

## **4.0 CUMULATIVE AND GROWTH INDUCING IMPACTS**

### **4.1 Cumulative Impacts**

This section evaluates the potential cumulative impacts that may arise from interactions between the Project and other projects that are under review for approval by local regulators, have been approved for development, and/or are planned for construction in the vicinity of the Project Area. Cumulative impacts occur when the individual impacts of one project interact with the impacts of another project in a manner which compounds or increases the extent of an impact that either project would have on its own. Cumulative impacts are most often the result of concurrent actions within the same location or in an overlapping larger impact area. These actions may vary from temporary uses associated with construction (i.e., construction traffic resulting from two or more projects being built at the same time) to more permanent impacts simultaneously affecting the same resource (i.e., cumulative visual impacts resulting from wind turbines from two or more projects within the same viewshed).

Due to the height of the proposed turbine structures and the unique nature of their movement, cumulative impacts are most likely to result from development of other potential wind energy projects, rather than development of facilities more common to the landscape. However, other types of projects also could give rise to cumulative impacts depending upon their nature, location and schedule. Although it is difficult to determine where and how future projects will be developed and which future projects might contribute to cumulative impacts to area resources, the SEQR process requires that reasonably related cumulative impacts be evaluated where other projects have been specifically identified and either are part of a single plan or program, or sufficient nexus of common or interactive impacts warrant assessing such impacts together. No other projects are part of a single plan or program with the Project. Thus, there are no other “common plan” projects that must be reviewed.

There are no existing wind energy projects within a 40-mile radius of the proposed St. Lawrence Windpower Project. As a result, cumulative impacts associated with existing wind projects also are not evaluated in this SDEIS.

SLW and interested or involved agencies have identified four proposed wind energy projects within the vicinity of the Project to be considered as part of this cumulative analysis. These include the BP Alternative Energy North America, Inc. (BP) Cape Vincent Wind Power Project, the Upstate NY Power Corporation (Upstate Power) Hounsfield Wind Farm; the Atlantic Wind, LLC Horse Creek Wind Power Project; and the Canadian Renewable Energy Corporation (CREC) Wolfe Island Wind Project. These wind energy projects are in various phases of

planning, development, and/or construction (see Table 4-1). Based upon consultation with the interested and involved agencies, SLW has determined that, other than these four proposed wind energy projects, there are no additional planned or proposed projects that appear likely to give rise to environmental impacts that would be cumulative to those of the Project.

The following sections assess the extent to which potential impacts of the projects listed in Table 4-1 are expected to be cumulative with the impacts of the Project. Specific information about these projects was obtained through publicly available documentation such as DEISs, FEISs, and other public documents available from company websites. This cumulative impact analysis is based on the following general assumptions:

- The most recent construction schedules available are provided in Table 4-1, while proposed construction schedules may change, these dates are assumed for this analysis.
- All of the indicated projects will be constructed as proposed based on publicly available project information appearing in project permit applications and permit documents.

#### **4.1.1 Soils, Topography and Geological Resources**

The impacts of all of the five projects will be additive, not cumulative or synergistic because of the distances between the projects and differences in their construction schedules.

#### **4.1.2 Water Resources**

The Project was developed to avoid or minimize disturbance to wetland habitats to the extent practicable; however, some impacts to wetlands are unavoidable. As discussed in Section 3.2, the Project will temporarily affect 1.95 acres and permanently affect 0.33 acre, of wetlands. In addition, 0.34 acre of forested wetlands will be permanently converted to non-forested wetlands as a result of rights-of-way maintenance practices. Fifty feet of stream banks, associated with two stream crossings, will also be altered as a result of the proposed Project. The four other proposed wind farms will also affect wetlands; however, limited information was publicly available regarding the quantity of wetlands and surface water bodies that could be affected.

The Cape Vincent Wind Farm estimates that there will be no permanent wetland impacts associated with the construction or operation of its permanent facilities, including wind turbines, electrical substation, and operations and maintenance facilities. Temporary impacts are anticipated to be associated with road and transmission line crossings; however, approximated impact acreages were not provided in that project's DEIS. Wetland impacts for one of four potential 115kV transmission lines are estimated at 3.2 acres. Two of the 3.2 acres included forested cover types that would be permanently converted (ERM, 2007).



