4 Unavoidable Adverse Impacts

The proposed Project will result in significant long-term economic benefits to participating landowners, as well as the Towns of Ripley and Westfield and Chautauqua County. Local economic benefits will include temporary construction employment and permanent O&M employment. There will be an increase in commerce in the towns and County due to spending by Project team employees, suppliers, and local merchants. The County, towns, and school districts will experience new revenue through payments in lieu of taxes. The towns will experience additional new revenue through payments made under the terms of host community agreements. Revenue increases will be experienced by local landowners in the form of royalty payments according to their individual lease agreements. When fully operational, the Project will provide approximately 125 MW of electric power generation capacity with no emissions of pollutants or greenhouse gases to the atmosphere. The development is compatible with surrounding land uses and will help maintain the area as predominately agricultural in use.

Notwithstanding the positive effects anticipated as a result of the Project, its construction and operation will result in certain unavoidable adverse impacts to the environment. The most significant adverse environmental impacts associated with the construction of the Project will be localized and/or of short duration. Site preparation (e.g., clearing and grading) and the installation of roads, turbines, interconnect cables, operations and maintenance building, the concrete batch plan, and the substation will have impacts on the soil, water, wetlands, and ecological resources of the site. Construction will also have minor short-term localized impacts on transportation, air quality, and noise levels. These impacts will largely result from the movement and operation of construction equipment and vehicles.

Long-term operational impacts include changes in community character due to changes in the viewshed as a result of the installation of the turbines, an increase in ambient noise levels primarily at participating landowner receptor locations (residences) within the Project Area, a relatively minor loss of agricultural land, wildlife habitat changes, wetland impacts, and an increase in avian and bat mortality associated with collisions with the turbines. Installation of a permanent meteorological tower is not expected to result in changes to the visual landscape, land use, terrestrial ecology or biological resources.

Although some adverse environmental impacts will occur, they will be minimized through the use of various general and site-specific mitigation measures and best

management practices. With the incorporation of 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 general and specific mitigation measures have been incorporated into the Project design and construction and operating procedures in order to minimize adverse impacts to specific resources.

4.1 Project Design Mitigation Measures

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:

- Pre-screening the site for environmental constraints prior to selection;
- Siting turbines and other Project facilities in compliance with all local setback requirements to minimize noise, shadow flicker, and public safety concerns (setback from the property line is equal to or greater than 1.5 times the proposed structure height; setback from overhead utility lines, dwellings, agricultural buildings, or other turbines is equal to 1.2 times the structure height, including blades);
- Adhering to NYSDAM Agricultural Mitigation for Windpower Projects, wherever possible;
- Siting turbines outside of wetlands and utilizing existing disturbed areas when access road and collection lines are required to cross streams and wetlands wherever possible;
- Siting turbines in open field areas to the extent possible to minimize forest clearing;
- Using existing roads for turbine access whenever possible, to minimize impact to soil, ecological, and agricultural resources;
- Ensuring that Project design, engineering, and construction is in compliance with industry standards and codes 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;
- Following best management practices for construction procedures for sediment and erosion control; and
- Including grounding and automatic shutdown/braking capabilities on all turbines to minimize public safety concerns.

4.2 Project Construction and Operation Mitigation Measures

Project construction and operation will also include specific measures to mitigate potential impacts to specific resources. These include:

- Developing and implementing a complaint resolution procedure to address landowner concerns throughout Project construction and operation.
- Developing and implementing a wetland mitigation plan to offset unavoidable impacts.
- 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 SPCC plan.
- Undertaking a pre-construction breeding bird survey to avoid impacting any nesting listed species during construction.
- Creating video documentation of existing road conditions, developing a road improvement plan, and undertaking public road improvement/repairs at no cost to the Town or County.
- Performing post-construction avian and bat monitoring studies to further agency knowledge on Project impacts to birds and bats; and, coordinating with state and federal agencies regarding potential adaptive management measures to address significantly adverse impacts to these resources.
- Entering into a Memorandum of Agreement (MOA) with NYSHPO to fund a historic preservation/restoration program as mitigation for unavoidable visual impacts on historic resources.
- Entering into PILOT agreements with the local taxing jurisdictions to provide significant predictable levels of funding for the Town, County and school districts; and entering into host community agreements with the towns to provide additional levels of funding.
- Developing an emergency response plan with local first responders prior to construction to address safety concerns during construction activities and major repairs.

4.3 Environmental Monitoring Plan

The Developer will adhere to an environmental monitoring plan to mitigate potential adverse impacts. As mentioned in Section 2.4 of this DEIS, construction activities will be monitored to ensure compliance with applicable permits and related conditions, agreements, the SWPPP, and BMPs. The draft EMP (see Appendix V) outlines permit conditions and other commitments associated with wet-

land and stream disturbance, vegetation removal, storm water management, erosion control, and agricultural resources.

An independent Environmental Monitor will be retained to coordinate environmental monitoring activities, document and implement mitigation activities, and prepare regular reports for submission to the Towns of Ripley and Westfield and relevant agencies/parties. The Environmental Monitor will consult with NYSDAM to ensure that construction activities are conducted in accordance with best management practices and NYSDAM guidelines to the extent practicable. If construction takes place in early spring to summer (during breeding season for endangered or threatened avian species), the Environmental Monitor will survey the work area prior to construction. If nesting threatened or endangered avian species are found in the vicinity of a specific construction area, the Developer will coordinate with the USFWS and/or NYSDEC to develop a mitigation plan to address site-specific occurrences of species of concern (see Section 3.7, Bird and Bat Resources). Avoidance of construction in environmentally sensitive areas during specific time frames will be coordinated with the applicable permits and/or agencies.

Concrete trucks will either rinse at the site of the next turbine foundation or back at their point of origin. If dewatering is required prior to pouring of concrete, the dewatering and discharge thereof would follow the detailed erosion and sediment control plans included in the SWPPP. Water will not be taken from naturally flowing streams.

5 Project Alternatives

This section discusses Project alternatives and describes the processes used to select the Project Area and the locations of all Project facilities within the Project Area. The alternatives discussed in this section include: the No-Build Alternative; the Preferred 61 Siemens 2.3-MW, model SWT-2.3-101 WTG project design, the Alternative 79 GE 1.5-MW project design; and a smaller capacity project.

5.1 Project Area Selection Criteria

The Project Area was selected through a systematic process that considered the location of wind resources, the availability of existing roads and utility interconnections, the location of other proposed wind projects, the availability of land with landowners willing to sign lease option agreements for their property, the presence of environmental constraints, and the presence of land use constraints. The selection process evaluated different potential project sites and WTG locations as the Developer obtained property rights within a preferred Project Area sufficient to develop a wind energy facility.

In 2007, the Developer installed meteorological towers in Chautauqua County, New York to explore the potential for commercial-scale wind generating project areas. The following criteria were used to evaluate potential facility locations:

- **Availability of sufficient wind resources.** Wind turbines must be sited in locations where there is sufficient wind flow of adequate speeds and duration. Potential project sites were evaluated using topographic maps, the Developer's internal resource analysis capabilities, and the New York State Wind Resource Map produced by TrueWind™ in 2005. Wind data from installed meteorological towers was used to determine the suitability of the Project Area for wind development. Generally, wind speeds averaging at least 7 m/s are needed for commercial wind energy project viability.

- **Proximity to existing roads and transmission lines.** Accessibility to an existing utility system to deliver the power generated into the energy grid is a key consideration for wind project siting. Use of existing transmission facilities minimizes environmental impacts associated with construction of new power transmission facilities, which otherwise would include clearing ROWs and other construction impacts. A state road and a county road traverse the Project Site and two interstate highways are located in the immediate Project

Area. These transportation routes provide several options to transport Project equipment and materials to the site mostly along roads that were designed to accommodate heavy equipment.

- **Availability of contiguous land.** Large, sparsely settled parcels require less encroachment on residential uses. Agricultural land is particularly important to project development because it offers large amounts of contiguous land, and wind turbines are generally compatible with agricultural practices. While the Project facilities would preclude agricultural production or development on a small portion of each parcel, they generally do not impact land uses in the areas adjacent to the WTGs or access roads, and they generally do not impede future development on surrounding land.

- **Other proposed projects in the area.** Lease agreements between wind developers and landowners typically provide the developer with exclusive rights to develop within a certain area. These agreements make it difficult for a competing developer to build a project in close proximity to a location where another developer already has significant land under lease.

Based on the above criteria, Chautauqua County was identified as an area with considerable potential for project development. The wind resource was verified through the installation and operation of meteorological towers within the Project Area to collect site-specific data. These data were compared to the NYS Wind Resource Map and modeled to predict electrical production from each potential turbine location. Through extensive computer analysis and results of on-site meteorological data, wind resources in this area were determined to be favorable.

At the time the Developer made a decision to target Chautauqua County as a suitable location for a wind project, three other locations in the county were being developed by two other developers. Horizon Wind Energy was developing a 79 MW project in the town of Arkwright and a 73 MW project in Pomfret. Noble Environmental Power LLC was developing a 90 MW project in the Towns of Villanova and Hanover. Because of the difficulty in obtaining adequate land resources with good wind potential in an area where a competing project already has land under lease, these parts of the county were eliminated from further consideration.

The Niagara Mohawk 230-kV Dunkirk-Ripley transmission line that runs through the town of Ripley makes electrical transmission possible in this area. The voltage of the power collection system extending between the WTGs will be 34.5 kV. The electrical interconnection between the Project and the utility will be at or near pole number 46 on Niagara Mohawk's Dunkirk-Ripley south 230-kV line.

Transportation in and through Chautauqua County and the Towns of Ripley and Westfield is provided by a well-developed system of local, state, and county roads. WTG components could be delivered eastbound on Route 86 to Exit 7 , traveling northbound on Route 33 to Route 18; westbound on Route 18 to Route

430; southwest on Route 430 to Route 76; and to the Project Area. County Route 21 and NYS Route 76 could be used for delivered within the Project Site. The roads are generally suitable for delivery of the equipment and materials needed to construct and maintain the Project, though some improvements may be necessary (see DEIS Section 3.12, Traffic and Transportation, and Appendix S, Transportation Assessment). The Project Area also includes many existing farm and logging roads. Improving these existing roads for Project access would minimize the disturbance of additional areas for new roads.

The Project Area comprises privately owned lands. These parcels have a low population density, making them attractive for wind energy development.

Once a potential Project Area was identified, the Developer met with landowners in 2007 and 2008 to determine whether there would be sufficient participation of landowners to develop a viable project. As a result of these discussions and meetings, the Project team determined that there was sufficient support to proceed with development of a wind project. The Developer sought and obtained agreements with landowners within the Project Area that would allow for the construction of Project facilities such as WTGs, access roads, collection lines, the substation, the temporary concrete batch plant, the permanent meteorological tower, and the O&M building and laydown area on their properties. Selection of the Project Area also involved the evaluation of a number of sensitive resource issues that had been identified during the review of an application by another wind developer for a project in the same general area in 2003 (see Appendix N, Bird and Bat Risk Assessment).

Based upon the availability of sufficient wind resources, the proximity to existing roads and transmission lines and availability of contiguous land, the Developer determined that project locations in other portions of the County were not viable or desirable. As such, additional locations were not further evaluated for Project development.

For each alternative analyzed in this DEIS, the Project Site is limited to those locations where the Developer was able to enter into the voluntary landowner agreements. Additionally, the Developer was approached by interested landowners and, as described in Section 2.1.5, is considering the potential for future development of a separate, stand alone project to the south of the Project.

