur within the Project Site. A relatively small number of state-classified trout streams and trout spawning streams occur in the Project area. These streams, which include the Cohocton River, Kirkwood Creek, and tributaries to Eelpot Creek and the Cohocton River, support a coldwater fish community including brook trout, brown trout, creek chub, and slimy sculpin. Ponds within the area likely support a warm water fish community (e.g., bass, sunfish, and shiners). Most of the ponds and streams within the Project Site are located on private property and lack any provisions for public access (i.e., public fishing easement). However, the Cohocton River is a significant fishery resource and is well used by area trout fishermen.

Public fishing rights have been obtained by the NYSDEC along much of the Cohocton River, and special regulations regarding the size, number, and method of taking trout apply to sections of the river.

3.3.1.2.5 Wildlife Habitat

As previously described, the Project Site includes a variety of ecological community types. The value of these communities to various wildlife species is summarized below.

Hayfields, Successional Old Field, and Wet Meadow Habitats

These grass/forb dominated areas provide preferred nesting and foraging habitat for open country bird species such as bobolink, red-winged blackbird, horned lark, eastern meadowlark, northern harrier, and savannah sparrow. The vegetation in these areas provides forage in the form of seeds and foliage, which is utilized by sparrows, finches, small mammals (mice, shrews, etc.), woodchucks, whitetail deer, and eastern cottontail. Birds of prey, such as northern harrier, and mammalian predators, such as red fox and eastern coyote, also use open fields as hunting areas.

Successional Shrubland and Scrub-Shrub Wetland Habitats

Shrub-dominated habitats (both wetland and upland) provide nesting and escape cover for a variety of wildlife species. Various songbirds, such as gray catbird, American goldfinch, indigo bunting, and yellow warbler, require low brushy vegetation for nesting and escape cover. Whitetail deer and eastern cottontail are also typically found in brushy edge habitat. In addition, many of the shrub species found in these areas produce berries, that are a food source for birds and mammals such as raccoon, striped skunk, and opossum.

Forest Habitat

Although generally limited to steep slopes and ravines within the Project Site, larger areas of contiguous woodland provide habitat for forest wildlife species such as wood thrush, veery, eastern wood pewee, red-eyed vireo, black-and-white-warbler, black-capped chickadee, great crested flycatcher, and pileated woodpecker. However, it is not clear if tracts of contiguous forest within the Project Site are large enough to support forest interior species. Mammals that utilize forest habitat include gray squirrel, eastern chipmunk, and whitetail deer. Smaller areas of contiguous woodland are found adjacent to active agricultural fields throughout the Project Site and provide habitat for forest edge species.

Emergent Marsh and Open Water Habitats

Emergent marsh and open water habitats in the Project Site are used as a source of food, water, and/or cover by waterfowl, shorebirds, aquatic mammals, and many of the upland species mentioned previously. Many of these water bodies support fish, amphibians, and a diversity of insects and aquatic invertebrates. They are preferred foraging areas for aerial insectivores, including songbirds and bats. In addition, these areas provide habitat for various wetland/aquatic wildlife species, including great blue heron, mallard, wood duck, painted turtle, bullfrog, mink, muskrat, and beaver.

3.3.1.2.6 Threatened and Endangered Species

As mentioned previously, written requests for listed species documentation were sent to the USFWS and the NHP. In addition, existing data sources, including the NYS Amphibian and Reptile Atlas, the BBS, and the BBA were consulted to assess the potential presence of state- and/or federally-listed threatened and endangered species.

According to a letter of November 3, 2005 from the NYSDEC, the NHP database indicates the occurrence of one state- and federally-listed threatened species (bald eagle) within 10 miles of the Project Site. Bald eagles have been recorded as nesting along the shores of Canandaigua Lake and Hemlock Lake. However, none of the on-site surveys or existing data sources have documented this species on or in the vicinity of the Project Site. To date, no response to the written request for information has been received from the USFWS.

BBS survey data indicate that two state-listed threatened species (northern harrier, Henslow's sparrow) and five state-listed special concern species (Cooper's Hawk, sharp-shinned hawk, horned lark, grasshopper sparrow, vesper sparrow) have been recorded in the general area of the Project Site. According to the BBA data, nine state-listed species (all special concern) have been documented on BBA blocks within, or immediately adjacent to, the Project Site. These species are Cooper's hawk, northern goshawk, sharp-shinned hawk, grasshopper sparrow, red-shouldered hawk, common nighthawk, horned lark, osprey, and vesper sparrow

The presence of state- and/or federally-listed threatened and endangered species was also assessed during site-specific avian and bat studies conducted by Woodlot. Five listed species were observed during the three raptor surveys conducted on-site. These included peregrine falcon (state-listed endangered), northern harrier (state-listed threatened), sharp-shinned hawk, Cooper's hawk, and red-shouldered hawk (all state-listed special concern). Woodlot indicated that most of the observed individuals appeared to be migrants rather than residents of the Project area. A summary of listed bird species documented in the area is presented in Table 7, below.

Table 7. Documented State-listed Species in the Vicinity of the Project Area[1]

Common Name	Scientific Name	NYS Legal Status
Red-Shouldered Hawk*	*Buteo lineatus*	Special Concern
Northern Harrier*	*Circus cyaneus*	Threatened
Peregrine Falcon*	*Falco peregrinus*	Endangered
Cooper's Hawk*	*Accipiter cooperii*	Special Concern
Sharp-shinned Hawk*	*Accipiter striatus*	Special Concern
Grasshopper Sparrow	*Ammodramus savannarum*	Special Concern
Horned Lark	*Eremophila alpestris*	Special Concern
Osprey	*Pandion haliaetus*	Special Concern
Vesper Sparrow	*Pooecetes gramineus*	Special Concern
Northern Goshawk	*Accipiter getilis*	Special Concern
Common Nighthawk	*Chordeiles minor*	Special Concern
Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Henslow's Sparrow	*Ammodramus henslowii*	Threatened

[1]Source: BBA, BBS, Agency Correspondence, and On-site Surveys
*Observed on site in 2005

Although not mentioned in agency correspondence regarding the Project, the NYSDEC and the USFWS have expressed concerns regarding potential impacts to Indiana bat (*Myotis sodalis*) from wind power projects. The Indiana bat is a state- and federally-listed Endangered species. Approximately 42,000 Indiana bats reside within New York State and the population appears to be growing (A. Hicks, pers. comm.). These bats winter (hibernate) in 10 known locations (caves and mines) throughout the state. They emerge in the spring and disperse on average up to 30 miles to their summer range. The nearest wintering cave (hibernacula) used by Indiana bats is located approximately 80 miles northeast of the Project Site, in Onondaga County.

Bat surveys (acoustic monitoring and mist netting) conducted by Woodlot and Bat Conservation Management in both Cohocton and Prattsburgh, did not reveal the presence of Indiana bat or any other listed bat species (Woodlot, 2005a). No rare mammal species were observed during EDR's field surveys, and based on review of existing habitat conditions, such species are not anticipated to occur on site. NYS Reptile and Amphibian Atlas data documented the occurrence of Jefferson salamander, a state-listed species of special concern. This species lives in mature forest habitat and breeds in vernal pools in the spring.

It most likely occurs on the wooded valley walls that line ravines and the Cohocton River Valley. No other listed reptile and amphibian species have been documented in the area, and on-site habitat conditions do not suggest that such species are likely to occur.

3.3.2 Potential Impacts

3.3.2.1 <u>Construction</u>

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.

Construction-related impacts to vegetation include cutting/clearing, removal of stumps and root systems, and increased exposure/disturbance of soil. Along with direct loss of (and damaged) vegetation, these impacts can result in a loss of wildlife food and cover, increased soil erosion and sedimentation, and a disruption of normal nutrient cycling. Impacts to vegetation will result from site preparation, earth-moving, and excavation/backfilling activities associated with construction/installation of staging areas, access roads, foundations, and buried electrical interconnect. Based on the area of impact assumptions described in Section 2.5 (Project Construction), these activities will result in disturbance to approximately 285 acres of agricultural land, 10 acres of successional old field, 16 acres of successional shrubland, and 67 acres of forest. As stated previously, impacts to agricultural land are likely to be significantly smaller than these disturbance calculations would indicate, due to the proposed use of existing farm lanes for most turbine access roads. As indicated in Table 8, 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 8. Impacts to Vegetative Communities

Community[1]	Total Disturbance	Temporary Disturbance	Permanent Loss
Agricultural Land	285	249	36
Successional Old Field	10	8	2
Successional Shrubland	16	16	>0.1
Forest	67	61	6
Disturbed/Developed	5	5	0
TOTAL	**383**	**339**	**44**

[1]Excludes wetland and open water communities

3.3.2.1.2 Fish and Wildlife

In general, construction-related impacts to wildlife will be minimal as a result of siting Project components away from sensitive habitat such as streams, wetlands, and mature forest. Construction-related impacts to wildlife are anticipated to be limited to incidental injury and mortality due to construction activity and vehicular movement, construction-related silt and sedimentation impacts on aquatic organisms, habitat disturbance/loss associated with clearing and earth-moving activities, and displacement of wildlife due to increased noise and human activities. Each of these potential impacts are described below.

Incidental injury and mortality should be limited to sedentary/slow-moving species such as small mammals, reptiles and amphibians, that are unable to move out of the area being disturbed by construction. If construction occurs during the nesting season, wildlife subject to mortality could also include the eggs and young offspring of nesting birds, as well as immature mammalian species that are not yet fully mobile. More mobile species and mature individuals should be able to vacate areas that are being disturbed.

Earth-moving activities associated with Project construction have the potential to cause siltation and sedimentation impacts downslope of the area of disturbance. Although most Project components have been sited well away from wetlands and streams, soil disturbance at one buried interconnect crossing, and along the overhead transmission line could adversely affect water quality and aquatic habitat.

The majority of the Project occurs in or adjacent to agricultural land, which in general provides habitat for only a limited number of wildlife species. In addition, these areas are already subject to periodic disturbance in the form of mowing, plowing, harvesting, etc. However, hayfields and pastureland do provide habitat for open country/grassland avian species (such as bobolink, red-winged blackbird, and savannah sparrow), and will be disturbed by Project construction. Successional old-field, shrubland, and forestland will experience less construction-related disturbance, but approximately 41 acres of forest and 6 acres of successional communities will be directly impacted by Project construction.

Some wildlife displacement will also occur due to increased noise and human activity as a result of Project construction. The significance of this impact will vary by species and the seasonal timing of construction activities. However, the species most likely to be disturbed/displaced by Project construction include grassland bird species such as bobolink, eastern meadowlark, red-winged blackbird, and savannah of sparrow.

None of the construction-related impacts described above will be significant enough to affect local populations of any resident or migratory wildlife species.

3.3.2.1.3 Threatened and Endangered Species

No rare plant species or unique natural communities are known to occur within the Project Site. Therefore, impacts to listed threatened and endangered plant species are not anticipated.

According to written correspondence received from the NYSDEC, bald eagles are known to nest approximately 10 to 12 miles north of the Project Site (as requested by NHP personnel, the exact location of bald eagle nests are not provided). This species was not observed on the Project Site, nor is there suitable habitat for bald eagles within or adjacent to the Project Site. Therefore, this species is not expected to be impacted or disturbed by Project construction activities.

BBA and BBS data indicate that several listed grassland bird species could occur within the Project Site, including northern harrier, grasshopper sparrow, horned lark, vesper sparrow, and Henslow's sparrow. Because the proposed Project will occur in or adjacent to some grassland habitat, construction-related impacts to these species are possible. Disturbance/displacement, habitat loss, and/or mortality impacts to eggs or young of these species could occur. However, given the relatively small area of grassland habitat that is being directly or indirectly impacted by Project construction, any impacts will be minor and largely temporary.

Listed raptors observed within the Project area include one state-listed endangered species (peregrine falcon), one state-listed threatened species (northern harrier), and three state-listed species of special concern (red-shouldered hawk, sharp-shinned hawk, and Cooper’s hawk). No federally-listed species were documented on the Project Site, and based on existing habitat conditions, are not considered likely to occur. Based upon observations made during the on-site raptor surveys, Woodlot determined that it is likely all of the listed raptors observed were migrants. The Project area lacks the cliff habitat required by peregrine falcons, the open water habitat required by ospreys, and the large riparian forests preferred by red-shouldered hawks. However, as mentioned previously, Project construction will impact the open country/grassland habitat preferred by northern harrier, and therefore disturbance/displacement, habitat loss, and/or mortality impacts to this species could occur. Clearing of some forest land along the transmission line could have similar effects on forest-nesting species such as Cooper's hawk and sharp-shinned hawk. However, given the relatively small area of habitat that is being directly or indirectly impacted by Project construction, any impacts to these species, will be minor and largely temporary.

Forested areas used by Jefferson salamander could be impacted by clearing of the transmission ROW. This activity could result in incidental injury or mortality to salamanders, and will convert the habitat to an early successional community, which is generally not preferred by this species. However, the amount of forest habitat being affected is relatively small, and if fallen logs and rocks are left in place, the habitat still may be used by Jefferson salamander to some extent. In addition, no vernal pools or other wetlands, which represent critical breeding habitat for this species, will be disturbed by Project construction.

3.3.2.2 Operation

3.3.2.2.1 Vegetation

As indicated in Table 8, Project construction will result in permanent conversion of 44 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 36 acres of agricultural land, 2 acres of successional old-field, and 6 acres of forest. Permanent impacts to wetlands were previously discussed in Section 3.2.2. It should be noted that for vegetation, permanent impact includes both conversion of natural communities to built facilities, and conversion of one vegetative community to another (e.g., forest to successional shrubland or old field). This conversion will occur within a 200-foot radius of all forested tower sites and within a 70-foot-wide permanent ROW where the overhead transmission line crosses forested areas. A total of 42 acres of forestland will be converted to successional communities for the duration of Project operation. Other than 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

As with construction-related impacts, operational impacts to wildlife are expected to be limited to minor loss of habitat, possible forest fragmentation, wildlife displacement due to the presence of the wind turbines, and some avian and bat mortality as a result of collisions with the wind turbines. Each of these potential impacts are described below.

<u>Habitat Loss</u>

A total of 44 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 36 acres) will occur in agricultural lands, which have limited wildlife habitat value. In addition, approximately 42 acres of forest will be maintained as a successional community (old field, shrubland, or saplings) for the life of the Project. However, the cumulative habitat loss/conversion resulting from Project development is not significant.

<u>Forest Fragmentation</u>

As mentioned in the discussion of construction-related impacts, the proposed Project will result in permanent loss or conversion of 48 acres of forest habitat. However, the forested habitat being impacted by the Project generally occurs as relatively small blocks or woodlots. Thus it is questionable as to whether forest interior conditions exist in these areas. In most places the proposed turbines and access roads, as well as the overhead transmission line, are not far from a forest edge. This being the case, these forests will not be significantly fragmented by the proposed Project.

<u>Disturbance/Displacement</u>

While wildlife will likely become habituated to the presence of wind turbines within a few years, the rate (and degree) of habituation, is currently unknown because long-term studies have not been conducted. Forest and forest edge birds should not be significantly disturbed because these species are familiar with tall features (i.e., trees) in their habitat. However, evidence indicates that some grassland species do not respond favorably to the presence of tall structures in their habitat. Studies conducted at the Buffalo Ridge wind power project in southwest Minnesota and the Foote Creek Rim Project in Wyoming, revealed that grassland nesting birds are found in reduced numbers as the proximity to wind turbines increases (Johnson *et. al.*, 2000; Leddy *et. al.*, 1999). Assuming similar behavior by grassland species within the Project Site, the completed Cohocton Project may result in a reduced number of grassland species in open fields that contain wind turbines.

The potential impacts of the Project on foraging Canada geese will not be significant. Kerlinger (2005) indicates that Canada geese often habituate rapidly to man-made structures, and that geese have been observed foraging in fields that contain operating wind turbines at the Fenner Wind Power Project in Madison County, New York. This observation is also supported by a study conducted by the Iowa Cooperative Fish and Wildlife Research Unit at the Top of Iowa Wind Farm located in Worth County, Iowa. Due to its proximity to three state-owned Wildlife Management Area's (WMA), the Top of Iowa Wind Farm experiences very high use by waterfowl (over 1.5 million duck and goose use days per year). Observations at that site revealed that the wind turbines did not affect the use of the fields by Canada geese or other species of waterfowl. In addition, over the two year course of the study, no turbine-related waterfowl or shorebird mortality was documented (Koford *et. al.*, 2005). Based on these study results, and observations at other wind power projects, the proposed Cohocton Project is not anticipated to have a significant, long-term displacement or mortality effect on resident or migrating Canada geese.

Landowners are also often concerned over the potential displacement effect of wind turbines on game species such as deer and wild turkey. While habituation to the presence of the turbines may not be immediate, species such as deer and wild turkey generally adapt quickly to the presence of man-made features in their habitat (as evidenced by the abundance of these species in suburban settings). Significant displacement of game species from a wind power site has not been reported, and the primary landowner at the existing Madison Wind Power Project in Madison County, New York, has indicated that he has not detected any apparent decline in game species on his property (C. Stone, pers. comm.).

<u>Collision</u>

Collision with man-made structures has been documented as a potentially significant source of songbird mortality (Erickson *et. al.*, 2001). According to the Avian Risk Assessment (ARA) prepared by Woodlot (Appendix E), an estimated 28,000 to 33,000 birds were killed at about 15,000 wind turbines in the United States in 2001 (Erickson et al. 2001). Fatalities ranged from zero to about 6 birds per turbine per year, yielding an average of 2.2 birds per turbine per year. Studies from the Eastern United States generally reveal slightly higher fatality levels than those observed farther west. A study conducted in 2003 at the Mountaineer Wind Energy Center in West Virginia found an average mortality rate of about 4 birds per turbine per year (Kerns and Kerlinger 2004). As mentioned previously, a study at the Top of Iowa Wind Power Project site revealed no fatalities to Canada Geese or other waterfowl (Koford et al. 2005). Fewer than 1.5 birds per turbine per year were found to be killed at that site.

As these study results illustrate, bird collisions are relatively infrequent events at wind farms. No federally-listed endangered or threatened species have been recorded, and only occasional raptor, waterfowl, or shorebird fatalities have been documented. In the Midwestern and Eastern United States, night migrating songbirds have accounted for a majority of the fatalities at wind turbines. In general, the documented level of fatalities has not been large in comparison with the source populations of these species, and minor when compared to other potential sources of avian mortality (Erickson, et al. 2001).

Although collision risk is likely to be low, data on avian migration at the Project Site were collected to determine if site-specific migration characteristics might suggest an elevated level of risk relative to other sites. As indicated in Table 9, radar data collected at the Cohocton site are similar to data from other sites in the Northeast in terms of passage rates, flight altitudes, and flight directions. Perhaps most important, in terms of the potential for collision impacts, is the flight altitude of migratory birds. Data from radar studies at proposed and existing wind power project sites across the Eastern United States consistently show mean flight altitudes well above the height of the proposed wind turbines. Radar data from Northeastern sites typically show mean songbird flight altitudes in the range of 1,200 to 2,000 feet with between 1% and 13% flying below the 125-meter (410 foot) altitude. Data collected at the Cohocton site are consistent with these observations.

Table 9. Summary of Results from Radar Studies Conducted in the Eastern United States since 2000.

Site	Season	Topography/ Elevation	Targets/ Km/Hr	Mean Altitude of Flight (AGL)	Percent Targets <100-125m	Mean Flight Direction
Chautauqua, NY	Fall	Hilltop/Ridge	238	532 m (2,366 ft)	4% below 125m	199°
	Spring	Hilltop/Ridge	395	528 m (1,830 ft)	4% below 125 m	29°
Flat Rock, Tug Hill Plateau, NY	Fall	Hilltop/Ridge	158	415 m (1,362 ft)	8% below 125m	184°
Prattsburgh, NY	Fall	Hilltop/Plateau	200	365 m (1,198 ft)	9% below 125 m	177°
Jordanville, NY	Fall	Hilltop/Ridge	380	440 m (1,444 ft)	6% below 125 m	208°
	Spring	Hilltop/Ridge	409	317 m (1,217 ft)	21% below 125 m	40°
Jack Mountain, WV[1]	Fall	Straight Ridge	229	583 m (1,912 ft)	8% below 125 m	175°
Mt. Storm, WV	Fall	Straight Ridge	241	410 m (1,245 ft)	13% below 125 m	184°
Martindale, PA[1]	Fall	Disjunct Ridge	187	448 m (1,469 ft)	~8% below 125 m	188°
Casselman, PA[1]	Fall	Disjunct Ridge	174	436 m (1,430 ft)	~8% below 125 m	219°
Dans Mountain, MD[1]	Fall	Straight Ridge	188	542 m (1,778 ft)	~7% below 125 m	193°
Searsburg, VT[1]	Fall	Mountaintop	178	503 m (1,659 ft)	1% below 100 m	194-223°
	Fall	Mountaintop	178	624 m (2,047 ft)	5% below 100 m	194-223°
Sheffield, VT	Fall	Mountaintop	114	566 (1,857 ft)	1% below 125 m	200°
Average[2]			207	1,630 ft	7.4 (8.1)	

[1]Data from draft reports in preparation by, and with permission from: Alaska Biological Research, Inc. Woodlot Alternatives, Atlantic Renewable Energy, PPM Energy, St. Francis University/McLean Energy Partners.
[2]Average excludes those percentages that are reported below 100 meters (Searsburg, VT).
Sources: Chautauqua, NY (Cooper, 2003, 2004a), Mt. Storm, WV (Cooper, 2004b), Prattsburgh, NY (Mabee et al., 2005), Jordanville, NY (Woodlot, 2005).

Because there currently is no predictive model available to quantify expected avian collision mortality as a result of wind power project operation, risk assessments must be based on pre-construction indices and indicators of risk (e.g., breeding bird survey and radar data) at the proposed Project Site, along with empirical data from operating projects (e.g., avian mortality surveys). Because pre-construction surveys at the Cohocton site revealed no indicators of elevated risk (e.g., abundance of rare species, unusually high numbers, unusually low flight altitude, habitat that would act as an ecological magnet), it appears that avian collision mortality rates at the site should be similar to the relatively low rates seen at other Eastern sites (i.e., 0 to 6 fatalities per turbine per year). Even if as many as 6 birds per turbine per year are killed (i.e., the high end of what has been observed at other projects), total annual collision mortality for a 41 turbine project would be approximately 246 birds. Although this number may appear large, as the radar data indicate, it is a tiny fraction of the population that migrates through the area, and is not considered a biologically significant impact.

With the exception of the Altamont Pass project in California, documented raptor fatalities at wind power projects are virtually non-existent. In fact, just more than ten raptor fatalities have been documented from all the mortality studies conducted outside of California (R. Roy, pers. comm.). In addition, studies conducted at operating wind power projects that are near concentrated hawk migration corridors indicate that raptors rarely collide with wind turbines (DeLucas *et. al.*, 2004; Kerns and Kerlinger, 2004). Based on the results of published collision mortality studies and the results of on-site raptor migration surveys, Project operation is not expected to result in significant collision mortality to migrating raptors. On-site surveys determined that raptor passage rates were low, and that migration occurred across a broad front (Woodlot, 2005a). The species most likely to be impacted are those that forage in open country, as opposed to migrating raptors that pass through the site or general area.

The northern harrier (threatened) forages and probably nests on the Project Site, as was evident from BBA data, and on-site observations. These birds are at some risk of collision with turbines, although documented fatalities involving northern harriers at wind power facilities are relatively rare. The foraging flight of these birds is generally below the rotor-swept height, but their aerial displays ("sky dancing") during the nesting season may put them at rotor height and at increased risk of collision.

Findings from the Mountaineer Wind Facility in West Virginia and the Meyersdale Wind Facility in Pennsylvania have heightened concerns regarding collision risk to migratory bat populations. While few studies have been conducted to document bat mortality at operating wind power sites, Johnson and Strickland (2004) documented bat mortality rates of 46.2 fatalities per turbine per year at wind projects sited along forested ridgelines in the Appalachians. This differs from the much lower rates (ranging from 0.07 to 2.32 fatalities per turbine per year) documented at more open midwest and western sites (Erickson *et al.* 2002).

Estimates of the number of bats that may collide with wind turbines at the Cohocton Wind Power Project can be derived by multiplying reported mortality rates by the number of proposed turbines. This results in estimates of 2.9 to 95 bat fatalities per year if fatality rates similar to western and mid-western projects occur and 1,894 bat fatalities per year if fatality rates are similar to rates found at facilities along forested ridgelines of the central Appalachians.

This range appropriately estimates the potential high and low ends of the range of potential bat mortality that may arise from operation of the Project. However, as stated in the Project ARA, the site characteristics of the Cohocton Wind Power Project are not identical to the site characteristics of either the low mortality mid-western and western sites, or the higher mortality Appalachian ridge sites. The Project will be located in an agricultural landscape, with the turbines placed in fields on rolling hills. These characteristics are similar to those of western and mid-western facilities. However, the Project Site is located atop a plateau that is separated from other plateaus by steep-sided, narrow valleys. It is also located in the eastern United States where bat populations in general may be higher than western and mid-western areas due to the prevalence of forested habitat. These characteristics are similar to those of the eastern facilities have been investigated.

Given that the characteristics of the Cohocton site lie in between the characteristics of the sites of the other projects that have been investigated for bat collision mortality, it is likely that the bat collision mortality for the proposed Project will lie within the range bracketed by the observed mortality at those other projects (Woodlot, 2005a).

3.3.2.2.3 Threatened and Endangered Species

As previously mentioned, no threatened or endangered plant species (or unique natural communities) are known to occur in the Project Site. Therefore, operational impacts to rare vegetation or rare communities are not expected.

NHP correspondence reported that nesting bald eagles have been documented approximately 10 to 12 miles north of the Project. However, due to the lack of any sizeable open water habitat within the Project area, and the design/spacing of the proposed turbines, and because this species is not known to be susceptible to wind turbine collisions, the operating Project poses very little risk to bald eagles (Woodlot, 2005a).

Operational impacts to listed grassland bird species, such as northern harrier, horned-lark and grasshopper sparrow, could include occasional collision mortality and disturbance/displacement of nesting individuals. Of the listed grassland species documented within the Project area, only horned lark is considered susceptible to significant collision risk. This is due to the aerial courtship displays performed by males of this species. Regularly flying in circles at 100-200 feet (30-60 m) above the ground would put these species at risk of colliding with turbine rotors (Kerlinger, pers. comm.).

Because grassland birds have evolved in a habitat that lacks large overhead structures (i.e., trees), it is possible that the presence of wind turbines in open fields could have a disturbance/displacement effect on listed grassland species. However, the siting of wind turbines at field edges and outside of the open meadow/pastureland habitat typically utilized by these species will result in very limited disturbance/displacement impacts on grassland birds.

As mentioned previously, the NYSDEC and the USFWS have expressed concerns regarding potential impacts to Indiana bats as a result of wind power projects in New York State. This concern has resulted primarily from sizeable bat kills that have occurred at wind power projects in recent years at the Mountaineer site in West Virginia and the Meyersdale site in Pennsylvania (although no Indiana bats are known to have been killed at these sites). Specific to this Project, correspondence received from the USFWS and the NYSDEC did not indicate any concern over the Project's potential to impact Indiana bat. Regardless, an analysis of potential impact to Indiana bat is provided below.

The nearest wintering cave (hibernaculum) used by Indiana bats is located approximately 80 miles northeast of the Project Site, in Onondaga County. While the proposed Project Site is within the dispersal distance of Indiana bats, Project-related impacts on this species are not considered likely for a variety of reasons, including:

1. Acoustic monitoring and mist netting surveys in the area did not document any Indiana bats.

2. The Project Site is not in an area designated by regulatory agencies as critical habitat for Indiana bats.

3. Bats utilizing the Onondaga County hibernaculum are likely to be widely dispersed once they leave the cave. NYSDEC telemetry studies also indicate that most Indiana bats in New York breed within 30 miles of their hibernacula (A. Hicks, Pers. Comm.). Thus, relatively few individuals are likely to occur in the vicinity of the proposed Project.

4. There are no physiographic landscape features (e.g., abrupt ridge lines or water courses) that might direct or concentrate bats migrating to and from the Onondaga County hibernaculum toward the Project Site.

5. High winds and low temperatures make the Project site less likely to receive use by Indiana bats, when compared to warmer, less exposed valley and lake plain areas located closer to the hibernaculum. Based on the results of previous NYSDEC studies of Indiana bats elsewhere in the state, it is reasonable to expect that Indiana bats (especially reproductive females) will remain within suitable habitat at lower elevation (e.g., large valley and lake plain areas west of the hibernaculum on the Lake Ontario plain). Results of a 2005 telemetry study conducted by the NYSDEC and the USFWS at the Glen Park Indiana bat hibernaculum revealed that none of the bats traveled further than 17 miles from the cave. More specific data on the distance and direction Indiana bats travel from the Onondaga County hibernaculum will be available following a NYSDEC radio telemetry study, which is expected to begin in the spring of 2006.

6. The majority of documented turbine-related bat mortality has involved three species of migratory tree bat (hoary bat, red bat, and silver-haired bat). An Indiana bat

fatality has never been documented at any wind power project site in the United States, even those in proximity to Indiana bat hibernacula and summer maternity roosts, and where sizable numbers of other bat species have been killed.

Based on all of the information presented above, the Project is not expected to result in any impacts to the Indiana bat.

3.3.3 Proposed Mitigation

The development of wind power projects can legitimately be considered a form of mitigation, in that power generated from the wind can satisfy demand that would otherwise utilize power generated by other means. All electric generating facilities impact ecological resources (fish, wildlife, natural communities). However, as indicated in Table 10 below, environmental impacts that result from more traditional power generating facilities (fossil fuel, hydroelectric, nuclear) are much more significant than the impacts caused by wind power projects.

Table 10. Environmental Impacts of Electricity Sources.