**Table 4-1**  
**Proposed Wind Projects - Jefferson County, New York and Frontenac County, Ontario**

Project Name	Number of Turbines	Location	Approximate Distance of Project Boundary from St. Lawrence Windpower Project <sup>1</sup>	Project Status <sup>2</sup>
St. Lawrence Windpower Project	53	Towns of Cape Vincent and Lyme in Jefferson County, New York approximately 1.5 miles southeast of the St. Lawrence River and New York State Route 12E, The transmission line will extend about 9 miles southeast to an existing substation in the Town of Lyme.	(this Project)	Project construction will occur in a single phase. Project construction scheduled to commence in Spring of 2010 and be completed by December 2010.
Cape Vincent Wind Power Project	140	Town of Cape Vincent, Jefferson County, New York. Approximately two miles southeast of the Village of Cape Vincent and six miles northwest of the Village of Chaumont.	1.2 miles southeast (Contiguous to the St. Lawrence Windpower Project to the southeast)	Project construction is anticipated to occur in a single phase. It is scheduled to start in the spring of 2011 and be completed by December 31, 2011.
Hounsfield Wind Farm	84	Galloo Island, Town of Hounsfield, Jefferson County, New York. Approximately 12 miles west of Sacketts Harbor in Lake Ontario.	17 miles south southwest	The NYSDEC issued a Notice of Intent to Prepare a Draft EIS on May 21, 2008. A public scoping session was conducted on June 17, 2008 and a Final Scoping Document was prepared on September 18, 2008.
Horse Creek Wind Power Project	62	Towns of Clayton and Orleans, Jefferson County, New York. Approximately five miles south-southeast of the Village of Clayton and three miles northeast of the Village of Chaumont. The Project boundary abuts the Towns of Brownville and Lyme between Perch Lake and the Chaumont River.	9 miles east	The Project was scheduled to be constructed in one phase, anticipated to commence in April 2008 and to finish in December 2008. In June 2008, Horse Creek Wind Farm announced that development on the project was suspended.
Wolfe Island Wind Project	86	Wolfe Island, the Township of Frontenac Islands, County of Frontenac, Province of Ontario. The City of Kingston is located north of the Project on the Canadian mainland.	5 miles west	Construction was scheduled to commence in the first quarter of 2007, with a targeted in-service date of October 2008. As on November 2008 construction had commenced and will continue through the winter into 2009. A July 2009 completion date is assumed.

<sup>1</sup> Distance calculated using a central point within project boundary of the Project and the closest point of each proposed boundary.

<sup>2</sup> Information obtained through publicly available information for each project.

Although no detailed information regarding wetland impacts is available for the Hounsfield Wind Farm, there are significant areas of wetlands and surface waters on and surrounding Galloo Island and construction of the proposed wind farm has the potential to result in adverse impacts to wetlands under NYSDEC and/or USACE jurisdiction (NYSDEC, 2008).

No detailed wetland delineation has been conducted of the Horse Creek Wind Power Project. Based on an analysis of the preliminary Project layout and the approximated wetland boundaries, 12 acres of temporary wetland/stream impact are anticipated to occur due to project construction (not including impacts that may result from any public road improvements). The permanent footprint of access roads is anticipated to result in approximately 1.8 acres of permanent impacts to wetlands/streams (EDR, 2007).

Information regarding specific acreages of impact associated with the Wolfe Island Wind Project was not obtainable. Provincially Significant Wetlands, Non-Provincially Significant Wetlands, and Unevaluated Wetlands were identified on the island as well as sixteen watercourses that would require permanent vehicle crossings (Stantec, 2007).

Disturbances to wetlands and water bodies affect the functions and values (e.g., fish and wildlife habitat, flood protection and abatement, sediment retention, and biological diversity, among others [NYSDEC, 2008]), that these resources provide to surrounding areas. Temporary disturbances associated with construction of access roads, underground and overhead collection lines, and turbines will occur at the Project and at the other proposed wind farm development projects within the region. According to information that is publicly available, these projects have differing schedules (see Table 4-1) and impacts to wetlands will not be concurrent.

Most of these wind generation facilities will cause localized and temporary effects to wetlands during construction; however, these effects would, for the most part, occur at different times for the five projects, and wetland functions and values would be restored following construction. Therefore, significant cumulative impacts from temporary disturbances associated with these five projects are not anticipated.

Permanent disturbance to wetlands is regulated, both by state and federal agencies, which require avoidance and minimization, as well as compensatory mitigation for unavoidable disturbances. All wind projects considered in this cumulative effects analysis that would disturb wetlands are required to restore or improve functions and values of degraded wetlands through compensatory mitigation, resulting in a net increase in wetland acreage. To maintain ecological functions,

wetland mitigation sites are usually required to be located in the same watershed in which the affected wetlands occur.

Compensatory mitigation is typically implemented and functioning in advance of, or concurrent with, project impacts thus reducing temporal losses of functions and values as well as uncertainty regarding the success of offsetting project impacts. Because compensatory mitigation is anticipated to initiate during, and continue following, construction, wetland functions and values provided to the watershed are adequately maintained. Furthermore, compensatory mitigation works to prevent “no net loss” of wetlands, and is often implemented at greater than 1 to 1 replacement ratios, 2 to 1 in the case of the Project. Therefore, construction and operation of the planned wind generation facilities considered in this analysis is not expected to result in significant cumulative adverse impacts to wetlands.

#### **4.1.3 Ecological Resources**

From a regional perspective, localized disturbances to wildlife and wildlife habitats are expected to occur during construction of all of the wind farms listed in Table 4-1. Temporal differences in project schedules will lessen the cumulative effects of temporary impacts to wildlife and wildlife habitats. Disturbances to wildlife and wildlife habitats associated with wind development are consistent with disturbances caused by agricultural and logging practices throughout the region. Permanent loss of wildlife habitats caused by development of these five projects is minimal relative to the habitat coverage in the region. Wildlife and wildlife habitat are common and regionally appropriate for all five projects. Significant cumulative adverse effects are not anticipated because none of the projects, when considered individually, are anticipated to cause significant impacts to wildlife or wildlife habitats and the projects, taken together, will not cause impacts that interact with or increase the extent of the impacts of other projects.

