Baron Winds Project

Case No. 15-F-0122

1001.24 Exhibit 24

Visual Impacts

TABLE OF CONTENTS

EXHIBIT 24 VISUAL IMPACTS

(a) Visual Impact Assessment

A Visual Impact Assessment (VIA) was conducted to determine the extent and assess the significance of Facility visibility. The VIA procedures used for this study are consistent with methodologies developed by various state and federal agencies, including the U.S. Department of the Interior, Bureau of Land Management (1980), U.S. Department of Agriculture, National Forest Service (1995), the U.S. Department of Transportation, Federal Highway Administration (1981), U.S. Army Corps of Engineers (USACE; Smardon, et al., 1988) and the New York State Department of Environmental Conservation (NYSDEC, 2000). The components of the VIA include identification of visually sensitive resources, viewshed mapping, confirmatory visual assessment fieldwork, visual simulations (photographic overlays), cumulative visual impact analysis, and proposed visual impact mitigation. The VIA, included as Appendix GGG to this Article 10 Application, addresses the following issues:

(1) Character and Visual Quality of the Existing Landscape

Per the definition set forth at 16 NYCRR § 1000.2(ar), the visual study area to be used for analysis of major electric generating facilities is defined as "an area generally related to the nature of the technology and the setting of the proposed site. For large facilities or wind power facilities with components spread across a rural landscape, the study area shall generally include the area within a radius of at least five miles from all generating facility components, interconnections and related facilities and alternative location sites. For facilities in areas of significant resource concerns, the size of a study area shall be configured to address specific features or resource issues."

During the early stages of the VIA, a 10-mile visual study area was established for the purpose of identifying visually sensitive resources of regional and/or statewide significance. Although a 5-mile study area is typical in some instances, a 10-mile study area was used in order to identify any potential "significant resource concerns" beyond 5 miles that would warrant the use of a larger study area. A more inclusive inventory of locally significant visually sensitive resources was conducted for the area within 5 miles of the proposed Facility. As described below in Section (b)(3) and in Section 3.6 of the VIA, through the public outreach process, several resources were identified as locally significant that occur outside the 5-mile visual study area, but within the 10-mile visual study area; therefore, the 10-mile-radius visual study area was utilized going forward for the various visual analyses presented herein (e.g., visual fieldwork, viewshed analysis, and simulations). However, the 5-mile-radius visual study area was also retained for the purposes of discussing locally significant visually sensitive resources and because the area within 5 miles of a Facility typically represents the area within which significant visual effects may occur. The 5-mile and 10-mile visual study area boundaries for the Facility are depicted on Figure 4 of the VIA.

The 10-mile radius visual study area lies within the Central Appalachian physiographic region of New York State (Reschke, 1990). The area is distinguished by elevated ridges that are dissected by narrow, steep-walled valleys and ravines. These dissected plateaus transition rapidly to relatively flat river valleys associated with the Cohocton River and Canisteo River. Both of these valleys run generally northwest to southeast through the visual study area. The Cohocton River Valley is adjacent to the proposed northern turbine arrays and the Canisteo River Valley is approximately 4 miles southwest of the proposed southern arrays. Ground surface elevation within the study area ranges from approximately 600 to 2,985 feet above sea level (amsl). In comparison, ground surface elevation within the Facility Site itself, where the turbines will be built, ranges from 1,420 to 2,142 amsl.

Vegetation is characterized by a roughly even mix of open fields and forest throughout the majority of the study area; however, forestland is more prevalent than agricultural fields in the south, while in the northern end of the study area farm fields predominate. Open fields include active cropland and pasture and generally occur on more level hilltops and within the major valleys. Forest vegetation is primarily deciduous (oak-hickory and northern hardwoods) with some native conifers (white pine and hemlock) mixed in. Blocks of planted conifers (Norway spruce, Scotch pine, etc.) also occur in the upland portions of the study area. Forestland occupies the unfarmed ravines and ridge slopes throughout the study area, and can also be found along river banks and in woodlots, hedgerows and wooded wetlands in the more agricultural portions of the study area.

Per the requirements set forth in 16 NYCRR § 1000.24(b)(1), Landscape Similarity Zones must be defined within the visual study area to be shown along with other indicators of potential visual impact (i.e. viewshed maps). Definition of discrete landscape types within a given study area provides a useful framework for the analysis of a project's potential visual effects. These landscape types, referred to in the VIA and this Exhibit as Landscape Similarity Zones (LSZs), are defined based on the similarity of various landscape characteristics including landform, vegetation, water, and/or land use patterns, in accordance with established visual assessment methodologies (Smardon et al., 1988; USDA Forest Service, 1995; USDOT Federal Highway Administration, 1981; USDI Bureau of Land Management, 1980). Within the visual study area, six distinct LSZs were defined. The approximate location of these zones is illustrated in Figure 5 of the VIA (Appendix GGG). LSZs within the study area are described in more detail in the VIA and include the following:

- Forest
- Rural Valley

- Rural Upland/Ridgeline
- City/Village/Hamlet
- Waterfront/Open Water
- Transportation Corridor

(2) Visibility of the Facility

The VIA includes an analysis of potential visibility and identifies locations within the visual study area where it may be possible to view the proposed Facility turbines. This analysis included identifying potentially visible areas on viewshed maps and verifying line of sight conditions in the field. The purpose of these field visits was to verify the existence of direct lines of sight to the Facility as indicated by viewshed analysis, and to obtain photographs for subsequent use in the development of visual simulations. With respect to line of sight, see Section (b)(1) below.

Topographic and vegetation viewshed maps were created to identify potential visibility of wind turbines. The methodology for these analyses is described in detail below in Section (b)(2) of this Exhibit and Section 4.1.1 of the VIA. Topographic and vegetation viewshed maps were also prepared for the substation and overhead segments of collection lines.

EDR personnel conducted visual field review in the study area on multiple dates from December 2016 through May 2017 (December 20, 2016, January 12, 2017, March 23, 2017, and May 10 and 18, 2017). During these site visits, EDR staff members drove public roads and visited public vantage points within the 10-mile radius study area to document locations from which the turbines and other Facility components would likely be visible, partially screened, or fully screened. This determination was made based on the visibility of the distinctive Facility Site ridges/landforms, as well as existing tall structures (such as existing wind turbines, silos, and temporary meteorological towers) on or around the Facility Site, which served as locational and scale references. These site visits resulted in photographs from 207 representative viewpoints within the 10-mile study area. The viewpoints document potential visibility of the Facility from the various LSZs, distance zones, directions, visually sensitive resources, and areas of high public use throughout the visual study area. A representative photograph documenting the general view towards the Facility site from each viewpoint is included in Appendices B and D of the VIA and the location of each viewpoint is shown on Figure 10 of the VIA.

The December 20, 2016 field review focused on documenting existing landscape characteristics and verifying potential visibility of the proposed Facility from identified sensitive sites, all with the idea that the viewpoints/photographs may be selected for subsequent development of visual simulations. Weather conditions during the site visit were not consistent with the predicted forecast, and remained overcast and cloudy throughout the majority of the day (although there were points throughout the day when skies partially cleared and visibility improved). Representative photos were taken during these periods and provide different sunlight/sky conditions typical of the winter season. These photographs also capture the distinctive landforms and ridges within the study area, as well as existing tall structures, which provided adequate scale and location references to allow for determination of potential Facility visibility.

Additional site visits were conducted in January, March, and May of 2017 to supplement the photography obtained in December. As shown in the photolog included in Appendix B of the VIA, this resulted in a set of photographs that document a range of weather/sky conditions, visibility, and seasonal characteristics. It is worth noting that a percentage of the visual field review was conducted during the leaf-off season and therefore many of the photographs depict the most conservative scenario in terms of potential Facility visibility.

During each site visit, photos were taken using digital SLR cameras with a minimum resolution of 14.1 megapixels.[1] All cameras utilized a focal length between 28 and 35 mm (equivalent to between 45 and 55 mm on a standard 35 mm film camera). This focal length is the standard used in visual impact assessments because it most closely approximates normal human perception of spatial relationships and scale in the landscape (CEIWEP, 2007). At each viewpoint, a series of overlapping photos were taken to cover the full field of view toward the Facility Site. Viewpoint locations were documented using hand-held global positioning system (GPS) units and high resolution aerial photographs (digital ortho quarter quadrangles). The time and location of each photo were documented on all electronic equipment (cameras, GPS units, etc.) and noted on field maps and data sheets. Viewpoints photographed during field review generally represented the most open, unobstructed available view toward the Facility.

Field review confirmed that the actual Facility visibility is likely to be more limited than suggested by viewshed mapping (Figure 8 of the VIA). This is due to the fact that trees that typically vegetate the steep slopes within the study area provide a more extensive and effective screening than assumed in these analyses (e.g., vegetation is more extensive than indicated on the United States Geological Survey (USGS) National Land Cover Dataset (NLCD), and often taller than 40 feet in height), and screening provided by buildings is significant within more developed areas (e.g., the villages and hamlets). The results of EDR's field review, presented in detail with visual aids in Section 5.1.3 of the VIA, are summarized below and organized generally according to Landscape Similarity Zone.

[1] Digital SLR cameras used in the photography field work included Nikon D3100, D5200, and D7100.

Forest LSZ

Field review confirmed that actual visibility of the Facility from the Forest LSZ, which covers a majority of the study area, is very limited. Photographs of typical views from the Forest LSZ are included in Section 3.3.1 of the VIA (see Inset 2). Even under leaf-off conditions, the density of tall forest vegetation in forest stands and woodlots block nearly all outward views toward the Facility Site. Visually sensitive resources in this LSZ, where field review confirmed no (or minimal) Facility visibility, include Bully Hill State Forest, Canacadea State Forest, Canaseraga State Forest, and Stony Brook State Park, as represented by Viewpoints 26, 29, 148, 153-155, and 161 (see Appendix B of the VIA).

Field review from the NYSDEC Truck Trail within the Canacadea State Forest, the recreation area within Stoney Brook State Park and Blank Road within Canaseraga State Forest (among others) confirmed that outward views from the Forest LSZ are generally limited to locations adjacent to roadways and small forest clearings. Even along roadways and at formal overlooks and clearings with the potential for outward views from interior forest areas, views of the Facility will be fully or substantially screened (see Inset 14 of the VIA).

Field review also confirmed that public trail networks within the state forests rarely leave forested areas, and open field traverses or cleared overlooks are rare. The one exception is the North Country/Finger Lakes Trail, where portions of the trail leave the forest and run along public roads. Views from these open portions of the trail network are consistent with the description of the Facility visibility from the Rural Valley and Rural Upland/Ridgeline LSZs, as described below.

Rural Valley LSZ

Field review indicates that potential Facility visibility within the Rural Valley LSZ is highly variable. Photographs of typical views from the Rural Valley LSZ are included in Section 3.3.2 of the VIA (see Insets 3 and 4). The siting considerations of a wind energy facility require turbines to be sited on hilltops or ridgelines, outside of valley areas. In many of the rural valleys in the visual study area, where outward visibility is not screened by foreground buildings or vegetation, the most dominant visual feature is typically the nearest ridge and/or series of hills and ridges that define the valley walls. The portions of the Rural Valley LSZ that are agricultural often provide open views across flat valleys framed by ridges (see VIA Inset 15). When located in proximity to the proposed Facility, such valley locations will provide unobstructed views of nearby wind turbines located on the adjacent ridgetops. However, these ridges that define the valley walls will also be effective in blocking views of more distant turbines. This is demonstrated by available views of the existing Cohocton and Howard Wind Farms within the study area. When traveling on a road located in the rural valleys, the existing turbines are dominant visual features when located on adjacent ridges. However, when traveling even just one valley over, the same turbines are well screened by the combination of foreground topography and vegetation.

The Rural Valley LSZ also includes areas where hedgerows, yard plantings, small forest stands, and/or residential and agricultural buildings screen (or partially screen) longer distance views.

Visually sensitive resources located in the Rural Valley LSZ that may afford views of the Facility include scattered National Register of Historic Places (NRHP)-eligible sites (primarily farmsteads and cemeteries).

Rural Uplands/Ridgeline LSZ

The Rural Uplands/Ridgeline LSZ generally offers the greatest opportunity for views of the Facility within the study area. Photographs of typical views from the Rural Upland/Ridgeline LSZ are included in Section 3.3.3 (see Inset 5). Vantage points in areas of relatively high elevation minimize the screening effects of intervening topography, and often offer open, long distance views toward ridge tops and plateaus, where most Facility components are proposed to be located. Additionally, the open and agricultural character of the landscape within the majority of this zone minimizes the amount of screening offered by trees.

This LSZ has relatively fewer visually sensitive resources when compared to the other LSZs due to the low density of human settlement/development. Portions of the North Country Trail/Finger Lakes Trail and Quad County Snowmobile Trails cross open areas and follow local roadways within the Rural Upland/Ridgeline LSZ. These trails offer foreground, mid-ground, and background views of existing turbines due to the open elevated natures of the landscape and the fact that this LSZ is the preferred location for siting wind turbines.

City/Village/Hamlet LSZ

Actual visibility of the Facility from the City/Village/Hamlet LSZ, as confirmed by field review, is anticipated to be variable. Photographs of typical views from the City/Village/Hamlet LSZ are included in Section 3.3.4 (see Inset 6) of the VIA. In most portions of the City of Hornell and the various villages and hamlets within the study area, buildings and yard vegetation screen outward views. In these areas, views of the Facility will often be limited to partially screened views of turbines in gaps between buildings and vegetation, unless proposed turbines are located on a ridge or open agricultural area directly adjacent to the village or hamlet. Appendix B of the VIA includes representative views from the Villages of Cohocton, Wayland, Hornell, and Dansville.

Areas with the best opportunity for more open views within this LSZ are generally located on the outskirts of these developed areas, or where relatively large areas of unvegetated land (e.g., parks, ponds, school grounds, and athletic fields) occur within a village or hamlet. Appendix B includes representative views from the hamlets of North Cohocton (Viewpoint 21), Atlanta (Viewpoint 23), and Arkport (Viewpoint 110). In general, the less-densely settled hamlets provide more opportunities for Facility visibility than the City of Hornell and the villages.

This LSZ is the location of most of the NRHP-listed and eligible properties in the study area. Views available from these visually sensitive resources will depend on their location and degree of foreground screening. As represented by the photos included in Inset 17 of the VIA, views from areas of dense development will be partially screened or include a limited number of turbines (e.g., narrow views available between nearby structures or through gaps in vegetation), while open views are more likely from historic sites on the periphery of the villages and hamlets.

