DRAFT ENVIRONMENTAL IMPACT STATEMENT

Middle Island Solar Farm
Solar Energy Production Facility

Moriches-Middle Island Road
Hamlet of Mastic, Town of Brookhaven
Suffolk County, New York

PREPARED FOR

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January 2016

DRAFT ENVIRONMENTAL IMPACT STATEMENT
PROPOSED MIDDLE ISLAND SOLAR FARM
SOLAR ENERGY PRODUCTION FACILITY
MORICHES-MIDDLE ISLAND ROAD
HAMLET OF MASTIC, TOWN OF BROOKHAVEN
SUFFOLK COUNTY, NEW YORK

PROJECT LOCATION: 100.33± acres located on the south side of Moriches-Middle Island Road

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DATE OF PREPARATION: January 2016

AVAILABILITY OF DOCUMENT:	This document represents a Draft Environmental Impact Statement (DEIS) prepared in accordance with the Article 8 of the New York Environmental Conservation Law (the State Environmental Quality Review Act [SEQRA]) and its implementing regulations at 6 NYCRR Part 617. Copies are available for public review and comment at the offices of the lead agency.
DATE OF ACCEPTANCE:	February 10, 2016
DEADLINE FOR COMMENTS:	April 6, 2015

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Executive Summary

This document is a Draft Environmental Impact Statement (DEIS) prepared in accordance with the State Environmental Quality Review Act (SEQRA) and its implementing regulations at 6 NYCRR Part 617 for the action contemplated herein, and is based upon the Positive Declaration issued by the Town of Brookhaven Planning Board (the "Planning Board"), as lead agency. Public scoping was conducted by the Town of Brookhaven Town Board (the "Town Board") for a nearly identical proposal at the subject property (i.e., a Special Permit application for a solar photovoltaic Electric Generating Facility), and a Final Scope was promulgated by the Town Board for that application on September 16, 2014. As indicated in the Planning Board Positive Declaration (see Appendix A), rather than conduct a new public scoping process, the prior Final Scope will be considered for the purposes of the SEQRA review process. This DEIS evaluates the potential adverse impacts associated with the proposed action, which consists of a request for a special permit for a solar energy production facility located on approximately 100.33 acres of vacant land to be known as Middle Island Solar Farm (hereinafter "MISF"). The subject property is located south Moriches-Middle Island Road and east of Cranford Boulevard in the hamlet of Mastic, Town of Brookhaven, Suffolk County, New York.

The DEIS evaluated the following issues, based on the Positive Declaration (and the Final Scope for the previous application) issued by the Planning Board and Town Board, respectively (see Appendix A):

- Geological Resources
- Water Resources and Plans
- Ecological Resources
- Air Resources
- Land Use, Zoning, and Plans
- Transportation
- Aesthetics, Visual Resources and Noise
- Energy

This Executive Summary is designed solely to provide an overview of the proposed action, a brief summary of the potential adverse impacts identified and mitigation measures proposed, as well as alternatives considered. Review of the Executive Summary is not a substitute for the full evaluation of the proposed project performed in Sections 2.0 through 5.0 of this DEIS.

Introduction

The proposed action consists of a special use permit for a solar energy production facility on the 100.33±-acre vacant property, known on the Suffolk County Tax Map (SCTM) as District 0200 – Section 712.00 – Block 09.00 – Lot 001.000 (the "subject property"). The proposed project, MISF, consists of the development of a photovoltaic (PV) solar energy farm capable of generating approximately 19.6 megawatts (MW) of renewable electricity for distribution onto the Long Island Power Authority (LIPA) – PSEG Long Island power grid. The subject property is located along the south side of Moriches-Middle Island Road and the east side of Cranford Boulevard in the hamlet of Mastic, Town of Brookhaven.

Project Description

The applicant, which has controlled the subject property for over 30 years and is invested in the future of the site, has developed the proposed action to establish a renewable, "green" source of electricity that will benefit the Town of Brookhaven and Long Island by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, MISF anticipates that the proposed facility would be interconnected to the power grid supplying 19.6 MW of electricity to the system for use by PSEG Long Island's customers through a Power Purchase Agreement (PPA). However, MISF does not have an executed PPA at this time.

The proposed project will include a field of solar panel arrays, associated electrical distribution equipment, a maintenance and operations building, perimeter and centerline internal driveways, site fencing, drainage retention areas and vegetated (natural) buffer areas. The developed portion of the site would occupy 61.03± acres, equating to 60.83 percent of the property. The remaining 39.30± acres, equating to 39.17 percent of the property, would remain in its existing natural, wooded state.

Regrading of the site would occur as necessary for appropriate mobility and equipment installation needs, as well as to contain and recharge all stormwater runoff from the developed portion of the site. It is not expected that any fill material would need to be brought in, nor that any cut material will need to be removed from the site. Approximately 54.18 acres, or approximately 88.78 percent of all cleared area, will be re-vegetated with native species after equipment installation has been completed.

The solar arrays will consist of interconnected, ground mounted, fixed position photovoltaic solar collection panels. The arrays will be connected to metal frames supported on piles for stability. The piles will be either helical steel piles or pre-cast concrete piles, depending on results of future soil sampling. The arrays will be aligned east-to-west, oriented and angled toward the sun exposure. The low end of each panel array will be fixed at approximately eight feet above grade level (agl), and the high end will extend to approximately 17 feet agl.

The array strings will be arranged in parallel rows, with each row spaced 24 feet on center, separated by a 12-foot-wide grassed (pervious) access pathway. Areas beneath and surrounding the solar arrays will be planted with a variety of native shrubs and grasses. Access to the arrays will be via a 20-foot-wide driveway running around the perimeter of the array field, as well a 20-foot-wide centerline driveway separating the two primary banks of arrays. These internal driveways will be pervious, unpaved, gravel surfaces to minimize stormwater runoff and allow for stormwater infiltration. Additionally, stormwater will be able to infiltrate at the areas beneath each array, established with native, low-growing vegetation. A stormwater management plan that locates shallow recharge areas at existing topographic low points would be implemented at the site.

A 100-foot-by-100-foot area at the southern portion of the subject property will be reserved for electrical equipment and switchgear required to convert the voltage generated at the site for distribution onto the local grid. A 4,032±-square-foot maintenance and operations building (84-feet-by-48-feet, approximately 24 feet high) is planned for construction within the northeast portion of the site, proximate to the site access drive. The building will be multi-functional with divided areas serving as office space, storage areas, security surveillance, control room, repair shop, and system monitoring. A parking area with 17 spaces and one loading space adjacent to the maintenance building will extend from the gravel driveway. Due to the low number of people expected to be on site, the number of vehicle generated trips from the project is expected to be minimal. An on-site subsurface septic system will be installed for the building, as well as a drywell for collection of roof stormwater runoff. Water usage for the site will be via connection to the Suffolk County Water Authority (SCWA) water main located along Moriches-Middle Island Road. A connection to the LIPA power grid at Moriches-Middle Island Road for electrical service will be necessary to power the maintenance and operations building, site lighting, etc. The proposed solar farm will be interconnected to the power grid to distribute electricity generated by the PV arrays, and New York Independent System Operator (NYISO)/PSEG Long Island will be responsible for locating, designing and installing the power line(s) for the distribution of power generated by the proposed facility. Accordingly, the identification of the connection route is not possible at this time, and it is not known or under the control of the applicant. A conceptual interconnection route has been identified, which extends from the northern boundary of the subject property east along Moriches-Middle Island Road and south along Weeks Avenue until reaching the aforementioned electric substation. However, details of the specific location or design of this or any interconnection are

not available, as the utility will ultimately design and implement the interconnection in the future. As the specific location and design is not known, this DEIS evaluates a conceptual interconnection route, which is shown on the *Conceptual Interconnection Route* plan in Appendix C.

Site security will be accomplished by the use of a double row of fencing to be installed around the perimeter of the internal cleared area and adjacent to the perimeter driveways. The fence rows will be spaced approximately 10 feet apart, with a six-foot-high inner chain link fence and an eight-foot-high outer chain link fence (with two-foot tip out). The area between the fences will be equipped with double level photoelectric beam detectors that when tripped, will alert security personnel in the operations building. Controlled access gates will be installed at the primary and emergency entrances to eliminate unwarranted entrance to the site.

Vehicular access to the site is proposed to extend from Moriches-Middle Island Road, along a 50±-foot-wide "flagpole" portion of the lot. Secondary access, for emergency use only, is proposed at the southwest corner of the parcel, the final design of which will be developed in cooperation with the Town of Brookhaven Fire Prevention Division and the local fire district during Site Plan review. The demand for off-street parking spaces would be minimal, due to the nature of the proposed facility. Nonetheless, a gravel area adjacent to the proposed operations and maintenance building, along the proposed internal site driveways, would provide a minimum of 17 off-street parking spaces and one loading space (in accordance with §85-852 of the Code of the Town of Brookhaven).

The site will be obscured from view by establishing surrounding buffer and screening areas. The west side of the subject property abuts a developed area, primarily improved with single-family residential uses. On this side of the property, a 211±-foot buffer of existing natural vegetation will be maintained between the easternmost property line of the residences and the double perimeter security fence of the array field. In addition, the outer (western) proposed fence will be fitted with privacy slats, and a row of evergreen screen plantings would be established along the entire western fence line (i.e., along the west side of the western of the two fences) to further preclude visibility of the proposed facility from surrounding areas. The subject property abuts vacant, wooded land to the north, east and south. On the northern border, a minimum 50-foot buffer[1] will be retained, and on the eastern border, a minimum 77-foot buffer area of existing natural vegetation will be retained. At the southern site boundary, a 220-foot wooded buffer would be retained on-site (including a 160-foot buffer area, and a 60-foot wide strip of land for potential future Town of Brookhaven highway purposes as provided for by deed covenant).[2]

▼

[1] The 50-foot buffer to be provided along the northern site boundary would be supplemented by the existing Town-owned open space that adjoins the subject property. The net effect is that a substantial natural buffer would exist between the proposed SEPF and Moriches-Middle Island Road.

[2] The existence of a deed covenant does not imply that a roadway will be built by the Town through this portion of the site.

The subject property is located approximately 0.5-to-1.0 mile east of the runways of the Town of Brookhaven Calabro Airport, and the solar panels are engineered to be light absorptive, reflecting as little as two percent of sunlight (as noted within the Federal Aviation Administration's *Technical Guidance for Evaluating Selected Solar Technologies on Airports* – November 2010). As such, the proposed facility is outside of the associated aircraft approach surfaces and would not present an obstruction to airport functions. Moreover, is not expected to represent a significant light reflective or glare hazard to pilots. Furthermore, the proposed project is environmentally friendly, in that site operations will not involve the generation of noise impacts or contain a source of emissions that would result in air quality and odor concerns. Therefore, the passive site operations will be compatible with residential property uses that exist to the west of the site and in the surrounding community.

Site security lighting to be installed will include low elevation (below the top of the surrounding tree canopy), downward-facing fixtures that would be 'Dark Sky' compliant. These lights would be for task-oriented purposes with various sections of the site being illuminated on-demand, as needed, rather than the whole site being lit on a full time basis. The design of the proposed site lighting will preclude light spill onto adjacent properties. Further, the substantial buffers of natural vegetation to be preserved at the site would preclude potential lighting impacts to surrounding residents.

The solar panels will require minimal maintenance, as no moving parts or motors are associated with their operation. Periodically, some light cleaning of the panels may need to be conducted. This will accomplished using a truck mounted wash station.

Purpose, Benefit and Need

The proposed action is the development of a PV solar farm. As a renewable, 'green' source of energy, MISF would have a substantial environmental benefit. This alternative energy source would reduce the demand for electricity generated by the burning of fossil fuels (e.g., oil, natural gas) at traditional power plants that produce air emissions of greenhouse gases. Vehicular trip generation, water use, and sanitary waste generation associated with the day-to-day operation of MISF would be minimal (and significantly less than that associated with development of the site in accordance with prevailing zoning, which is predominantly industrial), and no odor or air emissions would be generated by the proposed solar PV arrays. Additionally, the proposed project is expected to have various benefits (in addition to those associated with the proposed renewable energy source), including construction- and operation-phase job generation. The proposed project will also aid the local economy in that it is expected to generate approximately 32 construction jobs and 6 full-time post-construction positions. Construction activities will require the services of landscapers, heavy equipment operators, electricians, and building contractors for tasks involving vegetation clearing, site grading, array support installation, electrical equipment installations/connections, and building construction. Additional economic benefits would result from the purchase of green industry equipment and supplies.

As a source of renewable energy, the proposed project will benefit the Town of Brookhaven by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, the applicant anticipates that the facility will be interconnected to the LIPA power grid supplying 19.6 MW of electricity, to be sold for use by PSEG Long Island's customers through a PPA or similar agreement. Based on the United States Energy Information Administration's (U.S. EIA) 2012 annual capacity factor of 20.3 percent for utility scale solar photovoltaic generators (the most recent final year available),[3] it is anticipated that the proposed facility would generate approximately 34,854 megawatt hours (MWh) of electricity annually. According to the U.S. EIA, the average household in New York State consumes 6,578 kilowatt hours (kWh), or approximately 6.6 MWh, annually.[4] Therefore, the proposed project would generate sufficient electricity to power approximately 5,281 homes. The applicant anticipates that actual generation by the proposed Middle Island Solar Farm would range between 38,000 to 44,000 MWh annually,[5] which would be enough electricity to power up to approximately 6,666 homes.

The Suffolk County Planning Commission (SCPC) developed a model code for utility-scale solar photovoltaic installations, which was provided for consideration to local municipalities and for their adoption into their respective Town and Village codes at their discretion. The model code is the product of a working group comprised of County officials, representatives of several townships in Suffolk County (including the Town of Brookhaven), utility consultants, solar developers, environmental advocates and other interested parties, and, at its meeting of May 6, 2015, the SCPC adopted the model code by unanimous vote. The Town of Brookhaven Town Board became the first municipality in Suffolk County to adopt the SCPC's model code into its Town Code on August 6, 2015, with its status purpose being as follows:

> *"1. It is important to provide renewable energy facilities. It is equally important to protect our natural resources by providing standards for solar energy production facilities.*
> *2. It is altogether reasonable that the Town Board makes adequate provisions for these facilities, it is imperative that such facilities do not adversely affect surrounding and nearby properties.*
> *3. It is therefore the intent of this section to provide adequate safeguards for the location, siting and operation of solar energy production facilities."*
> (Town Code §85-812.A)

▼

[3] United States Energy Information Administration, *Table 6.7.b* from *Electric Power Monthly with Data from May 2014*, July 2014 (accessed December 2014); available from http://www.eia.gov/electricity/monthly/current_year/july2014.pdf.

[4] United States Energy Information Administration, *Table CE2.2* from *2009 Residential Energy Consumption Survey (RECS)* (accessed December 2014); available from http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=consumption.

[5] The specific technology to be implemented at the subject property has not yet been selected, and will be determined by the applicant based on the latest technology available at the time of final design. However, the applicant proposes to construct a state-of-the-art facility, with higher-rated solar PV panels and with significantly lower loss factors than many other solar PV facilities, such that the actual output is expected to be higher than the average published within the U.S. EIA's 2012 report.

The proposed MISF meets every one of the relevant standards for Solar Energy Production Facilities set forth within the Town Code at §85-812 through §85-814 (as demonstrated within this DEIS). Accordingly, the proposed action would have the benefit of achieving the County and Town goals of providing renewable energy facilities in a responsible manner that safeguards against adverse effects upon natural resources or surrounding properties.

Construction and Phasing

Construction activities will require the services of landscapers, heavy equipment operators, electricians, and building contractors for tasks involving vegetation clearing, site grading, array support installation, electrical equipment installations/connections, and building construction. Construction is expected to be completed over a 12-month period. General phasing is expected to occur in accordance with the following schedule:

- Clearing and Grading/Drainage: Months 1 – 2
- Electrical and Maintenance Building: Months 3 – 6
- Pile Foundations and Framing, Electrical (continued): Months 7 – 9
- PV Panel Installation: Months 10 – 12

During the 12-month construction period, construction activities will be limited to non-sensitive periods (i.e., 7:30 AM – 6:00 PM), Monday through Saturday. It should be noted that, in order to minimize potential impacts to wildlife, construction scheduling would avoid clearing during the late spring and summer seasons when breeding/nesting occurs for most resident wildlife species, and wildlife sweeps would be performed ahead of clearing activities to minimize direct impacts to the maximum extent practicable.

Required Permits and Approvals

The following permits and approvals are required for implementation of the proposed project:

Agency	Required Permit/Approval
Town Planning Board	Special Use Permit (Solar Energy Production Facility), Site Plan(Including Relief for Minimum Landscaping in Front Yard)
Town Zoning Board of Appeals	Area Variance (Lot Width)
Town Highway Department	Highway Work Permit
Suffolk County Department of Health Services	Water Supply, Sanitary, Stormwater
New York State Department of Environmental Conservation	SPDES General Permit for Stormwater (GP-0-15-002)
LIPA/PSEG Long Island	Power Purchase Agreement, Interconnection Agreement

Probable Impacts of the Proposed Action

Geological Resources

The *Soil Survey of Suffolk County, New York* (USDA, 1975) (the "*Soil Survey*") classifies the soils at the subject property as Carver and Plymouth sands, three-to-15 percent slopes (CpC); Carver and Plymouth sands, 15-to-35 percent slopes (CpE); Haven loam, zero-to-two percent slopes (HaA); Plymouth loamy sand, zero-to-three percent slopes (PlA); Plymouth loamy sand, three-to-eight percent slopes (PlB); and Riverhead sandy loam, zero-to-three percent slopes (RdA). The predominant soil type is RdA, for which the *Soil Survey* does not identify any relevant moderate or severe planning limitations; nor are any identified for HaA soils. The remaining soil types (CpC, CpE, PlA and PlB) each have one or more moderate or severe limitations for the siting of lawns and landscaping, due to sandy surface layer, or for the siting of structures or streets and parking lots, due to slopes. Strategic grading in accordance with the proposed *Grading & Drainage Plan* would address the relevant limitations due to slope, and soil amendments (e.g., application of topsoil) would address limitations associated with a sandy surface layer, as needed. It is not expected that any significant soil amendment will be needed, as the proposed plantings would consist of native species to the maximum extent practicable. For CpE soils, the severe limitations are not applicable to the proposed action, and these soils occur only in a portion of the site that is proposed to remain natural and undisturbed.

The disturbance of soils for construction and regrading activities increases the potential for erosion and sedimentation. To minimize the potential for adverse erosion and sedimentation impacts to result from these activities, a *Clearing and Erosion & Sediment Control Plan* would be implemented at the subject property. The New York State Department of Environmental Conservation (NYSDEC) requires coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002) for construction projects that will involve soil disturbance of one or more acres. As the proposed action would disturb more than one acre, a Storm Water Pollution Prevention Plan (SWPPP) acceptable to the Town of Brookhaven would be developed and submitted to both the Town of Brookhaven and the NYSDEC (Notice of Intent), prior to the commencement of construction activity. The measures to be employed (e.g., minimizing the total area of land to be disturbed at any one time, installation of sediment barriers along the limits of disturbance, protection of drainage inlets, etc.) are designed to be consistent with the relevant portions of the *New York State Stormwater Management Design Manual* (NYSDEC, 2010) and the *New York Standards and Specifications for Erosion and Sediment Control* (NYSDEC, 2005) as required by Town Code Chapter 86 – *Stormwater Management and Erosion Control*, and would be regularly inspected and maintained to ensure proper function. Sediment barriers and other erosion control measures would remain in place until upland disturbed areas are permanently stabilized. Paved areas would be cleaned and the drainage system flushed as necessary to remove any silt

and debris. With the aforementioned control measures employed, no significant adverse erosion- or sedimentation-related impacts are expected.

The subject property is relatively flat throughout under existing conditions, with elevations ranging from approximately 30 feet to 69 feet amsl, as discussed above. The proposed grades at the site would retain the existing grades to the extent practicable, and the *Grading & Drainage Plan* has been designed to minimize the extent of cut and fill needed to accommodate the proposed development. As such, there would be no need to import or export significant quantities of material to achieve final grades across the 100.33±-acre site. These grades would accommodate the proposed drainage system design, directing stormwater to the proposed shallow recharge areas located at the existing topographic low points of the site. A limited number of leaching pools would be installed at key locations (primarily along internal gravel drives), and an overflow system would interconnect all proposed retention areas. The proposed system is designed to contain and recharge 100 percent of stormwater (from developed areas) on-site from an eight-inch rainfall event. The proposed elevations at the portion of the site to be improved would range between 40± and 65± feet amsl, with the lowest elevations near the proposed drainage swales on the southern portion of the subject property, and the highest elevations near the proposed entrance on Moriches-Middle Island Road. As the proposed action would minimally alter the existing topography of the subject property, and as the proposed grades would retain the existing grades to the extent practicable, there would be no significant adverse impacts to topography as a result of the proposed action.

The conceptual interconnection route extends from the northern boundary of the subject property east along Moriches-Middle Island Road and south along Weeks Avenue until reaching the aforementioned electric substation and primarily contains soil types that are also found at the subject property, including RdA, PIB, CpC and PlA soils. Potential impacts associated with the conceptual interconnection evaluated in this DEIS would include limited disturbances in the immediate location of any utility cable support structures, disturbance due to the pruning or limited removal of vegetation along the existing roadways, and the removal of soils displaced by additional support structure foundations, if necessary.

Projected Water Consumption

The subject property is within Distribution Area 12 of the SCWA, which pumped approximately 70.5 billion gallons of water through 581 active wells (throughout all Distribution Areas) in 2013. The subject property, in its current undeveloped condition, does not utilize potable water. Upon implementation of the proposed action, SCWA would supply potable water to the proposed Middle Island Solar Farm via a connection to an existing 12-inch water main along Moriches-Middle Island Road. The anticipated water usage by the proposed Middle Island Solar Farm (i.e., the proposed 4,032±-square-foot maintenance building) is 161± gallons per day (gpd). As the proposed action includes the use of native landscape plantings, no irrigation would be required. The solar panels themselves would not use water, except for periodic cleaning, for which water would be brought to the site by water truck. The projected water consumption of the proposed action (i.e., 161± gpd), in comparison to the 70.5 billion gallons pumped by the SCWA, would be *de minimis*. As such, it is not expected that the proposed action would pose a significant adverse impact to groundwater supplies, and no significant adverse impacts associated with water usage would be expected.

Sanitary Waste and Discharge

As the subject property is currently undeveloped, it does not generate any sanitary waste, and there are no existing on-site sanitary systems. The proposed Middle Island Solar Farm would utilize an on-site sanitary system to accommodate approximately 161± gpd of sanitary waste generated by the proposed maintenance building. The remainder of the proposed facility (e.g., the solar panels and associated appurtenances) would not be expected to generate any sanitary waste. The on-site sanitary system to be installed would be designed to meet or exceed the anticipated hydraulic load for the maintenance building, and would be designed to comply with the most current standards of the Suffolk County Department of Health Services (SCDHS). Approval would be obtained from SCDHS prior to implementation of the proposed action, and the anticipated quantity of sanitary waste to be generated (i.e., 161± gpd) would be well within the relevant sanitary density limitations of Article 6 of the Suffolk County Sanitary System (SCSC) (see further discussion below).

The Long Island Comprehensive Waste Treatment Management Plan (208 Study)

The proposed action would control stormwater runoff in accordance with the proposed *Grading & Drainage Plan*, thereby minimizing the potential transport of sediments, nutrients, metals, inorganic chemicals, and bacteria to ground or surface

waters. Additionally, no fertilizers would be used. Only legally permitted cleaners would be used in the proposed on-site sanitary system, and the system would be routinely maintained. As such, the proposed action would be consistent with the relevant recommendations of the *208 Study* for Hydrogeologic Zone IV, within which the subject property is situated.

Suffolk County Sanitary Code

The proposed action is expected to generate approximately 161 gpd of sanitary waste, and is proposed to be served by an on-site sanitary system. Article 6 of the SCSC limits the maximum permissible discharge to on-site sanitary systems to 300 gpd per acre, or approximately 30,090 gpd for the 100.3±-acre subject property. Accordingly, the proposed action would comply with the relevant sanitary density limitation of Article 6. The proposed quantity of sanitary waste to be discharged to an on-site sanitary system is approximately one half of one percent of the maximum allowable pursuant to Article 6, which is intended to be protective of groundwater resources. No denitrification plant is proposed to treat the minimal quantity of sanitary waste to be generated on-site, and, therefore, the restriction of Article 6 for a maximum nitrogen effluent discharge concentration of 10 milligrams per liter (mg/l) (equivalent to the New York State drinking water standard for public water systems) is irrelevant to the proposed action. The proposed sanitary system would be designed to comply with the most current SCDHS standards, and approval would be obtained from SCDHS prior to implementation of the proposed action. As the proposed action would be consistent with Article 6 of the SCSC, and well within the sanitary density limitations set forth at Section 760-608 (A), no significant adverse impacts to groundwater are expected to result from the use of on-site sanitary systems at the proposed MISF. Additionally, potable water supply for the proposed MISF would be provided by SCWA, consistent with the requirements of Article 6.

The subject property is not located within a deep recharge area or a water supply sensitive area as defined in Article 7 of the SCSC. The proposed MISF will contain an on-site sanitary system that would discharge to groundwater (to accommodate the minimal quantity of sanitary waste to be generated), for which all applicable permits would be obtained.

There are no toxic or hazardous materials being stored or used on-site at the subject property. The proposed action includes the storage of LP gas in two, 2,500-gallon underground storage tanks proximate to the proposed maintenance building. These tanks would be utilized for emergency backup purposes only. All applicable permits would be obtained for these tanks, including any permits required pursuant to Article 12 of the SCSC.

Based on the above, the proposed action would be consistent with the relevant provisions of Articles 6, 7 and 12 of the SCSC.

Nitrogen Mass Balance

To quantify the change in nitrogen loads from the site due to the development of the proposed MISF, load contributions were calculated using a mass accounting method. The existing conditions and proposed development conditions were analyzed following the nitrogen load calculation approach used in the Town of Brookhaven's *Forge River Watershed Management Plan* (March 2012) (hereinafter, the "*Forge River Plan*"). VHB estimated loads from on-site wastewater treatment systems (OWTS), fertilizers, and atmospheric deposition as the nitrogen loads in the watershed. To estimate the site's current nitrogen load, atmospheric deposition was the only source considered, based on the *Forge River Plan* approach. Currently, the site has an estimated total nitrogen contribution of 300 lbs N/year. The site's current nitrogen contribution is 0.29 percent of the West Mill Pond subwatershed's nitrogen load and 0.001 percent of the total Forge River watershed's nitrogen load based on load estimates provided in the *Forge River Plan*.

The proposed plan would result in the clearing of approximately 61.03 acres of existing trees and shrubs. The solar farm project proposes to develop the property and alter site coverages by establishing solar PV panel arrays (with plantings below), planted/grass areas, gravel drives, asphalt pavement, a maintenance building, and paved surfaces for walkways and equipment pads. These proposed conditions fit into the *Forge River Plan*'s industrial category and therefore loads from atmospheric deposition, OWTS, and fertilizers are estimated to calculate the proposed site's nitrogen loads.

To estimate the nitrogen loads from atmospheric deposition, the *Forge River Plan* used an average nitrogen areal loading rate of 0.0234 lbs/acre/day and assumed a 65 percent removal rate between the source and receiving water due to plant uptake for land with stormwater recharge. Under the proposed conditions, the entire site's stormwater will be able to infiltrate before reaching groundwater and therefore the 65 percent removal rate is applicable. The proposed conditions also include a small OWTS. To estimate the nitrogen load for the OWTS, the nitrogen concentration of 0.0006 lbs/gal for commercial/industrial OWTS from the *Forge River Plan* was used. The proposed site's sanitary flow was estimated using the SCDHS' factor of 0.04 gpd/sf. The total nitrogen contribution for the proposed solar farm (i.e., the sum of the atmospheric deposition and OWTS sources) is 336.5 lbs N/year.

