



EIGHT POINT WIND ENERGY CENTER

Case No. 16-F-0062

1001.24 Exhibit 24

Visual Impacts

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Exhibit 24: Visual Impacts

24(a) Visual Impact Assessment

In order to determine the extent and assess the significance of the visibility of the built Facility, a Visual Impact Assessment (VIA) has been conducted (see Appendix 24-1). The VIA includes both quantitative and qualitative 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 is included as Appendix 24-1 of the Article 10 Application and addresses the issues presented herein with additional detail.

(1) Character and Visual Quality of the Existing Landscape

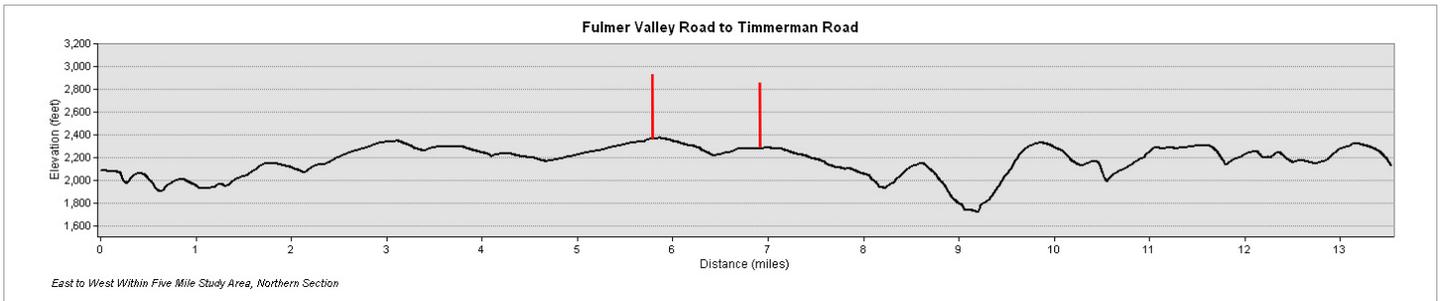
As defined in 1000.2(ar), the visual study area (VSA) to be used for analysis of major electric generating facilities is *“an area generally related to the nature of the technology and the setting of the proposed site. For large facilities or wind power facilities with components spread across a rural 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.”*

Turbines are proposed in the Towns of Greenwood and West Union, New York. Because of the typical height of an industrial type wind turbine proposed within a rural landscape, a primary VSA of 5 miles was evaluated. However, areas between 5 to 10 miles have also been investigated. The entire 10-mile VSA includes Steuben and Allegany Counties, NY and extends southerly into Pennsylvania. Pennsylvania will not be examined in the Article 10 Application. The 5 and 10-mile VSA boundaries for the Facility are depicted on Figure 1 in Appendix 24-1.

The 5-mile VSA includes the Towns of Andover, Greenwood, Jasper, Troupsburg, and West Union. The 10-mile VSA includes the Towns of Alfred, Andover, Canisteo, Greenwood, Hartsville, Independence, Jasper, Scio, Troupsburg, Ward, Wellsville, Willing, and Woodhull. The Site is within the Major Land Resource Area (MLRA) of the Glaciated Allegheny Plateau and Catskill Mountains. This MLRA is primarily in the southern New York section of the Appalachian Plateaus Province of the Appalachian Highlands. The plateau itself is mature and eroded. In the area of Steuben and Allegany counties, topography is hilly and rolling generally characterized by numerous valleys and troughs. Streams dissecting the plateau have created steep valleys that are as deep as 300-600 feet. Approximate elevations in the turbine 5-mile VSA range between 1,800 and 2,380 feet mean sea level (msl). The elevation profiles below help to show the topography in relation to turbine location and turbine height.

Elevation Profile 1

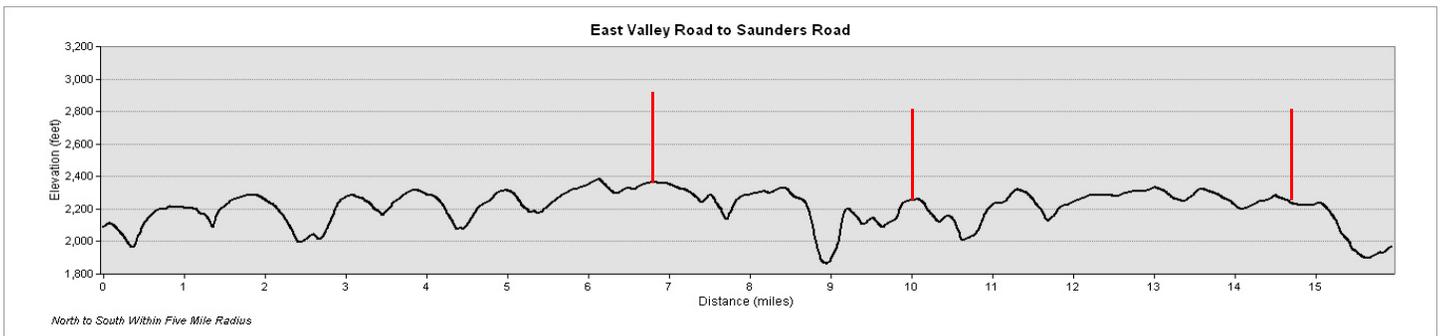
Wind Turbine



Elevation Profile 2



Elevation Profile 3



Profiles produced above focus on the terrain related to the proposed turbines. Elevation Profile 1 shows the cross section of the northern 5-mile VSA between a westerly location at Fulmer Valley Road in Andover to an easterly section of Timmerman Road in Jasper. Topography is rolling with distinct high points. Elevation Profile 2 is taken at the southern section of the 5-mile VSA between Route 248A in Independence easterly to Route 36 in Troupsburg. This profile shows the plateau nature of the Project Area. Elevation Profile 3 starts at East Valley Road in Alfred and traverses south to Saunders Road at the Pennsylvania border in West Union. Steeply dissected valleys appear frequently as illustrated by this profile.

To help define the quality and character of the visual landscape, Landscape Similarity Zones (LSZ) were defined as required per 16 NYCRR § 1000.24(b)(1). LSZs are areas of similar landscape/aesthetic character based on patterns of landform, vegetation, water resources, land use, and user activity. These

zones provide additional context for evaluating viewer circumstances and visual experiences. Land cover classification datasets from the 2011 USGS National Land Cover Dataset (NLCD) (Homer *et al.*, 2015) are available for GIS analysis and were used for an initial establishment of LSZs as they provide distinct and usable landscape categories. These NLCD land cover groupings were then refined based on aerial photo interpretation and general field review. This effort resulted in the definition of five final LSZs within the full 10-mile VSA. LSZs with respective visual impacts are described in greater detail in the VIA and include the following:

Zone 1 - Agricultural/Open Field

Agricultural and open fields predominantly consist of large farm complexes with cultivated crops, hay, or pasture. Views from this zone are from expansive open areas occurring at various elevations. Frequently there are hedgerows or small tree groups that provide intermittent screening. When located in higher elevation areas, there are often long distance vistas affording long-range views.

Zone 2 – Forested

Views from inside the Forest Zone are highly limited since it is assumed that tree canopy precludes outward views unless there are intermittent gaps in trees. Forested areas may include roadway segments where there are permanent residents.

Zone 3 - Developed

This zone includes small villages and towns with low to moderate-density residential (and limited commercial) development, generally oriented along a primary road that is typically a county road. Often adjacent buildings are visual impediments for views as well as street side trees. However, there may be open yards or road corridors with less screening that could afford longer distant views. Most of the developed denser residential areas are in the lower valley regions.

The Developed Zone also includes the major roadways where residential development is intermittently established along the existing road network, as well as where the transient segment of the population is found.

Zone 4 - Ridge/Plateau (areas at or above 2,200 feet mean sea level)

Those areas that are 2,200 feet msl or higher are delineated as high point ridges or plateaus within rolling terrain marked out as Zone 4 areas. A cutoff elevation of 2,200 feet msl was chosen based on GIS terrain analysis and the geomorphological characteristics in the landscape; it is a general elevation where typically, steeper valley walls begin a descent from a plateau and ridge-type landform. It is in Zone 4 where the turbines are located. Although this plateau area comprises a smaller portion of the overall 10-mile VSA, it is also a LSZ that could offer an additional understanding of visual character due to proximity to turbines or landscape position. Agricultural, forest, developed, and open water zones are found above and below 2,200 feet msl.

Zone 5 - Open Water

There are very few open water bodies in the area. They typically exist as small isolated ponds within larger forest tracts ranging from six to eighteen acres in size. Foster Lake in Alfred is approximately 25 acres.

U.S. Forest Service defined Distance Zones (USDA, 1995) were also considered. The level of detail and acuity of proposed turbines in relation to viewer distance can be inferred using distance zones. There are three distance zones applied for this Project:

- Distance Zone 1: Foreground (up to 0.5 miles from the viewer). This is the closest distance at which details of the landscape can be seen. Individual forms (shape of an object or unification of shapes) are typically dominant.
- Distance Zone 2: Middleground (up to 4 miles from the viewer). At this distance individual tree forms can be distinguished. Landscape details are viewed in masses or continuous cover. Form, texture, and color remain dominant and pattern is important.
- Distance Zone 3: Background (4 miles from the viewer to the horizon). At background distance texture has disappeared and color has flattened but large patterns of vegetation or open land is distinguishable, and ridgelines and horizon lines are the dominant visual characteristics. Landscapes have been simplified and are viewed in groups or patterns.

Distance Zones with respect to visibility are discussed in greater detail in the VIA (Appendix 24-1).

(2) Visibility of the Project

To understand the locations from which the Project may be visible, viewshed maps were developed (See description of methodology in Exhibit 24(b)(2)). From the results of the viewshed maps, the percent visibility of the land area located in the 5 and 10-mile VSAs are shown in Tables 24-1 and 24-2.

A substantial portion of the 5-mile VSA shows significant visibility when considering the effects of topography only. When considering blade tip height, Table 24-1 shows that 73.6% of the 5-mile VSA will have visibility of some portion of the turbine array. Views are precluded primarily in the steeply dissected valleys. Views only of the nacelle are diminished somewhat to 66.2%. When examining the full 10-mile VSA, visibility is more influenced by terrain, dropping to 47.9% for the turbine blade tip analysis and 41.1% at nacelle height as shown in Table 24-2. The major lower elevation valleys of Cowanesque and Genesee Rivers and their tributaries as well as Bennetts Creek lie in this zone. Visibility is assumed reduced due to slope and the acute angle of view from these lower areas, thus preventing views.

As expected, the presence of trees in the landscape offers the most visual impediment. Visibility is substantially reduced and within the 5-mile VSA drops more than half to 29.1% when considering the full turbine and 23.7% when viewing only the nacelle. Tree heights of 50 feet were assigned to the viewshed model to remain conservative, although many mature trees in the area have heights of 70 feet as measured in the field using a digital rangefinder. Yet the effects of trees on visibility be it 50 or 70 feet will likely remain similar due to the size of the turbines in relation to the trees. The GE Model 3.4 turbines at the most vertical position will be approximately 585 feet high, approximately 11 times higher

than the surrounding trees. The model was developed with the assumption that a viewer would not see the Project within the density of a forest area.

Weather conditions, including cloudy days and foggy weather, may also affect the visibility of the Project. Also, due to the elevation and adiabatic cooling, elevated hilltops can be cloudy during some fair weather mornings which can also reduce visibility of the turbines to viewers. The basis of the visual assessment does not take into account weather conditions.