	Wind	**Hydro**	**Nuclear**	**Coal**	**Natural Gas**
Global Warming Pollution	None	None	None	Yes	Yes
Air Pollution	None	None	None	Yes	Limited
Mercury	None	None	None	Yes	None
Mining/Extraction	None	None	Yes	Yes	Yes
Waste	None	None	Yes	Yes	None
Habitat Impacts	Limited	Yes	Limited	Yes	Yes

Source: AWEA Factsheet. (www.awea.org/pubs/factsheets.html)

These impacts include a larger project footprint, which results in direct habitat loss; the use of surface waters for generation and/or thermal regulation, which results in thermal discharge, fish entrainment, and impingement; the extraction and transportation of raw materials, which results in habitat disturbance and air pollution; waste disposal, which increases the effective footprint of a project and presents pollution/contamination concerns; air pollution, which results in acid precipitation and the subsequent affects on ecological resources; and/or continued contribution to global warming, which is perhaps the greatest potential impact to ecological (and human/cultural) resources worldwide.

3.3.3.1 Vegetation

Mitigation of impacts to vegetation will be accomplished primarily through careful site planning. Large areas of forest and wetland areas are being avoided to the extent practicable. Therefore, the most ecologically significant communities within the Project Site will be largely protected from disturbance. Project access roads will be sited on existing farm lanes in most locations, and areas of disturbance will be confined to the smallest area possible. In addition, a comprehensive sediment and erosion control plan will be developed and implemented to protect adjacent undisturbed vegetation and other ecological resources.

Mitigation measures to avoid or minimize impacts to vegetation will also include delineating sensitive areas (such as wetlands) where no disturbance or vehicular activities are allowed, educating the construction workforce on respecting and adhering to the physical boundaries of off-limit areas, complying with guidance provided by environmental monitors, employing best management practices during construction, and maintaining a clean work area within the designated construction sites. Following construction activities, temporarily disturbed areas will be seeded (and stabilized with mulch and/or straw if necessary) to reestablish vegetative cover in these areas. Other than in active agricultural fields, native species will be allowed to revegetate these areas.

3.3.3.2 Fish and Wildlife

As previously discussed, construction-related impacts to fish and wildlife should be limited to incidental injury and mortality due to construction activity and vehicular movement, construction-related silt and sedimentation impacts on aquatic organisms, habitat disturbance/loss associated with clearing and earth moving activities, and displacement due to increased noise and human activities. Mitigation of impacts related to construction activity will be accomplished through careful site design (e.g., utilizing existing roads, avoiding sensitive habitat, and minimizing disturbance to the extent practicable), adherence to designated construction limits, and avoidance of off-limit sensitive areas.

To avoid and minimize impacts to aquatic resources resulting from construction-related siltation and sedimentation, an approved sediment and erosion control plan and Storm Water Pollution Prevention Plan (SWPPP) will be implemented. The sediment and erosion control plan and SWPP were previously described in Section 3.2 (Water Resources). Proper implementation of these plans will assure compliance with NYSDEC State Pollutant Discharge Elimination System (SPDES) regulations and New York State Water Quality

Standards. In addition, a Spill Prevention, Containment and Counter Measures (SPCC) Plan will be developed and implemented to minimize the potential for unintended releases of petroleum and other hazardous chemicals during Project construction and operation.

Mitigation for impacts related to permanent habitat loss and forest fragmentation will be accomplished through careful site design (i.e., minimizing the permanent footprint of Project components to the extent practicable) and restoration of all temporarily disturbed areas. In addition, cleared forest land along Project access roads and at the periphery of turbine sites will be allowed to grow back and reestablish forest habitat in these areas.

The Project has been designed to minimize bird and bat collision mortality. The turbines will be placed much further apart than in older wind farms where avian mortality has been documented, such as those in northern California. They will also be mounted on tubular towers (rather than lattice), which prevent perching by birds. In an effort to reduce avian and bat impacts, all electrical lines between the turbines will be buried and any the above-ground 115 kV transmission line will follow Avian Power Line Interaction Committee (APLIC) guidelines for insulation and spacing. Lighting of the turbines (and other infrastructure) will be minimized to the extent allowed by the FAA and follow specific design guidelines to reduce collision risk (e.g., using flashing lights with the longest permissible off cycle).

Despite the fact that significant impacts to birds and bats are not anticipated, a one year post-construction avian and bat fatality monitoring program will be implemented. Although this study will not directly mitigate Project-specific impacts, it will help to advance understanding of avian and bat collision impacts. Experts have indicated that, although the impact of wind power projects on wildlife has been studied more intensively than comparable infrastructure, such as communication towers, important research gaps remain (GAO, 2005). These gaps result primarily from the limited number of post-construction monitoring studies that have been conducted and made publicly available.

The purpose of the on-site, post-construction monitoring program will be to determine if avian and/or bat collision fatalities are occurring as a result of Project operation, and if so, the rate of mortality. This data can then be correlated with pre-construction data, and ultimately this information can help to develop models that will more precisely predict the impact of future wind power projects. The survey will focus on the spring and fall migration seasons, when avian and bat mortality is likely to be highest. The protocols and study design will follow established/accepted procedures for monitoring collision mortality at wind power facilities and other tall structures. These methods include searches under turbines, coupled with analysis of carcass removal rates (scavenging) and searcher efficiency rates. The need for additional years of study will be determined in consultation with the NYSDEC and USFWS, based on the data obtained during the first year of study.

3.3.3.3 Threatened and Endangered Species

To prevent impacts to rare plants and unique natural communities, a rare plant/community survey will be conducted during the spring and summer of 2006, and the results of this survey incorporated into the FEIS for the Cohocton Wind Power Project. This survey will involve investigation of all proposed areas of disturbance. If rare plants or unique natural communities are identified as a result of this survey, Project components will be relocated to the extent practicable in order to avoid adverse impact on these resources.

To avoid impacting listed threatened and endangered bird species, a preconstruction breeding bird survey will be undertaken. This survey will focus on the identification of habitat suitable for use by listed species. Areas where northern harriers or other listed threatened or endangered species could be nesting will be surveyed. If such species are nesting within or adjacent to proposed areas of disturbance, these areas will be avoided until after the nesting season, to the extent practicable. If the pre-construction breeding bird survey indicates the presence of listed grassland bird species, the Project developer will also undertake a post-construction habitat displacement study to ascertain whether, and to what extent, the operating turbines are disturbing/displacing nesting grassland birds. Although this study will not directly mitigate Project-specific impacts, it will serve to provide post-construction data that can be correlated with pre-construction data, and ultimately used to develop predictive models for use in the siting of future wind power projects.

3.4 CLIMATE AND AIR QUALITY

3.4.1 Existing Conditions

3.4.1.1 Climatic Conditions

The Natural Resources Conservation Service (NRCS) maintains and monitors National Water and Climate Centers (NWCC) in numerous locations throughout the United States, including one in Bath, New York approximately 12 miles south of the Project Site. This NWCC substation has collected temperature and precipitation data from 1971 through 2000. Based upon the compiled 30-year averages, the average daily maximum temperature in

Bath is 57.0 degrees Fahrenheit (°F), and the average daily minimum is 34.2°F. Historically, January is the coldest month with an average daily temperature of 22.7°F, and July is the warmest with an average daily temperature of 67.9°F. Temperature extremes range from a high of 94°F to a low of -15°F.

The 30-year annual average precipitation recorded in Bath is 31.9 inches. June, with an average monthly precipitation of 3.92 inches, is historically the wettest month of the year, and February, with an average monthly precipitation of 1.61 inches, is the driest. The 30-year average snowfall recorded in Bath is 46.0 inches annually. January and February are historically the snowiest months of the year with monthly averages of 11.3 inches and 10.2 inches, respectively. (NRCS, not dated)

3.4.1.2 Air Quality

Air quality data for New York State are published annually by the NYSDEC Division of Air Resources. The most recent summary of air quality data available for the state is the *2004 New York State Air Quality Report: Data Tables* (NYSDEC, 2004). Included in this report are the most recent ambient air quality data, as well as long-term air quality trends derived from data that have been collected and compiled from numerous state and private (e.g., industrial, utility) monitoring stations across the state. These trends are assessed by NYSDEC region. The Project Site is located in NYSDEC Region 8. Most of the air quality sampling points for Region 8 occur in the metropolitan Rochester area, where sources of pollution and air quality concerns are most significant. The other Region 8 sampling points are located in Elmira, Pinnacle, and Williamson. During the most recent year for which data were available (2004), all of the Region 8 sampling points were within the acceptable levels established by the National Ambient Air Quality Standards (NAAQS) for all tested parameters, which include sulfur dioxide, inhalable particulates, carbon monoxide, and ozone.

One of the largest sources of air emissions in the vicinity of the proposed Project is the AES Greenidge coal and biomass co-fired power plant in Dresden, Yates County, approximately 25 miles northeast of the Project Site. This power plant is ranked among the top ten facilities in New York State for total on-site releases (all chemicals) by the Environmental Protection Agency (EPA, 2003). Additionally, the NYSDEC listed this plant in the top ten facilities releasing mercury in New York in 2000 (NYSDEC, not dated). However, no local air monitoring data is available to further characterize air quality in the vicinity of the proposed Project.

3.4.2 Potential Impacts

3.4.2.1 Construction

During the site preparation and construction phases of the Project, minor, temporary adverse impacts to air quality could result from the operation of construction equipment and vehicles. Such impacts could occur as a result of emissions from engine exhaust and from the generation of fugitive dust during earth moving activities and travel on unpaved roads. The increased dust and emissions will not be of a magnitude or duration that would significantly impact local air quality. However, dust in particular could cause annoyance and property damage at certain yards and residences that are adjacent to unpaved town roads or Project access roads. These impacts are anticipated to be short-term and localized and will be avoided or corrected quickly, as discussed below.

3.4.2.2 Operation

The operation of this Project is anticipated to have a positive impact on air quality by producing 220,000 Megawatt hours (MWh) of electricity with zero emissions. Power delivered to the grid from this Project will directly off-set the generation of energy at existing convention power plants. Based on emissions rates for the average U.S. fuel mix, this 220,000 MWh wind farm is estimated to displace (AWEA, not dated):

- 1,078,000 pounds of NO_x
- 1,760,000 pounds of SO_2
- 334,400,000 pounds of CO_2

The operation of this Project is not anticipated to have any measurable effect on climate. Some recent studies have suggested that there may be minor impacts to microclimates within 0.5 mile of wind turbines. Modelling conducted by Roy, *et al*. (2004) suggests that large scale wind turbine installations (10,000 turbines) may have a warming effect on the local climate. During the environmental review process for a wind farm in Chautauqua, a study group analyzed the impacts of wind turbines on vineyard microclimates (DeGaetano, *et al*., 2004). This study group determined that a wind turbine could influence the ground level air temperature by no more than one degree Celsius (ºC) and concluded that there were unlikely to be significant positive or negative impacts to area vineyards as a result of this potential change in microclimate. However, by generating up to 82 MW of electricity without the production of “green house” gasses, the Project represents a significant effort to address the causes of global warming.

3.4.3 Proposed Mitigation

Except for minor, short-term impacts from construction vehicles, the Project will have no adverse impacts on air quality. A dust control plan will be developed and implemented to minimize the amount of dust generated by construction activities. In accordance with this plan, the extent of exposed/disturbed areas on the site at any one time will be minimized and restored/stabilized as soon as possible. The environmental monitor will identify dust problems and report them to the construction manager and the contractor. Water will be used to wet down dusty roads (public roads as well as Project access roads) as needed throughout the duration of construction activities. In more severe cases, temporary paving (e.g. oil and stone) could be used to stabilize dusty road surfaces in certain locations. In addition, CPP will implement a Complaint Resolution Procedure to establish an efficient process by which to report and resolve any construction (or operational) related impacts.

Project operation has the potential to reduce current emissions from existing power plants. The United States obtains approximately 85 percent of its energy from fossil fuels, and 55 percent from coal, the fossil fuel with the highest carbon dioxide content per unit of electricity produced (AWEA, 1998). A detailed analysis by the Department of Energy's Pacific Northwest Laboratory in 1991 estimated the energy potential of the United States wind resource at 10.8 trillion kilowatt-hours (kWh) annually, or more than three times total U.S. electricity consumption in 1996 (Elliot *et. al*., 1991; USDOE, 1997). Every 10,000 MW of wind installed can reduce carbon dioxide emissions by approximately 33 million metric tons (MMT) annually if it replaces coal-fired generating capacity, or 21 MMT if it replaces generation from the United States average fuel mix (San Martin, 1989). The American Wind Energy Association (AWEA) estimates that wind energy has the potential to reach 30,000 MW of installed generating capacity in the United States by 2010. If this target is achieved, wind would reduce national carbon dioxide emissions by 100 MMT annually (based on displacement of coal-fired generation) (AWEA, 1998). The PSC has estimated that achievement of the State's RPS goal will reduce in-State emissions of NOx by approximately 4,000 tons per year, emissions of SO2 by approximately 10,000 tons per year, and emissions of CO2 by approximately 4,129,000 tons per year.

Thus, by contributing to this effort, the Project will have a long-term beneficial impact on climate and air quality. This benefit can be viewed as mitigation for other environmental impacts associated with the Project.

3.5 AESTHETIC/VISUAL RESOURCES

3.5.1 Existing Conditions

Based on established visual assessment methodology (NYSDEC, not dated) the visual study area for the Project was defined as the area within a 5-mile radius of each of the proposed turbines. This area includes 177 square miles in Steuben County, 5 square miles in Livingston County, and 27 square miles in Ontario County, and 4 square miles in Yates County (see Figure 15). Existing visual and aesthetic resources within the visual study area were identified as part of a Visual Impact Assessment (VIA) conducted by EDR (Appendix F). The VIA included review of existing data and field reconnaissance to identify landscape similarity zones, viewer groups, and sensitive visual resources within the area. These existing visual/aesthetic components of the study area are described below.

3.5.1.1 Landscape Similarity Zones

Land use within the visual study area is dominated by active agricultural land, but also includes, rural residential development, forest land, and several small villages and hamlets. Within this area, four distinct landscape similarity zones were defined. The general landscape character of these zones is described below:

Zone 1. Upland Agricultural Zone

This landscape similarity zone occurs on hilltops and elevated ridges within the visual study area, and is characterized by open agricultural land with widely dispersed farms and rural residences along a network of county, and local roads. Active agricultural fields (corn, hay, soybeans, small grains, and potatoes), dominate the landscape. Topography ranges from undulating ridgetops in the northern and central portions of the study area, to more gently rolling terrain in the southern portions, west of the Cohocton River Valley. Views in the upland agricultural zone are generally open, at times expansive. These views typically include open fields in the foreground, often backed or bordered by trees that define the edges of the steep ridge slopes. Views across broad valleys to other hilltops are available from many locations. These views include widely scattered homes, barns and silos, with working farm equipment often seen in the fields.

Zone 2. Valley Agricultural Zone

This zone includes most of the Cohocton River Valley and Naples Valley. It is characterized by large flat crop fields with thinly scattered farms and residences located along the road system. This zone also includes most of the major roads within the study area, including Interstate Route 390 and State Routes 415, 21, and 371. These roads generally parallel the orientation of the major valley and offer open, at time panoramic, views of the valleys and surrounding hills. The Cohocton River meanders through the majority of this area and is characterized by a gentle gradient, numerous oxbows and extensive shoreline wetlands. The river banks are lined with mature trees and understory brush in most places, so views to and from the river are generally limited to locations where roads parallel or cross the channel. The dominant activity in this area is farming and local travel along Route 415, 21, and 371.

Zone 3. Village/Hamlet Zone

This landscape similarity zone includes the villages and larger hamlets in the study area. It is characterized by moderate to high-density residential and limited commercial development. Vegetation and landform may contribute to visual character in this zone, but buildings (typically 1-3 stories tall) and other man-made features dominate the landscape. These features can be highly variable in their size and architectural style. However, they are typically arranged along an organized street pattern that tends to screen outward views and focus views along the main streets and crossroads. Examples of this zone of the study area include the Villages of Cohocton and Naples, and the Hamlets of Atlanta and North Cohocton. Outward views from this zone are generally limited due to the screening provided by buildings and adjacent forested slopes. Views to the surrounding landscape are more likely from the edges of the village/hamlet zone, where housing and vegetation density decrease.

Zone 4. Forestland Zone

This zone is characterized by the dominance of forest vegetation (native deciduous/mixed forest and mature conifer plantations) and generally steep topography. The forestland zone occurs throughout the visual study area, primarily in the steep valleys and wooded ravines, that occur between the dissected upland ridges. Small streams and unpaved roads often run through these valleys. Also included in this zone are the wooded slopes of the Cohocton River Valley as well as some large woodlots that occur either on the ridge tops or within the major river valleys. Views within this zone are generally restricted to areas where small clearings, and road cuts provide breaks in the tree canopy. Where long distance views are available, they are typically of short duration, limited distance, and/or tightly framed by trees and adjacent slopes. Land use in this zone includes, low-density residential and recreational use (hunting, fishing, etc.).

These landscape similarity zones are illustrated in Figure 4 in Appendix F.

3.5.1.2 Viewer/User Groups

Three categories of viewer/user groups were identified within the visual study area. These include the following:

Local Residents

Local residents include those who live and work within the visual study area. They generally view the landscape from their yards, homes, local roads and places of employment. Except when involved in local travel, residents are likely to be stationary, and have frequent or prolonged views of the landscape. Local residents may view the landscape from ground level or elevated viewpoints (typically upper floors/stories of homes). Residents' sensitivity to visual quality is variable, however, it is assumed that residents may be very sensitive to changes in particular views that are important to them.

Through Travelers/Commuters

Commuters and travelers passing through the area view the landscape from motor vehicles on their way to work or other destinations. Commuters and through travelers are typically moving, have a relatively narrow field of view, and are destination oriented. Drivers on major roads in the area (Interstate Route 390, State Routes 21, 53, 371, and 415) will generally be focused on the road and traffic conditions, but do have the opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and accordingly, may have greater perception of changes in the visual environment.

Tourists/Recreational Users

Tourists and vacationers come to the area for the purpose of experiencing its cultural, scenic, or recreational resources. These viewers include sight-seers and visitors to area lakes and wineries. They may view the landscape on their way to a destination or from the destination itself. Some, such as weekend and seasonal homeowners, may spend extended time in the area. Tourists' and vacationers' sensitivity to visual quality and landscape character will be variable (depending on their reason for visiting the area), although this group is generally considered to have relatively high sensitivity to aesthetic quality and landscape character. Recreational users include local and seasonal residents involved in outdoor recreational activities at parks and recreational facilities, and in undeveloped natural settings such as forests, fields and water bodies. This group includes those involved in active recreation (e.g., snowmobilers, bicyclists, joggers), as well as those involved in more passive recreational activities (e.g., picnicking, fishing, or walking). Visual quality/scenery may or may not be an important part of the recreational experience for these viewers. However, recreational users will often have continuous views of landscape features over relatively long periods of time. Within the visual study area, tourists and recreational users will be concentrated in and around the Village of Naples and Canandaigua Lake, and will be traveling the major roads in the area. Most of these viewers will only view the surrounding landscape from ground-level or water-level vantage points.

3.5.1.3 Visually Sensitive Resources

The area within and adjacent to the visual study area includes several sites that the New York State Department of Environmental Conservation (NYSDEC) Visual Policy (DEP-00-2) considers scenic resources of statewide significance (NYSDEC, 2000). These are outlined below.

Sites listed on the State and National Register of Historic Places:
The study area includes a total of four sites and districts that are currently listed on the National Register of Historic Places (NYSOPRHP Website). These sites include the following:

1. Ephraim Cleveland House – Naples
2. Morgan Hook and Ladder Company – Naples
3. Naples Memorial Town Hall – Naples
4. Larrowe House – Cohocton

The Phase 1A Cultural Resources Survey conducted for the Project also indicated that at least 76 additional structures/sites within the visual study area may be eligible for listing on the State and National Register (Appendix H). The majority of these are located in the villages and hamlets within 5 miles of the Project.

State Wildlife Management Areas:

High Tor Fish and Wildlife Management Area - This 6,100-acre wildlife management area (WMA) is located in Ontario and Yates County on State Route 245. The WMA consists of three individual parcels, the largest of which straddles the northern study area boundary. This 3,400-acre parcel, east of the Village of Naples, is predominately steep wooded terrain. Approximately two thirds of this portion of the WMA is located within the study area boundary. Hunting, fishing, trapping, hiking, cross-country skiing, boating, and camping (by permit) are allowed in the WMA.

Designated Scenic Sites/Overlooks:

One scenic overlook is located along the north-bound lanes of Interstate Route 390 in the Town of Cohocton. The site includes parking and picnicking facilities, and provides expansive views of the Cohocton River Valley and the wooded hills that surround it. The primary view is to the north, toward the Village of Cohocton.

State or Federal Designated Trails:

The nearest designated trail is a spur of the Finger Lakes Trail, the Bristol Hills Branch Hiking Trail, that runs through the South Hill parcel of the High Tor WMA. It is located approximately 3.5 miles from the nearest proposed turbine.

Bond Act Properties (Exceptional Scenic Beauty, Open Space):

Memorial Town Hall (Old Town Hall), along with being listed on the State and National Register of Historic Places, is also a 1986 Environmental Quality Bond Act property. It is located in Naples, at the intersection of North Main and Monier Streets.

Other scenic resources of statewide significance do not occur within the visual study area. There are no State Parks, Adirondack Park lands, State Forest Preserve, Urban Cultural Parks, National Wildlife Refuges, National Natural Landmarks, National Park System lands, State Nature and Historic Preserve Areas, Palisades Park land, or Bond Act properties acquired under the scenic beauty category. There are also no designated scenic roads/byways, rivers protected under the State's Wild, Scenic or Recreational Rivers Act, or designated Scenic Areas of Statewide Significance. However, the area does include several resources considered visually sensitive from a local perspective. These resources, include the following:

Parks and Recreational Areas:

Beyond the state parks listed previously, the visual study area includes several additional parks and recreational areas, including the following:

- Pine Hill ATV Park – Cohocton
- Reservoir Creek Golf Course – Naples
- Cohocton River – Wayland and Cohocton
- Atlanta/North Cohocton Community Park – Cohocton
- Loon Lake – Wayland
- Smith Pond – Avoca

The most significant regional recreational resource is Canandaigua Lake, which lies just outside the visual study area to the north (7.2 miles from the nearest proposed turbine). The lake is a popular destination for fishermen and boaters and includes seasonal/vacation homes along its shorelines. Several vineyards/wineries that are popular tourist destination also occur along Canandaigua Lake.

Areas of Intensive Land Use:

Several communities within the study area are considered visually sensitive due to the concentration of residential development in these areas and intensity of land use they receive. These include the following:

- Village of Cohocton
- Hamlet of Atlanta
- Hamlet of North Cohocton
- Hamlet of Wallace
- Village of Naples
- Hamlet of Ingleside

Transportation Corridors:

The visual study area includes several highways that could be considered visually sensitive due to the number of drivers that travel these roads on a daily basis. These include:

- Interstate Route 390
- Interstate Highway 86/State Route 17

- State Route 21
- State Route 53
- State Route 371
- State Route 415

The locations of visually sensitive resources within the visual study area are illustrated in Figure 15.

3.5.2 Potential Impacts

3.5.2.1 Construction

Visual impacts during construction will include the addition of construction material and working construction vehicles and equipment to the local roads and landscape. Construction activity will also result in visible site disturbance, such as tree clearing, earth moving, soil stockpiling and road building, all of which will alter the character of the landscape, at least on a temporary basis. Dust generated by the movement of construction vehicles and sediment-laden storm water run-off could also potentially have an adverse impact on aesthetic resources. However, all of these activities will be relatively short term (i.e., generally restricted to the construction season), and at any one site, will generally occur on only a few days during the course of Project construction. Once construction activity ceases and site restoration activities are complete, construction-related visual impacts will no longer occur.

3.5.2.2 Operation

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

The VIA procedures utilized on this Project were based on visual impact assessment methodologies developed and/or accepted by various state and federal agencies. Potential Project visibility was evaluated using viewshed mapping, line-of-sight cross section analysis, and field verification (ballooning). Visual impact was evaluated by preparing computer-assisted visual simulations of the Project from representative/sensitive viewpoints from throughout the 5-mile radius study area. The Project's visual impact on the landscape was evaluated by an in-house panel of registered landscape architects with experience in visual impact assessment.

3.5.2.2.1 Viewshed Analysis

Viewshed maps for the study area were prepared using USGS digital elevation model (DEM) data (7.5-minute series) and the ArcView Spatial Analyst® computer program. Two 5-mile radius viewsheds were mapped, one to illustrate "worst case" daytime visibility (based on a maximum blade tip height of 400 feet above existing grade) and the other to illustrate potential visibility of turbine lights (based upon the nacelle height of 262 feet above existing grade). A third viewshed analysis (also based on blade tip height) was run using an 8-mile radius to evaluate potential Project visibility at sensitive sites outside the study area boundary. The viewshed analysis was based upon the location of all proposed turbines, as shown in Figure 3. Because the screening provided by vegetation and structures is not considered in this analysis, the viewsheds represent a "worst case" assessment of potential Project visibility.

Viewshed analysis revealed that the proposed Project has the potential to be visible in approximately 71% of the study area (disregarding the screening effect of vegetation and structures). Potential visibility extends over the ridgetop terrain in the central portion of the study area and includes slopes facing the Project on the opposite side of the Cohocton River Valley and above the Village of Naples (see Figure 6 in Appendix F). Most of the visually sensitive sites in the study area fall within the viewshed, including the Villages of Cohocton and Naples, the Hamlets of Wallace, North Cohocton, Atlanta, and Ingleside, the scenic overlook on Route 390, and the Register-listed historic sites and heavily-traveled state highways. Only those areas that are in deep valleys or on the backside of hills will be fully screened from view by topography alone. These include most of the High Tor WMA, Route 17/86, Smith Pond, half of Loon Lake, Tenmile Creek (and adjacent County Route 7), and West Creek. In most areas where potential visibility is indicated, the viewshed analysis suggests that views to multiple turbines could be available. Areas of potential nighttime visibility cover approximately 65% of the study area, and generally occur in the same areas where potential daytime visibility is indicated.

Review of the 8-mile radius viewshed map indicates that potential Project visibility decreases significantly outside the 5-mile radius study area. Within the 5 to 8 mile ring, the proposed Project will be fully screened by topography alone in 63% of the area. These screened areas include large valley areas and the backsides of hills. Sensitive receptors/sites in these areas, such as the Villages of Prattsburgh and Avoca, numerous small hamlets, State Route 53, and Interstate Routes 390 and 86, will not have views of the proposed Project. Visually sensitive sites that occur within the extended viewshed include the Village of Wayland, Canandaigua Lake, and much of the High Tor WMA. Areas of actual visibility are anticipated to be much more limited than indicated by the viewshed analysis, due to the slender profile of the turbines (especially the blade, which make up the top 139 feet of the turbine), the effects of distance, and screening from trees and structures, which are not considered in the viewshed analysis.

3.5.2.2.2 Cross Section Analysis

To illustrate the screening effect of vegetation within the study area, four representative line-of-sight cross sections (each approximately 6-miles long) were cut through the study area. Cross section locations were chosen so as to include visually sensitive areas (e.g., villages, historic sites, and water bodies) and various roads and local landmarks (see Figure 7, Sheet 1 in Appendix F). The cross sections are based on forest vegetation and topography as shown on the 7.5-minute USGS quadrangle maps and digital aerial photographs. For the purposes of this analysis, a uniform 40-foot tree height was assumed. A 10 fold vertical exaggeration was used to increase the accuracy of the analysis.

Cross section analysis revealed that, along selected lines of sight, vegetation and structures will significantly decrease potential Project visibility, when compared to the results of the viewshed analysis (see Figure 7 in Appendix F). The sections indicate a lack of visibility from Loon Lake, County Route 92, the Village of Cohocton, various valley roads, and most area streams, including the Cohocton River. Buildings will at least partially screen ground-level views from villages and hamlets such as Naples and Atlanta. In regard to other visually sensitive sites, the sections suggest that views of the turbines are likely to be available from the Naples Valley, Reservoir Creek Golf Course, Interstate Route 390, State Routes 415, 21, and 371, many of the hilltop roads, and the upper floors of some homes in the villages and hamlets.

3.5.2.2.3 Field Verification

Actual visibility of the proposed Project was evaluated in the field on November 11 and December 8, 2005. Four 15-foot by 6-foot helium-filled balloons were tethered at the approximate location of proposed turbines 3, 22, 41, and 46, and raised to a height of approximately 410 feet above the existing grade, thus slightly exceeding the maximum finished elevation of the turbine blade tip when oriented straight up. The purpose of this exercise was to provide a locational and scale reference for verification of turbine visibility and to obtain photographs for the subsequent development of visual simulations.

While the balloons were in the sky, field crews drove public roads and visited public vantage points within the 5-mile radius study area to document points from which the balloons could or could not be seen. Photos were taken from 184 representative viewpoints within the study area. Balloon visibility (or lack of visibility) was documented at each viewpoint with photos and field notes. Viewpoint locations were determined using hand-held global positioning system (GPS) units and high resolution aerial photographs (digital ortho quarter quadrangles). The time and location of each photo were documented on all electronic equipment (cameras, GPS units, etc.) and noted on field maps and data sheets.

