

result in a change to the setting and/or character of a historic property may be assessed as adverse. Given the low relief of the APE and the limited areas with stands of trees, it is probable that many of the inventoried structures within one mile, and possibly within five miles, of the project will be afforded views of one or more Project turbines.

3.7.2.3 Mitigation Measures

If it is determined that the Project would result in adverse effects, SLW would consider if minor redesign may be feasible to avoid adverse effects. If avoidance of effects is not possible, SLW would work with the Town of Cape Vincent Planning Board, SHPO, the USACE, and interested parties to develop a MOA that would stipulate appropriate activities that would be performed to mitigate effects.

3.8 Visual Resources/Community Character

3.8.1 Affected Environment

To evaluate Project visibility and visual impact, a Visual Resource Assessment (VRA) was prepared by Saratoga Associates, Landscape Architects, Architects, Engineers, and Planners, P.C. The VRA (included as Appendix C) followed basic New York State Department of Environmental Conservation Program Policy “Assessing and Mitigating Visual Impacts” (NYSDEC, 2000) and SEQRA criteria to minimize impacts on visual resources. This visual policy requires a visual assessment when a proposed facility is potentially within the viewshed of a designated aesthetic resource. In the case where significant impacts are identified, the Applicant (e.g., developer) is required to employ reasonable and necessary measures to eliminate, mitigate or compensate for adverse aesthetic effects. This NYSDEC visual policy is also included in Appendix C for reference. It should be noted that this visual resource study and assessment was performed prior to minor turbine location modifications. As a result, SLW is committed to performing updated visual resource impact studies as part of the SEQRA and permitting process.

The VRA for this Project included, but was not limited to, the following components:

- Define the existing landscape character/visual setting to establish the baseline visual condition from which visual change is evaluated;
- Conduct a visibility analysis (viewshed mapping and field investigations) to define the geographic area surrounding the proposed facility from which portions of the Project might be seen;
- Identify sensitive aesthetic resources to establish priority places from which further analysis of potential visual impact is conducted;

- Select key receptors from which detailed impact analysis is conducted;
- Depict the appearance of the facility upon completion of construction;
- Evaluate the aesthetic effects of the visual change (qualitative analysis) resulting from Project construction, completion and operation; and,
- Identify opportunities for effective mitigation.

As stated in the VRA, there are no specific Federal rules, regulations or policies governing the evaluation of visual resources and/or mitigation measures. However, the methodology used in the VRA report is based on standards and procedures used by the U.S. Department of Agriculture, U.S. Department of the Interior, Bureau of Land Management, U.S. Department of Transportation, Federal Highway Administration, New York State Department of Transportation, and the NYSDEC.

As stated in previous sections of this DEIS and within the VRA report, the Project area is located in the western portion of Jefferson County in the Towns of Cape Vincent and Lyme. Jefferson County is located in northwestern New York and is bordered by the St. Lawrence River to the north and Lake Ontario to the west, St. Lawrence County to the northeast, Lewis County to the southeast, and Oswego County to the south. Jefferson County is primarily rural and dominated by agricultural land, scattered rural homes, and farms. Further, the proposed Project is located in the scenic Thousand Islands region of New York State at the convergence of the St. Lawrence River and Lake Ontario. The Thousand Islands is a popular waterfront vacation destination extending from the eastern shore of the St. Lawrence River. The region, well known for the scenic beauty, of its shoreline and over 1,800 islands, offers numerous cultural, recreational and entertainment attractions. While resorts, restaurants and tourist attractions on the American side of the River are largely clustered around the Villages of Clayton and Alexandria Bay, recreational and tourism resources are found throughout the Thousand Islands coastal area, including the waterfront portion of the study area. The affected environment included the following specific features detailed in the VRA report:

- Topography and vegetation;
- Water features;
- Transportation; and
- Population centers.