After a potential Project Area was identified based on the above criteria and various levels of community outreach was conducted, an environmental screening analysis was completed, preliminary constraints maps were developed and a site visit was conducted to identify any additional environmental and land use constraints in the Project Area that had the potential to prevent Project development. In addition, existing data and reports were reviewed to identify any constraints or issues of concern.

The "area constraints map" was developed to determine where specific Project facilities could be located. The first step in this design process was to determine potential WTG locations.

The Project Area overlaps a portion of another Chautauqua County wind power project that was proposed for development in 2003 but was never permitted. Twenty-three of the 34 turbine locations proposed by the other project were sited along the Portage Escarpment where spring migrating raptors concentrate. As such, Ripley-Westfield Wind LLC sited the proposed Project to the east and south of the unrelated 2003 project to minimize potential impacts to birds. Areas were also eliminated from consideration as WTG locations if they were located on a NYSDEC or NWI-mapped wetland or in an area that appeared to be "wet" based on a review of soils mapping and or a site investigation.

Other areas generally were eliminated from consideration if they were located:

- Within a legally required setback distance established by relevant local law from a road, residence, or structure;
- Where legally mandated, sound pressure levels would be exceeded as in the case of a school, church, library, hospital, or park;
- In proximity to an airport based on FAA and other applicable requirements; or
- Within a microwave or other radiowave pathway.

When preliminary turbine sites were selected, field visits were conducted to verify that:

- Impacts on wetlands and other environmentally sensitive areas were avoided to the extent practicable;
- Specific landowner concerns were addressed;
- Setback requirements were met; and
- Engineering constraints, such as steep slopes, were minimized.

Once turbine locations were selected, access roads and collection lines were sited to minimize impacts to wetlands and other sensitive environmental features; maximize use of existing road and transmission infrastructure; avoid engineering constraints such as steep slopes; and meet the approval of individual landowners.

Specific criteria were utilized for the preliminary siting of collection lines. The criteria for collection line routing included shortening the length of circuits to minimize electrical losses and other environmental impacts; the availability of property rights; and the absence of environmental constraints. Once preliminary

collection routes were identified, the advantages and disadvantages of overhead versus underground collection lines for each segment of the line were considered. Impacts can be minimized by using various construction techniques, some of which are directional drilling, maintaining buried cable depths in agricultural areas coordinated with landowner operations, and by strategic pole placements. After careful analysis, an underground approach was selected in order to minimize visual impacts to the greatest extent possible.

Where practicable, access roads were sited in accordance with the NYSDAM guidelines to minimize loss of agricultural land and impacts on farming operations. The Developer reviewed the location of Project facilities with NYSDAM representative Michael Saviola in October 2008, who reviewed NYSDAM guidelines with the Project team. Mr. Saviola did not note any siting issues, make specific recommendations or suggest any modifications with respect to the Project layout.

In the interest of minimizing impacts, every effort was made to minimize the number of access road/interconnection systems needed. Each system was designed to collocate electrical lines and roads within the same corridor, where possible; optimize the use of previously disturbed areas, such as farmlands and roads; and avoid or minimize crossing wetlands and streams.

During route selection, desktop and field analyses were performed to determine whether the proposed route had any engineering constraints. Where avoidance of agricultural fields was not practical due to other engineering and/or environmental constraints, placement of access roads, WTGs and the collection system was determined in consultation with the individual landowners and reference to the NYSDAM "Guidelines for Agricultural Mitigation for Windpower Projects," so as to minimize agricultural impact.

Each WTG has been located outside the boundaries of wetlands. The majority of the minimal impacts on wetlands and streams under the proposed layout results from the need to cross wetlands and streams with access roads and/or collection lines. If the Project layout were to be modified to eliminate all impacts on wetlands, other adverse environmental impacts could occur. Examples of increased impacts include the additional lengths of roads and collection lines that would be required to avoid all wetlands. For every foot of additional road, there would be an increase of up to 65 square feet of disturbance to forest, farmland, and/or wildlife habitat. Each additional mile of road would result in an estimated additional 7.9 acres of soil and vegetation disturbance. The Preferred and Alternative Layouts (described in Section 5.2.2) avoid impacts on wetlands to the maximum extent possible without a major increase in the length of the roads. In addition to the increased length of roads within the Project Area, layout changes to further reduce wetland impacts would require the construction of additional road entrances at existing public roads to access some WTGs that would be otherwise inaccessible due to small wetlands or streams. This would create additional visual impacts on the rural character of the area due to the numerous entrance roads cutting into for-

ests and open spaces, and could result in additional traffic impacts in the areas and general inconveniences for the people living in the area. The proposed design has as many as five WTGs along one access road with a single entrance from a public road. Relocating the roads to completely avoid wetlands would increase the construction activity that would be visible from public roads. During the siting process, proposed roadways were modified to minimize impacts to wetlands, use existing access routes in order to minimize forest fragmentation to the extent practicable, complement existing land uses, and avoid cultural resources.

5.2 Project Alternatives Evaluated

5.2.1 No-Build Alternative

The No-Build Alternative assumes that the Project would not be built. Selection of the no-build alternative would preclude the development of a wind farm in an area with favorable wind resources and infrastructure to support such a project. As mentioned in Section 2.2, Detailed Description of the Proposed Action, Section 3.8, Climate and Air Quality, and Section 8, Growth Inducing Aspects, wind-powered electricity generation presents a no-air emissions alternative to fuel-based resources. In the northeastern United States, viable wind energy project sites are limited and those that do exist are primarily located in areas that will have similar social and environmental concerns. The selection of the No-Build Alternative would do nothing to reduce the reliance in the northeast on fossil fuels and nuclear materials to generate electricity. Fossil fuel and nuclear power generation results in adverse environmental impacts, such as:

- Air emissions;
- Water consumption;
- Toxic effluents and thermal emissions;
- By-product wastes;
- Significant infrastructure needs and related land use impacts, visual impacts, noise impacts, traffic impacts, and health impacts; and
- Socioeconomic effects (e.g., decreased energy diversity and reliability, fluctuating and increased consumer costs, and uncertainties regarding the ability to meet increasing energy demands).

The adverse environmental and health effects of air emissions from combustion of fossil fuels are well-documented and include global warming, acid rain, smog, respiratory health effects, and significant long-term impacts on wildlife. Air emissions and global climate change present serious concerns for bird populations and other sensitive wildlife species in North America. Renewable energy resources are cited as ways to slow global warming and reduce the threat it poses to people and wildlife.

Fossil fuel-fired facilities have other significant environmental impacts. These include, among others, massive water withdrawals/consumption for cooling (which entrain and impinge fish), the release of toxic effluents resulting from plant operations, thermal releases (when cooling waters are returned to the water body from which they were withdrawn), and visual impacts resulting from the facilities' structure and vapor/steam plume.

Beyond environmental impacts, fossil fuel power plant facilities also have significant adverse socioeconomic effects. Strict air emissions regulations and control measures, along with other environmental requirements to permit new or repowered fossil fueled facilities, have increased the capital and operating costs of power plants and the ultimate cost of electricity for the consumer. Further, the infrastructure required for efficient energy distribution is in some instances lacking, leading to price fluctuations and unreliability of energy supply. For example, although natural gas is heralded as the cleanest of the fossil fuels, it nonetheless has substantial drawbacks, both socioeconomic and environmental. Natural gas is transported through a network of pipelines throughout the country, but this network is not always capable of transporting the required gas to various regions. This results in significant price swings and increased costs to consumers due to supply and demand forces. In extreme instances, supply disruptions may force use of dirtier fuels such as fuel oil.[4] In addition, natural gas facilities suffer from many of the same adverse environmental impacts as do coal-fired and oil-fired plants, particularly with respect to water withdrawals, thermal releases, and visual impacts. Thus, fossil fuel-fired facilities, which depend on non-renewable resources, have undeniable and well-defined significant environmental and social costs.

Nuclear facilities pose their own unique set of dangers, including the disposal of radioactive waste (high-level and low-level), impacts on the marine environment from thermal water discharge, and the potential danger of a catastrophic radioactive release as the result of an accident or act of terrorism. Moreover, the stigma associated with, and public perception of, nuclear facilities (both the power plants themselves and radioactive waste disposal sites) render the siting of any new facilities difficult.

In marked contrast, according to the National Renewable Energy Laboratory (NREL), wind energy has the following characteristics: 1) economically competitive; 2) a valuable crop of the future for farmers and ranchers; 3) unlike most other electricity generation sources, wind turbines do not consume water; 4) an indigenous, homegrown energy source that contributes to national security; 5) inexhaustible and infinitely renewable; 6) has many environmental benefits; 7) reduces the risk associated with volatile fossil fuel prices; 8) the fuel of today and tomorrow; and 9) can be used in a variety of applications (United States Department of Energy 2005). With the No-Build alternative, the benefits of generating

[4] Diversity in the mix of energy sources that supply our electricity can help reduce price fluctuations for the consumer.

approximately 125 MW of clean, renewable electric energy to the power grid would be lost.

Wind projects are generally distributed over a large land area making rural areas most appropriate for wind project development. Rural areas often are used for farming or logging, and wind energy facilities are wholly compatible with these two land uses. They do not require the Project sponsor to take exclusive control of land; typically, a lease agreement is entered into with the landowner that allows for a continuation of the existing use of the land. Payments from revenues generated from energy production are made to the landowner, and these monies help sustain economic vitality in the rural area (United States Department of Energy 2003). In addition to lease payments to private landowners, the Project is expected to make significant PILOT and host community payments to local taxing jurisdictions, and make road improvements as a result of construction and post-construction remediation.

The No-Build Alternative would deprive the rural area of this direct economic benefit as well as preclude development of an environmentally benign and beneficial energy production technology.

If the No-Build Alternative were selected, the economic benefits of the Project would not be realized, including revenues to local taxing jurisdictions, lease revenues for participating landowners, income from O&M jobs, payments to Project neighbors, and income from construction jobs. The Project, as proposed, would also add up to 125 MW of electricity from a renewable resource to the New York State Energy Portfolio and support Governor Paterson's "45 by 15" policy, which requires New York State to meet 45% of its electricity needs through improved energy efficiency and clean renewable energy by 2015.

If the No-Build Alternative were selected, approximately 343 to 488 acres of construction disturbance would not be experienced, and the permanent conversion of approximately 53 to 68 acres of land would not take place.

If the No-Build Alternative were selected, 2.64 to 3.88 acres of wetlands would not be disturbed during construction, including less than 0.20 to 0.62 acre permanently impacted by placement of fill. Approximately 0.67 to 1.88 acres of forested wetland would not be permanently converted to shrub/scrub or emergent wetland as a result of periodic removal of woody vegetation within collection line corridors.

Selection of the No-Build Alternative would prevent a loss of upland vegetation including the removal of existing vegetation, which provides habitat for various wildlife species through minimal clearing of forested, shrub/scrub, and herbaceous vegetation as part of construction activities. Construction-related activities (e.g., clearing for road construction, infrastructure construction, equipment noise, and increased vehicle traffic) can potentially impact birds and bats by causing temporary displacement from habitat.

If the Project were not constructed, the potential impacts to birds and bats through collisions with the turbine blades and towers, displacement from habitat, or influence on migration would be avoided.

Other impacts that would be prevented include visual resources, noise, communication signals, traffic and transportation, land use, socioeconomics, and cultural resources. Specific impacts are discussed in detail in Section 3, Environmental Setting and Impacts, and its subsections.

