

# 3

## Cumulative Impacts and Benefits: Windpark and Regional Development

Consistent with the mandate of the New York State Environmental Quality Review Act (SEQRA), this Draft Environmental Impact Statement (DEIS) analyzes cumulative impacts where such impacts are “applicable and significant” (6 New York Codes, Rules, and Regulations [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.

### 3.1 Study Area

This section addresses the potential cumulative impacts that may arise from the combined impacts of the Project and other currently operating and proposed wind power projects in the region (northern Chautauqua County, western Cattaraugus County, and southern Erie County) (see Figures 3-1 and 3-2). For the purposes of this analysis it was assumed that projects that are located in close geographic proximity to the Ball Hill Project would generally have a greater potential to contribute to a cumulative impact than those farther away and 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 an evaluation of each proposed project within the region was completed to determine the potential for impact within each resource area. The level of analysis 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, approximately 25 miles northeast of the Ball Hill Project Area. The Project consists of eight, 2.5-megawatt (MW) turbines.

The closest proposed project to Ball Hill is Horizon Energy’s New Grange Windfarm (New Grange) which is under development to the west of the Noble Ball Hill Project Area in the Towns of Arkwright and Pomfret. The distance between the closest turbines of the Project and the New Grange Windfarm is approximately 1 mile. According to the DEIS prepared for the proposed New Grange project, the

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project consists of up to 47 1.8-MW turbines which are similar in height and appearance to the turbines Noble intends to use at the Project. Due to their proximity, construction of both the proposed New Grange project and the Noble Ball Hill Project has the potential to increase certain environmental impacts of the other. The New Grange DEIS is available online at <http://www.newgrangewind.com>.

Across Chautauqua County, several other wind power projects are in the early planning and development phases. Table 3.1-1 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 New York State Independent System Operator (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, including the proposed Pomfret Windfarm, assumptions on the project's potential impacts were based on the known impacts of similar sized projects in the area. For the Pomfret Windfarm and other projects in the NYISO Queue for which the number of turbines being proposed is unlisted, an assumption was made based on the proposed MW available in the NYISO Queue. (e.g., for Pomfret 73.5 MW would equate to up to 49 1.5-MW turbines).

We also assumed that the proposed New Grange Windfarm will be approved and constructed as proposed in the DEIS. As a result, there is potential that the construction schedule for New Grange could overlap with construction of the Ball Hill Windpark, but the construction schedule for the Pomfret project will not.

### **3.2 Wetlands**

Existing New York State Department of Environmental Conservation (NYSDEC) and National Wetland Inventory (NWI) wetland mapping show a significant distribution of wetlands in the area surrounding the Ball Hill Windpark with most watersheds ultimately draining to Lake Erie or to the Allegheny River. New Grange is the only proposed project with publicly available wetland information. Impacts to wetlands resulting from all other existing and proposed wind projects will likely be in different watersheds and, therefore, will not result in cumulative hydrologic impacts as wetland impacts are typically considered on a watershed basis by regulatory agencies. Only the New Grange project will be quantifiably analyzed for cumulative wetland impacts.

**Table 3.1-1 Local Wind Power Projects in Comparison to Ball Hill Windpark**

Wind Power Project Name	MW	Date of Interconnection Request	Distance to Ball Hill Project Area	Proposed In-Service Date	Interconnection	Status
Horizon New Grange	79.9	7/21/05	1 mile	12/2008	Dunkirk-Falconer 115-kV	Facilities Study Pending
Horizon Pomfret	73.5	3/27/08	12 miles	12/2010	Dunkirk-Falconer 115-kV	Feasibility Study Pending
Ripley-Westfield Wind (Babcock & Brown)	124.8	8/14/07	25 miles	12/2007	Ripley-Dunkirk 230-kV	System Reliability Impact Study Pending
State Line Wind (Babcock & Brown)	124.8	12/20/07	30 miles	12/2010	Ripley-Dunkirk 230-kV	Feasibility Study in Progress
Concord Wind (Babcock & Brown)	101.2	2/28/08	Location information is not public	9/2011	Ripley-Dunkirk 230-kV	Feasibility Study Pending

Source: NYISO Queue, July 2008.