##### **4.1.3.1 Birds and Bats**

Construction of the projects listed in Table 4-1 is expected to affect birds and bats although none of the projects is expected to result in significant adverse effects to either group. In addition to the Project, avian and bat studies have been conducted for the Cape Vincent Wind Power Project, the Horse Creek Wind Power Project; and the Wolfe Island Wind Project. These studies and the associated environmental impact analyses indicate that birds and bats in the prospective project areas were common and widely distributed, and that bird and bat habitats affected by project construction represent a small percentage of the habitat available in surrounding areas. Displaced birds and bats would return to the project area soon after the completion of construction activities and construction related effects to birds and bats caused by one project are not expected to increase effects caused by other projects considered in this analysis. Temporal

differences in project schedules will lessen the cumulative effects of temporary project impacts to birds, bats, and their habitats. Cumulatively, construction-related effects are not expected to result in significant adverse impacts to birds and bats.

Operation of wind generation facilities is known to cause fatalities to birds. Mortality studies conducted at eastern wind facilities indicate fatality rates between 3 and 10 bird fatalities per turbine per year (Kerns and Kerlinger 2004; Nicholson 2002, 2003; Jain et al. 2007). At the Maple Ridge Wind Farm in Lewis County, New York, the closest wind project conducting post-construction monitoring studies, the annual per turbine fatality rate was estimated between 3.1 and 9.6 birds (Jain et al. 2007). Based on the results from all eastern studies, migrant song birds represent approximately 60 to 80 percent of avian fatalities. Relative to other sources of avian mortality, avian-wind turbine collision is low. According to Erickson et al. (2001), collisions with buildings and automobiles result in high avian mortality in excess of 97 million and 60 million birds per year, respectively. Turbine collision mortality averages 2.3 bird deaths per turbine per year for 12 wind facilities located throughout the United States (National Wind Coordinating Collaborative, 2004) while mortality associated with wind projects in the eastern United States averaged 4.3 bird deaths per turbine per year.

**Migrant and Breeding Birds:** Some migrant birds may be subject to turbine collisions. Survey results conducted for the Project and the Cape Vincent Wind Power, the Horse Creek Wind Power, and the Wolfe Island Wind projects indicated slightly above average total number of migrants, birds/hour and number of species but no significant adverse affects to migrant bird populations (see Section 3.3.4.2 Table 3-6). Similarly, the breeding bird surveys identified regionally common, disturbance-tolerant species. Localized reductions in these stable populations are not expected to cause significant adverse effects to breeding bird populations in the project areas.

SLW utilized national and regional average estimates of avian mortality from post-construction monitoring studies of wind farms to evaluate potential avian mortality at individual wind farms. Based on the national average bird fatality per turbine per year as well as the eastern region bird fatality rate (2.3 and 4.3 birds per turbine per year, respectively [NWCC 2004]), estimated cumulative avian mortality from the five regional wind generation facilities is between 978 and 1828 birds per year (Table 4-2).

As an alternate method for estimating potential cumulative avian mortality, fatality rates documented during the first year of post-construction monitoring at the Maple Ridge Wind Farm, located approximately 50 miles southeast of the Project, were used to provide a more local

perspective. The Maple Ridge study documented avian fatalities between 3.1 to 9.6 birds per turbine per year (Jain et al., 2007). Applying these fatality rates, cumulative mortality for the five wind developments considered is estimated to be between 1,318 and 4,080 birds per year (Table 4-2).

Results from the Maple Ridge Wind Farm indicate that 68 percent of identified passerine fatalities occurred in September and October, during the fall migration period (Jain et al., 2007). While some mortality is likely to occur, the cumulative loss of birds is unlikely to adversely affect migrant bird populations found in these areas as these numbers represent a small percentage of the regional migratory population. Therefore, cumulative significant adverse affects to migrating and breeding birds are not anticipated to result from operation of the five wind generation facilities considered in this evaluation.

**Table 4-2**  
**Estimated Cumulative Avian Mortality from**  
**Wind Generation Facilities in Northern New York**

Project	Number of Turbines	Estimated Bird Fatalities per Year Based on NWCC 2004 National Average <u>1</u>	Estimated Bird Fatalities per Year Based on NWCC 2004 Eastern Average <u>2</u>	Estimated Range of Bird Fatalities per year based on 1 <sup>st</sup> Year Results of Maple Ridge Wind Farm <u>3</u>
St. Lawrence Windpower Project	53	122	228	164 - 509
Cape Vincent Wind Power Project	140	322	602	434 - 1344
Hounsfield Wind Farm	84	193	361	260 - 806
Horse Creek Wind Power Project	62	143	267	192 - 595
Wolfe Island Wind Project	86	198	370	267 - 826
Total	425	978	1,828	1,318 - 4,080

<sup>1</sup>National Wind Coordinating Collaborative (NWCC; 2004) reported national avian mortality rates of 2.3 birds per turbine per year (birds/turbine/year). Estimated rates of avian mortality in this table were derived by multiplying the number of turbines in each wind generation facility by the national average avian mortality rate.

<sup>2</sup> NWCC (2004) reported average avian mortality rates in the eastern US region of 4.3 birds/turbine/year. Estimated rates of avian mortality in this table were derived by multiplying the number of turbines in each wind generation facility by the eastern regional average avian mortality rate.

<sup>3</sup> Maple Ridge Wind Farm post-construction monitoring occurred from June through November, 2006 using several methods. Depending on the method employed, average fatalities ranged from 3.1 to 9.6 birds/turbine/year (Jain et al. 2007). Ranges reported in this table, based on data from Maple Ridge, were estimated by multiplying the low and high average mortality rates per turbine per year by the number of turbines in each wind facility.