Field review indicated that actual Project visibility, (as indicated by visibility of the helium-filled balloons raised at four proposed turbine sites) will be much more limited than suggested by viewshed mapping and cross section analysis. This is due to the fact that screening provided by buildings and trees within the study area is more extensive and effective than assumed in the previous analyses (e.g., vegetation is more extensive than indicated on the USGS maps, and often taller than 40 feet in height). The result is that certain sites/areas where "potential" visibility was indicated by viewshed mapping and cross section analysis, were actually well screened from views of the proposed Project. Field review confirmed a lack of visibility from areas west of the Village of Prattsburgh (northwest portion of the study area) and northwest of the Village of Naples. The balloons could not be seen from the Villages of Cohocton or Avoca, the Hamlet of Ingleside, or most of the Hamlet of North Cohocton, where ground-level views were typically blocked by buildings and street/yard trees. In the rural/agricultural portions of the study area, hedgerows and trees not indicated on the USGS maps also blocked/interrupted views of the balloons in many areas. Views were available from several sensitive sites, including the scenic overlook on Route 390, sections of Routes 21, 371, and 415, and the Atlanta-North Cohocton Community Park. However, the balloons could not be seen from any of the Register-listed historic sites, most of Route 415, the Twelvemile Creek Valley (including County Route 9), or the High Tor WMA (which is solidly wooded within the study area).

Independent of the ballooning exercise conducted by EDR, the Project cultural resource consultants identified numerous additional structures within the visual study area that could be eligible for listing on the National Register of Historic Places, some of which could have views of the proposed Project. Potential Project visibility from these sites will be evaluated after the State Historic Preservation Office (SHPO) has determined which of these structures are eligible for listing on the National Register.

3.5.2.2.4 Visual Simulations

Ten viewpoints were selected to show representative views of the Project from various distances and directions. The selected viewpoints also include each of the identified viewer/user groups and landscape similarity zones within the study area, as well as various sensitive resources. The selected viewpoints provide a sense of the scale/extent of the Project, and show the full range of visual change that will occur with the Project in place. The 10 selected viewpoints were:

- Viewpoint 11 - View from County Route 70 near the Hamlet of Howard, looking northwest (Figure 16).
- Viewpoint 57 - View from State Route 415 between County Route 9 and Hopkins Road, near the Hamlet of Wallace, looking north (Figure 16).
- Viewpoint 68 - View from Wraight Road in the Town of Prattsburgh, looking west.
- Viewpoint 74 - View from the scenic overlook on Interstate Route 390 near the Village of Cohocton, looking northeast.
- Viewpoint 94 - View from State Route 371 in the Village of Cohocton, looking northeast.
- Viewpoint 110 - View from Kirkwood-Lent Hill Road, looking northwest (Figure 16).
- Viewpoint 130 - View from Gay Road, looking southwest.
- Viewpoint 154 - View from North Main Street (State Route 21) in the Town of Naples, looking southwest (Figure 16).
- Viewpoint 160 - View from County Route 39 in the Hamlet of Atlanta, looking southeast.
- Viewpoint 178 - View from County Route 38, looking southeast.

To show anticipated visual changes associated with the proposed Project, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the completed Project from each of the 10 selected viewpoints. The photographic simulations were developed by constructing a three-dimensional computer model in 3D StudioMax®, based on turbine specifications and survey coordinates of the proposed facilities. For the purposes of this analysis, it was assumed that all new turbines would be Gamesa Eolica G90 machines.

Simulations from each of the 10 viewpoints listed above are shown as Figures 9-18 in Appendix F. A representative subset of these images are illustrated in Figure 16. These simulations of the proposed Project indicate that the Project will result in a change to the existing visual setting/landscape. However, the visibility and visual impact of the wind turbines will be highly variable based on distance, weather conditions, sun angle, the extent of visual screening, viewer sensitivity, and/or existing land use characteristics. The greatest impact occurs when the turbines are close to the viewer (i.e., less than 0.5 mile), which heightens the Project's contrast with the landscape in color, line, texture, form, and especially scale. In such views, the turbines become focal points, and begin to alter the perceived land use in the view. More distant views (i.e., over 2.0 miles), and those that occur in a working agricultural setting generally have more limited visual impact. These factors tend to decrease turbine visibility and/or contrast with the landscape.

3.5.2.2.5 Visual Impact Evaluation

An in-house panel of three EDR landscape architects was asked to rate the proposed Project in terms of its contrast with existing components of the landscape. Digital color prints (11 x 17-inch) of the before and after photos from each selected viewpoint were evaluated by the panel. Using a rating form developed by EDR, the Project's contrast with existing vegetation, landform, land use, water resources, and user activity was then rated on a scale of 1 (completely compatible) to 5 (strong contrast). For each viewpoint, these scores were added and averaged to provide an overall contrast rating.

This evaluation revealed that individual contrast ratings ranged from 1.0 (completely compatible) to 3.75 (moderate to high visual contrast). Composite scores (i.e., the average of individual rating panel members) ranged from 1.25 to 3.3. Scores in this range indicate a low to moderate level of visual contrast. The lowest contrast ratings (under 2.0) were received by viewpoints that were characterized by more distant views (over 2.0 miles) and the presence of other man-made features in the view. Higher contrast ratings were typical where turbines were in proximity to the viewer (i.e., under 0.5 mile), were the only man-made features in the view, or appeared out of context/character with existing land use or viewer activity. Based on the panel's evaluation, as well as viewer reaction to operating wind power projects elsewhere, public reaction to the Cohocton Wind Power Project is likely to be generally positive, but highly variable based on proximity to the turbines, the affected landscape, and personal attitude of the viewer regarding wind power.

Based upon review of nighttime photos/observations of existing wind power projects, the panel felt that the red flashing lights have the potential to create a significant nighttime effect. The potential significance of this impact depends on how many turbines are visible, what other sources of lighting are present in the view, the extent of screening provided by structures and trees, and nighttime viewer activity/sensitivity. However, it was felt that night lighting could be distracting and have an adverse impact on rural residents that currently experience dark nighttime skies. It should be noted that nighttime visibility/visual impact may be reduced on this Project due to 1) new FAA guidelines that result in fewer aviation warning lights than required on earlier projects, 2) the steep ridge slopes that largely screen portions of the Project from many valley locations, and 3) the concentration of residences in villages, hamlets, and along highways where existing lights already compromise dark skies and compete for the viewer's attention. Panel members also felt that new FAA guidelines requiring the synchronization of flashing lights would help to reduce adverse visual impact.

3.5.2.2.6 Assessment of Shadow Flicker

In addition to the VIA prepared by EDR, a separate assessment of the phenomenon known as "shadow flicker" was conducted by Wind Engineers, Inc. (WEI) (see Appendix G). Shadow flicker is the alternating change in light intensity or shadows created by the moving turbine blades when back-lit by the sun. These flickering shadows can cause an annoyance when cast on nearby or residences, however, due to the turbines' low blade pass frequency, shadow flicker is not anticipated to have any adverse health effects (e.g., trigger epileptic seizures). Although setback distances for turbines (1,500 feet from adjacent residences) will significantly reduce shadow flicker impacts to potential receptors, some limited impact will occur.

To calculate potential shadow flicker impacts, WEI used the following data to evaluate potential impacts related to shadow flicker:

- Turbine locations (coordinates)
- Shadow flicker receptor (residence) locations (coordinates)
- USGA 1:24,000 topographic and USGS DEM (height contours)
- Turbine rotor diameter
- Turbine hub height
- Joint wind speed and direction frequency distribution
- Sunshine hours (long term monthly reference data)

The model calculated shadow-flicker time at each assessed receptor location and the amount of shadow-flicker time (hours/year) everywhere surrounding the project (on an iso-line plot).

WEI's modeling indicated that of 187 potential receptors within 1,500 m (4,920 feet), 130 will experience no effect, and only one could experience over 25 hours of shadow flicker throughout a year (typically around sunrise or sunset). WEI indicates that this number is significantly lower than that calculated for other wind power projects in New York and throughout the U.S. They also note that these model results do not reflect many of the local conditions at the receptor site that could further reduce shadow flicker, such as trees and neighboring structures. This model also assumes that the turbine rotor is always turning, the receptor always has a window facing the direction of the sun, and that the receptor dwelling is occupied at all hours when shadow flicker may occur (i.e., at sunrise and sunset). These are highly conservative assumptions, and as such, the analysis over-predicts potential impacts. In reality, site-specific factors such as terrain, trees, buildings, and window location could significantly reduce impacts from shadow flicker. In addition, many of the modeled shadow flicker hours are expected to be of very low intensity, due to the distance of the proposed turbines from the affected receptors.

3.5.3 Mitigation

Construction-related visual impacts will be avoided, minimized, and mitigated through 1) careful site planning/Project layout, 2) development and implementation of various construction plans, and 3) a comprehensive site restoration process following completion of construction.

The proposed Project layout was developed so as to minimize the need for tree clearing and new road construction. The majority of the proposed turbines and other Project components have been sited in open fields (agricultural and successional). Mature forest and wetland communities have been avoided to the extent practicable, thus minimizing the need to clear existing vegetation. Existing farm lanes will be upgraded for use as turbine access roads wherever possible, while buried interconnect lines will follow access roads and field edges to minimize required clearing. Where clearing of undisturbed forest is unavoidable, such sites are typically well removed from adjacent roads and residences and therefore will not result in a significant adverse visual impact.

During construction, visual impacts associated with working construction equipment will be minimized through adherence to a construction routing and sequencing plan that minimizes impacts on local roads and residences. A dust control plan and a sediment and erosion control plan will be developed and implemented to minimize off-site visual impacts associated with construction activities. As described in the impacts discussion, any unavoidable construction-related visual impacts will be short term.

Following completion of construction, site restoration activities will occur. These will include removal of access road material from Project access roads (i.e., going from 30+ feet to 16 feet in width), restoration of agricultural fields (including soil decompaction, rock removal, and topsoil spreading), and stabilizing/revegetating disturbed sites through seeding and mulching. These actions will assure that, as much as possible, the site is returned to its preconstruction condition.

Mitigation options for the operating Project are limited, given the nature of the Project and its siting criteria (tall structures on high elevation sites). However, in accordance with NYSDEC Program Policy (NYSDEC, 2000), various mitigation measures were considered. These included the following:

A. Screening. Due do the height of individual turbines and the geographic extent of the proposed Project, screening with earthen berms, fences, or planted vegetation will generally not be effective in reducing Project visibility or visual impact. However, if adequate natural screening of the proposed substation site is not preserved, a planting plan will be developed and implemented to minimize visibility and visual impact associated with this component of the Project.

B. Relocation. Again, because of the extent of the Project, the number of individual turbines, and the large number of viewpoints from which the Project can be seen, turbine relocation will generally not significantly alter the visual impact of a wind power project.

C. Camouflage. The white or off-white color of wind turbines generally minimizes contrast with the sky under most conditions. Consequently, this color be utilized on the Cohocton Project. The size and movement of the turbines prevents more extensive camouflage from being a viable mitigation alternative (i.e., they cannot be made to look like anything else).

D. Low Profile. A significant reduction in turbine height is not possible without significantly decreasing power generation. To off-set this decrease, additional turbines would be necessary. There is not adequate land under lease to accommodate a significant number of additional turbines, and a higher number of shorter turbines would not necessarily decrease Project visual impact. In fact, several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones. The visual impact of the electrical collection system is being minimized by placing the lines underground rather than on overhead poles.

E. Downsizing. Reducing the number of turbines could reduce visual impact from certain viewpoints, but from most locations within the study area, unless this reduction were drastic, the visual impact of the Project would change only marginally. A dramatic reduction in turbine number (e.g., reduction by 50%) would render the Project economically infeasible.

F. Alternate Technologies. Alternate technologies for power generation would have different, and perhaps more significant, visual impacts than wind power. Alternative utility-scale wind power technologies, that would significantly reduce visual impacts, do not currently exist.

G. Nonspecular Materials. Non-reflective paints and finishes will be used on the wind turbines and nonspecular conductor will be used on the overhead transmission line to minimize reflected glare. Galvanized substation components will rapidly weather to a non-reflective gray color.

H. Lighting. Turbine lighting will be kept to the minimum allowable by the FAA. New FAA guidelines (FAA, 2005) do not require daytime lighting, and allow nighttime lighting of perimeter turbines only, at a maximum spacing of 0.5 mile. Medium or low intensity pulsing red lights will be used at night, rather than white or red strobes, or steady burning red lights. Lighting at the substation will be kept to a minimum, and turned on only as needed, either by switch or motion detector.

I. Maintenance. The turbines and turbine sites will be maintained to ensure that they are clean, attractive, and operating efficiently. Research and anecdotal reports indicate that viewers find wind turbines more appealing when they are operational and the rotors are turning. In addition, CPP will establish a decommissioning fund to ensure that if the Project goes out of service and is not repowered/redeveloped, all visible above-ground components will be removed.

J. Offsets. Correction of an existing aesthetic problem within the viewshed is a viable mitigation strategy for projects that result in significant adverse visual impact. However, results of this VIA do not suggest that such mitigation measures are warranted for the Cohocton Wind Power Project.

In addition to the mitigation measures committed to above, other measures that will reduce or mitigate the Project's visual impact include the following:

- Compliance with required set-backs from roads and residences.

- The turbines will have uniform design, speed, height and rotor diameter.

- Towers will include no exterior ladders or catwalks.

- The Project operations and maintenance building (although not yet designed) will reflect the vernacular architecture of the area (i.e., resemble an agricultural structure).

- New road construction will be minimized by utilizing existing town roads, woods roads and farm lanes whenever possible.

- No placement of advertising devices on the turbines

- A parking/viewing location, with an informational kiosk, will be developed to enhance public understanding and appreciation to the Project.

- A supplemental VIA will be prepared to evaluate the visibility and visual impact of the collector station, substation, and overhead 115 kV transmission line. This study will be completed once these facilities are designed, and will be submitted to the lead agency as part of the Project FEIS.

- Following completion of a final architectural survey by the Project cultural resource consultants, a determination of eligibility for listing on the National Register of Historic Places will be provided by the SHPO. A follow-up analysis of potential Project visibility from these sites will be conducted. Results of this analysis will serve as the basis for development of an agreement with the OPRHP to undertake various activities to mitigate potential visual impacts on historic structures.

- Additional investigation of the one receptor that could receive more than 25 hours of shadow flicker annually will be undertaken. This investigation will determine if site-specific conditions (building/window orientation, tree screening, etc.) will prevent or minimize the predicted impact.

3.6 HISTORIC AND ARCHAEOLOGICAL RESOURCES

The Public Archaeology Facility (PAF) at Binghamton University conducted a Phase 1A Archaeological/Architectural Assessment of the Project area (Appendix H). This study was undertaken to assess the potential impacts of the Project on cultural and architectural resources in the Project area, in compliance with the New York Standards for Professional Survey (NYAC, 1994).

3.6.1 Existing Conditions

3.6.1.1 <u>Prehistoric Sensitivity and Context</u>

Archaeological evidence indicates human populations moved into the newly glaciated Northeast during the last phase of the Wisconsin stadial retreat. Two distinct settlement and subsistence patterns emerged, characterizing the prehistory of upstate New York. The first, designated as the pre-agricultural hunter/gatherer, was developed with the arrival of highly mobile groups during the Paleo-Indian and Early-Middle Archaic periods around 10,000-8,000 B.C. and flourished until the Late Woodland periods (A.D. 900-1650) with the advent of early agriculture. As daily subsistence shifted from solely hunting/gathering toward the production and consumption of crops, the development of larger and more sedentary human populations, and the subsequent construction of hamlet and village settlements near agricultural fields occurred.

In general, the sparse archaeological evidence has led to the assumption that prehistoric groups did not consider the Allegany Plateau uplands a desirable region for long-term settlements. However, using the idea of "whole-valley system", some research has challenged that assumption and outlined the basic prehistoric site types and functions typically found in the Upper Susquehanna watershed (Versaggi, 1987; Versaggi, 1996; Versaggi et al. 2001). This theory suggests that larger base-camps or villages (typically located on valley floors near confluences) are associated with a series of small camps and processing stations, which tend to cluster near the margins of small streams or wetlands on the valley walls and uplands.

The majority of the Project Site is located in uplands and it is unlikely that large residential base-camps or villages occurred in these areas. The expected site types for the area, based on Versaggi's settlement model, are limited to seasonal camps and processing stations. Prime locations for these sites include the crests of plateaus near upland tributaries and wetlands (Funk, 1993).

A portion of the overhead transmission line will cross a section of the Cohocton River Valley south of the Village of Cohocton, and it is possible these landforms (outwash terraces and narrow floodplains) contain remnants of larger base-camp or village settlements. Several examples of such sites have been found on the outwash and floodplain terraces near the confluence of the Canisteo and Tioga Rivers in southern Steuben County.

3.6.1.2 Historic Sensitivity and Context

Although no direct information about the land within the Project Site is available, background information indicates that European settlement of the area began in the 18th century. In general, most economic development took place within the hamlet centers, with isolated agricultural land and dispersed farms predominating outside of the hamlets. Historic site files confirm this trend. Three historical sites have been documented in the vicinity of the Town of Cohocton. All three appear to be outside the main hamlet limits (the main hamlet in this area was the Village of Cohocton) and the majority are associated with rural farmsteads.

Historic maps from 1857 to 1873 show a similar trend of population aggregation within the Village of Cohocton, confirming the basic model generated from the historic site files. Both residential and rural industrial sites would be expected in the main hamlet. Outside of the village, the maps show isolated farmsteads along the growing road system. In the vicinity of the proposed turbine sites PAF did not find evidence of historic settlements until the mid-20th century. At present these settlements include clusters of post-1950 homes and cottages. Some isolated farmsteads are present in the area, but most of the land in the uplands was, and continues to be, used primarily for agriculture.

Overall, the potential for historic sites occurring within the Project Site is low, based on the relative lack of map-documented structures and the location of the Project outside of the main population clusters.

3.6.1.3 Archaeological Resources Survey Findings

Within the vicinity of the Town of Cohocton, at least six prehistoric archaeological sites have been documented in the State Site Files. All six are classified as unidentified occupations. Three of the six sites were found in the early 1920's by archaeologist Arthur C. Parker. Two of these are considered "village" sites, one of which is located along an unnamed creek in southern Yates County, the other on the east side of Hatch Hill in southern Yates County. The third site contained "traces of occupation" and is located near Naples in Ontario County. The three remaining prehistoric sites were found during Cultural Resource Management (CRM) investigations in the 1980's. During a survey for NYSDOT in the Town of Prattsburgh, archaeologists found evidence of prehistoric activity near a wetland east of State Route 53. The remaining two sites are located near the Town of Wheeler, along the western margin of Five Mile Creek. None of the six prehistoric sites are National Register eligible or listed.

Additionally, three historic sites have been documented in the area. The first is the Walsh Site, an 1850's foundation and sheet midden found during a CRM survey for State Route 53 in the Town of Prattsburgh. Just south of the Walsh Site (on the opposite side of Route 53) archaeologists documented an 1850's outbuilding foundation and a light-density sheet midden of nails, concrete, and wood beam fragments. The area was identified as the Beach Site. The third historic site was found near the Town of Naples during another CRM survey for Route 53. Designated as the Boon Site, crews discovered the remains of a middle 19th and early 20th century foundation and well. None of these historic archaeological sites are National Register eligible or listed.

In addition to the background research findings, a field assessment walkover/driveover was conducted by PAF. This assessment did not reveal any above-ground prehistoric cultural features or artifact scatters within the Project Site. However, two historic cemeteries were identified adjacent to portions of the access roads leading to turbine sites 20 and 23. Both cemeteries are shown on the 1857 and 1873 historic maps under the family names "Hatcher" and "Wheaton". In addition, a segment of the overhead transmission line will parallel a portion of the historic Erie-Lackawanna railroad tracks.

3.6.1.4 Architectural Survey Results

The architectural assessment documented at least 80 National Register listed and/or eligible historic structures/properties and one potential "historic district" within five miles of the proposed Project (as measured to the nearest turbine). This total includes four National Register listed structures, including Ephraim Cleveland House, Naples Memorial Town Hall, Morgan Hook and Ladder Company, and Larrowe House. The location of these four structures is indicated on Figure 15. The potential historic architectural district spans North Main Street in the Village of Naples from County Route 33 to the intersection with Mount Pleasant Street. Several of these sites may have views of the proposed wind turbines.

3.6.2 Potential Impacts

3.6.2.1 Construction

3.6.2.1.1 Archaeological Resources

Prehistoric sites have been found in upland environments on the Allegheny Plateau, and it is probable that hunter-gatherer groups in the region used the uplands throughout the Town of Cohocton for short-term activities. Larger base-camp and village settlements are typically found on valley bottom landforms, particularly near the confluences of river tributaries. Therefore, archaeological features or artifact deposits may be located within the Project Site on or adjacent to high sensitivity landforms (e.g., areas near water sources, elevated knolls offering good views, etc.). Most Project construction will occur in upland areas where prehistoric sites are unlikely to be encountered. Additionally, based on the background research and historic maps, the probability of encountering buried or above-ground historic archaeological sites during construction is also considered to be low.

3.6.2.1.2 Historic Structures

No structures will be demolished or physically altered in connection with construction of the Project. The two historic cemetery sites identified adjacent to proposed access roads will not be directly impacted by the proposed development. However, Project construction (e.g., vehicle traffic, stockpiled materials, crane activity) will be visible from some Register-eligible sites, which has the potential to result in a temporary visual effect on historic properties within the study area.

3.6.2.2 <u>Operation</u>

3.6.2.2.1 Archaeological Resources

Once built, there will be no significant earth-disturbing activities associated with operation and maintenance of the Project. Therefore, Project operation will have no adverse effect on archaeological resources.

3.6.2.2.2 Historic Structures

Permanent, physical impacts to historic structures will not occur because the Project will not result in any structures being demolished or physically altered. However, as indicated in the Project VIA (Appendix F), viewshed mapping indicates that the Project may be visible throughout significant portions of the study area. The degree of visual effects on any historic or architecturally significant property is dependent on a number of factors including distance, topography, vegetation, and the types and density of existing modern features (such as buildings/residences, overhead electrical transmission lines, cellular towers, and silos). Although field review conducted during the Project visual studies suggests that the Project will not be visible from Register-listed sites within five miles, it is possible that the Project will be visible from some Register-eligible historic properties within the study area. As stated previously, potential Project visibility from these sites will be evaluated after the SHPO has determined which of these structures are eligible for listing on the National Register.

3.6.3 Proposed Mitigation

3.6.3.1 <u>Archeological Resources</u>

To mitigate for potential impacts to archaeological resources, CPP has committed to conduct a Phase 1B archaeological survey prior to Project construction. The Phase IB archaeological survey will be scheduled in an attempt to coincide with plowing and disking by the farmers to maximize the use of surface inspection, which in general is the method that results in the most thorough and efficient identification of archaeological resources in cultivated areas. A recommended testing protocol (based on the current Project layout) is described in the Phase 1A report (Appendix H). The scope of this survey will be modified once final turbine locations have been determined, and will comply with guidelines recently issued by the SHPO (see Appendix H). The 1B survey will also be conducted in accordance with a work plan developed in consultation with the SHPO.

In general, archaeological testing (subsurface and/or surface) will be conducted for samples of turbine pads, each measuring roughly 120 m (400 ft) in diameter, and some portions of the access road and buried cable locations. This methodology will be geared toward the identification of sites on or adjacent to high sensitivity landforms (e.g., areas near water sources, elevated knolls offering good views, etc.). Upland prehistoric sites are more likely to be encountered in these areas as opposed to broad and homogenous upland plateaus. Areas with low archaeological potential (landforms with > 15 percent slope) will be excluded from the testing strategies. In addition, any stretches of land with visible ground modification or adjacent to utility disturbances will be exempted from the testing proposals. If archaeological resources are discovered during this survey, additional studies/data retrieval will be conducted, or Project components will be relocated/rerouted (as necessary) to avoid these resources. Thus, the Project will not result in temporary or permanent impacts to archaeological resources, and additional mitigation is not necessary.

3.6.3.2 Historic Resources

A more detailed architectural reconnaissance will be completed during the Phase 1B investigation. This survey will include descriptions and photographs of all structures/properties, as well as a more detailed assessment of potential Project visibility and appropriate mitigation measures. The results of this survey will be provided to the SHPO for a determination of eligibility for listing on the National Register of Historic Places. An analysis of potential Project visibility will then be conducted for each Register-eligible site. Results of this analysis will be provided to the SHPO, and serve as the basis for identification of mitigation measures to address the visual impacts of the Project on historic properties. Based on experience elsewhere, this mitigation could involve funding of historic structure protection/restoration projects within the Project viewshed.

3.7 SOUND

To obtain background sound levels and evaluate potential sound impacts from the Project, an Environmental Sound Survey and Noise Impact Assessment was prepared (Appendix I). The two phases of the sound study included a background sound level survey and a computer modeling analysis of future turbine sound levels. The study was performed by Hessler Associates, Inc. (Hessler), a member of the National Council of Acoustical Consultants.

The primary basis for evaluating potential Project sound is the NYSDEC Program Policy *Assessing and Mitigating Noise Impacts* (NYSDEC, 2001). Following this assessment procedure, a simplified "first level sound impact evaluation" is initially carried out to determine if any residential receptors may experience a noticeable increase in sound level. This is followed by a more in depth "second level sound impact evaluation" if any sensitive receptors are identified as being possibly affected. The procedure essentially defines a cumulative increase in overall sound level of 6 dBA as the threshold between no significant impact and a potentially adverse impact.

3.7.1 Existing Conditions

For most wind power projects, the sound produced during construction and operation is a concern to local residents. Certain activities inherently produce sound levels or sound characteristics that have the potential to create noise (i.e., unwanted sound). Some properties of sound which can be measured include:

1. Frequency: Frequency is the rate at which the source produces sound waves, i.e. complete cycles of high and low pressure regions. In other words, frequency is the number of times per second that a vibrating body completes one cycle of motion. The unit for frequency is the hertz (Hz = 1 cycle per second). Low pitched or bass sounds have low frequencies. High-pitched or treble sounds have high frequencies. The sensitivity of the human ear to sound depends on the frequency or pitch of the sound. People hear some frequencies better than others.

2. Sound Pressure: Sound pressure level (SPL) is the amount of air pressure fluctuation a sound source creates. We "hear" or perceive sound pressure as loudness. Sound pressure is usually expressed in units called pascals (Pa). The common sounds we hear have sound pressure over a very wide range (0.00002 Pa - 20 Pa). It is difficult to work

with such a broad range of sound pressures. To overcome this difficulty a unit of decibel (dB) is used which compresses the scale of numbers into a manageable range. SPL can be statistically summarized as the residual, or L90, sound level. The L90 is the sound level exceeded during 90% of a measurement interval. It excludes sporadic, short-duration sound events, thereby characterizing the more quiet lulls between such events. It is this consistently present "background" level that forms a conservative basis for evaluating the audibility of a new sound source.

3. Sound Power: The sound power is the sound energy transferred per second from the sound source to the air. A sound source has a given, constant sound power that does not change if the source is placed in a different environment. Sound power is expressed in units called watts (W). An average whisper generates a sound power of 0.0000001 watts, a truck horn 0.1 W, and a turbo jet engine 100,000 W. Like sound pressure, sound power (in W) is usually expressed as sound power levels in dB. Sound measurement readings can be adjusted to correspond to human hearing with an "A-weighting filter" which de-emphasizes low frequencies or pitches that are outside the normal range of human hearing. Decibels measured using this filter are A-weighted and are called dB(A).

4. Time Distribution: Sound can be continuous, variable, intermittent or impulsive depending on how it changes over time. Continuous sound remains constant and stable over a given time period.

The Project Site is a rural, agricultural area with generally low ambient sound levels. As a part of the background sound level survey, Hessler measured the existing sound environment within the Project area during a 12 day period from November 17-29, 2005. The purpose of the survey was to determine what minimum environmental sound levels are consistently present and available at the nearest potentially sensitive receptors to mask or obscure potential sound from the proposed Project. Three residential properties within the Project area were selected as representative measurement locations (see Figure 17). These locations were chosen because they were typical of the two major sound environments (open uplands and sheltered hollows) where receptors are located within the Project area.

Hessler recorded the hourly L90 (residual) sound levels at the three representative measurement locations. As discussed in the introduction to this section, the L90, or residual, sound level is a conservative measure of background sound levels, in the sense that it filters out short-duration, sporadic sound events. The L90 ambient sound level at the three sampling sites ranged from less than 20 to over 50 decibels (dBA), which is typical of a rural setting. In general, ambient sound levels at all three sampling sites were highly correlated with wind speed. Data collected at the three sampling locations indicate that all elevated, exposed sites within the Project area probably experience similar environmental sound levels, which are highly variable depending on wind speed. A steadier background sound level generally exists at homes located in valleys protected from the wind.

Wind turbine operation occurs at a ‘cut-in’ wind speed of approximately 4 meters per second (m/s) (1 m/s = 2.236 mph), and at a wind speed of 8 m/s turbine-related sound levels reach their maximum value. Beyond a wind speed of 8 m/s, background sound continues to increase with wind speed while turbine sound remains constant. Due to this relationship, Hessler studied ambient sound in relation to wind speeds ranging from 4 m/s to 9 m/s at a reference height of 10 m. According to Hessler, background sound levels at exposed, high elevation sites ranged from 30 dBA at wind speeds of 4 m/s to 39 dBA at wind speeds of 9 m/s. At the more sheltered measurement location, the rate of increase was significantly lower. This is largely due to the fact that the background sound level was not as strongly influenced by wind speed. In this case, a sound level of 36 dBA might be expected at the turbine cut in speed of 4 m/s and a level of 38 dBA would be associated with an 8 m/s wind. What this generally indicates is that, when the turbines (which are all positioned on hilltops above the residences in the sheltered valleys) produce maximum sound at wind speeds of 8 m/s or higher, a masking sound level of at least 38 dBA can be expected at these receptors.

For modeling purposes, the more conservative value of 37 dBA was assumed to be the background sound level consistently available to mask Project sound at all locations. This is the ambient sound level that can reasonably be expected when the turbines are operating at maximum speed and producing the most sound.

3.7.2 Potential Impacts

Virtually everything that has moving parts will make some sound, including wind turbines. Table 11 lists examples of common sound levels using typical dB(A) levels.