Selection of the No-Build alternative is undesirable since it would preclude the development of a wind farm in an area with favorable wind resources and infrastructure to support such a project. Selection of the No-Build Alternative would also prevent the positive impacts of a wind farm on the reliance in the northeast on fossil fuels and nuclear materials to generate electricity. Also significant is the fact that the selection of the no-build alternative would result in the loss of lease payments to private landowners and the significant PILOT and host community payments to local taxing jurisdictions that the Project owners would be expected to make.

5.2.2 Preferred Layout

Care was taken to choose a project design that would minimize impact to the use of both wooded areas and active agricultural resources. Facilities were carefully sited to minimize impacts to agricultural land in consultation with NYSDAM and NYSDAM Guidelines for Agricultural Mitigation for Windpower Projects. In addition, landowner concerns and current land use practices were considered and are also reflected in the proposed layout of facilities. In accordance with NYSDAM guidance, WTGs, access roads and interconnects were located on the edge of agricultural fields to the greatest extent possible in order to maximize energy efficiency and interconnection capacity while minimizing impacts to agricultural operations without increasing impacts on wetlands; and reducing the crossing of drain tiles.

Various numbers of turbines and layouts were evaluated in an attempt to maximize energy efficiency while minimizing adverse environmental impacts. The Project layout, as proposed, has been engineered to capture the area's high wind energy resource while minimizing wake effects on downwind turbines. The original siting configurations were revised based on landowner agreements/ considerations and the protection of sensitive resources, such as wetlands, wildlife habitat, and productive agricultural land. The final proposed location of turbines and associated facilities reflects input and guidance received from landowners and Project consultants focusing on noise, land use, and ecological impacts.

The commercial wind industry has moved toward the use of larger wind turbine generators. This is because they are more cost effective than smaller machines since energy capture increases more rapidly with rotor diameter than costs increase with rotor diameter. In addition, wind speed increases with height above

ground. The rate of increase per meter of elevation is greatest near the ground and lessens with elevation above ground. A wind turbine therefore is generally more economical with taller structures. For land-based use, the industry has developed turbines with generating capacities in the range of 1.5 MW to approximately 3 MW.

As evaluated in this DEIS, the Preferred Layout proposes up to 61 Siemens SWT-2.3-101 2.3-MW model wind turbine generators, and associated Project facilities, such as access roads, collection lines, the O&M Building and laydown area, an off-site temporary concrete batch plant, a permanent meteorological tower, and the substation. The completed or "built" Project would be limited to 125 MW of capacity that the Developer has reserved in the NYISO queue and associated facilities. The maximum height of each WTG will be 130.5 meters (430 feet) when the rotor blade is at the top of its rotation. Currently, the Town of Westfield local law restricts WTG height to 400 feet. As mentioned in Section 3.17, Land Use, the Developer will request a waiver or variance from the Town to permit construction of the Siemens 2.3-MW WTG.

Of the layouts evaluated under the Preferred Layout, the proposed layout results in the most favorable balance of energy production, environmental protection, and community involvement. Significant relocation of the turbines would have a ripple effect, in that the location of all other turbines would have to be re-examined and some possibly changed in order to maintain an efficient and workable Project design. Therefore, reduction of environmental impacts in one location could result in increased impacts in another location and/or reduced power generation. In the case of visual impact, removal, or relocation of one or two individual WTGs from the proposed layout is unlikely to result in a significant change in Project visibility and visual impact from most locations. As designed, the Project maximizes energy efficiency and interconnection capacity while minimizing environmental impacts.

Alternative project designs likely to pose equal or greater risk of adverse environmental impacts while yielding equal or less electrical output were rejected.

5.2.3 Alternative Layout

Because the Town of Westfield height restrictions currently preclude turbines exceeding 400 feet in height, the Developer chose to evaluate an Alternative Layout with smaller turbines with an 80-meter hub height (same hub height as the Preferred Layout model). As evaluated in this DEIS, the Alternative Layout would consist of 79 GE 1.5 MW, model xle WTGs and associated Project facilities. The maximum height of each WTG would be 121.5 meters (399 feet) when the rotor blade is at the top of its rotation.

While smaller turbines are available, a greater number of WTGs would be required to produce comparable amounts of power. This would increase temporary and permanent impacts to resources as the number of towers and the length of re-

quired access roads and interconnections increases. Potential operational impacts would increase with a larger number of smaller machines.

5.2.4 Comparison of Preferred and Alternative Layout Impacts

Overall, the Project would result in the disturbance of approximately 343 to 507 acres of land during construction, depending on which layout is implemented. Post construction, the Project would result in the permanent conversion of approximately 53 to 68 acres of land for Project facilities (turbine pedestals, access roads, turbine crane pads and the substation, and the O&M building laydown area depending on which layout is implemented). The remaining 290 to 420 acres of land would be restored to pre-construction conditions. Minimal grading will be required to the turbine sites to level off the areas; however, these alterations will not change the overall topography of the Project Area. Construction practices, including the building of access roads, installation of turbines, and placement of electrical collection and transmission lines, may impact the condition of groundwater and surface water resources, and ultimately, water quality, through ground disturbance and runoff. Tables 5-1 and 5-2 show the construction and permanent disturbances by project component for each Alternative.

Table 5-1 Permanent Disturbance Footprint for the Preferred and Alternative Layout (acres[1])

Facility	Preferred Layout (61 WTGs)/2.3-MW	Alternative Layout (79 WTGs)/1.5 MW
WTGs and Crane Pads	11.5	11.2
Access Roads	34.1	47.8
Underground collection lines	-	-
Substation	7.0	7.0
O&M Building and Associated Parking Area	<1.0	<2.2
Meteorological Tower	<.1	<.1
Total Footprint	**52.5**	**68.2**

Note:
[1] Acreages listed may differ slightly from other resource areas due to rounding.

Table 5-2 Temporary Disturbance Footprint for the Preferred and Alternative Layout (acres[1])

Facility	Preferred Layout (61 WTGs)/2.3-MW	Alternative Layout (79 WTGs)/1.5 MW
70 to 120-foot Access Road ROW	157	222
Collection Line ROW (not co-located with access roads)	61.45	139
WTG Laydown Area	114.04	127
Substation	7.0	7.0
O&M Building and Laydown Area	10.1	10.1
Concrete Batch Plant[2]	2.0	2
Total Footprint	**351.7**	**507**

Note:
[1] Acreages listed may differ slightly from other resource areas due to rounding.

A comparison of impacts for the Preferred and Alternative Layout by resource area is presented below. Tables 5-3 and 5-4 provide a summary of these impacts.

Topography and Geology

Overall, the construction and operation of a wind energy facility within the Project Area will not result in impacts to topography and geology on a regional scale. Under both alternatives, impacts to topography would be minimal at a local scale due to the leveling of areas to accommodate Project facilities. Impacts to geologic resources are also anticipated to be minimal. Topography and geology impacts would be greater with the Alternative Layout at over 500 acres of temporary impacts and nearly 70 acres of permanent impacts, than with the Preferred Layout, at approximately 350 acres of temporary impacts and approximately 50 acres of permanent impacts.

Soils

Soil impacts are not problematic under either alternative, as the majority of disturbed soil will be restored post construction. While there is potential for soil erosion, compaction, damage to soil structure resulting from construction equipment traffic, and the introduction of stones or rocks into the topsoil, best management practices and erosion and sediment control measures will be implemented to mitigate these impacts. Steep slopes (greater than 15%) and poorly drained soils are also present in the Project Area and are more likely to erode or become damaged. These soils have been avoided to the greatest extent practical in both layouts. The Preferred Layout has fewer acres of steep slopes and poorly drained soils because it contains a smaller Project footprint than the Alternative Layout. In the same respect, the Preferred Layout contains approximately 344 acres of soils with a high compaction potential while the Alternative Layout contains approximately 222 acres.

Agricultural Land

Wind farms are generally compatible with agricultural operations. Construction and operation of the Project will have minimal impact on agricultural uses in the area. In some instances, agricultural operations may be enhanced with the installation or upgrading of access roads. Under each layout, the total acreage of prime farmland, statewide important soils, and prime farmland if drained that will be permanently impacted by conversion to nonagricultural uses is minimal and will not have an overall long term negative effect on these soil resources in the towns and county.

Specifically, the Preferred Layout would temporarily impact approximately 164 acres of active and abandoned agricultural land and permanently remove approximately 17 acres from production. Of the 17 acres permanently impacted, approximately 6.32 acres is prime farmland (less than 1% of prime farmland soils in the Project Area); 17.4 acres are soils of statewide importance (less than 1% of soils of statewide importance in the Project Area); and 25.1 acres is considered prime farmland if drained (less than 1% of such soils in the Project Area). Construction of the Alternative Layout would temporarily impact approximately 156

acres of agricultural land and would result in the permanent loss of approximately 24 acres of active agricultural land. The Alternative Layout will permanently impact approximately 7.4 acres of prime farmland (about 1% of prime farmland soils in the Project Area); 20.6 acres of soils of statewide importance (less than 1% of soils of statewide importance in the Project Area); and 32.7 acres of soils considered prime farmland if drained (less than 1% of such soils in the Project Area).

Water Quality

Impacts to water quality as a result of implementing the Project will be minimal and mainly occur during construction. Shallow groundwater may be encountered during excavation for the turbine foundations or during the installation of the underground collection line cables. The installation of these facilities may affect shallow groundwater movement and water quality in localized areas. While the overall impact will be minimal, it is likely that groundwater will be impacted to a greater extent under the Alternative Layout due to the greater number of WTG's and collection lines.

Implementing the Project will have direct impacts to surface waters. Under the Preferred Layout, 30 streams will be crossed during construction totaling approximately 1,119 linear feet of stream. Under the Alternative Layout, 33 streams will be crossed during construction totaling approximately 1,755 linear feet of stream. Not all the linear feet of stream crossed will be disturbed. Collection lines could be installed using horizontal directional drilling method and culverts will be installed within the width of the access roads and not the full width of the construction ROW. During operation, surface water impacts will be limited to culvert crossings in the access roads. Approximately 266 linear feet of stream will be permanently impacted under the Preferred Layout and 254 linear feet will be permanently impacted under the Alternative Layout. A freshwater man-made pond will be used as a water source to supply the temporary concrete batch plant.

There could be a minimal increase in stormwater due to a slight increase in impervious area within local watersheds. There will be approximately 0.39 acres of impervious area and approximately 51 acres of graveled surface under the Preferred Layout. There will be approximately 0.41 acres of impervious surface and approximately 68 acres of graveled surface under the Alternative Layout.

Wetlands

Impacts to wetlands are expected to be similar for both the Preferred Layout and Alternative Layout except that the total amount of disturbance will be less if the Preferred Layout is adopted. Under the Preferred Layout there will be fewer impacts (temporary and permanent) associated with road and collection line construction because fewer roads and collection line corridors will be required. However, there will be a minor increase in the amount of temporary disturbance associated with the larger laydown area required at each turbine location to accommodate the assembly of a larger rotor. Permanent and temporary wetland im-

pacts resulting from construction of the Preferred Layout total 2.84 acres. Permanent and temporary wetland impacts for the Alternative Layout total 4.50 acres.