Key:

kV = Kilovolt.

MW = Megawatt.

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As described in Section 2.8, Wetlands: Impacts and Mitigation, Noble sited the Project largely to avoid significant wetland impact. 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 Noble's Ball Hill Windpark, 6.54 acres of temporary wetland impact from ground disturbance will take place; however, these areas will be returned to pre-construction contours following construction activities. Upon completion of construction there will be 0.33 acres of permanent wetland impacts and 5.13 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, Noble has developed a Conceptual Compensatory Wetland Mitigation Plan, which is provided in Appendix I. A final mitigation plan will be developed as part of the United States Army Corps of Engineers (USACE) and NYSDEC permitting process and will incorporate agency input and site-specific mitigation plans.

Complete avoidance of wetlands is not feasible at the New Grange project, and is likely not feasible at the Pomfret project 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 all temporary and permanent impacts related to clearing, grading, and placing fill. Construction of the New Grange project will result in approximately 13.6 acres of impact, of which approximately 11.9 acres will be restored to pre-existing conditions. The remaining 1.6 acres of wetlands will be permanently impacted by placement of fill for access roads. However, as discussed in greater detail below, this permanent loss of wetlands will be mitigated for in accordance with state and federal permits. The amount of construction-related and permanent wetland impact at the proposed Pomfret project is unknown, but has been assumed to be similar to New Grange due to project proximity and similar project size.

Project facilities at each wind power project will have minimal individual impacts on wetlands. The Ball Hill project contributes a small portion (0.33 acres) to the approximately 2 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 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 for wetland impacts. The USACE and NYSDEC typically require greater than a one-to-

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one mitigation ratio for permanent loss of wetlands. Mitigation for wetland impacts may result in a net increase in wetland acreage in the region.

#### **3.3 Wildlife**

Except for transient individuals, it would be uncommon for non-bird and non-bat resident wildlife in the region to travel many miles from the Project Area. In addition, because of their distance from the Ball Hill Project, other wind power facilities in the region will not result in continuous tracts of habitat alteration with the Project Area. The nearest operating wind power facility is the Steel Winds facility located along the shores of Lake Erie in Lackawanna, approximately 25 miles northwest of the Project. Steel Winds was built on a Brownfield site with limited habitat for wildlife; habitat impacts to other distant sites are expected to be localized and will not pose any cumulative impact with the Project. At other proposed wind power facilities in the region, it is expected that there will be small areas of localized habitat alteration similar to those at the Project, with much of that habitat restored after the completion of construction. Based on proximity, only New Grange and Pomfret have the potential to contribute to cumulative wildlife impacts, with the exception of threatened and endangered species. These species require special consideration. See Section 3.5 for a discussion of cumulative threatened and endangered species impacts.

Construction of multiple wind power projects will result in localized habitat alterations; however, neither the individual project impacts nor the cumulative impact from the New Grange and Pomfret projects are expected to be significant. Most species are expected to avoid the project sites during the active construction period. Since it is possible that New Grange and Ball Hill Project construction schedules will overlap, a larger temporary area of habitat disturbance may occur. During the course of construction of each project, some limited mortality may occur to less mobile species. 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. Construction of the Projects will result in a localized reduction in the amount of available forest habitat. Based on field surveys, approximately 122 acres of forest habitat will be impacted. The largest percentage of forested vegetation impacted by Ball Hill is successional northern hardwood forest (approximately 51 acres). Other forest communities affected at Ball Hill include hemlock-northern hardwood forest (approximately 45 acres) and beech maple mesic forest (approximately 26 acres). The reduction in the amount of forested habitat within the Ball Hill Project Site is minor in comparison with the overall acreage of forested land located in the Project Area (these three forest types comprise approximately 7,400 acres and approximately 122 acres or 1.6% of the forested communities in the Project Area will be impacted). Two hundred two acres of upland communities will be temporarily impacted by Ball Hill Project facilities including agricultural land (cropland/field crops, row crops, pastureland, and vineyards [approximately 182 acres]) and to a lesser extent, successional old fields, and shrubland (totaling approximately 20 acres). These communities are routinely subjected to disturbance or have been subjected

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to past disturbance and are a result of re-vegetation following disturbance. Wildlife will likely relocate to adjacent suitable habitat during construction or, upon cessation of construction, make use of areas temporarily disturbed, as revegetation takes place.