Because the atmospheric load of nitrogen remains the same, the estimated increase in the site's nitrogen load by 36.67 lbs/year or 12.3 percent is caused by the proposed OWTS. This nominal change will increase the subwatershed's nitrogen contribution by 0.035 percent and it will increase the Forge River Watershed's nitrogen contribution by 0.012 percent. It should be noted that this value is far less than that which would be expected if the site were to be developed in accordance with the prevailing industrial zoning, as discussed within the Alternatives section of this DEIS (see summary below).

Stormwater

The proposed action includes a stormwater management system comprised of shallow retention areas located at the existing topographic low points of the site. A limited number of leaching pools would be installed at key locations (primarily along internal gravel drives), and an overflow system would interconnect all proposed retention areas. The proposed system is designed to contain and recharge 100 percent of stormwater (from developed areas) on-site from an eight-inch rainfall event. A natural vegetated buffer would remain along the perimeter of the subject property (except in the areas of the proposed access, emergency access and interconnection), and some stormwater runoff from these natural portions of the site may continue to flow overland onto adjacent properties.

No fertilizers or pesticides would be routinely applied to the grounds at the subject property, as the proposed Planting Plan includes the installation of native and low-maintenance plantings (nearly 90 percent of all areas to be cleared will be revegetated with native species). Accordingly, stormwater runoff would not transport such fertilizers over land surfaces on the site.

Chapter 86 of the Town of Brookhaven Town Code entitled, Stormwater Management and Erosion Control, is intended to control activities that result in flooding, siltation, increases in stream temperature, stream bank erosion and pollution, and minimizing of the volume of stormwater runoff that flows from any specific site during and following development activities to the maximum extent practicable.

The proposed action would disturb greater than one acre of land during clearing and grading activities, and, accordingly, coverage under SPDES GP-0-15-002 would be obtained prior to implementation of the proposed action. A SWPPP would be developed to identify erosion and sedimentation control measures to be implemented during construction. These controls are expected to generally be as depicted on the preliminary *Clearing and Erosion & Sediment Control Plan*, and would include

- Protection of existing vegetation to remain.
- Scheduling of clearing and grading activities to minimize the total area of land disturbed at any one time.
- Limiting the length of time areas are exposed by establishing pavement and plantings at exposed areas as soon as practicable.
- Installation of sediment barriers (e.g., silt fence, hay bales) along the limits of disturbance for the duration of the work. No sediment from the site would be permitted to wash onto adjacent properties, wetlands or roads.
- Stabilization of graded and stripped areas and stockpiles via temporary seeding or other effective cover.
- Protection of drainage inlets through the use of sediment barriers, sediment traps, etc., to prevent sediment buildup.

- Control of fugitive dust (e.g., covering of stockpiles, temporary seeding, use of a water truck during extended dry periods).
- Establishment of a stabilized construction entrance to prevent soil and loose debris from being tracked onto local roads.

The SWPPP would also address post-construction stormwater management practices, as required for projects that would disturb greater than five acres of land. All components of the SWPPP would conform to the technical standards contained within the *New York State Stormwater Management Design Manual* and the *New York Standards and Specifications for Erosion and Sediment Control*; and the SWPPP would be reviewed and approved by the Town of Brookhaven prior to implementation of the proposed action in accordance with §86-6(A)(1) of the Town Code.

The proposed action has been reviewed with respect to the relevant recommendations of the Long Island Segment of the Nationwide Urban Runoff Program (*NURP Study*) with regard to stormwater runoff, as it pertains to the protection groundwater and surface water resources. Based on the proposed drainage design, and the adherence to the relevant provisions of Article 12 of the SCSC, the proposed action is consistent with the relevant recommendations offered within the *NURP Study*.

The proposed action addresses potential stormwater runoff-related impacts during construction and operational phases, and is consistent with relevant regulatory controls and the recommendations of *NURP Study*, as detailed herein. As such, no significant adverse impacts associated with stormwater runoff are expected to result from implementation of the proposed action.

Surface Water, Wetlands and Floodplains

There are no surface waters or wetlands mapped by the NYSDEC or the National Wetlands Inventory present at or adjacent to the subject property. Additionally, field investigations conducted by VHB on October 20 and November 2, 2014, did not identify any surface waters or wetlands at the subject property. The nearest mapped wetland, located approximately 1,121 feet east of the southeast corner of the subject property, is well outside of the NYSDEC's 100-foot regulated Adjacent Area setback for freshwater wetlands. Therefore, the proposed action would have no significant adverse impact upon such resources.

Additionally, the subject property is not located within a Special Flood Hazard Area, as identified on the FEMA Flood Insurance Rate Map. As such, the proposed action would have no significant adverse impact upon floodplains.

Forge River Watershed Management Plan

The subject property is situated within the West Mill Pond subwatershed, as defined in the *Forge River Plan*. There are several recommendations within the *Forge River*

Plan that aim to protect and improve the quality of the Forge River and its streams that have been degraded over time as a result of nitrogen loading from primarily agricultural (i.e., duck farming) and residential land uses. However, as the subject property is vacant and undeveloped, the only source of nitrogen contribution is related to atmospheric deposition. As discussed in detail in the *Groundwater* subsection above, implementation of the proposed action would result in a 12.3 percent increase in the subject property's nitrogen contribution to the Forge River, due to the proposed on-site sanitary system. The 12.3 percent increase of the subject property's nitrogen contribution would increase the Forge River's overall nitrogen load by 0.012 percent – a miniscule increase.

Several of the objectives and strategies contained within the *Forge River Plan* can be applied to the proposed MISF development. Following is a consistency analysis of the proposed action with the relevant objectives and strategies.

Objectives

- ***Reduce nitrogen concentrations.*** *Nitrogen is the primary pollutant responsible for the degradations of the estuary's water quality. Measurable indicators for this objective include concentrations of total nitrogen and dissolved oxygen and/or number of algal blooms.*

  Aside from a single on-site sanitary system to serve the proposed maintenance building, the proposed action would not include any other nitrogen contributors, such as fertilizers. Although the proposed action would not reduce nitrogen concentrations in the watershed, it represents a *de minimis* increase contribution in the context of the overall watershed. It is further noted that the main contributor of nitrogen loading within the West Mill Pond Subwatershed is the drainage and treatment lagoon discharge from the duck farms, which the *Forge River Plan* notes ceased operations in 2011.

- ***Implement TMDL-allocated scenario.*** *The TMDL process will provide a long-term framework, particularly in a regulatory context, for achieving the restoration of the Forge River. Its success can be measured by the degree of completion of its adopted allocation scenario.*

  A TMDL has not yet been established for the Forge River Watershed. Regardless, it is expected that the proposed action would result in a total nitrogen contribution of 336.5 lbs N/year (see the *Groundwater* subsection above for detailed Nitrogen Mass Balance discussion). This represents a *de minimis* increase in the nitrogen contribution by the subject property to the overall Forge River Watershed of 0.012 percent. Further, with the cessation of duck farm operations, this minimal increase would be offset by the decrease in nitrogen discharges from these operations.

Strategies

- ***Establish a Forge River Protection Overlay District (FRPOD) (p. 25-1)***

  The FRPOD has not been formally adopted by the Town of Brookhaven. However, the purpose of the FRPOD is to impose additional regulations upon the underlying zoning districts within the Forge River Watershed, such as enhanced review, restrictions and/or standards for a wide range of land use and development activities (e.g., mining, raising of livestock, fertilizer-intensive agriculture and heavy and/or noxious industries). As previously discussed, the proposed action would not use fertilizers, and would cause a minimal increase in nitrogen contribution to the Forge River Watershed as a result of the proposed on-site sanitary system. Moreover, the proposed LP gas underground storage tanks would be in compliance with the relevant provisions of the SCSC.

- ***Impose stricter clearing limits (p. 25-11)***

  The *Forge River Plan* recommends that the FRPOD adopt the Clearance Standards of the Central Pine Barrens Comprehensive Land Use Plan (CLUP). For industrial uses, the maximum site clearance would be 65 percent (see Figure 5-1 of the CLUP). The recently adopted code provisions regulating Solar Energy Production Facilities reflect an equivalent restriction, requiring that 35 percent of the site remain natural and undisturbed (see §85-815[D][1] of the Town Code). Taken over the entire 100.33±-acre site, the 65 percent clearing limit would require that 35.11± acres of natural area be retained. Taken over the L Industrial 1 portion only (as the A Residence 1 portion may not be utilized for yield), a total of 32.97 acres would be required to remain. The *Proposed Site Plan* indicates that 39.30± acres (i.e., 39.17± percent) of the subject property would remain natural and undisturbed, meaning 60.83± percent of the site would be cleared. Accordingly, the proposed action would preserve an even greater area of natural vegetation than would result under the recommended stricter clearing limits of the FRPOD. Further, less clearing is proposed than the CLUP standard would allow in the Central Pine Barrens Compatible Growth Area. Several additional acres of existing woodland would be retained above and beyond the 35 percent requirement for Solar Energy Production Facilities. Moreover, as indicated on the *Proposed Site Plan*, much of the area to be cleared would be established in native, low-maintenance plantings (beneath and surrounding the proposed solar panel arrays), such that a total of 93.17± percent of the subject property would be either natural or re-vegetated upon implementation of the proposed action. The proposed action therefore complies with and exceeds the more strict limits for clearing as recommended within the FRPOD.

- ***Replace direct discharge stormwater systems (p. 25-11)***

  This strategy recommends that existing stormwater conveyance systems that discharge directly to the estuary be replaced with green alternatives such as vegetated swales, bio-retention areas, rain gardens, etc. Although the subject property does not contain any existing stormwater infrastructure, the proposed MISF has been designed with vegetated drainage swales and leaching basins to accommodate stormwater. These improvements, in conjunction with gravel driveways and vegetated surfaces beneath and between the proposed solar panels, would contain and recharge 100 percent of stormwater runoff on-site. Thus, the proposed action is consistent with this strategy.

- ***Impose strict limits on nitrogen fertilizer use (p. 25-14)***

  The proposed action includes indigenous (native), low-maintenance plantings that would not require fertilizer application as part of routine landscape maintenance.

- ***Enact ordinance requiring pumpouts for all OWTS within FRPOD every five years (p. 25-17)***

  This strategy allocates a portion of the Forge River Protection Fund for the maintenance of all on-site wastewater treatment systems every five years. The proposed on-site sanitary system would be properly maintained in accordance with the relevant provisions of the SCSC.

- ***Encourage use of indigenous landscape plants (p. 25-23)***

  As detailed on the *Planting Plan*, a variety of native, low-maintenance species would be used in landscaping the subject property.

Based on the above, the proposed action is consistent with the relevant objectives and strategies of the *Forge River Plan*. As such, no significant adverse impacts upon the Forge River watershed are expected to result from implementation of the proposed action. It should be noted that the proposed action would result in far less contribution of nitrogen to the watershed than would the development of the subject property in accordance with prevailing zoning (see discussion of Alternatives within this DEIS).

Interconnection

With respect to groundwater resources, the potential installation of an interconnection from the northern boundary of the subject property east along Moriches-Middle Island Road and south along Weeks Avenue to the Weeks Avenue substation (see *Conceptual Interconnection Route* plan in Appendix C) would not generate discharges of sanitary waste, would not create a demand for potable water, and would not be expected to involve the application of fertilizers.

The conceptual interconnection would not result in the establishment of any significant quantity of impervious surfaces, as same would be limited to the immediate location of any utility cable support structures (e.g., foundations) that may be installed. Accordingly, and as only a limited amount of pruning or removal of vegetation would be expected (i.e., along the roadside), there would be no significant change in the quantity of stormwater runoff generated, and no significant related impacts on the Forge River Watershed are anticipated.

Ecological Resources

Habitat/Vegetation

The entire subject property supports the Pitch Pine-Oak Forest ecological community. This community occurs commonly within the central Long Island region and the immediate surrounding area of the site, and the community is considered apparently secure in New York State by the New York Natural Heritage Program (NYNHP). Overall vegetative diversity within the Pitch Pine-Oak Forest community was observed to be low and the flora is dominated by common native tree, shrub and herbaceous plant species that typically comprise this community type. Some atypical native and non-native/invasive plant species are present along the community edges, unpaved trails and within disturbed openings, and evidence of historical fires is evident at several locations at the subject property.

Due to the implementation of the proposed action, 60.83± percent (61.03± acres) of the subject property would be cleared and graded prior to development, while the remaining 39.17± percent (39.30± acres) of the site would be preserved. As detailed on the *Proposed Site Plan*, clearing would occur primarily within interior portions of the subject property, with buffer areas comprised of existing uncleared vegetation to remain along the site perimeter (except at access and emergency access locations). The vegetated buffers would range in size from a minimum of 50 feet to 220 feet in width.[6]

Accordingly, the chief impact of the proposed action would be the clearing of 61.03± acres of Pitch Pine-Oak Forest. Removal of the forest overstory would represent a permanent impact, as the solar farm would be maintained free of trees to prevent shading of the solar panel arrays. However, substantial on-site areas of Pitch Pine-Oak Forest would remain as a result of the preservation of 39.30± acres of this ecological community. Significantly, the acreage of Pitch Pine-Oak Forest to be preserved would occur in perimeter areas, allowing for connectivity with similar forested habitat on adjoining parcels. In particular, the vegetated buffers to be preserved along the eastern and southern subject property boundaries would form large contiguous habitat blocks with, and allow habitat connectivity to, extensive off-site areas of Pitch Pine-Oak Forest.

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[6] The minimum 50-foot buffer would be located along the northern property boundary, adjacent to Town-owned, wooded open space.

As noted on the *Planting Plan*, following installation of the solar equipment at the subject property, almost 90 percent of all areas to be cleared (i.e., areas beneath and surrounding the proposed solar arrays) would be planted with native heath shrubs, Pennsylvania sedge, a seed mixture comprised of common fescues, rye grasses and yellow sweet clover. A native evergreen screen consisting of 350 eastern red cedar and 350 American holly plantings would be installed along the western fence line of the solar farm. In total, 54.18± acres of the subject property would be re-vegetated with the aforementioned native species. Several of the aforementioned plantings species are already found on the site under existing conditions. In addition, "plant rescue" techniques will be utilized during clearing of the site to the maximum extent practicable to excavate and replant existing native plants of species that are appropriate for the proposed development area. Given the relatively homogenous vegetative on-site species assemblage, it is anticipated that the preservation of 39.30± acres of existing site habitat would result in the preservation of the vast majority of the existing flora.

As a result of periodic maintenance to be performed within the revegetated areas (e.g., pruning of shrubs), the native vegetation within the solar farm would be maintained in an early-to-mid successional state, providing some of the ecological functions and benefits of old field and shrubland habitats.

No New York State or federally-listed endangered, threatened or rare plant species were observed at the subject property at the time of the 2014-2015 field inspections, and no significant adverse impacts to same are anticipated as a result of the proposed action.

Wildlife

The primary impact of the proposed action on wildlife would be the clearing of 61.03±-acres of Pitch Pine-Oak Forest habitat. The immediate effect of clearing would be the direct elimination of individuals of some wildlife species, (i.e., less-mobile animals, underground dwelling mammals and reptiles, eggs and juveniles of certain species) and the displacement of other wildlife. Impacts due to direct elimination can be minimized by avoiding clearing and/or conducting wildlife sweeps prior to clearing activities (in order to identify and remove certain less mobile species from the targeted areas) during the late spring and summer, when breeding/nesting occurs for most resident wildlife, most notably avian species. The majority of wildlife present within or expected to utilize the subject property are considered to be generally more mobile (e.g., most birds and mammals), and, therefore, would avoid elimination and be displaced to adjacent and nearby areas of undisturbed habitat.

It is anticipated that wildlife displaced from the cleared areas of Pitch Pine-Oak Forest within the subject property interior would be displaced to the 39.30± acres of on-site Pitch Pine-Oak Forest to be preserved in perimeter areas of the site, as well as to the extensive contiguous areas of this habitat located to the south and east. Additional emigration of more mobile species (e.g., birds and some mammals) would likely occur to the 662± acres of pine- and oak-dominated habitat located across

Moriches-Middle Island Road to the north of the subject property. Overall, the individual population densities of some resident wildlife species are expected to decrease correspondingly with the proposed decrease in forested habitat, while increases in population densities are anticipated for other resident wildlife species due to the creation of vegetated, but non-wooded habitat within the site interior.

Rare/Protected Species and Communities

The subject property provides habitat for the New York State Special Concern species eastern box turtle, and evidence of this species was noted at the subject property during the field inspections. Due to their territorial behavior and low mobility, individuals of this species may suffer direct elimination during clearing and grading of the solar farm area. These activities would be restricted during the breeding season and/or wildlife sweeps would be conducted prior to clearing activities to minimize potential direct impacts. With respect to potential impacts due to habitat loss, habitat for eastern box turtle includes open woodlands, meadows, old fields and power line cuts. Accordingly, although implementation of the proposed action would significantly reduce on-site forested habitat, the post-development subject property would continue to support extensive forested habitat (39.30± acres) and meadow/old field habitat (54.18± acres, to be created by re-vegetation beneath and surrounding the solar arrays) suitable for use by this species.

No other New York State or federally-listed endangered, threatened, special concern or rare plants or wildlife, or significant natural communities, were observed at the subject property at the time of the 2014-2015 field inspections. Furthermore, as suitable habitat to support the ten species that appear on the USFWS Federally Endangered and Threatened and Candidate Species List for Suffolk County does not exist at the subject property, these species would not be expected to occur at the site.

The northern long-eared bat was recently listed as federally Threatened under section 4(d) of the Endangered Species Act. Potential roosting habitat and foraging habitat for this species is supported within the Pitch Pine-Oak Forest community that occurs across the entire subject property. Pursuant to the USFWS guidelines, any potential direct impact to northern long-eared bat would be avoided by restricting clearing during the pup-rearing season (June 1-July 31). Potential adverse impacts due to the loss of potential habitat, due to clearing, could be partially mitigated by the placement of bat roosting boxes at various on-site locations. Further, the preservation of 39.17± percent (39.30± acres) of Pitch Pine-Oak Forest would ensure that substantial on-site habitat for this species would remain following development.

Five New York State exploitably vulnerable shrubs and herbaceous plants were noted during the 2014-2015 field inspections (i.e., American holly, inkberry, northern bayberry, sheep laurel and striped wintergreen). All five species were noted at multiple locations at the subject property and are relatively common in the general surrounding area of the site and central Suffolk County in general. Accordingly, no significant adverse impacts to overall populations of these five plant species are anticipated as a result of the proposed action.

Three New York State Special Concern avian species known to occur in New York State have been identified by Town of Brookhaven as potentially occurring at the subject property: Cooper's hawk (*Accipter cooperii*); sharp-shinned hawk (*Accipter striatus*); and whip-poor-will (*Caprimulgus vociferous*).

Cooper's Hawk

Cooper's hawk was not identified in the survey block within which the subject property is located during the 2000-2005 New York State Breeding Bird Atlas (NYSBBA) survey, and was not observed during the 2014-2015 field inspections. However, this raptor is listed as either a confirmed, probable or possible breeder in the surrounding survey blocks, and the wooded habitat of the subject property represents potential breeding and foraging habitat for Cooper's hawk. Clearing of forested habitat associated with the proposed action may reduce habitat for this hawk. However, preservation of 39.30± acres of Pitch Pine-Oak Forest would ensure that substantial on-site habitat for this species would remain following development.

Sharp-Shinned Hawk

Although the mixed woodland habitat of the subject property represents potential breeding and foraging habitat for sharp-shinned hawk, this avian species was not recorded within the survey block, within which the subject property is located, during the 1980-1985 NYSBBA survey, and was only recorded within eight scattered atlas survey blocks on Long Island during that time period. Sharp-shinned hawk was not recorded within the subject property survey block or anywhere on Long Island during the 2000-2005 NYSBBA survey. Given the absence of this species from Long Island during the most recent NYSBBA survey, it is considered unlikely that sharp-shinned hawk currently utilizes the subject property as breeding habitat. Nevertheless, preservation of 39.30± acres of Pitch Pine-Oak Forest would ensure that potential on-site habitat for this species would remain following development.

Whip-poor-will

The wooded habitat of the subject property represents potential breeding habitat for whip-poor-will and the species is known to occur within the general surrounding area of the site. Potential on-site habitat would remain following development, due to the preservation of 39.30± acres of Pitch Pine-Oak Forest. Furthermore, as whip-poor-will is known to forage within open areas near their breeding habitat, the proposed creation of 54.18± acres of successional habitat within the subject property interior may provide a net benefit to this species by increasing the on-site area of available foraging habitat.

Wetlands

No wetland habitats were observed at or adjacent to the subject property at the time of the 2014-2015 field inspections. In addition, there are no New York State- or

federally-regulated wetlands mapped at or adjacent to the subject property. As such, no impacts to wetlands are anticipated as a result of the proposed action.

Interconnection

The proposed solar farm will be interconnected to the power grid to distribute electricity generated by the PV arrays, and NYISO/PSEG Long Island will be responsible for locating, designing and installing the power line(s) for the distribution of power generated by the proposed facility. This DEIS evaluates a theoretical interconnection route that extends from the northern boundary of the subject property east along Moriches-Middle Island Road and south along Weeks Avenue until reaching the aforementioned electric substation.

Only a limited amount of pruning or removal of vegetation would be expected (i.e., along the roadside), if any, to accommodate the interconnection improvements. There are no wetland habitats present along the identified interconnection route. Due to the nature and location of this interconnection, no significant adverse impacts to ecological resources would be anticipated.

Air Resources

Air Quality

Construction and demolition activities associated with implementation of the proposed action would result in a slight, short-term increase in air pollution emissions. The primary source of potential emissions is from fugitive dust resulting from construction operations (e.g., clearing, grading). This construction-related air-quality impact (i.e., fugitive dust) would be of relatively short duration. Also, during construction, emission controls from construction vehicles and machinery would include proper maintenance and reduced idling on-site. Therefore, the impacts on ambient air quality from construction activities associated with site-specific development are not expected to be significant.

Subsequent to construction, MISF is expected to include minimal stationary sources of air emissions, specifically in the small (4,032±-square-foot) maintenance building, such as a heating boiler, hot water heater, and emergency generator. Specific equipment has not been chosen. If applicable, the NYSDEC Division of Air Resources regulatory process would ensure that these emission sources meet the National Ambient Air Quality Standards. No significant sources of mobile air emissions would be established as a result of the proposed action.

Carbon Sequestration

The proposed project includes the clearing of 61.03 acres of wooded area for the development of a 19.6 MW solar PV farm, which would negate the amount of carbon that would otherwise been sequestered by the vegetation. In total, it is estimated that the clearing of 61.03 acres of vegetation would negate 82.1 tons per year of CO_2 that would have otherwise been sequestered.

The establishment of a renewable, "green" source of electricity would reduce reliance on traditional energy sources that burn fossil fuels to generate electricity and emit carbon dioxide (CO_2) (as well as various other air pollutants). Based on U.S. EIA 2012 factors, the proposed facility is expected to generate approximately 34,854± megawatt-hours (MWh) of electricity per year. The applicant anticipates that actual generation for the proposed solar farm will range between 38,000 to 44,000 MWh per year.[7] The amount of fuel that will be consumed for 34,854 MWh, 38,000 MWh and 44,000 MWh, using common fossil fuel sources used to generate electricity (i.e., coal, natural gas and petroleum) was calculated, and the respective quantities of carbon emissions were determined to facilitate a comparison with the quantity sequestered by the existing wooded areas to be cleared. The results are presented in the table below.

[7] The specific technology to be implemented at the subject property has not yet been selected, and will be determined by the applicant based on the latest technology available at the time of final design. However, the applicant proposes to construct a state-of-the-art facility, with higher-rated solar PV panels and with significantly lower loss factors than many other solar PV facilities, such that the actual output is expected to be higher than the average published within the U.S. EIA's 2012 report. The 34,854 MWh projection is presented within this DEIS as a conservative estimate.

	CO_2 Emissions Savings (tons per year)[1]		
	USEIA Estimate 34,854 MWh	Project Estimate: Lower Threshold 38,000 MWh	Project Estimate: Upper Threshold 44,000 MWh
CO_2 Impacts: Loss of Carbon Sequestration[1]			
	-82.1	-82.1	-82.1
CO_2 Savings: Replacement of Fossil Fuel Usage with Proposed Solar Farm (By Fuel Type)			
Coal	36,948	40,283	46,643
Natural Gas	21,063	22,964	26,590
Petroleum	28,982	31,598	36,587
Net CO_2 Project Emissions Savings[2]			
Coal	36,866	40,201	46,561
Natural Gas	20,981	22,882	26,508
Petroleum	28,900	31,516	36,505

1 The estimated carbon sequestered by the 61.03 acres of vegetation that will be removed for the construction of the solar farm
2 Total CO_2 Emissions = the amount of CO_2 emissions from fossil fuel consumption + the carbon sequestered by the 61.03 acres of vegetation.

As demonstrated above, the proposed solar farm will result in a significant benefit with respect to CO_2 emissions. It is important to note that, 28 percent of LIPA's available capacity relies on oil (petroleum) and another 42 percent relies on oil and natural gas as dual fuel. When comparing the proposed solar farm to petroleum as a fuel source, the table above indicates that the proposed action would result in a significant net benefit of up to 36,505 tons of CO_2 per year - - this equates to the CO_2 emissions from just under 7,000 passenger vehicles. If making the same comparison to coal, the CO_2 savings would equate to nearly 9,000 passenger vehicles, or to over 5,000 passenger vehicles for natural gas. The calculations above are conservative, as no credit is taken for the 54.18± acres of land that would be re-vegetated following clearing. Nearly 90 percent of all areas to be cleared would be established in native shrubs and grasses, thereby partially off-setting the effects of clearing on the carbon sequestration value of the property. Nonetheless, the net air quality benefit is substantial, and far outweighs the average carbon sequestration capacity of 61.03± acres of woodland. Overall, the proposed MISF is expected to result in a significant net benefit to air quality, as the generation of 19.6 MW of electricity from a clean, renewable source reduces the reliance on conventional energy sources.

Interconnection

The conceptual interconnection of the proposed solar farm to the local electric grid would not include the establishment of any new air emissions sources. A limited amount of clearing and/or trimming of vegetation may be expected based on the ultimate design of the conceptual interconnection (e.g., along the roadside) to accommodate the interconnection. The significant air quality benefits expected to result from the proposed action, as described herein, would be expected to far outweigh the nominal potential effect of the aforesaid pruning or removal of roadside vegetation, if same is ultimately required.

Land Use, Zoning and Plans

The 100.33±-acre subject property, located south of Moriches-Middle Island Road, is currently vacant and unimproved, and predominantly wooded. Surrounding land uses include a mixture of single-family residential, open space, vacant land, community facility, agricultural, and industrial uses. Generally, the subject is bounded by undeveloped, publicly-owned lands to the north, east and south; and single-family residential uses (or vacant land) along Cranford Boulevard to the west.

The subject property is situated within the L Industrial 1 and A Residence 1 zoning districts of the Town of Brookhaven, such that approximately 93.9 percent of the site (i.e., 94.20± acres) is within the L Industrial 1 District, and the remaining 6.1 percent (i.e., 6.13± acres) along the western property boundary is within the A Residence 1 District. The L Industrial 1 zoning district prevails, provided that all development is situated within that less restrictive district.

The L Industrial 1 district permits a range of light industrial uses, including, but not limited to, agricultural or nursery uses (including associated retail sale), and manufacturing, office, and warehouse uses. Solar energy production facilities are permitted within the L Industrial 1 district by special permit from the Planning Board, pursuant to §85-813(C) of the Town Code.