Table 24-1. Percent Visibility of the Five Mile VSA Summarized for Bare Earth Topography, Incorporated Trees, Nacelle Height, and Blade Tip Height

County, State	Percent Bare Earth Visibility Within 5 Miles <i>Nacelle</i>	Percent Visibility with Trees Within 5 Miles <i>Nacelle</i>	Percent Bare Earth Visibility Within 5 Miles <i>Blade Tip</i>	Percent Visibility with Trees Within 5 Miles <i>Blade Tip</i>
Allegany County, NY	13.5%	4.5%	15.4%	5.8%
Steuben County, NY	43.4%	16.6%	46.7%	19.3%
New York Total	56.9%	21.1%	62.1%	25.1%
<i>Pennsylvania Total</i>	9.3%	2.6%	11.6%	3.9%
Grand Total	66.2%	23.7%	73.6%	29.1%

Table 24-2. Percent Visibility of the Ten Mile VSA Summarized for Bare Earth Topography, Incorporated Trees, Nacelle Height, and Blade Tip Height

County, State	Percent Bare Earth Visibility Within 10 Miles <i>Nacelle</i>	Percent Visibility with Trees Within 10 Miles <i>Nacelle</i>	Percent Bare Earth Visibility Within 10 Miles <i>Blade Tip</i>	Percent Visibility with Trees Within 10 Miles <i>Blade Tip</i>
Allegany County, NY	10.9%	3.1%	12.9%	4.2%
Steuben County, NY	21.5%	7.6%	24.1%	9.2%
New York Total	32.3%	10.7%	37.1%	13.4%
<i>Pennsylvania Total</i>	8.7%	1.6%	10.8%	2.4%
Grand Total	41.1%	12.2%	47.9%	15.8%

Additional viewshed analyses were performed to assess the amount of visibility within LSZs and Distance Zones. Refer to the VIA in Appendix 24-1 for greater detail.

(3) Visibility of Above-ground Interconnections and Roadways

Listed below are other above-ground aspects of Project operational characteristics. A 0.5-mile VSA was applied to the transmission corridor which also encompasses the Project collection substation. Please refer to the VIA where viewshed analyses, percent visibility, LSZs, and simulations are provided in greater detail.

Transmission Line

The Applicant proposes to construct an approximately 16.5-mile overhead 115 kilovolt (kV) transmission line that will be permitted separately under Article VII of the New York PSL. The transmission line will interconnect from a Project collection substation to new point of interconnect (POI) facilities within NYSEG's 115 kV Bennett Substation in Hornellsville, NY.

Collection Lines: Collection lines rated for 34.5 kV will connect wind turbines with the Project collection substation. The total length of collection line is approximately 27.9 miles. The bulk of the collection lines will be installed underground (approximately 27.2 miles) via direct burial. A small portion (approximately 0.67 miles or 3,538 feet) of the collection system will require overhead installation where direct burial is impractical for constructability and environmental reasons such as extensive bedrock, steep slopes and/or crossing of sensitive waterbodies.

Project Collection Substation: The 34.5 kV collection lines will gather the power from all the wind turbines and transport it to a new centrally located Project collection substation where the power will be transformed to 115 kV and connected to the Article VII jurisdictional interconnecting transmission line that connects to the Bennett Substation in Hornell. The Project collection substation will be located in the Town of Greenwood. The construction of the Project collection substation is anticipated to encompass approximately 1 acre of the site which currently is open field.

Access Roads: Roads used to access construction work pads for turbine sites and collection line, as well as post-construction operations and maintenance, will follow existing farm roads and trails where practicable in order to minimize the need for new roads. Temporary access roads used during construction will be gravel surfaced and up to approximately 32 feet wide to accommodate the movement of component delivery. Following the completion of construction the temporary access roads will be restored to a narrower width of 16 feet for permanent operations and maintenance purposes. The permanent access roads will remain gravel surfaced. The total length of access roads included for review in this Application is approximately 14.2 miles.

(4) Appearance of the Facility Upon Completion

The appearance of the Facility after construction is shown by use of photographic overlays (e.g. simulations). Photographs were taken with a full frame Canon 5D Mark II digital camera equipped with a 50-millimeter lens. Fifty millimeters was used as it most closely resembles human vision. Coordinates of camera locations intended for simulations were recorded through the use of a sub-meter Global Positioning System unit (GPS), as well as other reference points within the view. These reference locations were later used to refine the placement of the facility within the simulation photographs. Heights of select high reference points were measured with a Nikon Forestry 550 digital rangefinder.

To create visual simulations, 3DS MAX 2016 software was used to correctly dimension the 3d models into the digital photographic image from each viewpoint location. The 3D model of the turbine was created by TRC using available GE engineering and color specifications. Sargent & Lundy provided the Project collection substation and O&M building, and the transmission line 3D models. The simulation model was further developed to position the viewer at the selected vantage point. For a given vantage point, the visualization software is capable of providing and adjusting a camera view that matches that of the actual photograph. From the field effort, the documented camera coordinates (x, y, z) positions were entered into the model. Reference locations, which are existing visible objects in the photograph such as light posts, building corners, trees, gate posts or utility poles were obtained by GPS to assist with refined placement of the proposed Project within the photograph. In some instances, GIS terrain modeling and analysis helped in locking in the 3D facility model within the photograph. Ground point elevations of the camera location and other referenced objects were obtained from the USGS digital elevation model (DEMs).

The day and time of the photographs were also recorded and typically exist as electronic information embedded in the respective digital photograph files. This information was used to adjust for sun angle in the simulation software in order to represent lighting conditions for the time of day and year.

The photographic simulations of the Project upon completion are provided in Exhibit 24(b)(5) along with a description of the visual impacts and appearance for each of the viewpoints. The visual simulations show that the appearance of the Facility varies with distance from the Facility and the character of the landscape and manmade features in the area. Conclusions on impacts are provided in Exhibit 24(b)(8).

(5) Lighting

Aviation warning lights will be required on most or all of the turbines, and will contrast with the night sky particularly due to the rural setting of the Project where there is a minimal amount of currently existing ambient lighting. The introduction of the aviation lighting at night may suggest to the viewer a more commercial/industrial land use. There will be no daytime aviation lighting and as a result the aviation lighting is not anticipated to negatively impact viewers traveling through the area during the day or utilizing those public areas such as parks, trails and historic sites that are used primarily during the daylight hours.

Because the GE 3.4 turbines are above 499 feet (152.1 meters), each of that turbine model is required to be lit with two L-864 medium intensity flashing red lights on the nacelle. The GE 2.3 turbines will be under 499 feet (152.1 meters). Some or all of them may require at least one L-864 medium intensity flashing red light.

The Applicant is evaluating the use of Aircraft Detection Lighting Systems (ADLS) and if feasible, will propose the use of ADLS to the Federal Aviation Administration (FAA). ADLS are radar activated lights. These sensor-based systems are designed to detect aircraft as they approach an obstruction or a group of obstructions. The systems automatically activate the appropriate obstruction lights until they are no longer needed by the aircraft. The use of ADLS is discretionary by the FAA and is evaluated on a case by case basis depending on proximity to airports; flight paths, aeronautical safety concerns and other considerations. If approved, night time visual impacts would be significantly reduced. If the FAA does

not approve the use of the radar system, the FAA would require the use of the red lights flashing in unison throughout the nighttime hours. If the ADLS system is approved, this same lighting system would flash only when an aircraft approaches the airspace in proximity to the Project, and would then shut off after the aircraft has safely left the area.

No security lighting at the base of the towers is planned. Security lighting shall be installed at the Project collection substation and the O&M building. During unoccupied periods, ingress/egress and security lighting will not be illuminated. The O&M yard lighting will be designed with similar illumination levels for open areas and parking as those in the collection substation. These lights will be controlled by a timer. Similar to the collection substation, the O&M yard will normally be unoccupied after dark. Exhibit 11(e) contains a detailed lighting plan for the Facilities.

(6) Photographic Overlays

In order to simulate the visual changes that are anticipated from introducing the built facilities into the Project Area, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the proposed components (including turbines, transmission structures, collection substation and O&M building) from selected viewpoints. The following is a summary of the visual impacts to viewers at or in the immediate vicinity of the photo viewpoint. The complete visual simulations for the Project are provided in Appendix 24-1.

VP 3 County Road 61 (North) - Greenwood



The location of this viewpoint along County Road 61 is at the top of a rise approximately 0.5 miles south of the intersection with Route 417. County Road 61 is used to reach Route 417, a state highway and major roadway in the area. The purpose of this viewpoint is to represent a view of agricultural use in the northern part of the Project. The photo orientation is south. The view from this point shows a farmstead with active farmland, which occupies large and long segments of road which is typical of the area. However in this instance there is multi land use. A portion of the property is occupied by the Southern Tier Expressway, a family owned trucking company (located at the foreground silos but hidden from view by the road).

Within the view extents, six turbines are visible as well as a permanent met tower as sightlines are not impeded and foreground elements remain small in scale. Location to the nearest turbine in view

(rightmost turbine) is approximately 1 mile. Forest land is viewed as a homogeneous mass where form and color are prominent in the view and provides a sweeping pattern across the landscape. The photo was taken from the top of a hill looking down with a fairly long distance view where the horizon line is interrupted by new perpendicular vertical elements set against the otherwise horizontal grouping of forest. There will be long duration views held by workers and residents. There will be shorter duration views to motorists associated with local or commuter viewer types.

VP 5 County Road 61 (South) - Greenwood



This viewpoint along County Road 61 is near the junction with County Road 60. The vantage point was chosen to show a representative view from newer residential houses in an open agricultural area that may also have views of the transmission line. Neither of the residences at County Road 61 are in view. One house is 536 feet down the road and to the left of the viewer out of the photo extents. A second house is 890 feet behind the viewer. Both properties are expected to have views of turbines that show above the tree line. Since this is a roadside vantage point, it represents an intermittent view of what motorists would see when traveling in an easterly direction. Generally the view shows large homogeneous uninterrupted simple shapes of horizontal field or forest. The transmission line is embedded within the middle section of the horizontal band of trees in the background running across the view. The transmission structures will be minimally visible. Although not very discernible, some of the upper parts of the structures may be seen above the tree canopy.

VP 6 County Road 60 –West Union



This viewpoint is at the intersection of County Road 60 and Town Line Road. The view is looking northeast into Greenwood at the site of the proposed Project collection substation and O&M building. Town Line Road is seen sweeping across the middle view of the photo. The view shows a mix of field and forest and existing electric distribution lines and poles. This simulation shows cumulative effects with both generating and transmission elements. All of the major aspects of the Project are visible at this location; the collection substation and O&M building, a portion of the transmission line as it departs from the collection substation, and turbines in the background.

Although Project components are visible, even during winter views a fair portion of the collection substation and transmission line structures are visually obstructed by a hedgerow of bare-branched trees and shrubs that split the fields. Sections of denser forest in the background block views of lower turbine towers. Visibility will be substantially reduced during leaf-on conditions where most of the Project at this location west of the hedgerow will be obscured by the mass of vegetated tree canopy.

VP 8 Cemetery Hill Road – West Union



This photo shows a southeasterly view in the central portion of the Project and represents a residential location on Cemetery Hill Road near the intersection with Town Line Road. The overall impression to the viewer is of open field looking down from a slightly elevated location.

The photo shows Cemetery Hill Road as a rural dirt road located left in the photo. Wide open agricultural land surrounds a single residence in the photo middleground. There is a single turbine in an adjacent field which will add a notable visual focal point to the immediate area.

VP 9 Cemetery Hill Road – West Union (Rexville)



This viewpoint is on Cemetery Hill Road as it crosses Bennetts Creek in the hamlet of Rexville. The vantage point was chosen to show representative stream and open water in a valley location as well as a small population center while also being near the closest New York State Cultural Resource Information System (CRIS) listed eligible historic site to the Project. The location is 370 feet northwest of the junction with State Route 248. The photo shows a pastoral landscape with an open marsh area in the foreground and a series of hills in the background. One turbine is in view and sits on a distant hill visually co-dominant with other elements in the view due to distance and size and scale against foreground conifers and barn to the left. Although not very discernible, there are a couple of blades from other turbines visible that are seen just over the hilltops.

Motorists along Cemetery Hill Road would have short duration views along an approximate 1,000 foot stretch of road until either the buildings from the hamlet to the south or wooded sections of road to the north would begin to obscure views. There are residential houses along the portion of road opposite the marsh in view including the eligible historic site. Views to the Project from the road itself in front of the houses are similar to what is represented in the simulation. However, there are mature trees lining sections of the road at the residential properties between the houses and the Project that offer good screening and will likely minimize views of the turbines for those residents.