Table 11. Common Sources of Sound and Associated Typical Sound Levels (dBA)

Source/Activity	Indicative sound level (dBA)
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Car at 40mph at 100m	55
Busy general office	60
Truck at 30mph at 100m	65
Pneumatic drill at 7m	95
Jet aircraft at 250m	105
Threshold of pain	140

Source: The Scottish Office, Environment Department, Planning Advice Note, PAN 45, Annex A: Wind Power, A.27. Renewable Energy Technologies, August 1994. Cited in "Noise from Wind Turbines," British Wind Energy Association, http://www.britishwindenergy.co.uk/ref/noise.html .

The Town of Cohocton Windmill Local Law requires that a project operate so that the sound produced during operation does not exceed fifty (50) dBA, "at the boundaries of all abutting parcels that are owned by persons other than the owner of the parcel on which each turbine is located." There are no other state or federal sound regulations that would apply to the Project.

The potential sound-related impacts resulting from the construction and operation of wind turbines are described below.

3.7.2.1 Construction

Construction of wind power projects requires the operation of heavy equipment and construction vehicles for various activities including construction of access roads, excavation and pouring of foundations, the installation of buried electrical interconnects, and the erection of turbine components. Assessing and quantifying construction-related impacts is difficult because construction activities will constantly be moving from place to place around the site leading to highly variable impacts at any given receptor location. In general, the maximum potential impact at any single residence might be analogous to a few days to a week of repair or repaving work occurring on a nearby road. More commonly, the sounds from Project construction are likely to be faintly perceived as the far off sound of diesel-powered earthmoving equipment characterized by such things as irregular engine revs, back up alarms, gravel dumping and the clanking of metal tracks.

The types of equipment likely to used on the Project and their typical sound levels are presented in Table 12 below. Also shown are the maximum total sound levels that might temporarily occur at the closest residences (roughly 1500 feet away) and the distance from a specific construction site at which its sound would drop to 42 dBA (the nominal threshold for disturbance).

Table 12. Construction Equipment Sound Levels

Equipment Description	Typ. Sound Level at 50 ft., dBA	Est. Maximum Total Level at 50 ft. per Phase, dBA*	Max. Sound Level at a Distance of 1,500 ft., dBA	Distance Until Sound Level Decreases to 42 dBA, ft.
Road Construction and Electrical Line Trenching				
Dozer, 250-700 hp	88	92	58	4,800
Front End Loader, 300-750 hp	88			
Grader, 13-16 ft. blade	85			
Excavator	86			
Foundation Work, Concrete Pouring				
Piling Auger	88	88	54	3,660
Concrete Pump, 150 cu yd/hr	84			
Material and Subassembly Delivery				
Off Hwy Hauler, 115 ton	90	90	56	4,200
Flatbed Truck	87			
Erection				
Mobile Crane, 75 ton	85	85	51	3,000

*Not all vehicles are likely to be in simultaneous operation. Maximum level represents the highest level realistically possible at any given time.

What the values in this table indicate is that, depending on the particular activity, sounds from construction equipment are likely to be insignificant at distances of more than 3,000-4,800 feet. During construction in any one location, most houses will be further than 4,800 feet, and therefore should be largely or completely unaffected by construction sound. However, in some places these activities will occur relatively close to existing residences and, at distance of 1,500 feet, a total sound level ranging from 51 to 58 dBA might occur over several working days. Such levels would generally be unacceptable if they were occurring on a permanent basis or outside of normal daytime working hours. However, as a temporary, daytime occurrence, construction sound of this magnitude may well go unnoticed by many in the Project area.

Sound from the very small amount of daily vehicular traffic to and from the construction site should be negligible in magnitude relative to normal traffic levels, and temporary in duration at any given location.

3.7.2.2 Operation

Operating wind turbines most commonly produce some broadband sound (a “swishing” or “whooshing” sound) as a result of revolving rotor blades encountering turbulence in the air. Although less common with newer turbine designs, turbines can also produce tonal sounds (a “hum” or “whine”), caused by mechanical components (AWEA 2005).

Hessler's assessment modeled predicted operational sound from the built Project to evaluate potential impacts on adjacent residential receptors. The study’s methodology followed guidelines included in the NYSDEC program policy (NYSDEC, 2001). Hessler also considered the unique attributes of sound from wind power generating facilities, where wind conditions change background sound levels, as well as the sound levels produced by the turbines themselves.

The sound output in Hessler’s assessment was based upon a Gamesa Eolica G87 wind turbine, which is the model proposed for use on the Cohocton Project. The test protocol used by Hessler required measurements from wind speeds of 6 m/s (just above the cut-in wind speed of 4 m/s when the turbine begins to generate power) up through 10 m/s (when the rotational speed of the turbine becomes constant and sound levels off). All of the values used in the analysis were derived from measurements taken downwind of the turbine (lower sound levels typically exist in other directions).

Using the sound power level spectrum, a worst-case, maximum sound level contour plot for the site was calculated using the "Cadna/A", ver. 3.5 sound modeling program devleoped by DataKustik, GmbH (Munich). This software enables the Project and its surroundings, including terrain features, to be realistically modeled in three-dimenions. The hill and valley topography of this site was digitized into the sound model from USGS maps. Each turbine is represented as a point sound source at a height of 78 m above the local ground surface (design hub height). The model uses conservative assumptions regarding ground absorption of sound and wind speed, and predicts downwind sound levels from all directions simultaneously, to evaluate the "worst case" sound scenario.

The results of the assessment performed by Hessler are summarized as follows:

- Preliminary sound modeling indicated that the potential for community sound impacts exists with this Project. This modeling work essentially performed the function of the First Level Noise Impact Assessment described in the NYSDEC policy and demonstrated that a Second Level assessment was necessary.

- According to the NYSDEC Noise Policy, a cumulative increase in total sound level up to 6 dBA is characterized as having "potential for adverse sound impact only in cases where the most sensitive of receptors are present" and is suggested as a threshold for determining what areas might be adversely impacted by a new sound source and what areas should see "no appreciable effect". For this site a 6 dBA cumulative increase is associated with a Project-only sound level of 42 dBA.

- A "Second Level" modeling study carried out per the NYSDEC guideline showed that, while most residences were beyond the 42 dBA contour and unlikely to be able to hear Project sound under most normal circumstances, there were a number of homes that may experience levels in the 42 to 44 dBA range and few that might see levels as high as 46 dBA (see Figure 18). In theory these levels mean that Project sound may be clearly audible above the typical minimum background sound level but it should be pointed out that the modeling is conservative in two important respects:

    - The background design sound level of 37 dBA is the residual, L90 level, which represents the quietest lulls between wind gusts, cars passing by, dogs barking, etc. As such, this level quantifies a very low value for masking environmental sound. Most of the time (90% of the time) a somewhat higher background sound level will exist during an 8 m/s wind condition.

    - The sound model assumes that an 8 m/s wind is blowing simultaneously from all directions and that the turbine sound level experienced at any given point is the sound level that would occur downwind from all nearby turbines. Such a sound level is a physical impossibility in many situations. For example, a receptor between two turbines cannot possibly be downwind from both units at the same time.

- Given these conservative assumptions and the fact that sound levels in the 42 to 46 dBA range are not particularly loud in absolute terms, a significant adverse reaction to Project sound is not expected. The maximum sound level of 46 dBA projected for one or two residences is a level that would normally be considered an acceptable design limit (i.e., numerous regulatory standards and guidelines commonly use a nighttime sound limit of 45 dBA for new projects).

- Although concerns are sometimes raised with respect to low frequency sound emissions from wind turbines, no adverse impact related to low frequency sound is expected from this Project. The maximum C-weighted sound level at any receptor is at least 7 dBC below the threshold of human perception.

- An analysis of potential sound impacts during low wind conditions when the background sound level is diminished, indicates that turbine sound levels drop in parallel with the level of masking sound so that any incremental increase or impact would not be any different for a low wind situation than it is during an 8 m/s wind when the turbines generate maximum sound levels.

- The Town of Cohocton Sound Ordinance limits sound produced during wind turbine operation to 50 dBA at the property line of any parcels of land belonging to non-participating landowners. For the most part operational sound at or above this level is confined to the properties on which the turbines are to be sited. However, there are seven instances where the 50 dBA sound contour line extends, if only slightly, onto non-participating properties (Figure 18). In none of these instances are homes actually exposed to sound levels of 50 dBA.

3.7.3 Proposed Mitigation

The Project lay-out addressed in this DEIS has already been revised to avoid or reduce sound impacts to adjacent and nearby receptors. Although residential sound impacts that remain are anticipated to be minor, additional mitigation measures will include the following:

- Implementing best management practices for sound abatement during construction, including use of appropriate mufflers and limiting hours of construction.
- Notifying landowners of certain construction sound impacts in advance (e.g., if blasting becomes necessary).
- Obtaining sound easements or other forms on consent from the owners of non-participating properties where property line sound levels in excess of 50 dBA are predicted.
- Implementing a complaint resolution procedure to assure that any complaints regarding construction or operational sound are adequately investigated and resolved.

3.8 TRANSPORTATION

The Project Site is served by an existing network of interstate, state, county, and local highways. Roads range from four lane divided highways (Interstate Route 390) to seasonally maintained, dirt/gravel roads. The primary transportation corridor through the Project area is Interstate 390. Other major routes through the area include NYS Routes 21, 371, and 415.

Route 390 runs in a generally southeast to northwest orientation through the Project area from Bath to Wayland, and then northerly towards Geneseo and Rochester. It is classified as a Rural Principal Arterial Interstate and has an annual average daily traffic volume of 10,960 vehicles per day (vpd) between Exits 1 & 2 and 9,910 vpd between Exits 2 & 3 (NYSDOT, 2004).

NYS Route 21 connects the Village of Wayland with the Hamlet of North Cohocton. It is classified as a Rural Minor Arterial and carries approximately 3,370 vpd (NYSDOT, 2004).

NYS Route 415 runs parallel to Interstate Route 390, and provides access to 390 at Exit 1 southeast of Avoca, Exit 2 west of Cohocton, and Exit 3 south of Wayland. It is classified as a Rural Major Collector and carries between 1,300 vpd and 4,760 vpd depending on the location throughout the Project area (NYSDOT, 2004). NYS Route 371 connects North Cohocton to the Village of Cohocton, and is classified as a Rural Major Collector. It carries approximately 1,920 vpd (NYSDOT, 2004). Table 13 lists the roads within the Project area, the towns in which they occur, and the ownership/jurisdiction of each road.

Table 13. Road System in Project Area

Roadway	Location	Ownership/ Jurisdiction
Interstate Route 390	Towns of Cohocton, Avoca & Wayland	State
State Route 415	Towns of Cohocton, Avoca & Wayland, Village of Cohocton	State
State Route 21	Town of Cohocton, and Wayland	State
State Route 371	Town & Village of Cohocton	State
Fairbrother Road	Town of Cohocton	Town
Wentworth Road	Town of Cohocton	Town
Van Aucker Road	Town of Cohocton	Town
County Route 121	Town & Village of Cohocton	County
County Route 39	Town of Cohocton	County
Wilcox Road	Town of Cohocton	Town
Maple Hill Road	Town of Cohocton	Town
Mann Road	Town of Cohocton	Town
Edmund Road	Town of Cohocton	Town
County Route 35 (Kirkwood-Lent Hill)	Town & Village of Cohocton	County
Pine Hill Road	Town of Cohocton	Town
Wheaton Road	Town of Cohocton	Town
Deusenberry Road	Town of Cohocton	Town
Mattice Road	Town of Cohocton	Town
Rynders Road	Town of Cohocton	Town
Wagner Gully Road	Town of Cohocton	Town
County Route 36 (West Main)	Town of Cohocton	County
University Road	Town of Cohocton	Town
Avery Hollow Road	Town of Cohocton	Town
Edmund Road	Town of Cohocton	Town

3.8.1 Existing Conditions

A roadway evaluation conducted by Fisher Associates (Fisher) examined roadway safety, traffic capacity, drainage structures, and roadway geometry along all state, county, and local roads that could be used during Project construction (see Appendix J).

The most recent five-year accident summary has been requested from the NYSDOT Safety Information Management System (SIMS) database. The SIMS data has not yet been received from NYSDOT. It will be assessed when available.

To determine if there are any existing traffic capacity or congestion problems, Fisher analyzed existing data and conducted on-site observations. Based on these efforts, Fisher concluded that in general, the Project area experiences light traffic volumes and that there are no existing traffic capacity or congestion problems.

The majority of the roads within the Project area are asphalt-surfaced, with widths in the range of 21-35 feet wide. Portions of the Project area roadways are surfaced with gravel (VanAucker, Rynders, Avery Hollow, Mattice, Edmond, and Pine Hill Roads) or oil & stone (Dusenberry, Wheaton and Lent Hill Road) and may be less than 20 feet in width. Most roadways are in fair to good condition and are capable of accommodating construction traffic**.**

Fisher also conducted an on-site drainage structures inventory. The structures inventory identified 116 culverts and bridges along roadways within the study area. Several of the culverts had deficiencies, including insufficient cover (28) and inadequate length (4), and all of the bridges present concerns with cover, length, and structural condition (see Tables and Figures in Appendix J).

3.8.2 Potential Impacts

Potential traffic impacts may occur as a result of short-term construction activities (temporary impacts) and as a result of long-term operation and maintenance of the Project (on-going or permanent impacts).

3.8.2.1 Construction

Although roads within and adjacent to the Project area are operating well under capacity, some temporary impacts to transportation in and around the Project area will result from the movement of vehicles involved in Project construction. These vehicles and their role in the Project are described below. The exact construction vehicles have not yet been determined, however, estimates of the truck dimensions are provided:

- Gravel trucks with capacity of approximately 10 cubic yards (cy) per truck and an estimated gross weight of 75,000 pounds (lbs), for access road construction (estimated total of approximately 1,000 trips throughout construction).
- Concrete trucks for construction of tower foundations with capacity of approximately 10 cy per truck and an estimated gross weight of 96,000 lbs (estimated total of approximately 1,200 trips throughout construction).

- Flatbed trucks (up to approximately 14 axles) for transporting turbine components (tower sections, blades, nacelles, hubs); these trucks may have gross weights up to 276,000 pounds, with lengths (from front of cabin to end of trailer) up to 170 feet, widths to 14 feet, and heights to 15 feet 6 inches (estimated 384 trips throughout construction).
- Pickup trucks for equipment and tools.
- Trucks and cars for transporting construction workers.

The Project delivery and construction routes have not yet been finalized, however, it is likely that turbine components will arrive at the Project Site from Interstate 390 via Exits 1, 2, or 3. Exit 1, south of the Project Site, provides access to Michigan Hollow Road then to Route 415, near Avoca. Traffic exiting at this location would then travel north on Route 415 to access the Project Site. Exit 2 is immediately adjacent the Site, providing access through the Village of Cohocton. However, traffic exiting at this location would have to maneuver through the Village streets to reach the Project Site. Exit 3 is west of the Project Site and provides access to Route 21. Traffic exiting at this location would travel on Route 21, to County Route 36, through the hamlets of North Cohocton and Atlanta, to reach the Project Site.

A preliminary review of Exits 1, 2, and 3 was completed by Fisher to determine the feasibility of using each exit for construction-related traffic. Exit 1 appears capable of accommodating construction traffic with improvements to the ramp intersection turning radii and a structural analysis of, and potential improvements to, the bridge over I-390. Exits 2 & 3 would require turning radii improvements at the exit ramps and likely require the turbine components to arrive on I-390 North due to bridge height restrictions at the exits. Should the components arrive on I-390 South, the maximum height of the delivery vehicles will need to be 14-feet 4-inches at Exit 3, and 14-feet 3-inches at Exit 2 due to the clearance limitations for the vehicles traveling under I-390.

Once beyond Exits 1, 2, or 3, the local roadway network would also require improvements in the form of turning radius improvements (200-foot radius to accommodate delivery vehicle length), bridge, pipe, or culvert upgrades (to accommodate the weight of the delivery vehicles and other construction traffic), and/or general roadway widening (to a minimum of 16-feet to accommodate delivery and construction vehicles and/or to maintain two-way traffic). The extent and location of these improvements will vary depending on the route selected to access the Project Site. Vehicle origination tables included in Appendix J give a preliminary indication of the required improvements if delivery vehicles approach the site from Exits 1, 2, or 3. These tables indicate anywhere from 26 to 30 required intersection radius improvements, 18 to 22 required pipe/culvert improvements, and eight to 13 bridge improvements, depending on the selected travel route.

Prior to construction, a transportation routing plan and final roadway improvement plan will be developed and provided to state, county, and local Highway Department officials. These plans will identify proposed travel routes, existing highway limitations, planned work schedules, required road and intersection widening, utility re-locations, and bridge reinforcement. Based on the results of the Fisher study, no roadways should present grade constraints for construction traffic. Oversize construction vehicles could also cause minor delays on Project area roadways, but these are unlikely to be significant given the relatively low traffic volume through the area.

As mentioned above, the pipe, culvert, and bridge inventory conducted by Fisher documented the location and condition of 116 drainage structures along roads within the Project area that could accommodate construction traffic. This inventory indicates that at least 46 of these structures may require improvement to accommodate safe passage of construction vehicles. Typical improvements may include:

- Placement of additional cover over structures
- Reinforcing structures with bracing
- Use of bridge jumpers to clear structures
- Replacement of structure prior to construction
- Replacement of structure during or after construction if damaged by construction activities
- Re-route construction traffic to avoid structures

The required improvements will be defined when the final transportation routing plan is developed. An engineering and improvement plan will be developed in coordination with state, county, and local highway departments, and undertaken by the Project developer/contractor (at no expense to these departments) prior to the arrival of oversize/overweight vehicles onsite. In addition, these road improvement activities may create additional Project-related impacts (i.e. wetlands, drainage, grading, etc.) that will be addressed in detail during the final Project design, and reviewed during all Project permitting subsequent to this DEIS (i.e., SPDES General Permit, USACOE/NYSDEC wetland permits, highway work permits).

3.8.2.2 Operation

Routine Project operation and maintenance will not generate a significant volume of traffic, or involve the use of oversized/heavy weight vehicles on a regular basis. Thus, following the completion of construction and road restoration/repair, on-going traffic and transportation impacts are not anticipated. Should repair work require the use of over-sized or heavy vehicles, some damage to the roads could occur on a very occasional basis.

3.8.3 Proposed Mitigation

Prior to construction, the applicant and/or contractor will obtain all necessary permits from the town and county highway departments and the NYSDOT, for activities including new access points, improving existing roadways, crossing highways with buried electrical interconnects, and operating oversized vehicles on the highways. The final transportation routing plan will be provided to the Town of Cohocton and Steuben County, and will specify the local, county, and state roads to be used as haul routes (both within and outside of the Project Site) by construction/transportation vehicles.

As part of the final routing plan, a road improvement plan will be prepared that defines various upgrades that may be required to accommodate construction vehicles, including shoring up bridge abutments, adding steel plates or gravel to road surfaces, widening roadways, reconfiguring intersection geometry to accommodate the turning radius of large construction vehicles, and identifying the bridges, pipes, and culverts that will not accommodate the construction related traffic. These improvements will be made at the applicants' expense prior to the arrival of oversized/overweight vehicles.

The road improvement plan will also be designed to avoid/minimize safety issues associated with the use of the approved haul routes, which will confine the heavy truck travel to a few select roads. Delivery/haul routes may change during the design and construction preparation process; however, the municipalities will be notified of the changes throughout the continued development of the Project. Additionally, design plans will be completed for all public road improvements, and will be made available to the affected local towns (and jurisdiction having responsibility for the affected roads) for review prior to the initiation construction activities.

Prior to construction, the Applicant will video document the existing roadways to verify pre-construction roadway conditions. Upon completion of the construction activities, the Applicant will, at a minimum, return all roadways to their pre-construction conditions (and video document) at no cost to the affected jurisdiction.

The following mitigation techniques will be utilized to avoid or minimize transportation-related impacts and/or to provide long-term improvement to the local road system:

<u>Insufficient roadway width</u>

- Widening roadway to accommodate construction vehicles.
- Rerouting construction traffic to wider roadways.

<u>Insufficient cover over drainage structures</u>

- Adding cover over structures.
- Reinforcing structures with bracing.
- Using bridge jumpers to clear structures.
- Replacing structure prior to construction.
- Replacing structure during or after construction if damaged by construction activities.
- Rerouting construction traffic to avoid structures.

<u>Poor structure condition</u>

- Replacing structure prior to construction.
- Replacing structure during or after construction if damaged by construction activities.
- Using bridge jumpers to clear structures.
- Rerouting construction traffic to avoid structures.

<u>Inadequate bridge capacity</u>

- Using bridge jumpers to clear bridge.
- Replacing bridge components that provide insufficient capacity.
- Reinforcing bridge with additional longitudinal or lateral support beams.
- Rerouting construction traffic to avoid structures.

Insufficient Roadway Geometry

- Constructing appropriate turning radii at intersections where construction traffic is anticipated.
- Rerouting construction traffic to avoid insufficient roadway geometry.
- Profile adjustments to roadways with insufficient vertical geometry.

Use of public roads by heavy equipment or oversized vehicles during Project operation and maintenance will be coordinated with state, county, and local Highway Department officials. Any damage to the roads will be repaired at the Project operator's expense.

3.9 SOCIOECONOMICS

To understand the effects this Project will have on socioeconomic conditions within the Town of Cohocton and the surrounding communities, it is important to understand the current state of the economy in the area. Thus, this section presents specific information regarding the labor force, including population and housing; the economy, in particular employment rates and opportunities; and municipal budgets and taxes, including the local school budgets and taxes. The potential impacts of the Cohocton Wind Power Project on these existing socioeconomic conditions, during both construction and operation, are then evaluated.

3.9.1 Existing Conditions

Existing population and housing, employment and income, and municipal budgets and taxes in the Town of Cohocton are described below.

3.9.1.1 Population and Housing Characteristics

According to U.S. Census Bureau data from 1980-2000, the Town of Cohocton has experienced a modest 6% increase in population over the last 20 years (U.S. Census Bureau website). However, between 2000 and 2004, the estimated resident population decreased by approximately 1% (New York State Data Center website). This trend is similar to Steuben County as a whole, which has experienced a slight population decline over the last 20 years. However, this county-wide trend is expected to slightly improve over the next five years (U.S. Census Bureau website; Southern Tier Central Regional Planning and Development Board website).

In 2000, the number of total housing units in the Town of Cohocton was 1,144. Of those, approximately 85% (or 972) were occupied and 15% (or 172) were vacant (100 units were vacant due to seasonal, recreational or occasional use). Not only is housing available but home ownership in the Town is strong, as indicated by the percentage of owner-occupied housing units. Approximately 83.6% of the housing units were owner-occupied and 16.4% were renter-occupied (U.S. Census Bureau website).

Likewise, home ownership in Steuben County is strong, at approximately 73%. The percentage of ownership reflects the affordability of housing in the area. As the population has slightly declined it can be rationally concluded that the availability of housing remains strong.

Currently, housing values in the Town of Cohocton are moderate to low, when compared to average values in Steuben County and New York State. The median housing value in the town is $50,600, whereas in the county the median value is $66,200. This compares to a statewide median value of $147,630. However, housing values in the Town of Cohocton have steadily increased over the past five years, and this trend is expected to continue (Southern Tier Central Regional Planning and Development Board website).

3.9.1.2 Economy and Employment

According to the 2000 Census, the largest industry in Steuben County is manufacturing, with 23.4% of all workers employed in this sector. The second largest industry is health care, and the third is retail. Some of the major employers in Steuben County include Corning Incorporated, Dresser-Rand, and the Gunlocke Company. However, the average annual number of non-agricultural workers employed in Steuben County has been decreasing since 2001 (Southern Tier Central Regional Planning and Development Board website) and some of the major employers in the county have incurred layoffs. As an example, in 2005 Alstom Inc., a major employer in the Town of Hornell, laid off approximately 160 employees. In addition to a reduction in the number of existing jobs, only a few new employment opportunities have materialized in recent years (Southern Tier Central Regional Planning and Development Board website; New York State Department of Labor website). The 2004 unemployment rate for Steuben County was 5.3%.

With respect to the agricultural industry in the county, in 2003 there were a total of 1,490 farms (totaling 372,800 acres) and the agricultural industry represented approximately 3.5%

of total employment in the county. This represents a 55% decrease in number of farms since 1959, when the county had over 2,700 working farms, accounting for a significant percent of the total employment. The decline in number of farms continues. In 2004 there were 1,450 farms in the county. The Town of Cohocton had 284 parcels in agricultural use, with an approximate total assessed value of $29,108,613 (United States Department of Agriculture website, NYS Office of Real Property Services website).

3.9.1.3 Municipal Budgets and Taxes

Municipalities (towns, villages and counties) and school districts are responsible for providing specific services and facilities to those who live and work within their boundaries. Municipalities and school districts incur costs when providing these facilities and services, and to pay these costs, collect revenues by levying taxes. Tax revenues in the Project area accrue from both sales taxes and real property taxes. The taxing jurisdictions in the Project area include Steuben County, the Town of Cohocton, and three school districts (Avoca Central School District, Wayland-Cohocton Central School District, and Naples Central School District). Table 14 summarizes the total 2003 property tax levy for these jurisdictions.

Table 14. 2003 Real Property Tax Levy Per Taxing Jurisdiction.

Taxing Jurisdiction	2003 Real Property Tax Levy
Town of Cohocton	$512,000
Steuben County	$27,923,173
Naples Central School District	$6,840,908
Avoca Central School District	$1,853,997
Wayland-Cohocton CSD	$3,916,156

(Source: NYS Office of Real Property Service; NYS Office of the State Comptroller)

The property tax rates for the Town of Cohocton are based on $1,000 of assessed valuation. For the fiscal year 2003, real property taxes for the Town of Cohocton were $649,293. In the Town of Cohocton, the highest percentage of land use (55% of total parcels) is classified as residential. Agriculture and vacant land are both approximately 16-17% of total land use. The percentage of vacant land has steadily increased over the last few years and has surpassed agriculture as the second highest percentage of land use. This distribution of broad land use categories is similar to that seen throughout Steuben County (Source: 2004 Office of Real Property Services). Type of land use contributes to the assessed value of property, and thus influences the total real property tax levy for the town and county. The total assessed value of the land use classifications for the Town of Cohocton is summarized in Table 15, below.

Table 15. Assessed Value of Property in the Town of Cohocton by Land Use Classification, 2004

Type of Land Use	Town of Cohocton	
	Assessed Value	Percent of Total Parcels
Residential	$28,994,813	55.4%
Commercial	$3,162,800	4.4%
Industrial	$544,514	0.45%
Recreation and Entertainment	$179,000	0.17%
Community Service	$2,432,400	2.6%
Agricultural	$10,092,825	16.1%
Vacant Land	$1,664,631	17.2%
Public Serve Properties	$5,572,712	3.2%
Public Parks, Wild, Forested and Conservation Properties	$43,825	0.28%
Total	**$50,667,5720**	**100%**

(Source: 2004 Office of Real Property Services)

The current sales tax rate for the County is 8% (4% local tax plus 4% state tax), which represents a reduction from a rate of 8.25% in 2003 (NYS Department of Taxation and Finance website). In 2003, total sales tax revenue for the County was $21,760,663, and for the Town of Cohocton was $198,160 (NYS Office of the State Comptroller website).

Table 16 summarizes municipal budgets for 2003 at the town and county levels. Table 17 summaries the 2003 budgets for the Naples, Avoca, and Wayland-Cohocton Central School Districts.

Table 16. 2003 Town and County Budgets.

Taxing Jurisdiction	Total Revenue	Total Expenditures
Town of Cohocton	$1,419,670	$1,319,077
Steuben County	$133,718,610	$137,722,236

(Source: 2003 New York State Office of the State Comptroller)

Table 17. 2003 School District Budgets

District	Revenue (total)	Expenditure (total)	Indebtedness
Naples CSD	$12,149,642	$12,142,742	$5,439,138
Avoca CSD	$8,869,272	$9,900,569	$13,509,949
Wayland-Cohocton CSD	$24,713,469	$24,611,163	$22,160,000

(Source: 2003 New York State Office of the State Comptroller)

The town, county and school districts face the yearly challenge of meeting their service obligations, or expenditures, through the collection of sales and/or real property taxes. As with most taxing jurisdictions in upstate New York, loss of, or lack of, commercial and industrial tax base, in combination with rising labor and material costs, make it increasingly difficult to meet their budgets without significantly raising taxes.

3.9.2 Potential Impacts

The Project will have both direct and indirect positive economic effects on the town, county, and school districts, as well as the individual landowners participating in the Project. These effects will commence during construction and continue throughout the operating life of the Project. In the short term, benefits will include additional employment and expenditures associated with construction of the Project. In the long term, the operating Project will generate significant additional revenue through a Payment in lieu of Taxes (PILOT) agreement, purchases of goods and services, and lease payments to participating landowners. The Project will also provide full-time employment for a limited number of individuals and likely result in some increased visitation to the Project area by tourists interested in wind power. All of these results could have a beneficial effect on local businesses. The overall socioeconomic impact of Project construction and operation is discussed in greater detail below.

3.9.2.1 Construction

3.9.2.1.1 Population and Housing

As mentioned above, the Town of Cohocton experienced a modest, 6% population growth rate from 1980 to 2000 with a slight decline from 2000 to 2004. This population trend will likely continue regardless of whether the proposed Project is built. The Project will not generate construction employment at a level that would significantly increase population in either the Town or county. Even though employment during the construction period will be significant (on the order of 50-60 full-time jobs), this employment is relatively short term, and is not expected to result in workers permanently relocating to the area. For the duration of construction (approximately nine months) there could be a temporary increase in local population and demand for temporary housing by out-of-town workers. However, this demand will be relatively modest, and can easily be accommodated by the available housing in Cohocton and the surrounding communities. Beyond this relatively minor (and positive) short-term impact, Project construction will have no significant impact on population and housing.

