4.0 ALTERNATIVES ANALYSIS

4.1 NO ACTION

Most of the information in Section 4.1 of the DEIS regarding the no action alternative remains relevant. However, there are some differences due to changes in the Project nameplate capacity from 87.5 MW to the 77.7 MW capacity that is now proposed. The no action alternative assumes that the Project site would continue to exist as agricultural, forested, successional and rural residential land. This no action alternative would not affect on-site ambient noise conditions, construction traffic or public road conditions, wildlife or wildlife habitat, wetlands and streams, or television/communication systems, and would maintain community character, economic and energy-generating conditions as they currently exist.

If the no action alternative is pursued, the following positive environmental impacts associated with adding 77.7 MW of new renewable energy capacity to the NYISO electric power system would not occur:

- A reduction of air emissions, specifically the displacement of up to 46 tons of NO_x and 121 tons of SO_2 during Project operation
- A reduction in the emission of greenhouse gases, specifically the displacement of up to 59,440 tons of CO_2 during Project operation
- A displacement of 5.4 pounds of mercury
- A displacement of 2,989 tons of lead compounds
- Loss of opportunity to develop wind resource in Project Area consistent with State Energy Plan and policies promoting the development of renewable energy projects.

Furthermore, if the no action alternative is pursued, the lack of economic development resulting from Project construction and operation would result in undesirable economic impacts. These would include loss of income from local operating and maintenance jobs of over $420,000 per year, loss of income from approximately 73 local construction jobs, loss of lease revenues for participating landowners, loss of increased revenues of local taxing jurisdictions, and loss of payments to Project neighbors.

Given the short-term nature of anticipated construction impacts and the generally minor long-term impacts of Project operation, as compared to the significant economic, policy and environmental benefits that the Project would generate, the no action alternative is not considered a preferred alternative.

4.2 ALTERNATIVE PROJECT LOCATION

The discussion of the process by which the Applicant determined the site for the proposed Project is as described in Section 4.2 of the DEIS. The process of selection for a wind farm location is based on multiple factors that contribute to the operation of a facility in a technically and economically viable manner. These factors generally include the following:

- adequate wind resource
- adequate access to the bulk power transmission system, from the standpoints of proximity and ability of the system to accommodate the interconnection and accept and transmit the power from the Project
- contiguous areas of available land
- compatible land use
- willing land lease participants and host communities
- limited population/residential development
- limited sensitive ecological issues
- compliance with local, state, and federal laws and regulations

All of the above listed factors were considered during the process of selection the location of the Project. Consequently, the current location of the Proposed Project reflects the best possible combination of these factors and is largely within the same Project Area that was defined for the DEIS.

4.3 ALTERNATIVE PROJECT DESIGN/LAYOUT

In the process of arriving at the Project layout presented in this SEIS, the Applicant has developed a number of different configurations, including those presented in the DEIS. Each iteration of the Project layout has incorporated either major or minor adjustments according to the often dynamic criteria that are considered when siting the Project facilities. The primary criteria that are utilized in the process of siting Project facilities are listed below:

- Exposure to adequate wind resources
- Adherence to setbacks from homes, structures, roads, and property lines
- Sufficient spaces between turbines to maximize production and minimize turbulence
- Adherence to agricultural protection measures
- Setbacks from gas wells
- Avoidance of environmental, cultural, and other sensitive resources

- Avoidance of unstable land forms and other engineering constraints
- Landowner preferences
- Sensitivity to viewshed and noise issues

A preliminary layout of the Project was based on constraint information from a desktop review and wind resource data. A process of refinement was then initiated that included incorporating information from engineering and environmental work to account for wetlands and other significant natural resources. Additional changes to the Project layout were made to incorporate setbacks, turbine spacing, meteorological data, and landowner participation. This process resulted in the 53 turbine layout of the Project presented in the DEIS.

Subsequent to the preparation of the DEIS, the applicant has continued the process of revision by conducting additional support studies and revising the engineering plans for the Project facilities. Furthermore, rapid improvements in wind turbine technology in recent years have allowed the Applicant to opt for taller, higher output capacity turbines compared to the models considered in the DEIS (which were proposed in 2008). Consequently, fewer turbines are required to achieve a similar nameplate capacity to the layouts presented in the DEIS and maintain the positive benefits associated with the original proposed renewable energy output for the Project. The combination of the above mentioned factors has resulted in the 37 turbine layout presented in this SEIS. This layout represents a significant reduction in both the number of turbines, and the Project impacts footprint when compared to the layout presented in the DEIS. Most notably, two of the turbine locations proposed in the DEIS layout, which were to be located east of the Chateaugay River, have been eliminated. Otherwise, the proposed turbine locations in SEIS layout remain for the most part in close proximity to the turbine locations that were previously evaluated in the SEIS. Table 40 below presents the differences between the Project layouts evaluated in the DEIS and SEIS, with respect to Project facilities and temporary and permanent impacts. Further detail regarding these impacts is provided in Sections 2.1, 2.2, 2.3 and 2.13 of this SEIS.