VP 10 County Road 60 – West Union



County Road 60 viewpoint is west of the Project and looks from an open high point location towards a grouping of turbines to the southwest. An attempt was made to choose the location along the road that would have the most unobstructed panoramic view from a middleground distance of 2 to 3 miles. Because of the high open ridge location, a longer far reaching vista is obtained where one sees a homogeneous and horizontal field and a forested ridge at the horizon. Although the turbines depicted in the simulation rise well above the trees and are over 2 miles away, distance somewhat diminishes size and discernible detail. Upon reaching the top of the hill at the viewpoint location, the visual field to the south would be occupied with a number of turbines.

Although there are no houses on the ridge at the viewpoint, there is one house 0.4 miles south down the road (right of viewer) which may have views but would be expected to have less visual impacts because of the lower valley location. One other house is 715 feet north to the left of the viewer. This house may have similar views as the simulation because the back property towards the Project remains open. The road itself is not heavily traveled. Because of the rural location of the road and few residents, the number of affected viewers is reasonably assumed to be low.

VP 12 Lewis Road – West Union



Lewis Road is an interior rural road at the southern end of the Project about 0.93 miles north of the Pennsylvania border. The photo viewpoint is representative of the character of the area in this part of the Project with rolling topography consisting of open agricultural land and intermittent forest, and isolated farmsteads whose adjoining working farmlands comprise nearly the entirety of a single road.

The photo is representative of turbine scale in the immediate area within approximately one mile. There are other turbines in the vicinity that may be visible, four of which are within one mile of the farmhouse seen in the simulation. This simulation shows a clear unobstructed view of a turbine at the top of a hill in the distance. Although relatively few residents are in the area and most are at lower elevations than what the simulation vantage point depicts, they would be a viewer group with long duration views from portions of their property. Views will be obtained from the Lewis Road vantage point but it is not highly traveled. Downey Road is at the bottom of the hill in the simulation and turns easterly to the right. Views of turbines are expected along this road as well.

VP 13 County Road 63 – Jasper



This viewpoint location is on a higher elevation hill approximately 4.4 miles east of the Project. The vantage point was chosen to represent a high point location to the northeast at a background Distance Zone beyond 4 miles. The photo shows a view of open field transitioning to rolling topography of field and forest that leads to the horizon. The scene is a homogeneous landscape with little visual clutter. The day is overcast and basic shapes consist of darker vegetation contrasting against white snow fields. Although the vantage point shows an unobstructed long distance panoramic type view of the Project, visual impacts are minimal due to distance and size and scale of the turbines in relation to the larger shapes of forest and foreground field. The turbines break the horizon line but do not offer a big color contrast against the gray sky conditions.

VP 14 Marsh Hill Wind Farm, Jasper



The Marsh Hill Wind Farm is located along Marsh Hill Road in the Town of Jasper. This photo was taken to show cumulative visual impacts as a result of the Project. This field work was performed in public rights of way. Visibility of Marsh Hill turbines was generally not observed when near proposed Project turbine locations. Many of the Project turbines are in open field. Frequently, outward views to the northeast to Jasper were impeded by trees even when viewed from many of the open areas. Typically, terrain or the trees surrounding the agricultural fields when within open areas was enough to block outward distant views to the northeast where most observations were made at ground level.

To obtain an understanding of size and scale and that relationship between the two locations with respect to potential cumulative impacts, a photo was then taken from the Marsh Hill Wind Farm with views towards the Eight Point Wind Project. The viewpoint is on Marsh Hill Road looking southwest over an agricultural field with rolling topography consisting of field and forested hills leading to the horizon. Two of the existing Marsh Hill Wind turbines can be seen. The proposed Eight Point Wind Project is approximately 9.7 miles away. The simulation shows proposed Project turbines as distant and small with low color contrast. Minimal Project views are experienced at this location. This photo was acquired from a section of Marsh Hill Road in an effort to acquire the most unobstructed views in order to provide a visual comparison of possible cumulative effects. At this vantage point there is only agricultural field and a low-traffic rural dirt road.

VP 15 Junction Route 248 and Route 417 – Greenwood



The location of this viewpoint is at the intersection of Routes 248 and 417. Both roads are state highways and are major travel corridors in the area. The purpose of this photo was to represent this particular high use road intersection. The photo looks south westerly and the intersection is behind the viewer. Varying foreground compositional shapes and contrasts provide immediate visual distractions. There are residential dwellings in view and the northern portion of the village of Greenwood becomes noticeable in the distance when the road disappears after traversing a bridge that crosses Bennetts Creek (left of photo center). Also along Route 248 as it traverses towards downtown Greenwood are several commercial buildings. The upper parts of three turbines are visible, located behind the hill that is center in the photo. Compared to the foreground and photo middleground objects the views of these turbines at this location are minimal as they are subordinate in the view. As most of the turbine is blocked by the hill already, the views to motorists will be brief.

VP 17 Route 248 – Marsh Creek



This viewpoint is on Route 248, on the west bank of Marsh Creek looking northeast across Marsh Creek. The viewpoint represents a lower valley location at close proximity to the Project at 1879' msl. The nearest turbine is approximately 0.48 miles from the viewer with a ground elevation at ~2249' msl. The view from this area shows the road and guard rail of Route 248 in the foreground, and the creek and forested hillside beyond. The overall impression to the viewer is of a homogeneous natural setting as there are no other transmission lines or manmade structures. This section of Marsh Creek is a NYSDEC public fishing rights easement.

At this location, two wind turbines will be partially visible. Looking northeast, the upper half of a turbine blade of one wind turbine will be visible, and looking more to the east, there will be a full view of the turbine blades of the second wind turbine along with the upper half of the tower. Several different kinds of views are derived in this area. From the roadside location, the turbines are a focal point for motorists along the road as there are new vertical elements in the landscape. However, by nature of the mobile activity, the visual impression will be transient and of short duration. For users of the fishing easement, changes to views are essentially none, as the activity takes place on the eastern shore facing west in the opposite direction. The turbines are located behind viewers where visibility is physically blocked by the hill.

VP 19 Town Line Road – Greenwood/West Union



This viewpoint is on Town Line Road that borders Greenwood and West Union. The photo was taken simulating the view that a motorist traveling east to west would have. It is at a point along the road just after one crests a hill if traveling from the Cemetery Hill Road area. The view is looking northwest into Greenwood and shows open fields bordering the road, interspersed with trees groups and a local electric distribution line located along the side of the road. The overall impression to the viewer is of pastoral open field and forest looking down from a slightly elevated location.

This simulation shows cumulative effects with both generating and transmission elements. The Project collection substation and O&M building will be visible, and beyond that, three wind turbines will be visible: two turbines will be visible from about the midpoint of the tower upward, and the third turbine is visible from the nacelle upward. The proposed Project elements dominate the view.

The collection substation and outbuildings have a relatively low profile on a site that covers roughly five acres. The highest transmission structure at the station is 100' feet in height. The visual cumulative effects with the addition of the turbines in the view are apparent against the existing landscape. For the collection substation, visual impacts at this location and in the immediate vicinity may be somewhat reduced when considering that views will be transient and of short duration. Town Line Road is a rural dirt road where portions are not maintained during the winter months.

VP 20 County Road 22 - Andover



As required by 16 NYCRR § 1000.24(b)(4), the Applicant conducted outreach to obtain community input for simulation viewpoints (see Appendix 24-1). Allegany County Planning responded with recommendations to explore several high point county roads within the VSAs. Per their recommendation, the Applicant conducted a photosimulation of the Project from a high point area just south of Andover along County Road 22 (Sky Tour Scenic Drive), one of Allegany County's designated scenic roads, and at a location that was fairly proximal to the Project (3 miles).

County Road 22 is undulating. The photo was taken at a high point along the road at a location that afforded an unimpeded long distance vista towards the Project. The view looks across an open agricultural field towards a horizon line of a fairly even plane of hills. An electric distribution line runs through the foreground field. Composition of the view consists of large homogeneous shapes conveyed by color contrast of field and forest. Although the turbines are small in comparison to the one distribution pole, the turbines in view appear as a co-dominant focus.

Viewer types affected would be local travelers, commuters, and perhaps non-local recreational sight-seers. As typical though, vehicular traffic views would be intermittent and of short duration as one passes through this section.

VP 22 County Road 22a – Independence



Another recommended location by Allegany County Planning was to explore Independence and Whitesville. Although viewshed results suggest that Whitesville might experience visibility of the Project, a preliminary simulation showed that a view from Main Street in Whitesville would not see turbines. See the original photo shown in Inset 13 of the VIA. This location on Main Street in Whitesville is on the bridge that crosses Cryder Creek near Mill Street and is approximately 250 feet north of a NYSDEC fishing easement.

The location on County Road 22a provided one of the better opportunities to gain a view from Independence. The viewpoint is at a place along an open area of the road that would afford a clear view of turbines. The view is looking easterly where three turbines are seen above the treetops. Although not very discernible, there are blade tips to one other turbine as well. As is typical in isolated rural areas with clear Project views in the middleground Distance Zone, the turbines remain as a co-dominant focus in the view. The mass and color of larger simplistic shapes of open field and grouped tree forest provides a visual offset to the smaller but incongruous vertical elements of the turbines at the tree-sky interface. Unless focused at the horizon line while driving or immediately upon view, visual focus is usually at ground level foreground objects first. There are roadside distribution poles larger in scale than the distant turbines that may draw and occupy the eye.

(7) Nature and Degree of Visual Change from Construction

Visual effects during construction are anticipated to be minor and temporary in nature. Construction activities for a wind energy facility are site and project dependent; however, construction of a typical facility would normally involve the following major actions with potential visual impacts: building/upgrading roads; grading the site; constructing laydown areas; removing vegetation from construction and laydown areas; transporting towers, turbines, nacelles, structures, and other materials and equipment related to the wind energy facility site; assembling and erecting the wind turbine generators; installing permanent meteorological towers (as necessary); constructing ancillary structures (e.g., control building, fences); installing transmission structures and constructing substations; and

installing power-conducting cables and signal cables (typically buried). Additional construction activities will include constructing temporary offices and a temporary concrete batch plant. Potential visual contrasts that could result from construction activities include contrasts in form, line, color, and texture resulting from vegetation clearing and grading (with associated debris); road building/upgrading; construction and use of staging and laydown areas; wind turbine generator, electric transmission, and support facility construction; vehicular, equipment, and worker presence and activity; dust; and emissions.

Construction visual contrasts would vary in frequency and duration throughout the course of construction; there may be periods of intense activity followed by periods with less activity, and associated visual impacts would vary in accordance with construction activity levels. The temporary offices, laydown yards and concrete batch plants will have the greatest degree of visual change, but they are on sites that are central to the Project, thus landowners participating in the Project will be most affected. Construction schedules are project dependent. The Project is expected to be constructed in roughly six to nine months.

(8) Nature and Degree of Visual Change from Operation

During operation, visual effects will occur from the wind turbines as shown and discussed in Exhibit 24(a)(6). Viewer characteristics and concepts such as viewer type, context of viewer, number of viewers, duration of view, and viewer activities were incorporated into the summary of each simulation viewpoint.

The visual impact analysis makes it clear that there would be some areas from which the Project would be prominently in view. But there are a multitude of areas from which it would not be seen. Conclusions are as follows:

- Scenic resources of local, statewide, or national significance that may have potential visibility in the VSAs, are not exceedingly unique or natural landmark landscapes that are high destination type locales visited by the public. Landscape diversity represented in the simulations is fairly low. The landscape characteristics are typical of what you would find in a rural area in this part of New York. Therefore, views of the Project will not be affecting unique scenic features in the State.
- The Project does not always appear as a dominant feature in the region and should not interfere with the general enjoyment of recreational resources in the area.
- The Applicant has employed reasonable mitigation measures (as discussed in Exhibit 24(a)(10) below) in the overall design and layout of the proposed Project so that it fits reasonably well into the character of the area.
- There are four operational wind farms in the Steuben County (Marsh Hill, Howard, Cohocton, and Dutch Hill) comprised of 85 wind turbines, with a combined capacity of approximately 185 MW. Howard, Cohocton, and Dutch Hill are outside of the 10-mile VSA. Marsh Hill Wind Farm is approximately 9.7 miles from the proposed Project. The potential for cumulative impacts from other existing wind farms in the region is very low.
- Scale is relative. The apparent size of a wind turbine in relation to its surrounding is more relevant. Vertical scale may be an issue primarily if the turbines appear to overwhelm a ridgeline, focal point,

or cultural feature that appears diminished in prominence due to the relative height of the turbines. The Project turbines do not overwhelm such physical areas although they do appear in the viewshed of some residences.