Transportation Corridors LSZ

Field review revealed that potential Facility visibility from the Transportation Corridors LSZ will be highly variable. Due to their length, these areas run through a variety of different settings from settled areas to agricultural valleys and uplands, and areas of forest cover. Photographs of typical views from the Transportation Corridors LSZ are in Section 3.3.5 of the VIA (see Inset 7). Field review confirmed that foreground, mid-ground, and background views to the Facility Site are present along different section of Interstate Routes 390 and 86.

Visibility of the proposed turbines from visually sensitive resources along the interstates will be variable. For example, foreground views of portions of the Facility will be possible from the Interstate 390 Scenic Overlook, as the turbines rise above the foreground ridges while views from the Interstate 86 Scenic Overlook include intervening vegetation and topography that will significantly screen visibility of the proposed wind turbines.

Waterfront/Open Water LSZ

Field review of the limited areas that make up the Waterfront/Open Water LSZ within the study area indicated that Facility visibility is likely to be very limited with the exception of Loon Lake. Photographs of typical views from the Waterfront/Open Water LSZ are included in Section 3.3.6 (see Inset 8 and 20) of the VIA. Waterfront and open water areas offer relatively open outward views when compared to other landscape types due to the expanse of open water and the lack of screening by foreground topography, vegetation, or buildings. This holds true for Loon Lake and Almond Lake; however, the other waterbodies in this study area are largely limited to small ponds and impoundments, or meandering patterns where long-distance views are screened by shoreline trees and adjacent hills. Waterbodies that are included in this LSZ and that were visited during the field review include Hornell Reservoirs Number 1 and 3, Loon Lake, Almond Lake, and the Cohocton River. Viewshed analysis suggested that potential Facility visibility from Almond Lake will be limited to the southwestern shoreline. Field review and a wire frame rendering confirmed that the proposed turbines will not be visible from the water's surface (see Inset 21 of the VIA).

The largest area of the Waterfront\Open Water LSZ where the proposed Facility will likely be visible is the shoreline and surface of Loon Lake. This is due to the close proximity of the northern-most turbines and the lack of intervening vegetation. Field review in this area confirmed potential Facility visibility from the Loon Lake shoreline, adjacent residences, and surrounding roadways.

(3) Visibility of Above-ground Interconnections and Roadways

Potential visibility of the collection substation, as indicated by the viewshed analysis, is illustrated in Figure 9, Sheet 1 of the VIA. This analysis, based on the tallest proposed structures and topography alone, indicates that some portion of the substation could be visible from approximately 28.9% of the 1-mile study area. Visibility is limited by the hillside location of the substation and the relatively high topographic relief within the 1-mile radius study area. The southeastern portion of the study area slopes toward Neils Creek and is screened from view, as are the northern and eastern slopes of Brown Hill. The largest area of potential visibility extends north and west from the collection substation on hilltops and slopes facing the proposed station. Two visually sensitive resources occur with 1 mile of the proposed collection substation: the NRHP-eligible Merrill (Parkhill) Cemetery and Neils Creek Public Fishing Stream. Views of the substation are fully screened from both of these resources by intervening topography.

When vegetation is factored into the analysis, potential visibility of the proposed substation is further reduced to approximately 7.7% of the 1-mile study area. Views from the remaining 92.3% of the study area are screened by the combination of topography and forest vegetation. Remaining areas of potential substation visibility include an open area adjacent to the proposed substation (limited by the hilltop to the south), portions of an agricultural field on Brown Hill to the northeast, portions of the cleared transmission line right-of-way (ROW) extending to the northwest, and several areas within open fields on hilltops and slopes facing the substation site in the northwestern quadrant of the 1-mile study area.

Results of the overhead collection line viewshed analysis are illustrated in Figure 9, Sheet 2 of the VIA. The topographic viewshed analysis indicates that approximately 77.6% of the area within 1 mile of the overhead collection line could potentially have views of the proposed structures. The remaining 22.4% of the area includes topographic depressions such as Hinkle Hollow and Oil Well Hollow, which would be screened from view of the overhead line. Factoring vegetation into the analysis reduces potential visibility to 32.1% of the 1-mile study area;

however, most elevated open areas within 1 mile of the overhead collection line could potentially have views of some portions of the proposed structures. Eight visually sensitive resources occur within the overhead collection line 1-mile study area, including one NRHP-eligible property (a 1923 Gothic Revival church), a snowmobile trail, the Village of Cohocton, three major transportation corridors (Interstate Route 390 and State Routes 21 and 415), and two named streams (Neils Creek and Reynolds Creek). The viewshed analysis indicates that the overhead collection line will not be visible from either of the NRHP-eligible properties and that the Village of Cohocton, NYS Route 415, and Neils Creek will be largely screened from view. While much of Interstate 390 will be screened by the walls of Hinkle Hollow, potential visibility is indicated within the Interstate Route 390 ROW south of Loon Lake Road. More substantial visibility is indicated along NYS Route 21, Reynolds Creek, and the Quad County Snowmobile Trail, which have the greatest potential for prolonged views of the proposed overhead collection line.

A 16-foot wide gravel drive is represented in any simulations where the proposed access roads would be visible in the photograph.

(4) Appearance of the Facility Upon Completion

To show anticipated visual changes associated with the proposed Facility, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the proposed Facility from each of the 21 selected viewpoints. The photographic simulations were developed by using Autodesk 3ds Max Design® to create a simulated perspective (camera view) to match the location, bearing, and focal length of each existing conditions photograph. Existing elements in the view (e.g., topography, buildings, roads) were modeled based on aerial photographs and DEM data in AutoCAD Civil 3D®. All three dimensional (3-D) topographic mesh of the landform (based on DEM data) was then brought into the 3-D model space. At this point minor adjustments were made to camera and target location, focal length, and camera roll to align all modeled elements with the corresponding elements in the photograph. This assures that any elements introduced to the model space (e.g., the proposed turbines) will be shown in proportion, perspective, and proper relation to the existing landscape elements in the view. As a result, the alignment, elevations, dimensions and locations of the proposed Facility structures will be accurate and true in their relationship to other landscape elements in the photograph.

Computer models of the proposed turbine layout and overhead collection line were prepared based on specifications and data provided by the Applicant. For the purposes of this analysis, it was assumed that all turbines would be Vestas V126 (3.6 MW) machines with a hub height of 89 meters (292 feet) and a rotor diameter of 126 meters (413 feet); (see Figure 3 of the VIA) as this is the tallest turbine model under consideration for the Facility. All turbine rotors were modeled facing into the prevailing wind (i.e., oriented to the southwest). Structures for the overhead collection line were assumed to be wood poles ranging from 50 to 60 feet in height. Specific structure type/design information was provided by the Facility electrical engineer. Using the camera view as guidance, the visible portions of the modeled Facility components were imported to the landscape model space described above, and set at the proper coordinates. Coordinates for proposed turbines and collection line poles were provided to EDR by the Applicant.

Clearing limits were assumed to be a 225-foot radius around each turbine, a 100-foot wide cleared ROW for the overhead line, and a 75-foot wide corridor along access roads in forested areas. A 16-foot wide gravel drive is represented in any simulations where the proposed access roads would be visible in the photograph.

Once the proposed Facility was accurately aligned within the camera view, a lighting system was created based on the actual time, date, and location of the photograph. Using the Mental Ray Rendering System® with Final Gather and Mental Ray Daylight System® within the Autodesk 3ds Mas Design® software, light reflection, highlights, color casting, and shadows were accurately rendered on the modeled Facility based on actual environmental conditions represented in the photograph. The rendered Facility was then superimposed over the photograph in Adobe Photoshop® and portions of the turbines that fall behind vegetation, structures or topography were masked out. Photoshop was also used to take out any existing structures or vegetation proposed to be removed as part of the Facility. Once the turbines or poles were added to the photo, any shadows cast on the ground by the proposed structures were also included by rendering a separate "shadow pass" over the DEM model in Autodesk 3ds Max Design® and then overlaying the shadows on the simulated view with the proper fall-off and transparency using Adobe Photoshop CS5®. A graphic illustration of the process is included in Figure 7 of the VIA (Appendix GGG).

The visual simulations for the Facility are included as Appendix D of the VIA and are further discussed in Section 4.2.2 of the VIA.

In addition, for some views, "wireframe renderings" were prepared to illustrate the potential screening effect of vegetation or other features in the photograph. In these wireframe renderings, the portions of the proposed turbines that will be screened by vegetation (or other landscape features) are shown in a bright green color (for illustrative purposes). In some instances, these wireframe renderings were prepared for viewpoints that were being considered as candidates for visual simulations to determine the potential visibility of the Facility (and therefore, whether the viewpoint was a good candidate for visual simulation). In other instances, wireframe renderings were prepared for the explicit purpose of illustrating the effects of screening. The wireframe renderings are included as insets to illustrate the discussion of potential Facility visibility included in Section 5.1.3 of the VIA.

(5) Lighting

The potential visibility of Federal Aviation Administration (FAA) warning lights for the proposed turbines is described in Section 5.1.1 of the VIA and Section (b)(1) of this Exhibit (see Figure 8 of the VIA). Nighttime photos from the Fenner Wind Power Facility (Figure 11 of the VIA), which is located in Madison County, New York, and has been in operation since 2001, are included to illustrate the type of nighttime visual impact that could occur at certain viewpoints. The contrast of the aviation warning lights with the night sky could be appreciable in dark, rural settings, and their presence suggests a more commercial/industrial land use. Viewer attention is drawn by the flashing of the lights, and any positive reaction that wind turbines engender (due to their graceful form, association with clean energy, etc.) is lost at night. While generally not an issue from roads and public resources visited almost exclusively during the day (parks, trails, historic sites, etc.), turbine lighting could be perceived negatively by area residents who may be able to view these lights from their homes and yards in dark, rural settings. However, this impact will be limited along major roadways and in areas of more concentrated human settlement, where nearby ridgelines will generally screen views of large numbers of turbines and existing light sources will limit the visibility and contrast of the aviation warning lights.

It should be noted that the size and brightness of the lights depicted in Figure 11 of the VIA are due to the use of a long exposure during photography to ensure that the lights were visible in the photographs, and therefore, are not representative of what would be seen with the naked eye. In addition, the Fenner Wind Power Facility pre-dates current FAA regulations, and all 20 turbines were required to be lit. Typically, only a portion (around one-third to half) of the proposed turbines will actually be lit, as determined in consultation with the FAA. For all these reasons, the appearance of the lights presented in Figure 11 of the VIA illustrates a worst-case analysis of potential nighttime visibility. Lighting at the substation will be kept to a minimum, and turned on only as needed, either by switch or motion detector. Final exterior lighting at Facility components will be described in the Facility Exterior Lighting Plan in accordance with Applicant's proposed condition 60.

(6) Photographic Overlays

To show anticipated visual changes associated with the proposed Facility, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the proposed Facility from each of the 21 selected viewpoints. See Section (a)(4) above for discussion of the methodology and specific software packages that were used for creating the simulations. The visual simulations for the Facility are included as Appendix D and are further discussed in Section 5.2 of the VIA.

(7) Nature and Degree of Visual Change from Construction

Visual impacts during construction are anticipated to be relatively minor and temporary in nature. Representative photographs of construction activities are included in Figure 14 of the VIA (Appendix GGG). As shown on these photographs, anticipated visual effects during construction include the following:

- There will be a temporary increase in truck traffic on area roadways. Construction vehicles for the Facility will include pick-up trucks, dump trucks, crane transporters, concrete trucks, and oversized semi-trailers, including specialized transportation vehicles. For instance, wind turbine blades are transported on trailers with one blade per vehicle, and tower sections are typically transported in three to four sections, depending on the supplier (one section per truck). The size of the proposed blades and tower segments generally control the height and width of the transportation vehicle.
- As described in Exhibit 25 of this Application, it is anticipated that temporary widening of some public roads with an aggregate roadway surface will be required to accommodate the turning movements of delivery vehicles in certain locations (e.g., road intersections). These temporary improvements will generally be removed at the completion of construction. Public roads may also be damaged by the heavy vehicle traffic during the course of construction. However, as required by road use agreements, all such damage will be repaired at the end of construction.
- The construction laydown yards will be developed by stripping the topsoil, grading as necessary, and installing a level gravel-surfaced working area. Electric and communication lines will be brought in from existing distribution poles to allow connection with construction trailers. During Facility construction, the yard will be occupied by vehicles, construction trailers, and stockpiled materials, all of which will be removed, and the site restored, at the end of construction.
- Facility access roads will be sited on existing farm lanes and forest roads wherever possible, and areas of disturbance will be confined to the smallest area possible. However, construction of access roads will involve topsoil stripping and grubbing of stumps, as necessary. Stripped topsoil will be stockpiled along the road corridor for use in site restoration. Following removal of topsoil, subsoil will be graded and compacted, and surfaced with approximately 12 inches of gravel or crushed stone. During construction, access roads with a travel surface of up to 40 feet wide will be required to accommodate large cranes and oversized construction vehicles. This road width will be narrowed to 16 feet following completion of construction. Following construction, access roads generally take on the appearance of farm lanes (see simulation from Viewpoint 198).
- Once the roads are complete for a particular group of turbines sites, turbine foundation construction will commence on that completed access road section. Initial activity at each tower site will typically involve

clearing and leveling (as needed) up to a 225-foot radius around each tower location. Topsoil will be stripped from the excavation area, and stockpiled for future site restoration. Following topsoil removal, tracked excavators will be used to excavate the foundation hole. Subsoil and rock will be segregated from topsoil and stockpiled for reuse as backfill. Once the concrete is poured and sufficiently cured, the excavation area around and over it is backfilled with excavated on-site material. The base of each tower will be surrounded by a 6-foot wide gravel skirt, and an area approximately 100 feet by 60 feet will remain as a permanent gravel crane pad. Otherwise, the turbine sites will be revegetated. Because turbines are typically well removed from public roads and adjacent residences, visibility of earth work at these sites is generally limited.