Table 40. Soil Disturbance Impacts by Project Component from DEIS to SEIS[1]

	DEIS		SEIS	
	Temporary (acres)	**Permanent (acres)**	**Temporary (acres)**	**Permanent (acres)**
Turbines	226	9	151.5	14.8
Access Road	90	61	35.5	33.3
Road Improvements	No data	No data	9.2	0
Underground Collection Line	43	0	72.7	0
Overhead Collection Line	<1	0	<1	0
Substation	0	16	0.75	1.25

	DEIS		SEIS	
	Temporary (acres)	**Permanent (acres)**	**Temporary (acres)**	**Permanent (acres)**
Laydown Yard	20	0	10.0	0
O&M Building	5	5	0	0
Meteorological Tower	No data	No data	0.9	0.1
Total	**384[3]**	**91**	**281**	**50**

1The impact acreages in this table apply to the 37 turbine proposed layout. Six alternate turbine locations and associated facilities have been studied as well, although the final Project will be built with 37 turbines.
[3]The text of the DEIS in Section 2.1.2.2.1 states that of the total 323 acres proposed to be disturbed, 232 acres would be restored, indicating that 232 acres would have been the temporary impact to soils. However, totaling the DEIS impact numbers in table 2.1-4 indicates that 384 acres would have been disturbed through the DEIS Project.

Table 41. Natural Resources Impacts from DEIS to SEIS[1]

	DEIS		SEIS	
	Temporary (acres)	**Permanent (acres)**	**Temporary (acres)**	**Permanent (acres)**
Soil Disturbance[2]	384	91	280.6	49.4
Vegetation	426.5	88.6	432.6	49.5
Agricultural Land Use	400	100	265	29.6
Prime Farmland Soil	7.48	3.28	3.6	1.0
Wetlands	8.81	0.87	3.70	0.13

[1]The impact acreages in this table apply to the 37 turbine proposed layout, including associated facilities. Six alternate turbine locations and associated facilities have been studied as well, although the final Project will be built with 37 turbines.

As shown in Table 1, if the Project were to continue to use smaller turbines as proposed in the DEIS, the number of turbines required to meet the Project's stated purpose, need and benefits would increase. The use of a greater number of smaller turbines may have the effect of reducing visibility, but as discussed in Section 2.5 of this SEIS, this impact is expected to be negligible. Also, smaller turbines would require more participating parcels of land, which results in additional impacts to other resources due to ground and vegetation disturbance and particularly more wetland disturbance and impacts (more project roads, more electrical lines and additional land disturbance).

As noted above, the layout represents significant effort in analyzing the development potential of the site, landowner participation, wind resource assessment and a review of the site's zoning constraints. The current layout represents a balance between renewable energy production and avoidance of environmental impacts. Significant relocation of any of the turbines to a site other than the one of the identified locations would significantly complicate development across the Project and could potentially create different or new impacts than originally proposed at other locations. Therefore,

reduction of environmental impacts through significant modifications of turbine location at a few locations is not feasible. Moreover, in the case of potential visual impacts, reduction in number of turbines by a few is unlikely to have any significant change in Project visibility or visual impact from most locations.

Finally, the Applicant has proposed 43 turbine sites but ultimately proposes to develop 37 turbines. The alternative turbine sites were identified based on the siting constraints and factors discussed in this section. The Applicant selected more sites than proposed turbines to provide additional flexibility in choosing sites that balance the Applicant's goals with respect to energy generation, but also avoiding and minimizing potential environmental impacts. The final selection of the 37 turbines to be constructed from the 43 turbine locations evaluated herein will be determined prior to construction. It is also worth noting that the Applicant has proposed 2.1 MW turbines to maximize potential energy production within the constraints of their approved interconnection agreement while minimizing the number of proposed wind turbines.

4.4 ALTERNATIVE ENERGY PRODUCTION TECHNOLOGIES

An extensive discussion of alternative energy production technologies is provided in Section 4.4 of the DEIS and is still fully relevant to this SEIS. It is the Applicant's purpose to generate electricity from wind. Even if the Applicant had a more broadly defined purpose, such as to generate renewable energy from any technology that could qualify under the New York State RPS, the alternative technologies available to the Applicant to achieve this purpose are limited, and none are reasonable alternatives given the capabilities of the Applicant. The Applicant does not currently operate any coal facilities that can be co-fired with biomass and no portfolio of hydroelectric facilities that can be developed or expanded. Furthermore, the tidal energy, biofuel, utility-sized solar, and biogas sectors are not well developed and not necessarily suitable for power generation in New York.