- Visual clutter often is adversely perceived and commonly results from the combination of human-made elements in close association that are of differing shapes, colors, forms, patterns, or scales. Generally simple and uniform arrays or groupings of wind turbines are more visually appealing than mixed types and sizes and was designed into this Project.
- The public recreational areas in the 10-mile VSA are not high-use areas relative to other public recreational areas in the State.

(9) Operational Effects of the Facility

Analysis of potential shadow flicker impacts entitled “*Eight Point Wind Energy Center Shadow Flicker Report*” was conducted by Epsilon (see Appendix 15-1). The analysis evaluated the potential impact to nearby residences by modeling flicker contours and estimating the number of hours per year the residences in may experience shadow flicker.

In the absence of a regulatory limit, a design goal of 30 hours per year of expected shadow flicker was established. The basis for this design goal is detailed in Exhibit 15. The modeling analysis conservatively included the 31 proposed and the four alternate wind turbines for this Project (thus shadow flicker calculations are overestimated). The duration of shadow flicker was calculated at 763 discrete modeling points, and isolines were generated from a grid encompassing the area surrounding the wind turbines.

In total, five locations are predicted to experience greater than 30 hours per year of shadow flicker; however, all of these locations are participating landowners. As these receptors exceed the design goal, the Applicant has obtained waivers from each of the homeowners. The proposed layout results in a worst-case maximum expected annual duration of shadow flicker at a sensitive receptor of 76 hours, 8 minutes. This is the seasonal hunting cabin of a participating landowner and is not a full time residence. All of the non-participating sensitive receptors are predicted to be below 30 hours per year of shadow flicker meeting the shadow flicker design goal.

A number of homes could experience more than 30 minutes of shadow flicker for a given event. However, studies, including the Health Canada study do not find a link between daily duration of shadow flicker and health impacts, nor has shadow flicker been a controversial issue or complaint at NextEra’s exiting wind projects. Therefore, as explained in Exhibit 15, the Applicant does not believe that this is a metric that should be used as a design goal. Shadow flicker during operation of the Project will be minimized to the maximum extent practicable, primarily with careful siting, setback and design analysis.

(10) Measures to Mitigate for Visual Impacts

It is difficult to mitigate the visual impact of wind turbines as turbines typically need to be placed in higher elevations for maximum wind power. However, careful siting during the site design and layout process can help moderate visual impacts.

Several documents and case study papers in the U.S. and overseas over the last few years have been produced that offer a general industry consensus of Best Management Practices (BMP) for siting wind farms to reduce visual impacts in the landscape (USDOJ, 2013; GP Wind, 2012). The Applicant has adopted some of those BMPs to the extent possible as follows:

- Considered the character of the rolling topography in the vicinity. The Applicant has opted for non-linear turbine configurations which are better suited to rolling terrain.
- Provided organized clusters of wind turbines or single turbines separated by open zones to create distinct visual units. The breaks reduce visual clutter and the potentially overwhelming visual presence of turbines.
- Kept multiple turbine types grouped together and separated from dissimilar models to lessen the perceived contrasts in height or appearance. Proposed dissimilar models are few. Four out of 31 proposed turbines are of the smaller GE 2.3 model. All turbines are the same color and same general design (single tower, three blades).
- Downsized the facility by using fewer, larger turbines to achieve desired power output in preference to using a greater number of smaller turbines. Fewer larger turbines vs. more and smaller turbines assist in moderating visual impacts.
- Use of non-reflective paints and coatings on wind turbines to reduce reflection and glare.
- No commercial messages or symbols such as logos which add to the color contrast of wind turbines, particularly at shorter viewing distances.
- Almost all electrical collection lines between the individual turbines and the collection substation are underground.
- The O&M building and collection substation were strategically placed behind an existing row of trees to help reduce the visual impact from nearby roads.
- Use of shadow flicker impact model to improve turbine siting and reduce visual impacts.
- Anticipate minimizing nighttime lighting of the wind turbines to the maximum extent possible within the guidelines and requirements of the FAA. Lighting will be synchronized and if possible radar activated to minimize hours of lighting required.
- Tubular towers provide a simplified profile with less complex surface characteristics and less reflectance.
- Minimal security lighting at the collection substation and O&M building with directed or shielded lighting and lighting timers to minimize lighting impacts.
- Residences anticipated to experience shadow flicker from the Facility can reduce exposure by vegetative screening and closing blinds or shades at the time of the flicker events. In some cases, the Applicant may work with landowners to provide blinds, screening or other mitigation measures.

(11) Description of Visual Resources to be Affected

Exhibit 24(b)(3) discusses the visual resources in the 10-mile VSA and includes a table that indicates their proximity to the Project and the extent the turbines are visible from these visual resources (e.g., visibility of nacelle or blade tip, or no visibility). In addition, several of the visual resources themselves are captured in simulation photos and impacts described further with respect to the simulations.

(12) Cumulative Impacts

Specific subject area stipulations for cumulative impacts are included in the final Project stipulations dated September 19, 2017, and are addressed as follows:

1. The approximately 16.5-mile overhead 115 kV transmission line and related facilities (that will be permitted separately under Article VII of the New York PSL)

The consideration of visual impacts as a result of the proposed 115 kV transmission line and related facilities are addressed in the VIA (Appendix 24-1). Approximately 13.8 miles of the southerly 0.5-mile VSA for the transmission line overlaps the 10-mile turbine VSA from near Clair Road in Hartsville to the proposed Project collection substation in Greenwood. Simulations VP5, VP6, and VP19 shows views where turbines and/or transmission structures are expected to be visible. While the transmission line is visible from the Project Area, the overall impact is not significant. The Project Area is largely forested which provides some screening for the transmission line structures which average approximately 100 feet in height. Additionally, there are a number of existing electric distribution lines and telephone poles and cables in the area, thus, unlike the wind turbines, the transmission poles will not be entirely new or different structures when compared to the existing structures in the area. Finally, the Applicant is using single pole structures for the majority of the transmission line, which will help to reduce the overall footprint and visual impact of the transmission line. As is shown in the VIA, the transmission line structures will have a visual impact, however, when tree screening and existing structures in the area are taken into consideration, the overall cumulative impact from adding the transmission line to the Project is relatively small.

2. General elements of the Canisteo Wind Energy Center within the VSAs

There may be overlap between the Project and the proposed Canisteo Wind Energy Center (Canisteo project). Some of the Canisteo project turbines may encroach into the 10-mile VSA in the Towns of Canisteo, Greenwood, Jasper, Troupsburg, and West Union. The Canisteo project may encroach into the 5-mile VSA in Greenwood, Jasper, Troupsburg, and West Union.

The New York State Department of Environmental Conservation (NYSDEC) instructs that “assessment of cumulative impacts should be limited to consideration of reasonably foreseeable impacts, not speculative ones” (NYSDEC, The SEQR Handbook at 83 (3d Ed. 2010)). Design for the Canisteo project is not complete and the location of any potential transmission lines and turbines is preliminary. The type of turbine that will be used and the height of those turbines are unknown to the Applicant. Additionally, given transmission system constraints and other variables that could halt development such as land availability and permitting, construction of the Canisteo project is currently speculative.

Because information on important and relevant aspects of the Canisteo project is not available, an attempt to assess any potentially significant cumulative visual impacts of the Canisteo project and the Applicant's Project would be speculative and non-meaningful.

3. Other existing wind turbines and related facilities within the 10-mile VSA; with "proposed wind turbines" being wind turbines that are part of a project for which an application under Article 10 of the PSL has been submitted to the Siting Board as of the date of submission of the Application for the Project.

The proposed Baron Wind Project is located northeast of the Project. The nearest turbines are approximately 7 miles from the northeast boundary of the 10-mile VSA. Similar to the Canisteo project, the location of any potential wind turbines and transmission line structures is preliminary and the type and heights of turbines and transmission structures are unknown to the Applicant. Because information on important and relevant aspects of the Baron project is not available, an attempt to assess any potentially significant cumulative visual impacts of the Baron project and the Applicant's Project would also be speculative and non-meaningful.

There are four operational wind farms in the vicinity of the Project: Marsh Hill, Howard, Cohocton, and Dutch Hill.

- Marsh Hill Wind Farm is in the Town of Jasper and is within the 10-mile VSA, approximately 9.7 miles from the proposed Project. Simulation VP14 shows the Project from the Marsh Hill Wind Farm, which is from an open view and where upper parts of Eight Point Wind Project turbines are visible. When in proximity of proposed Project turbine locations, outward views to the northeast to Jasper were frequently impeded by trees even when viewed from many of the available open areas. Typically, terrain or the trees surrounding the agricultural fields when within open areas was enough to block outward distant views to the northeast where most observations were made at ground level.

To obtain an understanding of size and scale and that relationship between the two locations with respect to cumulative impacts, a photo was then taken from the Marsh Hill Wind Farm with views towards the Eight Point Wind Project. The Applicant's Project is approximately 9.7 miles away. The simulation shows proposed Project turbines as distant and small with low color contrast. Very minimal visual cumulative impacts are experienced at this location. The same potential minimal visual impacts are expected from other view points and locations.

- Howard Wind Farm is in the Town of Howard and does not fall within the 10-mile VSA. Nearest turbines are approximately 4 miles northeast from the Project 10-mile VSA.
- Cohocton Wind Farm is located in Cohocton, approximately 20 miles away from the proposed Project 10-mile VSA.
- Dutch Hill Wind Farm is located in Cohocton and is approximately 17 miles away from the proposed Project 10-mile VSA.

The potential cumulative visual impacts of the Project when added to the visual impact of the Howard, Cohocton and Dutch Hill wind farms is projected to be minimal to none because of the distance of these existing wind projects.

24(b) Viewshed Analysis

(1) Viewshed Maps

A viewshed analysis is a computerized GIS analytical technique that illustrates the predicted visibility that may potentially be expected for a project. It allows one to determine if and where an object, such as a wind turbine, can geographically be seen within a larger regional area. The viewshed model accounts for topography, vegetation, and the height of the turbines. The results of the viewshed analysis, typically displayed over a USGS topographic map or aerial photo, are combined with other sensitive location information such as historic places, national forests, or state parks, etc. Incorporating GIS integrated data along with a viewshed analysis assists in understanding the potential for project visibility at sensitive resource locations.

(2) Methodology

A viewshed analysis, encompassing a 5 and 10-mile VSA surrounding the Project turbines, was performed. This evaluation utilized a standard 10-meter resolution USGS DEM in order to establish baseline elevations within the Project Area. To further enhance the accuracy of the viewshed model, tree data obtained from the most recent digital 2011 (NLCD) was used (Homer *et al.*, 2015). The NLCD is a USGS spatial dataset derived from Landsat Thematic Mapper satellite data. It is a comprehensive land cover database available for the entire U.S. that includes 21 classes of land cover, percent tree canopy, and percent imperviousness. Deciduous and coniferous tree data greater than 5 meters (16.4 feet) in height was extracted from this dataset and processed as a visual impediment layer to be included with the base DEM. A threshold height of 5 meters was used, as that is the height within the NLCD classification that distinguishes mature trees from shrubs. However, the NLCD tree data is coarse with a resolution of 30 meters. For greater refinement, this NLCD vegetation layer was subsequently cross-checked and adjusted against more recent leaf-on aerial photography dated September 2013.

ESRI Spatial and 3D Analyst GIS software was used to develop the viewshed model. The x, y and z data were incorporated into the model. For all analyses, the data was controlled within the model to ensure that the vertical offsets of the turbines were embedded properly against the DEM surface elevation and tree layers.

The viewshed model was further developed by establishing an observer height of 5.5 feet, and the assumption that the Project would not be visible to a viewer who is standing amongst trees in a forested area or in buildings themselves. The final resulting output grid identified those areas from which viewers would potentially see all or some part of the proposed turbines.

Four major viewshed analyses have been produced for the proposed wind turbines (See viewshed maps at Figure 4, 5 and 8 of Appendix 24-1):

- Nacelle Topography Only: this is a topography only based viewshed analysis that accounts for the part of the turbine between the ground up to the nacelle height. The nacelle height represents the location of FAA lighting. A topography only analysis illustrates the effects of the surrounding terrain and determines if landform is responsible for obscuring some of the views.