**Raptors:** WEST concluded that both migrant and breeding raptor use of the Project Area were low, and thus Project impacts to raptors would also be low. From a regional perspective, the five

wind projects considered are not expected to cause significant cumulative adverse effects to breeding or migrant raptors. In general, mean raptor use of the region is low, based on migrating raptor and breeding bird surveys; therefore, direct raptor mortality is expected to be low. In addition, results from the first year of post-construction monitoring at Maple Ridge Wind Farm indicate fewer than 3 percent of all bird fatalities were raptors. Combined with low populations and low risk of expected mortality, no significant cumulative effects to raptors are expected from operation of the five wind energy project considered in this evaluation.

Habitats used by raptors may be indirectly affected by wind project construction; however, raptors are expected to return to the area after temporary impacts cease, or relocate to nearby suitable habitats. For these reasons, no significant adverse effects are expected to occur as a result of construction or operation of the five wind energy facilities. Since construction is asynchronous, any temporary impacts are not expected to be cumulative.

**Bats:** Operation of wind generation facilities is known to result in fatalities to bats, particularly to long-distance migrant tree bats of the *Lasiurus* genus. Based on data collected at three of the four other wind facilities considered in this analysis, operational impacts to resident bats are expected to be lower than to migratory bats. Fatality rates recorded at national and regional wind facilities can provide an estimate of cumulative bat mortality to be expected from operation of the five wind projects considered in this analysis; however, these values do not address seasonal trends or distinguish resident and migrant populations. Average fatalities of 3.4 and 46.3 bats per turbine per year have been reported by NWCC (2004) for U.S. national and eastern region wind facilities. Applying these rates to the number of turbines associated with the five projects the cumulative average annual bat fatality is estimated to be between 6,855 to 11,050 bats (Table 4-3). Annual average bat fatality estimates documented at Maple Ridge Wind Farm during first year monitoring efforts ranged between 15 to 24 bats per turbine, with 244 of 326 identified bat fatalities (75 percent) occurring in July and August (Jain et al., 2007). If patterns of bat fatality for the five regional wind facilities considered are consistent with those observed in the Maple Ridge Wind Farm, cumulative average annual bat fatality is estimated to be between 6,460 to 10,413 bats (Table 4-3).

Although it is difficult to assess population-level impacts on bats because of the lack of regional population data, these predicted ranges of mortality are not anticipated to produce significant adverse effects to regional populations of bat species (Kunz et al., 2007). In addition to man-made factors such as the number, location, and type of turbines or other man-made structures, many natural factors also influence the impacts on regional bat populations. These factors include the number and type of species in an area, species behavior, topography, predators,

disease (i.e., “white nose syndrome”), and weather. In itself, the migration period for bats can be a time of high mortality, mostly when it coincides with adverse weather and other random events (Griffin, 1970; Fleming and Eby, 2003). The ranges of bat mortality estimated to result from the wind projects is not expected to add significantly to the mortality caused by these other factors, or to alter the population dynamics. While cumulative effects to bats may occur due to increased development in the area, factors external to the five projects evaluated herein, such as “white nose syndrome,” are likely to have greater cumulative effects on bats than the five projects.

The Applicant will conduct post-construction monitoring for birds and bats for a minimum period of 3 years to estimate direct impacts of the operating project in terms of mortality rates of birds and bats caused by collisions with wind turbines. These data will be provided to wildlife management agencies to better understand the implications of wind development on bird and bat populations, as well as to develop appropriate additional mitigation measures if impacts to bats significantly exceed the anticipated impacts. Cumulative impacts to Indiana bats are discussed separately in Section 4.1.3.2.

**Table 4-3**  
**Estimated Cumulative Bat Mortality from**  
**Wind Generation Facilities in Northern New York**

Project	Number of Turbines	Estimated Bat Fatalities per Year Based on NWCC 2004 National Average <sup>1</sup>	Estimated Bat Fatalities per Year Based on NWCC 2004 Eastern Average <sup>2</sup>	Estimated Range of Bat Fatalities per year based on 1 <sup>st</sup> Year Results of Maple Ridge Wind Farm <sup>3</sup>
St. Lawrence Windpower Project	53	180	2,454	806 – 1,299
Cape Vincent Wind Power Project	140	476	6,482	2,128 – 3,430
Hounsfield Wind Farm	84	286	3,889	1,277 – 2,058
Horse Creek Wind Power Project	62	211	2,871	942 – 1,519
Wolfe Island Wind Project	86	292	3,982	1,307 – 2,107
Total	425	1,445	19,678	6,460 – 10,413

<sup>1</sup> National Wind Coordinating Collaborative (NWCC 2004) reported national average bat mortality rates for the 3.4 bats per turbine per year (bats/turbine/year). Estimated bat fatalities based on NWCC results were derived by multiplying the number of turbines by the reported national average.

<sup>2</sup> NWCC (2004) reported bat mortality rates for the eastern US region of 46.3 bats/turbine/year. Estimated bat fatalities based on NWCC results were derived by multiplying the number of turbines by the reported eastern regional average. This estimate was used in the Marble River Wind Farm DEIS.