3.9.2.1.2 Economy and Employment

It is anticipated that construction of the proposed Project will employ a total work force of approximately 50-60 employees. It is anticipated that the majority of this employment will be drawn from the Southern Tier and Finger Lakes labor markets, which, in light of the size of the labor force and the number of unemployed, can easily supply the required work force. Local employment will primarily benefit those in the construction trades, including equipment operators, truck drivers, laborers and electricians. Project construction will also require workers with specialized skills, such as crane operators, turbine assemblers, specialized excavators, and high voltage electrical workers. It is anticipated that the majority of these workers will be imported from outside the area and will remain only for the duration of construction.

In addition to the jobs created during construction and the wages paid to the work force, this Project is expected to have an indirect impact on the local economy through the purchase of goods and services (including $4-5 million in locally-sourced construction material), which will support local businesses and perhaps result in the creation of some additional new jobs.

3.9.2.1.3 Municipal Budgets and Taxes

During construction, the Project will not impact municipal budgets and taxes. Temporary construction workers will not create significant demand for municipal or school district services or facilities. These workers will also not generate significant revenue through payment of property taxes. The Project will result in impacts to the local road system (see discussion of transportation impacts in Section 3.8.2). This has the potential to affect local highway department expenditures/budgets. However, as will be discussed in the mitigation section, the cost of construction-related road repairs/improvements will be borne by the Project developer.

3.9.2.2 Operation

3.9.2.2.1 Population and Housing

Approximately six full-time jobs will be created once the Project is fully operational. These will include four wind technicians, a project manager and an administrative support person. These employees are expected to reside locally, which could translate into purchase of a few homes and addition of a few families to Cohocton and the surrounding communities. Although this represents a positive economic impact, long-term employment associated with the Project is not large enough to have a significant impact on local population or housing characteristics.

Local residents often express concern over the potential for local property values to depreciate as a result of a proposed wind power project. This issue has come up during the siting and review of other wind power projects in New York and throughout the United States. In order to address this concern, a quantitative study was conducted by the Renewable Energy Policy Project (REPP) in 2003. REPP assembled a database of real estate transactions adjacent to every wind power project in the United States (10 MW or greater) that became operational between 1998 and 2001 (a total of 10 projects, including the Madison and Fenner projects in Madison County, New York). For this study, data was gathered within 5 miles of the wind projects, as this was determined to be the potential area of visual impact (viewshed). For each of the 10 projects, similar data was also gathered for a comparable community that was located outside of the project viewshed (comparable communities were based on interviews with local assessors as well as analysis of U.S. Census Bureau demographic data). The goal of the data collection was to obtain real estate transaction records for a time period covering roughly six years (three years pre-construction and three years post-construction). The data was then analyzed in three different ways: Case 1 examined the price changes in the viewshed and the comparable community for the entire period of the study; Case 2 examined how property values changed in the viewshed before and after the project became operational; and Case 3 examined how property values changed in the viewshed and the comparable community after the project became operational.

The results of these analyses showed no negative affect on property value from existing wind farms. Of the 10 projects examined in the Case 1 analysis, property value actually increased faster within the wind power project viewshed in eight of the 10 projects. The Case 2 analysis revealed that the property values also increased faster after the wind farms became operational in nine of the 10 projects examined. In the Case 3 analysis, property values increased faster in the wind power project viewshed than in the comparable community in nine of the 10 projects. More specifically (and perhaps most relevant to the proposed Cohocton Wind Power Project) is the fact that these positive results apply to the Madison Wind Power Project and the Fenner Wind Power Project in New York State. The results from the Madison and Fenner analysis revealed a generally positive affect on property value. In five of the six case studies (Case 1, 2, and 3 analyses for both projects), the monthly average sales price grew faster or declined slower in the viewshed communities than in the comparable communities outside the project viewshed. The REPP study therefore concluded that there is no evidence that the presence of the Madison and Fenner wind farms had a significant negative effect on residential property values in Madison County, New York (REPP, 2003).

Given the results of the REPP study and the similarity of the Madison County sites to Cohocton, it is reasonable to conclude that the proposed Project will not have an adverse impact on local property value.

3.9.2.2.2 Economy and Employment

Total wages for these Project's six full-time employees are estimated to be approximately $360,000 per year. It is anticipated that these jobs will have a spin-off effect on the local economy, through local expenditures on goods and services associated with Project operation and maintenance. Additionally, expected lease payments in the range of $410,000 per year, will be provided to local landowners participating in the Project. These lease payments are a direct financial benefit to all participating landowners and will enhance the ability of those in the agricultural industry to continue farming. Russell Cary, Supervisor of the Town of Fenner, New York believes that lease payments from the wind power project in his town are preserving a rural life style and protecting family farms from being taken over by large-scale commercial farming operations (Cary, Pers. Commun.). Local lease payments will also enhance the ability of participating landowners to purchase additional goods and services. To the extent that these purchases are made locally, they will have a broader positive effect on the local economy.

With respect to tourism in the region, it is worth noting that other wind power projects in New York have resulted in a significant increase in visitation from tourists interested in the projects. This has certainly resulted in increased local expenditures for goods and services, but these have not been quantified, and are probably fairly modest. It should also be acknowledged that this effect is likely to diminish as wind power projects become more common in the state and their novelty decreases.

Despite concerns expressed by some area residents, there is no evidence to indicate that the presence of wind turbines will have a negative impact on tourism. A 2002 study conducted in the Argyll Region of Scotland, involving interviews with over 300 tourists, found that 91% said the presence of wind farms in the area would not influence their decision about whether to return to the area (MORI Scotland, 2002). Almost half (48%) of the tourists interviewed were visiting the area because of the 'beautiful scenery and views'. Of those who had actually seen wind farms, 55% indicated that their effect was "generally or completely positive", 32% were ambivalent, and 8% felt that the wind farms had a negative effect. Similar positive effects have been reported from various wind farm locations in Australia. According to the Australian Wind Energy Association (AusWEA), initial concerns that wind turbines would negatively impact tourism in that country, have proven unfounded (AusWEA, 2003). Similarly, a recent survey of visitors, to Vermont's Northeast Kingdom found that 95% would not be deterred from further visits by the existence of a proposed wind farm (Institute for Integrated Rural Tourism, 2003). This is also evident in the resort community of Palm Springs, California, where there are over 3,500 wind turbines. Tours of this wind farm regularly draw 10,000 to 12,000 curious tourists every year (AWEA, 2005).

3.9.2.2.3 Municipal Budgets and Taxes

As a new land use, the Project will positively impact the municipal budgets of all of the involved jurisdictions. Studies of the impact of wind power projects on property values have indicated that these projects typically do not have an adverse effect on assessed property value (REPP, 2003). Therefore, the Project should not negatively affect the total amount of real property taxes levied by the local taxing jurisdictions or the budgets of these jurisdictions. According Town of Fenner (NY) Supervisor Russell Cary, the wind farm in his town has required the town to purchase additional road maintenance equipment to service roads that have been improved or are more heavily traveled as a result of the project (Cary, pers. comm.). However, the improved roads are a benefit to the community, and represent the only significant municipal service required by the project. The Cohocton Wind Power Project will place similar, limited demand on municipal (and school district) services.

The Project will more than off-set any impact on municipal budgets and taxes through additional revenue provided in the form of a PILOT agreement. The details of the PILOT agreement are described in Section 3.9.3.2.3 below.

3.9.3 Mitigation

3.9.3.1 <u>Construction</u>

As described in the Impacts discussion, construction of the proposed Project will not have a significant impact on local population and housing, and will have a short-term beneficial impact on the local economy and employment. Consequently, no mitigation is necessary to address these impacts. The only potential adverse impact to municipal budgets and taxes is the impact of Project construction on local roads, and the need to repair or upgrade these roads to accommodate construction vehicles/activity. To mitigate this impact, construction-related damage or improvements to state, county, or Town roads will be the responsibility of the Project developer, and will be undertaken at no expense to the town or county (see additional detail in the discussion of transportation mitigation in Section 3.8.2.1).

3.9.3.2 <u>Operation</u>

3.9.3.2.1 Population and Housing

As discussed in Section 3.9.2.1, the operating Project is not anticipated to adversely affect population or housing availability in the Town of Cohocton or the surrounding area. Nor is it expected to have a depressing effect on local property values. Consequently, mitigation measures to address population and housing impacts are not necessary.

Property owners within the viewshed of proposed wind power projects are often concerned about the possibility that these projects could at some point be abandoned, and that the derelict facilities will have a depressing effect on local property values. To address this concern, the Project developer will establish a decommissioning fund. This fund will assure that the proposed wind power facility will be dismantled and removed in the event that it is not completed, proves economically unviable, or reaches the end of its operational life span. Prior to the start of construction the Project developer will submit evidence of the mechanisms that are in place to ensure the removal of each wind turbine in the event it is not in active service for one year or more.

3.9.3.2.2 Economy and Employment

As described previously, the operating Project's potential impact on the local economy and employment will be positive, in that additional jobs will be created and additional local expenditures made (lease payments to participating landowners, as well as local purchase of goods and services). However, the number of permanent jobs created is not large enough to create a financial burden on the town, county or school districts by requiring provision of additional services and/or facilities. Thus, mitigation measures to address either loss of jobs or increased demand for municipal services are not necessary.

3.9.3.2.3 Municipal Budgets and Taxes

Because operation of the proposed Project will not create a significant demand for municipal or school district services and facilities, it will have no adverse impact on municipal or school budgets. CPP plans to enter into a PILOT agreement with the Steuben County Industrial Development Agency. CPP proposes that the PILOT agreement have a term of 20 years. Although the specific terms of the PILOT agreement have not been negotiated, CPP anticipates, based upon annual PILOT payments for other wind energy projects in New York, that the annual PILOT payment will be approximately $5300 per MW of installed generation capacity. At that rate, and assuming that 82 MW of generation is installed, the PILOT payments would average approximately $434,600 per year. Further, over an assumed 20-year duration of the PILOT agreement, the local jurisdictions would receive total payments of nearly $8.7 million. CPP anticipates that the annual PILOT payments would be distributed between the Town of Cohocton, the County of Steuben, and the local school districts. The percentage sharing of the payments has not yet , however, been negotiated. After the PILOT expires, the facility will be taxed at its assessed value.

The PILOT payments will increase the revenues of the local taxing jurisdictions, and will represent a significant portion of their total tax levy. Further, the PILOT payments will more than off-set any minor increases in community service costs that may be associated with long-term operation and maintenance of the Project (e.g., small number of additional school children, slightly increased road maintenance costs).

Because the wind farm facility will generate a predictable source of additional revenue for all of the affected municipalities and school districts over the next 20+ years, the Project will positively impact municipal and school district revenues. This will enhance the type and level of services these jurisdictions provide to local residents for the duration of the Project's operational life.

3.10 PUBLIC SAFETY

This section addresses the potential impacts of the Project on public safety. Background information on public health and safety issues associated with wind energy projects is presented first, followed by a discussion of potential impacts associated with the Project, and proposed mitigation measures.

3.10.1 Background Information

Public safety concerns associated with the construction of a wind power project are fairly standard construction-related concerns. These include the potential for injuries to workers and the general public from 1) the movement of construction vehicles, equipment and materials, 2) falling overhead objects, 3) falls into open excavations, and 4) electrocution. These types of incidents are well understood, and do not require extensive background information.

Public safety concerns associated with the operation of a wind power project are somewhat more unique, and are the focus of this section.

In many ways, wind energy facilities are safer than other forms of energy production since a combustible fuel source and fuel storage are not required. In addition, use and/or generation of toxic or hazardous materials are minor when compared to other types of generating facilities. However, wind turbines are generally more accessible to the public, and risks to public health and safety can be associated with these facilities. Examples of such safety concerns include ice shedding, tower collapse, blade throw, stray voltage, fire in the nacelle, and lighting strikes. Each of these concerns is discussed individually below.

3.10.1.1 Ice Shedding

Ice shedding and ice throw refer to the phenomena that can occur when ice accumulates on rotor blades and subsequently breaks free and falls to the ground. Although a potential safety concern, there has been no reported injury caused by ice being "thrown" from an operating wind turbine (NYSERDA Power Naturally NY Website). However, ice shedding does occur, and could represent a potential safety concern.

Icing in the Cohocton area would generally result from freezing rain events forming a “glaze” ice (as opposed to “rime” icing that occurs at high elevations). Under such conditions, either the anemometer on the top of the nacelle would freeze, which would in turn signal for the wind turbine to shut down, or the ice buildup would register as an imbalance in the weights of the blades and the turbine would shut down.

Field observations and studies of ice shedding indicate that most ice shedding occurs as air temperatures rise and the ice on the rotor blades begins to thaw. Therefore the tendency is for ice fragments to drop off the rotors and land near the base of the turbine (Morgan, 1998).

Ice can potentially be "thrown" when ice begins to melt and stationary turbine blades begin to rotate again (although usually turbines do not restart until the ice has largely melted and fallen straight down near the base). Several observational studies and mathematical models examining this phenomenon have calculated how far ice can potentially be thrown from a moving rotor blade before hitting the ground (Morgan and Bossanyi, 1996). The distance traveled by a piece of ice depends on a number of factors, including the position of the blade when the ice breaks off, the location of the ice on the blade when it breaks off, the rotational speed of the blade, the shape of the ice that is shed (e.g., spherical, flat, smooth), and the prevailing wind speed. Data gathered at existing wind farms have documented ice fragments on the ground from 50 to 328 feet from the base of the tower (<33 to 197 feet blade diameter). These fragments were in the range of 0.2 to 2.2 pounds in mass (Morgan, 1998). The risk of ice landing at a specific location is found to drop dramatically as the distance from the turbine increases. European studies have identified a safety threshold of 200-250 meters (660-820 feet) from any turbine, beyond which there is no significant risk from falling ice fragments (Morgan and Bossanyi, 1996).

3.10.1.2 <u>Tower Collapse/Blade Throw</u>

Another potential public safety concern is the possibility of a wind turbine tower collapsing or a rotor blade dropping or being thrown from the nacelle. These are extremely rare occurrences, but such incidents do occur (a tower collapse at the Weatherford Wind Power Project in Oklahoma occurred in May, 2005), and are potentially dangerous for project personnel, as well as the general public. The reasons for a turbine collapse or blade throw vary depending on conditions and tower type. Past occurrences of these incidents have generally been the result of design defects during manufacturing, poor maintenance, wind gusts that exceed the maximum design load of the turbine structure, or lightning strikes (AWEA, 2006). Most instances of blade throw and turbine collapse were reported during the early years of the wind industry. Technological improvements and mandatory safety standards during turbine design, manufacturing and installation have largely eliminated such occurrences.

3.10.1.3 <u>Stray Voltage</u>

Stray voltage is a phenomenon that has been studied and debated since at least the 1960's. It is an effect that is primarily a concern of farmers whose livestock can receive electrical shocks. Stray voltage can be defined as a "low level of neutral-to-earth electrical current that occurs between two points on a grounded electrical system" (Wisconsin Rural Energy

Management Council, 2000). In a farm setting, stray voltage typically originates from low levels of Alternating Current (AC) voltage on the grounded conductors of a farm wiring system. These voltages are termed “stray voltage” when they are large enough to form a circuit when a person or an animal simultaneously touches two objects which are part of an electrical system.

The occurrence of stray voltage may result from a damaged or poorly connected wiring system, corrosion on either end of the wires, or weak/damaged insulation materials on the “hot” wire. Livestock may encounter stray voltage in their everyday activities when they contact two surfaces with voltage differences, resulting in a small electrical current flowing through the animal and creating a shock. In a barn, stray voltage may occur at watering systems, dairy stanchions, animal pens, or even the metal siding on the building. Dairy barns are particularly prone to the occurrences of stray voltage since they contain all the necessary components, including: concrete or dirt floors that are likely to be wet, metal confinement structures and water systems, metal rebar in the concrete floor, and metal walls with moisture condensed on the surfaces.

Wind power projects and other electrical facilities can create stray voltage to varying degrees, based on factors such as operating voltage, geometry, shielding, rock/soil electrical resistively, and proximity (D. Carr, Pers. Commun.). Stray voltage from such facilities usually only occurs if the system is poorly grounded and located in proximity ungrounded or poorly grounded metal objects (fences, buildings, etc.).

3.10.1.4 Fire

Wind turbines, due to their height, physical dimensions, and complexity, have the potential to present response difficulties to local emergency service providers and fire departments. Although the turbines contain relatively few flammable components, the presence of electrical generating equipment and electrical cables, along with various oils (lubricating, cooling and hydraulic) does create the potential for fire or a medical emergency within the tower or the nacelle. This, in combination with the elevated location of the nacelle and the enclosed space of the tower interior makes response to a fire or other emergency difficult, and beyond the capabilities of most local fire departments and emergency service providers.

Other Project components create the potential for a fire or medical emergency due to the storage and use of diesel fuels, lubricating oils and hydraulic fluids. Storage and use of these substances may occur at the substation, in electrical transmission structures, staging area(s), and the O&M building/facility. Due to the accessibility of these areas, response to an emergency should not pose difficulty to local fire and emergency personnel. However, the presence of potentially hazardous materials as well as high voltage electrical equipment at the substation could present potential safety risks to local responders.

3.10.1.5 Lightning Strikes

Due to their height and metal/carbon components, wind turbines are susceptible to lightning strikes. Statistics on lightning strikes to wind turbines are not readily available, but it is reported that lightning causes four to eight faults per 100 turbine-years in northern Europe, and up to 14 faults in southern Germany (Korsgaard and Mortensen, 2006). Most lightning strikes hit the rotor, and their effect is highly variable, ranging from minor surface damage to complete blade failure. All modern wind turbines include lighting protection systems which generally prevent catastrophic blade failure.

3.10.1.6 Electro-magnetic Fields

Electric power transmission lines create EMF because they carry electric currents at high voltages. Electric charges push and pull on other charges and, therefore, each electric charge generates an *electric field* that exerts a force on nearby charges. The movement of electric charges is called electric current and is measured in *amperes* (amps). Current measures the "flow" of electricity, which is analogous to the flow of water in a plumbing system. The moving charges in an electric current produce a *magnetic field* which exerts force on the other moving charges. Magnetic fields are measured in *gauss* (G) or *tesla* (T) (1 T = 10,000 G). Smaller fields are measured in *milligauss* (1 mG = 0.001 G) or *microtesla* (1µT = one-millionth of a tesla). Milligauss is the unit most often used to measure the strength of magnetic fields in electric transmission lines.

EMF decrease in size as the distance form the source (the electric charges or currents) increases. For an electric transmission line, EMF levels are highest next to the transmission lines (typically near the center of the right-of-way) and decrease as the distance from the transmission corridor increases. Electric fields are attenuated by objects such as trees and walls of structures, and are completely shielded by materials such as metal, the earth, or the surface of the body. Thus, underground electric transmission lines do not produce electric fields at the ground surface. Magnetic fields, on the other hand, penetrate most materials.

Humans are exposed to a wide variety of natural and man-made EMF both in the outdoor environment and in homes, schools, and businesses. The EMF produced by electric transmission lines are well within the range of EMF exposures from such other sources. Numerous public health review groups, including the National Institute of Environmental Health Sciences, the National Institutes of Health, and the U.S. Department of Energy, have examined the public's exposure to EMFs produced by power lines. The consistent overall conclusion of these groups is that available data do not support a cause and effect relationship between exposure to environmental levels of EMF and elevated risk of disease.

3.10.2 Potential Impacts

3.10.2.1 Construction

As mentioned in the background information section, public safety concerns associated with Project construction include 1) the movement of large construction vehicles, equipment and materials, 2) falling overhead objects, 3) falls into open excavations, and 4) electrocution. These issues are most relevant to construction personnel who will be working in close proximity to construction equipment and materials, and will be exposed to construction related hazards on a daily basis. The risk of construction-related injury for such personnel will be minimized through regular safety training and use of appropriate safety equipment.

The general public could also be exposed to construction-related hazards due to the passage of large construction equipment on area roads and unauthorized access to the work site (on foot, by motor vehicle, ATV, or snowmobile). The latter could result in collision with stockpiled materials (soil, rebar, turbine/tower components), as well as falls into open excavations. Because construction activities will occur primarily on private land, and be well removed from adjacent roads and residences, exposure of the general public to construction-related risks/hazard is expected to be very limited.

3.10.2.2 Operation

3.10.2.2.1 Ice Shedding

As stated previously, while turbine icing may occur at times, ice accumulation on the rotor blades will either cause an imbalance, or freeze-up of the control anemometer, both of which would result in turbine shut-down. As the ice begins to thaw, it will typically drop straight to the ground. Any ice that remains attached to the blades as they begin to rotate could be thrown some distance from the tower. However, such a throw will usually result in the ice breaking into small pieces, and falling within 300 feet of the tower base. European studies have identified a safety threshold of 200-250 meters (660-820 feet), beyond which there is no significant risk from falling ice fragments (i.e., the risk is equivalent to being hit by lighting) (Morgan and Bossayani, 1996). The minimum setback distance of 500 feet from roads and property lines included in the Town of Cohocton ordinance, and a minimum distance of 1,500 feet between the proposed turbines and adjacent residences, should adequately protect nearby residents and motorists from falling ice of any significant size. In addition, unauthorized public access to the site will be limited by installing gates at the entrance of access roads, and/or posting signs to alert the public and maintenance workers of potential ice shedding risks. No snowmobile trails traverse the Project Site, but snowmobiles do use area fields and seasonal roads during the winter. CPP will contact local landowners and snowmobile clubs, and inform them of the potential risks posed by falling ice in the vicinity of the wind turbines. Based upon the results of studies/field observations at other wind power projects, the Cohocton Project's siting criteria, and the proposed control of public access to the turbine sites, it is not anticipated that the Project will result in any measurable risks to the health or safety of the general public due to ice shedding.

3.10.2.2.2 Tower Collapse/Blade Throw

Modern utility-scale turbines are certified according to international engineering standards. These include ratings for withstanding different levels of hurricane-strength winds and other criteria (AWEA, 2006). The engineering standards of the wind turbines proposed for this Project are of the highest level and meet all federal, state, and local codes. In the design phase, state and local laws require that licensed professional engineers review and approve the structural elements of the turbines. Design and construction of the Project will comply with construction standards established by various industry practice groups. State of the art braking systems, pitch controls, sensors, and speed controls on wind turbines have greatly reduced the risk of tower collapse and blade throw. As mentioned in Section 2.6, the wind turbines proposed for the Cohocton Project will be equipped with two fully independent braking systems that allow the rotor to be brought to a halt under all foreseeable conditions. In addition, the turbines will automatically shut down at wind speeds over 55 mph. They will also cease operation if significant vibrations or rotor blade stress is sensed by the turbines' blade monitoring system. For all of these reasons, the risk of catastrophic tower collapse or blade failure is minimal.

3.10.2.2.3 Stray Voltage

Stray voltage is largely preventable with proper electrical installation and grounding practices. The Project's electrical collection cable will be covered with a grounding sheath, and physically and electrically isolated from all of the buildings in and adjacent to the Project Site. Additionally, the wind farm's electrical collection lines will be located 36 to 48 inches below ground, which will prevent incidental contact and protect the system's insulation materials from sustaining any damage. The only potential for stray voltage would be if metal objects (underground pipelines, metal fences, etc.) run continuously for long distances in close proximity and parallel to the power lines. Proper siting, grounding, installation, and maintenance practices will assure that the Cohocton Wind Power Project does not cause or contribute to stray voltage in the area.

3.10.2.2.4 Fire

All turbines and electrical equipment will be inspected by the utilities (for grid and system safety) prior to being brought on line. This, along with implementation of built-in safety systems, minimize the chance of fire occurring in the turbines or electrical stations. However, fire at these facilities could result from a lighting strike, short circuit or mechanical failure/malfunction. Any of these occurrences at a turbine would be sensed by the System Control and Data Acquisition (SCADA) system and reported to the Project control center. Under these conditions, the turbines would automatically shut down and/or Project maintenance personnel would respond as appropriate.

In the event that a wind turbine catches fire, typically, it is allowed to burn itself out while maintenance and fire personnel maintain a safety area around the turbine and protect against the potential for spot ground fires that might start due to sparks or falling material. Power to the section of the Project with the turbine fire is also disconnected. An effective method for extinguishing a turbine fire from the ground does not exist, and the events generally do not last long enough to warrant attempts to extinguish the fire from the air (NYSERDA Power Naturally NY Website). However, since the public typically does not have access to the private land on which the turbines are located, risk to public safety during a fire event would be minimal.

Transformers at the substation will be located at least 50 feet from the control building. In addition the secondary oil containment system beneath the transformers will be filled with stone, so that if there was an oil spill, the fluid level in the containment basin would not be above the rock surface, preventing an oil pool fire. In addition, the circuit breakers would trip in the event of a transformer failure, thus isolating the substation from the transmission system, and allowing the local fire department to extinguish any fire.

Generally, any emergency/fire situations at a wind turbine site or substation that are beyond the capabilities of the local service providers will be the responsibility of the Project owner/operator. Construction and maintenance personnel will be trained and have the equipment to deal with emergency situations that may occur at a wind turbine site (e.g., tower rescue, confined spaces, high voltage, etc.). Consequently, such an incident would generally not expose local emergency service providers or the general public to any public health or safety risk.

3.10.2.2.5 Lightning Strikes

Lightning protection systems were first added to rotor blades in the mid 1990s, and are now a standard component of modern turbines (Korsgaard and Mortensen, 2006). These systems rely on lightning receptors and diverter strips in the blades that provide a path for the lightning strike to follow to the grounded tower. The turbines' blade monitoring system provides documentation of all critical lightning events. If a problem is detected, the turbine will shut down automatically, or at a minimum, be inspected to assure that damage has not occurred.

3.10.2.2.6 Electro-magnetic Fields

EMFs will be generated by the operation of various Project components, including the turbine generator, electrical collection lines, transformers, and the overhead transmission line. However, the strength of EMF's produced by all of these components will not be significant at any receptor location. The height of the turbine generator (over 250 feet) above the ground; the location of electrical collection cables 3-4 feet underground; the 70-foot width of the transmission line ROW; and the location of substation transformers and other electrical equipment inside a fenced yard, should adequately separate these components from any human receptors.

3.10.3 Proposed Mitigation

3.10.3.1 <u>Construction</u>

Contractors will comply with Occupational Safety and Health Administration (OSHA) regulations, in addition to state worker safety regulations, regarding electricity, structural climbing, and other hazards, during construction of the wind farm. To minimize safety risks to construction personnel, workers will be required to adhere to a safety compliance program protocol, which will be prepared by CPP (or their representative) prior to construction. The safety compliance program will address appropriate health and safety related issues including:

- personal protective equipment such as hardhats, safety glasses, orange vest, and steel-toed boots)
- job safety meetings and attendance requirements
- fall prevention
- construction equipment operation
- maintenance and protection of traffic
- hand and power tool use
- open hole and excavation area safety
- parking
- general first aid
- petroleum and hazardous material storage, use, containment and spill prevention
- posting of health and safety requirements
- visitors to the job site
- local emergency resources and contact information
- incident reporting requirements

As mentioned in Section 3.8, a construction routing plan will be developed to assure that construction vehicles avoid areas where public safety could be a concern (schools, clusters of homes, etc.). To minimize safety risks to the general public, over-sized vehicles will be accompanied by an escort vehicle and/or flagman to assure safe passage of vehicles on public roads. Because construction activity will occur on private land, the general public should not be on the construction site. After hours, vehicular access to such sites may be blocked by parked equipment, and temporary construction fencing or other visible barrier will be placed around excavations that remain open during off hours. In addition, material safety data sheets (MSDS) for potentially hazardous construction materials will be provided to local fire and emergency service personnel. The contractor will also coordinate with these entities to assure that they are aware of where various construction activities are occurring, and avoid potential conflicts between construction activity and the provision of emergency services (e.g., road blockages, etc.).

3.10.3.2 Operation

3.10.3.2.1 Ice Shedding

As stated previously, compliance with required set-backs and measures to control public access (gates, warning signs, etc.) should minimize any public safety risk associated with ice shredding. CPP will also meet with local landowners and snowmobile clubs to explain the risks of ice shredding and proper safety precautions. Relocation of any designated snowmobile trails that occur within 200 feet of a proposed turbine will be undertaken by CPP in coordination with the local snowmobile clubs and affected landowners. Additionally, icing of the sensors on the wind turbines will result in automatic turbine shut-down.

3.10.3.2.2 Tower Collapse/Blade Throw

In regard to tower or blade failure, a fall zone set-back from roads and property lines equivalent to the maximum turbine height (i.e., base of tower to tip blade), plus a safety factor is generally considered adequate for public safety purposes. In those rare instances where towers or blades have failed, the failure typically results in components crumpling or falling straight down to the ground. It would be very unusual for the tower to break off at the base and fall over. However, that is what the fall zone set-backs from roads, utility lines, and property lines allow for. The minimum 500 foot setbacks included in the Town of Cohocton's ordinance, should assure that even a "worst case" tower failure would not endanger adjacent properties, roadways or utilities. Members of the public do not typically have access to the private lands on which the turbines are located, and as stated above, gates, signage, and public education/outreach efforts will be used to discourage unauthorized access. These actions should further reduce any risk due to a turbine collapse or blade throw.

3.10.3.2.3 Stray Voltage

Stray voltage will be prevented through proper design and grounding of the Project's electrical system. Any reported stray voltage problems will be addressed through the Project's Complaint Resolution Procedure.

3.10.3.2.4 Fire

An employee safety manual will be incorporated into the overall operating and maintenance policies and procedures for the Project. Included in that manual will be specific requirements for a fire prevention program. In addition, a Fire Protection and Emergency Response Plan will be developed in consultation with the fire department(s) that have jurisdiction over the proposed wind power Project Site. This plan will include the following components:

- Training of all operating personnel and procedures review in conjunction with local fire and safety officials.
- Regular inspection of transformer oil condition at each wind turbine step-up transformer.
- Regular inspection of all substation components.
- Regular inspection of fire extinguishers at all facility locations where they are installed.
- All Project vehicles will be equipped with fire fighting equipment (fire extinguishers and shovels) as well as communications equipment for contacting the appropriate emergency response teams.
- The MSDS for all hazardous materials on the Project site will be on file in the construction trailers (during construction) and the O&M building (during operation), and provided to local fire departments and emergency service providers.
- The facility Safety Coordinator shall notify the local fire department of any situation or incident where there is any question about fire safety, and will invite an officer of the fire department to visit the workplace and answer any questions to help implement a safe operating plan.