Bird and Bat Resources

No biologically significant impacts are anticipated on bird and bat resources in the region on account of construction and operation of the Project. A higher number of birds and bats are estimated to collide with the turbines with the Alternative Layout due to the higher number of turbines within the layout. The estimated mortality rate of birds and bats for the Preferred Layout is 153-585 birds/ year and 336-1,495 bats/year. The estimated mortality rate of birds and bats for the Alternative Layout is 198 -758 birds/year and 435-1,936 bats/year.

Climate and Air Quality

The Project will produce electricity from wind energy, an emission-free renewable resource. The Project will generate up to 125 MW of electric power without causing any emissions to the atmosphere in-turn providing a positive contribution to global efforts to improve air quality and address climate change. The Climate and Air Quality Impacts for the Preferred Layout and Alternative Layout will be essentially the same given that they are both approximately 125 MW.

Visual Character

The Project will be visible in many locations within the local region. In terms of visibility and visual impact, while smaller turbines might be marginally less visible, higher density and greater numbers could actually increase the Project's visual impact. Thus, the Alternative Layout is expected to be more visible and could have a greater impact on the visual character of the community than the Preferred Layout despite the smaller turbine size.

Cultural Resources

The Project will be visible from numerous architectural resources. There are 140 NRL, NRE and recommended NRE properties within the APE for the Preferred Layout, as compared to 132 NRL, NRE and recommended NRE properties in the Alternative Layout APE. Two of these properties are districts that comprise a total of 125 structures. The Preferred Layout has the potential to impact a greater number of architectural resources (263 compared to 255) because the viewshed mapping considers turbine size and a larger turbine would be used in this layout. The difference between the number of properties (8) potentially impacted under both layouts is relatively small.

No archeological impacts are anticipated due to the construction or operation of the Preferred Layout. A Phase 1B investigation was not performed for the Alternative Layout however the results of the Phase 1B for the Preferred Layout indicates that the Project Area is not sensitive for prehistoric sites. It is unlikely that the Alternative Layout would impact archeological resources also.

Sound

Neither alternative clearly stands out as having less of a noise impact. Based on the percentage of time that the worst-case wind speeds could occur (6.6% to 12%), for the majority of the time, both the Preferred Layout and the Alternative Layout are expected to comply with the NYSDEC guidance for noise. Between 6.6% to 12% of the time, the 6 dBA differential could be experienced as follows: for the Preferred Layout, 54 of 250 houses could exceed the NYSDEC 6 dBA threshold in the summer; and 184 houses could exceed this threshold in the winter. For the Alternative Layout, 97 of 250 houses could exceed this threshold in the summer; and 224 houses could exceed this threshold in the winter. Under both summer and winter conditions, the general extent of the potential impact area (a 6 dBA increase) for the Preferred Layout is smaller compared to the Alternative Layout.

Similarly, the Preferred and Alternative Layouts are mostly expected to comply with the Town of Westfield's zoning ordinance noise limit of 50 dBA applicable at the property lines of adjacent non-participating land parcels in both Ripley and Westfield. There are a limited number of cases where this may not occur. For the Preferred Layout, the Project would not comply with this limit at six parcels. For the Alternative Layout, the Project would not comply with this limit at four parcels. However, the sound levels at many of the nearest residences are in the 45 to 49 dBA range under the Preferred Alternative as compared to 35 dBA in the Alternative Layout (see Table 5-3 for a comparison of the two alternatives).

Traffic and Transportation

The increase in traffic due to construction-related activities under both layouts is not expected to significantly impact the overall usage of major public roads in the areas and, as such, construction will cause only minimal limited duration delays to local traffic. The delivery of the turbine components will require inbound oversize and overweight truck traffic. For the Preferred Layout, 1,464 individual truck trips would be generated for component delivery and 1,896 individual truck trips for the Alternative Layout. There will be an estimated 2,471 concrete truck trips for the Preferred Layout and 3,200 concrete truck trips under the Alternative Layout. Under both layouts, intersection improvements will be required to accommodate equipment, material and supply delivery. Under both alternatives, the pavement thickness on some town roads along the proposed haul routes may become damaged during delivery of WTG components. Oversized construction vehicles could cause minor damage to the road surface, especially during rainy periods in the spring and fall. For both Alternatives, the Developer will enter into road use agreements with the towns; will survey road conditions both before and after construction; and if it is determined that public roadways have had damage related to Project activities, will repair the damage. No impacts are anticipated during operations.

Public Health and Safety

The nominal risk to public health and safety as a result of implementing the Project is similar under both layouts. Under both Alternatives, the proposed Project

will be designed and constructed in accordance with all applicable electrical codes including the National Electric Code (NEC) and the National Fire Protection Association (NFPA) requirements. A continuous grounding system will eliminate any potential hazard that stray voltage created by the Project may pose to persons or livestock. Lightning protection will also be built into each turbine. In nearly all cases, minimum setbacks from structures, residences, property lines, roads, and utility lines have been incorporated into the Project to provide additional protection in the unlikely event of a structural failure. Ice throw from a turbine is highly unlikely to strike a human or a dwelling. Each turbine will be secure from unauthorized entry and signage posted on all access roads to deter unauthorized access to the site.

While the hours and locations of shadow flicker annoyance differ between the Preferred and Alternative Layouts, shadow flicker could cause an annoyance to 48 structures for more than 30 hours each year under both layouts.

Community Facilities

Construction of the Project under both layouts will increase employment in the area on a short-term basis. Short-term construction workers would likely be hired from the local area or only temporarily relocated and are unlikely to impact schools. All of the parks, trails, and recreational areas are located within the villages or near the lakeshore and will not be directly adversely impacted during construction or operation of the Project. A fire protection and emergency response plan will be devised in consultation with the local fire departments/ emergency service providers. Local community facilities, such as schools and health care facilities, are considered adequate to serve the needs of the community. The increase in permanent population resulting from Project operations will be negligible and will not impact the ability of current service providers to meet the needs of the local population. Some community facilities are expected to benefit from the Developer's PILOT payments to local taxing jurisdictions, and/or from host community payments made to the towns.

Communication Facilities

No discernible change in operation will occur to LMR, cellular, and or PCS communication signals because of the nature of their operation and the frequency bands of operation. For both Project alternatives, interference with most communication signals have been limited or eliminated through siting of the turbines.

Land Use

The Project is generally compatible with local and regional land uses and would not preclude existing uses or planned uses in the vicinity of the Project Area. Overall, implementation of the Preferred Layout would impact less acreage overall than the Alternative Layout due to the difference in the number of WTGs, length of access roads, and the length of underground collection lines. Under the Preferred Layout, approximately 350 acres of land would be temporarily impacted; and approximately 50 acres would be permanently impacted. Under the

Alternative Layout, approximately 488 acres of land would be temporarily impacted; and approximately 66 acres would be permanently impacted.

Table 5-3 Comparison of Permanent Resource Impacts Under the Preferred and Alternative Layouts

Resource Area	Preferred Layout (61 WTGs)/2.3-MW	Alternative Layout (79 WTGs)/1.5 MW
Soil Disturbance	52 acres	68 acres
Agricultural Land Resources (prime farmland, soils of statewide importance, and prime farmland if drained)	48.92 acres	60.80 acres
Streams	266 linear feet	254 linear feet
Wetlands	0.20 acres	0.60 acres
Permanent Conversion of Forested Wetland	0.67 acres	1.88 acres
Ecological Communities	52 acres total	66 acres total
Agriculture	27.3 acres	32.8 acres
Tree Farm/Vineyard	0.3 acres	0.5 acres
Successional Old Field	6.2 acres	6.7 acres
Successional Shrubland	4.6 acres	4.0 acres
Beech-Maple Mesic Forest	9.6 acres	15.3 acres
Hemlock-Northern Hardwood Forest	0 acres	0 acres
Successional Northern Hardwoods Forest	3.3 acres	4.4 acres
Pine-Northern Hardwood Forest	1.4 acres	2.6 acres
Open Water	0 acres	0 acres
Shallow Emergent Marsh	0 acres	0 acres
Birds	153-585 birds/year	198 -758 birds/year
Bats	336-1,495 bats/year	435-1,936 bats/year
Cultural Resources	263 properties	255 properties
Noise	54 houses where 6 dBA differential may be exceeded in the summer; and 184 houses where 6 dBA differential may be exceeded in winter (levels which may solicit complaints) 6 non-participating parcels where the sound level may exceed 50 dBA for a limited time.	97 houses where 6 dBA differential may be exceeded in the summer; 224 houses where the 6dBA differential may be exceeded in winter (levels which may solicit complaints) 4 non-participating parcels where the sound level may exceed 50 dBA for a limited time
Public Health and Safety		
Shadow Flicker	48 structures could receive 30 or more hours each year	48 structures could receive 30 or more hours each year

Table 5-3 Comparison of Permanent Resource Impacts Under the Preferred and Alternative Layouts

Resource Area	Preferred Layout (61 WTGs)/2.3-MW	Alternative Layout (79 WTGs)/1.5 MW
Socioeconomics		
PILOT	$4,000/MW	$4,000/MW
Host Community Agreement	$6,000/MW	$6,000/MW
Estimate Total Revenue to Local Community	$1,250,000/year	$1,250,000/year
Land Use	28 acres total	35 acres total
Agricultural	12.5 acres	18.3 acres
Residential	15.8 acres	16.7 acres

Table 5-4 Comparison of Temporary Resource Impacts Under the Preferred and Alternative Layouts

Resource Area	Preferred Layout (61 WTGs)/2.3-MW	Alternative Layout (79 WTGs)/1.5 MW
Soil Disturbance	356 acres	507 acres
Agricultural Land Resources (prime farmland, soils of statewide importance, and prime farmland if drained)	106 acres	103 acres
Streams	1,119 linear feet	1,755 linear feet
Wetlands	2.64 acres	3.88 acres
Ecological Communities	395 acres total	488 acres total
Agriculture	179.1 acres	235.19 acres
Tree Farm/Vineyard	2.4 acres	2.41 acres
Successional Old Field	47.5 acres	49.60 acres
Successional Shrubland	34.2 acres	28.42 acres
Beech-Maple Mesic Forest	81.8 acres	96.14 acres
Hemlock-Northern Hardwood Forest	0.2 acres	2.02 acres
Successional Northern Hardwoods Forest	36.2 acres	40.32 acres
Pine-Northern Hardwood Forest	13 acres	32.30 acres
Open Water	0.3 acres	0.27 acres
Shallow Emergent Marsh	0.2 acres	0.89 acres
Noise	56 to 63 dBA (worst case)	56 to 63 dBA (worst case)
Traffic and Transportation	1,464 Delivery Truck Trips 2,471 Concrete Truck Trips	1,896 Delivery Truck Trips 3,200 Concrete Truck Trips
Land Use	347 acres total	488 acres total
Agricultural	164 acres	234 acres
Residential & Other	183 acres	254 acres

5.2.5 Smaller Project Size

The Developer considered reducing the size of the Project by using a smaller number of turbines. However, reducing the Project's size would reduce its energy production, environmental benefits, and the economic benefits to the community.

A project consisting of fewer turbines would reduce the localized environmental impacts. The footprint and visibility of the project would be slightly reduced, thereby also reducing the amount of disturbed forest land, vegetation, and wetlands. Visually, a reduction in the number of turbines may provide a minimal benefit at a particular receptor, but it would do little to change the overall impact of the Project on the regional landscape. Thus, the reduction of the size of the Project would only marginally change its aesthetic profile. Additionally, a project consisting of fewer turbines could reduce the total number of receptors that would experience sound impacts, although the level of impact at a particular WTG would depend on a variety of factors including time of year, critical wind speed, wind speed, and turbine model. A smaller project would result in fewer avian impacts overall.