Construction of New Grange will result in permanent impact to 102.2 acres of forest and 68.8 acres of cropland, pastures, and hayfields. Relative to the overall Project Area, this amounts to less than 1% of available habitat. Impacts to wildlife habitat at the Pomfret project can reasonably be expected to be similar and impact only a small percentage of available forested and other habitat within the defined project areas, due to the similarities in Project components and siting strategies at projects of this nature. Cumulative habitat loss will result in an even smaller proportion when considering the percentage of habitat loss within the region.

Cumulatively, the three wind power projects will result in minimal loss of habitat within the respective project areas as well as compared with available habitat within the region. Further, the Ball Hill Project can reasonably be considered to contribute to only a third of the projected habitat loss. In addition, the impacts on habitat are consistent with activities and conditions that regularly occur throughout the region as a result of normal farming and timber activities. It is anticipated that wildlife in the vicinity of the proposed projects will either relocate to other adjacent suitable habitat. Once the Ball Hill, New Grange, and Pomfret projects are in operation, it is anticipated that wildlife will make use of areas that were temporarily disturbed during construction.

#### **3.4 Birds and Bats**

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 Ripley-Westfield and State Line projects and the existing Steel Winds project that are greater than 20 miles away from the Ball Hill 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 New Grange and Pomfret projects in the vicinity of the Project Area, and the proposed Ripley Westfield and State Line Windfarms and existing Steel Winds project were assessed in the BBRA using approximate fatality rates from post-construction studies conducted

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in the northeast (see Section 2.12, Bird and Bat Resources: Impacts and Mitigation, and Appendix J, for an explanation of the fatality rate approximations). An approximate range of bird fatalities for the Project was identified by multiplying the National Wind Coordinating Committee (NWCC) eastern average and 2006 Maple Ridge daily survey fatality rates for bird kills with the proposed number of turbines (see Table 3.4-1). Likewise, an approximate number of bat fatalities for the Project was identified by multiplying the NWCC national average and 2006 Maple Ridge daily survey bat fatality rates with the proposed number of turbines (see Table 3.4-2).

Tables 3.4-1 and 3.4-2 only present estimates of fatalities based on national averages and surveys conducted at an existing windfarm in upstate New York. Furthermore, the available data indicates that there can be considerable variation in fatality rates, especially for bats from turbine to turbine and project to project. More information on available data is discussed in Appendix J, Bird and Bat Risk Assessment. The number of bird and bat fatalities for a particular facility will be determined with post-construction mortality studies; however, this estimate allows an evaluation of the potential cumulative impacts.

**Table 3.4-1 Approximate Regional Number of Bird Fatalities**

Project	Number of Turbines	Approximate Bird Fatalities Per Year Based on NWCC Eastern Average Rate <sup>1</sup>	Approximate Bird Fatalities Per Year Based on 2006 Maple Ridge Daily Survey Rate <sup>2</sup>
<b>Noble Ball Hill</b>	<b>60</b>	<b>258</b>	<b>576</b>
Horizon New Grange	47	202	451
Horizon Pomfret	49 <sup>3</sup>	211	471
Babcock & Brown – Ripley-Westfield Wind Farm	79	340	758
Babcock & Brown – State Line Wind	79 <sup>4</sup>	340	758
Steel Winds (existing)	8	35	77
<b>Total</b>	<b>313</b>	<b>1,386</b>	<b>3,091</b>

Notes:

<sup>1</sup> 4.3 birds/turbine/year (NWCC 2004).

<sup>2</sup> 9.59 birds/turbine/survey season (Jain et al. 2007).

<sup>3</sup> 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.