Development and implementation of this plan will assure that Project construction and operation will not have a significant adverse impact on public safety, or the personnel and equipment of local emergency service providers.

3.10.3.2.5 Lightning Strikes

Beyond the turbines' lightning protection system, and the fire/emergency response plan described previously, no additional measures to mitigate the effects of lightning strikes are proposed.

3.10.3.2.6 Electro-magnetic Fields

Because no significant impacts from EMF are expected, no mitigation is required. However, to mitigate the potential effects of EMF from the Project to the maximum extent practicable, CPP will voluntarily adhere to the electric field strength interim standards established in the PSC's Opinion No. 78-13, and the magnetic field strength interim standards established in the PSC's Interim Policy Statement on Magnetic Fields, issued September 11, 1990. Opinion No. 78-13 established an electric field strength interim standard of 1.6 kV/m for Article VII electric transmission lines, at the edge of the right-of-way, one meter above ground level, with the line at the rated voltage. The Interim Policy establishes a magnetic field strength interim standard of 200 mG, measured at one meter above grade, at the edge of the right-of-way, at the point of lowest conductor sag. The measurement is based on the expected circuit phase currents being equal to the winter-normal conductor rating.

3.11 COMMUNITY FACILITIES AND SERVICES

Community facilities and services provided to the Project area include public utilities, police and fire protection services, emergency medical services (EMS), health care facilities, education facilities, waste disposal, and recreational facilities. The level of services provided to the Project area was determined through telephone communications with State, County, Town, and School District personnel, including the State Police Department, County Sheriff's Department, County Emergency Services Coordinator, local volunteer fire department, and administrative personnel at the Avoca, Naples, and Wayland-Cohocton Central School Districts.

3.11.1 Existing Conditions

Public Utilities and Infrastructure

Public utilities and infrastructure in the Project area include various overhead and underground facilities. Above-ground components include electric distribution and telephone lines along most of the public roads within the Project Site. Cable television lines and communications towers, including radio broadcast antennas and cellular phone communications towers, also occur in and around the Project Site. Underground utilities include telephone and cable television lines, and natural gas transmission lines.

Police Protection

The New York State Police, Steuben County Sheriff's Department and Town of Cohocton Police Department have jurisdiction within and around the Project Site. The Town of Cohocton is the primary provider of police services, while the Steuben County Sheriff's Department and New York State Police provide secondary police service to the area. The Town of Cohocton Police Department, located in the Town Hall on South Main Street in the Village of Cohocton, has two police officers and one patrol car. Each officer works part-time approximately twenty (20) hours per week, for a total of 40 hours of police service. The hours of service provided vary from week to week. The Steuben County 911 Emergency Center dispatches all police and fire calls. If neither of the Town police officers are on duty when a call is received, then either the County Sheriff's office or the State Police are dispatched (Adams, pers. comm.).

The Steuben County Sheriff's Department is located on Rumsey Street Extension in Bath, New York. The department provides 24-hour coverage seven days per week with approximately 19 road patrol deputies. The number of patrol cars deployed per shift varies between two to seven for the entire county (Tweddell, pers. comm.; www.steubencony.org/roadpatrol).

New York State Police, Troop E, serves the Project area and operates out of the main station located in Bath, New York as well as their satellite station located in Wayland, New York. The Bath station has 18 troopers, five investigators, two sergeants, and approximately eight patrol cars. There are 14 troopers, two investigators, and two sergeants assigned to the Wayland station, with five patrol cars. The State Police provide police services 24 hours per day, seven days per week. Typically, the State Police provide one patrol car with one officer during the day, and two officers during the night shift (from 12:00 a.m. to 5:00 a.m.) (Cleveland, pers. comm.).

Fire Protection and Emergency Response

The Cohocton Volunteer Fire Department provides fire protection and emergency response service to the Project area. The Cohocton Volunteer Fire Department has a firehouse on Maple Avenue in the Village of Cohocton. It provides fire and emergency services to the village and all of the Town of Cohocton, except for the north central portion. Its 30 active volunteers (including six EMTs) respond to approximately 86 calls annually. The Fire

Department's equipment includes one pumper with pumping capacity of 1,250 gallons per minute and a 1,000 gallon water tank, one pumper with pumping capacity of 1,000 gallons per minute and a 1,000 gallon water tank, one tanker with a 1,800 gallon water tank, one rescue truck, and an ambulance equipped to provide basic life support emergency services (Gilman, pers. comm.).

The North Cohocton Volunteer Fire Department is a neighboring department that services the north central portion of the Town of Cohocton. These two fire departments provide mutual aide when dispatched from the Steuben County 911 Emergency Center.

Health Care Facilities

There are three hospitals in Steuben County and one hospital in Livingston County that provide health care services to residents of Steuben County. Guthrie Corning Hospital on Denison Parkway East in Corning is located approximately 30 miles from the Project Site. The hospital is an affiliate of the Guthrie Health Care System, which is a regional system of hospitals, nursing homes, and home-care-service providers, serving the Southern Tier of New York and northern Pennsylvania. Guthrie Corning provides primary care, general acute care, and specialty services in the Corning-Elmira metropolitan area. There are approximately 123 physicians on staff who provide a full complement of medical and surgical services. The hospital provides 99 beds for the following patient needs; intensive care (8 beds), maternity (8 beds), medical-surgical (78 beds), and pediatric patients (5 beds) (www.hospitals.nyhealth.gov; www.corninghospital.com).

The Ira Davenport Memorial Hospital is a 66-bed acute care hospital located on New York State Route 54 in Bath, approximately 10.8 miles from the Project Site. There are approximately 69 physicians on staff who provide medical services including surgical care, cardiac rehabilitation, physical therapy, primary care, respiratory therapy, and pediatric care in addition to other medical services. Additional urgent, primary and dental health care services are provided by the Davenport and Taylor Health Center located on West Morris Street in downtown Bath (www.davenportandtaylor.org; www.hospitals.nyhealth.gov).

Saint James Mercy Hospital is located on Canisteo Street in Hornell and is approximately 10.5 miles from the Project Site. This hospital is an affiliate of the Catholic Health East health care system. St. James Mercy Hospital provides primary care, general acute care, and specialty services to residents in the northwestern portion of the county. There are approximately 48 physicians on staff, and 157 beds for coronary care (7 beds), intensive care (7 beds), maternity (10 beds), medical-surgical (85 beds), pediatric (10 beds) and psychiatric/mental patients (38 beds) (www.hospitals.nyhealth.gov; www. Stjamesmercy.org).

Nicholas H. Hoynes Memorial Hospital is a comprehensive acute medical care facility located on Clara Barton Street in Dansville, Livingston County, approximately 13 miles from the Project Site. The hospital is a 72-bed facility with approximately 38 physicians on the active medical staff. Nicholas H. Hoynes Memorial Hospital provides comprehensive acute medical care, offering a full compliment of surgical services, a birthing center, inpatient medical care, telemetry monitoring, intensive care, emergency services, laboratory services, diagnostic imaging, and physical and occupational therapy (http://noyes-health.org/; www.hospitals.nyhealth.gov).

Educational Facilities

There are three public school districts that provide educational services to residents within and adjacent to the Project Site. However, no public schools or school district facilities are located within the Project Site. The Wayland-Cohocton Central School District includes two schools. The Cohocton Central School, which houses students in pre-kindergarten through twelfth grade (1,642 student population), is located on New York State Route 63 in Wayland, which is approximately 7.3 miles from the Project Site. The other school, Cohocton Elementary School (225 student population), is located on Park Avenue in the Village of Cohocton, which is approximately 1.0 mile from the Project Site.

The Avoca Central School District has one school building for the entire student population from grades pre-kindergarten through twelfth grade (612 student population). The school is located on Oliver Street in Avoca, approximately 4.4 miles from the Project Site.

The Naples Central School District has two schools. Naples High School (480 student population) is located on North Main Street in the Village of Naples and is approximately 3.1 miles from the Project Site. The Naples Elementary School (517 student population) is located on Academy Street in the Village of Naples, approximately 3.3 miles from the Project Site. A private school, St. Joseph School-Wayland, which includes grades pre-kindergarten through sixth grade (87 student population), is located on Fremont Street in the Village of Wayland and is approximately 7.0 miles from the Project Site.

Solid Waste Disposal

Solid waste produced by residents of the Town of Cohocton is brought by the individual residents or contractors to a transfer station in the Town of Wayland, located approximately eight miles northwest of the Project Site. Steuben County then transports the waste from the transfer station to the Bath Sanitary Landfill, located on Turnpike Road in Bath, New York approximately 20 miles southeast of the Project Site (Orcutt, S., 2006). This landfill accepts multiple types of solid wastes, including those from residential, commercial, industrial, and construction practices (NYSDEC Division of Solid and Hazardous Materials).

Parks and Recreation

The study area includes several areas that offer opportunities for local recreation, including fishing, boating, swimming, and/or field sports. These include the following:

- Pine Hill ATV Park – Pine Hill Road, Cohocton
- Reservoir Creek Golf Course – Cohocton Street, Naples
- Cohocton River – Adjacent to State Route 21, 371, and 415, Wayland and Cohocton
- Atlanta/North Cohocton Community Park – County Route 39, Cohocton
- Loon Lake – Cohocton Loon-Lake Road (County Route 121), Wayland
- Smith Pond – Smith Pond Road, Avoca

The most significant regional recreational resource is Canandaigua Lake, which occurs approximately 7.2 miles north of the nearest proposed turbine. The lake is a popular destination for fishermen and boaters and includes seasonal/vacation homes along its shorelines. Several vineyards/wineries that are popular tourist destination also occur along Canandaigua Lake. The High Tor Wildlife Management Area (WMA), located approximately 3.5 miles to the north of the Project, provides a variety of outdoor recreational opportunities, including hunting, trapping, fishing, hiking, bird watching, cross-country skiing, and snowmobiling.

3.11.2 Potential Impacts

3.11.2.1 Construction

During construction, the Project will result in no significant increase in the demand for utilities such as telephone, natural gas, electric, water, sanitary sewer, etc. However, the Project will have a beneficial impact by generating a total of up to 82 MW of clean renewable energy that can be used by the people of Steuben County and New York State.

The Project may require the relocation of some overhead utility lines to allow the passage or accommodate the turning movements of large trucks. Buried utilities could also be subject to disturbance/damage due to construction activity. NYSEG owns the majority of the local overhead distribution poles and lines that could be affected.

The police, fire, and emergency response departments have adequate personnel and equipment to respond to basic emergency needs during construction of the Project. However, during construction, access to some area roadways may be temporarily blocked due to the presence of large construction and delivery vehicles. In addition, damage to the roadways caused by oversized/heavy equipment has the potential to reduce the response time of emergency personnel. This is not anticipated to be a significant problem due to the small number of residents within the Project Site, the general availability of alternate access routes, and correspondence and coordination that will occur between construction managers and local police and fire departments. The construction site could also experience vandalism/trespass problems that would require involvement of local police. However, based on experience with other wind power projects in New York, this is not anticipated to be a significant impact.

Project construction will generate some solid waste, primarily plastic, wood, cardboard and metal packing/packaging materials, construction scrap, and general refuse. This material will be collected from turbine sites and other Project work areas, and disposed of in dumpsters located at the construction staging area(s). A private contractor will empty the dumpsters on an as-needed basis, and dispose of the refuse at a licensed solid waste disposal facility.

During construction, the Project will not adversely impact the local school districts, beyond the possible delay of school bus pick-ups and drop-offs at homes within the Project area due to construction traffic/activity. Temporary construction workers will not create significant demand for school district services or facilities. These workers will also not generate a significant demand on local recreational facilities or other community services/facilities.

3.11.2.2 Operation

Once in operation, the Project will not result in any significant impacts to local utilities. Facility operation and maintenance will require energy use, but this impact will be minor because the amount of required electricity and fuel is small, and local fuel suppliers and utilities have sufficient capacity available to serve the Project's needs. As a result, no improvements to the existing energy supply system will be necessary. In addition, the Cohocton Project will generate up to 82 MW of electric power and will advance the State's goal of having 25% of the state's power provided by renewable sources by 2013.

No significant problems that would require response by local police, fire, and emergency service personnel are anticipated to result from Project operation. The wind turbines are located at least 500 feet from property lines and public roads, and 1,500 feet from residences. This is well outside of any area that could be affected in the unlikely event of a tower fall or catastrophic blade failure. Although, operation of the proposed Project could result in accidents that result in personal injury and/or property damage, their occurrence is relatively unlikely, and well within the response capabilities of local emergency service providers. Local providers have experience in responding to fire and accidents in rural locations, including off-road areas used by hikers, ATVers, and snowmobilers. This topic is discussed in detail in Section 3.10.

As described in Section 3.10, local fire departments do not have the specialized equipment necessary to respond to a fire in one of the turbines. Generally, any emergency/fire situations at a wind turbine site or substation will be the responsibility of the Project owner/operator. Operations and maintenance personnel will be trained and equipped to deal with emergency situations that may occur at the Project Site (e.g., tower rescue, working in confined spaces, high voltage, etc.), and will coordinate such efforts with the local departments.

During Project operation, very little solid waste will be generated. Any that is, will be placed in containers or dumpsters at the O&M facility and hauled away on a regular basis (e.g., weekly) by a private contractor. The waste will be disposed of at a licensed solid waste disposal facility.

The Project is not anticipated to result in a significant increase in the demand for educational services/facilities. While the operating Project will require up to six full-time employees, existing educational facilities/staff within the school districts are adequate to accommodate the addition of up to six families to the area.

3.11.3 Mitigation

The impacts to community services resulting from the proposed Project are not of the type or magnitude to require mitigation. In fact, development of the proposed Project will have minimal impact on population, and place little demand on community services. At the same time, the Project will provide significant income and tax revenue to the Town, county, and school districts. This income will more than offset any incurred costs, and will assist with the financing of community services that benefit all residents of the towns and county.

To mitigate any potential concerns regarding Project construction, CPP will meet with the local emergency service personnel (fire, police, and EMS) to review the planned construction process. During this meeting, unique construction equipment/material, construction traffic routing, and construction scheduling/phasing will be discussed. Prior to construction, CPP will implement a coordinated emergency response plan, which will be developed in consultation with local emergency service personnel.

Ongoing communication between CPP and Town police, fire, and emergency services officials will help assure adequate levels of public safety throughout Project operation. As discussed in Section 3.10, CPP representatives will meet with fire, police and other emergency responders to develop safety plans that address emergency response procedures/responsibilities during Project operation.

Because the solid waste impacts of the Project will be so small, and because the Project will utilize existing permitted disposal facilities, the Project will not create any conflict with the county's solid waste management plan.

3.12 COMMUNICATION FACILITIES

To evaluate the potential for the Project to impact existing telecommunication signals, Comsearch was contracted to conduct a Microwave Systems Studies and an Off-Air Television Reception Analysis (see Appendices K and L, respectively).

3.12.1 Existing Conditions

3.12.1.1 <u>Microwave Analysis</u>

Microwave telecommunication systems are wireless point-to-point links that communicate between two sites (antennas) and require clear line-of-sight conditions between each antenna. Comsearch identified six microwave paths that intersect the Project Site (see Figure 1 in the Licensed Microwave Search and Worst Caste Fresnel Zone Study in Appendix K).

3.12.1.2 <u>Off-Air Television Analysis</u>

The television reception analysis identified all of the off-air television stations within a 100-mile radius of the proposed Project (as measured from the approximate center of the Project Site). Off-air television stations transmit broadcast signals from terrestrially located facilities that can be received directly by a television receiver or house-mounted antenna. The results of the study indicate that there are 213 off-air television stations within 100 miles of the Project Site (see Appendix L).

3.12.1.3 <u>Cellular, PCS, and LMR Systems</u>

No formal study of cellular, personal communication system (PCS), or land mobile radio (LMR) coverage/use in the area was conducted. However, the area does have some cell phone coverage, and LMR is used by state, county, and local agencies and departments (police, fire, etc.) for vehicle-to-vehicle communications

3.12.2 Potential Impacts

3.12.2.1 <u>Construction</u>

Temporary communication interference as a result of Project construction may occur. Cranes used during construction activities (and the individual turbine components being raised by the cranes) can cause temporary obstruction of microwave links as well as some degradation to television and radio signals (L. Polisky, pers. comm.). However, because individual turbines have been sited to avoid interference with microwave paths that cross the Project, the potential for microwave interference by equipment assembling and erecting these turbines should be minimal. Any impact on television or radio reception caused by construction equipment would be temporary, as turbine assembly and erection at each turbine site is typically completed within 1-3 days.

3.12.2.2 Operation

3.12.2.2.1 Microwave Communication Systems

To assure an uninterrupted line of communications, a microwave link should be clear, not only along the axis between the center point of each antenna, but also within a mathematical distance around the center axis known as the Fresnel Zone. A Worse Case Freznel Zone (WCFZ) was calculated for each of the six microwave paths identified within the Project Site. The WCFZ calculation only includes a horizontal analysis for each microwave path (i.e., its width). An analysis of the vertical limits of the Fresnel zone, to determine if it is actually above or below the proposed height of the turbines, was not conducted). Based upon the horizontal analysis, interference from the rotor blades of Turbines 7, 17, 24, and 45 (identified as Turbines 149590, 149578, 149569, and 149554 in Appendix K) could occur along three of the microwave paths that cross the Project Site. Due to the potential interference, Comsearch was contracted to conduct a detailed interference study (i.e., a vertical analysis of each path). This study determined that all three microwave paths would still experience interference as a result of the proposed Project because the rotor blades of Turbines 7, 17, 24, and 45 would not be below the vertical limits of the Fresnel zones (see Appendix K).

3.12.2.2.2 Television Systems

Comsearch examined the coverage of the identified off-air television stations within a 100 mile radius of the Project Site and the potential for degraded television reception as a result of the Project. The Comsearch report indicated that off-air stations located within 40 miles of the Project Site are most likely to provide serviceable coverage for local residents. Of the 213 stations initially identified, 31 stations are located within the 40-mile range, and only 17 of the 31 stations were licensed and operational at the time of the Comsearch analysis (November 2005). Of the 17 licensed and operational stations, only two are full power and full service stations (Channel 48 [WYDC] out of Corning and Channel 51 [WPXJ] out of Batavia), The remaining 15 stations are either low power stations or translators with limited coverage. According to the Comsearch study the proposed Project will not affect stations with these characteristics. Because off-air coverage to this area only includes two full service stations and 15 low power or limited coverage stations, it does not appear that the off-air television stations are the primary mode of delivering television service to the local communities. Given that, the Project is not likely to result in significant impacts to television reception in the area. However, because some level of off-air coverage is provided to the area, impacts to existing television reception for some residents as a result of the Project are possible. These impacts would most likely include noise generation at low VHF channels (2 through 6) within 0.5 mile of turbines, reduced picture quality (ghosting, shimmering), and signal interruption (NWCC, 2005).

3.12.2.2.3 Cellular, PCS and LMR Systems

Telephone mobile communications in the cellular and PCS frequency bands will not be significantly affected by the presence of the wind turbines. This is because the blockage caused by wind turbines is not destructive to the propagation of signals in these frequency bands. In addition, these systems are designed so that if the signal from (or to) a mobile unit cannot reach one cell, it will be able to reach one or more other cells in the network. Therefore, local obstacles are not normally a problem for these systems, whether they are installed in urban areas near large structures and buildings, or in a rural area near a wind energy facility. Similarly, the frequencies of LMR repeaters are generally unaffected by the presence of wind turbines. Very little, if any, change in the coverage of the repeaters will occur when the wind turbines are installed. (L. Polisky, pers. comm.).

3.12.3 Proposed Mitigation

3.12.3.1 Construction

If disruptions to existing communication systems occur as a result of Project construction, they will be temporary, and will only occur during the erection of specific turbines. Because turbine installation/crane activity will occur at different locations and at different times during the construction period, any degradation/disruption to existing communications will not represent a constant interference to a given television/radio reception area or microwave signal (L. Polisky, pers. comm.). In addition turbine erection will be performed as efficiently as possible (under favorable conditions, one turbine can be erected in one day). Therefore, mitigation is not warranted.

3.12.3.2 Operation

3.12.3.2.1 Microwave Communication Systems

To eliminate the potential for interference with microwave communications, Comsearch recommended moving Turbine 7 at least 9 feet from its proposed location, Turbine 17 at least 36 feet, Turbine 24 at least 219 feet, and Turbine 45 at least 52 feet (perpendicular to, and away from, the microwave path in question). These turbines will either be relocated or removed from the Project layout. Therefore, the proposed Project, will not result in any interference to existing microwave telecommunication systems.

3.12.3.2.2 Television 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. Mitigation actions could include adjusting existing receiving antenna's, upgrading an antenna, or providing cable or satellite systems to the affected households. In addition, the FCC's mandate to transition all off-air television broadcasts from analog signals to digital signals by February, 2009 will eliminate any turbine-related contrast variation (shimmering), thus reducing the potential for television signal interference from wind turbines (L. Polisky, pers. comm.).

3.12.3.2.3 Cellular, PCS and LMR Systems

If a cellular or PCS company were to claim that their coverage had 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. Utility, meteorology, and/or the turbine towers within the Project Site could serve as the structure platforms for the additional cellular or PCS base station or sector antennas. Similarly, if there is a reported change in LMR coverage in the area, it can be easily corrected by repositioning or adding repeaters that operate with the LMR mobile systems. This could be accomplished by adding or positioning the repeaters at locations within the Project area. Repeater antennas could also be installed on utility, meteorological or turbine towers within the Project Site, if needed.

3.13 LAND USE AND ZONING

Land use and zoning in the Project area was determined through review of local town codes, tax parcel maps, aerial photographs, and field review conducted during 2005. Land use and zoning are discussed in terms of regional land use patterns, Project Site land use and zoning, agricultural districts, and future land use.

3.13.1 Existing Conditions

3.13.1.1 <u>Regional Land Use Patterns</u>

The Town of Cohocton is located in northern Steuben County. Steuben County is in the southern portion of the Finger Lakes region of New York State, and borders Yates County to the north and the state of Pennsylvania to the south. The southern part of Keuka Lake dips into northeastern Steuben County, and Canandaigua Lake is located approximately 6 miles north of the county line. The county is characterized by dissected plateaus/ridges, with active and reverting agricultural land and small woodlots occurring on the ridge tops, and forestland on the ridge slopes and in the narrow valleys. Broad valleys are associated with the Cohocton, Canisteo, and Tioga Rivers. These valleys are dominated by agricultural land and wetlands, but also include major transportation corridors and all of the larger villages and cities in the county. Residential land use is concentrated in and around cities, villages, and small hamlets, but occurs thoughout the county along the network of state, county, and local roads. Pockets of commercial and industrial development are also scattered along the major transportation corridors. The majority of the population, as well as most commercial and industrial land uses, are located in and around the Cities of Corning and Hornell. Over the past few decades there has been a significant loss of farmland to new commercial and residential development. Most of this loss has occurred near larger villages and cities such as Corning, Hornell and Erwin. The largest state recreational lands in the county are Erwin State Wildlife Management Area and Pinnacle State Park, located in the southern portion of the county, and Stony Brook State Park in the northwestern portion of the county.

Land use patterns within the Town of Cohocton are similar to those of the larger region and county. The town is predominantly rural, with the majority of land being either active agricultural fields or undeveloped forestland. Approximately 16% of the tax map parcels in the town are classified as agricultural, 17% as vacant land, and 55% as residential. Residential and commercial land uses are primarily located in the valleys and are concentrated in and around the Village of Cohocton, the Hamlets of Atlanta and North Cohocton, and along major roads such as NYS Route 371, 21, and 415. There are numerous rural homes and farms scattered throughout the ridgetop and valley portions of the town.

3.13.1.2 Project Site Land Use and Zoning

The Project Site is dominated by open crop fields (primarily hay and corn), with forested areas generally confined to small woodlots and steep slopes that descend to adjacent valley bottoms. The site also includes successional old field, hedgerow, successional shrubland, yards, farms, small wetlands, and ponds. Existing built features within the site boundaries include roads, single-family homes, barns, silos, and other agricultural buildings.

The Town of Cohocton zoning ordinance regulates land use throughout the town. The Town of Cohocton Zoning Law (1990; amended by L.L. No. 1-1992; amended by L.L. No. 1-2002) regulates and restricts "the location, construction, alteration, occupancy and use of structures and the use of land in the Town of Cohocton" (Town Zoning Law, §100). The Town Zoning Law identifies the following five zoning districts: Agricultural-Residential (AG-R); Low Density Residential (LDR); General Business (GB); Interchange Commercial (IC); and Industrial (I). The proposed Project Site is entirely within the Agricultural-Residential (AG-R) district (see Figure 20). Principal permitted uses within the AG-R district include agricultural uses and structures, single and two-family dwellings, seasonal homes, churches and similar places of worship, municipal parks and playgrounds, libraries, day nurseries, kindergartens, nursing homes, historical museums, monuments, and markers.

The Town of Cohocton also has a local law (Local Law No. 1 of 2006) governing wind energy facilities (Windmill Local Law). This local law provides the Town of Cohocton with the authority to approve or deny applications for Residential and/or Commercial Windmills, as well as Industrial (utility-scale) Windmills, through a special use permit process. A copy of the Windmill Local Law is included in Appendix M. A special use permit, if approved, would allow for the construction, maintenance and operation of a utility-scale wind energy facility within the AG-R zoning district, without the need to obtain a use, area, or height variance.

Table 18 summarizes certain of the requirements of the Windmill Local Law that are applicable to a wind-powered electric generating facility in the Town of Cohocton.

Table 18. Local Wind Power Facility Requirements and Approvals.

Requirements	Approvals
• Wind energy facilities are allowed in the Town, pursuant to the approval of a special use permit by the Planning Board. • Guidelines for industrial wind energy facilities include: - Setback for each wind turbine tower from adjacent property lines, rights-of-way, easements, public ways, power lines, other generation units (turbines) or areas/structures customarily used by the public shall be 100 ft. plus the maximum structure height. * - Minimum setback from adjacent residences and public structures shall be 1,500 ft. - Noise level limits applicable at abutting property boundaries. - All guy wires or cables shall be marked with high-visibility orange or yellow sleeves from the ground to a point 10 feet above ground. - 50 foot setback from any property line for any anchor point for guy wires or cables - Landscaping/building and grounds maintenance requirements - Maximum height limit: 500 feet	• Approval of special use permit from Planning Board

*The Planning Board may reduce setback requirement during special permit review under specific conditions as stated in the Windmill Local Law.

3.13.1.3 Agricultural Districts

The 2002 Census of Agriculture reported that 1,450 working farms occupied 370,400 acres in Steuben County, or 41.9% of the land in the county (USDA National Agriculture Statistics Service website). Of that total, 177,644 acres were classified as harvested cropland and 63,388 acres as pastureland (USDA NASS website). According to the U.S. Census Bureau, 1.4% of the Steuben County population (603 residents) listed farming, fishing or forestry as their occupation (2000). Similarly, 25 residents within the Town of Cohocton (2.2%) listed farming, fishing or forestry as their primary occupation (2000 Census, U.S. Census Bureau website). The number of commercial wineries in the county has increased over the years.

Steuben County has 23 separate agricultural districts. One district (District 5) occurs within the Project Site (see Figure 21). Approximately 4,828 acres (84%) of the Project Site are included within this district. Agricultural land use is a significant component of the Project Site with approximately 3,582 acres of the 5,755-acre area (62%) in row crops, field crops, or pastureland. The Project Site includes nine working farms, the majority of which are dairy farms.

3.13.1.4 Future Land Use

Other than the proposed Project, (and other proposed wind power projects) future land use patterns in Steuben County and the Town of Cohocton are anticipated to remain largely unchanged for the foreseeable future. The Southern Tier Regional Planning and Development Board (STRPDB) continues to promote agriculture, manufacturing, and tourism as growth opportunities in the region (STRPDB web site). However, land use within the area is anticipated to undergo some degree of change as farms are sold and agricultural land goes out of production.

3.13.2 Potential Impacts

The Project will be compatible with the agricultural land use that dominates the Project Site. However, there will be temporary, construction-related impacts, as well as permanent impacts (operation related) on land use within the Project Site and the larger community. Anticipated land use and zoning impacts are described below.

3.13.2.1 Construction

Construction-related disturbance to agricultural land will total approximately 285 acres. Along with this direct impact to agricultural land, movement of equipment and material could result in damage to growing crops, fences and gates, and subsurface drainage systems (tile lines), as well as temporary disruption of farming practices (e.g., temporary blockage of farmers' access to fields). However, wind turbines and associated facilities have been located so as to minimize loss of active agricultural land and interference with agricultural operations, and Project construction will be in compliance with NYSA&M Agricultural Protection Guidelines.

Construction activities could have a similar temporary impact of forest management/timber harvest activities. Movement of equipment and materials could temporarily block or damage forest access roads. Timber harvest activities may also need to be curtailed/rescheduled in certain areas to avoid interfering with Project construction. Construction will result in clearing approximately 67 acres of forestland. However, it is anticipated that marketable timber will be salvaged and stockpiled for use/removal by the landowner. Improvements to existing roads to accommodate construction activity will ultimately enhance access to these properties for future forest management activities.

Construction-related impacts to residential land use will include sound, traffic, dust, and visual impacts. All of these issues are address in detail elsewhere in this DEIS. Construction activity will be in compliance with requirements of the Windmill Local Law and zoning regulations in Cohocton. No variances or waivers from the requirements of these local laws are anticipated.