The proposed action would result in a change of use from existing undeveloped, wooded land to a solar PV farm (i.e., a solar energy production facility). Of the 61.03± acres to be cleared, 54.18± acres would be re-vegetated with native species of trees, grasses and shrubs, beneath and between the proposed solar arrays, as well as at drainage areas on the southern portion of the site and along the perimeter of the area to be cleared. The 39.30± acres to remain undeveloped and wooded would serve as a visual buffer from surrounding roads and land uses.

Site coverage would be modified as a result of the proposed action, as follows:

Type of Coverage	Existing Conditions	Proposed Conditions
Vacant/Wooded	100.33±	39.30±
Area Re-Vegetated Back to Natural (native landscape trees, grasses and shrubs)	0.00±	54.18±
Gravel Driveways and Parking Lot	0.00±	6.30±
Roads, Buildings and Other Paved Surfaces	0.00±	0.55±
TOTAL	100.33±	100.33±

The significant natural buffers that would be retained at site perimeters (except at the locations of the proposed access and emergency access), including a buffer that ranges between 211 and approximately 500 feet along the western property boundary (adjacent to residential uses); the pattern of surrounding land use; and the extremely low level of activity associated with the proposed use (e.g., traffic, noise, occupancy, etc.), significantly limit the potential for the proposed action to affect surrounding land uses, such that no significant adverse land use impacts are expected to result from implementation of the proposed action.

The proposed action is consistent with all special permit criteria applicable to solar energy production facilities. Further, the proposed action is substantially consistent with the bulk and dimensional requirements of the L Industrial 1 zoning district and the Town's applicable land development standards, except as follows:

- An area variance from the Zoning Board of Appeals is requested for lot width (see §85-568(B)(3) of the Town Code) where 200 feet is required, and 50 feet is provided, at a point 100 feet from the street line.

- Pursuant to §85-843(A)(2) of the Town Code, 50 percent of the required minimum natural area/landscaping (i.e., 50 percent of 30 percent of the total site area) must be provided within the front yard. Due to the subject property's flag lot shape, it is not possible to fit the required landscaping within the front yard. As such, relief of this requirement would be required from the Planning Board at the time of site plan review.

The requested area variance is related to the existing shape of the subject property, which includes a 50-foot-wide "flagpole" driveway. The lot width through the portion of the site to be developed is approximately 1,000 feet, which significantly exceeds the minimum lot width requirement of 200 feet. Further, the insufficient lot width at the setback would not be perceptible from Moriches-Middle Island Road, as vacant, naturally-vegetated Town-owned property is present along either side of the site frontage (extending approximately 175 feet in depth from the roadway). No significant adverse environmental impact or impact on neighborhood character would result from the granting of this area variance.

The presence of the vacant, vegetated Town-owned property along either side of the site frontage on Moriches-Middle Island Road would significantly limit views of the front yard from the public roadway, such that the relief of the requirement at §85-843(A)(2) of the Town Code (which is required due to the shape of the subject property) is also not expected to result in significant adverse environmental impacts or impacts on neighborhood character.

The proposed action is consistent with the relevant recommendations of the Town of Brookhaven's *1996 Comprehensive Plan* and *The Tri-Hamlet Comprehensive Plan*.

Interconnection

The potential interconnection route identified on the *Conceptual Interconnection Route* plan in Appendix C proposes an interconnection between the subject property and the nearby existing electric substation located at the southern terminus of Weeks Avenue. Electrical transmission facilities are present throughout the surrounding neighborhood (e.g., along Cranford Boulevard, Moriches-Middle Island Road, along Weeks Avenue, etc. – see photographs in Appendix E), such that the installation of the proposed interconnection would not introduce a new land use to the area. With respect to land use and zoning, the erection, construction, alteration or maintenance by public utilities of electrical transmission and distribution systems (defined as "essential services" pursuant to §85-1 of the Code of the Town of Brookhaven) is a permitted use in all zoning districts (see §85-893 of the Town Code), such that no adverse zoning impacts are anticipated. However it should be noted that the final interconnection route will be determined and implemented by NYISO/PSEG Long Island prior to implementation of the proposed action.

Transportation

Construction traffic associated with the proposed action will include trucks and equipment for performing operations on the site, as well as the delivery and removal of materials, and worker's vehicles. The number and types of construction vehicles will vary depending on the phase of construction and the particular operations underway at any given time, during the 12±-month construction period. All construction vehicles will arrive and depart via a construction entrance on Moriches-Middle Island Road, the final design of which will be determined in consultation with the Town of Brookhaven. Materials deliveries will be scheduled to occur at off-peak hours, so as not to coincide with peak commuter traffic times, to the extent practicable. The total number of vehicles travelling to and from the site (i.e., approximately 30 vehicles per day) is not substantial, and is not expected to result in a significant adverse impact upon traffic conditions during the construction phase.

Upon completion of construction of the proposed solar farm, primary site access will consist of an asphalt driveway, transitioning to gravel, extending from the south side of Moriches-Middle Island Road. One emergency access point will be provided near the southwestern portion of the subject property, connecting to Grove Drive. As site occupancy would be low (e.g., up to six employees at any given time), the number of

vehicular trips to-and-from the subject property during the operational phase would be nominal, and no significant adverse transportation impacts would result from implementation of the proposed action.

Interconnection

The proposed conceptual interconnection would extend from northern boundary of the subject property east along Moriches-Middle Island Road and south along Weeks Avenue until reaching the aforementioned electric substation (see *Conceptual Interconnection Route* plan in Appendix C). Other than construction-related traffic, which would be temporary and would cease upon project completion, there would be no vehicular trip generation on area roadways as a result of the proposed interconnection. Improvements associated with the interconnection may result in traffic impacts while improvements are undertaken within the Moriches-Middle Island Road and/or the Weeks Avenue roadway rights-of-way. Such construction-related impacts are expected to be of relatively short duration, and would cease upon project completion. Therefore, no significant adverse transportation impacts are anticipated.

Aesthetics, Visual Resources and Noise

Aesthetics and Visual Resources

Views of the subject property from surrounding areas are significantly limited by the minimal street frontage, and due to the presence of undeveloped, vacant properties to the east and south. All views of the site from surrounding areas are of vacant, wooded property. With the exception of the creation of an access driveway along Moriches-Middle Island Road, and an emergency access driveway at the southern terminus of Cranford Boulevard (to be designed in consultation with the Town and local fire district during Site Plan review), views of the subject property from surrounding roadways would be unaltered.

The proposed action would retain significant natural buffers along the site perimeters, surrounding the proposed solar PV farm. At the north, a 50-foot wooded buffer would remain, adjacent and, in addition to the wooded parcels 175 feet in depth (owned by the Town of Brookhaven) that would separate the subject property from the Moriches-Middle Island Road corridor. A 77-foot wooded buffer would be provided to the east, and a 220-foot buffer would be provided to the south where the subject property abuts vacant (publicly-owned) land. At the west, where the subject property abuts Cranford Boulevard and properties primarily developed with single-family residential uses, a vegetated buffer ranging from approximately 211 feet to 500 feet in depth would be retained. These vegetated buffers would provide significant screening of the proposed facility from surrounding areas. The proposed *Planting Plan* includes staggered evergreen screen plantings to be installed along the length of the western limit of the proposed cleared area, and the adjacent fence would include privacy slats. Therefore, should there be any visibility through the

211-foot wooded buffer, the evergreen plantings would screen the solar facility, even in winter months.

Site lighting would be installed within the solar PV farm. All fixtures would be downward facing, and the relevant fixtures would be fitted with shields to direct all light toward the center of the site. As confirmed by photometric analysis, there would be no light spill onto adjacent properties upon implementation of the proposed action.

Based on the foregoing, no significant adverse aesthetic or visual impacts (including lighting impacts) are expected to result from implementation of the proposed action.

Noise

The Town of Brookhaven adopted Chapter 50 – Noise Control to, "prevent excessive sound that may jeopardize the health, welfare or safety of the citizens or degrade the quality of life" in the Town (see §50-1(A) of the Town Code). Relevant restrictions are set forth within the Town Code to prevent noise impacts from construction activities, as well as operations.

In accordance with the relevant provisions of Chapter 50, construction activities would not be undertaken between the hours of 6:00 p.m. and 7:00 a.m. the following day; or on weekends or legal holidays. Proposed construction activities may generate sound in connection with clearing, earth moving, construction of the proposed maintenance building, etc. However, these impacts would be of relatively short duration, and would cease upon project completion. Moreover, construction activities would not occur outside of the proposed limits of clearing, which incorporate a minimum 211-to-500-foot densely vegetated buffer from the nearest sensitive receptors (i.e., residential uses along the western site boundary).

The level of activity at the subject property would be extremely low, and there would be no substantial noise sources established at the site as a result of the proposed action. There are no moving parts or motors associated with operation of the proposed solar panels. Occasional maintenance activities would be conducted during non-sensitive time periods, only. Additionally, as indicated above, the proposed facility would be significantly buffered from the nearest sensitive receptor. Overall, no significant adverse noise impacts are expected to result from implementation of the proposed action.

Interconnection

It should be noted that the conceptual interconnection of the proposed facility to the LIPA utility grid, which would be designed and implemented by NYISO/PSEG Long Island, may have the potential to result in aesthetic impacts. The specific location and design of such interconnection cannot be determined at this time. The proposed interconnection would be expected to be visible due to its location along the established street frontage and the frontage of existing residential development. A

limited amount of clearing and/or trimming of vegetation may be expected to be needed (e.g., along the roadside) to accommodate the interconnection. Visible elements of the interconnection (e.g., overhead utility cables, support structures) would represent visual impacts to the immediately adjacent areas from which they may be seen. Transmission and distribution lines for electricity are present throughout the area surrounding the subject property, such that they are an established element of the visual environment of the Moriches-Middle Island Road and Weeks Avenue corridors and throughout the community (see photographs in Appendix E). Overall, any visual impacts resulting from interconnection improvements would be incremental to the existing condition, and significant adverse visual impacts are not expected to result from same.

With the exception of temporary construction noise, which would cease upon project completion, the conceptual interconnection is not expected to include the establishment of any new significant noise sources, such that adverse noise impacts would not be anticipated.

Energy

The proposed action consists of the development of a solar PV energy farm. As a renewable, "green" source of energy, the completed project will benefit the Town of Brookhaven area by helping to provide for growing energy needs in a non-polluting fashion. The proposed MISF solar PV farm is expected to supply 19.6 MW of electricity to the grid, supplying an estimated 38,000 to 44,000 MWh, annually[8] - - enough electricity to power up to approximately 6,666 homes. It is expected that any power purchase agreement for the electricity would be for 20 years, after which the agreement could be extended, transferred to another entity (for operation or upgrade) or the facility could be dismantled (and the property restored or application made for another use). The facility is expected to have a lifetime of approximately 40 years. A decommissioning plan will be provided for review and approval by the Town of Brookhaven prior to implementation of the proposed action.

The proposed action is consistent with the relevant energy goals of New York State, the Town of Brookhaven, and the local utility, as expressed within the Town's Clean Energy Action Plan for 2006, the LIPA Electric Resource Plan 2010-2020, the PSEG Long Island Utility 2.0 Long Range Plan Update Document, and the New York State Energy Plan.

[8] Based on the U.S. EIA's published 2012 capacity factor, the proposed facility would generate approximately 34,854 MWh per year. However, the applicant anticipates that actual annual generation will be somewhat higher (i.e., 38,000 to 44,000 MWh). The specific technology to be implemented at the subject property has not yet been selected, and will be determined by the applicant based on the latest technology available at the time of final design. However, the applicant proposes to construct a state-of-the-art facility, with higher-rated solar PV panels and with significantly lower loss factors than many other solar PV facilities, such that the actual output is expected to be higher than the average published within the U.S. EIA's 2012 report.

Proposed Mitigation

This section discusses the proposed measures that have been incorporated into the proposed action to avoid, minimize or mitigate potential environmental impacts of the project, as detailed within this DEIS.

Geological Resources

- Strategic grading and application of topsoil (as needed) to address potential soil limitations.
- Protection of existing vegetation to remain.
- Scheduling of clearing and grading activities to minimize the total area of land disturbed at any one time.
- Limiting the length of time areas are exposed by establishing pavement and plantings at exposed areas as soon as practicable.
- Installation of sediment barriers (e.g., silt fence, hay bales) along the limits of disturbance for the duration of the work. No sediment from the site would be permitted to wash onto adjacent properties, wetlands or roads.
- Stabilization of graded and stripped areas and stockpiles via temporary seeding or other effective cover.
- Protection of drainage inlets through the use of sediment barriers, sediment traps, etc., to prevent sediment buildup.
- Control of fugitive dust (e.g., covering of stockpiles, temporary seeding, use of a water truck during extended dry periods).
- Establishment of a stabilized construction entrance to prevent soil and loose debris from being tracked onto local roads.
- Providing a water truck on-site during dry periods to dampen exposed soils.
- Implementation of a *Grading & Drainage Plan* that minimizes the alteration of existing topography and the quantities of cut and fill, to the maximum extent practicable.

Water Resources

- The use of native, low-maintenance plant species to eliminate irrigation demand and fertilizer and pesticide application.
- Installation of vegetated swales and leaching basins to retain and recharge stormwater on-site.
- Re-vegetation and natural areas to comprise 93.17± percent of the subject property.
- Adequate separation distance to be provided between the base of leaching structures (i.e., leaching pools, sanitary system) and groundwater to allow for the filtration of stormwater and sanitary waste.
- Adherence to the relevant requirements and recommendations of SCSC Articles 6, 7 and 12, the *NURP Study*, the *208 Study*, and the *Forge River Plan*.
- Coverage to be obtained under SPDES GP-0-15-002 for stormwater discharges from construction activity. The proposed stormwater management system would

meet or exceed all relevant requirements of SPDES GP-0-15-002 and the Town of Brookhaven.

- Erosion and sedimentation controls and stormwater management would be implemented as part of an approved SWPPP.

Ecological Resources

- Minimization of potential adverse impacts would occur through implementation of an extensive planting plan consisting of native species.
- Utilization of "plant rescue" techniques during clearing of the site.
- Minimization of potential adverse impacts would occur through placement of security fencing around the solar farm area, rather than surrounding the entire site.
- Security fencing design (including intermittent openings along the fence bases) that facilitates the movement of eastern box turtle, small mammals, etc., between the solar farm and the surrounding forested habitat.
- Placement of breeding boxes for bluebird and other avian species around the perimeter of the solar farm.
- Placement of bat roosting boxes on-site, and restricting clearing during the northern long-eared bat pup-rearing season (June 1-July 31).
- Establishment of an eastern box turtle nesting site(s) along the perimeter of the solar farm.
- Avoidance and minimization of potential adverse impacts to wildlife would occur through avoiding clearing during the late spring and summer seasons, when breeding/nesting occurs for most resident wildlife species.
- Conducting wildlife sweeps prior to clearing activities to identify and remove less mobile wildlife from the targeted areas (e.g., eastern box turtle).

Air Resources

- Emission controls for construction vehicles (e.g., proper maintenance of all motor vehicles, machinery, and construction equipment, maintenance of manufacture's muffler equipment or other regulatory-required emissions control devices).
- During construction, dust control measures would be implemented during dry or windy periods (e.g., application of water, the use of stone in construction roads, and vegetative cover).
- Regular sweeping of pavement of adjacent roadway surfaces during construction.

Land Use, Zoning and Plans

- Retention of a significant area of wooded, natural areas at the site (39.30± acres).
- Establishment of significant natural perimeter buffers, including a buffer of 211-to-500 feet along the western property boundary and additional screening (i.e., privacy fence slats, evergreen plantings) where the subject property abuts residential uses.

- Re-vegetation of 54.18± acres (nearly 90 percent of the total area to be cleared) with native shrubs and grasses.

Transportation

- Materials deliveries would be scheduled to occur at off-peak hours during the construction phase, so as not to coincide with peak commuter traffic times to the extent practicable.

Aesthetics, Visual Resources and Noise

- Significant natural buffers will be retained along site perimeters to obscure views of the proposed facility.
- Evergreen screen plantings will be installed along the length of the western project limit, and privacy slats would be installed in the adjacent fence. Should there be any visibility through the 211-foot wooded buffer, the evergreen plantings would screen the solar facility, even in winter months.
- Construction activities would not be undertaken during sensitive time periods.
- Significant natural buffers would also minimize the potential for noise impacts.

Energy

- The proposed action would have a beneficial energy impact by establishing a renewable "green" source of energy, thereby reducing the demand for electricity from traditional energy sources (such as power plants that that rely on the burning of fossil fuels).

Alternatives and Their Impacts

Four alternatives to the proposed action are evaluated within this DEIS, as follows[9]:

- SEQRA-Mandated "No Action" Alternative
- Sale/Transfer of Land to a Government Entity for Preservation
- Solar Farm Development without Variance Relief
- Development in Accordance with Existing L Industrial 1 / A Residence 1 District Zoning

[9] These alternatives were defined within the Town Board Final Scope for a prior, nearly identical application. As identified in its Positive Declaration (see Appendix A), the Planning Board elected to consider the Final Scope for the purposes of the SEQRA review process, rather than conduct a new public scoping process.

No-Action Alternative

The No-Action alternative involves leaving the subject property in its present state. Specifically, the property would remain wooded and vacant.

Implementation of the No-Action alternative would forego the various beneficial impacts of the proposed action discussed throughout this DEIS. Most notably, the proposed alternative energy source would reduce the demand for electricity generated by the burning of fossil fuels (e.g., oil, natural gas) at traditional power plants that produce air emissions of greenhouse gases. Without the proposed renewable "green" source of energy, the energy demands of the surrounding community would continue to rely on traditional sources to provide enough electricity to power up to an estimated 6,666 homes.

If the No-Action alternative is implemented, there would be no construction-related impacts. Among such impacts are potential positive impacts, including construction job generation and investment in the local "green" economy, etc.

Because no physical improvements would occur in connection with the implementation of this alternative, there would be no potential impacts to geologic resources, or ecological resources, nor would land use or zoning impacts result. Further, because the site would remain vacant and unimproved, there would be no impacts associated with traffic generation, nor would there be any adverse impacts upon groundwater (e.g., water use, sanitary waste generation), surface water, or stormwater runoff.

The No-Action alternative would not have adverse impacts upon air quality or energy. However, the positive impacts of the proposed action related to air quality and energy would be foregone.

It is important to note that the No-Action alternative does not meet the objectives of the applicant, including its objective to develop the subject property with a solar PV farm as a renewable "green" source of energy.

Sale/Transfer of Land to a Government Entity for Preservation

Because this alternative considers the preservation of the subject property in its current wooded and vacant state, the environmental impacts of this alternative would generally be equivalent to that of the No-Action alternative.

It is important to note that the subject property has been controlled by the applicant for greater than 30 years. During that time, no reasonable offer has been received or made by any parties, either private or municipal, to acquire the subject property for alternative uses or preservation. Additionally, early in the application process of the subject special use permit, the applicant pursued the opportunity for the

preservation of the subject property by public acquisition, or by other means such as a "land swap" whereby the subject property would be preserved in exchange for the development of other available land (to meet the objectives of the applicant). No alternatives came forward. Accordingly, as of the date of preparation of this DEIS, implementation of this alternative is not feasible.

Solar Farm Development without Variance Relief

The proposed action requires a lot width variance, which would be required no matter what is developed at the subject property, and which is not a condition that the applicant has created. Specifically, §85-5686(B)(3) of the Town Code requires that a lot width of 200 feet be provided at a setback of 100 feet from the street line (i.e., from Moriches-Middle Island Road), and only 50 feet is provided. Because this variance is required to implement the proposed action, and it is related to the shape of the subject property, there is no change to the design of the proposed MISF that could avoid the need for the variance. Therefore, implementation of this alternative is not feasible.

Development in Accordance with Existing L Industrial 1 / A Residence 1 District Zoning (As-of-Right)

Under this alternative, the subject property would be developed "as-of-right" (as described in the Final Scope) in accordance with the use, bulk and dimensional regulations of the prevailing L Industrial 1 zoning district.[10] A *Yield Map Plan* was prepared to depict this alternative. The *Yield Map Plan* illustrates that the prevailing L Industrial 1 zoning would allow for the development of an intensive, industrial land use(s), resulting in clearing of the subject property to a greater extent than the proposed action, and resulting in the generation of significantly greater quantities of vehicular trips on area roadways and sanitary waste to be discharged to groundwater, among other things.

Development in accordance with this alternative could include approximately 752,250± square feet of industrial building space, 39.83± acres of surface parking and other paved areas, and 10.05± acres of landscaped area. Various uses could potentially occupy the 752,250± square feet of building area (shown among three buildings on the *Yield Map Plan*), in whole or in combination, as permitted in the L Industrial 1 district, such as:

- Agricultural or nursery use, including the retail sale of products raised on the premises
- Bank
- Commercial laundry establishment
- Day-care facility
- Health club

▼

[10] A lot width variance would be required due to the existing shape of the property, which would be required no matter what is developed at the subject property.

- Manufacturing
- Office
- Printing plants
- Research and development uses, including laboratories for scientific or industrial research, testing and development
- Warehouse

For the purposes of this DEIS, an industrial warehouse use is anticipated. Site coverage data for the *Yield Map Plan* is as follows:

Type of Coverage	Existing Conditions	Proposed Action	As-of-Right Alternative
Vacant/Wooded	100.33±	39.30±	29.73±
Area Re-Vegetated Back to Natural (native landscape trees, grasses and shrubs)	0.00±	54.18±	0.00±
Landscaped Area (grass)	0.00±	0.00±	6.73±
Gravel Driveways and Parking Lot	0.00±	6.30±	0.00±
Roads, Buildings and Other Paved Surfaces	0.00±	0.55±	57.10±
TOTAL	100.33±	100.33±	100.33±

This alternative would result in the disturbance of a greater land surface area than the proposed action (i.e., 70.60± acres instead of 61.03± acres), and, due to the construction of foundations for 752,250± square feet of building area, paved parking (with drainage), sanitary systems, utilities, etc., this alternative also has a greater potential for altering site topography and/or requiring the removal of natural material from the site. Additionally, a longer construction period may be necessary, as compared with the proposed action.

This alternative would be expected to have greater impacts to water resources, including groundwater and surface waters. Based on a theoretical 752,250± square feet of industrial use, this alternative would utilize an estimated 30,090 gpd of potable water for domestic purposes (plus additional water use for irrigation), and would generate an equivalent quantity of sanitary waste for discharge to on-site sanitary systems (this analysis does not presume the use of a sewage treatment plant or denitrification, as same would not be required pursuant to Article 6 of the SCSC). A Nitrogen Mass Balance calculation was performed for this alternative, similar to that performed for the proposed action. The results indicate that, primarily due to sanitary waste generation, this alternative would generate an estimated nitrogen load of 7,829.25 lbs N/year, which is a 2,226.0 percent increase compared to the proposed solar farm. Based on this calculation, this alternative would increase the nitrogen contribution of the West Mill Pond subwatershed of the Forge River watershed by an estimated 7.4 percent and increase the total watershed's contribution by 2.6 percent (as compared with existing conditions). This increase in nitrogen loading could result in adverse impacts to the Forge River surface waters.

With respect to stormwater, this alternative would result in the establishment of 57.10± acres of roads, buildings and other impervious surfaces at the 100.33±-acre site (as compared with 0.55± acre under the proposed action). This area of impervious surfaces would require an extensive stormwater management system that may include, but that may not necessarily be limited to, underground leaching structures, drainage swales, and/or one or more recharge basins, to contain stormwater runoff at the site. Additionally, the quality of any stormwater runoff generated under this alternative from paved parking and loading areas, landscaped areas, etc., may be reduced as compared with runoff from the re-vegetated areas to be established beneath the solar arrays under the proposed action. The increased total area of ground disturbance (approximately 9.57 additional acres) associated with this alternative would incrementally increase the potential for adverse erosion and sedimentation-related impacts as compared with the proposed action, although similar control measures may be implemented.

The clearing of natural vegetation that would result under this alternative would have similar impacts as would the proposed action, except to a somewhat greater extent as an additional 9.57± acres would be cleared. The proposed action includes the re-vegetation of 54.18± acres at the site with native species, following the installation of the solar PV arrays. The mitigating effects of that substantial re-vegetation effort (which would provide habitat for various species, including Species of Special Concern) would not occur under this alternative, which would establish 57.10± acres in buildings and paved surfaces and another 10.05± acres in landscaping (which could include non-native and fertilizer-dependent species).

The air quality-related impacts of this alternative would vary with the specific industrial use that would occupy the site. Several of the most prevalent sources of criteria air pollutants (e.g., heating fuel combustion, vehicle fuel combustion, emissions from manufacturing equipment, dry cleaning, coating, and other industrial processes). Depending upon the ultimate use of the property, several vehicular trips to-and-from the subject property may be generated by employees, delivery and/or distribution trucks, customers or patrons, etc., representing mobile emissions sources. Emissions may also be generated by electricity usage, directly or indirectly. This alternative would also forego the significant air quality benefits expected to result from the proposed action, which would establish a renewable "green" source of energy as an alternative to conventional power plants that burn fossil fuels to generate electricity.

With respect to land use and zoning, as indicated above, the development of the subject property under this alternative would result in the establishment of an industrial land use(s), resulting in clearing of the vacant subject property to a greater extent than the proposed action, and resulting in the generation of significantly greater quantities of vehicular trips on area roadways and sanitary waste to be discharged to groundwater, among other things. It is noted that the surrounding area predominantly contains single-family residential uses and undeveloped land, although some industrial development is present in the vicinity of the subject property (e.g., along Moriches-Middle Island Road and Weeks Avenue). As this

alternative has been designed to be "as of right" it conforms to the use, bulk and dimensional regulations of the L Industrial 1 zoning district, with the exception of the minimum lot width requirement (200 feet required, 50 feet provided) due to the parcel shape. Accordingly, a zoning variance for lot width would be required for implementation of this alternative.

The proposed action is expected to generate only a nominal number of vehicular trips to-and-from the subject property. By contrast, this alternative could generate several vehicular trips, to a varying degree depending on the specific industrial uses to occupy the site.

Based on the theoretical *Yield Map Plan*, the following traffic generation would be anticipated:

Proposed Use/ITE Land Use Code	Building Area	Peak Hour Trips		
		AM	PM	SAT
Warehouse	Rate	0.30 trips/1000 SF	0.32 trips/1000 SF	0.13 trips/1000 SF
	752,250 SF	**226**	**241**	**98**

It is noted that the trip generation numbers presented above reflect a theoretical development scenario, and that greater trip generation numbers may result from development of the entire site with a different use or mix of uses) (e.g., office use). A detailed traffic analysis would be required to determine the significance of traffic impacts of this alternative, the need for mitigation (e.g., installation of a traffic signal), etc. However, it is clear that from the perspective of trip generation on area roadways, this alternative would have a far greater potential to result in an adverse traffic impact than would the proposed action.

Due to the shape of the subject property, development under this alternative would not be expected to significantly alter views from Moriches-Middle Island Road or Cranford Boulevard. This alternative would provide the minimum 75-foot wooded buffer along all property boundaries that abut residentially zoned land. These buffers would minimize, but not necessarily eliminate, potential visual impacts of this alternative (including potential lighting impacts). Where the subject property abuts existing single-family development (i.e., along the western property boundary), the vegetated buffer is reduced from the 211-to-500-foot buffer that would be established under the proposed action.

The noise environment at the subject property would be altered as a result of the development and operation of 752,250±square feet of industrial use(s) at the site, to a degree that would be dependent upon the specific uses that occupy the site. Operational noise may be associated with rooftop equipment, manufacturing equipment, vehicular activity (including truck deliveries), and other similar noise sources from permitted uses. By comparison, there will be no measureable activity occurring at the subject property (with the exception of occasional maintenance or

security-related activity), such that there would be limited operational noise (if any) under the proposed action.