<sup>4</sup> Number of turbines estimated based on 124.8 MW (same as Ripley-Westfield). This may change based on final turbine selection.

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**Table 3.4-2 Approximate Regional Number of Bat Fatalities**

Project	Number of Turbines	Approximate Bat Fatalities Per Year Based on NWCC National Average Rate <sup>1</sup>	Approximate Bat Fatalities Per Year Based on 2006 Maple Ridge Weekly Survey Rate <sup>2</sup>
<b>Noble Ball Hill</b>	<b>60</b>	<b>204</b>	<b>1,470</b>
Horizon New Grange	47	160	1,152
Horizon Pomfret	49 <sup>3</sup>	167	1,201
Babcock & Brown – Ripley-Westfield Wind Farm	79	269	1,936
Babcock & Brown – State Line Wind	79 <sup>4</sup>	269	1,936
Steel Winds (existing)	8	28	196
<b>Total</b>	<b>322</b>	<b>1,097</b>	<b>7,891</b>

Notes:

<sup>1</sup> 3.4 bats/turbine/year (low = 0.7; high = 47) (NWCC 2004).

<sup>2</sup> 24.5 bats/turbine/survey season (Jain et al. 2007).

<sup>3</sup> 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.

<sup>4</sup> 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 1,400 to 3,000 birds per year is not considered to be biologically significant, considering the size of the populations and losses due to 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) (USFWS 2002) is slight compared to other sources of mortality, such as:

- Vehicles (60 million or more deaths per year);
- Building windows (97 million 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);

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- 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 deaths per year) (Gill 1995; Erickson et al. 2001; USFWS 2002).

These sources of mortality are also present within the Project Area.

In addition, the bird kills that occur would be from many different species. Nocturnal migrant passerines, if present in the area, will likely make up the majority of bird kills. This is of concern because of the potential of Neotropical migrant species, 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).

At the present time, there is no evidence to conclude whether the cumulative annual loss of approximately 1,100 to 7,900 bats (as estimated for wind energy facilities) is 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 due to the spreading of White Nose Syndrome, due to the increasing number of wind projects and the fact that bats continue to be found during mortality studies at newly constructed wind sites. As the population sizes and trends of most bats in New York State are unknown, it is uncertain what level of impact is made from wind projects alone. While bird species populations have been studied and estimated, we are not aware of similar studies for bats and estimates for bat populations are not available and/or are 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 and operation of several wind projects in the northeast and implementation of long-term monitoring protocols would the significance of potential cumulative impacts be assessable. However, in order to reasonably analyze potential cumulative impacts to bats for this Project, available national data and 2006 survey data from the Maple Ridge Windfarm in New York State were utilized.

Post-construction monitoring programs have been established at each of Noble's wind power projects to determine if bird and/or bat collision fatalities occur as a result of project operation, if so, the rate of mortality. Other wind projects will develop similar monitoring programs. These data will be correlated with pre-construction data, including radar data, to determine whether the mortality rates are consistent with the identified impacts. This information can also be used to

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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.

As per the discussion on cumulative habitat impacts in the Section 3.3, the cumulative decrease in habitat availability resulting from the proposed wind power projects is not expected to have a significant impact on birds and bats in the region.

#### **3.5 Threatened and Endangered Species**

All projects in the region were included in the threatened and endangered species cumulative impacts evaluation because the presence of threatened and endangered species is likely similar at all proposed sites in the region.

Based on consultation with the United States Fish and Wildlife Service (USFWS) and New York State National Heritage Program (NHP), except for transient individuals, no threatened or endangered species or communities were identified within the Ball Hill Project Area (see section 2.9, Biological Resources: Environmental Setting).