3.13.2.2 Operation

The Project as proposed is consistent with existing zoning/wind energy facilities regulations and land use patterns within the Town of Cohocton. The Project will occur entirely on private land in areas dominated by active and reverting agricultural land and undeveloped forestland. Project components will be sited in accordance with local setback requirements and no public lands or recreational facilities will be impacted. Therefore, impacts to residential, commercial, and recreational land use will be minimized. The operating Project will be compatible with agricultural land use, which dominates the Project Site, and may serve to help keep land in agricultural use. Russell Cary, Supervisor of the Town of Fenner, New York believes that the wind power project in his town is preserving a rural life style and protecting family farms from being taken over by large-scale commercial farming operations (Cary, pers. comm.). The presence of wind turbines may also limit or prevent the conversion of agricultural and forest land to seasonal or permanent residential use.

Only very minor changes in land use within the Project Site are anticipated as a result of Project implementation. The 48 possible turbine sites, substation, and other ancillary facilities together represent a maximum conversion of approximately 44 acres of land from agricultural land, meadow/brushland, or forestland to developed land use. Very little residential land will be directly impacted by the Project, and these impacts will be confined to the properties of participating landowners, and largely temporary in nature (construction activity). Other than occasional maintenance and repair activities that could have impacts similar to those described in the ‘Construction’ discussion, operation of the wind power Project should not directly interfere with existing land use.

However, as noted in the Visual Impact Assessment prepared for the Project (Appendix F), the Project may result in a perceived change in land use in some areas of the town (and some portions of surrounding towns). As discussed in Section 3.5, the visibility and visual impact of the wind turbines will be highly variable based upon distance, weather conditions, sun angle, the extent of visual screening, viewer sensitivity and/or existing land uses. The visual impact evaluation indicated a low to moderate level of visual contrast.

3.13.3 Proposed Mitigation

The Project is generally consistent with existing zoning and is compatible with the agricultural land use that dominates the Project Site. However, the Project will impact agricultural activities (at least temporarily) and may result in a change in perceived land use in some areas.

Mitigation measures that will be undertaken to reduce the impact of the wind energy facilities on land use and zoning include appropriate design and full compliance with the local windmill laws. These include:

- Placing all turbines a minimum of 1,500 feet from neighboring residences, and 500 feet from all public roads.
- Locating electrical collection (interconnect) lines underground.
- Lighting towers only to the extent necessary to comply with FAA requirements. Lighting for the substation and other ground level facilities will be kept to a minimum and generally operated by switch or motion detector.
- Not affixing television, radio or other communication antennas or advertising signs to the towers or any other Project structures.
- Utilizing tubular towers and finishing structures with a single, non-reflective matte finish color.
- Installing turbines in locations where proximity to existing fixed broadcast, retransmission, or reception antenna for radio, television, or wireless phone or other personal communications systems will not interfere with signal transmission or reception.
- Designing all Project components in a way that minimizes the impacts of land clearing and the loss of open space.
- Locating Project components so as to minimize impacts on state and federal jurisdictional wetlands.
- Managing storm water run-off and erosion control in a manner consistent with all applicable state and federal laws and regulations.

- Removing all solid waste, hazardous materials and construction debris from the site and managing its disposal in a manner consistent with all appropriate rules and regulations.
- Generally limiting construction to daylight hours (typically 7:00 a.m. to 5:00 p.m.), except for certain activities that have to occur outside these hours due to wind or temperature constraints.

To minimize and/or mitigate impacts to active agricultural land and farming operations, Project siting, and construction will comply with NYS Department of Agricultural & Markets (NYSA&M), agricultural protection guidelines. A Notice of Intent to Undertake an Action within an Agricultural District will be filed with the NYSA&M and the Steuben County Agriculture and Farmland Protection Board. Proposed agricultural protection measures and a Preliminary Notice of Intent have been prepared in accordance with NYSA&M guidelines, and are included with this DEIS as Appendix D. These mitigation measures include the following:

- Limiting permanent road widths to a maximum of 20 feet or less, and where possible, following hedgerows and field edges to minimize loss of agricultural land.
- Having roads that must cross agricultural fields stay on ridge tops and other high ground to minimize cut and fill as well as potential drainage problems.
- Avoiding disturbance of surface and subsurface drainage features (ditches, diversions, tile lines, etc).
- Prohibiting vehicular access to turbine sites until topsoil has been stripped and permanent access roads have been constructed.
- Prohibiting stripping of topsoil or passage of cranes across agricultural fields during saturated conditions when such actions would damage agricultural soils.
- Avoiding blocking of surface water drainage due to road or installation or stockpiled topsoil.
- Maintaining access roads throughout construction so as to allow continued use/crossing by farmers and farm machinery.
- Temporarily fencing open excavation areas in active pastureland to protect livestock.
- Washing of concrete trucks and disposal of excess concrete outside of active agricultural areas in locations approved by the environmental monitor.
- Restricting erection cranes to designated access roads, crane paths, and work pads at the structure sites for all set-up, erection, and breakdown activities.

- Site restoration, including removal of excess road material, soil decompaction, rock picking, and respreading of topsoil in disturbed agricultural fields following the completion of construction.
- Stabilizing restored agricultural areas with seed and/or mulch.
- Removing and disposing of all construction debris offsite at the completion of restoration.

These actions will assure that adverse impacts on land use and zoning are minimized or mitigated to the extent practicable.

4.0 UNAVOIDABLE ADVERSE IMPACTS

The proposed Project will result in significant long-term economic benefit to participating landowners as well as to the Town of Cohocton, the local school districts, and Steuben County. When fully operational, the Project will provide up to 82 MW of electric power generation with no emissions of pollutants or greenhouse gases to the atmosphere. The development of the site is consistent with surrounding land uses and will help maintain the area in agricultural use.

Despite the positive effects anticipated as a result of the Project, its construction and operation will necessarily result in certain unavoidable adverse impacts to the environment. The majority of the adverse environmental impacts associated with the Project will be temporary, and will result from construction activities. Site preparation (e.g., clearing, grading), improvement of local roads, and the installation of roads, turbines, interconnects, staging areas, the O&M building, meteorological towers, the collection station, and the substation will have short-term and localized adverse impacts on the soil, water, agricultural and ecological resources of the site. This construction will also have short-term impacts on the local transportation system, air quality, and noise levels. These impacts will largely result from the movement and operation of construction equipment and vehicles, which will occur during the one-year development of the Project. The level of impact to each of these resources has been described in other sections of the DEIS and will generally be localized and/or of short duration.

Long-term unavoidable impacts associated with operation and maintenance of the Project include turbine visibility from many locations within the town. While the presence of the turbines will result in a change in perceived land use from some viewpoints, their overall contrast with the landscape is low to moderate in most locations. The Project also may function to keep land within the Project Site in agricultural use, thus protecting open space and existing land use patterns. Project development will also result in an increased level of sound at some receptor locations (residences) within the study area, a minor loss of agricultural and forest land, wildlife habitat changes, and some level of avian and/or bat mortality associated with bird/bat collisions with the turbines. As described in Section 3.0, these impacts are not considered significant.

Although adverse environmental impacts will occur, they will be minimized through the use of various general and site-specific avoidance and mitigation measures. With the incorporation of these mitigation measures, the Project is expected to result in positive, long-term overall impacts that will offset the adverse effects that cannot otherwise be avoided.

The following subsections summarize general mitigation and avoidance measures that have been incorporated into the Project design, and specific mitigation and avoidance measures proposed to minimize adverse impacts to specific resources.

4.1 GENERAL AVOIDANCE AND MITIGATION MEASURES

General mitigation measures include compliance with the conditions of various local, state, and federal ordinances and regulations that govern Project development, as well as the inherent characteristics of the Project. The primary government review/approval processes that apply to the Project include:

- State Environmental Quality Review Act (SEQRA).
- New York State Department of Transportation (NYSDOT) and Steuben County Department of Public Works (DPW) highway regulations.
- Federal Clean Water Act regulations (Section 404 individual permit, 401 water quality certification).
- Town of Cohocton building and zoning regulations.
- Town of Cohocton Local Windmill Law.
- NYSDEC water resources regulations (Article 24, Article 15, Section 401 water quality certification).
- NYSDEC SPDES regulations (stormwater management).
- Occupational Safety and Health Administration (OSHA) regulations (standard conditions for safe work practices during construction).
- NYS Agricultural Districts law.

SEQRA regulations require environmental review of proposed development projects so that potential adverse impacts and public concerns can be identified prior to project implementation and avoided or mitigated, to the extent practicable. This DEIS was prepared in accordance with these regulations, and provides a primary means by which the potential costs and benefits of the Project are described and weighed in a public forum. Compliance with SEQRA regulations will assure that public and agency comments are solicited and appropriately addressed, Project alternatives are evaluated, and potential adverse impacts are identified and mitigated to the extent practicable. Response to comments and preparation of a Final Environmental Impact Statement (FEIS) will provide the information necessary for lead agency and other involved agencies to draw conclusions (Findings Statement) regarding the Project's overall environmental impacts and impose conditions on its approval, if necessary.

Compliance with the other various federal, state, and local regulations governing the construction and design of the proposed Project also will serve to minimize adverse impacts. Construction activities and building designs will be in compliance with state and local building codes and federal OSHA guidelines to protect the safety of workers and the public. State permitting required by the NYSDEC will serve to protect water resources, while state and county highway permitting will assure that safety, congestion, and damage to highways in the area is avoided or minimized. Compliance with town ordinances that require building and highway permits will further serve to minimize impacts of the Project. The Town's Windmill Local Law contains protective requirements for the siting and regulation of wind energy facilities that are consistent with (or exceed) the requirements found in other local wind power ordinances in New York State.

Along with regulatory compliance, the Project has been designed in accordance with various siting criteria, guidelines, and design standards that serve to avoid or minimize adverse environmental impacts. These include:

- Siting the Project away from population centers and areas of residential development
- Siting turbines in compliance with all local set-back requirements to minimize noise, shadow flicker, and public safety concerns.
- Following NYSAM Agricultural Protection Guidelines.
- Utilizing existing disturbed areas for stream and wetland crossings.
- Siting turbines primarily in open field areas to minimize forest clearing and potential impacts to bats.
- Using existing farm roads for turbine access whenever possible, to minimize impact to soil, ecological, and agricultural resources.
- Designing the overhead transmission line in accordance with Avian Power Line Interaction Committee (APLIC) guidelines to minimize impacts on birds.
- Project design, engineering, and construction will be in compliance with various codes and industry standards to assure safety and reliability.

- Limiting turbine lighting to the minimum allowed by the FAA to reduce nighttime visual impacts, and following lighting guidelines to reduce the potential for bird collisions.
- Construction procedures will follow Best Management Practices for sediment and erosion control.
- Turbines will include grounding and automatic shutdown/braking capabilities to minimize public safety concerns.

4.2 SPECIFIC MITIGATION MEASURES

Project development and operation will also include specific measures to mitigate potential impacts to specific resources. These were described in detail in Section 3.0, but generally include the following:

- Developing and implementing a complaint resolution procedure to address landowner concerns throughout Project construction and operation.
- Developing and implementing various plans to minimize adverse impacts to air, soil, and water resources, including a dust control plan, sediment and erosion control plan, and Spill Prevention, Control, and Countermeasure (SPCC) plan.
- Undertaking a pre-construction breeding bird survey to avoid impacting any nesting listed species during construction.
- Video documentation of existing road conditions, development of a road improvement plan, and undertaking public road improvement/repair at no cost to the town or county.
- Post-construction avian and bat monitoring studies to document Project impacts on birds and bats.
- A historic resource mitigation program to be developed in consultation with the SHPO.
- Entering into a PILOT agreement with the local taxing jurisdictions to provide a significant predictable level of funding for the town, county, and school districts over the first 20 years of Project operation.
- Development of an emergency response plan with local first responders.

4.3 ENVIRONMENTAL COMPLIANCE AND MONITORING PROGRAM

In addition to the mitigation measures described above, CPP will develop an environmental compliance program and employ environmental monitors to oversee compliance with environmental commitments and permit requirements. The environmental compliance program will be similar to that utilized on the Maple Ridge project in Lewis County (TtEC, 2005), and will include the following components:

1. Planning – Prior to the start of construction, the environmental monitors will review all environmental permits and, based upon the conditions/requirements of the permits, prepare an environmental management document that will be utilized for the duration of the Project. This document will outline environmental requirements for construction and restoration included in Project permits and approvals.

2. Training – The environmental monitors will hold environmental training sessions that will be mandatory for all contractors and subcontractors. The purpose of the training sessions will be to explain the environmental compliance program in detail prior to the start of construction.

3. Preconstruction Coordination – Prior to construction, the contractor(s) and the environmental monitors will conduct a walkover of areas to be affected by construction activities. This walkover will identify landowner restrictions, sensitive resources, limits of clearing, proposed stream or wetland crossings, and layout of sediment and erosion control features. The limits of work areas, especially in sensitive resource areas, will be defined by flagging, staking or fencing prior to construction, as needed.

4. Construction and Restoration Inspection – The monitoring program will include the inspection of construction work sites by the environmental monitor. The monitor will be present during construction at environmentally sensitive locations, will keep a log of daily construction activities, and will issue periodic/regular reporting and compliance audits. Additionally, the monitor will work with the contractors to create a punch list of areas for restoration in accordance with issued permits. Following construction, CPP or an environmental monitor will maintain a monitoring presence for two year following completion of site restoration (in accordance with NYSA&M requirements) to evaluate areas disturbed during construction and assure that agricultural and ecological functions and values are restored and maintained over the long term.

5.0 ALTERNATIVES ANALYSIS

The following alternatives to the proposed action are described and evaluated: no action, alternative project site, alternative project design/layout, alternate project size, and alternative technologies. These alternatives offer a potential range and scope of development for comparative analysis and consideration.

5.1 NO ACTION

The no action alternative assumes that the Project Site would continue to exist as active agricultural land, residential property and vacant land. This no action alternative would not affect current zoning, ambient noise conditions, traffic or public road conditions, television/communication systems, and would maintain community character, economic and energy-generating conditions as they currently exist.

Under this alternative, no wind turbines or infrastructure (e.g., roads, interconnects, and substations) would be developed on the site. Consequently, none of the environmental impacts associated with Project construction and operation would occur. In addition, no economic benefits would accrue to the area. These unrealized economic benefits would include income from construction jobs, lease payments to the landowners, annual PILOT payments to the affected towns and school boards. Annual revenues to the Town of Cohocton and the area school districts are anticipated to average in excess of $400,000 per year for the first 20 years of Project operation, declining thereafter based on depreciation. Under the no action alternative, multiplier effects from these economic benefits would also not be realized. In addition, to the extent that the Project helps supplement farm income and keeps land in active agricultural use, the no action alternative could have an adverse impact on land use and grassland bird habitat. As family farms go out of business, the land is either incorporated into larger corporate farming operations, converted to residential use, or allowed to revert to successional communities. All of these possibilities would result in a change to the Town's existing character and available wildlife habitat. Furthermore, the benefits of adding up to 82 MW of clean, renewable electric energy to the power grid would be lost, and reliance on fossil-fuel-fired generators, which contribute to emissions of sulfur dioxide (a precursor of acid rain), nitrogen oxide (a smog precursor), and carbon dioxide (a greenhouse gas) would continue unabated. Given the short-term nature of anticipated construction impacts and the generally minor long-term impacts of Project operation, as compared to the significant economic benefits that the Project would generate, the no action alternative is not considered a preferred alternative.

5.2 ALTERNATIVE PROJECT AREA

Under 6 NYCRR § 617.9(b)(5)(v)(g), site alternatives addressed in an EIS may be limited to parcels owned by, or under option to, a private project sponsor. CPP does not own, or have under option, any parcels other than the ones that constitute the Project Site. Therefore, there is no requirement to evaluate any alternative project areas. Nonetheless, this section provides background information on CPP's selection of the Project Site to facilitate understanding of the criteria that CPP employed.

The selection of wind turbine locations is constrained by several factors which are essential for the Project to operate in a technically and economically viable manner. These factors include the following:

- adequate wind resource
- adequate access to the bulk power transmission system, from the standpoints of proximity and ability of the system to accommodate the interconnection and accept and transmit the power from the Project
- contiguous areas of available land
- compatible land use
- willing land lease participants and host communities
- limited sensitive ecological resources
- limited population/residential development

UPC Wind began a search for appropriate project sites within the Southern Tier of New York that had these characteristics in September 2002. The analysis of potential sites concluded that many other locations in the region presented significant constraints on wind power development, including, incompatible land uses, lack of contiguous land, proximity to population centers, a lack of adequate wind resource, or unsuitable transmission facilities (either too far to connect or in need of major system upgrades).

UPC Wind selected the proposed Cohocton site because of the quality of the wind resource, the ease of access to the site, relatively low population density, positive feed-back from landowners and town officials, and the relative lack of sensitive resources. These factors combined to make the proposed site desirable from the standpoint of wind power development. Based upon the result of the site evaluations performed in the region, other potential locations do not have the same combination of desirable features.

5.3 ALTERNATIVE PROJECT DESIGN/LAYOUT

CPP's ability to develop a significantly different project layout within the Project Site is constrained by the need to maintain required set-backs and adequate separation of turbines, and to limit environmental impacts. Keeping the turbines on high-elevation sites with adequate wind, staying 500 feet from roads and property lines, and 1,500 feet from residences, leaves very little room for modification of the Project layout. In addition, the turbines must have adequate separation to avoid energy loss associated with wake effects. They, and other Project components, also must be sited so as to minimize loss of active agricultural land and/or interference with agricultural operations. Avoidance of wetlands, streams, forested areas, and steep slopes further reduces available siting alternatives. Proposed turbine siting also needs to be sensitive to landowner agreements/considerations. All of these factors have guided the location of potential turbine sites, and limit the ability to significantly change the proposed configuration.

The layout of 48 potential turbine sites as proposed results in a carefully achieved balance of energy production and environmental protection. By identifying 48 potential turbine sites, from which 41 final turbine sites will be selected, CPP has bracketed the potentially feasible layout alternatives within the Project Site. Relocation of any of the turbines to a site other than one of the identified 48 potential sites would have a ripple effect, in that the location of other turbines would have to be reexamined and possibly changed to maintain an efficient/workable Project design. Therefore, reduction of environmental impacts in one location could result in increased impact in another location and/or reduced power generation. In the case of visual impact, removal or relocation of one or two individual turbines from a 41-turbine array is unlikely to result in a significant change in Project visibility and visual impact from most locations.

The final 41 turbine sites will be selected based on input and guidance received from landowners and Project cultural resource, noise, and ecological consultants, as well as agency personnel (e.g., NYS Department of Agriculture & Markets) to assure that adverse impacts have been reduced to the extent practicable.

In addition to evaluating turbine siting alternatives, alternate means of connecting with the existing NYSEG 230 kV line were evaluated. Different voltage levels for the transmission line (34.5, 115, and 230 kV) were considered, as well as different routes, and the alternative or placing the line underground. An analysis of potential transmission line voltages was undertaken to assure that the line would be appropriately sized to accommodate expected generation from the proposed Project, while minimizing line losses of electricity. This analysis determined that, given the length of the line (9.4 miles), the size of the generating project, and electrical losses, a 115 kV line would be the most appropriately sized transmission facility. This being the case, the alternative of going underground became cost prohibitive. In addition, crossings of steep slopes, wetlands, and the Cohocton River were unavoidable along any transmission line route across the Cohocton River Valley. An underground line, while reducing visual impacts, would likely result in more disturbance to these sensitive resources than would an overhead facility.

As far as the proposed route is concerned, the transmission line route proposed avoids the Village of Cohocton and other areas of concentrated settlement. Public roads are also being avoided to the extent practicable in an attempt to minimize disturbance/interference with yards, homes, street tress, and utility lines. The proposed route largely follows field edges and crosses open land (farm fields, successional old field/shrubland, and scrub-shrub wetland), where required tree clearing will be limited. On the valley walls, where forest clearing is unavoidable, alternative routing that would reduce the extent of clearing were not considered acceptable by the involved landowners (because CPP does not have the right of Eminent Domain, any proposed route must be agreed to by the affected landowners). The proposed alignment across Wetland AV-1 utilizes previously disturbed areas (including a rudimentary road, junkyard, and existing railroad ROW) to minimize disturbance to this area. Consequently, the proposed transmission line route is considered the only feasible route available to the Applicant.

As to turbine selection, the wind industry is generally moving toward the use of larger wind turbine generators, since they are generally more cost-effective (i.e., have a more favorable ratio of the rotor-swept area to generator size). Use of smaller turbines would not significantly reduce environmental impacts. If installed at the same density, the number of tower sites, length of access road, and length of electric interconnect would not be reduced. Thus, impacts would be roughly equal, while potential power generation would be significantly reduced through the use of smaller turbines. To maintain an equivalent level of power generation, more of the smaller turbines would be required. This would increase temporary and permanent disturbance to soils, vegetation, and agricultural resources as the number of towers and the length of required access road and interconnect increases. Potential operational impacts (e.g., noise, avian mortality) would also likely increase with a larger number of smaller machines. In terms of visibility and visual impact, while smaller turbines might be marginally less visible, they would still be very tall structures and their higher density/greater number could actually increase the Project's visual impact. For example, to achieve 82 MW of total nameplate capacity with a 660 kilowatt (kW) generator (the smallest of the currently available turbines for commercial wind farms), about 124 wind turbines would be required. Several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones (Thayer and Freeman, 1987; van de Wardt and Staats, 1988). Also, given the local set-back requirements and other siting constraints described previously, it is questionable whether a significantly larger number of smaller turbines could be accommodated within the Project Site.

The Project Site, as with most places in New York State, has positive wind shear, which means that the average wind velocity increases along with the height of the wind turbine tower. Eighty-meter towers are the highest towers now commercially available; use of a smaller tower would substantially increase the cost of energy from the facility. As mentioned previously, use of lower towers (e.g., 65 to 70 meters) would not reduce impact associated with road and interconnect construction, and would only marginally reduce visual impact.

In terms of other Project components, the Project is using tubular steel towers instead of lattice, permanent access roads widths will be the minimum necessary to maintain the Project, and all on-site electrical interconnects will be placed underground. These actions will minimize visual impacts associated with the Project.

Consequently, CPP believes that alternative project designs are likely to result in equal or greater adverse environmental impacts, while yielding lower electrical output. They are therefore considered less desirable than the proposed design.

5.4 ALTERNATIVE PROJECT SIZE

As discussed in the previous section, project components of alternative size and number were considered. A project of significantly more, or fewer, turbines would pose challenges to the technical or economic feasibility of the Project. If the proposed number of turbines were significantly reduced, the maximum benefit of the available wind resource would not be realized. If the turbine number was even moderately reduced, the Project would cease to be economically viable due to the high fixed cost of interconnection with the power grid. As with environmental impacts, economic benefits would also be reduced proportionately with a smaller project. Fewer landowners would participate in the Project, and therefore, fewer landowners would realize direct economic benefits. In addition, PILOT payments to the county and Town (which are typically developed on a per MW or per turbine basis), as well as construction expenditures, would be greatly reduced.

As mentioned previously, various siting constraints dictate the size and layout of a wind power project. These constraints make a significantly larger number of turbines within the Project Site highly unlikely. A larger project would result in location of wind turbine towers in areas that do not have ideal wind resources, and would also require installation of more turbines in areas with more sensitive resources and/or higher population density. Although a larger facility would theoretically have more economic value, the greater environmental impacts would not justify the marginally increased power generation potential of the Project.

5.5 ALTERNATIVE TECHNOLOGIES

The turbines proposed for the Project will utilize the latest in wind power generation technology to enhance Project efficiency and safety and minimize impacts such as noise and bird collisions. Alternative power generation technologies, such as fossil-fuel and biomass combustion, would pose more significant adverse environmental impacts, particularly on air quality but also on land use, aesthetics, and water resources. Most fossil fuel-fired generating facilities would require significant amounts of water to operate, the use of which may pose impacts to surface water or groundwater resources as well as fish and other aquatic organisms. Nuclear power plants have not been constructed in the U.S. for over 25 years, due primarily to public opposition, high cost, and concerns over the safe storage and disposal of nuclear waste. These plants also present potential public safety and security/terrorism concerns. Conventional power plants also would not advance the RPS goal of generating 25% of the state's power by 2013.

In regard to other renewable sources of generation, hydroelectric plants have significant impacts on terrestrial and aquatic ecological resources, land use, and aesthetics. They can also only be developed in places with appropriate water volumes and topographic conditions (which do not exist in the Project Site). Other renewable energy technologies, such as solar power and hydrogen, are still either cost-prohibitive or in development. Aside from cost constraints, utility-scale solar power is not feasible in an area such as Western New York, where available sunshine is limited. Currently, wind is the only renewable energy source that can help meet energy needs in a technologically and economically efficient manner. It can also do this without the emission of greenhouse gases and other environmental impacts that alternative power generation technologies would create.

5.6 ALTERNATIVE CONSTRUCTION PHASING

CPP proposes to construct the Project in a single phase during a single construction season. Single phase construction will result in a more efficient construction process, with a shorter duration of construction-related impacts, than a multiple phase construction approach, and will allow resources, such as soils, wildlife, and vegetation, that are temporarily impacted by construction, to begin to recover and/or habituate sooner. In contrast, a multiple phase construction process would result in a longer period of construction disturbance, and would be less economically efficient for both CPP and the local beneficiaries of the direct and indirect economic benefits of the Project.

6.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed Project will require the irreversible and irretrievable commitment of certain human, material, environmental, and financial resources, as described below. For the most part, the commitments of these resources will be offset by the benefits that will result from implementation of the Project.

Human financial resources have already been expended by CPP, the State of New York (i.e., various state agencies), Steuben County and the Town of Cohocton for the planning and review of the Project. The expenditure of funds and human resources will continue to be required throughout the permitting and construction phases of the Project (e.g., for environmental reviews and permitting, site plan approval, building and construction inspections).

The Project also represents a commitment of land for the life of the Project. Specifically, the approximately 44 acres of land to be developed for wind turbines, access roads, and substations will not be available for alternative purposes for the life of the Project. However, because the turbines/towers could be removed, and the land reclaimed for alternative uses at some future date, the commitment of this land to the Project may be neither irreversible nor irretrievable.

Various types of construction materials and building supplies will be committed to the Project. The use of these materials, such as gravel, concrete, steel, etc., will represent a long-term commitment of these resources, which will not be available for other projects.

Energy resources also will be irretrievably committed to the Project, during both the construction and operation of the Project. Fuel, lubricants, and electricity will be required during site preparation and turbine construction activities for the operation of various types of construction equipment and vehicles, and for the transportation of workers and materials to the Project Site. However, the energy resources utilized to construct and operate the Project will be minor compared to the energy generated by the Project and made available to the people of New York State.

7.0 GROWTH INDUCING IMPACTS

Certain proposed actions covered under the SEQRA process have the potential to trigger further development by either attracting a significant local population, inviting commercial or industrial growth, or by inducing the development of similar projects adjacent to the built facility. The proposed Project does not require a work force greater than approximately six employees, and therefore will not lead to significant growth in local population or housing. Although it will support the local economy through the purchase of goods and services, the type and level of expenditures are not of the sort that would generate significant growth of businesses that serve the proposed facility. Therefore, secondary/indirect impacts resulting in local growth are not anticipated to occur as a result of the proposed action.

The Cohocton Wind Power Project is proposed, in part, because of the presence of existing resources and facilities that allow the Project to be economically viable. Specifically, the availability of adequate wind and the presence of an existing transmission line allows for generation and transmission of the Project's electric output to the state power grid. The occurrence of these resources/facilities might suggest that other wind power projects could be proposed on adjacent lands. However, this would be the case with or without the proposed Project. Its presence alone will not encourage the development of additional wind power projects in the area. In fact, because existing transmission facilities have limited additional capacity, the Project may make future projects more difficult to develop if such development could only be accommodated by upgrading the existing transmission line. If this were the case, such upgrades would likely make future projects less economically viable. In addition, landowner willingness and environmental sensitivity play a significant role in the location of wind power projects. As currently proposed, the Project maximizes the land resource of willing landowners within the Pine Hill, Lent Hill, and Brown Hill, portions of the Town of Cohocton, while maintaining environmental sensitivity. Any, additional wind power development in these portions of the Town is likely to be limited due to set-back constraints, more significant environmental impacts, and lack of landowner participation. Construction of the 115 kV transmission line, and associated collector station and substation could make wind power development elsewhere within the Town more likely, if these facilities facilitate interconnection with the existing power grid.

8.0 CUMULATIVE IMPACTS

SEQRA requires a discussion of cumulative impacts where such impacts are "applicable and significant." 6 NYCRR § 617.9(b)(5)(iii)(a). Cumulative impacts are two or more individual environmental effects which, when taken together, are significant or which compound or increase other environmental effects. The individual effects may be effects resulting from a single project or from separate projects.

Where individual effects of the Project may interact with other effects of the Project, such potential cumulative impacts have been addressed in Section 3 above.

This section addresses the potential cumulative impacts that may arise from interactions between the impacts of the Project and the impacts of other projects. In general, cumulative impact analysis of external projects is required where the external projects have been specifically identified and either are part of a single plan or program, or there is a sufficient nexus of common or interactive impacts to warrant assessing such impacts together. The subsections below discuss whether there are identified projects for which cumulative impact analysis is required, and assess the extent to which the impacts of such projects will be cumulative with the impacts of the Cohocton Wind Power Project.

<u>Existing and Approved Projects</u>

There are currently no operating or approved utility-scale wind power projects in Steuben County. The nearest existing project is the Wethersfield Wind Farm, a 10 turbine, 6.6 MW wind energy facility located in the town of Wethersfield in Wyoming County. The Wethersfield facility is located approximately 40 miles from the Project Site, and therefore does not have an impact on the Project Site or the surrounding area within and near the Town of Cohocton.