This alternative would establish an energy demand at the subject property, where, currently, the vacant, wooded site does not require an energy supply or use energy. The potential demand for electricity and the potential demand for fossil fuel for heating or other purposes cannot be estimated, as the demand would vary significantly based on the specific light industrial use established at the site in accordance with prevailing zoning. Allowable uses within the L Industrial 1 zoning district may be energy-intensive (e.g., refrigerated storage, manufacturing), such that the operation of the large industrial use provided for on the *Yield Map Plan* could represent a significant energy demand. By comparison, the proposed action is expected to result in only minimal on-site energy demands associated with the operation of the proposed 4,032±-square-foot maintenance building and site lighting. Moreover, the proposed action would establish a solar PV farm at the subject property and would represent a renewable, "green" source of energy capable of powering up to 6,666 homes in the region (thereby reducing reliance on fossil fuels). This alternative also would not further the energy goals of New York State, the Town of Brookhaven, or the local utility.

It is noted that this alternative would not necessitate an interconnection to the electric utility grid for the distribution of energy generated at the site, which is contemplated as part of the proposed action. Accordingly, implementation of this alternative would preclude potential impacts of an interconnection, which will vary depending upon the ultimate design (by others), but which may include impacts related to pruning/removal of vegetation, limited ground disturbance, and visual resources, as identified throughout this DEIS.

2.0

Description of Proposed Action

2.1 Introduction

This document is a Draft Environmental Impact Statement (DEIS) prepared in accordance with the State Environmental Quality Review Act (SEQRA) and its implementing regulations at 6 NYCRR Part 617 for the action contemplated herein, and is based upon the Positive Declaration that was issued by the Planning Board and the Final Scope that was issued by the Town Board for a nearly identical application[11] at the subject property as referenced within the Positive Declaration (see Appendix A). This DEIS evaluates the potential adverse impacts associated with the proposed action, which consists of a special use permit for a solar energy production facility on the 100.33±-acre vacant property, known on the Suffolk County Tax Map (SCTM) as District 0200 – Section 712.00 – Block 09.00 – Lot 001.000 (the "subject property"). The proposed project, known as Middle Island Solar Farm (hereinafter "MISF"), consists of the development of a PV solar energy farm capable of generating approximately 19.6 megawatts (MW) of renewable electricity for distribution onto the Long Island Power Authority (LIPA) – PSEG Long Island power grid. The subject property is located along the south side of Moriches-Middle Island Road and the east side of Cranford Boulevard in the hamlet of Mastic, Town of Brookhaven. A site location map is included as Figure 1, and an excerpt of the Suffolk County Tax Map is included as Figure 2.

This DEIS is divided into six sections, the first of which is the Executive Summary. This section, Section 2.0, provides a brief discussion of existing site and surrounding area conditions, and provides a description of the components of the proposed project including the special use permit, proposed site layout, a brief history of the site, the project's purpose, need and benefits, proposed construction and phasing, and the required permits and approvals.

[11] A Final Scope was promulgated by the Town Board on September 16, 2014, for a Special Permit application for a solar photovoltaic Electric Generating Facility at the subject property. As indicated in the Planning Board Positive Declaration, rather than conduct a new public scoping process, the prior Final Scope will be considered for the purposes of the SEQRA review process.

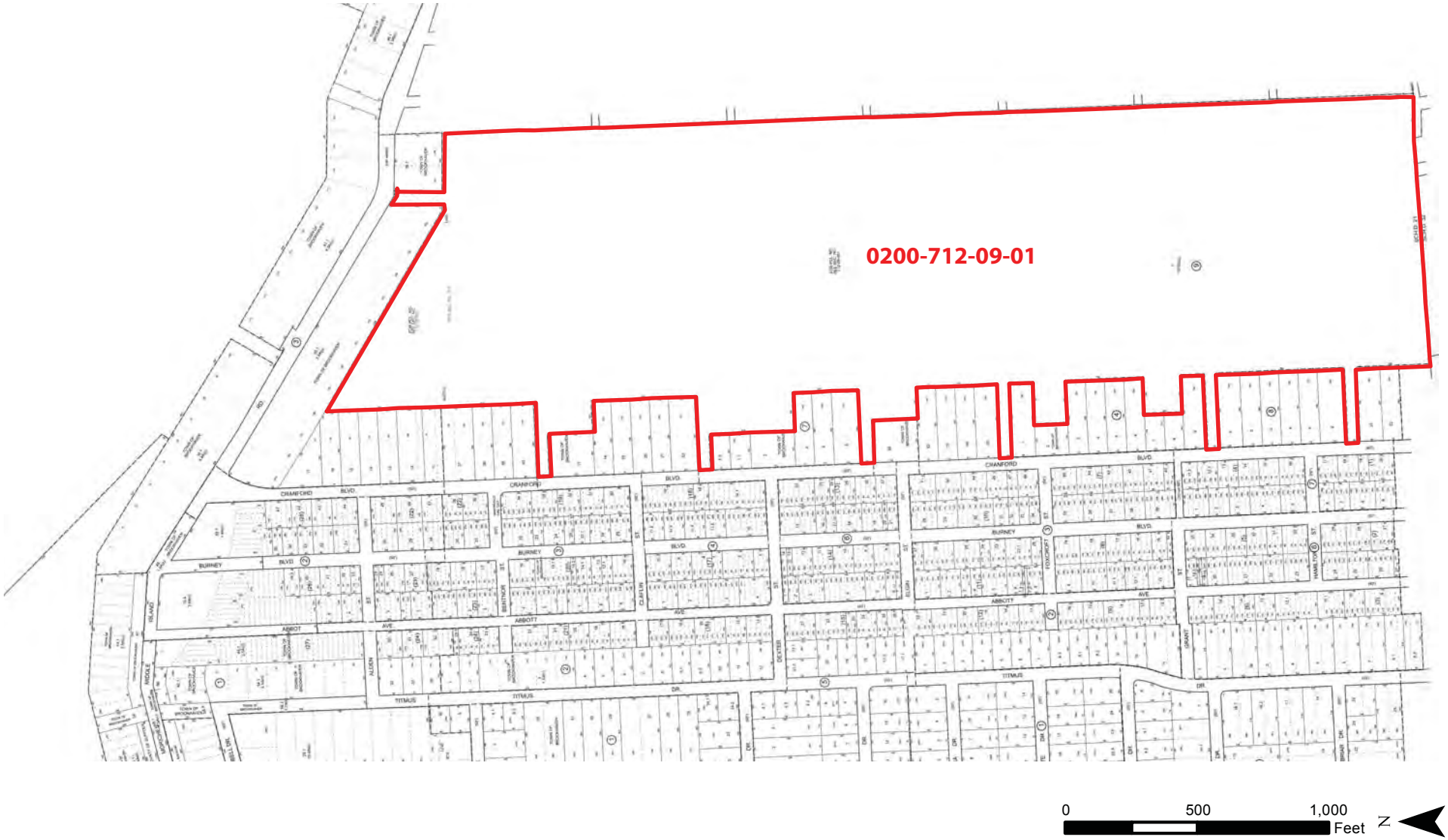
Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Site Location

Figure # 1

1 Subject Property (w/ Parcel ID No.)

Sources: 1 Image courtesy of USGS Earthstar Geographics SIO © 2014 Microsoft Corporation



Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Suffolk County Tax Map Excerpt
District 0200 – Sections 645, 673 & 712

Figure # 2

Approx. Location of Subject Property

LEGEND

Property or RW Line	Subdivision Lot No.	Block Line	School District Line — SCH —
Deceased Common Owner	Subdivision Block/Bldg. No. (21)	Block No. (2)	Fire District Line — F —
Subdivision Lot Line	Deed Dimension		Water District Line — W —
Stream / Shore	Scaled Dimension	County Line	Light District Line — L —
Parcel No.	Deed Area 12.1 A(d) or 12.1A	Town Line	Park District Line — P —
	Calculated Area 12.1 A(c)	Village Line	Sewer District Line — S —

Hydrant District Line — H —	UNLESS SHOWN OTHERWISE, ALL PROPERTIES ARE WITHIN THE FOLLOWING DISTRICTS
Refuse District Line — R —	SCHOOL 21
Historical District Line — HS1 —	FIRE FM1
Ambulance District Line — A —	LIGHT LX1
Wastewater District Line — WW —	PARK
	AMBULANCE MAN
	SEWER
	HYDRANT
	WATER
	REFUSE
	WASTEWATER

Sources: Suffolk County Water Authority, June 26, 2014

Section 3.0 of this DEIS provides a discussion of the environmental setting for the project, by topic. Within each section the existing conditions, potential impacts that are likely to occur upon project implementation, and proposed mitigation measures that reduce or eliminate those impacts are discussed. Section 4.0 discusses cumulative impacts, unavoidable adverse impacts, irreversible and irretrievable commitment of resources, growth inducing aspects, and the effects on the use and conservation of energy resources. Alternatives and their impacts are discussed in Section 5.0 of the DEIS. Among these alternatives is the "No Action" alternative that is required to be discussed pursuant to SEQRA and its implementing regulations at 6 NYCRR Part 617. References are included in Section 6.0 of this DEIS.

2.2 Existing Site Conditions

The subject property is currently undeveloped and vacant. Existing site data for the subject property are described in the table below:

Table 1 – Site Coverage: Existing Conditions

Site Coverage	Acres	Percent
Roads, buildings, and other paved or impervious surfaces	0.0±	0.0±
Impervious Surface Total	0.0±	0.0±
Forested (woodlands)	100.33±	100.00±
Meadowlands, grasslands or brushlands	0.0±	0.0±
Agricultural	0.00±	0.00±
Surface Water Features	0.00±	0.00±
Wetlands	0.00±	0.00±
Non-vegetated	0.00±	0.00±
Pervious Surface Total	100.33±	100.00±
TOTAL	100.33±	100.00±

The land uses surrounding the subject property predominantly include wooded, vacant land (to the north, east and south), with residential uses to the west (along Cranford Boulevard. The general surrounding area contains a mixture of single-family residential, open space, vacant land, community facility, agricultural, and industrial uses. Land uses to the north of the subject property predominantly include private and municipally-owned vacant/wooded land along the north and south sides of Moriches-Middle Island Road. There is also a Town of Brookhaven Highway Yard and a wireless communications facility present on the north side of Moriches-Middle Island Road, across from the proposed entrance to the subject property. Immediately east of the subject property is wooded open space. A mixture of single-family residential, agricultural and industrial uses follows along the west side of Weeks Avenue, south of Moriches-Middle Island Road. An electric substation is situated at the southern terminus of Weeks Avenue. The area to the south of the subject

property is vacant, publicly-owned land. Single-family residences represent the predominant land use to the west of the subject property. See Section 3.5 of this DEIS for additional information on land uses in the surrounding area.

The overall topography of the parcel is relatively flat with a gentle slope in elevation from the high area on the northwest corner of the site (approximately 69 feet above mean sea level [amsl]) to the low area on the southeast corner of the site (30 feet amsl). The depth to groundwater ranges from approximately 36 feet below grade surface (bgs) on the northwest corner of the site to approximately 5 feet bgs on the southeast corner of the site. Groundwater on site flows in a generally south-southeast direction.

The subject property is currently fully vegetated, being entirely composed of a Pitch Pine – Oak woodland habitat with a low growth shrub and sapling tree understory. The vegetation varies in density possibly due to fire events and/or fire suppression in the recent history of the site. Moreover, predominant soils at the property are of the Riverhead (RdA), Plymouth (PlA and PlB), and Haven (HaA) series, and are characterized as very well drained and typical of Pitch Pine White/Scarlet Oak woodlands on eastern Long Island. There is no evidence of any structures past or present, and no evidence of any substantial dumping on the site.

The site and immediate adjacent properties do not contain any water, wetlands, streams or ponds. The nearest mapped water feature is the headwaters of the Forge River, located over 1,121± feet to the east of the southeast corner of the site at its nearest point. Surface water from this feature flows southeastward, away from the project site, towards the Forge River and eventually to the Great South Bay. The subject property and vast surrounding area are located within the 9,451-acre watershed area of the Forge River. The project area is also situated on the northern peripheral of the South Shore Estuary Reserve Watershed area, which extends across the entire southern portion of Long Island. In addition, according the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) the subject property is located in Zone X, outside of any special flood hazard areas. The subject property is not within a designated Critical Environmental Area (CEA).

2.3 Project Description

The applicant, which has controlled the subject property for over 30 years and is invested in the future of the site, has developed the proposed action to establish a renewable, “green” source of electricity. The proposed action consists of the development of a solar PV energy farm and associated site improvements (see preliminary project plans in Appendix C). As such, the proposed project will benefit the Town of Brookhaven and Long Island by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, MISF anticipates that the proposed facility will be interconnected to the power grid supplying 19.6 MW of

electricity to the system for use by PSEG Long Island's customers via a Power Purchase Agreement (PPA). However, MISF does not have an executed Power PPA at this time.

The proposed project will include a field of solar panel arrays, associated electrical distribution equipment, a maintenance and operations building, perimeter and centerline internal driveways, site fencing, drainage reserve areas and vegetated (natural) buffer areas. The developed portion of the site would occupy 61.03± acres, equating to 60.83± percent of the property. The remaining 39.30± acres, equating to 39.17± percent, would remain in its existing natural, wooded state.

Regrading of the site would occur as necessary for appropriate mobility and equipment installation needs, as well as to contain and recharge all stormwater runoff from the developed portion of the site. It is not expected that any fill material would need to be brought in, nor that any cut material will need to be removed from the site. Approximately 54.18 acres, or approximately 88.78 percent, of all cleared area will be re-vegetated with native species after equipment installation has been completed.

The solar arrays will consist of interconnected, ground mounted, fixed position, photovoltaic solar collection panels. The arrays will be connected to metal frames supported on piles for stability. The piles will be either helical steel piles or pre-cast concrete piles, depending on results of future soil sampling. The arrays will be aligned east-to-west, oriented and angled toward the sun exposure. The low end of each panel array will be fixed at approximately eight feet above grade level (agl), and the high end will extend to approximately 17 feet agl.

The array strings will be in arranged in parallel rows, with each row spaced 24 feet on center, separated by a 12-foot-wide grassed (pervious) access pathway. Areas beneath and surrounding the solar arrays will be planted with a variety of native shrubs and grasses, and bush areas, and additional plantings will be established beneath the array rows. Access to the arrays will be via a 20-foot-wide driveway running around the perimeter of the array field, as well a 20-foot-wide centerline driveway separating the two primary banks of arrays. These internal driveways will be pervious, unpaved, gravel surfaces to minimize stormwater runoff and allow for stormwater infiltration. Additionally, stormwater runoff from off of the face of the arrays will be directed to vegetated, pervious areas beneath each array, established with native, low-growing vegetation.

A 100-foot-by-100-foot area at the southern portion of the subject property will be reserved for electrical equipment and switchgear required to convert the voltage generated at the site for distribution onto the local grid. A 4,032±-square-foot maintenance and operations building (84-feet-by-48-feet, approximately 24 feet high) is planned for construction within the northeast portion of the site, proximate to the site access drive. The building will be multi-functional with divided areas serving as

office space, storage areas, security surveillance, control room, repair shop, and system monitoring. An on-site subsurface septic system will be installed for the building. Water usage for the site will be via connection to the Suffolk County Water Authority (SCWA) water main located along Moriches-Middle Island Road. A closed-loop geothermal heating system is proposed to be installed beneath gravel areas adjacent to the maintenance building, and two, 2,500-gallon underground liquid petroleum gas tanks are contemplated for emergency generator and/or heating use. Power from the proposed solar array directly to the proposed maintenance building is not expected to be practical due to the need for step-down of currents and other electrical engineering requirements, and solar power backup would not be ideal due to the potential need for emergency power during the night. A connection to the LIPA power grid at Moriches-Middle Island Road for electrical service will be necessary to power the maintenance and operations building, site lighting, etc. The proposed solar farm will be interconnected to the power grid to distribute electricity generated by the PV arrays, and New York Independent System Operator (NYISO)/PSEG Long Island will be responsible for locating, designing and installing the power line(s) for the distribution of power generated by the proposed facility. Accordingly, the identification of the connection route is not possible at this time, and it is not known or under the control of the applicant. Notwithstanding this, a potential interconnection route that extends from the from the north side of the subject property east along Moriches-Middle Island Road and south along Weeks Avenue (see *Conceptual Interconnection Route* plan in Appendix C) is analyzed in this DEIS as part of the proposed action.

Site security will be accomplished by the use of a double row of fencing to be installed around the perimeter of the internal cleared area and adjacent to the perimeter driveways. The fence rows will be spaced approximately 10 feet apart, with a six-foot-high inner chain link fence and an eight-foot-high outer chain link fence (with two-foot tip out). The area between the fences will be equipped with double level photoelectric beam detectors that when tripped will alert security personnel in the operations building. Controlled access gates will be installed at the primary and emergency entrances (which would be designed in consultation with the Town of Brookhaven Fire Prevention Division and the local fire district) to eliminate unwarranted entrance to the site.

Vehicular access to the site is proposed to extend from Moriches-Middle Island Road, along a 50±-foot-wide "flagpole" portion of the lot. Due to the low number of people expected to be on site, the number of vehicle generated trips from the project is expected to be minimal. Secondary access, for emergency use only, is proposed at the southwest corner of the parcel, at Grove Street. The demand for off-street parking spaces would be minimal, due to the nature of the proposed facility. Nonetheless, a gravel area adjacent to the proposed operations and maintenance building, along the proposed internal site driveways, would provide a minimum of 17 off-street parking spaces and one loading space (in accordance with the Code of the Town of Brookhaven).

The site will be obscured from view by establishing surrounding buffer and screening areas. The west side of the subject property abuts a developed area, primarily improved with single-family residential uses. On this side of the property, a 211±-foot buffer of existing natural vegetation will be maintained between the easternmost property line of the residences and the double perimeter security fence of the array field. In addition, a chain link fence with privacy slats will be installed along the outer (western) proposed fence, and a row of evergreen screen plantings would be established along the entire western fence line to further preclude visibility of the proposed facility from surrounding areas. The subject property abuts vacant, wooded land to the north, east and south. On the northern border, a 50-foot buffer[12] area of the natural vegetation will be retained. On the eastern border, a 77-foot minimum buffer would be retained. At the southern site boundary, a 220-foot wooded buffer would be retained on-site (including a 160-foot buffer area, and a 60 foot wide strip of land for potential future Town of Brookhaven highway purposes pursuant to a deed covenant). Clearing within the proposed buffers would be limited to that required for access or emergency access, as identified on the preliminary project plans in Appendix C.

The subject property is located approximately 0.5-to-1.0 mile east of the runways of the Town of Brookhaven Calabro Airport, and the solar panels are engineered to be light absorptive, reflecting as little as two percent of sunlight (as noted within the Federal Aviation Administration's *Technical Guidance for Evaluating Selected Solar Technologies on Airports* – November 2010). As such, the proposed facility is well outside of the associated aircraft approach surfaces, would not present an obstruction to airport functions, and is not expected to represent a significant light reflective or glare hazard to pilots. Furthermore, the proposed project is environmentally friendly, in that site operations will not involve the generation of noise impacts or contain a source of emissions that would result in air quality and odor concerns. Therefore, the passive site operations will be compatible with residential property uses that exist to the west of site and in the surrounding community.

Site security lighting to be installed will include low elevation (below the top of the surrounding tree canopy), downward-facing fixtures that would be 'Dark Sky' compliant. These lights would be for task-oriented purposes with various sections of the site being illuminated on-demand as needed rather than the whole site being lit on a full time basis. The design of the proposed site lighting will preclude light spill onto adjacent properties. Further, the substantial buffers of natural vegetation to be preserved at the site would preclude potential lighting impacts to surrounding residents.

[12] The 50-foot buffer to be provided along the northern site boundary would be supplemented by the existing Town-owned open space that adjoins the subject property. The net effect is that a substantial natural buffer would exist between the proposed SEPF and Moriches-Middle Island Road.

The solar panels will require minimal maintenance, as no moving parts or motors are associated with their operation. Periodically, some light cleaning of the panels may need to be conducted. This will be accomplished using a truck mounted wash station.

2.4 Purpose, Benefit and Need

The proposed action is the development of a PV solar farm. As a renewable, "green" source of energy, MISF would have a substantial environmental benefit. This alternative energy source would reduce the demand for electricity generated by the burning of fossil fuels (e.g., oil, natural gas) at traditional power plants that produce air emissions of greenhouse gases. Furthermore, the proposed project has been designed to incorporate various measures that will preclude or minimize potential environmental impacts to the maximum extent practicable, including, the retention of 39.30 acres of natural buffers; the planting of approximately 54.18 acres of native plants and grasses within areas to be cleared beneath the proposed solar arrays; design of security lighting to minimize potential impacts on surrounding properties; and the implementation of erosion and sediment controls during construction in accordance with an approved Stormwater Pollution Prevention Plan.

It should be noted that vehicular trip generation, water use, and sanitary waste generation associated with the day-to-day operation of MISF would be minimal, and no odor or air emissions would be generated by the proposed solar PV arrays. Additionally, the proposed project is expected to have various benefits (in addition to those associated with the proposed renewable energy source), including construction- and operation-phase job generation. The proposed project will also aid the local economy in that it is expected to generate approximately 32 construction jobs and 6 full-time post-construction positions. Construction activities will require the services of landscapers, heavy equipment operators, electricians, and building contractors for tasks involving vegetation clearing, site grading, array support installation, electrical equipment installations/connections, and building construction. Additional economic benefits would result from the purchase of green industry equipment and supplies.

As a source of renewable energy, the proposed project will benefit the Town of Brookhaven by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, MISF anticipates that the facility will be interconnected to the LIPA power grid supplying 19.6 MW of electricity to the system for use by PSEG Long Island's customers. Based on the United States Energy Information Administration's (U.S. EIA) 2012 annual capacity factor of 20.3 percent for utility scale solar photovoltaic generators (the most recent final year available),[13] it is

▼

[13] United States Energy Information Administration, *Table 6.7.b* from *Electric Power Monthly with Data from May 2014*, July 2014 (accessed December 2014); available from http://www.eia.gov/electricity/monthly/current_year/july2014.pdf.

anticipated that the proposed facility would generate approximately 34,854 megawatt hours (MWh) of electricity annually. According to the U.S. EIA, the average household in New York State consumes 6,578 kilowatt hours (kWh), or approximately 6.6 MWh, annually.[14] Therefore, the proposed project would generate sufficient electricity to power approximately 5,281 homes. The applicant anticipates that actual generation by the proposed Middle Island Solar Farm would range between 38,000 to 44,000 MWh annually,[15] which would be enough electricity to power up to approximately 6,666 homes.

The Suffolk County Planning Commission (SCPC) developed a model code for utility-scale solar photovoltaic installations, which was provided for consideration to local municipalities and for their adoption into their respective Town and Village codes at their discretion. The model code is the product of a working group comprised of County officials, representatives of several townships in Suffolk County (including the Town of Brookhaven), utility consultants, solar developers, environmental advocates and other interested parties, and, at its meeting of May 6, 2015, the SCPC adopted the model code by unanimous vote. The Town of Brookhaven Town Board became the first municipality in Suffolk County to adopt the SCPC's model code into its Town Code on August 6, 2015, with its status purpose being as follows:

> *"1. It is important to provide renewable energy facilities. It is equally important to protect our natural resources by providing standards for solar energy production facilities.*
> *2. It is altogether reasonable that the Town Board makes adequate provisions for these facilities, it is imperative that such facilities do not adversely affect surrounding and nearby properties.*
> *3. It is therefore the intent of this section to provide adequate safeguards for the location, siting and operation of solar energy production facilities."*
> *(*Town Code §85-812.A)

The proposed MISF meets every one of the relevant standards for Solar Energy Production Facilities set forth within the Town Code at §85-812 through §85-814 (as demonstrated within this DEIS). Accordingly, the proposed action would have the benefit of achieving the County and Town goals of providing renewable energy facilities in a responsible manner that safeguards against adverse effects upon natural resources or surrounding properties.

▼

[14] United States Energy Information Administration, *Table CE2.2* from *2009 Residential Energy Consumption Survey (RECS)* (accessed December 2014); available from http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=consumption.

[15] The specific technology to be implemented at the subject property has not yet been selected, and will be determined by the applicant based on the latest technology available at the time of final design. However, the applicant proposes to construct a state-of-the-art facility, with higher-rated solar PV panels and with significantly lower loss factors than many other solar PV facilities, such that the actual output is expected to be higher than the average published within the U.S. EIA's 2012 report.

2.5 Construction and Phasing

Construction activities will require the services of landscapers, heavy equipment operators, electricians, and building contractors for tasks involving vegetation clearing, site grading, array support installation, electrical equipment installations/connections, and building construction. Construction is expected to be completed over a 12-month period. General phasing is expected to occur in accordance with the following schedule:

- Clearing and Grading/Drainage: Months 1 – 2
- Electrical and Maintenance Building: Months 3 – 6
- Pile Foundations and Framing, Electrical (continued): Months 7 – 9
- PV Panel Installation: Months 10 – 12

Equipment expected to be used includes two-to-three excavators, four trenchers, and one dump truck. Not all equipment would be active during all phases of construction. On average, construction-related traffic would be limited to an estimated four-to-six deliveries per day, approximately 15 worker vehicles, and occasional (twice daily) coffee truck visits.

During the 12-month construction period, construction activities will be limited to non-sensitive periods (i.e., 7:30 AM – 6:00 PM), Monday through Saturday. Potential construction-related impacts (e.g., temporary, minor traffic delays on Moriches-Middle Island Road during truck deliveries and worker arrivals/departures; short term periods of equipment noise; fugitive dust generation) would be minimized or precluded by the phasing of deliveries, off-setting worker arrival/departure times, ensuring appropriate mufflers are installed on trucks and equipment, routing on-site truck traffic in such a fashion as to avoid unnecessary back-up maneuvers, and water misting of haul roads and areas of exposed soils during dry periods.

A Stormwater Pollution Prevention Plan (SWPPP), including an Erosion and Sediment Control Plan, will be developed (subject to approval by the Town of Brookhaven during site plan review) and implemented to address potential stormwater and erosion impacts. During construction, periodic inspections of the site (e.g., once or twice per week) will be conducted by a NYSDEC-certified erosion and sediment control inspector to evaluate control measures and identify any potential corrective actions needed.

It should be noted that, in order to minimize potential impacts to wildlife, construction scheduling would avoid clearing during the late spring and summer seasons when breeding/nesting occurs for most resident wildlife species, and wildlife sweeps would be performed ahead of clearing activities to minimize direct impacts to the maximum extent practicable. It is expected that similar measures would be incorporated into the construction of the conceptual interconnection between the

proposed facility and the local electric grid, if any pruning/removal of roadside vegetation is determined to be necessary.