- Wherever possible, underground collection lines will be installed by direct burial, which involves the installation of bundled cable (electrical and fiber optic bundles) directly into a narrow cut or "rip" in the ground. The rip disturbs an area approximately 24 inches wide with bundled cable installed to a minimum depth of 36 inches. Where direct burial is not possible, an open trench will be excavated. Using this installation technique, topsoil and subsoil are excavated, segregated, and stockpiled adjacent to the trench. Following cable installation, the trench is backfilled with suitable fill material and any additional spoils are spread out or otherwise properly disposed of. Following installation of the buried collection line, areas will be returned to pre-construction grades and revegetated.
- Turbine assembly involves the use of large tracked cranes, smaller rough terrain cranes, boom trucks, and rough terrain fork-lifts for loading and off-loading materials. The tower sections, rotor components, and nacelle for each turbine will be delivered to each site by flatbed trucks and unloaded by crane. A large assembly crane will set the tower segments on the foundation, place the nacelle on top of the tower, and install the rotor either by individual blade installation or, following ground assembly, by placing the rotor onto the nacelle. The visibility of these cranes will be comparable to the visibility of the proposed turbines (in terms of height). However, use of crane equipment at each turbine site will be limited to the time necessary to complete turbine erection (generally 1 to 2 days).
- Restoration of temporarily disturbed areas will be achieved by restoring original grades (where feasible) and seeding with a native seed mix to reestablish vegetative cover in these areas. Other than in active agricultural fields, native species will be allowed to revegetate these areas. This will minimize visual impacts associated with soil and vegetation disturbance during construction and operation.

(8) Nature and Degree of Visual Change from Operation

To evaluate anticipated visual change, the photographic simulations of the completed Facility were compared to photos of existing conditions from each of the 21 selected viewpoints. These "before" and "after" photographs, identical in every respect except for the Facility components to be shown in the simulated views, were provided as 11 x 17 inch color prints to three registered landscape architects (one in-house and two independent), who were then asked to determine the effect of the proposed Facility in terms of its contrast with existing elements of the landscape. The methodology utilized in this evaluation is a modified version of the U.S. Bureau of Land Management (BLM) contrast rating methodology (USDI BLM, 1980) that was developed by EDR in 1999 (and subsequently updated), for use on wind power projects. It involves using a short evaluation form, and a simple numerical rating process. Along with having proven to be accurate in predicting public reaction to wind power facilities, this methodology 1) documents the basis for conclusions regarding visual impact, 2) allows for independent review and replication of the evaluation, and 3) allows a large number of viewpoints to be evaluated in a reasonable amount of time. Landscape, viewer, and facility-related factors to be considered by the landscape architects in their evaluation will include the following:

- *Landscape Composition:* The arrangement of objects and voids in the landscape that can be categorized by their spatial arrangement. Basic landscape components include vegetation, landform, water and sky. Some landscape compositions, especially those that are distinctly focal, enclosed, detailed, or feature-oriented, are more vulnerable to modification than panoramic, canopied, or ephemeral landscapes.

- *Form, Line, Color, and Texture*: These are the four major compositional elements that define the perceived visual character of a landscape, as well as a project. Form refers to the shape of an object that appears unified; often defined by edge, outline, and surrounding space. Line refers to the path the eye follows when perceiving abrupt changes in form, color, or texture; usually evident as the edges of shapes or masses in the landscape. Texture in this context refers to the visual surface characteristics of an object. The extent to which form, line, color, and texture of a project are similar to, or contrast with, these same elements in the existing landscape is a primary determinant of visual impact.

- *Focal Point*: Certain natural or man-made landscape features stand out and are particularly noticeable as a result of their physical characteristics. Focal points often contrast with their surroundings in color, form, scale, or texture, and therefore tend to draw a viewer's attention. Examples include prominent trees, mountains and water features. Cultural features, such as a distinctive barn or steeple can also be focal points. If possible, a proposed project should not be sited so as to obscure or compete with important existing focal points in the landscape.

- *Order*: Natural landscapes have an underlying order determined by natural processes. Cultural landscapes exhibit order by displaying traditional or logical patterns of land use/development. Elements in the landscape that are inconsistent with this natural order may detract from scenic quality. When a new project is introduced to the landscape, intactness and order are maintained through the repetition of the forms, lines, colors, and textures existing in the surrounding built or natural environment.

- *Scenic or Recreational Value*: Designation as a scenic or recreational resource is an indication that there is broad public consensus on the value of that particular resource. The particular characteristics of the resource that contribute to its scenic or recreational value provide guidance in evaluating a project's visual impact on that resource.

- *Duration of View*: Some views are seen as quick glimpses while driving along a roadway or hiking a trail, while others are seen for a more prolonged period of time. Longer duration views of a project, especially from significant aesthetic resources, have the greatest potential for visual impact.

- *Atmospheric Conditions*: This refers to clouds, precipitation, haze, and other ambient air-related conditions that affect the visibility of an object or objects. These conditions can greatly affect the perceived contrast of Facility components with the landscape in terms of the design elements of form, line, color, texture, and scale.

- *Lighting Direction*: Backlighting refers to a viewing situation in which sunlight is coming toward the observer from behind a feature or elements in a scene. Front lighting refers to a situation where the light source is coming from behind the observer and falling directly upon the area being viewed. Side lighting refers to a viewing situation in which sunlight is coming from the side of the observer to a feature or element in a scene. Lighting direction can have a significant effect on the visibility and contrast of landscape and facility elements.

- *Project Scale*: The apparent size of a proposed facility in relation to its surroundings can define the compatibility of its scale within the existing landscaping. Perception of project scale is likely to vary depending on the distance from which it is seen and other contextual factors.

- *Spatial Dominance*: Spatial dominance refers to the degree to which an object or landscape element occupies space in a landscape, and thus dominates landscape composition from a particular viewpoint.

- *Visual Clutter*: Visual clutter refers to the extent to which numerous unrelated built elements occurring within a view can create visual clutter, which adversely impacts scenic quality.

- *Movement*: Project components that are in motion are typically more noticeable, but in the case of wind turbines, have also been shown to make them appear more functional and visually appealing. Numerous studies have documented that viewers prefer to see wind turbines in motion. The following quote and citations are taken from an on-line summary of perceptional studies of wind farms conducted by the Macaulay Land Research Institute (MLURI, 2010):

> "Motion has also been indicated as a powerful predictor of preference (Gipe, 1993; Thayer and Freeman, 1987). This is a unique feature of wind turbines in comparison with other forms of static structures. People find wind farms that appear to be working by relating this with moving rotors as more attractive than those that do not. Motion is equated with lower perceived visual impact (Gipe, 1993). They are likely to find wind farms visually interesting because of their motion. In this mode, the turbines are perceived as abstract sculptures, arousing interest with their novel, unfamiliar forms and animation (Thayer R.L. and H. Hansen, 1988)."

(9) Operational Effects of the Facility

To determine operational effects of the Facility, EDR (2017) conducted a shadow flicker analysis using WindPRO software. The analysis looked at the potential shadow flicker occurrence on nearby potential receptors, identifying the number of potential receptors and predicted annual hours of shadow flicker at each receptor within the shadow flicker study area. The Applicant obtained land use data from the Steuben and Livingston County GIS departments and through consultations with the host towns. Potential receptors include any known residential structures (both participating and non-participating), schools, office buildings, store fronts, or high-use public recreation areas within a 10-rotor diameter area (1,400 meters) around the proposed turbines. Shadow flicker was previously discussed in Exhibit (15)(e)(4) and the Shadow Flicker Report is provided as Appendix U to this Application. Below is a summary of the shadow flicker analysis.

No consistent national, state, county, or local standards exist for allowable frequency or duration of shadow flicker from wind turbines at the proposed Facility Site. The Wisconsin Administrative Code (WAC) specifies a limit of 30 hours per year at any non-participating residence or occupied community building (Wisconsin Public Service Commission, 2012). The Ohio Power Siting Board uses 30 annual hours of shadow flicker as a threshold of acceptability in certifying commercial wind power projects (OPSB, 2011a, 2011b, 2012, 2013, 2014). The New York State Department of Public Service has suggested "operations shall be limited to a maximum of 30 hours annually at any non-participating residential receptor" (NYSDPS, 2017). Additionally, international guidelines from Europe and Australia have suggested 30 hours of shadow flicker per year as the threshold of significant impact, or the point at which shadow flicker is commonly perceived as an annoyance (NRC, 2007; DECC, 2011; DPCD, 2012). Accordingly, a threshold of 30 shadow flicker hours per year was applied to the analysis of the proposed Facility to identify any potentially significant impacts on identified non-participating receptors.

The shadow flicker analysis for the proposed Facility used *WindPRO 2.9.285* software and associated Shadow module. *WindPRO* is a widely accepted modeling software package developed specifically for the design and evaluation of wind power projects. Input variables and assumptions used for shadow flicker modeling calculations for the proposed Facility include:

- Latitude and longitude coordinates of 76 proposed wind turbine sites (provided by the Applicant).
- Latitude and longitude coordinates for 435 potential receptors located in the 10-rotor diameter (1,400 meters) study area (provided by the Applicant).
- U.S. Geological Survey (USGS) 1:24,000 topographic mapping and USGS 10-meter resolution digital elevation model (DEM) data.
- The rotor diameter (140 meters) and hub height (80 meters) for the Senvion 3.6 megawatt (MW) MM140 model.
- Annual wind rose data (provided by the Applicant), which is depicted in Attachment A of the Shadow Flicker Report (Appendix U).
- To account for the occurrence of cloudy conditions, the average monthly percent of available sunshine for the nearest National Oceanic and Atmospheric Administration (NOAA) weather station in Binghamton, New York, was used.
- No allowance was made for wind being below or above generation speeds. Blades are assumed to be moving during all daylight hours when the sun's elevation is more than 3 degrees above the horizon. Shadow flicker is generally considered imperceptible when the sun is less than 3 degrees above the horizon (due to the scattering effect of the atmosphere on low angle sunlight) (States Committee for Pollution Control, 2002).
- The possible screening effect of all existing trees and buildings adjacent to the receptors was not taken into consideration in the modeling. In addition, the number and/or orientation of windows in residential structures were not considered in the analysis.

A summary of the Facility shadow flicker at each of the 435 receptors located within a 10 rotor diameter radius of all proposed turbine locations is presented below. Because the shadow flicker analysis conducted for the proposed Facility was based on the conservative assumptions that 1) all 76 turbines will be built, 2) the turbines are in continuous operation during the daylight hours, and 3) that shadow flicker can be perceived at a receptor structure regardless of the presence or orientation of windows or the screening effects of all surrounding trees and buildings, the analysis herein is a conservative projection of the shadow flicker effects at ground level.

- 101 (23%) of the receptors are not expected to experience any shadow flicker,
- 3 (1%) of the receptors may be affected 0-1 hour/year,
- 113 (26%) of the receptors may be affected 1-10 hours/year,
- 120 (28%) of the receptors may be affected 10-20 hours/year,
- 43 (10%) of the receptors may be affected 20-30 hours/year,
- 55 (13%) of the receptors may be affected by more than 30 hours per year.

Results of the shadow flicker analysis for the Baron Winds Facility indicate that up to 55 receptors could exceed the 30-hour threshold. However, nine of these receptors (16%) are located on properties owned by Facility participants. An additional three receptors (5%) are identified as cabins. Because these structures are generally only occupied periodically throughout the year, the occupants will not be present during all shadow flicker events. Finally, three receptors (5%) are identified as "unknown structures" that most likely consist of agricultural and maintenance buildings and so are not occupied. As these six structures (three cabins, three unknown) are only periodically occupied, they are considered non-participating receptors, but are not considered non-participating residential receptors. Therefore, only 40 non-participating residential receptors could potentially exceed the 30-hour per year threshold. The details regarding anticipated shadow flicker at all structures predicted to receive in excess of 30 hours are summarized in Exhibit 15 and Table 1 of the Shadow Flicker Report (Appendix U).

Although shadow flicker at these receptors exceeds the 30-hour per year threshold, these calculations do not take into account the actual location and orientation of windows, or the screening effects associated with existing, site-specific conditions and obstacles such as trees (i.e., does not take into account the results of the viewshed analysis) and/or buildings. Further, this analysis assumes turbine rotors are continuously in motion.

Given these assumptions, the predicted shadow flicker frequency represents a conservative scenario, and almost certainly overstates the actual frequency of shadow flicker that would be experienced at any given receptor location. In addition, many of the modeled shadow flicker hours are expected to be low in intensity because they would occur during the early morning or late afternoon hours when the sun is low in the sky. As the sun sinks below the horizon, more of its light is scattered by the atmosphere, which has the effect of dampening its brightness and therefore reducing its ability to cast dark shadows (EMD, 2013). Results of predicted shadow flicker at each receptor is provided in Attachment B of the Shadow Flicker Report (see Appendix U).

To provide a more realistic prediction of where shadow flicker will actually be perceived, *WindPRO* modeled results were compared to the results of the viewshed analysis conducted for the Facility. The viewshed analysis takes into consideration the screening effect of mapped forest vegetation with an assumed average height of 40 feet.

The analysis indicates that 17 of the 46 non-participating receptors (13 of the 40 non-participating residential receptors) predicted to experience over 30 hours of shadow flicker will not have views of the Facility due to screening provided by mapped topography and vegetation. Therefore, only 27 non-participating residential receptors will have views of the Facility and potentially experience over 30 hours of shadow flicker per year. Further results and discussion are provided in Exhibit 15 and Table 2 of the Shadow Flicker Report (Appendix U).

A qualitative review of the potential impact from shadow flicker on recreational areas was also conducted. Recreational resources (parks, trails, campgrounds) were mapped in relation to the shadow flicker model results/isolines (see Appendix U, Figure 4). Two regional snowmobile trails (Bath Snowflakes Snowmobile Trail and Quad County Snowmobile Trail), a bike trail, and a scenic overlook are located within the shadow flicker study area, and portions of these recreational areas will experience shadow flicker. In general, however, the Facility will have minimal impact on recreational areas because viewers will not be subject to shadow flicker for extended periods of time. In addition, based on the viewshed analysis, a large portion of the recreational resources that are within the study area are anticipated to have limited to no views of Facility turbines; therefore, limiting and/or eliminating shadow flicker from these areas. Figure 4 of Appendix U depicts the results of the shadow flicker modeling in relation to the viewshed analysis and recreational areas.