- Nacelle With Trees: a second viewshed analysis that accounts for nacelle height but incorporates the presence of trees. Including the trees contributes to a more realistic representation of landscape conditions over the topography only analysis.
- Blade Tip Height Topography Only: a third viewshed analysis that shows a topography only analysis accounting for all of the turbine from the ground to the height of the blade tip in the most vertical position. This includes the rotor and blades which represents the part of the turbine that provides motion.
- Blade Tip Height With Trees: a fourth viewshed analysis that accounts for the height of the blade tip in the most vertical position with trees included.

By comparing the viewshed results of the nacelle height against full blade tip height, one can gain a better understanding of which of the upper parts of the turbine might be seen above the trees. In some instances, the tower might be obscured but the rotors that impart motion might be visible. In addition, by analyzing nacelle heights, one may determine the potential to see night time lighting.

Additional viewshed analyses were performed to assess the amount of visibility within LSZs and USGS defined Distance Zones. Refer to the VIA (Appendix 24-1) for greater detail.

Assumptions and Limitations of the Viewshed Model

The viewshed analysis identifies cells (image pixels) that contain elevation information and computes the differences along the terrain surface between an observer in the landscape and a target (e.g. wind turbine). The analysis is a clear line of sight and therefore certain factors in the interpretation of results need to be considered:

- The model, because of its computerized aspect, assumes the observer to have perfect vision at all distances. Therefore, a certain amount of reasonable interpretation needs to be considered because of the limitations of human vision at greater distances or those atmospheric/meteorological conditions that may cause imperfect vision, such as haze or inclement weather. Additionally, an object is naturally smaller and shows much less detail at distances and will have less visual impact. These aspects cannot be conveyed with this analysis.
- Not all small groups of trees were incorporated into the model, particularly those that are isolated, are along tree lined streets in village areas, or exist as smaller tree rows. Buildings were also not incorporated. Therefore, there may be more visual impediments occurring in the landscape than is represented in the model.
- Because an area may show visibility, it does not mean the entirety of the Project or even an entire turbine or structure will be seen. The viewshed analysis depicts areas of visibility over a regional area. It can only predict geographically on a map areas where some part of a turbine or transmission pole might be seen. It does not and cannot determine if it is seeing a full on view or a partial view of just an upper portion of one structure or several. Additionally, if visibility is occurring in an area, it may sometimes only be a result of glimpsing a portion of the Project over undulating treetops or between gaps of trees and not a full-on view. Likewise, there may be understory tree gaps where there may be visibility of the Project.

- The viewshed model assumes that any vegetation is opaque and therefore represents a leaf-on condition. By nature of the software model and available parameters, the trees are treated as an opaque object and therefore leaf on conditions are assumed. Transparency predictions through something similar to bare-branched trees under leaf off conditions cannot be made.

- The model was developed with the assumption that a viewer would not see turbines or structures if standing amongst trees in forested areas as it is assumed the tree canopy would preclude outward looking views.

(3) Viewer Groups - Scenic Resources Inventory

Local, state, and federal sensitive visual resource area were investigated per 16 NYCRR §1001.24. An inventory of publicly available and accessible visual resources was explored through the acquisition of GIS data, review of town, county, and agency reports, topographic data, and site visits. Visual resources within 10 miles of the Project are listed in Table 24-3.

For historic sites, listed National Register of Historic Places (NRHP) and previously identified historic properties obtained from CRIS are addressed in this report. In addition, as part of the Section 106 cultural resources investigation, between March 21–24 and April 3–7, 2017 the Applicant completed a Historic Architecture Reconnaissance Survey for the Project with a 5-mile Project Area of Potential Effects (APE) for turbines. Refer to Exhibit 20 for greater detail on cultural resources.

According to 16 NYCRR §1001.24, the following were reviewed:

- Landmark landscapes;
 - There are no landmark landscapes found within 10 miles of the Project.
- Wild, scenic or recreational rivers administered respectively by either the DEC or the APA pursuant to ECL Article 15 or Department of Interior pursuant to 16 USC Section 1271;
 - There are no DEC or APA wild, scenic or recreational rivers found within 10 miles of the Project.
- Forest preserve lands, conservation easement lands, scenic byways designated by the federal or state governments;
 - There are no federal or state forest preserves, known conservation easements or federal or state scenic byways found in the 10-mile VSA.
- Scenic districts and scenic roads, designated by the Commissioner of Environmental Conservation pursuant to ECL Article 49 scenic districts;
 - There are no state designated scenic districts or scenic roads in the 10-mile VSA.
- Scenic Areas of Statewide Significance;
 - There are no Scenic Areas of Statewide Significance found within the 10-mile VSA.
- State parks;

-There are no State parks managed by the Office of Parks, Recreation and Historic Preservation (OPRHP).

- Sites listed on National or State Registers of Historic Places;
 - According to CRIS, there are several listed and eligible National or State Registers of Historic Places within 10 miles. Please refer to Table 3.
- Areas covered by scenic easements, public parks or recreation areas;
 - There are two local county designated scenic drives in Allegany County. They are the Mid-County and Sky Tour Scenic Drives. State Bikeways #17 and #19 are found in the western section of the 10-mile VSA. Several NYSDEC Public Fishing Rights easements are located along Marsh and Cryder Creeks. Numerous snowmobile trails are found in the area. Five state forests are found within 10 miles; Greenwood, Rock Creek, Turkey Ridge, Vandermark, and Phillips Creek State Forests. The Wag Trail is a 9-mile multi-use recreational trail and historic transportation corridor in Allegany County, extending between the Village of Wellsville and the Pennsylvania state line. It follows the route of the former Wellsville, Addison and Galeton (WAG) Railroad.
- Locally designated historic or scenic districts and scenic overlooks;
 - There are no known scenic districts or overlooks in the 10-mile VSA. All previously listed and eligible historic sites were determined through CRIS. The Applicant also conducted a survey of newly identified architectural resources 50 years of age or older located within the cultural resources designated 5-mile APE. Refer to Exhibit 20 for more discussion.
- High-use public areas;
 - Several of the aforementioned resources are often high-use public areas. An additional local recreational area is Tall Pines ATV, located in the Towns of Alfred and Andover.

Table 24-3 provides the results of this investigation listing the resources found within the full 10-mile VSA with other information regarding location characteristics such as Distance Zones, LSZs, and potential for visibility.

Table 24-3. Inventory of Visual Resources Within 10 Miles

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
<i>N = nacelle visible, B = blade tip visible, U = unlikely/no expected visibility</i>						
Federal-State-Recreation Lands						
Greenwood State Forest	x		2	2, 4	N	Greenwood
Rock Creek State Forest	x		2, 3	2, 4	N	Greenwood
Turkey Ridge State Forest	x	x	3		N	Greenwood, Jasper

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
Vandermark State Forest		x	3	2, 4	U	Ward
Wag Trail		x	2, 5		U	Willing
Phillips Creek State Forest		x	3	2	U	Alfred, Ward
Allegany County Scenic Drives						
Mid-County Scenic Drive		x	3	1, 2, 3, 4	U	Alfred, Scio, Ward
Sky Tour Scenic Drive	x	x	2, 3	1, 2, 3, 4	N	Andover, Independence, Wellsville, Willing
Bike Routes						
State Bikeroute 17	x	x	2, 3	1, 2, 3	N	Alfred, Andover, Wellsville
State Bikeway 19		x	3	1, 2, 3	U	Willing
Fishing Easements						
NYSDEC Public Fishing Rights	x	x	1,2 ,3	5	N	Independence, West Union, Willing
Local Additional						
Tall Pines ATV (Perimeter Trail)		x	3	1, 2, 4	N	Alfred, Andover
Foster Lake		x	3	5	U	Alfred
Snowmobile Trails (Allegany Co Recreational Trailways published map)						
Various, numerous trails	x	x	2, 3	1, 2, 4	N	Andover, Independence, Ward, Wellsville, Willing
Historic, NRHP Listed**						
00341.000001, Steinheim, Ford St		x	3	3	U	Alfred
00341.000004, Octagon House, 57 South Main St		x	3	3	U	Alfred
00341.000005, Alumni Hall, East University St		x	3	3	U	Alfred
00341.000010, The Gothic, 6 Ford St		x	3	3	U	Alfred

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
00341.000016, Crandall Hall, 8 South Main St		x	3	3	U	Alfred
00341.000017, Scholes Barn Apt, 7 South Main St		x	3	3	U	Alfred
00341.000018, Collins/Schdes House, 5 South Main St		x	3	3	U	Alfred
00341.000020, Crandall Barn, 8 South Main St		x	3	3	U	Alfred
00341.000040, Sun Publishing Co Print Shop, 11-13 South Main St		x	3	3	U	Alfred
00341.000087, 6 Sayles St		x	3	3	U	Alfred
00341.000128, Residence, 15 South Main St		x	3	3	U	Alfred
00341.000129, Residence, 16 South Main St		x	3	3	U	Alfred
00341.000130, 17 South Main St		x	3	3	U	Alfred
00341.000131, Residence, 18 South Main St		x	3	3	U	Alfred
00341.000132, Residence, 19 South Main St		x	3	3	U	Alfred
00341.000133, Residence, 21 South Main St		x	3	3	U	Alfred
00341.000134, Residence, 22 South Main St		x	3	3	U	Alfred
00341.000135, Alpha Kappa Omicron Fraternity House, 26 South Main St		x	3	3	U	Alfred
00341.000136,		x	3	3	U	Alfred

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
Residence, 29 South Main St						
00341.000137, Residence, 30 South Main St		x	3	3	U	Alfred
00341.000138, Residence, 31 South Main St		x	3	3	U	Alfred
00341.000139, Residence, 32-34 South Main St		x	3	3	U	Alfred
00341.000140, Residence, 33 South Main St		x	3	3	U	Alfred
00341.000141, Residence, 35 South Main St		x	3	3	U	Alfred
00341.000142, Residence, 36 South Main St		x	3	3	U	Alfred
00341.000143, Residence, 37 South Main St		x	3	3	U	Alfred
00341.000144, Residence, 38 South Main St		x	3	3	U	Alfred
00341.000145, Residence, 40 South Main St		x	3	3	U	Alfred
00341.000146, Residence, 42-44 South Main St		x	3	3	U	Alfred
00341.000147, Residence, 45 South Main St		x	3	3	U	Alfred
00341.000148, Residence, 46 South Main St		x	3	3	U	Alfred
00341.000149, The Grange Apts, 48 South Main St		x	3	3	U	Alfred
00341.000150, Residence, 52 South		x	3	3	U	Alfred

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
Main St						
00341.000151, 53 South Main St		x	3	3	U	Alfred
00341.000152, Residence, 54 South Main St		x	3	3	U	Alfred
00341.000153, 55 South Main St		x	3	3	U	Alfred
00341.000154, Residence, 56 South Main St		x	3	3	U	Alfred
00341.000155, 58-58-1/2 South Main St		x	3	3	U	Alfred
00341.000156, Residence, 60 South Main St		x	3	3	U	Alfred
00341.000157, Klan Alpine Fraternity House, 61 South Main St		x	3	3	U	Alfred
00341.000158, Residence, 62 South Main St		x	3	3	U	Alfred
00341.000159, George Rosebush House, 63 South Main Street		x	3	3	U	Alfred
00341.000160, William O. Place House, 64 South Main Street		x	3	3	U	Alfred
00341.000161, Residence, 65 South Main St		x	3	3	U	Alfred
00341.000162, Residence, 71 South Main St		x	3	3	U	Alfred
00341.000163, Residence, 72 South Main St		x	3	3	U	Alfred
00341.000164, Residence, 74 South Main St		x	3	3	U	Alfred