During field surveys, one state-endangered species (Golden Eagle), two state-threatened species (Bald Eagle and Northern Harrier); and seven state species of special concern (Common Loon, Osprey, Sharp-shinned Hawk, Cooper's Hawk, Red-shouldered Hawk, Horned Lark, and Grasshopper Sparrow), were observed in the Project Area; all in low numbers. The only non-bird species that are listed as threatened and endangered and may potentially occur in the Project Area are the endangered clubshell and special concern rayed bean, both mollusks. Both of these species are freshwater mussels that have been found in the Lake Erie area. These species are listed county-wide on USFWS's Web site. There has been no indication from the USFWS that these species occur within the Project Area. As such, cumulative impacts to these populations will not be experienced. Only limited use of the Project Area is anticipated by endangered, threatened, and special concern species during construction as most of any occurrences would be related to migration or transient (i.e., limited) use. Therefore, no significant adverse impacts on these species are expected during construction. In addition, 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 DEIS prepared for the New Grange project, 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). No critical habitat for such species was identified in the Project Area. Similar species occurring in the vicinity of the Project were identified as occurring in the vicinity of the New Grange project. Northern Harrier,

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Coopers Hawk, and Red-shouldered Hawk were all observed at the New Grange project site during avian surveys. Due to the proximity of the Pomfret project to the New Grange project, it can be considered likely that the USFWS and NHP will identify similar species as occurring in the vicinity of the Ball Hill Project Area. If additional threatened or endangered species are identified at Pomfret that were not identified as part of the consultation process for Ball Hill and New Grange, they would likely be site-specific species and would not experience cumulative impacts from the construction of the Ball Hill Windpark or New Grange projects. No threatened and endangered species information was available for the other projects in the region. Steel Winds was built on a Brownfield site with limited habitat for wildlife, therefore, the presence of threatened and endangered species is unlikely.

Little to no use of these areas is anticipated by federally endangered, threatened, and special concern species; therefore, the potential cumulative risk to federally threatened and endangered species from both construction and operation of multiple windparks is considered low.

#### **3.6 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 windpark, the more diminished the impacts and visual influence of the Project become. The dominance of the Ball Hill Windpark 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 Ball Hill Project Area.

Noble retained the services of Saratoga Associates, Landscape Architects, Architects, Engineers, and Planners, P.C. (Saratoga) to evaluate the potential cumulative impact of the Ball Hill Windpark along with the proposed New Grange project to the regional viewshed within and outside of the Project's 5-mile study area.

No cumulative visual impacts are expected during construction of the wind power projects due to the distance between the projects (1 mile between the nearest turbines). 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). As such, construction-related visual impacts at any given receptor location will be brief and are not expected to result in adverse prolonged visual impacts to area residents or visitors. As previously stated, the construction schedule for the New Grange Windpark may overlap with the Ball Hill Windpark; however, as identified in Table 3.1-1, these projects are located at a sufficient distance apart to not contribute to cumulative visual impacts during construction. The Pomfret Windpark will almost certainly be

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on a different construction schedule due to its current stage of development in comparison to Ball Hill and New Grange.

Cumulative visual impacts may occur during operation of the multiple wind power projects. The proposed New Grange project is comprised of 47, 410-foot tall vertical structures distributed throughout the landscape; topped with large rotating blades. For the purposes of this analysis, the Pomfret Project is assumed to be comprised of 49, 389-foot-tall 1.5-MW turbines. The introduction of such clearly man-made and kinetic structures creates an obvious disruption of the rolling agricultural landscape of the 5-mile study area. However, the white or off-white colors of the turbines will be highly compatible with the hue, saturation, and brightness of the background sky and distant elements of the natural landscape. Furthermore, the tubular style towers at each wind power project have been specifically selected to minimize textural contrast and provide a more simple visually appealing form.

To assess the cumulative visual impacts resulting from operation, a series of viewshed maps were created to show where there was a possibility to see both the New Grange and Ball Hill turbines from locations within the Ball Hill Windpark's 5-mile study area. The Pomfret Project was not considered in this analysis, as the location of proposed turbines was not (and still is not) known at the time the analysis was conducted. The viewshed mapping process is discussed in Section 2.13, Visual Resources: Environmental Setting. A cumulative viewshed map is provided as Figure B1 of Appendix B of the Visual Resource Assessment (VRA) (see Appendix K). Theoretically, one or more turbines would be visible from approximately 35% of the entire 5-mile Ball Hill study area (comprised of 100,022 acres).