Because the Baron Winds Facility is located adjacent to the Cohocton Wind Project and the Dutch Hill Wind Project, there exists the potential for cumulative shadow flicker impacts at certain receptors (i.e., those occurring within a 10 rotor diameter distance of Baron Winds turbines and a 10 rotor diameter distance of turbines in one of both of the other project(s)). To evaluate the potential for cumulative shadow flicker impacts from the Cohocton Wind and the Dutch Hill Wind projects, a second shadow flicker analysis was run for selected turbines. Both the Cohocton Wind and Dutch Hill Wind projects use Clipper C96 turbines with a rotor diameter of 96 meters. To determine receptors that would be potentially affected by turbines from both projects, a buffer defining the maximum distance of potential effect was applied to the existing Cohocton Wind turbines (960 meters), Dutch Hill turbines (960 meters), and to the proposed Baron Winds turbines (1,400 meters). No receptors were located within the areas where the Dutch Hill and Baron Winds buffers overlapped, so no cumulative impacts are anticipated as a result of these turbines. The 10 receptors located within the area where the Cohocton Wind and Baron Winds buffers overlap have the potential for cumulative shadow flicker impacts.

The analysis was run using the same software described in Exhibit 15, along with latitude and longitude coordinates for 10 receptors that were located in the area of potential cumulative impact. The remaining input variables, assumptions, and model methodology used are the same as described in Exhibit 15. The results of this analysis are presented in Table 3 of the Shadow Flicker Report.

The cumulative shadow flicker analysis results indicate that no additional receptors are anticipated to exceed the 30-hour threshold when the effect of both projects is taken into consideration.

In summary, significant adverse shadow flicker impacts are not anticipated. Of the 55 receptors predicted to exceed the 30-hour threshold, nine are Facility participants, while the remaining 46 are non-participating receptors. Additional evaluation through viewshed analysis revealed that 17 of the 46 non-participating receptors are not anticipated to receive any shadow flicker due to the extent of the screening by intervening vegetation. In addition, two of the non-participating receptors that are not screened from the Facility are unknown structures, which are typically structures in rural settings usually associated with agriculture or maintenance buildings. These structures are not residential, and, as such, individuals at these structures will not actually experience 30 hours per year of shadow flicker. Therefore, only 27 non-participating residential receptors will have views of the Facility and experience over 30 hours of shadow flicker per year. However, because the final turbine model is not known, and to provide a conservative, worst-case analysis, this study evaluates the potential impact of Senvion 3.6MW MM140 turbines with the largest rotor diameter. Therefore, it is anticipated that the number of hours per year that some receptors will experience shadow flicker will be less than modeled. A discussion of mitigation options is provided in Exhibit 15 and the Shadow Flicker Report (Appendix U).

(10) Measures to Mitigate for Visual Impacts

Mitigation options are limited given the nature of the Facility and its siting criteria (very tall structures typically located in open fields at the highest locally available elevations). However, in accordance with NYSDEC Program Policy: Assessing and Mitigating Visual Impacts, DEP-00-2 (NYSDEC, 2000) (hereinafter "NYSDEC Visual Policy"), various mitigation measures were considered. These include the following:

- Professional Design: All turbines will have uniform design, speed, color, height and rotor diameter. Turbines will be mounted on conical steel towers that minimize visual clutter. The placement of any advertising devices (including commercial advertising, conspicuous lettering, or logos identifying the Facility owner or turbine manufacturer) on the turbines will be prohibited.
- Screening: Due to the height of individual turbines and the geographic extent of the proposed Facility, screening of individual turbines with earthen berms, fences, or plated vegetation will generally not be effective in reducing Facility visibility or visual impact. Additionally, based on site-specific field investigation both the point of interconnection (POI) and collection substations are not anticipated to have

significant visual effect on nearby sensitive receptors. Therefore, visual screening of these Facility components is not anticipated to be necessary.

- Relocation: Because of the limited number of suitable locations for turbines within the Facility Site, and the variety of viewpoints from which the Facility can be seen, turbine relocation will generally not significantly alter visual impact. Moving individual turbines to less windy sites would not necessarily reduce impacts but could affect the productivity and viability of the Facility. Where visible from sensitive resources within the study area, views of the Facility are highly variable and include different turbines at different vantage points. Therefore, turbine relocation would generally not be effective in mitigating visual impacts on sensitive resources. Additionally, the Facility layout has been designed to accommodate various setbacks from roads and residences, which limits options for relocation of individual Facility components.
- Camouflage: The proposed white/off white color of wind turbines (as mandated by the FAA to avoid daytime lighting) generally minimizes contrast with the sky under most conditions. This is demonstrated by simulations prepared under a variety of sky conditions. The size and movement of the turbines prevents more extensive camouflage from being a viable mitigation alternative (i.e., the turbines cannot be made to look like anything else). Nielsen (1996) notes that efforts to camouflage or hide wind farms generally fail, while Stanton (1996) feels that such efforts are inappropriate. She believes that wind turbine siting "is about honestly portraying a form in direct relation to its function and our culture; by compromising this relationship, a negative image of attempted camouflage can occur." Other components of the Facility will be designed to minimize contrast with the existing agricultural character in the Facility Area. For instance, new road construction will be minimized by utilizing existing farm lanes wherever possible and, in most instances, electrical collection lines will be buried.
- Low Profile: A significant reduction in turbine height is not possible without significantly decreasing power generation. Less generating capacity (resulting from smaller turbines) could threaten the Facility's economic feasibility. To avoid generation losses, use of smaller turbines would require that additional turbines be constructed. Several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones (Thayer and Freeman, 1987; van de Wardt and Staats, 1988). There will be minimal visual impact from the electrical collection system because the majority of the collection system will be installed underground, and where overhead sections are necessary, the poles will generally not exceed the height of surrounding trees.
- Downsizing: Reducing the number of turbines could reduce visual impact from certain viewpoints, but from most locations within the study area where more than one turbine is visible, the visual impact of the Facility would change only marginally unless a substantial number of turbines were removed. As illustrated in the visual simulations, even where existing wind farms are visible, the number of visible

turbines rarely feels overwhelming. Moreover, the number of proposed turbines, anticipated to be up to 120 at the time the Preliminary Scoping Statement (PSS) was prepared, has already been reduced to 76. Along with affecting the financial viability of the Facility, further elimination of turbines could significantly reduce the socioeconomic benefits of the Facility and reduce the Facility's ability to assist the State in meeting its energy policy objectives and goals.

- Alternate Technologies: Alternate technologies for comparable power generation, such as gas-fired or solar-powered facilities, would have different, and perhaps more significant, visual impacts than wind power. Viable alternate wind power technologies (e.g., vertical axis turbines) that could reduce visual impacts do not currently exist in a form that could be used on a commercial/utility-scale facility.
- Non-specular Materials: Non-specular conductors will be considered for the overhead portions of the electrical collection lines. Non-reflective paints and finishes will be used on the wind turbines to minimize reflected glare.
- Lighting: The analyses presented herein are based on the conservative assumption that all turbines will be lit with FAA warning lights. However, turbine lighting will be kept to the minimum allowable by the FAA. Medium intensity red strobes will be used at night, rather than white strobes or steady burning red lights. Fixtures with a narrow beam path will be utilized as a means of minimizing the visibility/intensity of FAA warning lights at ground-level vantage points. Lighting at the substations will be kept to a minimum, and turned on only as needed, either by switch or motion detector.
- Maintenance: The turbines and turbine sites will be maintained to ensure that they are clean, attractive, and operating efficiently. Research and anecdotal reports indicated that viewers find wind turbines more appealing when the rotors are turning (Pasqualetti et al., 2002; Stanton, 1996). In addition, the Facility developer will establish a decommissioning fund to ensure that if the Facility goes out of service and is not repowered/redeveloped, all visible above-ground components will be removed (see Exhibit 29 for details).
- Offsets: Correction of an existing aesthetic problem within the viewshed is a viable mitigation strategy for wind power projects that result in a substantial adverse visual impact at a particular viewpoint. Based on rating panel results, such impacts could be experienced by certain viewers at Loon Lake. Projects that provide enhanced public access to recreational opportunities at Loon Lake could be proposed as offset mitigation for potential visual impacts to this resource and its users.

(11) Description of Visual Resources to be Affected

Visually sensitive resources of statewide significance were identified within the larger 10-mile Facility study area. As defined in the NYSDEC Visual Policy, these include any of the following types of resources:

- Properties listed on or determined eligible for listing on the State and National Register of Historic Places (S/NRHP).
- State Parks.
- Urban Cultural Parks (or New York State designated Heritage Areas).
- State Forest Preserves (i.e., the Adirondack or Catskill Parks).
- National Wildlife Refuges, State Game Refuges, and State Wildlife Management Areas.
- National Natural Landmarks.
- The National Park System, Recreation Areas, Seashores, or Forests.
- Rivers designated as National or State Wild, Scenic or Recreational Rivers.
- Sites, areas, lakes, reservoirs, or highways designated or eligible for designation as scenic.
- Scenic Areas of Statewide Significance.
- A State or federally designated trail, or one proposed for designation.
- Adirondack Park Lands and Scenic Vistas.
- State Nature and Historic Preserve Areas.
- Palisades Park.
- Bond Act Properties purchased under Exceptional Scenic Beauty or Open Space category.

In addition, resources of local significance within the 5-mile study area were also identified. These scenic areas include places of concentrated activity such as village centers and heavily used roadways, or landscapes of high aesthetic merit that may be considered important by local residents. See Section (b)(3) below for additional detail on visually sensitive resources.

(b) Viewshed Analysis

The Visual Impact Assessment includes identification of locations within the visual study area where it may be possible to view the proposed wind turbines and other proposed above ground facilities from ground-level vantage points. This analysis includes identifying potentially visible areas on viewshed maps. The methodology employed is described below.

(1) Viewshed Maps

Viewshed maps define the maximum area from which any portion of the components of the completed Facility could potentially be seen within the study area during both daytime and nighttime hours based on a direct line of sight, and ignoring the screening effects of existing vegetation and structures. Maps showing the results of viewshed analysis based on the screening effect of topography alone, and the combined screening effect of mapped forest vegetation and topography were prepared. The viewshed analyses were based on maximum blade tip height and FAA warning light height. These maps are presented on both USGS DEM Hillshade (Figure 15 of the VIA) and the most recent edition 1:24,000 scale topographic base map (Appendix A of the VIA). Additionally, results of the viewshed analysis are also shown on maps that depict visually sensitive sites, viewpoint locations, and LSZs (Appendix A of the VIA).

With respect to line of sight profiles, note that the computer model program defines the viewshed (when evaluating topography only, for instance) by reading every cell of the digital elevation model (DEM) data and assigning a value based upon the existence of a direct, unobstructed line of sight to proposed Facility location/elevation coordinates from observation points throughout the study area. Therefore, for the purposes of this Application, the viewshed analyses will also serve to document the line of sight profiles for resources of statewide concern.

Potential turbine visibility, as indicated by the viewshed analyses, is illustrated in Figure 15 of the VIA and summarized in Table 24-1. Based on only the screening provided by topography alone, the blade tip viewshed analysis indicates some portion of the proposed turbine array could potentially be visible in approximately 74.3% of the 5-mile study area and approximately 54.6% of the 10-mile study area (Figure 15 of the VIA; Table 24-1). This "worst-case" assessment of potential visibility indicates the area where any portion of any turbine could potentially be seen, without considering the screening effect of existing vegetation and structures. Areas where there is no possibility of seeing the Facility include locations in narrow ravines and on hillsides oriented away from the Facility Site. The broad valley that runs through the western portion of the 10-mile study area (associated with Canisteo River and Marsh Ditch) is also screened from view by topography alone. Screened areas are concentrated in the outer portions of the study area, with visibility typically beginning to taper off at distances of 2 to 3 miles from the nearest turbine. Visually sensitive resources that will be fully screened from view by topography alone include 14 NRHP-listed and 41 NRHP-eligible sites, the Harriet Hollister Spencer State Recreation Area, Bath National Cemetery, seven surface water resources, and three schools (Arkport Central School, Hornell Intermediate School, and Bryant Elementary School). Visually sensitive resources that will not experience any screening by intervening topography include five NRHP-listed and 77 NRHP-eligible sites; the I-390 Scenic Overlook; the hamlets of North Cohocton, Fremont, and Haskinville; Michael Fucci Memorial Park at Shawmut; Reynolds Creek; Hemlock – Canadice State Forest Trail; three fishing access/boat launch sites; and three schools (Wayland Elementary School, Cohocton Elementary School, and Wayland-Cohocton Middle and Senior High School). The remaining 86 inventoried visually sensitive resources will receive some level of topographic screening (see Appendix C of the VIA). For example, potential Facility visibility is indicated throughout much of the Cohocton

River Valley (as turbines are located on the adjacent western ridge); however, the portion of the Cohocton River that is north of the proposed Facility will be screened from view by Dutch Hill.

Table 24-1. Summary of Viewshed Results for 5-mile and 10-mile Study Areas

Number of Turbines Visible	5-Mile-Radius Study Area[1] Viewshed Results							
	Blade Tip Topography Only		Blade Tip Topography and Vegetation		FAA/Nacelle Topography Only		FAA/Nacelle Topography and Vegetation	
	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area	Square Miles	% of Study Area
0	56.1	25.7	136.2	62.4	69.7	32.0	146.2	67.0
1-15	49.5	22.7	34.0	15.6	60.1	27.5	37.5	17.2
16-30	38.0	17.4	20.6	9.4	38.3	17.5	18.1	8.3
31-45	25.7	11.8	10.9	5.0	18.7	8.6	7.3	3.3
46-60	14.8	6.8	6.6	3.0	11.8	5.4	4.3	2.0
61-76	34.1	15.6	9.9	4.5	19.7	9.0	4.8	2.2
Total Visible	162.1	74.3	82.0	37.6	148.5	68.0	72.0	33.0
10-Mile-Radius Study Area[2] Viewshed Results								
0	258.8	45.4	438.9	77.1	293.2	51.5	457.7	80.4
1-15	89.7	15.8	51.4	9.0	99.7	17.5	53.6	9.4
16-30	62.4	11.0	30.1	5.3	65.2	11.5	27.8	4.9
31-45	46.2	8.1	17.6	3.1	35.5	6.2	11.8	2.1
46-60	30.1	5.3	11.4	2.0	23.7	4.2	7.7	1.4
61-76	82.2	14.4	19.9	3.5	52.1	9.1	10.9	1.9
Total Visible	310.6	54.6	130.5	22.9	276.1	48.5	111.7	19.6

[1]The 5-mile study area includes approximately 218.2 square miles, or approximately 139,650 acres.
[2] The 10-mile study area includes approximately 569.4 square miles, or approximately 364,390 acres.