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
00341.000165, Residence, 75 South Main St		x	3	3	U	Alfred
00341.000191, Residence, 2 Terrace St		x	3	3	U	Alfred
00341.000192, Residence, 4 Terrace St		x	3	3	U	Alfred
00341.000193, Residence, 6 Terrace St		x	3	3	U	Alfred
00341.000194, Residence, 8 Terrace St		x	3	3	U	Alfred
00341.000195, Residence, 10 Terrace St		x	3	3	U	Alfred
00341.000196, Residence, 12 Terrace St		x	3	3	U	Alfred
00341.000197, Residence, 14 Terrace St		x	3	3	U	Alfred
00341.000198, Residence, 15 Terrace St		x	3	3	U	Alfred
00341.000199, Residence, 16 Terrace St		x	3	3	U	Alfred
00341.000200, Residence, 17 Terrace St		x	3	3	U	Alfred
00341.000201, Residence, 18 Terrace St		x	3	3	U	Alfred
00341.000202, Residence, 20 Terrace St		x	3	3	U	Alfred
00341.000203, Residence, 4 Park St		x	3	3	U	Alfred
00341.000204, Crumb House, 8 Park St		x	3	3	U	Alfred

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
00341.000205, Residence, 10 Park St		x	3	3	U	Alfred
00341.000206, Residence, 12 Park St		x	3	3	U	Alfred
00341.000207, Residence, 16 Park St		x	3	3	U	Alfred
00341.000208, Residence, 18 Park St		x	3	3	U	Alfred
00341.000209, Residence, 22 Park St		x	3	3	U	Alfred
00341.000210, Residence, 2 Sayles St		x	3	3	U	Alfred
00341.000211, Residence, 4 Sayles St		x	3	3	U	Alfred
00341.000212, Sorority House, 9 Sayles St		x	3	3	U	Alfred
00341.000213, 10 Sayles St		x	3	3	U	Alfred
00341.000214, Residence, 13 Sayles St		x	3	3	U	Alfred
00341.000215, Residence, 17 Sayles St		x	3	3	U	Alfred
00341.000216, Sorority House, 23 Sayles St		x	3	3	U	Alfred
00341.000232, Residence, 2 Ford St		x	3	3	U	Alfred
00341.000233, Residence, 4 Ford St		x	3	3	U	Alfred
00341.000247, Clawson House/Demolished, 2 Park St		x	3	3	U	Alfred
Historic, Eligible**						
00306.000005, 5 West Greenwood St	x		3	2	B	Andover
00343.000003, Andover Free Library, 40 Main St	x		3	2	N	Andover
00343.000006, The	x		3	2	U	Andover

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
Castle, 23 Hill St						
00343.000040, 11 East Ave	x		3	2	U	Andover
00343.000054, Private Residence, 47 East Greenwood St	x		3	2	B	Andover
00343.000060, Andover Central School, 31-35 Elm St	x		3	2	U	Andover
00343.000063, 44 South Main St	x		3	2	B	Andover
00343.000065, 30 South Main St	x		3	2	N	Andover
00343.000066, 5 West Greenwood St	x		3	2	B	Andover
10107.000030, 4863 NY 248		x	3	3	U	Canisteo
10114.000006, Greenwood Methodist Church (Structure 10), 2729 NY 248	x		3	2	N	Greenwood
10114.000007, Cross-Gable Residence, 2707 NY 248	x		3	2	N	Greenwood
10114.000008, Commercial Building (Heckman Grocery--Structure 33), 2700 NY 248	x		3	2	B	Greenwood
10114.000009, Greek Revival Residence (Structure 54), 2670 NY 248	x		3	2	N	Greenwood
10114.000010, Gothic Revival Residence (Structure 57), 2667 NY 248	x		3	2	N	Greenwood
10114.000011, Italianate Residence (Structure 19), 2721 NY 248	x		3	2	N	Greenwood
10114.000012, Brick	x		3	2	N	Greenwood

Resource	Within 5 Miles of Project, Article 10	Between 5-10 Miles of Project, Article 10	Distance Zone for Turbines	LSZ	Potential Visibility* (N, B, U)	Town
Queen Anne Residence (Structure 22), 2717 Main St						
10114.000013, Greek Revival Residence (Structure 31), 2703 NY 248	x		3	2	N	Greenwood
10114.000036, 1467 Church Hill Rd	x		3	2	U	Greenwood
00321.000010, 511 Main St	x		3	2	N	Independence
00321.000015, 531 Main St	x		3	2	N	Independence
10125.000019, Jasper-Troupsburg Elementary School, 908 Main St		x	3	3	U	Troupsburg
10130.000001, Freberg, 1750 Cemetery Hill Rd	x		3	2	N	West Union

* Potential visibility for turbines determined by viewshed analysis of nacelle and blade tip height with trees incorporated only. Including the trees contributes to a more realistic representation of landscape conditions over the topography only analysis. It is assumed that if the nacelle is visible, so are the turbine blades.

** Historic properties in this table include listed NRHP and previously surveyed historic properties obtained from the New York State Cultural Resource Information System (CRIS).

Federal-State-Recreation Lands

All of the state forests listed in Table 24-3 are heavily wooded. Of the five state forests present within 10 miles, viewshed results show that Greenwood, Rock Creek, and Turkey Ridge State Forests may have views of the turbines in discrete areas. Each of these three forests are heavily wooded. Minimal visibility may occur in small open or cleared areas within the overall larger forest tracts. Visibility is not expected at Vandermark and Phillips Creek State Forests.

At the southwestern boundary of the 10-mile VSA, approximately 2.2 miles of the Wag Trail meanders through the Town of Willing and is not expected to have views of the Project.

Allegany County Scenic Drives

The Sky Tour Scenic Drive and the Mid-County Scenic Drive are two county designated scenic drives that pass through the 10-mile VSA. The Mid-County Scenic Drive is located near the 10-mile extent and is not expected to have visibility of the Project. The Sky Tour Scenic Drive travels through towns west of the Project. Drivers travelling along the north-south oriented County Road 22 between Andover and Independence will likely experience intermittent views to the east while driving through the rolling topography. Many areas along this stretch of road are located within agricultural land at high elevations with open vistas. Where the Sky Tour Drive diverges from County Road 22 and follows County Road 39 and Beech Hill Road, there may be intermittent views westerly to Lampe Road.

State Bikeways

Two bikeways pass through the western portion of the 10-mile VSA. State Bikeway #17 will have infrequent views, some of which will consist of both the nacelle or turbine blades only. State Bikeway #19 passes through the same area in Willing as the Wag Trail and is not expected to have views of the Project.

NYSDEC Public Fishing Rights

NYSDEC public fishing easements exist along Cryder and Marsh Creeks. They are in low lying valley areas generally paralleling Route 248 in the vicinity of the Project out to the settled enclave of Independence and are then located along Route 248A at farther southwesterly locations. Closest easement to the Project occurs along Route 248 in West Union where the nearest turbine is approximately 0.3 miles away. The easements in West Union will have varying intermittent views where in some locations only the turbines blades are expected to be visible. Most of the easements will not have views of turbines near the 5-mile VSA and points southwesterly.

Historic Sites

Seventy-seven NRHP listed sites are found in the 10-mile VSA. All of them are in the Town of Alfred. Due to landscape in the area, none of the NRHP historic sites are expected to have views of the turbines. Alfred historic sites are in a location where topography obscures visibility of the Project.

Twenty-three eligible historic sites per NY CRIS are listed:

- Nine are in Andover where two sites will potentially see the nacelle, four may see only turbine blades, and three are not expected to see the Project. Please refer to Table 24-3, which indicates the type of view at each of the properties.
- Nine eligible historic sites are in Greenwood. Of these, seven sites may have views of the nacelle while one may see only turbine blades and one is expected to have no views.
- One historic site is in Canisteo and is not predicted to have views.
- One historic site is in Troupsburg and is not predicted to have views.
- Two sites are in Independence. Both may have potential views of turbine nacelles.
- One site is in West Union where the nacelle may be visible.

Please also refer to Exhibit 20 for further details on cultural resources investigations.

Local Sites and Snowmobile Trails

- Tall Pines ATV, a local recreational ATV park with 75 miles of trails within approximately 1,300 acres lies just outside of the 5-mile VSA in the Towns of Andover and Alfred. Several of the trails are routed in open area as well as on-site cabins. Viewshed results predict there could be some visibility of the Project from open areas.
- Published snowmobile maps were available for Allegany County. Trails pass through forested and open field at various elevations throughout the rolling topography in the towns west of the turbines. It is likely that there could be views of turbines in the open areas as viewshed results predict.
- Foster Lake, a 25-acre recreational lake, is located in Alfred. Views of the Project are not expected at this location.

Visual impacts are expected to occur at select private residences in addition to local roadways throughout the area. Much of the visible acreage occurs in open fields as further described in the VIA however many of these open fields are not accessible to the viewing public.

(4) Viewpoint Selection

Integrating the results of the GIS resources inventory data along with the viewshed analysis results provided initial desktop reconnaissance for recognizing areas with potential visibility and identifying candidate locations for photo simulations. While focusing on inventoried locations as listed in Table 24-3, an additional objective in the viewpoint selection process is to also choose locations for simulations that represent the various LSZs as well as Distance Zones. As well, site field visits are necessary for ground-truthing and increasing the understanding of the visual environment. In December 2016, the Applicant began site visits to acquire on-the-ground information to support the VIA and the photo simulation site selection process. A second site visit was made to obtain additional photographs on April 5, 2017.

16 NYCRR § 1000.24(b)(4) requires both general and specific consultations with affected agencies and municipalities. *“The applicant shall confer with municipal planning representatives, DPS, DEC, OPRHP, and where appropriate, APA in its selection of important or representative viewpoints that may be subject to project visibility”*. On February 23, 2017 an information request was sent out to 41 stakeholders. In this request, a preliminary visual report was provided, indicating the extent and findings of visibility studies at that point in time which consisted of identified visual resources as well as the result of the trees-only viewshed analysis. Opportunity was provided for municipalities to suggest additional and reasonable candidate locations for photo simulations or append additional visual resources of concern to the inventory. Correspondence can be found in Appendix 24-1.

In February of 2017, a telephone conference meeting was held with the DPS to discuss the preliminary report and further refine photo locations. In summary, viewpoints were selected based on the need to incorporate the LSZs, inventoried locations, different distance zones, different viewer types, varying lighting conditions, views that offered a clear unobstructed sightline and that were captured on a clear resolution photograph, and careful consideration of DPS comments and stakeholder and agency consultations. Table 24-4 provides data about the selected viewpoints, their significance, landscape similarity zones represented, and distance and viewer types represented. The level of viewer exposure is not included in Table 24-4. It can be found on the Visual Impact Rating Form in Attachment 4 of Appendix 24-1. In Part 2 of this form the preparer rated the viewpoint based on the number of viewers (low or high use activity).