Given the minimal impacts to forest land, vegetation, and wetlands of the Project as proposed, as well as the marginal change in the aesthetic profile of the project if smaller, the smaller project alternative may not warrant the loss of generating capacity and related social and economic benefits to the community.

A smaller project is also not as financially attractive to the Developer as a smaller sized project. Wind generating projects have certain fixed costs that are relatively independent of the size of the facility. Some of these costs have to do with Project infrastructure. The substation, switchyard, and transmission line, while indeed smaller, utilizing smaller transformers, and switching equipment for example, are not proportionately less expensive. Other costs such as construction overheads including mobilization and demobilization costs, permitting, legal fees, and financing costs are relatively constant regardless of the size of the project. The financial viability of a project depends, to a large extent, on its ability to recover fixed costs by maximizing electricity generation.

The Project has been sized to maximize its output to defray its fixed costs, maximize its environmental benefits through the production of clean energy, and maximize local economic benefits through landowner lease payments, PILOT and host community payments, and other direct and indirect local economic benefits, all while minimizing environmental and other impacts on the Project Site. A smaller project would produce fewer global benefits (i.e., clean energy, emissions reductions, and reductions in fossil fuel use) and contribute less towards the Governor Paterson's goal of meeting 45% of New York State's electricity needs through improved energy efficiency and clean renewable energy by 2015.

6 Irreversible and Irretrievable Commitment of Resources

The proposed Project is not expected to require any significant irreversible and irretrievable commitment of resources; however, during the period that the Project is operational, there will be a temporary commitment of resources.

The Project requires the commitment of land for the life of the Project. The expected useful physical life of the primary Project components is approximately 20 to 25 years. At the end of the Project's useful life, all aboveground and up to 4 feet below grade of underground machinery, equipment, property, and fixtures would be removed from the property.

Approximately 8,900 acres of land have been optioned for lease within the 9,021-acre Project Area. However, only a small percentage of the leased land would be committed for the actual Project footprint. While the majority of the land under agreement will continue to be available for existing land uses once the Project is operational, the actual locations of the wind turbine generators (WTGs), access roads, substation, permanent meteorological tower, and operation and maintenance (O&M) facility would not be available for other purposes for the life of the Project. The commitment of this land to the Project would be neither irreversible nor irretrievable. In accordance with the decommissioning plan described in Section 2.4 and in Appendix F, the turbines will be removed at the end of their useful life and the land may be reclaimed for other uses. It is possible that after the end of their useful life, the turbines could be replaced with newer, technologically advanced, and more efficient turbines.

During the life of the Project, surface drainage patterns may be altered due to the addition of impervious surfaces such as turbine pedestals, a substation, and an O&M facility. Post-construction, the Developer will restore the ground surface to pre-existing grade to the extent practicable. Temporary loss of habitat could result in a temporary displacement of plants and animals. Any impacts to wildlife will be minimized to the greatest extent practicable and will be monitored and mitigated as appropriate based on post-construction monitoring and agency requirements.

7 Cumulative Impacts and Benefits: Wind Farm and Regional Development

Consistent with the mandate of the New York State Environmental Quality Review Act (SEQRA), this DEIS analyzes cumulative impacts where such impacts are "applicable and significant" (6 NYCRR 617.9). Cumulative impacts are defined herein as two or more individual environmental effects, which, when taken together, may become environmentally significant or may compound or increase other environmental effects. Cumulative impacts are most likely to occur when a proposed action is related to actions that could occur in the same or an overlapping geographic location and at the same or a similar time.

7.1 Study Area

This section addresses the potential cumulative impacts that may arise from the combined impacts of the Project's Preferred Layout and other currently operating and proposed wind power projects in the region (northern Chautauqua County and Erie County) (see Figure 7-1). For the purposes of this analysis it was assumed that projects that are located in close geographic proximity to the Ripley-Westfield Project would generally have a greater potential to contribute to a cumulative impact than those farther away and that the potential contribution would vary depending on the resource area evaluated. For example, noise from a project located several miles away would not contribute to a cumulative impact, but that same project may have a cumulative visual impact. During this cumulative impact analysis, the impacts of each proposed project within the region was evaluated for each resource area. The level of analysis (quantitative versus qualitative) that could be completed was limited by the public information available for a given project.

The nearest operating wind power facility is Steel Winds, located along the shores of Lake Erie in Lackawanna, Erie County, New York, more than 50 miles northeast of the Ripley-Westfield Project Area. The Project consists of eight, 2.5-MW turbines.

The closest proposed project in an advanced development stage to the proposed Ripley-Westfield Project is Horizon Energy's Arkwright Summit Windfarm, formerly known as the New Grange Wind Farm, which is under development ap-

proximately 20 miles to the northeast of the Ripley-Westfield Project Area in the Towns of Arkwright and Pomfret. According to the Final EIS prepared for the proposed Arkwright Summit project, the project would consist of up to 42 1.8-MW wind turbines. The Arkwright Summit EIS is available online at http://www.horizonwindfarms.com/ny/under-dev/arkwright-summit.htm.

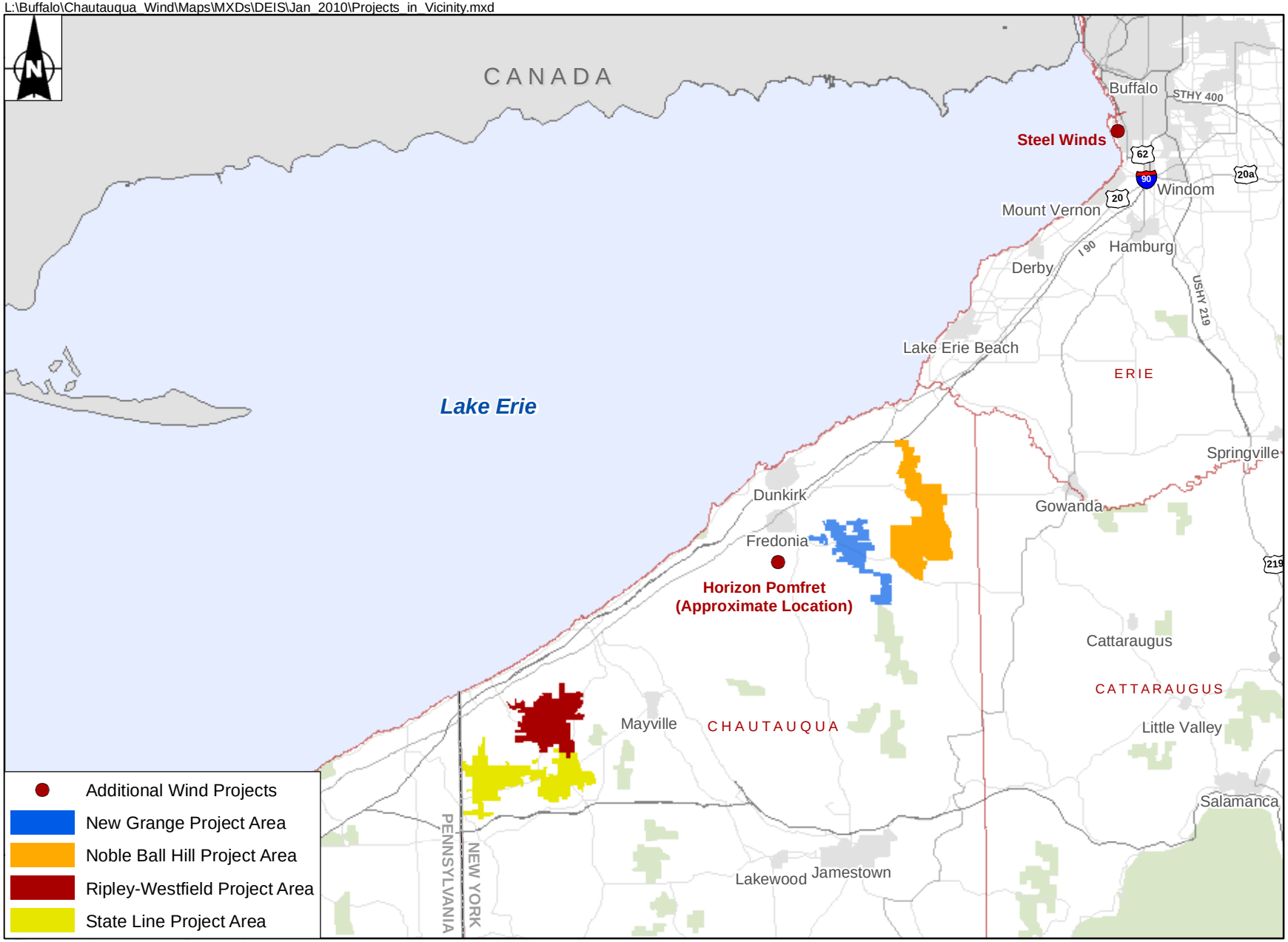
Less than one mile to the west of Arkwright Summit Project, and 25 miles from the proposed Ripley-Westfield Project, is the Ball Hill Windpark, proposed by Noble Environmental Power in the Towns of Villenova and Hanover. According to the DEIS prepared for the proposed Ball Hill projects, the projects would consist of 60 1.5-MW turbines. The Ball Hill DEIS is available online at http://www.noblepower.com.

Across Chautauqua County, several other wind power projects are in the early planning and development phases, including the Horizon Pomfret project near the Arkwright Summit project and Pattern's State Line project near the Ripley-Westfield project. Pattern's Concord Wind project, although in the NYISO queue, has not moved past the early planning stages. Because the project location is not known at this time, the Concord Wind project is not evaluated in this cumulative impact evaluation. Also contained in the NYISO queue is a project named State Line II. Pattern requested that the NYISO investigate a second interconnection point for the State Line project, which the NYISO was willing to do provided the second interconnection point was given a different name. To comply with this requirement, Pattern filed for interconnection with State Line II as the project name. Either of the interconnection points would serve the same project, therefore, only one of the State Line projects would be constructed.

Table 7.1-1 identifies the proposed production (in MW) at each proposed wind power project in the region that is listed in the Queue of Interconnection Requests maintained by the NYISO on their Web site, http://www.nyiso.com, and the current status of development. The review and approval status of these projects is highly variable, ranging from preliminary site investigations to those with completed System Reliability Impact Studies (SRIS), a requirement of the NYISO. Projects are reviewed by NYISO in three main phases: submittal of an interconnection request, preparation of an optional feasibility study, and completion of an SRIS. It is reasonable to assume that wind power projects with SRISs in-progress and with upcoming proposed operation dates, may be considered proposed or future projects for the purposes of cumulative impact analysis.