3.8.2 Potential Impact

Due to the height of the proposed wind turbines, the project would be visible from a variety of locations within five (5) miles of the proposed Project area. The VRA report identified the following:

- Viewshed maps indicate that one or more turbine highpoints (i.e. apex of blade rotation) will be theoretically visible from approximately 65% of the five-mile radius study area. Approximately 35% of the study area will likely have no visibility of any wind turbines due to intervening landform or vegetation. Additionally:
 - 20+ turbine highpoints will be visible from approximately 51% of the study area;
 - 40+ turbine highpoints will be visible from approximately 42% of the study area;
 - 60+ turbine highpoints will be visible from approximately 36% of the study area; and
 - 80+ turbine highpoints will be visible from approximately 28% of the study area.
- Photo simulations provided in the VRA illustrate that, when visible, a substantial portion of individual turbines will be seen above intervening landform and vegetation. From foreground vantage points (within ½ mile), all or most of the 275-foot tall turbine tower, nacelle and 300-foot diameter turbine rotor will commonly be visible above intervening vegetation. From background vantage points (3+ miles), foreground vegetation will often screen the lower portions of the turbine structure (tower and nacelle) limiting views to the upper portion of the rotor turning above the tree line. This high degree of Project visibility is attributed to the broad agricultural clearing and lack of screening hills typical throughout much of the five-mile radius study area. Turbine visibility is most common from inland areas where cleared agricultural lands provide long vistas in the direction of turbine groupings. The area most affected by views of the Project will be the central portion of the turbine area where multiple turbines will be visible up to 360-degrees around a vantage point. Multiple turbines will also be visible from portions of the St. Lawrence River coastal area northeast of the Village of Cape Vincent. Based on field observation, such visibility would likely be lessened to some degree by existing clusters of localized (non-forest) vegetation.
- Direct views of multiple turbines will occur from offshore vantage points on the St. Lawrence River and Lake Ontario. Views are also found on lake and river islands from shoreline areas oriented toward the Project, as well as island hillsides with downslope

vistas in the direction of the Project. Such views will occur on both sides of the international border within the five-mile radius study area.

- While the viewshed map indicates theoretical visibility of multiple turbines within the Village of Cape Vincent, field observation determined the prevalence of mature street trees and site landscaping combined with one- and two-story residential and commercial structures will commonly block views in the direction of the Project from the downtown and waterfront area. Filtered or framed views of proposed turbines are likely through foreground vegetation and buildings from the perimeter of the Village. Direct views are more prevalent on the outskirts of the Village and hamlet where localized residential and commercial structures, street trees and site landscaping are less likely to provide a visual barrier.
- Based on viewshed analysis, the highpoint of one or more of the proposed turbines will be visible from approximately 45 (67%) of the 67 inventoried visual resources. Photo simulations provided in the VRA illustrate the degree and character of Project visibility from 16 representative visual resources impacted by the Project. In addition, the Project will be within view of 31 visual resources of Statewide Significance. Of these, 19 are private properties listed on the National Register of Historic Places. Considering these properties are not open to the general public, and the listed historic significance is not associated with the cultural sensitivity of the setting (e.g., the listed historic significance of the property is associated with a person, event, and/or architecture/engineering), the aesthetic impact of Project visibility on these resources is diminished.
- The proposed Project will also be visible from much of the Seaway Trail Scenic Byway. Of the 23.6 miles of the Seaway Trail (NY Route 12E) traversing the five-mile radius study area, the high point of one or more turbines will be visible from approximately 17.5 miles (74 percent).
- The scenic value of waterfront property has resulted in a nearly continuous pattern of residential development along the shoreline. Built structures include traditional single-family residences, cottages, camps and mobile homes; nearly all oriented to take best advantage of water views. Development density along the waterfront is highly variable, ranging from large wooded estate lots set back from nearby roadways and neighboring properties, to neighborhood scale clusters of small wood frame camps and trailer homes of varying quality, vintage and size. Shoreline areas between the water's edge and residential structures are commonly cleared, partly or often completely, to create unencumbered vistas of the water. While many waterfront properties are very well maintained and contribute to the overall beauty of the waterfront landscape, other private properties have fallen to some degree of disrepair and detract from the visual quality of the waterfront setting.