Table 24-4. Summary Table Simulation Viewpoints

Viewpoint	Location	Significance	Landscape Similarity Zone	Distance Zone	Viewer Types
3	County Road 61 (North) - Greenwood	Agricultural, Farmstead, Representative of northern section of Project	>2,200 feet: Ag/Open	1.1 miles, Middleground	Local Through Travelers, Commuters, Workers, Resident
5	County Road 61 (South)	Representative view from newer residential in proximity to project along fairly high use travel corridor	>2,200 feet: Developed	1.2 miles, Middleground	Local Through Travelers, Commuters, Resident
6	County Road 60 – West Union	Project collection substation and O&M building location	>2,200 feet: Ag/Open (major)	0.15 miles, Foreground	Local Through Travelers, Commuters

Viewpoint	Location	Significance	Landscape Similarity Zone	Distance Zone	Viewer Types
8	Cemetery Hill Road - West Union	Residential, Agricultural, Representative of interior rural roads and middle section of Project	>2,200 feet: Ag/Open, Developed Residential	0.58 miles, Middleground	Local Through Travelers, Commuters, Resident
9	Cemetery Hill Road - West Union (Rexville)	Stream - open water valley location, Near nearest eligible historic site to Project	Open Water	2.3 miles, Middleground	Local Through Travelers, Commuters, Resident
10	County Road 60 - West Union	Forested and open land at high point location.	>2,200 feet: Ag/Open, Forested	2.4 miles, Middleground	Local Through Travelers, Resident
12	Lewis Road - West Union	Agricultural, Farmstead, Representative of southern section of Project	>2,200 feet: Ag/Open, Developed	0.81 miles, Middleground	Local Through Travelers, Resident
13	County Road 63 - Jasper	High elevation vantage point with long distance view representative from east location	>2,200 feet: Ag/Open	4.4 miles, Background	Local Through Travelers, Commuters
14	Marsh Hill Wind Farm - Jasper	Show cumulative visual impacts	>2,200 feet: Ag/Open	9.7 miles, Background	Local Through Travelers
15	Junction Route 248 & Route 417 - Greenwood	Intersection of two major travel corridors. Close to Village of Greenwood, Lower valley location	Developed Highway	2.5 miles, Middleground	Local Through Travelers, Commuters, Longer Distance Travelers, Residents

Viewpoint	Location	Significance	Landscape Similarity Zone	Distance Zone	Viewer Types
17	Route 248 – Marsh Creek	Major road, NYDEC Public Fishing Rights	Developed Highway, Open Water	0.48 miles, Foreground	Local Through Travelers, Commuters, Tourists, Recreational Users
19	Town Line Road – Greenwood/West Union	Project collection substation and O&M building location	>2,200 feet: Ag/Open (major)	0.17 miles, Foreground	Local Through Travelers, Commuters, Residents in vicinity
20	County Road 22 - Andover	County scenic drive	>2,200 feet: Ag/Open	3.0 miles, Middleground	Local Through Travelers, Commuters, Non-local recreational sight-seer, Resident
22	County Road 22a - Independence	Representative view from west	>2,200 feet: Ag/Open	2.4 miles, Middleground	Local Through Travelers, Commuters, Residents in vicinity

(5) Photographic Simulations

As described previously, photographic simulations were prepared using high-resolution photos with three dimensional visualization software in order to realistically represent the built facilities from each of the selected viewpoints. As indicated in Exhibit 24(b)(4) above, viewpoints were selected in part to represent varying LSZs and Distance Zones as well as for their open views. As previously mentioned representative viewpoints were also selected based upon the feedback from the agencies and stakeholders. The photographic simulations are presented in Attachment 2 of Appendix 24-1.

(6) Mitigation Strategies

Visual mitigation was considered during the siting of turbines via the arrangement and clustering of turbines as well as other means. See Exhibit 24(a)(10) for a discussion of mitigation strategies and the summary of best management practices used for siting and designing the Project to reduce visual impacts.

(7) Visual Impact Rating of Project Photo simulations

TRC has developed a visual impact rating form for use in comparing project photo simulations. This form is a simplified version of various federal agency visual impact rating systems. It includes concepts and applications sourced from:

- U.S. Bureau of Land Management (BLM), Handbook H-8431: Visual Contrast Rating, January 1986 (USDOI, 1986).
- Visual Resources Assessment Procedure for U.S. Army Corps of Engineers, March 1988 (Smardon, et al., 1988).
- National Park Service Visual Resources Inventory View Importance Rating Guide, 2016 (NPS, 2016c).
- USDA Forest Service (USFS), United States Department of Agriculture Forest Service, Landscape Aesthetics: A Handbook for Scenery Management. USDA Forest Service Agriculture Handbook No. 701, 1995 (USDA, 1995).

Depending on the project location, a variety of VIA guidance and established procedures exist as noted above that apply to management of federal lands that fall under a specific agency such as the U.S. Forest Service or Bureau of Land Management. These guidance documents vary in regards to agency specific rating systems or procedures and often begin with the evaluation of existing conditions such as scenic quality or presence of sensitive resource locations.

This form has been developed by TRC for efficient and streamlined use with projects that undergo state environmental permitting processes. It is assumed that visual resource inventories, terrain analyses, development of landscape similarity zones or viewshed analyses have already been performed in the project VIA according to state regulatory requirements or other visual policy. This form was developed to be used as a numerical rating system for the comparison of Existing Conditions (Before) vs. With Project (After) photo simulations of final selected viewpoint locations and is meant to accompany the Project VIA.

For evaluating visual impacts there are two parts to the form. Part 1 is *Visual Contrast Rating* which rates the Project as it contrasts against compositional visual elements of the viewpoint scene. This includes compositional contrasts against the existing and natural environment such as vegetation, water, sky, landform, or structures. The higher the rating total the higher the contrast. Part 2 is *Viewpoint Sensitivity Rating*. This section rates the sensitivity of the viewpoint location which inherently considers the importance of the viewpoint (if it falls within a visual resource area), duration of view, if it is a high use area, as well as general scenic quality. The higher the rating total, the more sensitive the viewpoint is.

The rating scale is as follows:

Rating Scale	
0	None
0.5	
1	Weak
1.5	
2	Moderate
2.5	
3	Strong

Part 1 Visual Contrast Rating

Form Contrast: Form in this sense generally means the shape of an object or unification of shapes massed together by perceived pattern or color. In many rural undeveloped areas, the landscape may consist of homogenous or visually restful views of large shapes or shapes of color belonging to expanses of open field or forested areas. New project elements may provide a contrast or interruption against existing homogenous shapes within the view (strong). Conversely, there may be much visual existing clutter comprised of multiform shapes found in developed or urban areas where newly introduced project elements may better be visually absorbed in the view (weak).

Line Contrast: Line generally refers to the perceived edges of shapes as well as the orientation of these line edges. An undeveloped area at distance may be mostly horizontal line comprised of distant ridges or forest treetops as well as forest and field interfaces. New project elements may disrupt some of the line or they may introduce new vertically oriented lines as such as from a transmission line or wind farm (strong).

Texture Contrast: Trees and their leaves or buildings at close proximity will offer higher detail (strong). Texture and the level of discernible detail decreases with distance (weak). Objects at distance may appear as one homogenous texture or shape.

Color Contrast: Does the project color contrast greatly against color in the existing view (strong)? Color contrast may occur with the terrestrial background or the sky.

Project Scale Contrast/Spatial Dominance: Is the project size and scale dominant (strong), co-dominant, or subordinate (weak) in the view in relation to the rest of the surroundings?

Broken Horizon Line: Does the project remain below the horizon line (weak) or is the horizon line broken by project elements (strong)?

Visual Acuity: Visual acuity is the acuteness or clarity of vision, most often related to the amount of discernible detail or contrast with distance. Atmospheric conditions may also decrease visual acuity, especially on humid days.

Amount of Project Clearing Perceived: The With Project (After) simulation may show extensive clearing that has occurred compared to existing conditions, thereby showing a large visual change from the project (strong). In many cases, no clearing is required (none), or minimal clearing might be seen from a viewpoint location (weak or moderate).

Screening/Mitigation Needed: This category is treated in two ways. 1) Is the project at a particular viewpoint seen because of being mostly in the open which would require some type of vegetative or structural mitigation (strong) to obscure direct views? Conversely, is there some type of existing screening that blocks partial or whole views such as trees, buildings, or topography that act as visual impediments in the landscape (weak). Or 2) How important is it to mitigate at a certain area or how high is the visual absorption capacity? For example there may be a clear unobstructed view of a new transmission structure in the view, but if there are existing transmission poles or cell towers, or distribution lines along the street in a more urban area providing similar utility development it may not be necessary to mitigate (weak). Is a substation being proposed where there is a clear view but within industrial development (weak)? Or, there may be visible modifications to an existing substation but proposed elements are visually absorbed because of “like” components and thereby require no mitigation (weak).

Please see Attachment 4 of Appendix 24-1 VIA which presents the individual rating forms to see the mitigation rating scores for each viewpoint. It is likely impossible to mitigate for something as large as wind turbines, however, the Applicant implemented careful siting during the site design and layout process and other mitigation measures as discussed above to help moderate visual impacts.

Part 2 Viewpoint Sensitivity Rating

Within a Visual Resource: Is the viewpoint located within a visual resource as listed in the Visual Resources Inventory section of the VIA? This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied. If yes, then viewer expectations and sensitivity may be higher.

View of Other Visual Resources: Can you see a visual resource listed in the Visual Resources Inventory from the viewpoint location in combination with the Project? This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied.

A Listed/Known Scenic Area of Visual Quality: Is the viewpoint located within a listed or known scenic area of visual quality? This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied. If yes, this location would also be identified as a visual resource as listed in the Visual Resources Inventory section of the VIA. It is evaluated in the Viewpoint Sensitivity Rating because there are often town by-laws, master plans, or regional planning documents that call out specifically named locations that have been designated as a scenic viewing area and is important to note. It means that the location has added importance to the community and if yes, then viewer expectations and sensitivity are likely higher. This will be used infrequently.

Number of Viewers/High Use Activity: An area of high use and high number of viewer will incur a greater amount of visual impact to the community (strong). These areas may consist of high destination type locales visited by the public such as recreational areas, shopping centers, densely populated areas, or highways with large traffic counts. A roadway may not always be considered as high use. There may be viewpoints along local rural roadways that have relatively very low traffic counts. This category accounts for the immediate vicinity; the simulation might only show a roadway, but a resident may be very nearby or behind the viewer.

Duration of View: The duration of views is categorized as Long Duration (strong), Short Duration (weak) or Infrequent (weak). Residents or workers with views from the workplace or day long use at a picnic area would be a long duration view. Short duration views imply movement and are transient, such as passing the site on a highway, glimpsing a project from an open area on a hiking or snowmobile trail. A

moderate duration view might be a destination type location such as a summit or historic landmark where the visitor seeks the location with purpose but only stays for a few hours. However care must be taken when attributing an area to a short duration view. There could be short duration views encountered frequently over distance, such as a snowmobile trail.

Presence of Existing Development: Is there much existing development consisting of commercial, utility, or industrial development or densely populated residential or urban neighborhoods in the photo or near vicinity? If so, then the sense of place or importance may be diminished and decreases viewer sensitivity as a place that does not have high value and should be rated as weak. Conversely, the lack of existing development contributes to the intactness of a more undisturbed natural environment a gives a sense of greater value.

Uniqueness of Landscape Compared to Region: Photographs for project simulations are generally taken within a designated VSA. Landscape features or scenic quality shown in simulations may be found to be consistently similar or unvaried (weak). If the viewpoint shows a view that is unique to the area such as an outstanding water feature, a series of dramatic cliffs, or mountain views not typically found elsewhere in the vicinity then it should be rated as strong.

Presence of Water: Generally the presence of water implies greater scenic quality or importance. This is a yes or no question, therefore either a rating 0 (none) or 3 (strong) should be applied. If there is the presence of water and it is not very discernible in the view, then a rating of 2 (moderate) can be applied.

Visual Impact Rating Results

Three panelists evaluated and scored the simulations presented in Table 24-5. Panelist 1 has a B.F.A. (traditional printmaking) with a minor in art history and an M.S. in Soil Science. Panelist 2 is a landscape architect. Panelist 3 is independent with no visual arts study but has extensive experience with the Article VII and 10 process. The final scores and averages are tabulated for Part 1 Visual Contrast and Part 2 Viewpoint Sensitivity. Mean deviations are also calculated to gauge the variation between each of the panelists.