<sup>3</sup> Maple Ridge Wind Farm post-construction monitoring occurred from June through November 2006 using several methods. Depending on the method employed, average fatalities ranged from 15.2 to 24.5 bats/turbine/year (Jain et al. 2007). Ranges reported in this table, based on data from Maple Ridge, were estimated by multiplying the low and high average mortality rates per turbine per year by the number of turbines in each wind facility.

#### ***4.1.3.2 Threatened and Endangered Species***

Listed plant, fish, reptile and amphibian species were not observed within the Project Site; however, suitable wetland habitat for these species was identified. Impacts to wetland or shoreline habitats suitable to these species and non-raptor avian species are avoided or minimized to the extent practical by the layout and design of the Project. Limited temporary disturbance or displacement of grassland avian species may occur. The risk to bald eagles and northern harriers from Project is not expected to be great due to low use and poor nesting habitat of the Project Area, and the low level flights and low soaring frequency, respectively. Based on available information and results of site surveys, it is assumed that Indiana bats may occupy areas near the project area from May through September. Development of the Project could indirectly affect the summer distribution of Indiana bats in Jefferson County by causing abandonment or movement of a known maternal colony located south of the proposed Project Area. However, maternal roosting areas move over time and Indiana bats, along with other bat species populations are expected to continue to use the Cape Vincent peninsula regardless of the proposed Project.

Information regarding listed species within the proposed Hounsfield Wind Farm was not available.

Potential impacts to threatened and endangered species for the Cape Vincent Wind Farm were identified to be limited to the Indiana bat. Individuals were recorded within 10 miles from the proposed project and foraging habit for the species was identified on-site. Based on the EIS, “further evaluation and consultation with USFWS and NYSDEC is on-going.”

According to the DEIS for the Horse Creek Wind Farm, plant species and unique communities would be avoided during construction. Operational impacts to grassland avian species are expected to include occasional collision mortality and disturbance/displacement. Collision mortality for forest dwelling avian species was anticipated to be minimal due to limited placement of turbines in forested areas. Collision risk to raptors was not anticipated to be high. Species most at risk were anticipated to be those that forage in open country as opposed to individuals migrating through the area. Risks to water birds were deemed low as they do not forage in large numbers within the proposed wind farm area. Studies indicate that Indiana bats travel through and forage in areas where turbines would be constructed, and collision mortality could occur as a result of the Horse Creek project. However, the report indicated that “the level of mortality that could result from operation of the [project] is not anticipated to be biologically significant.”

The Natural Heritage Information Center identified ten sensitive species within the proposed Wolfe Island Wind Project. These included six avian species and four plant species. In addition, the Ontario Herpetofaunal Summary listed two reptile/amphibian species within the vicinity of the proposed Wolfe Island Wind Project. Limited information was obtained regarding impacts to threatened and endangered species.

Baseline studies including mist-net surveys for Indiana bats have occurred at SLW, the Cape Vincent wind project and the Horse Creek wind project, and have documented Indiana bat occurrence throughout the region (Woodlot Alternatives, 2006; Kerns et al., 2007b). The magnitude of cumulative effects on Indiana bats is difficult to measure. While cumulative effects to Indiana bats may occur as a result of increased growth and development in the area, unrelated catastrophic events, such as “white nose syndrome,” are likely to have greater cumulative effects on Indiana bats than the projects under review in this analysis or continued human encroachment on Indiana bat habitat.

In general, rare species breeding habitat will be avoided by all of the projects; however, some foraging habitat may be affected. These effects would be localized and temporary because suitable adjacent habitats are readily available. Most of the wind generation projects considered in this analysis also identified potential habitats for state-protected species; those projects similarly concluded that although displacement and mortality might occur, direct and indirect effects would be localized and would affect few, if any, individuals. Each project concluded it would not cause significant adverse effects to state-listed species. As all projects are implementing techniques to reduce or avoid impact to listed species and development of these projects are occurring at different times, cumulative adverse effects to threatened and endangered species are not anticipated from the construction and operation of the wind generation facilities.

#### **4.1.4 Transportation/Traffic**

Temporary increases to traffic volumes are expected as a result of the construction of the Project. The construction schedules of the Hounsfield Wind Farm and the Horse Creek Wind Power Project have not yet been determined. The construction periods for the Cape Vincent Power Project and the Wolfe Island Wind Project, do not overlap with construction of the Project (see Exhibit 4.1.1); therefore, no cumulative impacts to traffic and transportation routes are expected as a result of the Project.

If construction schedules for the Hounsfield Wind Farm and Horse Creek Wind Power Project coincide with that of the Project, it is unlikely that similar transportation routes will be used

because of the location of these projects relative to the Project. However, if construction schedules overlap and similar local transportation routes are used, coordination regarding use of proposed transportation routes would be undertaken by the involved project developers, NYSDOT, and local highway authorities to assure that the duration and extent of impact is minimized and that road repair/restoration work is accomplished at the appropriate time.

Road traffic in the Project Area is currently below capacity and traffic conditions are light. During operation of the Project a limited number of trucks will access the Project Site as well as the other projects in the area for service and maintenance. The Cape Vincent Wind Power Project has not disclosed its estimated operational trip generation. However, because the wind projects typically generate very few trips during their operational periods, no adverse cumulative impact on traffic or local roads is anticipated to result from simultaneous operation of the Project and the Cape Vincent Wind Power Project.