Areas with potential nighttime views of the turbines, as indicated by the FAA topographic viewshed analysis (Figure 8 of the VIA, Sheet 2; Table 24-1), include approximately 68.0% of the 5-mile radius study area and approximately 48.5% of the 10-mile radius study area. This analysis indicates that the potential visibility of FAA warning lights at a height of 302 feet (92.1 meters) will generally be concentrated in the same areas where daytime blade-tip height visibility was indicated. As stated above, this topographic analysis presents a "worst-case" assessment of potential nighttime visibility that does not take into account the screening effect of existing vegetation and structures, and is based on the conservative assumption that all turbines could be equipped with FAA warning lights. (A more realistic assumption is that one-third to half of the turbines will be lighted.)

Factoring vegetation into the viewshed analysis significantly reduces potential Facility visibility throughout the study area (Figure 8 of the VIA, Sheets 3 and 4). Vegetation, in combination with topography, will serve to block daytime views of the Facility from approximately 62.4% of the 5-mile study area and approximately 77.1% of the 10-mile study area (i.e., 37.6% and 22.9% of the study areas, respectively, are indicated as having potential Facility visibility when topography and vegetation are considered). Areas of potential nighttime visibility, as indicated by FAA vegetation viewshed analysis, are limited to approximately 33.0% of the 5-mile radius study area and approximately 19.6% of the 10-mile radius study area. Based on the results of the viewshed analysis, visibility will generally be most available in open agricultural areas and along significant portions of Interstates 86 and 390, and NYS Routes 15, 21, 63, 371, and 415 within the study area. Visibility is also indicated throughout much of the Villages of Avoca, Cohocton and Wayland, and to a lesser extent, in the Villages of Dansville, Canaseraga, Arkport, North Hornell, and Almond. However, buildings and street trees, which are not accounted for in this analysis, will likely screen many of those views. Visually sensitive sites that were not fully screened by topography alone but will not have views of the Facility due to intervening forest vegetation include five NRHP-listed and five NRHP-eligible sites, High Tor Wildlife Management Area, Lime Kiln Creek, Klipnocky State Forest, five state forest trails, and Hornell Junior and Senior High School. Factoring vegetation into the viewshed analysis indicates reduced, but not eliminated, Facility visibility at a number of additional visually sensitive resources. Resources that are not indicated as receiving any screening of the Facility views by either topography or vegetation (i.e., some portion of the proposed Facility would theoretically be visible from all locations within the resource's mapped boundary) include one NRHP-listed site (Larrowe House), 67 NRHP-eligible sites, Wayland Elementary School, Cohocton Elementary School, Laugh-A-Lot Restaurant Boat Launch, and Mill Creek and Cohocton River Fishing Access areas (see Appendix C of the VIA). However, as mentioned previously, actual Facility visibility in these areas is anticipated to be more limited than indicated by the vegetation viewshed analysis, due to the slender profile of the turbines, the effects of distance, and screening provided by hedgerows, street trees and structures, which are not considered in the analysis.

An analysis comparing potential daytime Facility visibility within the various LSZs is presented in Table 24-2.

Table 24-2. Blade Tip Vegetation Viewshed Results by Landscape Similarity Zone, 10-Mile Study Area

Number of Turbines Visible	10-Mile-Radius Study Area[1] Viewshed Results by Landscape Similarity Zone (LSZ) (% of LSZ with Potential Facility Visibility)					
	Forest[2]	Waterfront / Open Water	Transportation Corridor	Rural Valley	Rural Uplands / Ridgelines	City / Village / Hamlet
0	100%	48.7%	47.6%	67.9%	44.1%	74.9%
1-15	0%	23.6%	34.4%	18.6%	15.3%	13.2%
16-30	0%	22.4%	16.4%	8.7%	11.0%	8.7%
31-45	0%	5.2%	1.4%	3.2%	9.0%	2.6%
46-60	0%	0.1%	0.1%	1.1%	7.1%	0.4%
61-76	0%	0%	0%	0.4%	13.7%	0.2%
Total Percent Visible	0%	51.3%	52.4%	32.1%	55.9%	25.1%

[1]The viewshed analysis area (within 10 miles of proposed wind turbines) includes approximately 569.4 square miles, or approximately 364,390 acres.
[2]The viewshed analysis methodology concludes that there is no visibility in forested areas as an assumption of the model. However, it is possible that areas classified as forest, especially on the edges, will have small areas of visibility (See Section 4.1.1 of the VIA).

Potential visibility of the Facility (based on vegetation viewshed analysis) from the various LSZs within the study area is summarized as follows:

- The LSZ with the least amount of potential Facility visibility is Forest, which essentially offers no outward views due to the screening effects of the forest canopy. Note that small portions of the Forest LSZ may, in reality, offer limited outward views due to categorization errors by the USGS when classifying land-cover as Forested with a 30-meter x 30-meter cell resolution, especially at the edges of forested areas. Additionally, these digital data do not recognize small clearings or other breaks in the vegetation that may allow for occasional outward views from forest areas. However, the occurrence of these areas is generally limited, and there will be little to no Facility visibility from forested areas, especially during the growing season.
- Viewshed results indicate 25.1% of the more populated portions of the study area that make up the City/Village/Hamlet LSZ offer potential Facility visibility. The majority of this visibility is concentrated in the Villages of Wayland, Cohocton, and Avoca. However, as mentioned above, even this relatively small percentage likely overstates the opportunities for Facility visibility within this LSZ, as the buildings and associated vegetation clusters that typify city, village and hamlet centers will provide a great deal of screening that is not accounted for in the viewshed analysis.
- The potential for turbine visibility is indicated in approximately 32.1% of the Rural Valley LSZ. The portions of this LSZ that may have views of wind turbines include much of the Cohocton River Valley, valley areas around the Village of Wayland and southwest of the Village of Dansville, and the narrow valley along Big Creek (south of the Facility). The Canisteo River valley, extending north through the City

of Hornell, Village of Arkport and beyond, is largely screened from view, as are many of the valleys in the outer portions of the 10-mile study area.

- The Waterfront/Open Water LSZ only occupies 1.4 square miles within the 10-mile study area and has potential views of the Facility in 51.3% of its area. Viewshed results indicate that Loon Lake, Smith Pond, Hornell Reservoir Number 1, and unnamed open water/wetland areas near Perkinsville will experience widespread visibility; and that proposed turbine views may be available from the southwest portion of Almond Lake and the western portion of Hornell Reservoir Number 3. Demons Pond, and several additional small unnamed water bodies, are indicated as being fully screened from view by intervening vegetation and/or topography.
- The proposed turbines may be visible from approximately 52.4% of the Transportation Corridor LSZ. This LSZ includes the corridors of Interstate Routes 86 and 390, which are located 0.4 mile and 0.2 mile from a proposed turbine at their nearest points, respectively. Although intervening topography and vegetation provide screening in some areas, the viewshed analysis indicates that both of these corridors could experience long stretches of turbine visibility. Areas within the 10-mile study area where the Facility will not be visible from the Transportation Corridor LSZ include the portion of Interstate 390 that runs roughly from the Village of Dansville to the hamlet of Perkinsville; the portion of Interstate 86 roughly from the hamlet of Howard to the Cohocton River Valley; and the portions of Interstate 86 that run through the Canisteo River Valley as well as the area west of Almond Lake.
- The greatest potential for field visibility of the turbines is indicated within the Rural Upland/Ridgeline LSZ. The blade-tip vegetation viewshed indicates that 55.9% of this LSZ will potentially offer views of the Facility. Portions of this LSZ that are screened from view include hillsides oriented away from the Facility and areas screened by adjacent forestland. In general, visibility within this LSZ is most heavily concentrated in close proximity to the proposed Facility and dissipates as distance from the Facility increases.

(2) Viewshed Methodology

Topographic viewshed maps for the Facility were prepared using 10-meter resolution USGS digital elevation model (DEM) data (7.5-minute series) for the visual study area, the location and height of all proposed turbines, collection line poles, and five lightning masts within the substation (see Figure 8, Sheet 1 of the VIA), an assumed viewer height of 1.7 meters, and ESRI ArcGIS® software with the Spatial Analyst extension. To evaluate potential turbine visibility, two 10-mile radius topographic viewsheds were mapped, one to illustrate “worst case” daytime visibility (based on the tallest of all proposed turbines, with a maximum blade tip height of 152 meters, or 499 feet above existing grade) and the other to illustrate potential visibility of FAA obstruction warning lights at night. The nighttime viewshed was based on the FAA warning light height of 302 feet, or 92 meters, above existing grade, and the conservative assumption that all turbines would be equipped with lights.[2] Viewshed analysis of overhead segments of the collection line is based on a maximum pole height of 60 feet, while the substation viewshed is based on a maximum lightning mast height of 50 feet. The overhead collection line and substation viewshed analyses evaluated potential visibility within a 1-mile radius of the proposed location of these Facility components.

The ArcGIS program defines the viewshed by reading every cell of the DEM data and assigning a value based upon the existence of a direct, unobstructed line of sight to proposed Facility location/elevation coordinates from observation points throughout the study area. The resulting viewshed maps define the maximum area from which any portion of any turbine in the completed Facility could potentially be seen within the study area during both daytime and nighttime hours based on a direct line of sight, and ignoring the screening effects of existing vegetation and structures. A turbine count analysis was also performed to determine how many wind turbines would be potentially visible from any given point within the viewshed. The results of this analysis were then grouped by number of turbines potentially visible and presented on a viewshed map.

Because the screening provided by vegetation and structures is not considered in this analysis, the topographic viewshed represents a true "worst case" assessment of potential Facility visibility. Topographic viewshed maps assume that no trees exist, and therefore are very accurate in predicting where visibility will not occur due to topographic interference. However, they are less accurate in identifying areas from which the Facility could actually be visible. Trees and buildings can limit or eliminate visibility in areas indicated as having potential Facility visibility in the topographic viewshed analysis.

To supplement the topographic viewshed analysis, a vegetation viewshed was also prepared to illustrate the potential screening provided by forest vegetation. A base vegetation layer was created using the 2011 USGS NLCD to identify the mapped location of forest land (including the Deciduous Forest, Evergreen Forest, and Mixed Forest NLCD classifications) within the visual study area. Based on standard visual assessment practice, the mapped locations of the forest land were assigned an assumed height of 40 feet and added to the DEM. The turbine, collection line, and substation viewshed analyses were then re-run, as described above. As with the topographic viewshed analysis, two vegetation viewsheds were mapped, one to illustrate “worst case” daytime visibility (based on a maximum blade tip height of 499 feet above existing grade) and the other to illustrate potential visibility of FAA warning lights (based on a nacelle height of 302 feet above existing grade and the conservative

[2] The viewshed is intentionally conservative and overstates the potential visibility of the FAA warning lights. A hub height of 89 meters is assumed, when actual hub height is anticipated to be 87 meters. In addition, typically, fewer than half of the proposed turbines in a wind project are lit by FAA warning lights. However, the Applicant and FAA have not yet determined which turbines will need to be lit.

assumption that all turbines could be equipped with lights). Once the initial vegetation viewshed analysis was completed, a Spatial Analyst conditional statement was used to assign zero visibility to all areas of mapped forest, resulting in the final vegetation viewshed. The vegetation viewshed is based on the assumption that in most forested areas, outward views will be well screened by the overhead tree canopy. During the growing season, the forest canopy will fully block views of the proposed facilities, and such views will typically be almost completely obscured, or at least significantly screened by tree trunks and branches, even under "leaf-off" conditions. Although there are certainly areas of mapped forest that may have natural or man-made clearings that could provide open outward views, these openings are rare, and the available views would typically be narrow/enclosed and include little of the proposed Facility.

Because it accounts for the screening provided by mapped forest stands, the vegetation viewshed is a much more accurate representation of potential Facility visibility. However, it is important to note that because screening provided by buildings and street/yard trees, as well as characteristics of the proposed turbines that influence visibility (color, narrow profile, distance from viewer, etc.), are not taken consideration in the viewshed analyses, being within the viewshed does not necessarily equate to actual Facility visibility.

Per the requirements set forth in 16 NYCRR § 1000.24(a), the potential cumulative visual effect of the Facility as well as other wind energy projects proposed in the surrounding region must be considered. Cumulative impacts are two or more individual visual effects which, when taken together, are significant or that compound or increase other similar visual effects. This section addresses the potential cumulative visual impacts that may arise from interactions between the proposed Baron Winds Facility and the currently operating wind farms in Steuben County. In Steuben County, several wind-powered generating facilities are in operation. The closest operational projects are the TerraForm (formerly First Wind) Dutch Hill/Cohocton Wind Farm and the Everpower Howard Wind Farm, located approximately 0.7 mile and 2.6 miles, respectively, from the nearest point of the Baron Winds Facility.

To evaluate the potential cumulative visual impact of multiple wind power projects within the study area, cumulative viewshed analyses were conducted. The 10-mile radius vegetative viewshed analysis for the Baron Winds Facility (based on maximum blade tip height) was overlaid on viewshed analyses prepared for the operating wind farms (Cohocton, Dutch Hill, and Howard) using the same methodology described herein. Data on the existing turbines was based on publicly available layout and turbine height information included in each project's respective State Environmental Quality Review Act (SEQRA) documentation. The viewsheds for the existing and proposed projects were then plotted on a base map, and areas of viewshed overlap identified. Results of the cumulative viewshed analysis of the proposed wind projects are presented in Table 24-3 and 24-4, below.

Table 24-3. Cumulative Viewshed Count Analysis

Total Number of Turbines Potentially Visible[1]	10-Mile Radius Study Area Cumulative Viewshed Results[2]	
	Square Miles	% of Study Area
0	391.0	68.7
1-30	100.2	17.6
31-60	38.3	6.7
61-90	19.0	3.3
91-120	11.4	2.0
121-154	9.5	1.7
Total Visible	**178.4**	**31.3**

[1] The cumulative viewshed analysis accounts for existing turbines from the Cohocton, Dutch Hill, and Howard wind farms as well as proposed Baron Winds Facility turbines (35, 16, 27, and 76 turbines, respectively).
[2] The cumulative viewshed analysis area (within 10 miles of proposed Baron Winds Facility components) includes approximately 569.4 square miles, or approximately 364,390 acres.