Table 24-5. Visual Impact Rating Results

Viewpoint	Location	Contrast Rating Panelist 1		Contrast Rating Panelist 2		Contrast Rating Panelist 3		Avg Part 1	Mean Deviation Part 1	Avg Part 2	Mean Deviation Part 2
		Part 1	Part 2	Part 1	Part 2	Part 1	Part 2				
1	County Road 62 - Greenwood	13.5	7	11.5	6	13.5	7	12.8	0.9	6.7	0.4
3	County Road 61 (North) - Greenwood	19	6	20.5	6.5	19	6.5	19.5	0.7	6.3	0.2
5	County Road 61 (South)	18	8	20.5	8.5	17	7	18.5	1.3	7.8	0.6
6	County Road 60 – West Union	18	5.5	16.5	5.5	10.5	6	15.0	3.0	5.7	0.2
8	Cemetery Hill Road - West Union	22.5	7.5	23	7.5	20.5	6.5	22.0	1.0	7.2	0.4
9	Cemetery Hill Road - West Union (Rexville)	16.5	8.5	14.5	12.5	15.5	8.5	15.5	0.7	9.8	1.8
10	County Road 60 - West Union	19	6	16	5.5	13.5	6	16.2	1.9	5.8	0.2
12	Lewis Road - West Union	21	7.5	22	8	20	6.5	21.0	0.7	7.3	0.6
13	County Road 63 - Jasper	15	6	14.5	7	13.5	5.5	14.3	0.6	6.2	0.6
14	Marsh Hill Wind Farm - Jasper	7	3.5	5	3.5	6.5	3.5	6.2	0.8	3.5	0.0
15	Junction Route 248 & Route 417 - Greenwood	8.5	6	16	8	10	7	11.5	3.0	7.0	0.7
17	Route 248 – Marsh Creek	22.5	14	23	15.5	20	12.5	21.8	1.2	14.0	1.0
18	Brown Hollow Road – Greenwood State Forest	23.5	10	20.5	8.8	17	8.5	20.3	2.2	9.1	0.6

Viewpoint	Location	Contrast Rating Panelist 1		Contrast Rating Panelist 2		Contrast Rating Panelist 3		Avg Part 1	Mean Deviation Part 1	Avg Part 2	Mean Deviation Part 2
19	Town Line Road – Greenwood/West Union	24	6.5	24	6.5	21.5	5.5	23.2	1.1	6.2	0.4
20	County Road 22 - Andover	19	10.5	14	6.5	14	10	15.7	2.2	9.0	1.7
22	County Road 22a - Independence	18	6	13.5	5.5	15	6	15.5	1.7	5.8	0.2
24	Canisteo River, Substation	2.5	8.5	6	10.5	4.5	8	4.3	1.2	9.0	1.0
25	Canisteo River, Transmission Line	15.5	8.5	17	10.5	13.5	9	15.3	1.2	9.3	0.8

Part 1 Contrast Rating Results

The viewpoint with the highest contrast is VP19 with an average rating of 23.2. This simulation shows all of the project elements that include turbines, transmission structures and an unobstructed view of the Project collection substation in an open field. Other viewpoints with high contrast ratings which are grouped between an average rating of 20.3 and 22.0 are VP8, 12, 17, and 18. These vantage points usually show a turbine or two on a nearby hill within a mile or so of the viewer. VP18 however, is the viewpoint of the transmission line that is seen in an open field adjacent to Greenwood State Forest.

VP3 and 5 have average contrast ratings of 19.5 and 18.5 respectively and are both a little over 1 mile away and show several turbines.

The next logical grouping consists of VP1, 6, 9, 10, 13, 15, 20, 22, 25 with average contrast ratings ranging between 11.5 and 17.2. Except for VP1, 6, and 25, these viewpoints are typically between 2 and 4 miles from the viewer. However, VP1 and 25 are of the transmission line, are 0.25 or less from the viewer and visible below the horizon line. VP15 is partially blocked by terrain. VP6 shows all of the project elements that include the Project collection substation, turbines, and structures, yet does not fall among the highest end of the contrast ratings. Generally the panelists felt that existing vegetation even during leaf-off conditions provided enough mitigation to offset visual contrast against the existing environment.

The two viewpoints that stand out as having the lowest contrast and are most capable of being visually absorbed in the environment are VP14 and 24 with an average rating of 6.2 and 4.3, respectively. VP14 located at the existing Marsh Hill Wind Farm, shows the project approximately 9.7 miles away on a distant ridgeline where the turbines are difficult to discern. VP24 however is only 0.16 miles away but

shows proposed a proposed transmission structure in amongst other existing substation in-kind development.

Mean deviations were calculated to observe the level of variance between the panelists within each evaluated simulation. Mean deviations ranged between 0.6 and 3.0. Most results show reasonable compatibility with each other. VP6 and 15 had the highest deviation with a ranking of 3.0. Looking closer at the results it appears panelist opinion varied when it came to how well the existing hedgerow and vegetation mitigated the project at VP6 and how much visual contrast was reduced because of it. VP15 is located at the intersection of Routes 248 and 417. Although the simulation shows a turbine partially blocked by topography at distance (2.5 miles), it appears there were still differences in opinion when it came to how much form, line, and color contrast the turbine provided against the sky background as well as the influence of the terrain.

Part 2 Viewer Sensitivity Results

Viewpoint 17 was found to have the highest viewer sensitivity rating. There are several contributing reasons for the high rating. This location is looking at a NYDEC fishing easement that is a listed visual resource (Marsh Creek). There are not many visual resources listed in Table 4 that have such direct views of the Project. The high rating is also attributed to the presence of water which offers a higher intrinsic scenic value as well as contributing to a higher rating in the 'Uniqueness of Landscape Compared to Region' category. There are not too many areas in the overall 10-mile VSA that have larger expanses of open water features that have immediate public access.

VP9, 18, 20 24, and 25 all have sensitivity ratings between 9 and 10. VP9 has a rating on the higher end because of viewpoint proximity to the village of Rexville. VP18 has a direct view of the transmission line from Greenwood State Forest. Turbines can be seen on a distant ridge from a designated county scenic drive in Andover at VP20. VP24 and 25 are in locations where viewer numbers are higher.

VP1, 3, 5, 6, 8 10, 12, 13, 15, 19, and 22 have similar average sensitivity ratings between 5.7 and 7.8. These are locations that are not listed in Table 24-3 as a visual resource and are typically representative of what the community would see from roadways and residences.

VP14 at the Marsh Hill Wind Farm is considered to have the lowest sensitivity with a rating of 3.5.

Mean deviations for Part 2 Viewer Sensitivity do not show a lot of variance between panelists, with ratings between 0 and 1.8. This can be somewhat expected as the Part 2 categories are less subjective than Part 1. VP9 has the highest mean deviation at 1.8. This appears to occur based on how one ranked the importance of the number of viewers and duration of view to sensitivity for this vantage point. The remaining mean deviations are between 0 and 1.

(8) Visible Effects Created by the Project

As applicable to the proposed Project technology and as part of this application, the comprehensive VIA examined the overall appearance, operational characteristics, and general visible effects of the Project and related facilities by means of computerized GIS viewshed and terrain analysis and with the use of specialized 3d visualization software. Viewshed analyses results are mapped for illustrating geographic locations of predictive visibility as well as having used resultant data to quantify and compare amounts of visibility within varying parameters such as Distance Zones, LSZs, and sensitive resource locations. More descriptive and qualitative assessments of the proposed Project was further provided with photo

simulations that show comparisons between existing conditions and conditions with the Project. In the simulations shading, glare, color, and the size and scale within the regional landscape in varying weather conditions is represented within designated Distance Zones and LSZs and from select visual resource locations.

Portions of the VIA have been discussed in previous sections per Article 10 requirements of Exhibit 24(a) and Exhibit 24(b). However please refer to Appendix 24-1 for the full detailed VIA which also includes assessment of the transmission line as well as depicting all maps and tables analyzed.

Other related visual effects of facility operations include an assessment shadow flicker in a report entitled "*Eight Point Wind Energy Center Shadow Flicker Report*" which was conducted by Epsilon (Appendix 15-1). Regulations and evaluation criteria, methodology, results of shadow flicker, design goals, local laws, mitigation, production of shadow flicker isolines, as well as graphical and mapping results are discussed and presented in the report. A brief summary of findings can be found in Exhibit 24(a)(9).

References

- Allegany County Comprehensive Plan (2013). Allegany County Comprehensive Plan Review Committee & The Allegany County Office of Development.
- Allegany County Scenic Drives (2017). Available at: <http://www.discoveralleganycounty.com/>. Accessed January 2017.
- Cohocton and Dutch Hill Wind Farms Year 2 Post-Construction Monitoring Report, 2010 for the Cohocton and Dutch Hill Wind Farms in Cohocton, New York, 2011. Stantec Consulting Services Inc.
- Committee on Environmental Impacts of Wind Energy Projects (2007). *Environmental Impacts of Wind-Energy Projects*, National Research Council, National Academies Press, Washington DC.
- GP Wind Consortium (2012). Thematic Case Studies. Available at: http://ec.europa.eu/energy/intelligent/projects/sites/iee-projects/files/projects/documents/gpwind_thematic_case_studies_en.pdf and http://www.seai.ie/Renewables/Wind_Energy/Good_Practice_Wind/
- Homer, C.G., Dewitz, J.A., Yang, L., Jin, S., Danielson, P., Xian, G., Coulston, J., Herold, N.D., Wickham, J.D., and Megown, K. (2015). Completion of the 2011 National Land Cover Database for the conterminous United States-Representing a decade of land cover change information. *Photogrammetric Engineering and Remote Sensing*, v. 81, no. 5, p. 345-354. Available at: <https://www.mrlc.gov/nlcd2011.php>
- National Park Service (NPS) (2017a). *Find a Park in NY*. Available at: <http://www.nps.gov/state/ny/index.htm> Accessed Feb, 2017.
- NPS (2017b). *Nationwide Rivers Inventory*. Available at: <https://www.nps.gov/ncrc/programs/rtca/nri/states/ny.html> Accessed Jan, 2017.
- NPS (2016a). *National Natural Landmarks in New York*. Available at: <https://www.nps.gov/subjects/nnlandmarks/state.htm?State=NY> Accessed Dec, 2016.
- NPS (2016b). *National Register of Historic Places*. Available at: https://www.nps.gov/nr/research/data_downloads.htm Accessed Dec, 2016.
- NPS (2016c). *Visual Resources Inventory View Importance Rating Guide*.
- New York State Department of Environmental Conservation (NYSDEC) (2017c). New York's Forest Preserve. Available at: <http://www.dec.ny.gov/lands/4960.html> Accessed Feb 2017.
- NYSDEC (2000). *Program Policy: Assessing and Mitigating Visual Impacts*. DEP-00-2. Division of Environmental Permits, Albany, NY.

- NYSDEC (2017d). *Wild, Scenic and Recreational Rivers*. Available at: <http://www.dec.ny.gov/permits/32739.html> Accessed March, 2017.
- NYSDEC (2017e). *Western New York Public Fishing Rights Maps*. Available at: <http://www.dec.ny.gov/outdoor/44879.html> Accessed March 2017.
- New York State Department of State (NYSDOS) (2016). *Scenic Areas of Statewide Significance*. Available at: <http://www.dos.ny.gov/opd/programs/consistency/scenicass.html> (Accessed Nov, 2016). Office of Planning and Development.
- New York State Department of Transportation (NYSDOT) (2015). Annual Average Daily Traffic. Available at: <https://www.dot.ny.gov/tdv>
- NYSDOT (2013). Geotechnical Design Manual. Chapter 3 – Geology of New York State.
- New York State Historic Preservation Office; Parks, Recreation and Historic Preservation, Cultural Resource Information System (CRIS). 2016. Available at: <https://cris.parks.ny.gov/> Accessed Dec 2016.
- Office of Information Technology Services (ITS) (2014). Scenic Areas of Statewide Significance. Obtained from NYSGIS Clearinghouse.
- Office of Information Technology Services (ITS) (2017). DEC Lands. Obtained from NYSGIS Clearinghouse.
- Smardon, R.C, Palmer, J.F, Knopf, A. and Girinde, K. (1988). Visual Resources Assessment Procedure for US Army Corps of Engineers. Department of the Army.
- Thayer, R.L. and Freeman, C.M. (1987). *Altamont: public perception of a wind energy landscape*. Landscape and Urban Planning Vol 14, 379-398.
- The James Hutton Institute (2014). Perceptual Studies of Windfarms. Available at: <http://www.macaulay.ac.uk/ccw/task-two/strategies.html> Accessed March 2017.
- United States 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 (USDOI) (2013). Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands. Bureau of Land Management. Cheyenne, Wyoming.
- USDOI (1986). Bureau of Land Management . *Handbook H-8431: Visual Contrast Rating*.
- USDOI (1980). Bureau of Land Management . *Visual Resource Management Program*. U.S. Government Printing Office. 1980. 0-302-993. Washington, D.C.
- United States Department of Transportation (USDOT) (2017). *America's Byways*. Available at: <https://www.fhwa.dot.gov/byways/states/NY> Accessed March 2017.

United States Fish and Wildlife Service (USFWS) (2015). *National Wildlife Refuge Locator*. Available at: <https://www.fws.gov/refuges/refugeLocatorMaps/NewYork.html> Accessed March 10, 2015.

Vissering, J., (2011), *A Visual Impact Assessment Process for Wind Energy Projects*, Clean Energy States Alliance Windfarms and Landscape Values, (2005), Australian Wind Energy Association and Australian Council of National Trusts, Commonwealth of Australia.