Because only limited information is publicly available for most of the projects listed in the NYISO Queue, assumptions on the projects' potential impacts were based on the known impacts of similarly sized projects in the area. For the State Line I and Pomfret projects in which the number of turbines being proposed is unlisted in the NYISO Queue, an assumption was made based on the proposed MW available in the NYISO Queue (e.g., for Pomfret 73.5 MW would equate to

© Ecology & Environment, Inc. GIS Department Project #
L:\Buffalo\Chautauqua_Wind\Maps\MXDs\DEIS\Jan_2010\Projects_in_Vicinity.mxd



Source: ESRI, 2001

Figure 7-1 Proposed and Existing Wind Energy Projects in the Vicinity of Ripley-Westfield Wind Farm

0 5 10 20

Miles

Table 7.1-1 Local Wind Power Projects in Comparison to Ripley-Westfield Project Area

Wind Power Project Name	MW	Date of Interconnection Request	Approximate Distance to Proposed Ripley-Westfield Project	Current Proposed In-Service Date	Interconnection	Status
Arkwright Summit Wind Farm	79.2	7/21/05	18 miles	2010- 2011	Dunkirk-Falconer 115-kV	Feasibility Study Available, System Reliability Impact Study Available, Facilities Study in Progress, Joint Application for Permits Pending
Ball Hill Windpark	90	7/21/06	23 miles	2009	Dunkirk-Gardenville 230kV	Feasibility Study Available, System Reliability Impact Study Available
State Line Wind (Pattern)	124.8	12/20/07	Adjacent	2010/12	Ripley-Dunkirk 230-kV.	Feasibility Study Available
Concord Wind (Pattern)	101.2	2/28/08	Location information is not public	9/2011	Ripley-Dunkirk 230-kV	Feasibility Study Available
Pomfret	73.5	3/27/08	16 miles	12/2010	Dunkirk-Falconer 115-kV	Feasibility Study Pending

Source: NYISO Queue, May 27, 2009.

Key:
MW = Megawatt.
kV = Kilovolt.

up to 49 1.5-MW turbines). The number of turbines would be lower if larger turbines are used.

This cumulative impact analysis assumes that the proposed Arkwright Summit and Ball Hill projects will be approved and constructed as proposed in their respective DEIS. While the updated development schedules for these projects are not known, there is potential that the construction schedule for the Ripley-Westfield project could overlap with construction of the Arkwright Summit or Ball Hill projects.

7.2 Wetlands

Existing New York State Department of Environmental Conservation (NYSDEC) and National Wetland Inventory (NWI) wetland mapping indicate wetlands in and around the Ripley-Westfield Project Area, with most watersheds ultimately draining to Lake Erie. Arkwright Summit and Ball Hill are the only proposed projects with publicly available wetland information. These projects are located within the same watershed as the Ripley-Westfield Project Area. In addition, the State Line and Pomfret projects are anticipated to be within that same watershed. Only the Arkwright Summit and Ball Hill projects can be quantifiably analyzed for cumulative wetland impacts.

As described in Section 3.5, Wetlands, Ripley-Westfield Wind LLC sited the proposed Ripley-Westfield Project largely to avoid significant wetland impacts. Due to the overall distribution of wetlands in the Project Area, complete avoidance of wetland resources was not feasible. As a result, during construction of the Project, 2.64 acres of temporary wetland impact from ground disturbance would take place; however, these areas will be returned to pre-construction contours following construction activities. Upon completion of construction there will be 0.20 acre of permanent wetland impacts and 0.67 acres of permanent conversion of forested wetland to shrub/scrub or emergent wetland. However, to compensate for the long-term impacts resulting from wetland acreage losses, Ripley-Westfield Wind LLC will develop a mitigation plan as part of the United States Army Corps of Engineers (USACE) and NYSDEC permitting process and will incorporate agency input and site-specific mitigation measures.

Complete avoidance of wetlands is not feasible at the Arkwright Summit or Ball projects either, and is likely not feasible at the State Line or Pomfret projects for the same reasons identified above. As such, wetlands will likely be disturbed during construction of these projects to provide sufficient access to accommodate construction equipment and staging areas at various turbine locations, access roads, and collection lines, to safely and efficiently erect and construct the facilities. Impacts during construction include temporary and permanent impacts related to clearing, grading, and placing fill. According to the Arkwright Summit FEIS, construction of the Arkwright Summit project will result in approximately 13.6 acres of impact, of which approximately 13.1 acres will be restored to pre-existing conditions. The remaining 0.5 acres of wetlands will be permanently impacted by placement of fill for access roads. When construction is complete there

will be less than 0.5 acres of permanent conversion of forested wetland to other wetland classes. According to the Ball Hill DEIS, the Ball Hill Windpark will result in construction disturbance to a total of 15.9 acres of wetlands, of which approximately 0.3 acres will be permanently impacted by placement of fill and 6.5 acres of wetland will be temporarily impacted by grading, ground disturbance or placement of fill during construction and will be returned to preconstruction contours. 5.1 acres of forested wetland will be permanently converted to shrub/ scrub or emergent wetland. The amount of construction-related and permanent wetland impact at the proposed State Line and Pomfret projects is unknown, but has been assumed to be similar to Arkwright Summit and Ripley-Westfield due to project proximity and similar project size.

Project facilities at each project will have minimal individual impacts on wetlands. The Ripley-Westfield project contributes 0.20 acres to the approximately 0.61 acres of known combined permanent wetland impacts. Maintenance activities associated with the operation of the projects may result in the conversion of forested wetlands to shrub-scrub or emergent wetlands as a result of periodic removal of woody vegetation that may interfere with the operation of the facilities at each wind power project.

Although minor, localized, and temporary impacts to wetland function and values may result within each individual project area, no significant adverse cumulative impacts are expected because of the distance between projects. In addition, any localized wetland impacts will be offset by mitigation that will enhance wetland values within each individual project area. In accordance with NYSDEC and USACE regulations, developers of any wind power project in the region are required to avoid, minimize, and mitigate wetland impacts. The USACE and NYSDEC typically require greater than a one-to-one mitigation ratio for permanent loss of wetlands. Mitigation for wetland impacts may result in a net increase in wetland acreage in the region.

7.3 Wildlife

Construction of multiple wind power projects will result in localized habitat alterations; however, neither the individual project impacts nor the cumulative impact from the other projects are expected to be significant. Other wind power facilities in the region will not result in continuous tracts of habitat alteration with the Project Area because of their distance from the Ripley-Westfield Project. The nearest operating wind power facility is the Steel Winds facility located along the shores of Lake Erie in Lackawanna, more than 50 miles northeast of the Project. Steel Winds was built on a Brownfield site with limited habitat for wildlife. Based on DEIS prepared or in preparation for the proposed wind power facilities in an advanced development stage in the region, it is expected that there will be small areas of localized habitat alteration similar to those at the Project. Much of the altered habitat will be restored after the completion of construction. Based on proximity, only State Line has the potential to contribute to cumulative wildlife impacts. Threatened and endangered species require special consideration and are discussed in Section 7.5 of this DEIS.

During the course of construction of each project, some limited mortality may occur to less mobile species, though most species are expected to avoid the project sites during the active construction period. Indirect impacts on wildlife will also occur as a result of habitat alteration in association with construction of the projects; however, these impacts are not expected to be significant. Cumulatively, the multiple wind power projects will result in minimal loss of forest habitat within the respective project areas, compared with available habitat within the region. The impacts on forested habitat lie with the fragmentation of forest tracts with the installation of access roads, collection lines and in some cases, turbines. Forest fragmentation degrades habitat for forest dwelling and forest-interior dwelling wildlife species. These species that are sensitive to disruptions will move into adjacent forest tracts. Although these species will be lost in a localized area, wildlife that is adapted to forest edges will colonize the area. Once the Ripley-Westfield, Ball Hill, Arkwright Summit, State Line, and Pomfret projects are in operation, it is anticipated that wildlife will make use of areas that were temporarily disturbed during construction.

7.4 Birds and Bats

Generally, there is a potential for bird and bat impacts from other wind projects in the region to be cumulative if multiple projects are located within the same migratory corridor or within a common local bird movement area. As such, cumulative impacts associated with all of the proposed projects in the region including the proposed Arkwright Summit, Ball Hill, Pomfret, and State Line projects and the existing Steel Winds project were evaluated as they relate to birds and bats.

Construction-related activities at each project (e.g., clearing for road construction, infrastructure construction, equipment noise, and increased vehicle traffic) can potentially impact birds and bats by causing temporary displacement from habitat. Because these impacts are generally temporary in nature and will be limited at any one location, potentially cumulative construction impacts to bird and bat populations are not expected to be significant as a result of these projects.

The potential cumulative impacts of the operation of the proposed Arkwright Summit, Ball Hill, State Line I, and Pomfret projects and existing Steel Winds project were assessed in the BBRA using approximate fatality rates from post-construction studies conducted in the northeast (see Section 3.7, Avian and Bat Resources, and Appendix N of this DEIS, for an explanation of the fatality rate approximations). An approximate range of bird fatalities for the Project was identified by multiplying the 2006-2007 Erie Shores fatality rate, the 2008 Noble Bliss and 2006 Maple Ridge daily survey fatality rates for bird kills with the proposed number of turbines (see Table 5-4 of the BBRA). Likewise, an approximate number of bat fatalities for the Project was identified by multiplying the 2006-2007 Erie Shores fatality rate and 2006 Maple Ridge daily survey bat fatality rates with the proposed number of turbines (see Table 5-5 of the BBRA).

The same calculations are included for the five wind projects currently proposed in Chautauqua County and the existing Steel Winds project in the City of Lackawanna (Erie County), over 50 miles away from the Project Area, in order to demonstrate the potential cumulative impacts on birds and bats in the region (see Tables 7.4-1 and 7.4-2). These are only estimates and there can be considerable variation in fatality rates, especially for bats. Due to the current state of the science, the number of bird and bat fatalities can only be determined with post-construction mortality studies; however, this estimate allows an evaluation of the potential cumulative impacts.

Table 7.4-1 Approximate Regional Number of Bird Fatalities

Project	Number of Turbines	Approximate Bird Fatalities Per Year Based on 2006-2007 Erie Shores Rate[1]	Approximate Bird Fatalities Per Year Based on 2006 Maple Ridge Daily Survey Rate[2]
Ripley-Westfield (Preferred Layout)	**61**	**153**	**585**
Horizon Arkwright Summit	47	118	451
Horizon Pomfret	49[3]	123	471
Noble Ball Hill	60	150	576
Pattern – State Line Wind	52[4]	130	499
Steel Winds (existing)	8	20	77
Total	**277**	**694**	**2,659**

Notes:
1 2.5 birds/turbine/year (James 2008).
2 9.59 birds/turbine/survey season (Jain et al. 2007).
3 Project information is not publicly available, 49 turbines are assumed based on 1.5-MW turbines and the publicly available proposed MW of the Horizon Pomfret project.
4 Number of turbines estimated based on 124.8 MW (same as Ripley-Westfield). This may change based on final turbine selection.

Table 7.4-2 Approximate Regional Number of Bat Fatalities

Project	Number of Turbines	Approximate Bat Fatalities Per Year Based on 2006-2007 Erie Shores Rate[1]	Approximate Bat Fatalities Per Year Based on 2006 Maple Ridge Weekly Survey Rate[2]
Ripley-Westfield (Preferred Layout)	**61**	**336**	**1,495**
Horizon Arkwright Summit	47	259	1,152
Horizon Pomfret	49[3]	270	1,201
Noble Ball Hill	60	330	1,470
Pattern– State Line Wind	52[4]	286	1,274
Steel Winds (existing)	8	44	196
Total	**277**	**1,575**	**6,788**

Notes:
1 5.5 bats/turbine/year (James 2008).
2 24.5 bats/turbine/survey season (Jain et al. 2007).
3 Project information is not publicly available, 49 turbines are assumed based on 1.5-MW turbines and the publicly available proposed MW of the Horizon Arkwright Summit project.
4 Number of turbines estimated based on 124.8 MW (same as Ripley-Westfield). This may change based on final turbine selection.