To demonstrate how the actual turbines will appear within the study area, two locations, Prospect Road in the Town of Villenova (VP #2) and Route 83 in the Town of Arkwright (VP #33), were identified for photo simulations to represent the most likely locations where both windparks will be visible. The simulations are provided as Figures B2-a through B3-d of Appendix B of the VRA (see Appendix K).

Based on an evaluation of the aesthetic resources, land uses, users groups, and visual simulations, it is apparent that each project will change the visible landscape of the region and create a distinct visual aspect. Although there will be an increase in the number of locations in the area where one or more turbines can be seen, it is unlikely that the quality of the view will change if multiple turbines are visible. Generally, visibility of the 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 constructed; the proximity of the turbines to the viewer, whether the viewer is stationary or moving; and the landscape setting.

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Cumulative shadow flicker will not result from operation of the wind power projects and the Project. The New Grange windpark is located at a far enough distance to not contribute to cumulative shadow flicker. It is generally accepted that shadow flicker will have no affect on properties at a distance farther than 10 turbine rotor diameters (approximately 2,625 feet from turbines in the Ball Hill Windpark and approximately 2,950 feet for the New Grange Windpark). 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 2,625 feet from a turbine on the Ball Hill Windpark. The distance between the closest turbines on the Ball Hill Windpark and New Grange windfarm is approximately 1 mile (5,280 feet). The location of turbines at the Pomfret project, approximately 12 miles from the Ball Hill Project Area, is unknown; as such, the incidence of shadow flicker at that site is also unknown. It can be assumed that no cumulative shadow flicker impacts will result from the operation of the Pomfret Windfarm based on the distance of Pomfret from the Ball Hill Project Area.

Cumulative visual impacts from aviation safety lighting placed on turbines are anticipated in the same geographic areas as the viewshed for the turbines. The more turbines that are visible from a location will generally result in more turbines with safety lighting being visible from that same location. However, not all turbines proposed for the Ball Hill and New Grange projects will have safety lighting. The cumulative impact is highly variable depending on the final number of turbines with lighting. Factors affecting visual impact may include: the proximity of the turbines to the viewer, whether the viewer is stationary or moving; and the landscape setting. The lighting plan as part of the DEIS for New Grange proposes lights on 21 of the 47 turbines. Thirty-four of the 60 proposed turbines as part of the Ball Hill Windpark will have simultaneously flashing red lights. Pomfret will also be required to light turbines at night for aviation safety purposes.

#### **3.7 Sound**

Because sound impacts are limited by the distance sound travels, only the New Grange project has the potential to contribute to a cumulative sound impact during construction and operation of the projects. Pomfret was considered in this analysis, but based on distance from the Ball Hill Project Area, it is not likely to contribute to cumulative sound impacts. Construction of the Ball Hill Windpark and the New Grange Windpark will contribute minimal noise impacts in the vicinity of the respective project areas. Any noise impacts resulting from construction of the projects would be considered localized and temporary in nature. The anticipated construction periods of New Grange and Ball Hill could potentially overlap. However, given the distance between the projects, cumulative construction noise impacts are not expected. The distance between the closest turbines on the Ball Hill and New Grange windparks is approximately 1 mile (5,280 feet). The Pomfret Windpark will almost certainly be on a different construction schedule due to its current stage of development in comparison to Ball Hill and New Grange.

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Operational noise impacts will be localized in the area of the proposed turbines at each wind power project. The New Grange Windpark Project Area is located immediately west of the Ball Hill Windpark. The predicted noise contours for the two projects based on a worst-case L90 background level with an omnidirectional 6 meters per second (m/s) wind do not overlap. Appendix L and the DEIS for New Grange illustrate the predicted contours. The Pomfret Windpark can be assumed to emit similar noise levels.

#### **3.8 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 Pomfret Windfarm and other currently proposed projects in the region will almost certainly be on a different construction schedule due to their current stage of development, only the New Grange project, which is on a similar construction schedule, has 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 from both projects will result in minimal delay for local traffic.