4.5 ALTERNATIVE TURBINE TECHNOLOGY

A discussion of the various wind turbine technologies considered by the Applicant for the Project is provided in Section 4.5 of the DEIS and is still fully relevant to this SEIS. A variety of wind turbine technologies such as vertical axis turbines, two-bladed turbines, and significantly smaller turbines have been evaluated. However, the three-bladed, upwind, horizontal axis, propeller-type wind turbine has been determined to be the most reliable and commercially viable technology for the application of utility scale electrical power generation.

Since the preparation of the DEIS, the Applicant has revised the wind turbine model being considered for the Project from the Vestas V-82 to the Gamesa G114-2.1. This SEIS assumes that the Project will use Gamesa G114-2.1 WTGs.

As shown in Table 1 in Section 1.0 (Project Description) of this SEIS, the Gamesa G114-2.1 is larger wind turbine than the Vestas V-82 with respect to hub height, rotor diameter, and total height. Assuming use of the Gamesa G114-2.1 turbine, the anticipated tower height for the Project, or "hub height" (height from foundation to the rotor hub), is approximately 93 meters (305 feet). The Gamesa G114-2.1 has a rotor diameter of 114 meters (374 feet), resulting in a total height of 150 meters (492 feet). The Gamesa G114-2.1 also has a higher production capacity than the Vestas V-82. Fewer turbines are proposed in the current layout as a result of the increased nameplate capacities of the larger wind turbine. Taller turbines can create the potential for impacts due to setback issues, the potential for increased visibility, and higher rotor swept zones. However, when compared to a larger number of shorter turbines, the overall benefits associated with the energy production at the taller height and the net reduction of impacts due to fewer turbines outweigh the relatively minor differences in potential environmental impacts associated with the increased wind turbine dimensions. To address the fact that the installation of the Gamesa G114-2.1 would exceed local height restrictions, the Applicant has applied for waivers pursuant to Article V of the Town of Chateaugay Wind Energy Facilities Local Law No. 7 of 2006 and Article V of the Town of Bellmont Wind Energy Facilities Law No. 2 of 2006 (See Section 2.13.2.1.2 of this SEIS).

4.6 ALTERNATIVE PROJECT SCALE AND MAGNITUDE

A discussion regarding alternative scales and magnitudes considered for the Project is provided in Section 4.6 of the DEIS and is still relevant. Since the preparation of the DEIS, the Applicant has reduced the size of the Project from 53 wind turbines to 37 turbines as presented in this SEIS. Because the currently proposed Gamesa G114-2.1 turbine has a higher power output than the previously proposed Vestas V-82, the project power output will remain at a similar scale to that described in the DEIS. The current SEIS layout of the Project is considered by the Applicant to achieve a desirable balance between economic viability, limited impacts to environmental resources, and electricity production goals.

4.7 ALTERNATIVE PROJECT TIMING

The discussion of the factors and events that dictate the timing of the development of the Project provided in Section 4.7 of the DEIS remains generally relevant, with the exception that the earliest date Project construction may begin is early 2016. Constraints on the timing of Project construction include that clearing is expected to take place in the winter in order to avoid and minimize impacts to birds and bats that inhabit the trees in the summer. Therefore, Project construction is expected to begin in the winter of 2016. Factors determining when the Project can begin are both external and internal in nature, with external factors including securing sufficient equipment, and acquiring regulatory approvals, while internal factors include decisions by the Applicant to prioritize where to focus its available resources.

As stated in the DEIS, the Jericho Rise Project cannot be constructed until this SEQR process is complete and the applicable federal, state and local permits have been obtained. A preliminary construction schedule for the Project is provided in Table 2 in Section 1.6 of this SEIS.

4.8 ALTERNATIVE MITIGATION STRATEGIES

A discussion regarding alternative mitigation strategies considered for the Project is provided in Section 4.8 of the DEIS, and further detailed in Section 4.8 of this SEIS. In addition, Section 2.0 of this SEIS describes the anticipated impacts and corresponding proposed mitigation measures for each environmental resource based on the currently proposed Project layout. The Applicant has paid close attention to defining each environmental resource and land use constraint and siting the Project facilities so as to avoid or minimize impacts to them. For any resource or land use constraint areas that cannot avoided, mitigation measures have been developed by the Applicant in coordination with relevant agency staff, local officials, and affected stakeholders. A wide range of options were considered by the Applicant when developing these mitigation measures. The mitigation plan that has resulted from these efforts minimizes impacts both during construction and operation of the Project, and allows for flexibility to adapt to unforeseen impact conditions that may be encountered.