The cumulative loss of approximately 700 to 2,600 birds per year is not considered to be biologically significant to species populations, especially in consideration of other sources of bird mortality. The United States Fish and Wildlife Service (USFWS) estimates that a minimum of 10 billion birds breed in North America (USFWS 2002). There are many widespread sources of bird mortality. However, it is challenging to compare predicted mortality from a proposed wind site to other sources of mortality, because it is only a prediction and local mortality rates from other sources are rarely quantified to allow comparison. On a national scale, the annual bird mortality associated with wind energy facilities (estimated at 33,000 birds per year in 2002) is slight compared to other sources of mortality, such as vehicles (60 million or more deaths per year), building windows (97 to 976 million deaths per year), power and transmission lines (conservatively tens of thousands deaths per year, possibly closer to 174 million deaths per year), communication towers (conservatively 4 to 5 million deaths per year, possibly closer to 40 to 50 million deaths per year), electrocution (estimated tens of thousands per year), pesticides (at least 72 million deaths annually, likely far more), oil spills (hundreds of thousands of deaths per year), oil and wastewater pits (up to two million deaths per year), cats (hundreds of millions of deaths per year), agricultural practices (i.e., hay mowing, pesticides; at least 72 million), and hunting (up to 120 million) (Gill 1995; Erickson et al. 2001; USFWS 2002). These sources of mortality are also present within the Project Area.

The bird kills comprise many different species. Nocturnal migrant passerines will likely make up the majority of bird kills. This is of concern because of the potential of neotropical migrants, many of which are considered in decline, to be among the fatalities. However, these are also among the species that are most harmed by global warming and air pollution (Price and Glick 2004). For example, recent research suggests that acid precipitation from air pollution is contributing to the steady decline of the Wood Thrush in New York (Hames et al. 2002), where numbers are dropping up to 5% per year. Therefore, there are impacts from both non-renewable energy production and from wind energy. Mr. John Flicker, the president of the National Audubon Society recently (December 14, 2006) commented on this perception issue in support of wind energy (at appropriate sites), saying “When you look at a wind turbine, you can find the bird carcasses and count them. With a coal-fired power plant, you can’t count the carcasses, but it’s going to kill a lot more birds” (Levesque 2006).

At the present time, it is unknown whether the cumulative annual loss of approximately 1,500 to 6,600 bats is considered to be biologically significant. However, there are ongoing bat mortality studies to determine the overall effects on bat populations. There are increasing concerns about the cumulative impacts of bat fatalities to specific species as the number of wind projects increase and as bats continue to be found during mortality studies at more wind sites, in addition to the White Nose Syndrome situation. As the population sizes and trends of most bat species in New York State are unknown, it is uncertain what level of impact is from wind projects. While bird species populations have been studied and estimated, similar studies for bats and estimates for bat populations are not avail-

able and/or highly uncertain. Even with this limited current state of knowledge on bat populations and migration, some researchers have expressed concern that there is the potential for significant cumulative population impacts to bats (Kunz et al 2007; Arnett et al 2008). Only after construction of several wind projects in the northeast and implementation of long-term monitoring protocols would the significance of potential cumulative impacts be assessable.

The NYSDEC Guidelines recommend conducting two years of post-construction monitoring programs at wind farms in NYS. After this period, NYSDEC would review the monitoring data to determine if the protocol should be altered for a third year of study, if more than two years is necessary. A post-construction monitoring program will be developed for this project to determine if bird and/or bat collision fatalities occur as a result of project operation, and if so, the rate of mortality. Other wind projects in NYS will develop similar monitoring programs. These data will be correlated with pre-construction data to determine whether the mortality rates are consistent with the anticipated impacts. This information can also be used to develop possible means of mitigation. Information from these studies will also be a valuable resource for wildlife agencies and will provide needed data that can be used to assess the siting of future wind power projects.

7.5 Threatened and Endangered Species

Threatened and endangered species receive special consideration because of their Federal protection under the Endangered Species Act. As such, all projects in the region are included in the threatened and endangered species cumulative impacts evaluation. Information is not available for all of the proposed projects.

The New York State Natural Heritage Program (NHP) did not identify any threatened or endangered species within the Ripley-Westfield Project Area but did identify several bird species, including Bald Eagles, as occurring within 10 miles of the Project Area. Based on consultation with the USFWS, the Bald Eagle was identified as occurring in Chautauqua County. Bald Eagles do not nest in the Project Area; however, there are three nests within several miles of the Project Area. Nevertheless, since the nearest Bald Eagle nest (2007) is beyond the limits of the Project Area and is approximately one mile away from the closest turbine, no significant adverse impacts from construction activities on Bald Eagles are anticipated and potential adverse impacts during operations are considered low. No critical habitat for any threatened or endangered species were identified within the Project Area. As a result, no impacts to such habitat will occur. An environmental monitor will survey the work area for active nests if construction takes place in suitable nesting habitat for endangered or threatened bird species in the spring or early summer (breeding season).

As part of the DEISs prepared for the Arkwright Summit and Ball Hill projects, both the USFWS and NHP were consulted, and except for transient individuals, no threatened or endangered species or significant communities were identified within the project area (Tetra Tech 2007 and Ecology and Environment 2008); and no critical habitat for such species were identified in the project areas. Due to

the proximity of the State Line project to the Ripley-Westfield project, it can be considered likely that the USFWS and NHP will have similar findings as Ripley-Westfield. Steel Winds was built on a Brownfield site with limited habitat for wildlife, therefore, the presence of threatened and endangered species except for migrant and transient use is unlikely.

For the five projects evaluated, two pairs of them are proposed in adjacent areas (Ripley-Westfield and State Line; Arkwright Summit and Ball Hill) and the other (Steel Winds) is an existing project that is most distant from the Project Area. There is little use of these project areas by threatened and endangered species for breeding, although all areas can expect transient and migrant use. Therefore, the potential cumulative risk to threatened and endangered species from both construction and operation of multiple wind farms is considered low.

7.6 Visual

The topography and vegetation at the Project Area and the surrounding region are such that visual impacts from other proposed projects in the region would be significantly shielded from most viewpoints. The farther one travels from a wind farm, the more diminished the impacts and visual influence of the Project become. The dominance of the Ripley-Westfield project on the landscape will either be diminished to a distant background view as one travels further from the Project Area or, in most cases, will not be visible at all. As such, cumulative impacts are considered only for those projects within a 20-mile radius from the Ripley-Westfield Project Area, which include State Line and Pomfret.

Given the current status in the development process of the State Line and Pomfret projects, no cumulative visual impacts are expected during construction of the wind power projects due to the distance between the projects (20 miles between the nearest turbines) and the construction timing. Construction of each wind power project will require use of mobile cranes and other large construction vehicles. Components will be delivered in sections via large semi-trucks. However, the construction period is expected to be relatively short (approximately nine to 12 months).

Cumulative visual impacts may occur during operation of the multiple wind power projects. For the purposes of this analysis, the Pomfret Project is assumed to be comprised of 49, 389-foot-tall 1.5-MW turbines and the State Line I project would be similar to the Ripley-Westfield Project at up to 61 WTGs. The introduction of such clearly man-made and kinetic structures creates an obvious disruption of the rolling agricultural landscape. As discussed in Section 3.9, the turbines will be visible above intervening landform and vegetation. From background vantage points (3+ miles), foreground vegetation will often screen the lower portions of the turbine structure (tower and nacelle) limiting views to the upper portion of the rotor turning above the tree line. This high degree of project visibility is attributed to the broad agricultural clearing within much of the study area and beyond. In addition, while red flashing aviation obstruction lighting on communications towers is a commonly visible nighttime element almost every-

where, the concentration of lights within the turbine area would be a unique change to the region.

Generally, visibility of multiple projects may be found on higher elevations along road corridors or open agricultural lands. The cumulative impact of the projects is highly variable depending on: the number of turbines actually constructed; the proximity of the turbines to the viewer, whether the viewer is stationary or moving; and the landscape setting.

Cumulative shadow flicker will not result from operation of the wind power projects and the Project. The projects are located at a far enough distance to not contribute to cumulative shadow flicker. It is generally accepted that shadow flicker will have no effect on properties at a distance farther than 10 turbine rotor diameters. Beyond this distance a person should not perceive a wind turbine to be intercepting sunlight, but rather as an object with the sun behind it; thus, the intensity of the blade shadow is considered negligible at distances beyond 1,100-meters (3,609-feet) from a WTG on the Ripley-Westfield Wind Farm.

7.7 Sound

Because sound impacts are limited by the distance sound travels, no proposed projects have the potential to contribute to a cumulative sound impact during construction and operation of the projects. Any noise impacts resulting from construction of the projects would be considered localized and temporary in nature. The construction periods of Ripley-Westfield, Arkwright Summit, and Ball Hill have the potential to overlap. However, given the distance between the projects, cumulative construction noise impacts are not expected. The distance between the closest turbines on the Ripley-Westfield and Arkwright Summit projects is approximately 20 miles. The State Line and Pomfret projects will almost certainly be on a different construction schedule due to their current stages of development.

7.8 Traffic and Transportation

Roads in the vicinity of the projects will experience increased traffic volumes during the construction of each project due to equipment and material deliveries. Because the State Line and Pomfret projects will almost certainly be on a different construction schedule than Ripley-Westfield due to their current stage of development, only the Arkwright Summit and Ball Hill projects have the potential to contribute to cumulative traffic and transportation impacts.

No major or extended road closures or improvements are expected to be required to construct any of the projects. Minor intersection improvements will be required to accommodate the turning radii of oversize trucks. Because there is currently little or no congestion on the roads in the Project Area, it is expected that increased traffic volumes will result in minimal delay for local traffic.

Potential impacts during construction for each project will include minor damage to area roads and bridges. However, this will only be significant if the projects

are constructed simultaneously and if the same haul routes are used. Roadway repairs as a result of damage incurred by Project construction activity will be coordinated through road-use agreements with the Towns and the County. The process of creating a road use agreement will allow the Towns' plans for scheduled paving and resurfacing to be coordinated with improvements and repairs by the wind power projects' developers.

If construction of the Arkwright Summit and Ball Hill projects ultimately overlaps with construction of the Ripley-Westfield, any cumulative impacts will be temporary and short-term in nature. Based on current proposed haul routes, the haul routes for Ripley-Westfield and Arkwright Summit and Ball Hill Projects do not overlap. The proposed haul route for the Arkwright Summit project is Route 83 from New York State Route 60. The preferred haul route for Ball Hill is Route 39 from NYS Route 20 from the west. The Ripley-Westfield project proposes access from the south from I-86 and NYS 76. No overlap is expected.

In addition, delivery routes may change during the design and construction preparation. In the event that simultaneous hauling of equipment occurs in the area, Ripley-Westfield Wind LLC would re-evaluate roadway conditions and make appropriate modifications. In the New York State Department of Transportation (NYSDOT) permitting process, a final route survey will be developed that identifies road improvements necessary to accommodate delivery and construction vehicles when re-routing is impractical. This final plan is also coordinated with road-use agreements between the Towns and the County.

Existing road traffic within Chautauqua County is below capacity and existing traffic conditions are light. A limited number of light trucks will occasionally access the facilities for service and maintenance; therefore, operation of the projects is not expected to have permanent impacts on local traffic and transportation.