Table 24-4. Cumulative Viewshed Analysis by Landscape Similarity Zone

Landscape Similarity Zone	10-Mile Radius Study Area Cumulative Viewshed Results by Landscape Similarity Zones (LSZ)[1] (% of LSZ with Potential Turbine Visibility)		
	Visibility of Existing Wind Turbines[2]	Visibility of Proposed Turbines[3]	Newly Visible Area[4]
Forest[5]	0.0%	0.0%	0.0%
Waterfront/Open Water	20.4%	25.1%	10.4%
Transportation Corridor	44.9%	52.4%	19.5%
Rural Valley	63.3%	55.9%	10.1%
Rural Uplands/Ridgelines	37.7%	32.1%	10.7%
City/Village/Hamlet	29.1%	51.3%	30.0%

[1] The cumulative viewshed analysis area (within 10 miles of proposed Baron Winds Facility components) includes approximately 569.4 square miles, or approximately 364,390 acres. The viewshed analysis accounts for screening created by intervening topography and mapped forest vegetation and is based on the maximum blade tip height for each project.
[2] Percentage of each LSZ in which the viewshed analysis indicates potential visibility of existing wind turbines from the Cohocton, Dutch Hill, and/or Howard wind projects based on maximum the blade tip height (128 meters, 128 meters, and 130 meters, respectively).
[3] Percentage of each LSZ in which the viewshed analysis indicates potential visibility of proposed Baron Winds Facility wind turbines based on maximum the blade tip height (152.1 meters).
[4] Percentage of each LSZ in which existing wind turbines are not currently visible but the proposed Facility would potentially be visible.
[5] The viewshed analysis methodology concludes that there is no visibility in forested areas as an assumption of the model. However, it is possible that areas classified as forest, especially on the edges, will have small areas of visibility (See Section 4.1.1 of the VIA).

As shown in Table 24-3, the cumulative viewshed analysis indicates that approximately 68.7% of the 10-mile study area will not have views of the existing or proposed wind turbines due to screening provided by topography and mapped forest vegetation. The majority of the remaining area, where existing and/or proposed turbines may potentially be visible, will have views of between one and 30 wind turbines (17.6% of the 10-mile study area). However, there are more limited areas where greater numbers of turbines will be visible, including approximately 9.5 square miles (or 1.7% of the 10-mile study area) where more than 121 wind turbines may potentially be visible. These locations of greatest cumulative visibility are almost exclusively located in ridgetop agricultural settings where open fields and elevated vantage points offer expansive views of the landscape. These areas are concentrated in the eastern half of the visual study area. Visually sensitive resources that may have a view of over 121 wind turbines are limited to several isolated areas along snowmobile trails, and a very small segment of the North Country National Scenic Trail/Finger Lakes Trail where the co-located trails run across the top of Brooks Hill along Cochrane Road in the Town of Bath.

In addition to a cumulative turbine count viewshed analysis, an additional analysis was conducted to isolate areas where the proposed turbines may be visible from locations where views of existing turbines are not currently available. These areas total approximately 32.8 square miles (5.8%) of the 10-mile study area. These patches of new visibility are scattered throughout the 10-mile study area, and tend to occur in valley settings where views of the existing turbines are screened from view but an open line of sight toward one or more proposed turbines is available. These locations include, but are not limited to, a sizable area within the Cohocton River Valley extending through the Village of Avoca, the eastern half of Loon Lake (and the valley extending south from there), State Bike Route 17 south of the Facility Site, the northern portion of the City of Hornell, the Canisteo River Valley south of Arkport, northwestern Dansville, and the area north of Wayland (Appendix GGG, Figure 15).

The visibility and visual effect of wind turbines within the study area will vary based on viewing distance, viewer orientation, and the number of turbines visible, as well as the potential screening effects of topography and vegetation. If turbines from the Cohocton/Dutch Hill or Howard Wind Farms are visible from a vantage point within the Baron Winds Facility Site, they will typically be viewed as background features in any view that includes the proposed turbines in the foreground or mid-ground (see simulations from Viewpoints 50 and 79). The reverse will be true when the proposed Facility is viewed from any of the existing wind farms (e.g., Viewpoint 177). From longer distances, the three wind farms may appear to be a single larger facility (see simulation from Viewpoints 23 and 114). However, as indicated by the fieldwork results and review of the visual simulations, in areas dominated by forest or more concentrated human settlement (Forest and City/Village/Hamlet LSZs) screening provided by vegetation and/or structures generally limit broad open views to the surrounding landscape. Thus, views of multiple turbines within the proposed Facility, let alone those that also include turbines from the existing wind farms, are rare within these LSZs. In areas with views across open water, cumulative impacts are not anticipated because views of existing wind turbines from these areas are generally limited.

In the Rural Valley LSZ, ridges that define the valley walls typically limit the number of turbines from any one project that can be seen from a given viewpoint. When multiple projects are visible, the total number of turbines present within the view is generally not large, and the addition of a new project to the view appears to be an extension of the existing wind farm/land use, rather than the introduction of a new visual element to the landscape.

This tends to reduce the contrast presented by the new turbines, and in some cases serves to balance the composition of the view.

The zones where cumulative project visibility is most likely to occur are the Rural Upland/Ridgeline and the Transportation Corridor LSZs. Due to elevation and the abundance of open agricultural land, rural uplands offer the greatest opportunity to see numerous turbines from multiple projects. However, many of these turbines will be viewed at significant distances, which reduces their visual impact, and areas where such views are available generally have few visually sensitive resources and a limited number of viewers. Within the Transportation Corridor LSZ, turbines from multiple projects will be visible at a variety of distances and directions as travelers pass through the study area on the major highways. However, because the viewers are moving at a high rate of speed, the duration of their views will be limited. In addition, the travelers that will be experiencing these views generally have limited sensitivity to visual change within the landscape, and actually may find the additional turbines to be a point of interest as they travel through the area.

Consequently, although there may be locations where the cumulative effect of the existing and proposed wind projects is substantial, these instances will be relatively rare, will affect a limited number of viewers, and/or will not affect sites or receptors that are particularly sensitive to visual change. Thus, the addition of a limited number of new turbines to a working agricultural landscape where these features already exist is not expected to have a significant adverse cumulative visual impact.

(3) Sensitive Viewing Areas

In accordance with standard visual impact assessment practice in New York State, visually sensitive resources were identified in accordance with the NYSDEC Visual Policy, which defines specific types of properties as visually sensitive resources of statewide significance (NYSDEC, 2000). The types of resources identified in the NYSDEC Visual Policy are consistent with the types of resources identified in 16 NYCRR § 1000.24(b)(4) and include: landmark landscapes; wild, scenic or recreational rivers administered respectively by either the NYSDEC or the Adirondack Park Agency (APA) pursuant to Environmental Conservation Law (ECL) Article 15 or the Department of Interior pursuant to 16 USC § 1271; forest preserve lands, scenic vistas specifically identified in the Adirondack Park State Land Master Plan, conservation easement lands, and scenic byways designated by the federal or state governments; scenic districts and scenic roads designated by the Commissioner of Environmental Conservation pursuant to ECL Article 49; Scenic Areas of Statewide Significance; state parks or historic sites; S/NRHP-listed sites; areas covered by scenic easements, public parks or recreation areas; locally designated historic or scenic districts and scenic overlooks; and high-use public areas.

To identify visually sensitive resources within the visual study area, EDR consulted a variety of data sources including digital geospatial data (shapefiles) obtained primarily through the New York State Geographical Information System (GIS) Clearinghouse or the Environmental Systems Research Institute (ESRI); numerous national, State, county and local agency/program websites as well as websites specific to identified resources; the DeLorme Atlas and Gazetteer for New York State; USGS 7.5-minute topographical maps; and web mapping services such as Google Maps. Aesthetic resources of statewide significance were identified within a 10-mile radius of the Facility Site. NRHP-eligible sites, as well as locally significant aesthetic resources and areas of intensive land use were identified within a 5-mile radius of the Facility Site. Some of the identified visually sensitive resources lie beyond the study area boundaries because at the time the VIA outreach letter was set to municipal and state agencies the wind turbine layout was larger, resulting in larger VIA study areas. All the sensitive sites identified during the VIA outreach were kept in the VIA analysis even through the Facility boundaries shifted. The complete inventory of visually sensitive resources is presented in Appendix C of the VIA. Their locations are shown in Figure 6 of the VIA, and also on the composite overlay map included in Appendix A of the VIA.

In accordance with the requirements set forth in 16 NYCRR § 1000.24(b)(4) as well as the Article 10 PSS for the Facility dated August 2016, the Applicant conducted a systematic program of public outreach to assist in the identification of visually sensitive resources. Copies of the correspondence sent by the Applicant as part of this process, as well as responses received from stakeholders, are included as Appendix F of the VIA. This outreach included the following:

- The Applicant distributed a request on November 7, 2016 to appropriate state and municipal planning representatives and on February 27, 2017 to State of New York interested parties requesting feedback regarding the identification of important aesthetic resources and representative viewpoints in the Facility vicinity to inform field review efforts and the eventual selection of candidate viewpoints for the development of visual simulations. The materials provided as part of this submission to interested stakeholders included: a summary of the purpose and necessity of consultation per the requirements of Article 10; a definition, explanation, and map of the visual study area; a preliminary inventory and map of visually sensitive resources identified in accordance with the NYSDEC Visual Policy; a preliminary viewshed (visibility) analysis; a discussion of anticipated subsequent steps, including additional consultation regarding the eventual selection of viewpoints for development of visual simulations; and a request for feedback regarding additional visually sensitive resources to be included in the analysis.
- On January 3, 2017, Marcia Weber, Executive Director Southern Tier Central Regional Planning and Development Board provided an email response to the Applicant's November 7, 2016 preliminary

analysis. The response provided comments from two employees of the Planning and Development Board.

- o Gabriel Holbrow, Planner, stated that the list of potential Visually Sensitive Resources compiled by EDR seemed very complete. In addition, Mr. Holbrow provided a recommendation for viewpoint locations, primarily along the surrounding highways with broad views towards the proposed Facility.
- o Victoria Ehlen, Economic Development Coordinator, recommended that the viewshed or a map of the 120 wind turbines be provided.

- On March 15, 2017, EDR received an e-mail response from Andrew Davis, New York State Department of Public Service (DPS), which recommended including the following resources in the sensitive sites analysis:
  - o New York State lands and resources
    - ▪ Bully Hill State Forest and recreational trails
    - ▪ Canacadea State Forest and recreational trails
    - ▪ Canaseraga State Forest and recreational trails
  - o Waterways with New York State Public Fishing Rights access easements:
    - ▪ Neils Creek in and near the Facility Area
    - ▪ Mill Creek
    - ▪ Cohocton Creek near the Facility Area
- In their comments on the PSS provided on August 31, 2016, DPS staff identified four federally-designated resources to be included in the VIA. These sites are listed below:
  - o USACE Almond Lake Recreation Area
  - o North Country National Scenic Trail (coincident with the Finger Lakes Trail in the Facility vicinity)
  - o National Rivers Inventory Study Rivers, including the Cohocton River running east-northeast of the Facility through the Town of Cohocton and Canisteo River south-east of Hornell
  - o Scenic overlook at Route I-86 west of Hornell, which provides views to the Almond Lake Federal Recreation Area and potentially to the Facility Area.
- In addition, EDR conducted a historic resources survey (in consultation with the New York State Office of Parks, Recreation, and Historic Preservation [NYSOPRHP]) of the 5-mile study area to identify potential historic sites (EDR, 2017). The Historic Architectural Resources Survey report was formally submitted to NYSOPRHP via their Cultural Resource Information System website on April 14, 2017. The results of this survey are presented in a final report that is included as Appendix BB to this Application.
- On July 28, 2017, NYSOPRHP provided a response to the results and recommendations of the Historic Architectural Resources Survey Report, which included final determinations of eligibility for listing on the

NRHP. Of the 265 resources identified by EDR as part of the historic architectural resources survey, NYSOPRHP determined the following regarding historic properties located within the 5-mile area of potential effect (APE) for indirect (visual) effects:

- Eight extant properties listed on the NRHP are located within the APE for indirect effects, and one property previously listed on the NRHP was found to be no longer present.
- A total of 105 historic properties located within the APE for indirect effects were determined to be NRHP-eligible, and 143 properties were found to be not eligible for listing on the NRHP.
- Six additional previously identified historic properties were also found to be no longer extant, and the NRHP eligibility of two previously identified historic properties is undetermined due to lack of public access.

All of the visually sensitive sites that were identified as a result of research, stakeholder outreach, and subsequent consultation are included in Appendix C of the VIA, and further described below.

The Facility's 10-mile visual study area includes 157 sites that the NYSDEC Visual Policy considers aesthetic resources of statewide significance (see Appendix C of the VIA). These include: 20 sites and three districts listed on the NRHP; one state park; one state recreation area; two wildlife management areas; two eligible wild, scenic or recreational rivers; two scenic overlooks, one federally-designated trail; one state-designated trail; and four additional resources. Additionally, the area within and near the 5-mile study area boundary includes 105 sites and one district that have been determined by NYSOPRHP to be eligible for NRHP-listing. These resources are described in detail in Section 3.6.1 of the VIA (Appendix GGG).

In addition to the scenic resources of statewide significance listed above, the visual study area also includes aesthetic resources that are regionally and locally significant, sensitive to visual impacts, and/or receive significant public/recreational use. These aesthetic resources include recreation facilities, public open spaces, population centers, and heavily used transportation corridors. In addition, aesthetic resources of local significance were identified during the VIA public outreach effort. Notable local and regional resources within the 5-mile study area are described in detail in Section 3.6.2 of the VIA and also listed in Appendix C of the VIA.