CPP is not aware of any other existing or approved projects within the Town or surrounding area that do, or if constructed, would, have environmental effects that would interact with those of the Project.

Proposed or Future Projects

Across Steuben County and New York State, several additional wind-powered generating facilities are in the project planning and development phases. The review and approval status of these projects is highly variable, ranging from preliminary site investigations to those with completed system reliability impact studies (requirement of NYISO), detailed project plans, and landowner agreements. The NYISO reviews projects in three main phases: submittal of an interconnection request, preparation of a feasibility study, and completion of a system reliability impact study. This review process separates projects, initially by feasibility to connect to the New York power grid via a selected transmission facility. Proposed projects in any phase of project review by the NYISO are listed on a comprehensive queue listing maintained by NYISO on their website http://www.nyiso.com. It is reasonable to assume, that wind power projects with in-progress system reliability impact studies and with upcoming proposed operation dates may be considered 'proposed' or 'future' projects for the purposes of cumulative impact analysis.

In Steuben County, seven additional projects are considered proposed projects that may fall into this category (NYISO, queue updated 3/20/2006). These include the following:

- Ecogen Prattsburgh/Italy Valley Wind Farm (79.5 MW)
- Prattsburgh Wind Park [WindFarm Prattsburgh] (75 MW) proposed by UPC Wind Management, LLC and Global Winds Harvest, Inc.
- Hartsville Wind Farm (50 MW) proposed by Airtricity Developments, LLC
- Canisteo Hills Windfarm (149 MW) proposed by Invenergy NY, LLC
- Pine Hill Wind Generation (100 MW) proposed by Clipper Windpower, Inc.
- Canandaigua II [Dutch Hill] (42 MW) proposed by UPC Wind Management, LLC
- Pine Hills II (100 MW) proposed by Clipper Windpower Development, Inc.
- Howard Wind Project (102.3 MW) proposed by Everpower Global

Because the precise location of these proposed facilities is not made available on the NYISO queue, CPP is not able to identify the actual locations of most of these projects, and, therefore, is not able to provide a detailed cumulative impact analysis. The exceptions are the Ecogen Prattsburgh/Italy Valley Wind Farm, which has been the subject of a Final Generic EIS issued by SCIDA, the WindFarm Prattsburgh Project (proposed by an affiliate of CPP and Global Winds Harvest), and Canandaigua II (Dutch Hill) project, which is also being proposed by an affiliate of CPP. Further, it is important to note that the assumption that one or more of the proposed Steuben County projects would complete the NYISO review; complete SEQRA review; complete state, federal, and local permitting; receive funding; and be constructed is also speculative. Any, or all of the proposed projects in Steuben County may not be approved and/or constructed, and therefore would not contribute to cumulative impacts associated with the construction and operation of the Cohocton Wind Power Project.

Nonetheless, for purposes of this DEIS, CPP assumes that all of the proposed projects will be approved and constructed, and provides the analysis which follows of potential cumulative impacts to the extent ascertainable. In most cases, only limited information about the other projects is available, so only a limited analysis is possible.

Ecogen and Global Winds Harvest Prattsburgh Projects

The Ecogen Prattsburgh/Italy Wind Farm and the WindFarm Prattsburgh Project are proposed to be constructed in close proximity to each other in the Towns of Italy (Yates County) and Prattsburgh (Steuben County). As measured to the nearest turbine, these projects are located approximately 5 miles east of the Cohocton Wind Power Project. Due to the distance to these projects, they will not create cumulative construction impacts with the Project. With respect to operational impacts, the two projects will not create cumulative noise and shadow flicker impacts with the Project. Cumulative impacts arising from simultaneous operation of the three projects are anticipated to be limited to visual and avian impacts. However, such impacts are not anticipated to be significant, due to the distance between the Project and the other two projects. If the two Prattsburgh area projects are visible from the same vantage points as the Project, they will typically be background features in any foreground or midground view that includes the Cohocton turbines.

The Final Generic EIS prepared with respect to the Ecogen project analyzed the cumulative impacts that could arise between it and the Global Winds Harvest project.

Dutch Hill Project

Canandaigua Power Partners, II, LLC, an affiliate of CPP, has filed an interconnection request with the NYISO with respect to the Dutch Hill Wind Farm, a proposed 42 MW wind energy project. If constructed, the Dutch Hill project would consist of 21 2.0 MW wind turbines located on Dutch Hill in the Town of Cohocton. The Dutch Hill site is located directly west of the proposed Cohocton Wind Power Project, across the Cohocton River Valley. This site is approximately 1.6 miles from the nearest turbine included in the Project. It is located directly north of the Village of Cohocton and southwest of the Hamlet of Atlanta. Like the proposed Project Site, the Dutch Hill site is primarily elevated, open agricultural land.

Canandaigua Power Partners, II, LLC, is currently in the process of seeking the land rights necessary to develop the Dutch Hill project. It does not presently have all of the necessary rights, and it is unclear when it will secure them. If the rights can be secured, Canandaigua Power Partners, II, LLC, intends to proceed with project development on an expeditious schedule.

Canandaigua Power Partners, II, LLC, has not yet developed a final turbine layout, access road or collection system line arrangement, or interconnection route for the Dutch Hill project. Therefore, it is not possible to assess the impacts of the Dutch Hill project at this juncture, other than in the most general way. From that general perspective, it is possible to say that, if the Dutch Hill project were constructed at the same time as the Project, there could be cumulative impacts upon local roads, as well as cumulative noise or dust impacts. Should this situation arise, any cumulative impacts would be temporary and short-term in nature. CPP and its affiliate, Canandaigua Power Partners, II, LLC, would coordinate transportation routes to assure that the duration and extent of impact is minimized and that road repair/restoration work is accomplished at the appropriate time, and at no cost to the affect jurisdictions. If the projects are constructed sequentially, the effect would be to increase the period during which construction period impacts occur. If both projects are constructed and enter into operation, there could be cumulative noise, shadow flicker, and visual impacts given their relative proximity to each other on essentially adjoining hillsides. Conversely, if both projects are developed, the economic benefits to local landowners, the Town, and the other taxing jurisdictions would be increased.

It is important to note that the Dutch Hill project is not a second phase of the Cohocton Wind Power Project. Rather, the two projects are separate projects. The Dutch Hill project will be owned and operated by a separate project company, on a separate site, with a separate electrical interconnection. Construction and operation of the Project is not dependent upon the development or operation of the Dutch Hill project, and the two projects will not be functionally dependent upon each other. Review of the Cohocton Wind Farm Project pursuant to SEQRA, and subsequent issuance of the permits necessary to construct and operate the Project, will not commit any reviewing agency to approve the Dutch Hill project.

To the contrary, the Dutch Hill project will be separately reviewed. To assure that all environmental impacts are fully and appropriately reviewed, if and when the Dutch Hill project is reviewed pursuant to SEQRA, a full cumulative impact assessment of the interactions between the two projects will be conducted when the Dutch Hill project is reviewed pursuant to SEQRA. At that point, in contrast to now, information about the Dutch Hill project necessary to conduct such an assessment will be available.

Other Steuben County Wind Energy Projects

It is reasonable to assume, based upon the limited information provided by the interconnection queue, that all of the proposed project sites for the remaining four wind energy projects proposed in Steuben County are located from 3 to 30 miles from the Project Site. Given that, cumulative impacts to area residences from noise or shadow flicker are unlikely, as the turbines would not overlap or be interspersed with proposed Cohocton turbines (i.e. be located within ½ mile of each other). However, potential cumulative impacts could include construction-related impacts to area roads and bridges. This would only occur if two or more projects were constructed simultaneously and if they used the same construction delivery routes. Should this situation arise, any cumulative impacts would be temporary and short-term in nature. Upon issuance of approvals of individual projects, coordination of transportation routes would be undertaken by the involved project developers to assure that the duration and extent of impact is minimized and that road repair/restoration work is accomplished at the appropriate time, and at not cost to the affect jurisdictions.

The most likely cumulative impact resulting from the construction of multiple proposed wind power projects within the County would be the effects on visual/aesthetic resources and community character. The cumulative impact of multiple projects will be highly variable depending upon the number of turbines visible, their proximity to the viewer, the landscape setting and the viewer's attitude toward wind power. If multiple projects were visible from a particular viewpoint, the typical scenario would have portions of one project being visible in the foreground while another is visible in the background. Although a project may be visible from many miles away, its visual impact diminishes significantly at distances over 3.5 miles (Eyre, 1995). In addition, long distance views across Steuben County are highly variable and often screened by valley topography and forest vegetation. Consequently, visibility of multiple projects (if they are ultimately built) would generally be restricted to elevated, open (agricultural) areas, where residential density is generally lower (as opposed to villages and hamlets which are often located in valley setting and have limited outward views to the landscape due to the presence of building and trees).

9.0 EFFECTS ON USE AND CONSERVATION OF ENERGY RESOURCES

The proposed Project will have significant, long-term beneficial effects on the use and conservation of energy resources. The operating Project will generate up to 82 MW of electricity without any fossil-fuel emissions. Assuming that the average house in Western New York uses approximately 650 kilowatt hours of electric power per month, and assuming the Project actually generates approximately 30% of its nameplate generating capacity, this is enough power to support approximately 28,700 homes in New York State (on an average annual basis). The Project will add to and diversify the state's sources of power generation, accommodate growing power demand through the use of a renewable resource (wind) and over the long term may displace some of the state's older, less efficient, and dirtier sources of power.

It will also facilitate compliance with the Public Service Commission (PSC) "Order Approving Renewable Portfolio Standard Policy", issued on the 24th of September 2004. This Order calls for an increase in renewable energy used in the state to increase to 25% (from the then level of 19%) by the year 2013. The principal benefits of the Project are in accordance with the 2002 State Energy Plan (New York State Energy Planning Board, 2002), namely:

- "Stimulating sustainable economic growth"
- "Increasing energy diversity…including renewable-based energy"
- "Promoting and achieving a cleaner and healthier environment"

10.0 REFERENCES

Adams, J. 2006. [Personal Communication]. Town of Cohocton Police Department. Telephone Correspondence on March 7, 2006.

American Wind Energy Association (AWEA). *Wind Energy Fact Sheets: Comparative Air Emissions of Wind and Other Fuels, Wind Energy and Noise, Wind Power Myths vs. Facts*. Retrieved January 2006, from http://www.awea.org/pubs/factsheets.html.

AWEA. 2005. *Facts About Wind Energy and Noise*. Retrieved December 2005, from http://www.awea.org/pubs/factsheets/WE_Noise.pdf

AWEA. 2006. *Wind Energy and the Environment*. Retrieved January 2006, from http://www.awea.org/faq/.

Australian Wind Energy Association (AusWEA). 2003. *Wind Farms and Tourism*. September 18, 2003. Retrieved February 2006, from http://www.thewind.info/downloads/tourism.pdf.

Bat and Conservation Management, Inc (BCM). 2004. *2004 Woodland bat survey at Prattsburgh/ Italy New York, July 6 – August 26, 2004*. Final report prepared for Bat Conservation and Management, Inc. Carlisle, Pennsylvania, US.

Bellrose, F.C. 1976. *Ducks, Geese, and Swans of North America*. Wildlife Management Institute Publication. Stackpole Books, Mechanicsburg, PA.

Carr, D. 2005. [Personal Communication]. Electronic mail correspondence between David Carr and Chris Swartley, November 28, 2005.

Cary, R. 2005. [Personal Communication]. Town of Fenner Supervisor. Conversation with Matthew Jacobus, Student Intern at Finger Lakes Institute and author of *Wind Power Debate: Philosophical, Economic, and Social Issues Surrounding Wind Power in New York State and the Finger Lakes Region*. December 9, 2005.

Clean Power Now (website). *Impact on Tourism in Our Area. Retrieved January 2006, from* http://www.cleanpowernow.org/modules.php?op=modload&name=Sections&file=index&req=printpage&artid=15.

Cleveland, M. 2006. [Personal Communication]. Zone Sergeant, New York State Police Troop E. Telephone Correspondence, January, 2006.

Cooper, B.A., T.J. Mabee, and J.H. Plissner. 2004a. *A Visual and Radar Study of Spring Bird Migration at the Proposed Chautauqua Wind Energy Facility, New York*. Final Report. Prepared for Chautauqua Windpower, LLC, Lancaster, NY.

Cooper, B.A., T. Mabee, and J. Plissner. 2004b. *Radar study of nocturnal bird migration at the proposed Mount Storm wind power development, West Virginia, Fall 2003*. *Appendix in*: Baseline Avian studies Mount Storm wind power project, Grant County, West Virginia, final report April 2004. Prepared for NedPower Mount Storm, LLC.

Corning Hospital. 2006. *Medical Staff and Services.* Retrieved January, 2006 from http://www.corninghospital.com/ and http://hospitals.nyhealth.gov/browse_view.php?id=50.

DeGaetano, A., Bates, T., Davenport, T., Hecklau, J., and H. Walter-Peterson. 2004. *Chautauqua Windpower Project: Report on Potential Microclimatic Impacts to Vineyards.* Report prepared for the Towns of Ripley and Westfield, New York. December 8, 2004.

Drennan, S. R. 1981. *Where to Find Birds in New York State: The Top 500 Sites*. Syracuse University Press, Syracuse, NY.

Elliot, D.L., L.L. Wendell, and G.L. Gower. 1991. *An Assessment of Windy Land Area Wind Energy Potential in the Contiguous United States.* Battelle Pacific Northwest Laboratory, 1991.

Environmental Protection Agency (EPA). 2003. *2001 Toxics Release Inventory State Fact Sheet, New York*. Retrieved December 21, 2005 from http://www.epa.gov/tri/tridata/tri01/state/New%20York.pdf.

EPA. 2005. *Local Drinking Water Information*. Retrieved November 29, 2005 from http://www.epa.gov/safewater/dwinfo/ny.htm.

Erickson, W., G.D. Johnson, M.D. Strickland, K.J. Sernka, and R. Good. 2001. *Avian Collisions With Wind Turbines: A Summary of Existing Studies and Comparisons to Other Sources of Collision Mortality in the United States*. White paper prepared for the National Wind Coordinating Committee, Avian Subcommittee, Washington, DC.

Erickson, W.G., G.D. Johnson, M.D. Strickland, R. Good, M. Bourassa, K. Bay, and K. Sernka. 2002. *Synthesis and Comparison of Baseline Avian and Bat Use, Raptor Nesting, and Mortality Information from Proposed and Existing Wind Power Developments.* Booneville Power administration, Portland, OR.

Eyre, N.J. 1995. European Commission, DGXII, Science, Research and Development, JOULE, *Externalities of Energy, "Extern E" Project.* Volume 6. Wind and Hydro, Part I, Wind, pp1-121, Report No. EUR 16525.

Federal Aviation Administration (FAA). 2005. *Development of Obstruction Lighting Standards for Wind Turbine Farms*. DOT/FAA/AR-TN 05/50. U.S. Department of Transportation, Washington, D.C.

Funk, R. 1993. *Archeological Investigations in the Upper Susquehanna Valley, New York State Vol. 1*. Persimmon Press, Buffalo, NY.

Gilman, M. 2006. [Personal Communication]. Cohocton Volunteer Fire Department. Telephone correspondence on March 7, 2006.

Government Accountability Office (GAO). 2005. GAO-05-906. *Wind Power: Impacts on Wildlife and Government Responsibilities for Regulating Development and Protecting Wildlife*. Report to Congressional Requesters. September 2005.

Hicks, A. 2006. [Personal Communication]. Wildlife Biologist, NYSDEC. Electronic mail correspondence with Benjamin Brazell on February 9, 2006.

Hicks, A. 2006. [Personal Communication]. Wildlife Biologist, NYSDEC. Telephone correspondence with John Hecklau.

Hopkins, D. 2006. [Personal Communication]. Deputy Director of Emergency 911 Center, Steuben County, NY. Telephone Correspondence on February 3, 2006.

Institute for Integrated Rural Tourism. 2003. *Survey of NEK Visitors.* Report conducted for East Haven Windfarm. Retrieved February 2006, from http://www.revermont.org/press/neksurvey.pdf.

Ira Davenport Memorial Hospital, Inc. 2006. *Medical Staff and Primary Care*. Retrieved Januaury 2006, from http://www.davenportandtaylor.org/ and http://hospitals.nyhealth.gov/browse_view.php?id=84

Johnson, G.D., W.P. Erickson, M.D. Strickland, R.E. Good, and P. Becker. 2000. *Avian and Bat Mortality Associated in the Initial Phase of the Foote Creek Rim Windpower Project, Carbon County, Wyoming: November 3, 1998-October 31, 1999*. Report to SeaWest Energy Corp. and Bureau of Land Management.

Johnson, G.D., and M.D. Strickland. 2004. *An Assessment of Potential Collision Mortality of Migrating Indiana Bats (Myotis sodalis) and Virginia Big-eared Bats (Corynorhinus townsendii virginianus) Traversing Between Caves Supplement to: Biological Assessment for the Federally Endangered Indiana Bat (Myotis sodalis) and Virginia Big-eared Bat (Corynorhinus townsendii virginianus)*. Western Ecosystems Technology, Inc. Cheyenne, WY.

Kerlinger, P. 2005. *Phase I Avian Risk Assessment for the Munnsville Wind Farm, Madison and Oneida Counties, New York, January 2005*. Report prepared for Citizens Airtricity Energy.

Kerlinger, P. 2006. [Personal Communication]. Electronic mail correspondence with Benjamin Brazell on January 25, 2006.

Kerns, J., and P. Kerlinger. 2004. *A Study of Bird and Bat Collision Fatalities at the Mountaineer Wind Energy Center, Tucker County, West Virginia: Annual report for 2003*. Report to FPL Energy and the MWEC Technical Review Committee.

Koford, R., A. Jain, G. Zenner, and A. Hancock. 2005. *Avian Mortality Associated With the Top of Iowa Wind Farm*. Report prepared by Iowa Coop. Fish and Wildlife Res. Unit, Iowa State University, and the Iowa Department of Natural Resources.

Korsgaard, J., and I. Mortensen. 2006. *Lightning Protection Sought for Wind Turbine Blades. North American Windpower* 3: 1, 16-19.

Leddy, K., K. Higgins, and D. Naugle. 1999. *Effects of Wind Turbines on Upland Nesting Birds in Conservation Reserve Program Grasslands.* Wilson Bulletin 111:100-104.

Mabee, T.J., J.H. Plissner, and B.A. Cooper. 2005. *A Radar and Visual Study of Nocturnal Bird and Bat Migration at the Proposed Prattsburgh-Italy Wind Power Project, New York, Fall 2004*. Final Report prepared for Ecogen LLC, March 2005.

Market and Opinion Research International (MORI) Scotland. 2002. *Public Attitudes to Windfarms: A Survey of Local Residents in Scotland (2002).* Research Study Conducted for Scottish Renewables and British Wind Energy Association. Retrieved February 2006, from http://www.mori.com/polls/2002/windfarms.shtml

Morgan, C., and E. Bossanyi. 1996. *Wind Turbine Icing and Public Safety – A Quantifiable Risk?* Wind Energy Production in Cold Climates, Bengt, Tammelin, Kristiina, Säntti.

Morgan, C., and E. Bossanyi, H. Seifert. 1998. *Assessment of Safety Risks Arising from Wind Turbine Icing.* BOREAS IV. March 31 – April 2, 1998. Hetta, Finland.

National Wind Coordinating Committee (NWCC). 2005. *Technical Considerations in Siting Wind Developments Research Meeting.* Conference held in Washington, D.C., December 1-2, 2005.

Natural Resource Conservation Service (NRCS). 2005. *New York Portion of the National Hydric Soil List*. Retrieved November 22, 2005 from ftp://ftp-fc.sc.egov.usda.gov/NSSC/Hydric_Soils/Lists/ny.xls.

NRCS. Not Dated. *Climate Information for Steuben County in the State of New York*. Retrieved November 29, 2005 from http://www.wcc.nrcs.usda.gov/cgibin/climchoice.pl?state=ny&county=36101.

New York Archaeological Council (NYAC). 1994. *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State.* New York State Office of Parks, Recreation, and Historic Preservation, Waterford.

New York State Data Center. 2002. *2000 Population and Housing Data.* Retrieved January 2006, from http://www.nylovesbiz.com/nysdc/data_population.asp

New York State Department of Environmental Conservation (NYSDEC). Not Dated. *New York State 2000 Toxic Release Inventory Report*. Retrieved December 21, 2005 from http://www.dec.state.ny.us/website/der/tri/tri00.pdf.

NYSDEC. Not Dated. *Municipal Solid Waste Landfills*. Retrieved March 2006, from http://www.dec.state.ny.us/website/dshm/sldwaste/newsw2.htm

New York State Department of Environmental Conservation (NYSDEC). Not Dated. *D.E.C. Aesthetics Handbook*. NYSDEC. Albany, N.Y.

NYSDEC. Unpublished. *Freshwater Wetlands Act Classification Datasheet for Wetland AV-1*. Site visit October 12, 1982.

NYSDEC. 2000. *Program Policy: Assessing and Mitigating Visual Impacts.* DEP-00-2. Division of Environmental Permits, Albany, New York. Issued July 31, 2000.

NYSDEC. 2001. *Program Policy: Assessing and Mitigating Noise Impacts*. DEP-00-1. Division of Environmental Permits, Albany, New York. Issued October 6, 2000; revised February 2, 2001.

NYSDEC. 2004. *2004 New York State Air Quality Report: Data Tables*. Retrieved November 28, 2005 from http://www.dec.state.ny.us/website/dar/baqs/aqreport/index.html.

NYSDEC. 2006. *New York State Amphibian and Reptile Atlas Project: 1990-1999. Retrieved January 2006, from http://www.dec.state.ny.us/website/dfwmr/wildlife/herp/.*

New York State Department Of Labor. 2004. *New York Workforce & Industry Data, 2004 Business Expansions.* Retrieved January 2006, from http://www.labor.state.ny.us/workforceindustrydata/index.asp?reg=sou

New York State Department of Taxation and Finance. 2005. *New York State Sales and Use Tax Rate Decrease, Effective June 1, 2005.* Retrieved January 2006, from http://www.tax.state.ny.us/pdf/notices/n05_8.pdf.

NYSDOT. 2004. *2004 Traffic Volume Report*. Albany, NY. Retrieved December 2005, from http://www.dot.state.ny.us/tech_serv/high/tdr.html.

New York State Energy Planning Board. 2002. *State Energy Plan and Final Environmental Impact Statement.* Issued June 19, 2002. Retrieved December 2005, from http://www.nyserda.org/Energy_Information/energy_state_plan.asp

New York State Energy Research and Development Agency (NYSERDA). 2003. Power Naturally, NY (website). 2005. *Public Health and Safety.* Report by Global Energy Concepts. Retrieved December 2005, from http://www.powernaturally.org/Programs/Wind/toolkit/18_publichealthandsafety.pdf

New York State Museum/New York State Geological Survey. 1999a. *Surficial Geology*. Retrieved November 14, 2005 from http://www.nysm.nysed.gov/gis.html

New York State Museum/New York State Geological Survey. 1999b. *Statewide Bedrock Geology*. Retrieved November 14, 2005 from http://www.nysm.nysed.gov/gis.html

New York State Office of Parks, Recreation, and Historic preservation (OPRHP). 2003. *Statewide Comprehensive Outdoor Recreation Plan (SCORP)*, Albany, NY.

New York State Office of Real Property Services (NYSORPS). 2004. *Real Property Tax Law (RPTL) §487[8].* Retrieved January 2006, from http://dsireusa.org/documents/Incentives/NY07F.htm

New York Office of Parks, Recreation and Historic Places (OPRHP) Website. 2005. *State and National Listed Sites for Steuben County.*

New York State Office of the State Comptroller. *2003 Local Government Services and Economic Development, Financial Data*. Retrieved January, 2006 from http://www.osc.state.ny.us/localgov/datanstat/findata/index_choice.htm

Nicholas H. Noyes Memorial Hospital. 2006. *Physician and Health Services.* Retrieved January 2006, from http://www.noyes-health.org/ and http://hospitals.nyhealth.gov/browse_view.php?id=140

Orcutt, S. 2006. [Personal Communication]. Assistant Commissioner, Steuben County Landfill Four. Telephone Correspondence with Brian Schwabenbauer on March 24, 2006.

Polisky, L. 2006. [Personal Communication]. Comsearch. Electronic mail correspondence with Benjamin Brazell on February 13, 2006.

Public Service Commission (PSC). 2004. *PSC Votes to Adopt Aggressive Renewable Energy Policy for New York State.* Press Release dated September 22, 2004. Retrieved January 31, 2006 from http://www3.dps.state.ny.us

PSC. 2004a. *Final Generic Environmental Impact Statement in Cae 03-E-0188 – Proceeding on Motion of the Commission Regarding a Renewable Portfolio Standard*. August 26, 2004.

Reschke, C. 1990. *Ecological Communities of New York State.* New York Natural Heritage Program, New York State Department of Environmental Conservation, Latham, NY.

Robbins, L. W. and E. R. Britzke. 1999. *Discriminating Myotis sodalis from Myotis lucifugus with Anabat-a critique*. Bat Research News, 40:75-76.

Roy, R. 2006. [Personal Communication]. Electronic mail correspondence with Benjamin Brazell on February 7, 2006.

Roy, R. 2006. [Personal Communication]. Electronic mail correspondence with Benjamin Brazell on February 9, 2006.

Roy S.B., Pacala S.W., and R.L. Walko. 2004. *Can Large Wind Turbines Affect Local Meteorology?* Journal of Geophysical Research, 109, D190101.

Saint James Mercy Health System. 2006. *Physicians and Services*. Retrieved January 2006, from http://www.stjamesmercy.org/index.php?home and http://hospitals.nyhealth.gov/browse_view.php?id=197

San Martin, R. 1989. *Environmental Emissions from Energy Technology Systems: The Total Fuel Cycle*. U.S. Department of Energy, Spring 1989.

Sauer, J.R., J.E. Hines, and J. Fallon. 2005. *The North American Breeding Bird Survey, Results and Analysis 1996-2004*. Version 2005.2. USGS Patuxent Wildlife Research Center, Laurel, MD.

Southern Tier Central Regional Planning & Development Board. *Steuben County Data/Reports.* Retrieved January 2006, from http://www.stcrpdb.dst.ny.us/documentMenus/

Sterzinger, G and F. Back, D. Kostiuk. 2003. *The Effect of Wind Development On Local Property Values*. For Renewable Energy Policy Project (REPP). May 2003.

Stone, C. 2005. [Personal Communication]. Electronic mail correspondence with John Hecklau on December 1, 2005.

TetraTech EC, INC. 2005. Maple Ridge Wind Farm. *Construction and Environmental Monitoring Implementation: Wind Generating Facility*. April, 2005.

Thayer, R.L. and C.M. Freeman. 1987. *Altamont: Public Perception of a Wind Energy Landscape*. Landscape and Urban Planning. 14: pp. 379-398.

Tweddell, R.C. 2006. [Personal Communication]. Steuben County Sheriff. Telephone Correspondence on March 8, 2006.

United States Census Bureau. 2000. *American Fact Finder*. Retrieved January, 2006 from http://factfinder.census.gov/home/saff/main.html?_lang=en

United States Department of Agriculture (USDA). 1978. *Soil Survey of Steuben County, New York*. USDA Soil Conservation Service in Cooperation with Cornell University Agricultural Experiment Station, Washington, D.C.

USDA National Agricultural Statistics Service. 2002. *National Agricultural Statistics Service, 2002 Census of Agriculture.* Retrieved January 2006, from http://www.nass.usda.gov/Census_of_Agriculture/index.asp.

United States Department of Energy (DOE). 1997. *Total U.S. Consumption for 1996 is estimated at 3.2 trillion kWh. Annual Energy Review 1996.* Energy Information Administration, July 1997.

United States Geographical Services (USGS). 2003. *A Tapestry of Time and Terrain: The Union of Two Maps – Geology and Topography.* Retrieved November 17, 2005 from http://tapestry.usgs.gov/physiogr/physio.html.

Van de Wardt, J.W. and H. Staats. 1998. *Landscapes with wind turbines: environmental psychological research on the consequences of wind energy on scenic beauty*. Research Center ROV Leiden University.

Versaggi, N. 1987. *Hunter-Gatherer Settlement Models and the Archaeological Record: A Test Case from the Upper Susquehanna Valley of New York*. PhD dissertation. Binghamton University: Binghamton, New York.

Versaggi, N. 1996. *Prehistoric Hunter-Gatherer Settlement Models: Interpreting the Upper Susquehanna Valley*. A Golden Chronograph for Robert E. Funk, Occasional Publications in Northeastern Anthropology, No. 15: 129-140.

Versaggi, Nina M., LouAnn Wurst, T. Cregg Madrigal, and Andrea Lain. 2001. *Adding Complexity to Late Archaic Research in the Northeastern Appalachians*. Archaeology of the Appalachian Highlands, L.P. Sullivan and S.C. Prezzano (ed.), pp. 121-137. University of Tennessee Press: Knoxville.

Wisconsin Rural Energy Management Council. 2000. *Wisconsin Legislative Council Information Memorandum*. Retrieved December 2005, from http://www.legis.state.wi.us/lc/jlc00/im00_13.pdf

Woodlot Alternatives, Inc. 2005a. *Avian and Bat Information Summary and Risk Assessment for the Proposed Cohocton Wind Power Project in Cohocton, New York*. Final Report. Prepared for UPC Wind Management, LLC. February 2006.

Woodlot Alternatives, Inc. 2005b. *Spring 2005 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed WindFarm Prattsburgh Project in Prattsburgh, NY*. Prepared for WindFarm Prattsburgh, LLC.

Woodlot Alternatives, Inc. 2005c. *Fall 2004 Radar, Visual, and Acoustic Survey of Bird and Bat Migration at the Proposed WindFarm Prattsburgh Project in Prattsburgh, New York.* Prepared for WindFarm Prattsburgh, LLC. March, 2005.