2.6 Required Permits and Approvals

The following permits and approvals are required for implementation of the proposed project:

Table 2 – Required Permits and Approvals

Agency	Required Permit/Approval
Town Planning Board	Special Use Permit (Solar Energy Production Facility), Site Plan(Including Relief from Minimum Landscaping in Front Yard)
Town Zoning Board of Appeals	Area Variance (Lot Width)
Town Highway Department	Highway Work Permit
Suffolk County Department of Health Services	Water Supply, Sanitary, Stormwater
New York State Department of Environmental Conservation	SPDES General Permit for Stormwater (GP-0-15-002)
LIPA/PSEG Long Island	Power Purchase Agreement, Interconnection Agreement

The proposed action is subject to all relevant requirements of SEQRA and its implementing regulations at 6 NYCRR Part 617. As set forth at 6 NYCRR §617.3(a), no agency may approve the proposed action until it has complied with the provisions of SEQRA. Following acceptance of this DEIS by the lead agency (i.e., the Planning Board), a Notice of Completion must be prepared, filed and published, and a public comment period must be provided for review of the DEIS. The Planning Board may elect to hold a hearing on the DEIS, which can be combined with a public hearing on the requested Special Use Permit and/or other required hearings. If, based on the DEIS and public comments made thereon, the proposed action is determined not to result in a significant adverse environmental impact, the Planning Board conclude the SEQRA process by adopting a Negative Declaration. Otherwise, a Final Environmental Impact Statement (FEIS) must be prepared and filed in accordance with 6 NYCRR §617.9(a)(5). If the proposed action is the subject of an FEIS, the Planning Board must issue written findings prior to making a final decision to approve the proposed action. Additionally, all involved agencies must also make written SEQRA findings prior to their respective decisions to approve the proposed action.

Based on the specific design and location of an interconnection between the subject property and the electric utility grid, additional permits and approvals may be required. The potential interconnection evaluated within this DEIS, as identified on the *Conceptual Interconnection Route* plan in Appendix C, is expected to require an Interconnection Agreement with NYISO/PSEG Long Island.

3.0

Existing Conditions, Potential Impacts and Proposed Mitigation

3.1 Geological Resources

3.1.1 Existing Conditions

Soils

Soil Survey of Suffolk County

According to the *Soil Survey of Suffolk County, New York* (USDA, 1975) ("*Soil Survey*"), soils are classified according to distinct characteristics and placed (according to these characteristics) into "series" and mapping units." A "series" is a group of mapping units formed from particular disintegrated and partly weathered rocks that lie approximately parallel to the surface and that are similar in arrangement and differentiating characteristics such as color, structure, reaction, consistency, mineralogical composition and chemical composition. "Mapping units" differ from each other according to slope, and may differ according to characteristics such as texture.

The *Soil Survey* classifies the soils at the subject property as Carver and Plymouth sands, three-to-15 percent slopes (CpC); Carver and Plymouth sands, 15-to-35 percent slopes (CpE); Haven loam, zero-to-two percent slopes (HaA); Plymouth loamy sand, zero-to-three percent slopes (PlA); Plymouth loamy sand, three-to-eight percent slopes (PlB); and Riverhead sandy loam, zero-to-three percent slopes (RdA) (see Figure 3). The relevant excerpts from the *Soil Survey* relating to soil series and mapping units are presented below.

Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Soil Survey

Figure # 3

Subject Property

Soil Classification:

CpC - Carver and Plymouth sands, three-to-15 percent slopes
CpE - Carver and Plymouth sands, 15-to-35 percent slopes
HaA - Haven loam, zero-to-two percent slopes
PIA - Plymouth loamy sand, zero-to-three percent slopes
PIB - Plymouth loamy sand, three-to-eight percent slopes
RdA - Riverhead sandy loam, zero-to-three percent slopes

Sources: USDA Web Soil Survey National Cooperative Soil Survey

Riverhead Series

The Riverhead series consists of deep, well-drained moderately coarse textured soils that formed in a mantle of sandy loam or fine sandy loam over thick layers of coarse sand and gravel. These soils occur throughout the County in rolling to steep areas on moraines and in level to gently sloping areas on outwash plains. These soils range from nearly level to steep; however, they are generally nearly level to gently sloping. Native vegetation consists of black oak, white oak, red oak and scrub oak.

In a representative profile, the surface layer is brown to dark brown sandy loam about 12 inches thick. The upper part of the subsoil, to a depth of about 27 inches, is strong-brown, friable sandy loam. The lower part of the subsoil is yellowish-brown, very friable loamy sand to a depth of about 32 inches. Below is yellowish-brown, friable gravelly loamy sand to a depth of about 35 inches. The substratum is very pale brown and brown loose sand and gravel or sand to a depth of 65 inches.

Riverhead soils have moderate to high available moisture capacity. Internal drainage is good. Permeability is moderately rapid in the surface layer and in the subsoil and very rapid in the substratum.

Riverhead Sandy Loam, zero to three percent slopes (RdA)

This soil has the profile as that described as representative of the series. It generally is on outwash plains, and the areas are large and uniform. Where this soil occurs on outwash plains, it generally has slope characteristics of this landform. Slopes are undulating in places. A few small, irregular areas are on moraines.

Included with this soil in mapping are small areas of Sudbury soils that are less than one to two acres in size. Also included are areas of soils near Bridgehampton that have a profile similar to that of this soil, except that at a depth of about 30 inches they have layers of gray and strong brown silt loam 1 to 2 feet thick. Also included are areas of Haven and Plymouth soils that have a texture marginal to sandy loam and areas of soils that have a loam or fine sandy loam surface layer and a sandy loam subsoil. Areas of Montauk soils on moraines that have a very weak fragipan formed in loose sandy till are included.

The hazard of erosion is slight on this Riverhead soil. This soil is limited only by moderate droughtiness in the moderately coarse textured solum. It tends to develop a plowplan if it is intensively farmed.

This soil is well suited to all crops commonly grown in the county, and it is used extensively for that purpose. Most areas in the western part of the county, however, are used for housing developments and industrial parks.

Plymouth Series

The Plymouth series consists of deep, excessively drained, coarse-textured soils that formed in a mantle of loamy sand or sand over thick layers of stratified coarse sand and gravel. These nearly level to steep soils are throughout the county on broad, gently sloping to level outwash plains and on undulating to steep moraines. Native vegetation consists of white oak, black oak, pitch pine, and scrub oak.

In a representative profile, the surface layer is very dark grayish-brown loamy sand, about four inches thick, in wooded areas. In cultivated areas, the surface layer is mixed with material formerly in the upper part of the subsoil, and there is a brown to dark-brown plow layer of loam about ten inches thick. The subsoil is yellowish-brown and brown, very friable and loose loamy sand to a depth of about 27 inches. The substratum, to a depth of about 58 inches, is yellowish-brown, loose gravelly coarse sand.

Plymouth soils have low to very low available moisture capacity. Natural fertility is low. Internal drainage is good. Permeability is rapid in all these soils except in those of the silty substratum phase. Permeability is moderate in the silty layer of soils in the silty substratum phase.

Plymouth loamy sand, zero to three percent slopes (PlA)

This soil has the profile described as representative of the series. It is mainly on outwash plains south of the Ronkonkoma moraine. It is also on flat hilltops and in drainageways on morainic deposits. The areas generally are nearly level, but they are somewhat undulating in some places. Areas on outwash plains are large and uniform, and areas on the moraine are small and irregular.

Included with this soil in mapping are small areas of Riverhead soils that have a texture that is marginal to loamy sand. Also included are some loamy sands that have a profile similar in appearance to the soils of the Carver series.

The hazard of erosion is slight on this Plymouth soil. This soil is fairly well suited to crops commonly grown in the county. Many areas were formerly cleared for farming, but most of these areas are idle or are in brush or trees. Small areas that are in large tracts with Riverhead or Haven soils are the only

areas used for farming. In the western part of the county, most of this soil is used for housing developments and as industrial sites.

Plymouth loamy sand, three to eight percent slopes (PlB)

This soil is on moraines and outwash plains. Slopes are undulating, or they are single along the sides of intermittent drainageways. The undulating areas generally are large. The areas along intermittent drainageways are narrow and long, and they follow the course of the drainage channel.

The hazard of erosion is slight on this Plymouth soil. This soil tends to be droughty.

This soil is fairly well suited to the crops commonly grown in the county. Some areas were formerly used for farming, but most such areas are in brush or are idle. In the western part of the county, this soil is used mainly for housing developments.

Carver Series

The Carver series consists of deep, excessively drained, coarse-textured soils. These soils are nearly level to steep and are throughout the county on rolling moraines and broad outwash plains. Slopes range from 0 to 35 percent. Native vegetation is white oak, black oak, scrub oak and pitch pine.

In a representative profile, a thin layer of leaf litter and partly decayed organic matter is on the surface. Below this is the surface layer of dark-gray sand about three inches thick. The subsurface layer is gray or light-gray loose sand to a depth of eight inches. The subsoil is loose sand to a depth of about 22 inches. It is brown in the upper part and strong brown in the lower part. The substratum, to a depth of 60 inches is loose sand that contains some gravel. It is light yellowish brown to brownish yellow to a depth of 31 inches. Below this is a light yellowish brown.

Carver soils have a very low available moisture capacity. Natural fertility is very low. The response of crops to applications of lime and fertilizers is fair. Permeability is rapid throughout. The root zone is mainly in the uppermost 30 to 40 inches.

Carver and Plymouth Sands, 3 to 15 percent slopes (CpC)

These soils are mainly on rolling moraines; however, they are also on the side slopes of many drainage channels on the outwash plains. Individual areas of this mapping unit are large on the rolling topography of the Ronkonkoma moraine, and in these areas slopes are complex. On the outwash plain, this unit is in long, narrow strips parallel to drainageways.

This unit can be made up entirely of Carver sand, entirely of Plymouth sand, or of a combination of the two soils.

The Carver soil in this mapping unit has a profile similar to that described as representative of that series. The Plymouth soil in this unit has a profile similar to that described as representative of the Plymouth series, except that its texture is sand throughout the profile, rather than loamy sand.

Generally included with this unit in mapping are areas of Plymouth loamy sand or loamy coarse sand that are very close to sand in texture. Also included are small areas of Carver and Plymouth sands, 0 to 3 percent slopes. Small areas of these soils on moraines are as much as 25 percent gravel throughout, especially along the crest of low ridges. Also included are soils similar to this Carver soil that have dark iron and humus coatings on the sand grains in the upper part of the subsoil. In the bottom of many closed depressions, these soils have siltier accumulations from adjoining hillsides; and in some places silty lenses are deep into the substratum.

The hazard of erosion is slight to moderate on the soils in this unit. These soils are droughty, and natural fertility is low. In some places, slope is a limitation to use.

These soils are not well suited to crops commonly grown in the county. These sandy soils severely limit installation and maintenance of lawns and landscaping shrubs. Almost all of these soils are in woodland. Many areas in the western part of the county, particularly along the north shore, are used as homesites.

Carver and Plymouth Sands, 15 to 35 Percent Slopes (CpE)

These soils are almost exclusively on moraines except for a few steep areas on side slopes along some of the more deeply cut drainage channels on outwash plains. On morainic landforms these areas are large, and slopes generally are complex, especially on the Ronkonkoma moraine. On the outwash plains the areas are in long, narrow strips parallel to the drainage channels. Some areas are made up entirely of Carver sand, others entirely of Plymouth sand and still others of a combination of the two soils.
The Carver soil in this mapping unit has a profile similar to that described as representative of that series, except that the gravel content is greater, and gravel makes up as much as 15 percent, by volume, of the soil in some places. The Carver soil in this unit generally is a few inches thinner to the substratum than the soil described as representative. The Plymouth soil in this unit is similar to the soil described as representative of the Plymouth series, except that its texture is sand rather than loamy sand. Also, it has a

higher content of gravel, and gravel makes up as much as 15 percent by volume of the soil in some places.

Included with these soils in mapping are small areas of loamy sand and small areas of Carver and Plymouth sands, 0 to 3 percent slopes or 3 to 15 percent slopes. Also, on moraines, some areas of this unit contain as much as 30 percent gravel and a few cobblestones. Such areas generally are small and are in a mixed pattern with soils that contain less gravel. Also included are areas of Montauk loamy sand, sandy variant, 15 to 35 percent slopes, that have a weakly developed fragipan or a fragipan that is at a depth of more than about four feet. Also included are soils that are similar to Carver soils that have dark iron and humus coatings on the sand grains in the upper part of the subsoil. Also included are small areas of Haven and Riverhead soils that have slopes of more than 15 percent.

The hazard of erosion is moderate to severe on the soils in this unit. These soils are droughty, and natural fertility is low. Moderately steep to steep slopes are a limitation to use.

Haven Series

The Haven series consists of deep, well-drained medium-textured soils that formed in a loamy or silty mantle over stratified coarse sand and gravel. These soils are present throughout the county, but most areas are on outwash plains between the two terminal moraines. Slopes range from zero to 12 percent, but they generally are one to six percent. Native vegetation consists of black oak, white oak, red oak, scrub oaks, and pitch pines.

In a representative profile a thin layer of leaf litter and decomposed organic matter is on the surface in wooded areas. Below this is the surface layer of dark grayish-brown loam about three inches thick. In cultivated areas the surface layer is mixed with the material formerly in the upper part of the subsoil, and a plow layer of brown or dark-brown loam, about ten inches thick, is present. The subsoil is dark-brown to strong-brown, friable loam to a depth of about 19 inches. The lower part, to a depth of 28 inches, is yellowish-brown, friable gravelly loam. The substratum, to a depth of 55 inches, is yellowish-brown to brownish-yellow loose sand and gravel.
Haven soils have high to moderate available moisture capacity. Reaction is strongly acid to very strongly acid throughout. Natural fertility is low. The response of crops to lime and fertilizer is good. Internal drainage is good. Permeability is moderate in the surface layer and subsoil and rapid or very rapid in the substratum. The root zone is 25 to 35 inches thick.

Haven loam, zero to two percent slopes (HaA)

This soil has the profile as that described as representative of the series. It is nearly level and generally on outwash plains. Some areas of this soil are on moraines and generally are on the top of low-lying hills. Some of these areas are slightly undulating. Most areas of this soil are large, but on moraines the areas are smaller and are irregular in shape.

Included with this soil in mapping are small areas of Scio soils and some crescent-shaped, gravelly areas. Also included are soils that have a moderately coarse textured surface layer and a medium-textured subsoil. In many areas of this soil that are mapped in association with Bridgehampton soils, the soil is deeper and siltier than that described as representative of the series. Bridgehampton soils generally are include in mapping in these areas. Also included, on moraines, are areas of Montauk soils that have a very weak fragipan. Montauk soils formed in loose sandy till.

The hazard of erosion is slight on this Haven soil. Primary management concerns are keeping the soil from crusting after rain, maintaining tilth, and reducing the plowpan.

The soil is used extensively for crops, and it is well suited to all crops commonly grown in the county. Potatoes are the main crop, but cauliflower, cabbage, corn, onion, and sod crops are also grown. Because of the nearly level slope and ease of excavation, most areas of this soil in the western part of the county are being used for housing developments and industrial parks.

The *Soil Survey* includes the potential engineering and planning limitations for each mapping unit, as they relate to the siting of various uses. The relevant limitations offered for each of the on-site mapping units are summarized in Table 3 below.

Table 3 – Planning and Engineering Limitations of On-Site Soils

Symbol	Mapping Unit	Slopes	Sewage disposal fields	Homesites*	Streets and Parking Lots	Lawns, landscaping and golf fairways
CpC	Carver and Plymouth sands	3-15%	Slight to moderate (A)	Slight to moderate (A)	Moderate to severe (A)	Severe (B)
CpE**	Carver and Plymouth sands	15-35%	Severe (A)	Severe (A)	Severe (A)	Severe (A)(B)
HaA	Haven loam	0-2%	Slight	Slight	Slight	Slight
PlA	Plymouth loamy sand	0-3%	Slight	Slight	Slight	Severe (B)
PlB	Plymouth loamy sand	3-8%	Slight	Slight	Moderate (A)	Severe (B)
RdA	Riverhead sandy loam	0-3%	Slight	Slight	Slight	Slight

Reasons for limitations:
(A) Slopes.
(B) Sandy surface layer.
*The *Soil Survey* evaluates the engineering and planning limitations of soils for the development of "homesites." The *Soil Survey* does not include ratings for other types of buildings, and thus, the "homesites" evaluation is used to determine potential limitations for the development of structures.
**CpE soils represent less than 1 percent of the soils at the subject property, and are present only on an area to remain natural and undisturbed. As such, the limitations associated with CpE soils are not applicable to the proposed action.
Source: *Soil Survey of Suffolk County, New York (USDA, 1975)*

Topography

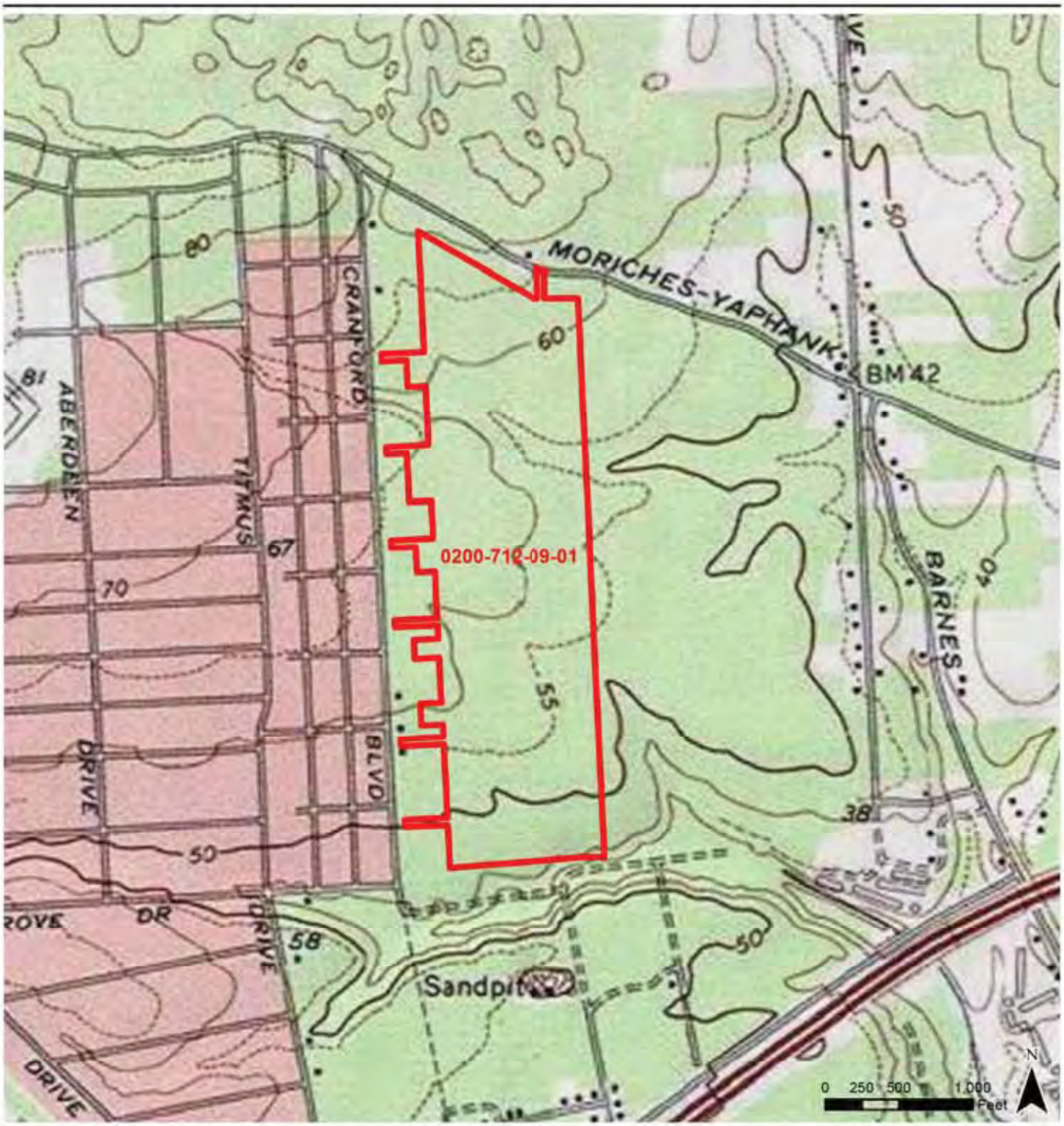
According to the United States Geological Survey (USGS) Topographic Map, Moriches Quadrangle (see Figure **4**), the topography of the area surrounding the subject property generally slopes upward from sea level at the shorelines of Moriches Bay and the Forge River (approximately 1.3 miles southeast of the subject property) to the north, reaching higher elevations (i.e., over 250 feet above mean sea level [amsl]) to the northeast of the subject property in the vicinity of Eastport-Manor Road, before gradually decreasing again to sea level at the Long Island Sound (approximately 9.5 miles north of the subject property). The USGS Topographic Map indicates that elevations at the subject property range from 30± to 70± feet amsl, gradually increasing from southeast to northwest.

A site-specific topographic survey of the subject property was prepared by T. Eason Land Surveyor P.C. (see *Boundary Survey* in Appendix B). Existing elevations are lowest near the southeast corner of the subject property, where the elevation is approximately 30 feet amsl. The overall site slopes gradually up toward the northwest corner, where the elevation is approximately 69 feet amsl, with minor variations along the way. The steepest grade exists near the southeast corner of the subject property, where elevations increase from 30± feet to 44± feet amsl over a 75±-foot distance. According to the project engineer, all existing slopes at the subject property range are at or below ten percent.

3.1.2 Potential Impacts

Soils

As indicated above, the *Soil Survey* classifies the soils at the subject property as CpC, CpE, HaA, PlA, PlB and RdA soils. Following is a discussion of the relevant limitations for each soil type as identified within the *Soil Survey* (see Table 3, above), and the measures incorporated into the project design to overcome such limitations.



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USGS Topographic Map

Figure # 4

1 Subject Property (w/ Parcel ID No.)

Sources: Copyright © 2013 National Geographic Society, i-cubed

The predominant soil type is Riverhead sandy loam (RdA), which occupies approximately 72 percent of the subject property. The RdA soil type does not present any moderate or severe limitations for the siting of sewage disposal fields; homesites; streets and parking lots; and lawns, landscaping and golf fairways. As such, no significant measures would be required to overcome engineering and planning limitations for the RdA soil type.

Plymouth soils (including PlA and PlB) occupy approximately 18 percent of the subject property. The PlB soil type presents moderate limitations for the siting of streets and parking lots due to slopes. To overcome these moderate limitations, strategic grading of the site would occur in accordance with a *Grading & Drainage Plan* (see preliminary plan in Appendix C) to ensure suitable grades and slopes within all proposed paved and gravel driveway and parking areas.

Additionally, both the PlA and PlB soil types present severe limitations for the siting of lawns, landscaping and golf fairways, due to a sandy surface layer. To overcome these limitations, topsoil would be installed, as needed, to support the establishment of trees and shrubs, in accordance with the *Planting Plan* (see Appendix C). It is not expected that any significant soil amendment will be needed, as the proposed plantings would consist of native species to the maximum extent practicable.

Haven loam (HaA) occupies approximately seven percent of the subject property. As with the RdA soil type, HaA soils do not present any moderate or severe limitations for the siting of sewage disposal fields; homesites; streets and parking lots; and lawns, landscaping and golf fairways. As such, no significant measures would be required to overcome engineering and planning limitations for the HaA soil type.

Carver soils (CpC and CpE) are the least prevalent soils, occupying the remaining three percent (approximately) of the overall subject property. The CpE soils present severe limitations for the siting of sewage disposal fields; homesites; streets and parking lots; and lawns, landscaping and golf fairways. However, it is noted that CpE soils represent less than one percent of the soils at the subject property, and are present only within areas to remain natural and undisturbed (see Figure 3 on Page 14 of this DEIS). As such, the severe limitations associated with CpE soils are not applicable to the proposed action.

CpC soils present limitations identified as slight-to-moderate for the siting of homesites (i.e., structures) due to slopes, moderate-to-severe for the siting of streets and parking lots due to slopes, and severe for the siting of lawns, landscaping and golf fairways due to a sandy surface layer. As discussed above, limitations due to slopes would be overcome via strategic grading of the site in accordance with *Grading & Drainage Plan* to ensure suitable grades and slopes within all proposed paved and gravel driveway areas, as well as areas upon which structures are proposed. Additionally, as discussed above, limitations due to a sandy surface layer

would be overcome via the installation of topsoil (if required), to support the establishment of the proposed plantings.

Based on the foregoing, as the engineering and planning limitations for on-site soils are either not applicable to the proposed action, or would be overcome by measures incorporated into the project design, no significant adverse impacts associated with soil limitations are anticipated.

Erosion and Sedimentation Impacts

The disturbance of soils for construction and regrading activities increases the potential for erosion and sedimentation. To minimize the potential for adverse erosion and sedimentation impacts to result from these activities, a *Clearing and Erosion & Sediment Control Plan* would be implemented at the subject property (see preliminary plan in Appendix C). The NYSDEC requires coverage under the SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002) for construction projects that will involve soil disturbance of one or more acres.[16] As the proposed action would disturb more than one acre, a Storm Water Pollution Prevention Plan (SWPPP) acceptable to the Town of Brookhaven would be developed and submitted to both the Town of Brookhaven and the NYSDEC (Notice of Intent), prior to the commencement of construction activity (see Section 3.2 of this DEIS entitled, *Water Resources*, for further discussion of the SPDES General Permit). It is expected that the erosion and sedimentation controls to be implemented during construction as part of an approved SWPPP would include:

- Protection of existing vegetation to remain.
- Scheduling of clearing and grading activities to minimize the total area of land disturbed at any one time.
- Limiting the length of time areas are exposed by establishing pavement and plantings at exposed areas as soon as practicable.
- Installation of sediment barriers (e.g., silt fence, hay bales) along the limits of disturbance for the duration of the work. No sediment from the site would be permitted to wash onto adjacent properties, wetlands or roads.
- Stabilization of graded and stripped areas and stockpiles via temporary seeding or other effective cover.
- Protection of drainage inlets through the use of sediment barriers, sediment traps, etc., to prevent sediment buildup.
- Control of fugitive dust (e.g., covering of stockpiles, temporary seeding, use of a water truck during extended dry periods).

[16] http://www.dec.ny.gov/chemical/43133.html

- Establishment of a stabilized construction entrance to prevent soil and loose debris from being tracked onto local roads.

The above measures are designed to be consistent with the relevant portions of the *New York State Stormwater Management Design Manual* (NYSDEC, 2010) and the *New York Standards and Specifications for Erosion and Sediment Control* (NYSDEC, 2005) as required by Town Code Chapter 86 – *Stormwater Management and Erosion Control*, and would be regularly inspected and maintained (e.g., removal of accumulated sediment and debris from drainage structures, repair of damaged sediment barriers, etc.) to ensure proper function. Sediment barriers and other erosion control measures would remain in place until upland disturbed areas are permanently stabilized. Paved areas would be cleaned and the drainage system flushed as necessary to remove any silt and debris. With the aforementioned control measures employed, no significant adverse erosion- or sedimentation-related impacts are expected.

As discussed in this section, on-site soils present moderate-to-severe limitations on development due to the presence of slopes and a sandy surface layer. However, these limitations would be overcome by strategic grading and the application of topsoil, as needed. During construction, erosion and sedimentation controls would be implemented to minimize the potential for soil-related impacts associated with the disturbance of land surfaces at the site. Overall, based on the above, no significant adverse soil-related impacts are expected to result from implementation of the proposed action.

Topography

The preliminary *Grading & Drainage Plan* (see Appendix C) identifies the proposed grades to be achieved at the site in order to accommodate the proposed solar farm. The subject property is relatively flat throughout under existing conditions, with elevations ranging from approximately 30 feet to 69 feet amsl, as discussed above. The proposed grades at the site would retain the existing grades to the extent practicable, and the *Grading & Drainage Plan* has been designed to minimize the extent of cut and fill needed to accommodate the proposed development. As such, there would be no need to import or export significant quantities of material to achieve final grades across the 100.33±-acre site. These grades would accommodate the proposed drainage system design, directing stormwater to the proposed drainage swales and leaching pools to contain and recharge 100 percent of stormwater (from developed areas) on-site. The proposed elevations at the portion of the site to be improved would range between 40± and 65± feet amsl, with the lowest elevations near the proposed drainage swales on the southern portion of the subject property, and the highest elevations near the proposed entrance on Moriches-Middle Island Road.