**Exhibit 4.1.1**  
**Project Construction Schedules as Proposed <sup>1</sup>**

2008				2009				2010				2011																											
May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec								

#### **4.1.5.2 Zoning and Other Applicable Laws**

Compliance with local town laws regulating the development of wind farm projects will ensure that cumulative impacts on land are minimal. Construction and operation of these wind farm projects will be conducted in compliance with each Town's local wind energy facility requirements and any conditions appearing in the local permits acquired for each of the projects.

#### **4.1.5.3 Agricultural Land Use**

Impacts to agricultural land would be greatest during construction of the projects because additional acreage will be required for workspace and movement of equipment and material. However, these projects have been located to minimize loss of active agricultural land and interference with agricultural operations in accordance with agriculture mitigation measures based on New York State Ag. & Markets guidelines for avoidance of impact, mitigation, and restoration of agricultural resources as described in Section 3.5.3.2.

Operation of the projects will be compatible with agricultural land use and could have a long-term positive benefit to individual towns in both counties because setback requirements for wind turbines on agricultural land discourage encroaching non-agricultural uses. In addition, participating farmers can afford to continue farming operations on their property as a result of a reliable supplemental source of income provided by lease and royalty payments.

#### **4.1.5.4 Future Land Use**

The proposed Project should not interfere with future plans to develop land in the area for single family, residential, agricultural, or other uses permitted under the applicable zoning ordinances provided that the proposed future uses comply with applicable setback requirements established by each host municipality.

#### **4.1.6 Utilities and Community Services**

The impacts of all of the five projects will be additive, not cumulative because: 1) the Project will inject new power into the regional grid at the Lyme Substation increasing the local electricity supply and system reliability; 2) the Project will not have significant adverse impacts on the demand for emergency services since existing services (e.g., police, fire, ambulance, and health care) have the personnel and equipment necessary to respond to emergencies that could occur during both construction and operation of the Project; 3) PILOT payments to be made by SLW will provide revenues for use by school districts.

#### **4.1.7 Cultural Resources**

Construction and operation of the Project will not have any impacts on archeological resources since the Project layout has been developed to avoid areas where archaeological resources are anticipated to be present. Since no Project-specific impacts are anticipated, the Project is not anticipated to contribute to any cumulative impacts on archeological resources that might be caused by planned development of the other four wind energy projects in the region.

Construction of the Project will not have any direct impacts on architectural resources (e.g., through demolition of any NRHP-listed or NRHP-eligible buildings), and no potential direct impacts have been identified associated with the other four projects considered in this evaluation. However, during construction, each of these projects could have visual impacts on nearby NRHP-listed or -eligible properties. It is unlikely that these impacts will be significant due to their temporal nature. In addition, since the Project will not be under construction at the same time as the other four projects, there will be no cumulative effect to the historic architectural resources due to construction-related activities.

Operation of each of the projects in the region will result in visual impacts on NRHP-listed and eligible properties within a 5-mile viewshed, the extent of the SHPO-determined viewshed for historic structures. The Applicant will review potential cumulative impacts with the lead agencies, the SHPO, and interested stakeholders, and the results of that review will be presented in the FEIS.

#### **4.1.8 Visual Resources/Community Character**

The adjacent St. Lawrence Wind and Cape Vincent Projects will have viewshed areas that substantially overlap. Considering the extended view opportunities within the Rural Agricultural Landscape Unit covering much of the Town of Cape Vincent, an observer will likely view multiple turbines of both projects from numerous locations. The degree of impact will not similarly increase within the Village Center Landscape Unit where intervening structures, street trees and other local vegetation will screen most, if not all turbines from view.

While owned and operated by individual entities, the distinction between projects will not be readily apparent to typical observers. The cumulative effect of the Cape Vincent Project would be perceived as the same as if the St. Lawrence Project were approximately three times its proposed size. Combined, the St. Lawrence and Cape Vincent Projects would encompass a majority of the land area of the Town of Cape Vincent. Views of the turbines would be dominant and widespread. Both Projects propose to utilize an existing National Grid substation in the

Town of Lyme. Developing a shared transmission ROW between the Cape Vincent and St. Lawrence Projects can mitigate cumulative impact from transmission lines.

The 86-turbine Canadian renewable Energy Corporation Wolfe Island Wind Project is currently under construction. Wolfe Island, Ontario, is directly across the St. Lawrence River from the Village of Cape Vincent; approximately three miles northwest of the nearest Project turbine. Due to the presence of existing woodland and hedgerow vegetation there are few inland locations within the Town of Cape Vincent where Wolfe Island or the St. Lawrence River is presently visible. Views of the Wolfe Island Project from inland agricultural areas in and around the project site will likely be limited to glimpses of blade tips above the intervening tree lines at distances of more than three miles.

Conversely, riverfront locations in the Village and Town of Cape Vincent will directly view the Wolfe Island Project across the St. Lawrence River. Simultaneous views of the Wolfe Island and the St. Lawrence Windpower Projects from coastal vantage points will be limited since, in all cases, the projects are located in opposite directions. Importantly, with primary views focused toward the River, the presence of the Wolfe Island Project creates a more direct impact on scenic river views from the U.S coastal area than does the St. Lawrence Windpower Project. Similarly, the Project will be directly visible from southeast coast and upland agricultural areas of Wolfe Island. Both projects will be visible from common on-water vantage points on Lake Ontario and the St. Lawrence River, albeit in different directions.