(4) Viewpoint Selection

16 NYCRR § 1000.24(b)(4) includes the requirements that "the applicant shall confer with municipal planning representatives, DPS, DEC, OPRHP, and where appropriate, APA in its selection of important or representative viewpoints." Building on the consultation with municipal representatives and stakeholders to identify visually

sensitive sites (as described above in Section (b)(3) of this Exhibit and Section 3.6 of the VIA), EDR conducted additional outreach to agency staff and stakeholder groups to determine an appropriate set of viewpoints for the development of visual simulations. Copies of the correspondence sent by EDR as part of this process, as well as responses received from stakeholders, are included as Appendix F of the VIA. This outreach effort included:

- On January 1, 2017, EDR distributed a letter entitled "Baron Winds Farm - Recommendations for Visual Simulations" to appropriate municipal planning representatives and to State of New York interested parties (see Appendix F of the VIA). This memo included: 1) a summary of research and consultation undertaken as part of the VIA to date; 2) description of the field review/photography conducted for the Facility; 3) a rationale for viewpoint selection; and 4) recommendations that 14 specified viewpoints be selected for the preparation of turbine simulations. The rationale provided for viewpoint selection included the following factors:
  - They provide representative views of the Facility from the various LSZs and Distance Zones within the study area.
  - They include visually sensitive resources/sites within the study area, including sites recommended by the DPS and other stakeholders during review of the Facility's PSS.
  - A significant portion of the Facility would be visible based on viewshed analysis and field review.
- On April 19, 2017, EDR distributed a letter entitled "Baron Winds Farm – Invitation to Consult Regarding Viewpoint Selection for Photo Simulations" via email and regular mail to appropriate municipal planning representatives (see Appendix F of the VIA). The purpose of this communication was to invite these municipal and state agencies to take part in one of two webinars that were scheduled for April 26, 2017.
- On April 26, 2017, EDR hosted two on-line webinars at 10:00 a.m. and 3:00 p.m. (to accommodate participants' schedules and maximize participation); however, the format and content of each meeting were identical. Each meeting included: 1) a review of the visual studies conducted to date; 2) a discussion of proposed and alternate viewpoints for the development of simulations; and 3) a request that stakeholders provide any additional suggestions or comments regarding viewpoint selection via email.
- Comments received during the April 26th webinars included the suggestion that the soccer fields located in the Cohocton Village at the elementary school be considered.
- As a follow-up to the on-line webinars, EDR provided a proposed list of viewpoints for visual simulations to DPS staff and other stakeholders via email on May 8, 2017.
- On June 13, 2017, EDR received an email from John A. Bonafide of the NYSOPRHP's Division for Historic Preservation (DHP) in regard to the recommended viewpoints for development of visual simulations. The letter stated that based on the DHP's review of the information provided in EDR's letter (email) on May 8, 2017, the DHP agrees with the viewpoints chosen.

- Three viewpoints were added following a field visit on May 10, 2017 to capture spring and summer leaf-on conditions.
- One simulation was added to Viewpoint 37 for comparing leaf-on and leaf-off conditions.

Based on the outcome of stakeholder and agency consultation, a total of 21 viewpoints were selected for the development of visual simulations. These viewpoints were selected based upon the following criteria:

1. They provide open views of proposed turbines (as indicated by field verification), or provide representative views of the screening effects of vegetation and/or buildings from selected areas.
2. They illustrate Facility visibility from sensitive resources identified by local stakeholders and State agencies.
3. They illustrate typical views from LSZs where views of the Facility will be available.
4. They illustrate typical views of the proposed Facility that will be available to representative viewer/user groups within the visual study area.
5. They illustrate typical views of different numbers of turbines, from a variety of viewer distances, and under different lighting/sky conditions, to illustrate the range of visual change that will occur with the Facility in place.
6. The photos obtained from the viewpoints display good composition, lighting, and exposure.

Locational details and the criteria for selection of each simulation viewpoint are summarized in Table 24-5, below.

Table 24-5. Viewpoints Selected for Simulation

Viewpoint Number	Location and/or Visually Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance[1]	View Orientation[2]
21	Quad County Snowmobile Trail, Town of Wayland	Rural Uplands/Ridgeline	Local Residents, Tourists/Recreational Users	2.4	SE
23	State Route 371, Town of Cohocton	Rural Valley	Local Residents, Through-Travelers	5.0	SSE
30	State Route 371, Cohocton River State Designated	Rural Valley	Local Residents, Tourists/Recreational Users	2.8	SW
37	Larrowe House and Memorial Park, Town of Cohocton	City/Village/Hamlet	Local Residents, Tourists/Recreational Users	1.5	SSW
43	State Route 415, Town of Cohocton	Rural Valley, Transportation Corridor	Local Residents	1.9	WNW
49	Interstate 390, Scenic Overlook, Town of Cohocton	Transportation Corridor	Through Travelers/Commuters	0.7	WNW
51	State Route 21, Town of Wayland	Rural Valley	Local Residents	1.1	E

Viewpoint Number	Location and/or Visually Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance[1]	View Orientation[2]
54	Interstate 390, NHRP Eligible Site, Town of Cohocton	Transportation Corridor	Local Residents, Through-Travelers/Commuters	1.0	W
57	Wallace Back Road, Town of Avoca	Rural Valley	Local Residents	2.8	WNW
66	County Route 46, Town of Fremont	Rural Uplands/Ridgelines	Local Residents	6.3	E
79	County Route 54 at Jones Road, Town of Fremont	Rural Uplands/Ridgelines	Local Residents	0.1	SSE
92	County Route 70A at Russell Road, Town of Fremont	Rural Valley	Local Residents	0.8	N
111	I86 Scenic Overlook	Transportation Corridor	Tourists/Recreational Users, Through Travelers/Commuters	8.6	NE
114	North Country Trail/Finger Lakes Trail, Town of Bath	Rural Uplands/Ridgelines	Tourists/Recreational Users	9.3	NW
118	Intersection of South Woods Road and Burt Hill Road, Town of Howard	Rural Uplands/Ridgelines	Local Residents	3.5	NNW
148	NYSDEC Truck Trail, Canacadea State Forest, Town of Hornellsville	Forest	Tourists/Recreational Users	6.6	NE
160	Canaseraga State Forest, Blank Hill Road, Town of Ossian	Forest	Tourists/Recreational Users	12.2	E
168	Ellsworth "Ozzie" Tripp Sports Complex, Town of Cohocton	City/Village/Hamlet	Local Residents, Tourists/Recreational Users	1.2	SW/SSW
177	Lent Hill Road at Eveland Road, Town of Cohocton	Rural Uplands/Ridgeline	Local Residents	5.8	SW/W
192	Loon Lake, Laf A Lot Road, Town of Wayland	Waterfront/Open Water	Local Residents, Tourists/Recreational Users	1.2	SE
198	Rex Road, Town of Cohocton	Rural Uplands/Ridgelines	Local Residents	0.1	NNE/NE

[1]Distance from viewpoint to nearest visible turbine (in miles)
[2]N = North, S = South, E = East, W = West

In addition to the viewpoints selected for the development of turbine simulations, two viewpoints were selected to illustrate the appearance of the proposed overhead segments of the collection line. These viewpoints included a location on County Route 121/Cohocton Loon Lake Road and a location on State Route 21 at Derevees Road, both in the Town of Cohocton. These locations offer unobstructed views of the overhead line segments, including required vegetation clearing and different structure types. Simulations of the proposed collection substation and POI substation modifications were not prepared due to a lack of visibility from public vantage points and/or the limited visual change these structures would make in the vicinity of the existing Canandaigua Substation (see Section 5.1.2 of the VIA).

(5) Photographic Simulations

To show anticipated visual changes associated with the proposed Facility, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the proposed Facility from each of the 21 selected viewpoints. The photographic simulations were developed using the method described in Section (b)(4) above. Viewpoints were selected, in part, for their open views. As a result, there will be no significant screening of the proposed Facility due to vegetation in the photographic simulations. However, one simulation was done to compare leaf-on and leaf-off conditions. As previously mentioned, representative viewpoints were selected based on the feedback provided by municipal planning representatives and DPS, NYSDEC, and NYSOPRHP staff, while also considering the other factors stated above. The photographic simulations are presented in Appendix D of the VIA (Appendix GGG).

(6) Additional Simulations Illustrating Mitigation

Due to the typical height of individual turbines and the geographic extent of a given wind power project, mitigation measures such as screening of individual turbines with earthen berms, fences, or planted vegetation will generally not be effective in reducing visibility. Therefore, additional simulations specific to mitigation will not be prepared.

(7) Simulation Rating and Assessment of Visual Impact

As described in Section 4.2.3 of the VIA, three registered landscape architects (one in-house and two independent) evaluated the visual impact of the proposed Facility. Utilizing 11 x 17-inch digital color prints of the 22 visual simulations (including two from Viewpoint 37) described above, the landscape architects (LAs) reviewed the existing and proposed views, evaluated the contrast/compatibility of the Facility with various components of the landscape (landform, vegetation, land use, water, sky, and viewer activity), and assigned quantitative visual contrast ratings on a scale of 0 (insignificant) to 4 (strong). The average contrast score assigned by each LA was calculated for each viewpoint, and an average score for each viewpoint was determined. Copies of the completed rating forms are included in Appendix E of the VIA. The methodology for the rating panel exercise is described in detail above in Section (a)(8).

The average score of the landscape components evaluated by each landscape architect was calculated for each viewpoint. The results of this process are summarized below in Table 24-6.

Table 24-6. Summary of Results of Contrast Rating Panel Review of Simulations

VP #	Distance to Nearest Visible Turbine[1]	Distance Zone	Landscape Similarity Zone	Viewer Groups			Contrast Rating Scores[2]				
				Local Residents	Through Travelers/ Commuters	Tourists/ Recreation	#1	#2	#3	Average	Contrast Rating Result
21	2.4	Mid-Ground	Rural Uplands / Ridgeline	●			2.8	1.4	1.9	2.0	Moderate
66	2.2	Mid-Ground	Rural Uplands / Ridgeline	●			3.6	3.0	2.4	3.0	Appreciable
79	0.1	Foreground	Rural Uplands / Ridgeline	●			2.4	3.0	3.2	3.0	Appreciable
114	9.3	Background	Rural Uplands / Ridgeline	●		●	0.5	0.8	1.2	0.8	Insignificant / Minimal
118	3.5	Mid-ground	Rural Uplands / Ridgeline	●			2.4	1.8	2.5	2.2	Moderate
177	5.8	Background	Rural Uplands / Ridgeline	●			1.0	1.2	2.1	1.4	Minimal
198	0.1	Foreground	Rural Uplands / Ridgeline	●			2.3	3.5	2.5	2.8	Moderate / Appreciable
Total average rating for the Rural Uplands / Ridgeline LSZ										2.2	Moderate
23	5.0	Background	Rural Valley	●	●		2.5	2.4	2.4	2.4	Moderate
30	2.8	Mid-ground	Rural Valley	●	●		3.1	2.8	2.4	2.8	Moderate / Appreciable
43	1.9	Mid-ground	Rural Valley	●	●		2.7	2.3	2.0	2.3	Moderate
51	1.1	Mid-ground	Rural Valley	●			3.1	2.0	2.2	2.4	Moderate
57	2.8	Mid-ground	Rural Valley	●			3.6	3.0	2.4	3.0	Appreciable
92	0.8	Mid-ground	Rural Valley	●			1.6	0.2	0.6	0.8	Insignificant / Minimal
Total average rating for the Rural Valley LSZ										2.8	Moderate / Appreciable
49	0.7	Mid-ground	Transportation Corridor		●		2.9	3.3	2.7	3.0	Appreciable
54	1.0	Mid-ground	Transportation Corridor		●		2.8	2.3	2.3	2.5	Moderate / Appreciable

VP #	Distance to Nearest Visible Turbine[1]	Distance Zone	Landscape Similarity Zone	Viewer Groups			Contrast Rating Scores[2]				
				Local Residents	Through Travelers/ Commuters	Tourists/ Recreation	#1	#2	#3	Average	Contrast Rating Result
111	8.55	Background	Rural Uplands / Ridgeline & Transportation Corridor		●		1.2	0.7	2.6	1.5	Minimal / Moderate
Total average rating for the Transportation Corridor LSZ										2.3	Moderate
37 Leaf Off	1.5	Mid-ground	City / Village / Hamlet	●		●	3.1	2.2	2.8	2.7	Moderate / Appreciable
37 Leaf On	1.5	Mid-ground	City / Village / Hamlet	●		●	2.7	1.9	2.5	2.4	Moderate
168	1.2	Mid-ground	City / Village / Hamlet	●		●	3.8	3.2	2.5	3.2	Appreciable
Total average rating for the City/Village/Hamlet LSZ										2.8	Moderate / Appreciable
148	6.6	Background	Forest			●	0.0	0.0	1.4	0.5	Insignificant / Minimal
160	12.2	Background	Forest			●	0.0	0.0	0.6	0.2	Insignificant
Total average rating for the Forest LSZ										0.4	Insignificant
192	1.2	Mid-ground	Open Water / Shoreline	●		●	3.5	3.3	3.9	3.7	Appreciable / Strong
Total average rating for the Open Water/Shoreline LSZ										3.7	Appreciable / Strong

[1]Distance in miles.
[2]Contrast Rating Scale: 0.0 - 0.4 (Insignificant), 0.5 – 0.9 (Insignificant/Minimal), 1 – 1.4 (Minimal), 1.5 – 1.9 (Minimal/Moderate), 2 - 2.4 (Moderate), 2.5 – 2.9 (Moderate/Appreciable), 3 – 3.4 (Appreciable) 3.5 – 3.9 Appreciable/Strong), 4 (Strong).

As Table 24-6 indicates, the average, overall composite contrast ratings for the 22 visual simulations ranged from 0.2 (Insignificant) to 3.7 (Appreciable/Strong). The results of this evaluation are summarized as follows:

Rural Upland/Ridgeline LSZ (Viewpoints 21, 66, 79, 114, 118, 177, and 198)

Simulations of the Facility from viewpoints located within the Rural Upland/Ridgeline LSZ received average contrast rating scores that ranged from 0.8 for Viewpoint 114 to 3.0 for Viewpoints 66 and 79. The low contrast rating for Viewpoint 114 is largely attributable to the background distance at which the proposed turbines are viewed. Comments from the rating panel indicated that the turbines would be visible, but would not have a substantial impact on the existing character or scenic quality of this viewpoint. Viewpoints 66 and 79 received contrast ratings of 3.0 due largely to the number of turbines visible or their proximity to the viewer. Under these conditions the turbines become the dominant features of the landscape and focal points in the view. The overall conclusion from the rating panel is that the Facility will have a generally moderate effect on viewpoints in the Rural Upland/Ridgeline LSZ. Although this is the only zone where turbines can be viewed from near foreground locations, their overall impact is relatively small due to the limited number of viewers and sensitive resources found within this LSZ, the visibility of existing wind farms, and the compatibility of the turbines with the working agricultural land use that characterizes most existing views.

Rural Valley LSZ (Viewpoints 23, 30, 43, 51, 57, and 92)

Simulations of the Facility from viewpoints located within the Rural Valley LSZ received average contrast rating scores that ranged from 0.8 at Viewpoint 92 to 3.0 at Viewpoint 57. Simulations within the Rural Valley LSZ received an overall average contrast rating of 2.3, which indicates a moderate level of impact can be expected throughout this LSZ. This can be attributed to the fact that mid-ground ridges that line the valleys typically screen background landscape features and limit views of turbines to those within the mid-ground distance zone.