- The introduction of large, clearly man-made structures creates an obvious disruption of the planar agricultural landscape. The well-defined vertical form of turbines on the horizon introduces a contrasting and distinct perpendicular element into the landscape. The proposed turbines would be the tallest visible elements within view and will be disproportionate to other elements on the regional landscape. The distribution of turbines across an extended area would result in the proposed Project being perceived as a highly dominant visual element. The moderately paced sweeping rotation of the turbine blades would heighten the conspicuity of the turbines; no matter the degree of visibility.
- This portion of New York State is quite rural with a very small year round population. The year-round population of the Town of Cape Vincent is just 3,345. However, with a large number of second homes, camps and cottages, along the waterfront the seasonal population of the Town is estimated at more than 8,000 during the summer vacation season. Highways within the study area are relatively lightly traveled. NY Route 12E has an average annual daily traffic (AADT) volume of less than 1,400 vehicles at the Village of Cape Vincent.
- Based on the VRA, of 197 studied shadow receptors located within 10 rotor diameters:
 - 22 (11.2 %) will be impacted 0-1 hrs/yr;
 - 89 (45.2 %) will be impacted 2-10 hrs/yr;
 - 29 (14.7 %) will be impacted 11-20 hrs/yr;
 - 22 (11.2 %) will be impacted 21-30 hrs/yr;
 - 21 (10.7 %) will be impacted 31-40 hrs/yr;
 - 11 (5.6 %) will be impacted 41-50 hrs/yr;
 - 3 (1.5%) will be impacted greater than 50 hrs/yr.

The three (3) receptors that will theoretically be impacted more than 50 hours per year include structure #102 (94.8 hours), structure #103 (81.5 hours) and structure #106 (72.5 hours); see Appendix C for reference.

There are no regulations or guidelines that establish an acceptable degree of shadow flicker impact on a potential receptor. Based on the limited number of hours any structure will be impacted, shadow flicker is not expected to create an adverse impact on most nearby residential dwellings. For residences where shadow flicker is greatest, this impact might be considered an annoyance by some, and unnoticed by others.

The United States Department of Transportation Federal Aviation Administration (FAA) requires aviation warning lights on the turbines, which could present a potential adverse visual impact from some viewing locations. The FAA works with Project proponents and wildlife

resource agencies to ensure the appropriate lighting scheme is chosen for each Project. The FAA provides technical guidance, which is described below, to establish a baseline for wind project lighting schemes. However, the FAA would deviate from the standards in its guidance when there is a demonstrated better approach.

The purpose of aviation warning lights is so that wind turbines can be seen by aircraft flying at an altitude at which a collision could occur. Therefore, aviation warning lights have a very tight beam that extends brightly at the elevation necessary for visibility from aircraft, but which does not cast noticeable light at the foot of the wind turbines.

The FAA's Technical Note: Development of Obstruction Lighting Standards for Wind Turbine Farms, November 2005, reports the most effective method of providing hazard warning lights to pilots of a wind turbine farm in a grid pattern, such as the St. Lawrence Wind Energy Project, is the following:

- Initially, each of the defined corners of the grid layout should be selected for lighting, and then, lights should be placed on turbines along the outer limits of the Project so that the maximum spacing between lit turbines is no more than 1/2 mile (approximately 50 of the proposed 96 turbines). If it appears as though the end of the lighting strings may be crowded, it may be necessary to move the lights back one or two turbines to create an even lighting configuration. If the grid is over 1 mile wide across the center of the group of turbines, it may be appropriate to position one or two lights within the center of the configuration to again provide warning to pilots attempting to climb over the outer limits of the grid, and descending into the center of the grid. Elevation should also be considered.
- On occasion, it has been documented that one or two turbines may be positioned at locations that really do not lend themselves to the linear, cluster, or grid layouts. In this event, the following guidelines should be followed. If the turbine protrudes from the general limits of the Project, the turbine should automatically receive a lighting fixture. If another turbine is collocated with the first turbine, it does not require any lighting as long as it is within 500 feet from the lit turbine and not positioned on the outboard side of the lit turbine. If these requirements cannot be met, both turbines, in this case, would need to be illuminated.