The Horse Creek Wind Farm Project is approximately seven miles southeast of the St. Lawrence Windpower Project. At this distance should both projects be simultaneously visible, it is likely that turbines from the closer project would be viewed in the foreground and dominate the scene. Turbines from the more distant project would be viewed as part of the distant background where impact is significantly diminished. Long distance views would generally be restricted to elevated, open (agricultural) areas. It is possible that views from intermediate locations could occur. However, such views would be in opposite directions.

Upstate Power proposes to install and operate up to 84 wind turbines on Galloo Island in the Town of Hounsfield. Galloo Island is situated in Lake Ontario more than five miles offshore. The Hounsfield project is approximately 13 miles southwest of the St. Lawrence Project. At this distance atmospheric and linear perspective will substantially diminish the clarity of view, often rendering turbine framework and rotating blades nearly indistinguishable. The presence of intervening islands and irregular coastline make views from common intermediate coastal vantage points unlikely. Where such vantage points exist, views will be in opposite directions.

**Cumulative Summary:** Cumulative project visibility does not increase aesthetic impact in a linear manner. For example, a view of 20 turbines is not twice as significant an impact as a view of 10 turbines. The first incidence of project visibility on an undeveloped landscape creates the greatest degree of aesthetic change. Installation of one wind energy project on an agricultural landscape changes the landscape's character. Installation of a second equally sized project within the same viewshed is compatible with the character with the first project, resulting in a lesser impact on the aesthetic quality of the land than the original development.

Turbines within multiple wind energy projects would typically be viewed within different distance zones. Turbines from the closer project would be viewed in the foreground and tend to be the dominant element within the scene. Turbines from a more distant project would be smaller in scale and less impacting as part of the distant background landscape.

Should all projects currently proposed or under consideration be constructed, the area in an approximately 13-mile radius of the town of Cape Vincent would include over 350 utility scale wind generating turbines each likely exceeding 390 feet in height. While not continuously visible, wind-generating turbines would be dominant and widespread from local roadways, homes and various places of interest. Turbines would also be visible on the horizon from vantage points on Lake Ontario and the St. Lawrence River along approximately 50 miles of waterway, from Clayton west and south to Southwick State Park, Jefferson County.

#### **4.1.9 Air Quality**

Cumulative impacts to air quality are not anticipated during construction of the Project due to the differing schedules as described in Section 4.4. However, there will be a cumulative positive impact from the operation of the Projects which will result in the avoidance of emissions to the air identified in Table 4-4.

#### **4.1.10 Noise**

Cumulative noise impacts were assessed for Project construction and operation. In assessing cumulative effects of noise for the Project, the Project noise study area was extended to include BP's proposed Cape Vincent Wind Project to the southeast of the Project, which could potentially impact the residences of concern. The three other wind energy development projects in Table 4-1 were determined to be sufficiently distant from the Project that they would not contribute to cumulative noise impacts to receptors within the Project study area.

**Table 4-4**  
**Estimated Emissions Reductions Resulting from the Projects**

Project	Total Annual Reductions (tons/year) <sup>1</sup>		
	Carbon dioxide (CO <sub>2</sub> )	Sulfur dioxide (SO <sub>2</sub> )	Nitrogen oxides (NO <sub>x</sub> )
St. Lawrence Windpower Project	73,085.4	313.4	86.7
Cape Vincent Wind Power Project	193,055.9	827.8	229.0
Hounsfield Wind Farm	247,111.6	1,059.6	293.2
Horse Creek Wind Power Project	121,349.4	520.3	144.0
Wolfe Island Wind Project	181,840.3	779.7	215.7
Total	816,442.6	3,500.9	968.6

<sup>1</sup> Based on USEPA's Emissions and Generation Resource Integrated Database (EPA eGRID), assumes average output emission rates for upstate New York power generators are approximately equal to: SO<sub>2</sub> at 3.00 pounds (lbs)/MWh, NO<sub>x</sub> at 0.83 lb/MWh, and CO<sub>2</sub> at 699.63 lbs/MWh (EPA eGRID 2007 Version 1.0 Year 2005 Summary Tables).

The cumulative modeling analysis (Appendix L) demonstrates that a number of turbines in the adjacent Cape Vincent Wind Project are close enough that the sound levels at some residences between the two projects are likely to experience slightly higher sound levels than they otherwise would if the St. Lawrence Project existed in isolation. However, the predicted cumulative sound levels are expected to be in the order of 1-2 dBA over that of the St. Lawrence Project alone, which is a barely perceivable increase in terms of increased cumulative sound impacts.

While addition of the BP turbines would clearly reshape the area within the 42 dBA impact threshold in many places, only a few non-participating residences that were formerly close to, but outside of, the 42 dBA contour would be inside of this area if the BP project were added. These residences or groups of residences are properties that are primarily affected by the St. Lawrence Project and where the noise from the adjacent project would be secondary. The actual change in sound exposure at these locations would be small due to this cumulative affect. The predicted sound levels with the St. Lawrence Windpower Project alone and with both projects at these four locations are summarized in Table 3-33 and also depicted in Exhibit 3.10.4 in Section 3.10.

In general, a change of at least 3 dBA is normally required before any real difference in sound level begins to be perceptible, so these cumulative increases of 2 dBA or less at some residences in the Project Area are minor and do not represent a substantial, or particularly tangible, change in the potential impact from the Project when combined with the adjacent project. Essentially,

whatever the reaction to noise might have been in response the St. Lawrence Project alone would occur to the same degree and extent if both projects were constructed.