Overall, the proposed action would minimally alter the existing topography of the subject property, and the proposed grades would retain existing grades to the extent

practicable. As such, there would be no significant adverse impacts to topography as a result of the proposed action.

Interconnection

The conceptual interconnection route extending from the northern boundary of the subject property east along Moriches-Middle Island Road and south along Weeks Avenue to the existing substation at the terminus of Weeks Avenue (see Appendix C) primarily contains soil types that are also found at the subject property, including RdA, PIB, CpC and PlA soils. Potential impacts associated with the conceptual interconnection evaluated in this DEIS would include limited disturbances in the immediate location of any utility cable support structures and the removal of soils displaced by support structure foundations. No significant impacts to soils are anticipated, and topographic changes are expected to result from the interconnection improvements.

3.1.3 Proposed Mitigation

Soils

No significant adverse soil impacts are expected to result from implementation of the proposed action. Notwithstanding this, the following measures have been incorporated into the proposed action to minimize potential soil impacts:

- Strategic grading and application of topsoil (as needed) to address potential soil limitations.
- Protection of existing vegetation to remain.
- Scheduling of clearing and grading activities to minimize the total area of land disturbed at any one time.
- Limiting the length of time areas are exposed by establishing pavement and plantings at exposed areas as soon as practicable.
- Installation of sediment barriers (e.g., silt fence, hay bales) along the limits of disturbance for the duration of the work. No sediment from the site would be permitted to wash onto adjacent properties, wetlands or roads.
- Stabilization of graded and stripped areas and stockpiles via temporary seeding or other effective cover.
- Protection of drainage inlets through the use of sediment barriers, sediment traps, etc., to prevent sediment buildup.
- Control of fugitive dust (e.g., covering of stockpiles, temporary seeding, use of a water truck during extended dry periods).

- Establishment of a stabilized construction entrance to prevent soil and loose debris from being tracked onto local roads.

It should be noted that several of the erosion control measures to be implemented would minimize the potential for adverse construction-related air quality impacts, as follows:

- Limiting of the total area of soil exposed at any given time.
- Paving or planting of exposed areas as soon as practicable to minimize the duration of soil exposure.
- Protection of stockpiles.
- Establishment of stabilized construction entrances.
- Providing a water truck on-site during dry periods to dampen exposed soils.

Topography

The proposed action would not result in any significant adverse impacts to topography. Proposed site elevations would mimic, to the extent practicable, the existing grades at the subject property, and the proposed *Grading & Drainage Plan* has been designed to minimize the quantities of cut and fill to the maximum extent practicable.

3.2 Water Resources and Plans

3.2.1 Existing Conditions

Groundwater

Long Island is considered a sole source aquifer region, which means that groundwater is the single water supply source. Thus, land uses have the potential to impact the quality of the drinking water supply. According to the NYSDEC, "the aquifers underlying Long Island are among the most prolific in the country. Almost all of Long Island's drinking water is from groundwater with surface water an insignificant contributor…The three most important Long Island aquifers are the Upper Glacial Aquifer, the Lloyd Aquifer, and the Magothy Aquifer."

More specifically, according to the NYSDEC,[17]

> *"The Upper Glacial Aquifer is an unconfined aquifer directly underlying the ground surface. The Upper Glacial aquifer was formed during the last ice age. Of note, the Harbor Hill Moraine and Ronkonkoma Moraine represent two different glacial advances and run roughly east to west for the length of Long Island. They comprise poorly sorted glacial till (sand, pebbles, rock, boulders) deposited at the glacier's leading edge. Found between these moraines and to the south, are outwash plains of well sorted sand and gravel.*
>
> *The Magothy is the largest of Long Island's aquifers. Consisting of sand deposits alternating with clay, it attains a maximum thickness of approximately 1,100 feet and is the source of water for most of Nassau County and about half of Suffolk County. The formation can be seen in the coastal bluffs of the north shore and plunges under the land surface to the south.*
>
> *The Raritan Formation underlies the Magothy. Its two primary units are an upper clay member and a lower sand member named the Lloyd Sand. The clay member separates the Magothy and Lloyd aquifers and serves as a confining unit for the underlying Lloyd Sand aquifer. The clay member has a maximum thickness of 300 feet.*

[17] Source: http://www.dec.ny.gov/lands/36183.html.

The Lloyd Aquifer is the deepest and oldest of Long Island's aquifers. It is a sand and gravel formation ranging in thickness from zero to five hundred feet. At its deepest, it is 1,800 feet below the surface. The water contained in the Lloyd aquifer is about six thousand years old. Not many wells tap this formation and New York Environmental Conservation Law §15-1528 establishes a moratorium on the use of water from this formation in order to maintain it for future generations. The Lloyd is underlain by bedrock."

According to the *USGS Water-Table and Potentiometric-Surface Altitudes in the Upper Glacial, Magothy, and Lloyd Aquifers beneath Long Island, New York, April-May 2010* (the "USGS Water Table Map"), the water table lies between approximately 25 and 33 feet amsl (see Figure 5). As previously indicated, the elevations at the subject property range from approximately 30 to 70 feet amsl (see Figure **4** on Page 23 and the *Boundary Survey* in Appendix B). Thus, the depth to groundwater ranges from approximately five to 36 feet below grade surface (bgs). Test holes would be completed, as required by the Town of Brookhaven and/or the Suffolk County Department of Health Services (SCDHS) (e.g., during the site plan permitting process), to confirm the depth to groundwater at the subject property.

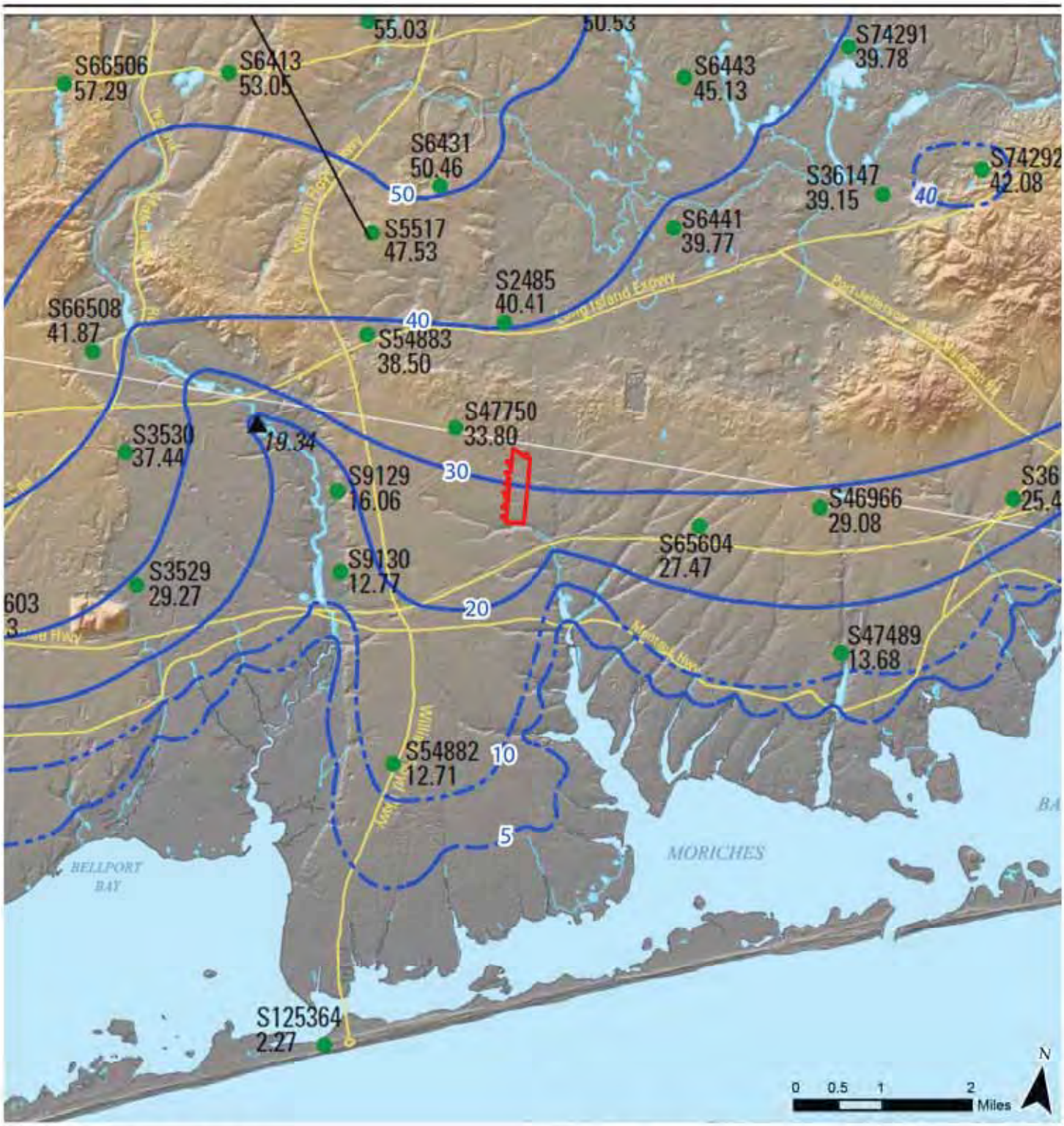
Based on a review of the aforementioned water table map, groundwater in the vicinity of the subject property is expected to flow to the southeast, toward the Forge River, consistent with the regional trend.

Groundwater underlying the subject property and the surrounding area is categorized by the NYSDEC as Class GA, a source of potable water supply (as is all fresh groundwater in New York State)[18]. This classification requires quality standards to be the most stringent.

The subject property is located within Suffolk County Water Authority's (SCWA) Distribution Area 12. In an effort to obtain information regarding groundwater quality, VHB reviewed the *Suffolk County Water Authority 2014 Drinking Water Quality Report*. The report did not indicate the presence of inorganics, synthetic organic compounds, volatile organic compounds, or disinfectant and disinfection by-products beyond regulatory limits within this distribution area. The testing did indicate the presence of iron (a naturally occurring inorganic compound) beyond the regulatory limit of 300 micrograms per liter (ug/L); however, the average value of 531 tests for iron was 99 ug/L. In addition, although Distribution Area 12 had detectable levels of nitrates,[19] they were below the maximum contaminant level of 10 milligrams per liter (mg/L) Thus, as of the most recent available report, drinking water in Distribution Area 12 of the Suffolk County Water Authority meets all federal and state requirements.

▼

[18] http://www.dec.ny.gov/chemical/23853.html
[19] Likely due to runoff from fertilizer and leaching from septic tanks and sewage.



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Water Table Elevation

Figure # 5

Approx. Location of Subject Property

Water-table contour—Shows altitude of water table, April-May 2010. Solid where approximately known; dashed where inferred. Contour interval is variable. Datum is NGVD 29

S 50922
2.55

Monitoring well—Green circle indicates the observation well is screened in the upper glacial aquifer; green circle with thick border indicates the supply well is screened in the upper glacial aquifer; red circle indicates the observation well is screened in the Magothy aquifer. Upper number is well number assigned by the New York State Department of Environmental Conservation; lower number is water-table altitude, in feet above or below NGVD 29

▲ 19.34 **Streamgage**—Number is altitude of water in the stream in feet above NGVD 29

398 feet
0 feet

Land surface topography—Shows land surface altitude in feet above NAVD 88

Sources: USGS Water Table and Potentiometric Surface Altitudes in the Upper Glacial, Magothy, and Lloyd Aquifers beneath Long Island, New York, April-May 2010

Water Supply and Availability

As the subject property is currently vacant and undeveloped, there are no existing on-site connections to a public water supply, and the subject property does not generate a demand for potable water.

As stated above, the subject property is located within SCWA's Distribution Area 12. Water mains are located along Cranford Boulevard to the west (eight inches), Moriches-Middle Island Road to the north (12 inches), and Weeks Avenue to the east (eight inches). According to the SCWA *2014 Drinking Water Quality Report* (for calendar year 2013), the SCWA supplies water to 1.2 million people, pumping 70.5 billion gallons of water through 581 active wells. Distribution Area 12 covers the central portion of Suffolk County and contains 112 active wells.

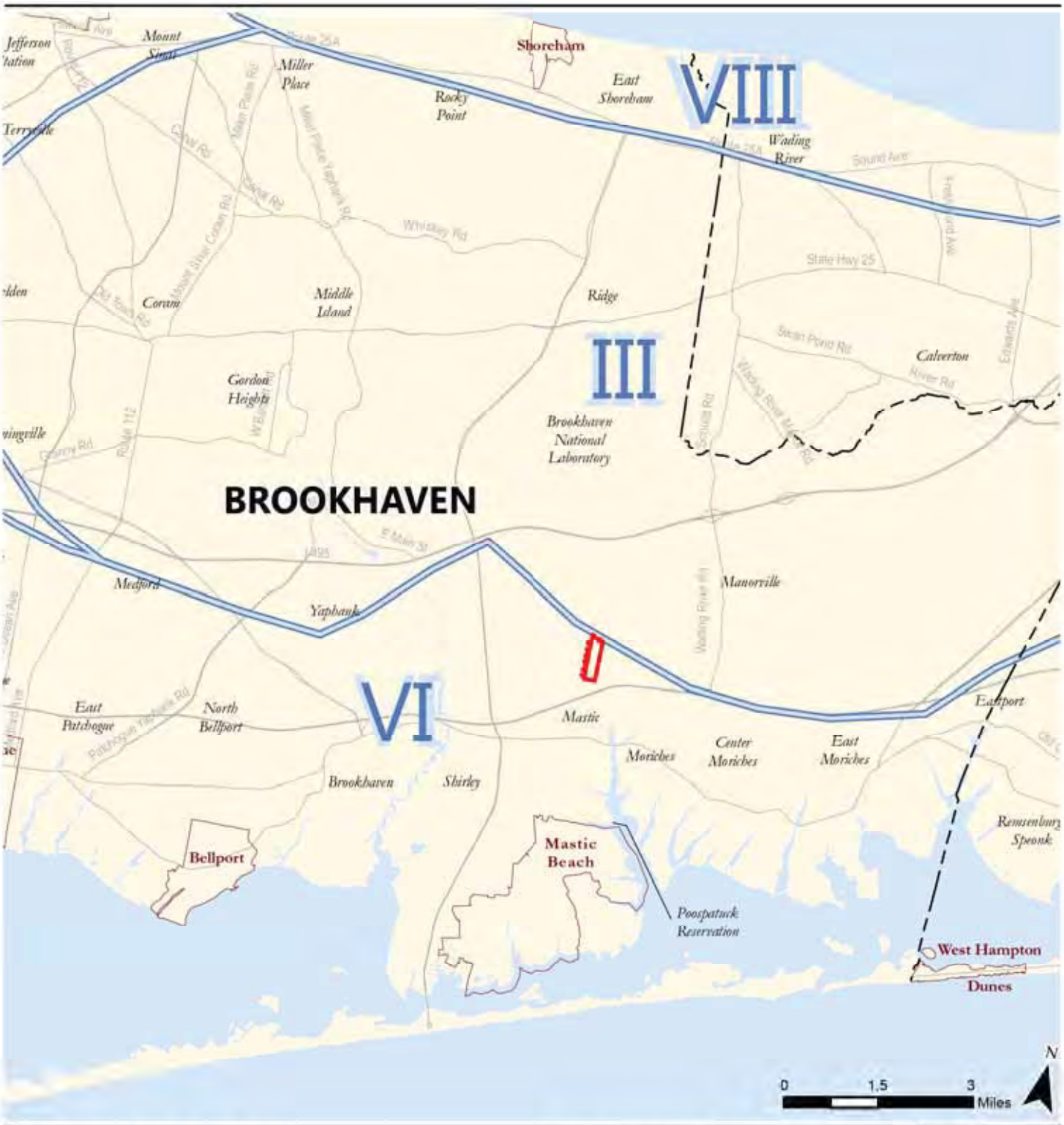
Sanitary Waste

The subject property is currently vacant and undeveloped, and thus does not generate any sanitary waste. Additionally, there are no existing on-site sanitary systems.

The Long Island Comprehensive Waste Treatment Management Plan (208 Study)

In 1978, Long Island was divided into eight hydrogeologic zones in the *Long Island Comprehensive Waste Treatment Management Plan* (hereinafter referred to as the "*208 Study*"). The subject property is located in Hydrogeologic Zone VI, according to the *208 Study* (Page 45, Volume I) (see Figure 6). Hydrogeologic Zone VI discharges into the eastern Great South Bay and Moriches Bay. This zone, located on the south shore of Suffolk County, extends from the eastern portion of the Town of Islip to the western portion of the Town of Southampton and is characterized by a shallow flow system, which directly impacts the water quality in the eastern portion of the Great South Bay and Moriches Bay. To protect the important natural resources of these bays, it is necessary to maintain groundwater and stream nitrogen concentrations at, or below, two milligrams per liter. Because the flushing rate in the eastern Great South Bay is so low, contaminant concentrations are not sufficiently dispersed and diluted. As such, alternatives developed for this zone stress the protection of the marine surface water quality.

The *208 Study* lists structural and non-structural recommendations, and from these recommendations, defines the highest priority area-wide alternatives to manage potential impacts to groundwater in each Hydrogeologic Zone. For Zone VI, the highest priority area-wide alternatives relevant to the proposed action are as follows:



Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Hydrogeologic Zones

Figure # 6

Approx. Location of Subject Property

Sources: Suffolk County Department of Economic Development & Planning, Division of Planning & Environment, NYS Office of Information Technology Services

- Control stormwater runoff to minimize the transport of sediments, nutrients, metals, organic chemicals and bacteria to ground or surface waters.
- Restrict the use of inorganic, fast-acting fertilizers, as well as promote the use of low-maintenance lawns.
- Prohibit the use of certain chemical cleaners in on-lot systems.
- Provide for routine maintenance of on-site disposal systems.

The Long Island Comprehensive Special Groundwater Protection Area Plan (SGPA Plan)

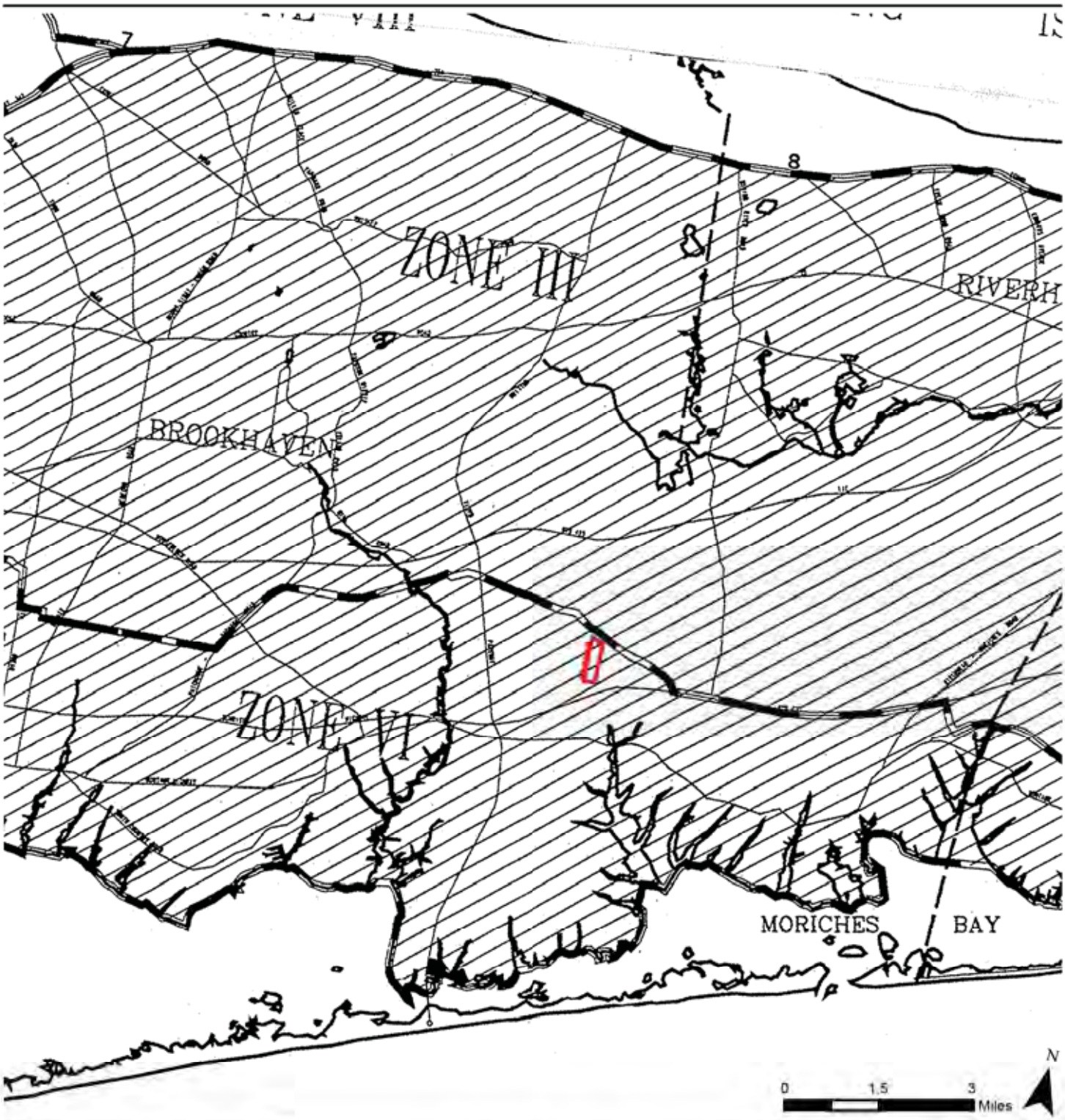
Special Groundwater Protection Areas (SGPAs), which are Critical Environmental Areas (CEAs), are significant, largely undeveloped or sparsely developed geographic areas of Long Island that provide recharge to portions of the deep flow aquifer system. SGPAs represent a unique, final opportunity for comprehensive, preventive management to preclude or minimize land use activities that can have a deleterious impact on groundwater. Nine SGPAs are located on Long Island: North Hills, Oyster Bay, West Hills/Melville, Oak Brush Plains, South Setauket Woods, Central Suffolk, Southold, South Fork and Hither Hills. The subject property is not located within an SGPA.

Suffolk County Sanitary Code

In order to protect groundwater quality in Suffolk County, the SCDHS adopted Articles 6, 7, and 12 of the Suffolk County Sanitary Code (SCSC). A discussion of the relevant provisions follows.

Article 6, Realty Subdivisions, Developments and Other Construction Projects

The subject property is within Groundwater Management Zone VI, as determined by SCDHS (see Figure 7). Pursuant to Article 6 of the SCSC, sewage discharge from on-site systems in Zone VI is limited to 300 gallons per day (gpd) per acre if an on-site sanitary system is used as the method of sanitary waste disposal. Thus, the maximum potential sanitary discharge to on-site sanitary systems for the 100.33±-acre subject property is approximately 30,099 gpd. A community sewerage method of sewage disposal (e.g., a Sewage Treatment Plant) would be required if the anticipated quantity of sanitary waste generation exceeds that amount. The subject property is not currently within an area served by public sewers.



Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Suffolk County Department of Health Services
Groundwater Management Zones

Figure #7

Approx. Location of Subject Property

Sources: Suffolk County Department of Health Services Division of Environmental Quality

Additionally, Article 6 requires a community water system method of water supply if "the construction project, or any portion thereof, is located within an existing water district or service area" (§760-608 [A]). As discussed above, the subject property is within the service area of the SCWA.

As the subject property is currently vacant and undeveloped, it does not generate any sanitary waste or potable water demand.

Article 7, Water Pollution Control

Article 7 of the SCSC is intended to protect water resources "…from discharges of sewage, industrial and other wastes, toxic or hazardous materials and stormwater runoff," and sets forth restrictions and prohibitions for certain discharges of such materials. Article 7 sets forth additional restrictions on discharges within deep recharge areas and water supply sensitive areas, and enumerates those activities which are excluded from such restrictions (e.g., application of approved fertilizers or pesticides, deicing salts, discharge of sewage to municipal sewers, etc.) As previously discussed, the subject property is in Zone VI, which is not considered to be a deep recharge area for the purposes of Article 7. The subject property is also not located within a Water Supply Sensitive Area as defined within Article 7.

Article 12, Toxic and Hazardous Materials Storage and Handling Controls

Article 12, *Toxic and Hazardous Materials Storage and Handling Controls*, relates to the storage and handling of toxic and hazardous materials. As the subject property is vacant and undeveloped, there are no toxic or hazardous materials being stored or used on-site.

Nitrogen Mass Balance

To quantify the change in nitrogen loads from the site due to the development of the proposed MISF, load contributions were calculated using a mass accounting method. The existing conditions and proposed development conditions were analyzed following the nitrogen load calculation approach used in the *Forge River Watershed Management Plan*[20] (hereinafter, the "*Forge River Plan*"). VHB estimated loads from on-site wastewater treatment systems (OWTS), fertilizers, and atmospheric deposition as the nitrogen loads in the watershed. As was done in the *Forge River Plan*, these inputs were estimated through four land use types; Agricultural, Commercial/Industrial, Residential, and Vacant.

[20] *Forge River Watershed Management Plan*. Town of Brookhaven, March 2012.

Table 4 – Upland Nitrogen Inputs from the Forge River Plan

	Atmospheric Deposition	OWTS	Fertilizers
Agricultural	√		√
Commercial/Industrial	√	√	√
Residential	√	√	√
Vacant	√		

The proposed project site, located off of Moriches-Middle Island Road in Mastic, NY, is currently fully vegetated. The land use of the 100.33 acres fits into the *Forge River Plan*'s category of vacant because there is no evidence of structures (past and present) or any other hazards.

To estimate the site's current nitrogen load, atmospheric deposition was the only source considered, based on the *Forge River Plan*'s approach. The *Forge River Plan* used an average nitrogen area loading rate of 0.0234 lbs/acre/day and assumed a 65 percent removal rate between the source and receiving water due to plant uptake for land with stormwater recharge, including the Vacant land use type. Under the existing conditions all of the site's stormwater infiltrates before reaching groundwater, so the 65 percent removal rate was used in the estimation.

$$100.33\ acres\ X\ \frac{0.0234\frac{lbs\ N}{acre}}{day} X\ (1-0.65) = 0.82\ \frac{lbs\ N}{day} = 299.92\ \frac{lbs\ N}{year} \qquad \text{(Eq. 1)}$$

Currently, the site has an estimated total nitrogen contribution of approximately 300 lbs N/year. The site's current nitrogen contribution is 0.29 percent of the West Mill Pond subwatershed's nitrogen load and 0.1 percent of the total Forge River watershed's nitrogen load based on load estimates provided in the *Forge River Plan*.

Stormwater

In general, the elevation of the area in the vicinity of the subject property slopes gradually downward from northwest to southeast (see Section 3.1 of this DEIS and Figure **4** – USGS Topographic Map on Page 23). Under existing conditions, no stormwater management infrastructure exists at the subject property and runoff is permitted to flow overland onto adjacent properties.

Town Code Chapter 86 – Stormwater Management and Erosion Control

Chapter 86 of the Code of the Town of Brookhaven establishes minimum stormwater management requirements and controls to protect and safeguard the general health, safety and welfare of the residents of the Town. Under the performance and design

criteria set forth at §86-7 of the Town Code, the *New York State Stormwater Management Design Manual* and the *New York Standards and Specifications for Erosion and Sediment Control* are considered to be the technical standards by which stormwater management practices should be designed and constructed.