Other key points include painting the turbines white to preclude daytime white strobe lights and red flashing lights at night that are synchronized to flash in unison. SLW would work with the FAA and wildlife resource agencies to establish the appropriate lighting system for the proposed

wind energy project and integrate best lighting configurations and practices during and after construction.

3.8.3 Mitigation Measures

Although the visual mitigation options are limited given the nature of the project and its siting criteria, the following mitigation measures are proposed for the Project. These mitigation measures are in addition, and similar, to those offered in the VRA report:

- Wind turbine design is largely driven by aerodynamic efficiency. SLW is limited in selection of turbine styles to designs presently offered by wind turbine manufacturers.
- The wind turbines should be painted (using a non-specular material) an off-white color and would not be used for commercial advertising.
- SLW places a high priority on facility maintenance, not only for operational purposes, but for aesthetic appearances in the community as well.
- Considering the proposed Project will include up to 96 wind turbines that will be visible over a wide viewshed area, traditional treatments such as fences, earthen berms and vegetative screening cannot be applied in an effective manner to screen these major structures.
- Perimeter screen plantings will be used to minimize visibility of the proposed substation and operations/maintenance buildings from the proposed right-of-way.
- Aviation warning lighting should be limited to the minimum required by the FAA. The Project would purchase aviation warning lights that are shielded or otherwise directed so that they are the least visible from the ground, and are sited in accordance with applicable Town land use laws and ordinances. Due to the height of the proposed turbines, the FAA requires red flashing aviation obstruction lighting to be placed atop the nacelle on a number of turbines, to be determined, to assure safe flight navigation in the vicinity of the project.
- To the extent practicable, the electrical interconnect would be installed underground. Any overhead electrical transmission, to the greatest extent practicable, would be sited away from where such infrastructure can be viewed from roads. SLW would also minimize clearing necessary for installation of the interconnect.
- The proposed turbines would maintain appropriate buffers to minimize visual impact and extended shadow flicker.

While it is a relatively common practice to conduct a tethered helium balloon visibility study to publicly demonstrate the horizontal and vertical position of a proposed structure, and establish

target points that assist in developing photographic simulations, a balloon visibility study has not been conducted for this Project for several reasons:

- Balloon studies require relatively calm conditions to assure reliable balloon positioning. By their very nature, wind energy sites are inherently windy places.
- The proposed wind energy facility includes up to 96 wind turbine locations. Raising 96 balloons simultaneously would be a difficult exercise at best. While it is certainly possible to launch three or five balloons representing a small sample of the total number of turbines, such an exercise would not offer a reliable representation of the full extent of the proposed project. Moreover, it is likely that none of the sample balloons would be visible from many potentially affected resources. This would result in false interpretation of Project impacts by untrained observers. Similarly, using fewer than 96 balloons would result in numerous photographs taken with no visible balloons, thus defeating the purpose of using the balloons as survey targets for photo simulation.
- As discussed, current three-dimensional modeling technology allows for highly accurate simulation of the proposed Project within the context of an existing condition photograph without use of target balloons.

This information notwithstanding, SLW is prepared to conduct a balloon visibility study in a timely manner should the Lead Agency determine that such a study is useful and desirable.

3.9 Air Quality

3.9.1 Affected Environment

The NYSDEC Division of Air Resources publishes air quality data annually. The most recent air quality data available is the *2005 Annual New York State Air Quality Report - Ambient Air Monitoring System* (NYSDEC, 2006a). This report includes ambient air quality data through 2005, as well as long-term monitoring trends in air quality derived from data collected at monitoring stations across the State. The following is a summary of existing air quality as reported therein:

Concentrations are taken from monitoring stations located in Jefferson County, New York, or the nearest location. Ambient air quality standards are shown in parentheses. Short-term concentrations are based on the highest and second-highest measured concentrations (consistent with the applicable standard not to be exceeded more than once per year) unless otherwise noted.

Sulfur Dioxide (SO₂) [Nick's Lake #2167-03]
Annual - 0.0009 parts per million (ppm) (0.03 ppm)