#### **4.1.11 Socioeconomics**

##### **4.1.11.1 Population and Housing**

Construction and operation of the wind projects are not anticipated to have adverse cumulative affects on the population and housing in the area, and it is not anticipated that additional (new) housing will be required. Construction for the Wolfe Island Wind Farm started in November 2008 and will be completed in July 2009 before the Project will be built. Based on the known schedules for the other wind projects, the Project construction will not overlap and therefore not cause or contribute to cumulative impacts on population and housing.

##### **4.1.11.2 Property Values**

The proposed projects should not have a cumulative adverse impact on local property values. The sales data collected in existing wind farm markets indicates that the construction and operation of wind farms have no influence on property values. A recent U.S. focused study, investigating four sites in the northeast (two in New York and two in Pennsylvania) with a sample size of over 350 home sales for each site, evaluated whether wind facilities affect local property values (Wiser and Hoen, 2007). This study evaluated three categories of concerns: 1) Area Stigma defined as “industrialization” of area leading to decreases in tourism and second home desirability, 2) Scenic Vista Stigma defined as decreases in quality of scenic vistas from homes; and 3) Nuisance & Health Effects defined as potential health/well being concerns of nearby residents. Preliminary results of this study indicate that there is no statistical evidence that homes within 4 to 7 miles of a facility are affected adversely based simply on proximity, or that homes with a view of turbines have different values than homes without.

##### **4.1.11.3 Economy and Employment**

Construction of the five projects will have cumulative benefits on the regional economy. The sustained construction over the next 3 years will result in the direct creation of a number of jobs. The five projects will also have indirect impacts on the local economy through the purchases of goods and services, which will support local businesses. In addition, local lease payments to participating landowners will enhance their ability to purchase additional goods and services. To the extent that these purchases are made locally, they will have a broader positive affect on the local economy.

Total construction cost for the four U.S. projects is estimated to be approximately \$511 million. Approximately 15 to 18 percent of this total is the expected local share. Local share of annual operating and maintenance costs is estimated to range between \$1.8 million and \$2.5 million, providing an economic benefit to the region. While these figures are not known for the Wolfe Island Wind Project, direct and indirect project expenditures will result in cumulative significant economic benefits to the region during construction and operation of the projects.

#### **4.1.11.4 Municipal Budgets and Taxes**

The projects will have a cumulative beneficial impact on municipal budgets and taxes since the taxing jurisdictions will receive additional revenues from the projects in the form of PILOT revenues.

#### **4.1.12 Telecommunications**

These impacts are additive and can be quantified by simply adding the total impacts quantities associated with each Project.

#### **4.1.13 Safety and Security**

These impacts are additive and can be quantified by simply adding the total impacts associated with each Project.

### **4.2 Growth Inducing Impacts**

Some proposed actions under the SEQR process have the potential to trigger further development by either attracting a significant local population, inviting commercial or industrial growth, or by inducing the development of similar projects adjacent to the built facility. The proposed SLW Project does not require a permanent work force greater than approximately four to six full-time employees, and therefore will not lead to significant, permanent growth in local population or housing. The temporary impacts associated with the construction workforce were discussed in Section 3.11. Although the Project's operations phase work force will likely support the local economy through the purchase of goods and services, the type and level of expenditures are not anticipated to generate significant growth in the businesses that serve the proposed facility. As a result, secondary or indirect impacts associated with local growth are not anticipated to occur as a result of the proposed Project.

The Project may result in improved local infrastructure which would better support unrelated economic development. Local roads used for component delivery routes would be improved to accommodate Project construction equipment. Improvements to these roads would accommodate heavier, larger vehicles once the Project is completed. In addition, the increased Project-related

income to local governments may allow localities to create amenities to attract desirable economic development within the Project Area. These improvements and enhancements are considered Project benefits.

The Project may enhance tourism traffic in the area, especially in the first few years of operation. Greater tourist traffic could generate business for local providers of gasoline, overnight accommodations, and restaurant services. Based on construction of other wind farms in New York State surrounding communities generally experience an increase in tourist traffic, but not to the extent that expansion of existing businesses or the establishment of new businesses have resulted. Certain communities such as the Town of Fenner, Madison County, New York have established a renewable energy education and visitor center aimed at sustaining wind farm-related tourism.

Participating farmers would receive economic benefits that would allow them to enhance their operations through better technology or expansion of available property and resources. The preservation of agricultural land and economic gain in the Project Area would provide these landowners alternatives to selling their farms for construction of residential tracts and subdivisions. The Project would also provide an additional revenue stream that could supplement their income in years of lower agriculture and farm yield.

The St. Lawrence Windpower Project is proposed, in part, because of the existing wind resource and associated transmission facilities allow the action to be economically viable. Specifically, the availability of adequate wind and the presence of an existing transmission line in the Town of Lyme allows for generation and transmission of the Project's electric output to the power grid. The availability of these resources/facilities has shown that other wind power projects will be proposed on adjacent properties. The construction of the Project will not encourage the development of additional wind power projects in the area. Since existing transmission lines have limited additional capacity, the Project may make future projects more expensive to develop if such development could only be accommodated by upgrading existing transmission lines.