As set forth in §86-1(B) of the Town Code, the overall purpose of the chapter is to "establish minimum stormwater management requirements and controls to protect and safeguard the general health, safety, and welfare of the residents of and the general public within the Town of Brookhaven by achieving the following objectives:

(1) Meet the requirements of minimum measures four and five of the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s), Permit No. GP-02-02 or as amended or revised;

(2) Require land development activities to conform to the substantive requirements of the NYSDEC SPDES General Permit for Construction Activities GP-02-01 or as amended or revised;

(3) Minimize increases in stormwater runoff from land development activities in order to reduce flooding, siltation, increases in stream temperature, and stream bank erosion;

(4) Minimize increases in pollution caused by stormwater runoff from land development activities, which would otherwise degrade local water quality;

(5) Minimize the total annual volume of stormwater runoff, which flows from any specific site during and following development to the maximum extent practicable; and

(6) Reduce stormwater runoff rates and volumes, soil erosion and nonpoint source pollution, wherever possible, through stormwater management practices and to ensure that these management practices are properly maintained and eliminate threats to public safety."

As the proposed action includes disturbance of more than one acre, it is subject to the requirements of Chapter 86, including submission of a SWPPP; conformance with the performance and design criteria for stormwater management and erosion and sediment control, as described above; maintenance, inspection and repair of stormwater facilities; construction inspection; and performance guarantees.
The consistency and compliance of the proposed action with the requirements set forth in Chapter 86 of the Town Code are discussed in Section 3.2.2 of this DEIS, below.

Long Island Segment of the Nationwide Urban Runoff Program (NURP Study)

Years of study, including various 208 studies, have provided conclusive evidence that in many areas pollutant loading contributed by non-point sources exceed those contributed by point sources, and urban runoff is the most significant non-point source. With regard to stormwater runoff, the *NURP Study* has made the following findings concerning groundwater and surface water:

Groundwater

- Most of the runoff into recharge basins is derived from rain that falls directly on impervious surfaces, except during storms of high intensity, high volume and/or long duration;
- In general, with the exception of lead and chloride, the concentrations of inorganic chemicals measured in stormwater runoff do not have the potential to adversely affect groundwater quality;
- Infiltration through the soil is generally an effective mechanism for reducing lead and probably chromium from runoff on Long Island. Although the *NURP Study* findings concerning chromium are not conclusive, data from a spill at Farmingdale indicate attenuation. Chloride is not attenuated. The effect of infiltration on nitrogen is undetermined; and
- Coliform and fecal streptococcal indicator bacteria are removed from stormwater as it infiltrates through soil.

Surface Water

- Any control of chemical constituents in runoff requires awareness of the year-round presence. The use of highway deicing salts in winter explains the high chloride concentrations found in runoff during that season;
- Stormwater is a major source of coliform loading to Long Island bays. Some of the bays in Suffolk County contain areas where impaired water quality exists for reasons other than stormwater runoff (e.g., localized duck farm discharges); and
- The evidence accumulated in the *NURP Study* strongly supports the belief that fecal coliform loads are derived from non-human sources. Estimates indicate that the dog population could be a major source of the fecal coliform load in stormwater runoff.

With regard to stormwater runoff, the *NURP Study* has made the following recommendations:

Groundwater

- Continue to use recharge basins wherever feasible for the disposal of stormwater and the replenishment of groundwater
- Avoid maintenance practice that would interfere with the natural revegetation of basins by grasses and shrubs.
- Use "ecological recharge basins" only where their aesthetic value justifies the additional cost.
- Consider the use of in-line storage leaching drainage systems, or components thereof, as a substitute for recharge basins in areas, other than parking lots where maintenance will be assured and where the value of the land for development purposes is greater than the cost of installing and maintaining the underground system. Storage leaching drainage systems should also be considered for use where the installation of recharge basins is not feasible.
- Prevent illegal discharges to drainage systems or recharge basins. Such discharges, which often result from improper storage or deliberate dumping of chemicals, must be controlled at the source.

Surface Water

- Maintain existing water quality where it is currently satisfactory
- Improve water quality in those area where modest reductions in coliform counts could lead to the conditional opening of currently uncertified areas or the unconditional opening of conditionally certified or uncertified shellfishing areas.

A consistency analysis of the proposed action with the recommendations of the *NURP Study* is included in Section 3.2.2 of this DEIS, below.

Surface Water, Wetlands, and Floodplains

According to the NYSDEC's Freshwater Wetlands Map of Suffolk County, Map No. 29 of 39, Moriches Quadrangle, there are no freshwater wetlands situated on or adjacent to the subject property (see Figure 8). The nearest wetland mapped by the NYSDEC is Freshwater Wetland M-7 (headwaters associated with the Forge River), located approximately 1,121 feet to the east of the southeast corner of subject property, and extending southeast to the Forge River.

The United States Fish and Wildlife Service National Wetlands Inventory (NWI) Wetlands Mapper was examined, and does not indicate the presence of any surface water features (including potential federally-regulated wetlands) on or adjacent to the subject property (see Figure 9).

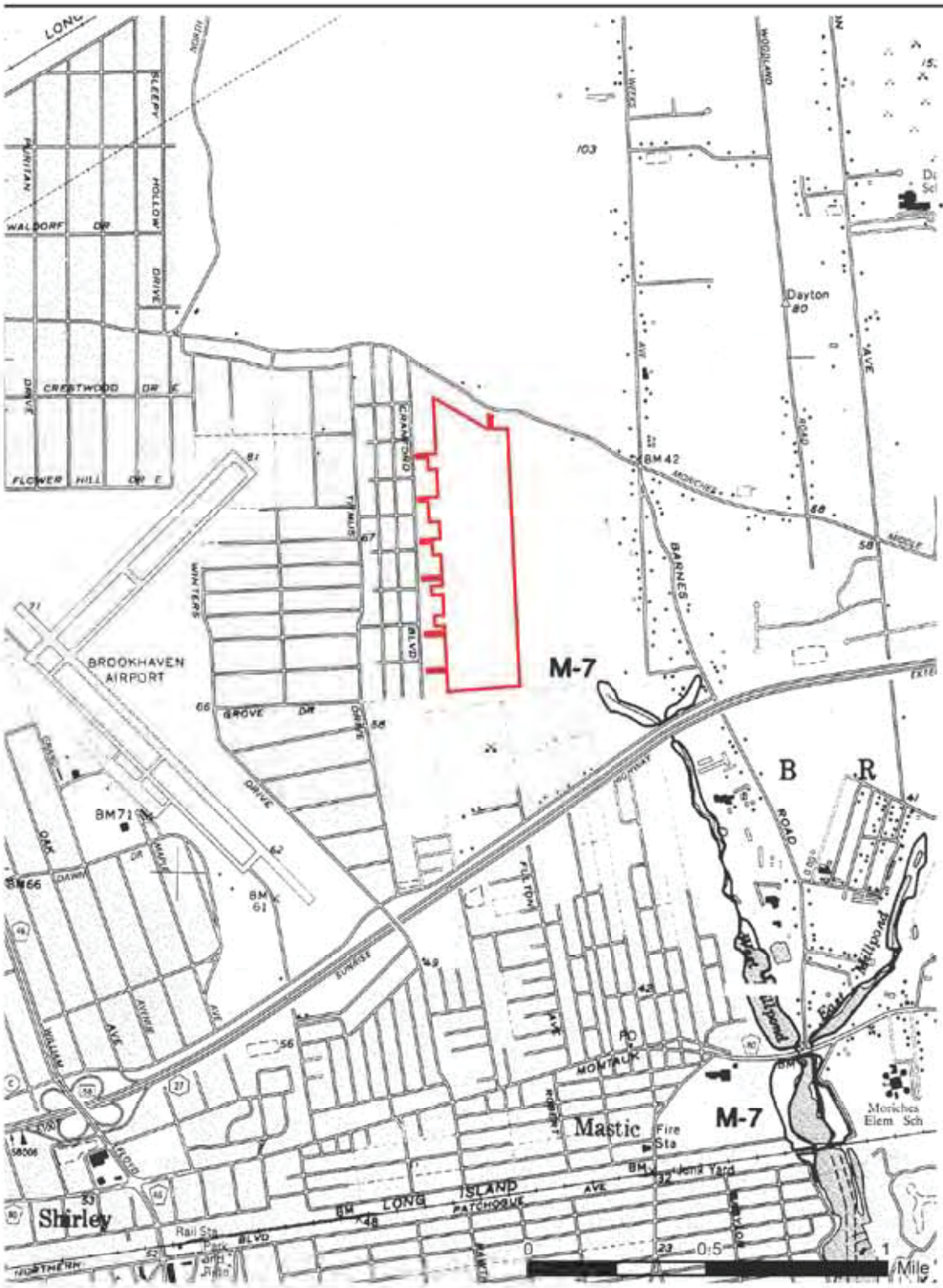
The NYSDEC's Tidal Wetlands Inventory Map Index was also examined. No individual Tidal Wetlands Inventory Map has been produced for the location of the subject property, indicating that no tidal wetlands exist on or adjacent to the subject property.

Additionally, field investigations were conducted by VHB on October 20 and November 2, 2014. No wetlands were identified at the subject property during these field investigations.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map of Suffolk County was reviewed as to whether the subject property is located within any special flood hazard areas. The subject property is located in Zone X, and is therefore outside of the 500-year floodplain and not within any Special Flood Hazard Area (see Figure 10).

Forge River Watershed Management Plan

The subject property lies within the study area for the Town's *Forge River Watershed Management Plan* (*Forge River Plan*), which was finalized in March 2012, and within the Forge River's West Mill Pond Subwatershed. According to the *Forge River Plan*, the groundwater and stormwater contributing areas comprise the "watershed." The *Forge River Plan* covers living resources within the estuary and adjacent upland area, and describes the quality of the sediments and the history of dredging and summarizes water quality data. The plan also includes detailed information on nitrogen sources. The primary goal of the *Forge River Plan* is to develop short- and long-term mitigation projects and restoration strategies with input from the local community.



New York State Freshwater Wetlands Map

Suffolk County

Map 29 of 39

This map was promulgated, pursuant to Article 24 of the Environmental Conservation Law (The Freshwater Wetlands Act) on May 26, 1993 by the Commissioner of New York State Department of Environmental Conservation.

LEGEND

Approximate wetland boundary

Upland inclusion

AA-00 Wetland identification code

This line groups parcels that have the same wetland identification code. This line does not delineate the adjacent area.

* Denotes extended adjacent area.

Notes:

This map indicates the approximate location of the actual boundaries of wetlands regulated according to the Freshwater Wetlands Act.

Map information other than the wetland boundaries was prepared by the New York State Department of Transportation and the United States Geological Survey. This locational information provided on the map is for reference only. Marsh symbols do not necessarily indicate the location of a regulated wetland.

Adjacent areas of the regulated wetlands are those areas within 100 feet of the boundary of the wetland. These areas are subject to regulation pursuant to the Freshwater Wetlands Act but are not delineated on this map. An adjacent area may be extended by special order of the Commissioner of the New York State Department of Environmental Conservation or the local regulatory authority.

Copies of Freshwater Wetlands Maps are available from the regional offices of the Department of Environmental Conservation. Maps are available for inspection at these offices and local government clerk's offices.

N

Middle Island Solar Farm DEIS

Mastic, Suffolk County, New York

NYSDEC Freshwater Wetlands

Figure #8

Approx. Location of Subject Property

Sources: New York State Freshwater Wetlands Map, Suffolk County, Map 29 of 39

0 250 500 1,000 Feet

N

Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

National Wetlands Inventory

Figure # 9

1 Subject Property (w/ Parcel ID No.)

Wetlands

Freshwater Forested/Shrub

Freshwater Pond

Sources: U.S. Fish and Wildlife Service, November 20, 2014

Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

FEMA Flood Insurance Rate Map

Figure # 10

Subject Property

FEMA 100-Year Flood Zone

Sources: National Flood Insurance Program Flood Insurance Rate Map, September 25, 2009

Nitrogen sediment loading from years of pollution resulting from duck farming and high-density residential development have led to foul odors, fish kills, and hypoxic and anoxic conditions from algal blooms in the Forge River and its creeks. The West Mill Pond Subwatershed —the northernmost of the 14 subwatersheds within the overall Forge River Watershed (see Figure 11), and the second-most impaired subwatershed based on the prioritization criteria utilized in the *Forge River Plan* (p.1-12)—has several management strategy objectives to achieve the desired water quality improvements and habitat restoration for the watershed. The management strategy objectives are as follows:

- ***Reduce nitrogen contributions.*** *Nitrogen is the primary pollutant responsible for the degradation of the estuary's water quality. Measurable indicators for this objective include concentrations of total nitrogen and dissolved oxygen and/or number of algal blooms.*
- ***Increase tidal flushing.*** *Anoxic conditions are exacerbated by stagnation of water in the creeks and poor flushing of the estuary in general. Significant increases in salinity of the waters of the estuary would be an indication of the attainment of this objective.*
- ***Enhance aquatic and riparian habitats.*** *Both aquatic and riparian environments have been degraded over time. The restoration of these habitats can be measured through a variety of plant, wildlife and marine life surveys.*
- ***Implement TMDL*** **[Total Maximum Daily Load]-*allocated scenario***. *The TMDL process will provide a long-term framework, particularly in a regulatory context, for achieving the restoration of the Forge River. Its success can be measured by the degree of completion of its adopted allocation scenario.*
- ***Increase public awareness*** *and support for Forge River protection and restoration. The successful implementation of this plan will depend heavily upon the public, that is, residents, businesses and institutions within the watershed. This indicator can be measured through public opinion surveys and compliance assessments (e.g., citations).*

The subject property is not identified as a significant contributor to pollutant loads in the watershed. The primary contributor to the impairment of the West Mill Pond Subwatershed is the "drainage and treatment lagoon discharge from the duck farms." Other contributing impairment factors include land cover, land use, stormwater, habitat, and ecological conditions. However, the *Forge River Plan* notes that the nutrient contribution from residential development to the west of West Mill Pond "may be mitigated by several factors: lots are relatively large, depth to groundwater is several tens of feet, and an undeveloped buffer surrounds the western side of the pond." It is further noted that, since the publication of the *Forge River Plan*, the Jurgielewicz Duck Farm, which was the primary pollutant contributor

Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Forge River Subwatersheds

Figure # 11

Approx. Location of Subject Property

Sources: Cameron Engineering & Associates, LLP

of the West Mill Pond Subwatershed, has ceased operations. Thus, it is expected that the impairment of the West Mill Pond Subwatershed may be significantly reduced over time by the cessation of this duck farm operation.

The *Forge River Plan* does not contain specific recommendations with respect to the subject property. However, other recommended strategies which may be applicable to groundwater and stormwater at the subject property include:

- *Establish a Forge River Protection Overlay District (FRPOD)*
- *Impose stricter clearing limits*
- *Replace direct discharge stormwater systems*
- *Impose strict limits on nitrogen fertilizer use*
- *Enact ordinance requiring pumpouts for all OWTS within FRPOD every five years*
- *Encourage use of indigenous landscape plants*

The conformance of the proposed action with the relevant recommendations of the *Forge River Plan* is discussed in Section 3.2.2 of this DEIS.

3.2.2 Potential Impacts

Groundwater

The proposed action would change the use of the subject property from vacant/undeveloped to a solar farm with associated site improvements. The proposed MISF would use a minimal amount of potable water; generate a minimal amount of sanitary waste; utilize shallow recharge areas and leaching basins, such that 100 percent of stormwater would be contained and recharged on-site; and utilize native plantings throughout, such that irrigation and routine application of fertilizers and pesticides would not be necessary. In addition, no hazardous waste generation, storage or disposal is proposed. Below is a detailed discussion of the proposed action's potential impacts to groundwater.

Projected Water Consumption

The subject property is within Distribution Area 12 of the SCWA, which pumped approximately 70.5 billion gallons of water through 581 active wells (throughout all Distribution Areas) in 2013. The subject property, in its current undeveloped condition does not utilize potable water.

Upon implementation of the proposed action, SCWA would supply potable water to the proposed Middle Island Solar Farm via a connection to an existing 12-inch water

main along Moriches-Middle Island Road. The anticipated water usage by the proposed Middle Island Solar Farm is 161± gallons per day (gpd)[21]. This usage reflects the potable water demand of the proposed 4,032±-square-foot maintenance building. As the proposed action includes the use of native landscape plantings, no irrigation would be required. The solar panels themselves would not use water, except for periodic cleaning, for which water would be brought to the site by water truck.

The projected water consumption of the proposed action (i.e., 161± gpd), in comparison to the 70.5 billion gallons pumped by the SCWA, would be *de minimis*. As such, it is not expected that the proposed action would pose a significant adverse impact to groundwater supplies. See discussion of the proposed action's compliance with Article 6 of the SCSC in the subsection entitled, *Suffolk County Sanitary Code*, below.

As the proposed action would represent a minimal increase in potable water usage as compared with the existing condition, no significant adverse impacts associated with water usage would be expected.

Sanitary Waste and Discharge

As the subject property is currently undeveloped, it does not generate any sanitary waste, and there are no existing on-site sanitary systems.

The proposed Middle Island Solar Farm would utilize an on-site sanitary system to accommodate approximately 161± gpd of sanitary waste generated by the proposed maintenance building. The remainder of the proposed facility (e.g., the solar panels and associated appurtenances) would not be expected to generate any sanitary waste.

The on-site sanitary system to be installed would be designed to meet or exceed the anticipated hydraulic load for the maintenance building, and would be designed to comply with the most current standards of the SCDHS. As discussed below (see subsection entitled *Suffolk County Sanitary Code, Article 6 – Realty Subdivisions, Developments and Other Construction Projects*), approval would be obtained from SCDHS prior to implementation of the proposed action, and the anticipated quantity of sanitary waste to be generated by the MISF maintenance building (i.e., 161± gpd) would be well within the relevant sanitary density limitations of Article 6 of the SCSC.

▼

[21] This calculation reflects the Project Density Loading Rates & Design Sewage Flow Rates, as published by the SCDHS in the *Standards for Approval of Plans and Construction for Sewage Disposal Systems for Other than Single-family Residences*. General industrial uses have a Density Load and Hydraulic Load of 0.04 gpd/sf. General industrial buildings may contain up to 15% related office space without applying a proportionate office density loading or flow rating to the space.

As introduced in Section 3.2.1, the subject property is within Hydrogeologic Zone VI. Among the highest priority areawide alternatives recommended in the *208 Study* for Zone VI, four are relevant to the proposed action:

- *Control stormwater runoff to minimize the transport of sediments, nutrients, metals, organic chemicals and bacteria to ground or surface waters.*

  As indicated on the *Grading & Drainage Plan*, the proposed MISF has been designed with leaching basins and drainage swales, with capacity in excess of the minimum requirements, such that 100 percent of stormwater runoff from disturbed areas would be contained and recharged on-site. Furthermore, a SWPPP will be implemented in accordance with Town requirements to prevent erosion and sedimentation during the construction phase (see *Clearing and Erosion & Sediment Control Plan* in Appendix C).

- *Restrict the use of inorganic, fast-acting fertilizers, as well as promote the use of low-maintenance lawns.*

  As indicated on the *Proposed Site Plan*, 39.17± percent (39.30± acres) of the subject property will remain natural and undisturbed. In addition, 54.00± percent of the site (54.18± acres) would be re-vegetated with natural landscaping (i.e., trees, shrubs and grasses native to the area) (see *Planting Plan* for details). The proposed landscaping and area to remain undisturbed would not require the use of inorganic, fast-acting fertilizers (or any other fertilizers)

- *Prohibit the use of certain chemical cleaners in on-lot systems.*

  It is expected that contractors hired to clean the proposed on-site sanitary system would use only legally permitted cleaners.

- *Provide for routine maintenance of on-site disposal systems.*

  The proposed on-site sanitary system would be regularly maintained and comply with the relevant Articles of the SCSC.

Based on the above, the proposed action is consistent with the relevant recommendations of the *208 Study*.

Suffolk County Sanitary Code

Article 6 – Realty Subdivisions, Developments and Other Construction Projects

The proposed development is expected to generate approximately 161 gpd of sanitary waste, and is proposed to be served by an on-site sanitary system. As discussed in Section 3.2.1 of this DEIS, Article 6 of the SCSC limits the maximum permissible discharge to on-site sanitary systems to 300 gpd per acre, or approximately 30,099 gpd for the 100.33±-acre subject property. Accordingly, the proposed action would comply with the relevant sanitary density limitation of Article 6. The proposed quantity of sanitary waste to be discharged to an on-site sanitary system is approximately one half of one percent of the maximum allowable pursuant to Article 6, which is intended to be protective of groundwater resources. No denitrification plant is proposed to treat the minimal quantity of sanitary waste to be generated on-site, and, therefore, the restriction of Article 6 for a maximum nitrogen effluent discharge concentration of 10 milligrams per liter (mg/l) (equivalent to the New York State drinking water standard for public water systems[22]) is irrelevant to the proposed action.

A single on-site sanitary system would be installed for the proposed 4,032±-square-foot maintenance building. The proposed sanitary system would be designed to comply with the most current SCDHS standards, and approval would be obtained from SCDHS prior to implementation of the proposed action. As the proposed action would be consistent with Article 6 of the SCSC, and well within the sanitary density limitations set forth at Section 760-608 (A), no significant adverse impacts to groundwater are expected to result from the use of on-site sanitary systems at the proposed MISF.

With regard to water supply, the subject property is located within the service area of the SCWA. Pursuant to Article 6 of the SCSC, a community water system method of water supply is required when the construction project, or any portion thereof, is located within an existing water district or service area. As previously discussed, potable water supply for the proposed MISF would be provided by SCWA, consistent with the requirements of Article 6.

Article 7 – Water Pollution Control

The subject property is located within Groundwater Management Zone VI, which is not considered to be a deep recharge area for the purposes of Article 7. Additionally, the subject property is not within a water supply sensitive area as defined in Article 7. As such, the proposed action would not be subject to the additional restrictions on discharges set forth in Article 7. The proposed MISF will contain an

[22] Table 2, 10 NYCRR 5-1.52.

on-site sanitary system that would discharge to groundwater (to accommodate the minimal quantity of sanitary waste to be generated), for which all applicable permits would be obtained.

Article 12 – Toxic and Hazardous Materials Storage and Handling Controls

As explained in Section 3.2.1, there are no toxic or hazardous materials being stored or used on-site at the subject property. The proposed action includes the storage of LP gas in two, 2,500-gallon underground storage tanks proximate to the proposed maintenance building. These tanks would be utilized for emergency backup purposes only. All applicable permits would be obtained for these tanks, in compliance with Article 12.

Based on the above, the proposed action would be consistent with the relevant provisions of Articles 6, 7 and 12 of the SCSC.

Nitrogen Mass Balance

The proposed plan would result in the clearing of approximately 61.03 acres of existing trees and shrubs. The solar farm project proposes to develop the property and alter site coverages by establishing solar PV panel arrays (with plantings below), planted/grass areas, gravel drives, asphalt pavement, a maintenance building, and paved surfaces for walkways and equipment pads. These proposed conditions fit into the *Forge River Plan*'s industrial category and therefore loads from atmospheric deposition, OWTS, and fertilizers are estimated to calculate the proposed site's nitrogen loads.

To estimate atmospheric deposition, the infiltration capabilities of the stormwater runoff must be analyzed. Although the proposed project would establish new impervious surfaces, precipitation that falls on these impervious surfaces would be re-directed to pervious areas and contained and recharged at the site. Stormwater that falls on the arrays will be directed to pervious grass areas that surround and are underneath the photovoltaic panels. The precipitation that falls on the inverter stations will also run off to grass areas. The precipitation that falls on the maintenance building will be directed to a dry well where the precipitation will infiltrate.

To estimate the nitrogen loads from atmospheric deposition, the *Forge River Plan* used an average nitrogen areal loading rate of 0.0234 lbs/acre/day and assumed a 65 percent removal rate between the source and receiving water due to plant uptake for land with stormwater recharge. Under the proposed conditions, the entire site's stormwater will be able to infiltrate before reaching groundwater and therefore the 65 percent removal rate is applicable.

$$100.33\ acres\ X\ \frac{0.0234\frac{lbs\ N}{acre}}{day} X\ (1-0.65) = 0.82\ \frac{lbs\ N}{day} = 299.92\ \frac{lbs\ N}{year} \qquad \text{(Eq. 2)}$$

The proposed conditions also include a small OWTS. To estimate the nitrogen load for the OWTS, the nitrogen concentration of 0.000623 lbs/gal for commercial/industrial OWTS from the *Forge River Plan* was used. The proposed site's sanitary flow was estimated using the SCDHS' factor of 0.04 gpd/sf which resulted in a nitrogen load of 36.67 lbs/year.

$$0.000623\ \frac{lbs\ N}{gal} X\ 0.04\frac{\frac{gal}{day}}{sf}\ X\ 4{,}032\ sf = 0.10\ \frac{lbs\ N}{day} = 36.67\ \frac{lbs\ N}{year} \qquad \text{(Eq. 3)}$$

Fertilizer was not taken into consideration for the nitrogen contribution because the proposed plan includes grasses and shrubs that are indigenous to the area and therefore do not require fertilization. It is expected that a small amount of fertilizer will be used when the area is planted, but it is assumed that this small amount will not significantly affect the annual contribution given that the fertilization is not a reoccurring event.

The total nitrogen contribution for the proposed solar farm (i.e., the sum of the atmospheric deposition and OWTS sources) is 336.5 lbs N/year.

$$299.92\ \frac{lbs\ N}{year} + 36.67\ \frac{lbs\ N}{day} = 336.59\ \frac{lbs\ N}{year} \qquad \text{(Eq. 4)}$$

Because the atmospheric load of nitrogen remains the same, the estimated increase in the site's nitrogen load by 36.67 lbs/year or 12.3 percent is caused by the proposed OWTS. This nominal change will increase the subwatershed's nitrogen contribution by 0.035 percent and it will increase the Forge River Watershed's nitrogen contribution by 0.012 percent.

Stormwater

The proposed action includes a stormwater management system comprised of several shallow retention basins located at the existing topographic low points of the subject property. A limited number of drywells and leaching pools would be installed at key locations (primarily along internal gravel drives), and an overflow system would interconnect all proposed retention areas (see preliminary *Grading & Drainage Plan* in Appendix C). This stormwater management system would contain and recharge stormwater runoff to the maximum extent practicable, including 100 percent of the stormwater runoff from the portion of the subject property to be disturbed, based on an eight-inch design criteria. A natural vegetated buffer would remain along the perimeter of the subject property (except in the areas of the

proposed access and emergency access), and some stormwater runoff from these natural portions of the site may continue to flow overland onto adjacent properties.

As described throughout this DEIS, no fertilizers or pesticides would be routinely applied to the grounds at the subject property, as the proposed Planting Plan includes the installation of native and low-maintenance plantings (nearly 90 percent of all areas to be cleared will be revegetated with native species). Accordingly, stormwater runoff would not transport such fertilizers over land surfaces on the site. Additionally, the proposed vegetated swales would capture and filter all stormwater runoff within the site.

Town Code Chapter 86 – Stormwater Management and Erosion Control

As identified in Section 3.2.1 of this DEIS, Chapter 86 of the Town Code provides substantive requirements of SPDES GP-0-15-002, with the objectives of controlling activities that result in flooding, siltation, increases in stream temperature, stream bank erosion and pollution, and minimizing of the volume of stormwater runoff that flows from any specific site during and following development activities to the maximum extent practicable.