The low contrast rating for Viewpoint 92 can be attributed to the relatively low baseline scenic quality of the existing view, along with the fact that the proposed turbines are largely concealed by intervening vegetation, even during leaf-off/winter conditions. Viewpoint 57 received the highest average contrast rating within this LSZ largely because of the high scenic quality of this classic rural view. However, even in this instance, the Facility's compatibility with the working agricultural landscape was noted by all of the rating panel members.

Transportation Corridor LSZ (Viewpoints 49, 54, and 111)

Simulated views of the Facility from viewpoints located within the Transportation Corridor LSZ received average contrast rating scores that ranged in value from 1.5 at Viewpoint 111 to 3.0 at Viewpoint 49. The low contrast rating received by Viewpoint 111 can be attributed to the distance of the Facility from the viewer. Although this viewpoint had the highest baseline scenic quality rating of the selected viewpoints within this LSZ, the effect of the Facility in the distant background was minimal. The appreciable contrast noted for Viewpoint 49 is due primarily to the proximity of the unscreened turbines at the apex of a nearby wooded hill. Impact of the Facility in this LSZ is mitigated by the limited sensitivity and relatively short duration of views typical of viewers traveling the Interstate highways. Although prolonged views are available at the designated rest stops, in these venues the turbines are likely to add interest to the view and actually enhance the experience of travelers passing through the area.

City/Village/Hamlet LSZ (Viewpoints 37 Leaf-Off, 37 Leaf-On, and 118)

Simulations from viewpoints located within the City/Village/Hamlet LSZ received average contrast rating scores that ranged from 2.4 at Viewpoint 37, to 3.2 at Viewpoint 168. At Viewpoint 37, rating panel results indicate that the proposed Facility has moderate to appreciable contrast with other landscape features in this view under both winter (leaf-off) and summer (leaf-on) conditions. The scale of the turbines contrasts with the adjacent vegetation and alters the residential character of the view. At Viewpoint 168, rating panel results suggest that the visual contrast would be appreciable to strong due to the size and number of turbines added to this view and the number of viewers exposed to the Facility at this location. However, visual impact was mitigated by the already compromised scenic quality of the existing view. It is also worth noting that both of the selected viewpoints are locations where a substantial number of turbines would be visible from the City/Village/Hamlet LSZ. This is an unusual circumstance, as outward views from most locations within this zone are well screened by structures and street/yard trees, which limit potential Facility visibility.

Forest LSZ (Viewpoints 148 and 160)

Viewpoints located within the Forest LSZ received average contrast rating scores that ranged from 0.2 for Viewpoint 160, to 0.5 for Viewpoint 148. Rating panel results indicated an insignificant to minimal contrast rating due to the distance of the turbines from the viewer and the screening provided by the forest vegetation in the foreground. Viewer sensitivity at the state forests where these viewpoints are located could increase perceived visual impact if the turbines were closer or less well screened.

Waterfront/Open Water (Viewpoint 192)

The visual simulation from Viewpoint 192, located within the Waterfront/Open Water LSZ, received a composite contrast rating of 3.7, which is the highest score received by any of the selected viewpoints. Rating panel results indicate that the proposed Facility will add highly visible utilitarian features to the landscape, which present strong contrast with the current land use and viewer activity. The focal point in the view will re-align upward from the water surface and shoreline to the skyline and the proposed turbines. The overall conclusion from the rating panel is that the Facility will present appreciable to strong contrast multiple features of the landscape within the Waterfront/Open Water LSZ. However, as noted previously, Viewpoint 192 represents "worst case" Facility visibility, and other areas within this LSZ are not anticipated to experience this degree of turbine visibility/visual impact.

As demonstrated in the contrast ratings summary in Table 24-6 (see also Appendix E of the VIA), the rating scores provided by the three landscape architects were generally consistent, with a few outliers or conflicting scores. Although appreciable to strong contrast was noted for some viewpoints, the overall contrast presented by the Facility is considered moderate. Rating panel results indicate that the number of turbines and their scale and form contrast with the landform, vegetation, and sky were the primary sources of visual contrast with the existing landscape. The greatest perceived visual impact typically occurs when numerous turbines are visible, where the turbines are in close proximity to the viewer, or where the turbines appear out of place in their setting (e.g., in a residential context). These conditions tend to heighten the Facility's contrast with existing elements of the landscape in terms of line, form, and especially scale. Factors mitigating visual impact within the study area include, 1) the dissected landform that limits the number of turbines visible from valley locations, 2) the relatively few viewers present on the elevated plateaus and ridgetops where views of numerous turbines and near foreground views will be available, 3) the substantial screening provided by existing foreground landscape features in forested areas and areas of concentrated human settlement, and 4) the working agricultural character of much of the landscape in which the Facility would be viewed.

Views from some water/waterfront settings (e.g., the northwest shore of Loon Lake) have the potential for more substantial visual impact due to the strong land use contrast presented by the turbines and the relatively high sensitivity of viewers in this setting. However, even in this context, visual impact is mitigated to some extent by the presence of existing turbines in the area and the fact that not all viewers will find the turbines to be aesthetic liabilities.

Although at times offering appreciable contrast with existing elements of the landscape, the proposed Facility will not necessarily be perceived by viewers as having an adverse visual impact. Wind turbines are unlike most energy/infrastructure facilities, such as transmission lines or conventional power plants, which are almost universally viewed as aesthetic liabilities. Wind turbines have a clean sculptural form that is considered attractive by some viewers (Pasqualetti et al., 2002). In EDR's experience, operating wind power projects in New York State have generally received a positive public reaction following their construction. This observation is supported by recent annual surveys conducted by Jefferson County Community College in Lewis County, New York (location of the 195-turbine Maple Ridge Farm Facility in operation since 2006), which revealed strong community support for wind power (JCCC, 2008, 2010, 2011, 2012). A significant majority (approximately 90%) of Lewis County residents who participated in these surveys expressed support for the development of additional wind energy projects (JCCC, 2010, 2011, 2012). Approximately 70% of respondents have consistently indicated that wind farms have had a positive impact on Lewis County (JCCC, 2008, 2010, 2011, 2012). The 2008 survey indicated that 77% of individuals that were able to see and/or hear turbines from their homes indicated that the wind farms have had a positive impact on Lewis County. Additionally, only 7.5% of participants who live within 1 mile of the nearest wind turbine felt that wind farms have had a negative impact (JCCC, 2008).

This finding is consistent with a number of broader studies that have found increased local support for wind projects once they are constructed and become operational. Public support often follows a "U" pattern, in which acceptance is initially high, drops during the planning and construction, and then rebounds after the wind farm commences operation, and impacts are found to be less detrimental than feared (Firestone et al., 2009). Similar results have also been documented in public opinion/acceptance surveys regarding constructed wind power projects in other locations (Bishop and Proctor, 1994; Gipe, 2003). A recent study of public perception of wind power in Scotland and Ireland (Warren, et. al., 2005) provided the following conclusions:

> "A remarkably consistent picture is emerging from surveys of public attitudes to wind power, and the case studies provide further evidence that this picture is a representative one. Large majorities of people are strongly in favour of their local windfarm, their personal experience having engendered positive attitudes. Moreover, although some of those living near proposed windfarm sites are less convinced of their merits, large majorities nevertheless favour their construction. This stands in marked contrast with the impression conveyed in much media coverage, which typically portrays massive grassroots opposition to windfarms."

Based on the analysis in this Exhibit and the VIA, it is expected that similar overall reactions, with some individual variability in acceptance, will result for this Facility.

(8) Visible Effects Created by the Facility

As previously mentioned, part of the visual impact analysis included a study of potential shadow flicker impacts on nearby receptors. Details of this study are enumerated in Section (a)(9), and Exhibit 15 of this Application.

REFERENCES

Bishop and Proctor. 1994. *Love Them or Loathe Them? Public Attitude Towards Wind Farms in Wales*. Cardiff, Wales.

Committee on Environmental Impacts of Wind Energy Projects (CEIWEP). 2007. Appendix D: A Visual Impact Assessment Process for Evaluating Wind-Energy Projects. In, Environmental Impacts of Wind Energy Projects, pp. 349-376. National Research Council, The National Academies Press, Washington, D.C.

Department of Energy and Climate Change (DECC). 2011. *Update of UK Shadow Flicker Evidence Base: Final Report.* Parsons Brinckerhoff, London, UK, p. 5.

Department of Planning and Community Development (DPCD). 2012. *Policy Planning and Guidelines for Development of Wind Energy Facilities in Victoria.* The State of Victoria, Department of Planning and Community Development, Melbourne, Australia.

EMD. 2013. *WindPRO 2.8 User Manual*. Available at: http://help.emd.dk/knowledgebase/ (Accessed February, 2016).

Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR). 2017. *Historic Architectural Resources Survey: Baron Winds Project, Towns of Cohocton, Dansville, Fremont, and Wayland, Steuben County, NY*. EDR, Syracuse, NY.

Firestone, J., W. Kempton, and A. Krueger. 2009. *Public Acceptance of Offshore Wind Power Projects in the United States*. Wind Energy, 12, 183-202.

Gipe, P. 1993. *The Wind Industry's Experience with Aesthetic Criticism*. Leonardo, No. 26, pp. 243-248.

Gipe, P. 2003. *Tilting at Windmills: Public Opinion Toward Wind Energy* [website]. Available at: www.wind-works.org/articles/tilting.html (Accessed January 20, 2011).

Jefferson County Community College (JCCC). 2008. *Presentation of Results: Second Annual Lewis Count Survey of the Community, December 2008.* Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: http://www.sunyjefferson.edu/ccs/index.html.

JCCC. 2010. *Presentation of Results: Third Annual Lewis Count Survey of the Community, February 2010.* Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: http://www.sunyjefferson.edu/ccs/index.html

JCCC. 2011. *Presentation of Results: Fourth Annual Lewis Count Survey of the Community, February 2011.* Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: http://www.sunyjefferson.edu/ccs/index.html

JCCC. 2012. *Presentation of Results: Fifth Annual Lewis Count Survey of the Community, February 2012.* Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: http://www.sunyjefferson.edu/ccs/index.html

Macaulay Land Use Research Institute (MLURI). 2010. *Perceptual Studies of Windfarms* [website]. Available at: http://www.macaulay.ac.uk/ccw/task-two/strategies.html (Accessed March 10, 2016).

National Research Council (NRC). 2007. *Environmental Impacts of Wind Energy Projects*. Committee on Environmental Impacts on Wind Energy Projects. The National Academies Press, Washington, D.C., pp. 160-162.

NYSDEC. 2000. Program Policy: Assessing and Mitigating Visual Impacts. DEP-00-2. Division of Environmental Permits, Albany, NY.

New York State Department of Public Service (NYSDPS). 2017. *Proposed Certificate Conditions in the Matter of 14-F-490 Application by Cassadaga Wind LLC for a Certificate of Environmental Compatibility and Public Need Pursuant to Article 10 of the New York State Public Service Law for the Cassadaga Wind Project, Towns of Charlotte, Cherry Creek, Arkwright, and Stockton, Chautauqua County*. Case No. 14-F-0490. Condition 55.

Nielsen, F.B. 1996. *Wind Turbines and the Landscape: Architecture and Aesthetics*. Prepared for the Danish Energy Agency's Development Programme for Renewable Energy. 63 pp.

Ohio Power Siting Board (OPSB). 2011a. *Opinion, Order, and Certificate in the Matter of Hog Creek Windfarm, LLC*. Case No. 10-654-EL-BGN, Section V, (44), p. 32.

OPSB. 2011b. *Opinion, Order, and Certificate in the Matter of Hardin Wind Energy, LLC*. Case No. 11-3446-EL-BGA. Opinion Section D, p. 5.

OPSB. 2012. *Opinion, Order, and Certificate in the Matter of Champaign Wind, LLC.* Case No. 12-160-EL-BGN. Section VI, (F), P. 48.

OPSB. 2013. *Opinion, Order, and Certificate in the Matter of Northwest Ohio Wind, LLC*. Case No. 13-0197-EL-BGN. Section V, (39).

OPSB. 2014. *Opinion, Order, and Certificate in the Matter of Hardin Wind, LLC*. Case No. 13-1177-EL-BGN. Opinion Section D, p. 2.

Pasqualetti, M.J., P. Gipe, and R.W. Righter (eds.). 2002. *Wind Power in View: Energy Landscapes in a Crowded World*. Academic Press, San Diego, CA.

Reschke, Carol. 1990. *Ecological Communities of New York State.* New York Natural Heritage Program. NYSDEC. Latham, N.Y.

Smardon, R.C., J.F. Palmer, A. Knopf, K. Grinde, J.D.Henderson and L.D. Peyman-Dove. 1988. *Visual Resources Assessment Procedure for U.S. Army Corps of Engineers.* Instruction Report EL-88-1. Department of the Army, U.S. Army Corps of Engineers. Washington, D.C.

Stanton, C. 1996. *The Landscape Impact and Visual Design of Windfarms*. ISBN 1-901278-00X. Edinburgh College of Art, Heriot-Watt University. Edinburgh, Scotland.

States Committee for Pollution Control – Nordrhein-Westfalen, 2002. Notes on the Identification and Evaluation of the Optical Emissions of Wind Turbines. Available at: http://www.umwelt.sachsen.de/umwelt/download/laerm_licht_mobilfunk/WEA-Schattenwurf-Hinweise_LAI.pdf (Accessed February, 2016).

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

Thayer, R.L. and H. Hansen. 1988. *Wind on the Land.* Landscape Architecture. Vol. 78, No. 2, pp. 69-73.

United Stated Department of Agriculture (USDA), National Forest Service. 1995. Landscape Aesthetics, A Handbook for Scenery Management. Agricultural Handbook 701. Washington D.C.

United States Department of the Interior, Bureau of Land Management. 1980. Visual Resource Management Program. U.S. Government Printing Office. 1980. 0-302-993. Washington, D.C.

United States Department of Transportation, Federal Highway Administration. 1981. Visual Impact Assessment for Highway Facilities. Office of Environmental Policy. Washington, D.C.

Van de Wardt, J.W. and H. Staats. 1998. *Landscapes with wind turbines: environmental psychological research on the consequences of wind energy on scenic beauty*. Research Center ROV Leiden University.

Warren, C.R., C Lumsden, S. O'Dowd, and R.V. Birnie. 2005. 'Green On Green': Public Perceptions of Wind Power in Scotland and Ireland. *Journal of Environmental Planning and Management*. Vol. 48, No. 6, pp 853-875.

Wisconsin Public Service Commission. 2012. *Wisconsin Administrative Code*, PSC 128.15.