Potential impacts during construction for each project will include 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 New Grange Windpark ultimately overlaps with construction of the Ball Hill Windpark, any cumulative impacts will be temporary and short-term in nature. Based on current proposed haul routes, the haul routes for New Grange and Ball Hill Projects may overlap. The proposed haul route for the New Grange project is Route 83 from New York State (NYS) Route 60. The Transportation Haul Route Study (see Appendix N) indicates that the preferred off-site route to the Ball Hill Project Area is the Northwest Access Alternative 2 route (NYS Route 39 from NYS Route 20 from the west). Northwest Access Alternative 1 is the same haul route proposed for the New Grange windpark. If Alternative 2 is ultimately selected, there will be potential overlap in the use of portions of Route 60.

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In addition, delivery routes may change during the design and construction preparation. In the event that simultaneous hauling of equipment occurs in the area, Noble 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.

As previously stated, 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.

#### **3.9 Land Use**

Based on proximity, only the New Grange and Pomfret projects have the potential to contribute to 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 Ball Hill Windpark. Activities associated with Ball Hill, New Grange, and Pomfret 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 limited residential density due to the presence of farms. The projects are located entirely on private lands in areas dominated by active agricultural and forested lands. Therefore, impacts to residential, commercial, and recreational land use have been avoided.

The proposed projects are compatible with agricultural land use, which dominates the region. Chautauqua County is comprised of approximately 255,896 acres of agricultural land, which represents approximately 38% of the county (Fedstats 2008). The total acreage of farmland that will be permanently impacted by conversion to nonagricultural uses for Ball Hill and New Grange is approximately 109 acres (40 for Ball Hill and 69 for New Grange). The permanent impact from

### **3. Cumulative Impacts and Benefits: Windpark and Regional Development**

Pomfret is unknown, but can be assumed to result in a similar acreage of permanent agricultural impact as the other sites. 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 laws regulating wind energy facilities have 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.

#### **3.10 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 Ball Hill and New Grange 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 2.26, Socioeconomics: Impacts and Mitigation, and Appendix P). Furthermore, the projects 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, license agreements with host communities, and lease revenues to participating landowners.

#### **3.11 Cultural Resources**

The construction and operation of the Ball Hill Windpark 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 (New Grange and Pomfret) would contribute to cumulative impacts on architectural resources. Construction of the Ball

### **3. Cumulative Impacts and Benefits: Windpark and Regional Development**

Hill Windpark 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) and no direct impacts have been identified in connection with the New Grange project. 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. (See discussions of visual and noise impacts during construction in Section 2.14, Visual Resources: Impacts and Mitigation, and 2.16, Sound: Impacts and Mitigation, respectively.) Architectural and archaeological data on Pomfret is not available for analysis. Therefore, the quantitative analysis of cumulative impacts of proposed projects in the region on historic architectural resources was limited to New Grange, based on the availability of detailed project information.

Operation of all three wind power projects with the 20-mile cumulative visual impact area will result in visual impacts on NRE and NRL properties within the region. Noble's archaeological and architectural resource consultants, Panamerican, identified eight NRE and 138 potentially eligible structures within the 5-mile Noble Ball Windpark study area. Within the 5-mile APE for New Grange, five NRL and 35 NRE were identified. One or more turbines may be visible from most of the structures. The visual impacts on these NRE structures resulting from the operation of the other projects will be additive in the sense that more turbines are potentially visible from each property. The impact will vary depending on the number of turbines from each project that may be visible from a given property. The cumulative impacts to these resources will be reduced by a number of factors including topography, distance from the turbines, existing landscaping and vegetation, and surrounding land uses. Mitigation will be required as a condition of the construction of each of the projects to offset these impacts.

#### **3.12 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. The construction and operation of the wind power projects in Chautauqua County clearly contributes to New York State's Renewable Portfolio Standard Policy, which calls for an increase in renewable energy used in the state to 25% by the year 2013 (NYPSC 2006). Collectively, the projects will have a nameplate capacity of 175 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.