7.9 Land Use

Based on proximity, only the State Line project has the potential to contribute to cumulative land use impacts. Impact from the other projects in the region will be localized and will not have a synergistic or region-wide cumulative impact with the proposed Ripley-Westfield project. Activities associated with Ripley-Westfield and State Line projects will result in temporary and permanent impacts to land use, primarily conversion from one land use to another.

Impacts will be greater during construction due to the need to build wider temporary access roads to support construction vehicles. Impacts will be reduced during operation when the width of these roads is reduced. For each project, locations of the turbines were chosen in large part to minimize the loss of active agricultural land and the interference with farm operations and other environmental resources.

Although, by their nature, each project will significantly change the appearance of the landscape, the projects are generally consistent with land use patterns within

the region and there is not expected to be a significant cumulative increase in the overall land use impact due to the operation of the projects. Land use in the region is described as rural-agricultural. The regional rural character is generally defined by its wide open agricultural parcels and low-density due to the presence of farms and vineyards. The projects are located entirely on private lands in areas dominated by active agricultural (including viticulture) and forested lands. Therefore, impacts to residential, commercial, and recreational land use have been avoided. The proposed projects are compatible with agricultural use, which dominate the region. 38% of Chautauqua County is classified as agricultural (Fedstats 2008). The total acreage of farmland that will be permanently impacted by conversion to nonagricultural uses for the Ripley-Westfield Preferred Layout is approximately 17 acres. The permanent impact from the State Line project is unknown, but can be assumed to result in a similar acreage of permanent agricultural impact as Ripley-Westfield. Regardless, cumulative loss of farmland will not significantly affect the total acreage of farmland in the region. Furthermore, while the impacts to land use generally occur on agricultural lands, agricultural activities on the individual farms will be allowed to continue in the future.

Full compliance with the local laws regulating the development of wind power facilities will ensure that cumulative impacts on land use are minimal. The town of Westfield town law regulating wind energy facilities has specific agricultural mitigation measures based on New York State Department of Agriculture and Markets (NYSDAM) guidelines, which include location of structures along field edges where possible, location of access roads along ridge tops, avoidance of dividing large fields into smaller fields, and avoidance and maintenance of all existing drainage and erosion control structures. While the town of Ripley does not currently have a local law related to the development of wind power facilities, the town of Westfield wind energy law was followed for the Project Area as a whole.

7.10 Socioeconomics

None of the projects in the region are expected to adversely impact housing and population. It is likely that motels/hotels in larger population centers, such as Dunkirk-Fredonia, Jamestown, and Buffalo, will be able to absorb the temporary influx of construction workers to the area, even if the Ripley-Westfield and other projects are constructed simultaneously. The hotels and motels will profit from extended construction worker stays during the construction period of each project. The length of time that these profits will be realized increases when considering the cumulative benefit of construction of multiple wind projects in the area. During construction of the projects, the local economy will experience several significant cumulative benefits from construction including an increase in local economic activity and purchases of automotive fuel, meals, and other items.

The sales data collected in existing wind farm markets indicate that the construction and operation of wind power projects has no influence on property values (see Section 3.13, Socioeconomics). Furthermore, the projects in Chautauqua County will have a positive long-term cumulative impact on the local economy in

the form of payments in lieu of taxes (PILOTs) to local municipalities, host community payments, and lease revenues to participating landowners.

7.11 Cultural Resources

The construction and operation of the Ripley-Westfield project will not have any impacts on archaeological resources in the Project Area. Since there will be no Project-specific impacts, there is no potential for contribution to cumulative archaeological impacts of the other proposed wind power projects in the region.

Based on the conservative 20-mile radius developed for cumulative visual impacts, those projects within that radius (State Line and Pomfret) would contribute to cumulative impacts on architectural resources. Construction of the Ripley-Westfield project will not have any direct impacts on architectural resources (i.e., demolition of any National Register Listed [NRL] listed or National Register Eligible [NRE] buildings). Project-specific architectural and archaeological data on State Line and Pomfret are not available for this analysis. Therefore, the quantitative analysis of cumulative impacts of proposed projects in the region on historic architectural resources is not possible based on the availability of detailed project information. There is, however, a potential for each of the proposed projects in the region to have visual and noise impacts on structures potentially eligible for the National Register of Historic Places (NRHP) due to construction activities. It is unlikely that these impacts will be significant due to their temporary nature.

7.12 Environmental Benefits

Construction and operation of all of the proposed projects in the region will have significant long-term beneficial effects on the use and conservation of energy resources. New York State Public Service Commission (NYS PSC) staff have recently noted that "it is in the public interest to expand renewable energy investments in New York". The PSC recently increased the targets of New York State's Renewable Portfolio Standard (RPS) to increase the proportion of renewable generation to 30% by 2015. The construction and operation of the wind projects in Chautauqua County clearly contribute to the RPS. Collectively, the projects will have a nameplate capacity of nearly 600 MW of electricity from a renewable resource without any fossil-fuel emissions. Increased production of renewable energy is expected to be part of the solution to reduce the use of polluting sources of energy thus reducing the negative impacts of global climate change and air emissions on people and wildlife.

8 Growth-Inducing Aspects

The Project will create temporary construction and new permanent jobs and provide a new revenue source for the County and Towns, as well as multiplier effects, but it is not anticipated to lead to significant long-term growth (i.e., residential, commercial, or industrial) in the towns of Ripley and Westfield or the surrounding areas. In the short-term, there will be some minor growth inducing aspects related to the Project. Temporary employment opportunities (up to 140 workers) will exist for area residents and other workers during the construction phase. Local commercial establishments may experience increased sales as a result of the Project and the presence of these workers for an extended period of time. In the long-term, employment opportunities will be available for approximately six to eight workers for the O&M of the turbines and associated facilities. To the extent practicable, local labor will be utilized to fill these positions to maximize the benefit to the local community. It is anticipated that individuals in the local community would be trained to complete the necessary tasks, and current residents would fill the majority of these jobs. Of the six to eight permanent operations jobs created, some positions would be filled by specialized individuals with experience in wind farm maintenance and management. No significant new residential growth is expected from the Project.

The existing roadway network will not be significantly altered, with the exception of several intersections whose widths will be modified to accommodate large vehicle turning radii. These intersection improvements are not designed to increase traffic capacity or facilitate growth. The Project does not include any new public utility infrastructure improvements, such as water or wastewater systems, which would enhance capacity or facilitate residential or industrial growth. Commercial growth will be limited to those businesses which supply site maintenance, vehicle maintenance, and general mechanical and office supplies to the Project O&M facility.

Power generated by the Project will be supplied to the NYISO bulk transmission system (BTS) and not to individual retail customers. The presence of wind turbines should help maintain the agricultural character of the area by providing active farms a secondary source of income through lease payments. The additional income from these payments is expected to help stabilize their income and provide some relief from the cash-flow fluctuations inherent to the agricultural industry.

The Project is not expected to affect the potential for the development of other wind projects in the area. It is designed as a stand-alone project that will use existing transmission infrastructure to provide power to the NYISO grid. It is anticipated that any upgrades to the transmission system will be limited to those necessary for the reliability of the grid based on the addition of energy from this Project only. The substation is designed to step-up only the power from the new generation produced by the facility.

9 Effects on Use and Conservation of Energy Resources

The New York State Energy Plan (the Plan) developed in 2002 and the NYS RPS adopted by the NYS Public Service Commission in 2004 establish goals of increasing the share of renewable energy as a percentage of statewide primary use. The Plan called for 15% of the state's energy to come from renewables by 2020 (up from 10% in 2000). The RPS was more aggressive, establishing a goal of 25% by 2015.

The NYSERDA reported in 2007 that the total renewable capacity supported by the RPS program since its inception could approach 1,162 MW by the fall of 2008. It was estimated that this renewable capacity could generate more than $720 million of in-state economic benefits over a 20-year period, excluding the impact of any economic roll-over multipliers or energy price suppression effects (NYSERDA 2007). In addition to the economic benefits, this renewable capacity would provide added environmental benefits, by avoiding increases of nitrogen oxides, sulfur oxides, and carbon dioxide. Based upon NYSERDA's June 2008 RPS Performance Report, 2009 production has a Main Tier Target of 4,768,000 MWh. According to this report, only 75% of the target will be met. In addition, it is further estimated that in 2013, only 34% of the target will be met. Unquestionably, new renewable energy projects are needed to ensure that 100% of the target is met by 2013. At this rate, it is unlikely that New York will meet the targets set forth in the RPS.

In April 2008, NYS Governor Paterson signed Executive Order No. 2 establishing the State Energy Planning Board. The Planning Board is tasked with the development of a new State Energy Plan that will support the development of a clean energy economy. Additionally, New York State Governor Paterson has proposed one of the most aggressive clean energy goals in the country, including an increase in the RPS to 30%. Governor Paterson's "45 by 15" policy, announced in January 2009, requires New York State to meet 45% of its electricity needs through improved energy efficiency and clean renewable energy by 2015. The realization of this goal will result in an estimated 50,000 new jobs.

PSC Staff have recently noted that "it is in the public interest to expand renewable energy investments in New York" and that the Main Tier of the RPS (the tier in which the Project would fall), "provides significant environmental benefits, does

not result in large rate increase, improves generation resource diversity, provides a number of difficult to quantify benefits, and has a potential to act as a hedge against wholesale electricity price swings." Renewable energy projects are needed because they reduce reliance on both domestic and foreign fossil fuel resources and help diversify the range of resources used to produce the electricity necessary to meet state and national electrical needs. In addition, as compared to fossil fuel energy sources, renewable energy projects avoid the generation air emissions from fossil fuel combustion commonly used for electrical generation. These emissions are detrimental to air quality and have been documented to adversely affect human health.

The proposed Ripley-Westfield Wind Farm will help the state meet its renewable energy goals. When constructed, the Project will have sufficient capacity to generate approximately 125 MW of power to the NYISO grid, filling the state and nation's need for a diverse energy portfolio that includes a higher percentage of energy generated from renewable resources.

The use of fossil fuels for energy production has resulted in an increase in carbon dioxide in the atmosphere, which is likely causing changes to the global climate. The systematic development of renewable energy and the implementation of other energy conservation measures will reduce reliance on fossil fuel combustion and result in the reduction of air pollutants and greenhouse gasses that contribute to climate change.

Wind energy's most important environmental benefit is its complete lack of the emissions of both air pollutants and greenhouse gases that are associated with conventional fuel-based methods of generating electricity. Moreover, when wind-generated electricity displaces more costly fuel-based sources in the competitive electric power market, power plant pollution is reduced.

Table 9-1 provides an estimate of the annual emissions that would be avoided with the installation of this Project, based on a 30% average efficiency as compared to a comparable sized coal plant.

The Project will provide an overall air quality benefit because it will provide energy from a renewable source without the creation of pollutants.

Table 9-1 Estimated Regional Emission Reductions Resulting from the Project

	MWh	SO_2 (TPY)	NO_X (TPY)	CO_2 (TPY)	Hg (lbs)
Existing NYS Coal Plant Emission Factors[1]	1	0.0142	0.00235	1.155	0.00011
Built Layout, 124.8 MW	327,974	-4,657	-771	-378,810	-36
Alternative Layout, 118.5 MW	311,418	-4,422	-732	-359,688	-34

Note:
[1] NYSERDA Energy Analysis Program 2007

Key:
CO_2 = Carbon dioxide.
Hg = Mercury.
Lbs = Pounds.
MW = Megawatt.
NO_x = Nitrogen oxides.
NYS = New York State.
SO_2 = Sulfur dioxide.
TPY = Tons per year.