The proposed action would disturb greater than one acre of land during clearing and grading activities, and, accordingly, coverage under SPDES GP-0-15-002 would be obtained prior to implementation of the proposed action. As detailed in the subsection below, entitled *Consistency with the SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-15-002)*, a SWPPP would be developed to identify erosion and sedimentation control measures to be implemented during construction. These controls are expected to generally be as depicted on the preliminary *Clearing and Erosion & Sediment Control Plan* included in Appendix C, and would include:

- Protection of existing vegetation to remain.
- Scheduling of clearing and grading activities to minimize the total area of land disturbed at any one time.
- Limiting the length of time areas are exposed by establishing pavement and plantings at exposed areas as soon as practicable.
- Installation of sediment barriers (e.g., silt fence, hay bales) along the limits of disturbance for the duration of the work. No sediment from the site would be permitted to wash onto adjacent properties, wetlands or roads.
- Stabilization of graded and stripped areas and stockpiles via temporary seeding or other effective cover.
- Protection of drainage inlets through the use of sediment barriers, sediment traps, etc., to prevent sediment buildup.

- Control of fugitive dust (e.g., covering of stockpiles, temporary seeding, use of a water truck during extended dry periods).
- Establishment of a stabilized construction entrance to prevent soil and loose debris from being tracked onto local roads.

The SWPPP would also address post-construction stormwater management practices, as required for projects that would disturb greater than five acres of land. All components of the SWPPP would conform to the technical standards contained within the *New York State Stormwater Management Design Manual* and the *New York Standards and Specifications for Erosion and Sediment Control*; and the SWPPP would be reviewed and approved by the Town of Brookhaven prior to implementation of the proposed action in accordance with §86-6A(1) of the Town Code.

With the implementation of the SWPPP and because 100 percent of stormwater runoff would be contained and recharged at the subject property, the proposed action would achieve the Town's objectives of controlling activities that result in flooding, siltation, increases in stream temperature, stream bank erosion and pollution, and minimizing of the volume of stormwater runoff that flows from any specific site during and following development activities to the maximum extent practicable. All applicable requirements of Chapter 86 of the Town Code and of SPDES GP-0-15-002 would be met, such that no significant adverse stormwater-related impacts would result from implementation of the proposed action.

Consistency with the SPDES General Permit for Stormwater Discharge from Construction Activity (GP-0-15-002)

Pursuant to Section 402 of the Clean Water Act, stormwater discharges from certain construction activities to "Waters of the United States"[23] are unlawful unless they are authorized by a National Pollutant Discharge Elimination System (NPDES) permit or by a state permit program.

The New York SPDES program, as administered by the NYSDEC, is a NPDES-approved program that includes a General Permit for Stormwater Discharges from Construction Activities (GP-0-15-002). This General Permit applies to the following construction activities, when stormwater may discharge to Waters of New York State (including Waters of the United States):

- Construction activities involving soil disturbances of one or more acres; including disturbances of less than one acre that are part of a larger common

[23] Pursuant to Title 33 of the Code of Federal Regulations (CFR) Part 328.3(a)

plan of development or sale that will ultimately disturb one or more acres of land; and

- Construction activities involving soil disturbances of less than one acre where the Department has determined that a SPDES permit is required for stormwater discharges based on the potential for contribution to a violation of a water quality standard or for significant contribution of pollutants to surface waters of the State.

Within its Responsiveness Summary issued in connection with the predecessor GP-0-10-001, the NYSDEC indicates that,[24]

> *"Discharges of stormwater to groundwaters are exempt from general permit requirements unless the Department determines that such discharges (or class of discharges) are significant contributors of pollution.* **To date, the Department has not determined that construction site discharges to groundwater are significant contributors of pollutants.***"* (page 46) (emphasis added).

As the proposed stormwater management controls would collect and recharge stormwater at the site, there would be no discharge to "Waters of the United States" or to "Waters of New York State."

Notwithstanding same, as discussed in Section 3.1.2 of this DEIS, a SWPPP will be prepared and implemented in connection with the construction of the proposed MISF, to include erosion and sedimentation controls and methods by which stormwater would be accommodated. The proposed SWPPP would be consistent with the *New York State Stormwater Management Design Manual* (NYSDEC, 2010) and the *New York State Standards and Specifications for Erosion and Sediment Control* (NYSDEC, 2005). The erosion and sediment control measures to be incorporated into the SWPPP would generally be as indicated on the preliminary *Clearing and Erosion & Sediment Control Plan* included in Appendix C of this DEIS, and as described above (see subheading regarding Town Code Chapter 86). Under post-development conditions, the proposed stormwater management system would contain and recharge 100 percent of stormwater runoff at the subject property (see discussion above and the *Grading & Drainage Plan* in Appendix C). As the proposed action would disturb greater than five acres of land, the SWPPP to be prepared would also address post-development stormwater management. Coverage would be obtained under GP-0-15-002, and erosion and sedimentation controls and stormwater management would be implemented in accordance with a SWPPP (to also be

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[24] *Responsiveness Summary for Public Comments Received on the New York State Department of Environmental Conservation SPDES General Permit for Stormwater Discharges from Construction Activity Permit No. GP-0-15-002 Issued Pursuant to Article 17, Titles 7, 8 and Article 70 of the Environmental Conservation Law* (NYSDEC, 2010) [http://www.dec.ny.gov/docs/water_pdf/gpconsrespon.pdf]

reviewed by the Town of Brookhaven in accordance with Chapter 86 of the Town Code), in satisfaction of all relevant requirements.

Long Island Segment of the Nationwide Urban Runoff Program (NURP Study)

The *NURP Study* includes recommendations with regard to stormwater runoff, as it pertains to the protection of groundwater and surface water resources. The proposed action's consistency with the relevant recommendations is discussed below each italicized recommendation:

GW 1: *Continue to use recharge basins wherever feasible for the disposal of stormwater and the replenishment of groundwater.*

The *Grading & Drainage Plan* for the proposed action does not include the use of recharge basins for stormwater disposal. However, drainage swales and leaching basins would be provided on-site, and would contain and recharge all stormwater to groundwater. Thus, the proposed action is consistent with the intent of this recommendation.

GW 4: *Consider the use of in-line storage leaching drainage systems, or components thereof, as a substitute for recharge basins in areas, other than parking lots, where maintenance will be assured and where the value of the land for development purposes is greater than the cost of installing and maintaining the underground system. Storage leaching drainage systems should also be considered for use where the installation of recharge basins is not feasible.*

The proposed action does not include construction of traditional recharge basins. The *Grading & Drainage Plan* includes a series of shallow retention basins (with a limited number of leaching pools to be installed at key locations) to contain and recharge all stormwater generated by a minimum 8-inch rainfall event. As such, the proposed action is consistent with this recommendation.

GW 5: *Prevent illegal discharges to drainage systems or recharge basins. Such discharges, which often result from improper storage or deliberate dumping of chemicals, must be controlled at the source.*

The proposed Middle Island Solar Farm would include the storage of LP gas within two 2,500-gallon underground storage tanks for emergency backup purposes. These tanks would be handled in accordance with the relevant provisions of the SCSC, and all required permits would be secured as needed. As such, no discharges of such materials to the proposed drainage

system are expected, and the proposed development would comply with this recommendation.

Based on the above, the proposed action is consistent with the relevant recommendations offered within the *NURP Study*.

The proposed action addresses potential stormwater runoff-related impacts during construction and operational phases, and is consistent with relevant regulatory controls and the recommendations of *NURP Study*, as detailed herein. As such, no significant adverse impacts associated with stormwater runoff are expected to result from implementation of the proposed action.

Surface Water, Wetlands and Floodplains

There are no surface waters or wetlands mapped by the NYSDEC or the National Wetlands Inventory present at or adjacent to the subject property (see Figure 8 on Page 42 and Figure 9 on Page 43). Additionally, field investigations conducted on October 20 and November 2, 2014, did not identify any surface waters or wetlands at the subject property. The nearest mapped wetland, located approximately 1,121 feet east of the southeast corner of the subject property, is well outside of the NYSDEC's 100-foot regulated Adjacent Area setback for freshwater wetlands. Therefore, the proposed action would have no significant adverse impact upon such resources.

Additionally, the subject property is not located within a Special Flood Hazard Area, as identified on the FEMA Flood Insurance Rate Map (see Figure 10 on Page 44 of this DEIS). As such, the proposed action would have no significant adverse impact upon floodplains.

Forge River Watershed Management Plan

The subject property is situated within the West Mill Pond Subwatershed, as defined in the *Forge River Plan* (see Figure 11 on Page 46 of this DEIS). There are several recommendations within the *Forge River Plan* that aim to protect and improve the quality of the Forge River and its streams that have been degraded over time as a result of nitrogen loading from primarily agricultural (i.e., duck farming) and residential land uses. However, as the subject property is vacant and undeveloped, the only source of nitrogen contribution is related to atmospheric deposition. As discussed in detail in the *Groundwater* subsection above, implementation of the proposed action would result in a 12.3 percent increase in the subject property's nitrogen contribution to the Forge River, due to the proposed on-site sanitary system. The 12.3 percent increase of the subject property's nitrogen contribution would

increase the Forge River's overall nitrogen load by 0.012 percent – a miniscule increase.

Several of the objectives and strategies contained within the *Forge River Plan* can be applied to the proposed MISF development. Following is a consistency analysis of the proposed action with the relevant objectives and strategies.

Objectives

- ***Reduce nitrogen concentrations.*** *Nitrogen is the primary pollutant responsible for the degradations of the estuary's water quality. Measurable indicators for this objective include concentrations of total nitrogen and dissolved oxygen and/or number of algal blooms.*

  Aside from a single on-site sanitary system to serve the proposed maintenance building, the proposed action would not include any other nitrogen contributors, such as fertilizers. Although the proposed action would not reduce nitrogen concentrations in the watershed, it represents a *de minimis* increase contribution in the context of the overall watershed. It is further noted that the main contributor of nitrogen loading within the West Mill Pond Subwatershed is the drainage and treatment lagoon discharge from the duck farms, which the *Forge River Plan* notes ceased operations in 2011.

- ***Implement TMDL-allocated scenario.*** *The TMDL process will provide a long-term framework, particularly in a regulatory context, for achieving the restoration of the Forge River. Its success can be measured by the degree of completion of its adopted allocation scenario.*

  A TMDL has not yet been established for the Forge River Watershed. Regardless, it is expected that the proposed action would result in a total nitrogen contribution of 336.5 lbs N/year (see the *Groundwater* subsection above for detailed Nitrogen Mass Balance discussion). This represents a *de minimis* increase in the nitrogen contribution by the subject property to the overall Forge River Watershed of 0.012 percent. Further, with the cessation of duck farm operations, this minimal increase would be offset by the decrease in nitrogen discharges from these operations.

Strategies

- ***Establish a Forge River Protection Overlay District (FRPOD) (p. 25-1)***

  The FRPOD has not been formally adopted by the Town of Brookhaven. However, the purpose of the FRPOD is to impose additional regulations upon the underlying zoning districts within the Forge River Watershed, such as enhanced review, restrictions and/or standards for a wide range of land use and development activities (e.g., mining, raising of livestock, fertilizer-intensive agriculture and heavy and/or noxious industries). As previously discussed, the proposed action would not use fertilizers, and would cause a minimal increase in nitrogen contribution to the Forge River Watershed as a result of the proposed on-site sanitary system. Moreover, the proposed LP gas underground storage tanks would be in compliance with the relevant provisions of the SCSC.

- ***Impose stricter clearing limits (p. 25-11)***

  The *Forge River Plan* recommends that the FRPOD adopt the Clearance Standards of the Central Pine Barrens Comprehensive Land Use Plan (CLUP). For industrial uses, the maximum site clearance would be 65 percent (see Figure 5-1 of the CLUP). The recently adopted code provisions regulating Solar Energy Production Facilities reflect an equivalent restriction, requiring that 35 percent of the site remain natural and undisturbed (see §85-815[D][1] of the Town Code). Taken over the entire 100.33±-acre site, the 65 percent clearing limit would require that 35.11± acres of natural area be retained. Taken over the L Industrial 1 portion only (as the A Residence 1 portion may not be utilized for yield), a total of 32.97 acres would be required to remain. The *Proposed Site Plan* indicates that 39.30± acres (i.e., 39.17± percent) of the subject property would remain natural and undisturbed, meaning 60.83± percent of the site would be cleared. Accordingly, the proposed action would preserve an even greater area of natural vegetation than would result under the recommended stricter clearing limits of the FRPOD. Further, less clearing is proposed than the CLUP standard would allow in the Central Pine Barrens Compatible Growth Area. Several additional acres of existing woodland would be retained above and beyond the 35 percent requirement for Solar Energy Production Facilities. Moreover, as indicated on the *Proposed Site Plan*, much of the area to be cleared would be established in native, low-maintenance plantings (beneath and surrounding the proposed solar panel arrays), such that a total of 93.17± percent of the subject property would be either natural or re-vegetated upon implementation of the proposed action. The proposed action therefore complies with and exceeds the more strict limits for clearing as recommended within the FRPOD.

- ***Replace direct discharge stormwater systems (p. 25-11)***

  This strategy recommends that existing stormwater conveyance systems that discharge directly to the estuary be replaced with green alternatives such as vegetated swales, bio-retention areas, rain gardens, etc. Although the subject property does not contain any existing stormwater infrastructure, the proposed MISF has been designed with vegetated drainage swales and leaching basins to accommodate stormwater. These improvements, in conjunction with gravel driveways and vegetated surfaces beneath and between the proposed solar panels, would contain and recharge 100 percent of stormwater runoff on-site. Thus, the proposed action is consistent with this strategy.

- ***Impose strict limits on nitrogen fertilizer use (p. 25-14)***

  The proposed action includes indigenous (native), low-maintenance plantings that would not require fertilizer application as part of routine landscape maintenance (see *Planting Plan* in Appendix C).

- ***Enact ordinance requiring pumpouts for all OWTS within FRPOD every five years (p. 25-17)***

  This strategy allocates a portion of the Forge River Protection Fund for the maintenance of all on-site wastewater treatment systems (OWTS) every five years. The proposed on-site sanitary system would be properly maintained in accordance with the relevant provisions of the SCSC.

- ***Encourage use of indigenous landscape plants (p. 25-23)***

  As detailed on the *Planting Plan*, a variety of native, low-maintenance species would be used in landscaping the subject property.

Based on the above, the proposed action is consistent with the relevant objectives and strategies of the *Forge River Plan*. As such, no significant adverse impacts upon the Forge River watershed are expected to result from implementation of the proposed action.

Interconnection

With respect to groundwater resources, installation of the conceptual interconnection along the route extending from the northern property boundary to the Weeks Avenue substation (see *Conceptual Interconnection Route* plan in Appendix C) would not generate discharges of sanitary waste, would not create a demand for potable water, and would not be expected to involve the application of fertilizers.

The conceptual interconnection would not result in the establishment of any significant quantity of impervious surfaces, as same would be limited to the immediate location of any utility cable support structures (e.g., foundations) that may be installed. Accordingly, and as only a limited amount of pruning/removal of vegetation would be expected (i.e., along the roadside), if any, there would be no significant change in the quantity of stormwater runoff generated, and no significant related impacts on the Forge River Watershed are anticipated.

3.2.3 Proposed Mitigation

No significant adverse impacts are identified, such that mitigation is not proposed. Notwithstanding this, a summary of measures that have been incorporated into the project to minimize or eliminate potential adverse impacts to water resources is presented below.

- The use of native, low-maintenance plant species to eliminate irrigation demand and fertilizer and pesticide application.
- Installation of vegetated swales and leaching basins to retain and recharge stormwater on-site.
- Re-vegetation and natural areas to comprise 93.17± percent of the subject property.
- Adequate separation distance to be provided between the base of leaching structures (i.e., leaching pools, sanitary system) and groundwater to allow for the filtration of stormwater and sanitary waste.
- Adherence to the relevant requirements and recommendations of SCSC Articles 6, 7 and 12, the *NURP Study*, the *208 Study*, and the *Forge River Plan*.
- Coverage to be obtained under SPDES GP-0-15-002 for stormwater discharges from construction activity. The proposed stormwater management system would meet or exceed all relevant requirements of SPDES GP-0-15-002 and the Town of Brookhaven.
- Erosion and sedimentation controls and stormwater management would be implemented as part of an approved SWPPP.

3.3 Ecological Resources

Existing ecological conditions at the 100.33±-acre subject property were assessed through a review of United States Fish and Wildlife Service (USFWS), New York State Department of Environmental Conservation (NYSDEC) and New York Natural Heritage Program[25] (NYNHP) maps and records. In addition, field inspections of the subject property were performed by a VHB project scientist during the autumn of 2014 and spring of 2015 (resume included in Appendix D). The field inspections, which took place on October 20, 2014, November 2, 2014 and May 5, 2015, included a habitat evaluation, vegetation and wildlife species inventories, and rare/protected species assessments.

3.3.1 Existing Conditions

Habitats/Vegetation

As observed during the field inspections, the entire subject property supports a pine- and oak-dominated forest habitat interspersed with a network of unpaved trails. In order to further characterize the forest habitat identified above, the NYNHP publication "Ecological Communities of New York State"[26] (ECNYS) was consulted. This guidance provides detailed descriptions of various habitat types, and includes global and state rarity rankings for many habitats found within New York. Utilizing ECNYS, the on-site habitat has been characterized according to the Pitch Pine-Oak Forest community description. The following narrative provides a description of the Pitch Pine-Oak Forest, based upon the ECNYS community description and supplemented with field observations from the subject property.

Pitch Pine-Oak Forest

> *"A mixed forest that typically occurs on well-drained, sandy soils of glacial outwash plains or moraines; it also occurs on thin, rocky soils of ridge tops.*
>
> *The dominant trees are pitch pine (Pinus rigida) mixed with one or more of the following oaks: scarlet oak (Quercus coccinea), white oak (Q. alba), red oak (Q.*

▼

[25] The NY Natural Heritage Program is a partnership between the New York State Department of Environmental Conservation and the State University of New York College of Environmental Science and Forestry.

[26] Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2014. *Ecological Communities of New York State.* Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

rubra), or black oak (Q. velutina). The relative proportions of pines and oaks are quite variable within this community type. At one extreme are stands in which the pines are widely spaced amidst the oaks, in which case the pines are often emergent above the canopy of oak trees. At the other extreme are stands in which the pines form a nearly pure stand with only a few widely spaced oak trees.

The shrub layer is well-developed with scattered clumps of scrub oak (Quercus ilicifolia) and a nearly continuous cover of low heath shrubs such as blueberries (Vaccinium pallidum, V. angustifolium) and black huckleberry (Gaylussacia baccata).

The herbaceous layer is relatively sparse; characteristic species are bracken fern (Pteridium aquilinum), wintergreen (Gaultheria procumbens), and Pennsylvania sedge (Carex pensylvanica).

Characteristic birds include rufous-sided towhee, (Pipilo erythrophthalmus), common yellowthroat (Geothlypis trichas), field sparrow (Spizella pusilla), prairie warbler (Dendroica discolor), pine warbler, (Dendroica pinus), blue jay (Cyanocitta cristata) and whip-poor-will (Caprimulgus vociferus).

At least two potential regional variants are known or suspected, the typical coastal variant on Long Island and the inland variant of upstate New York. More data on these regional variants are needed…"

The Pitch Pine-Oak Forest ecological community is ranked by the NYNHP as G4G5, S4. According to the NYNHP, G4 indicates a community that is considered "*Apparently secure globally, though it might be quite rare in parts of its range, especially at the periphery*." G5 is indicative of a community that has been designated as "*Demonstrably secure globally, though it might be quite rare in parts of its range, especially at the periphery".* The S4 ranking denotes a community that is considered "*Apparently secure in New York State*."

The Pitch Pine-Oak Forest community is common within the central Long Island region and the immediate surrounding area of the subject property, with large contiguous blocks of Pitch Pine-Oak Forest occurring at the adjoining properties to the east, south and north (beyond Moriches-Middle Island Road). Similar to the above description, a wide variation in the relative proportions of pines versus oaks exists within the Pitch Pine-Oak Forest observed at the subject property, presumably in response to fire regime. Generally speaking, increased burn frequency and/or severity results in dominance of pitch pine over tree oak species, while oaks dominate in areas with low burn frequency/severity, and particularly in areas where fire has been historically suppressed. Other factors, including soil moisture, soil fertility and human disturbance, are also relevant to community composition. Sandy, xeric (dry), low nutrient soils favor pitch pine, while mesic (moist), more nutrient-

rich soils are needed to support most oaks and other hardwoods. The variants of the Pitch Pine-Oak Forest community type observed on the subject property include the following:

- Communities with a canopy stratum comprised of mature pitch pines (estimated coverage of 70-80 percent), with 20-30 percent mixed tree oaks (e.g., scarlet, black and white oak) and a patchy shrub stratum consisting of heath shrubs (e.g., blueberries and black huckleberry), with scattered patches of scrub oak, bayberry (*Myrica pensylvanica*) and/or bearberry (*Arctostaphylos uva-ursi*) located primarily within disturbed canopy openings. Underneath the shrub stratum, the groundcover stratum is sparse-to-non-existent. Where present, dominant species include bracken fern (*Pteridium aquilinum*), wintergreen, (*Gaultheria procumbens*), pipsissewa (*Chimaphila maculata*) and mono-specific patches of Pennsylvania sedge (*Carex pensylvanica*). This community variant was observed primarily within the central and northern portions of the subject property.

- Communities with a canopy stratum comprised of a nearly even mixture of pitch pines and tree oaks (estimated coverage of 50 percent for each) growing over a low but relatively continuous heath stratum and a sparse-to-non-existent groundcover stratum. This community variant was observed to be dominant across most of the southern portion of the subject property, with scattered patches also occurring within the central and northern portions of the subject property.

- Communities dominated by white oak, with scattered scarlet oak, black oak and pitch pines over a low but relatively continuous heath stratum and sporadic groundcover plants. This community variant is dominant across the northwestern portion of the subject property and also occurs within scattered patches at the southern portion of the site.

- A nearly pure stand of young pitch pine (i.e., 10-20 feet in height) growing over a thick, mono-specific scrub oak shrub stratum. The lack of mature pines or tree oaks may indicate that the current composition of the stand has been influenced by past fire or other disturbance. This community variant occurs primarily beyond the eastern site boundary, with a small portion extending onto the southeastern portion of the subject property.

- Intermediate variations of the four communities described above.

Although the relative proportions of the dominant vegetative species described above varies significantly across the subject property, the site overall supports a relatively homogeneous species assemblage dominated by a few trees, shrubs and herbaceous plants. For example, the canopy stratum throughout the site is dominated by pitch pine and the three aforementioned tree oaks, while the shrub

stratum across much of the subject property is dominated by two species (Lowbush Blueberry [*Vaccinium angustifolium*] and black huckleberry [*Gaylussacia baccata*]). Similar to the ECNYS community description, overall vegetative diversity within the Pitch Pine-Oak Forest community was observed to be low.

Notwithstanding the vegetative associations described above, some atypical vegetation for the Pitch Pine-Oak Forest community occurs along edge areas between the subject property and the adjacent residential development to the west, as well as along the unpaved trails that traverse the site and within disturbed openings. In particular, cleared or otherwise disturbed areas containing dumped debris (e.g., building materials, cars, landscaping debris) were also observed at several locations throughout the subject property, primarily in areas adjacent to the aforementioned unpaved trails and residential development. The vegetation within these areas includes common native and non-native/invasive trees, shrubs, vines and herbaceous plants of successional habitats and disturbed areas, including black cherry (*Prunus serotina*), gray birch (*Betula populifolia*), crabapple (*Malus sp*.), big-tooth aspen (*Populus grandidentata*), multiflora rose (*Rosa multiflora*), brambles (*Rubus spp.)*, Tatarian honeysuckle (*Lonicera tatarica*), Japanese honeysuckle (*Lonicera japonica*), Asiatic bittersweet (*Celastrus orbiculatus*), roundleaf greenbrier (*Smilax rotundifolia*) poison ivy (*Toxicodendron radicans*), pokeweed (*Phytolacca americana*), mugwort (*Artemesia vulgaris*), goldenrods (*Solidago spp*.), garlic mustard (*Allaria petiolata*), plantains (*Plantago spp*.), foxtails (*Setaria spp*.) and various other grasses.

Evidence of past fires (i.e., blackened tree trunks) was observed at the southern portion of the subject property and along the western site boundary. Based upon field observations and review of historic aerial photographs, these fires do not appear to have occurred recently (i.e., not within the past 10± years).

In summary, the Pitch Pine-Oak Forest community at the subject property occurs commonly within the central Long Island region and the immediate surrounding area of the site, and the community is considered apparently secure in New York State by the NYNHP. Based upon site observations and similar to the ECNYS community description, a wide variation exists across the subject property in the relative proportions of the tree and shrub species that define this community (i.e., pitch pine, oaks and heath shrubs). However, the overall plant species assemblage is relatively homogeneous across the subject property. Similar to the ECNYS community description, overall vegetative diversity within the Pitch Pine-Oak Forest community was observed to be low and the flora is dominated by common native tree, shrub and herbaceous plant species that typically comprise this community type. Some atypical native and non-native/invasive plant species are present along the community edges, unpaved trails and within disturbed openings, and evidence of historical fires is evident at several locations at the subject property.

The following list provides an inventory of vegetation observed during VHB's October 20, 2014, November 2, 2014 and May 5, 2015 field inspections of the subject property. This plant species list is not intended to be an all-inclusive inventory of the vegetative species present at the subject property.

Plant Species List

Trees

Norway maple	*Acer plantanoides*
red maple	*Acer rubrum*
gray birch	*Betula populifolia*
autumn olive	*Elaeagnus umbellata*
eastern redcedar	*Juniperus virginiana*
crabapple	*Malus* sp.
pitch pine	*Pinus rigida*
big-tooth aspen	*Populus grandidentata*
eastern white pine	*Pinus strobus*
black cherry	*Prunus serotina*
white oak	*Quercus alba*
scarlet oak	*Quercus coccinea*
pin oak	*Quercus palustris*
northern red oak	*Quercus rubra*
black oak	*Quercus velutina*
black locust	*Robinia pseudoacacia*
sassafras	*Sassafras albidum*

Shrubs and Vines

bearberry	*Arctostaphylos uva-ursi*
Japanese barberry	*Berberis thunbergii*
Asiatic bittersweet	*Celastrus orbiculatus*
sweet fern	*Comptonia peregrina*
black huckleberry	*Gaylussacia baccata*
inkberry	*Ilex glabra*
American holly	*Ilex opaca*
sheep laurel	*Kalmia angustifolia*
privet	*Ligustrum sp.*
Japanese honeysuckle	*Lonicera japonica*
Tatarian honeysuckle	*Lonicera tatarica*
maleberry	*Lyonia mariana*
northern bayberry	*Myrica pensylvanicum*
Virginia creeper	*Parthenocissus quinquefolia*
chokecherry	*Prunus virginiana*
scrub oak	*Quercus ilicifolia*
shining sumac	*Rhus copallinum*
multiflora rose	*Rosa multiflora*
northern dewberry	*Rubus flagellaris*
bristly dewberry	*Rubus hispidus*
raspberry	*Rubus sp.*

greenbrier	*Smilax rotundifolia*
poison ivy	*Toxicodendron radicans*
Lowbush Blueberry	*Vaccinium angustifolium*
Blueridge Blueberry	*Vaccinium pallidum*
southern arrowwood	*Viburnum dentatum*
summer grape	*Vitis aestivalis*

Herbaceous Plants

yarrow	*Achillea millefolium*
garlic mustard	*Allaria petiolata*
common ragweed	*Ambrosia artemisiifolia*
broomsedge	*Andropogon virginicus*
hemp dogbane	*Apocynum cannabinum*
common mugwort	*Artemisia vulgaris*
common milkweed	*Asclepias syriaca*
Pennsylvania sedge	*Carex pensylvanica*
spotted knapweed	*Centaurea maculosa*
chicory	*Chicorium intybus*
striped wintergreen	*Chimaphila maculata*
orchard grass	*Dactylis glomerata*
Queen Anne's lace	*Daucus carota*
deertongue	*Dichanthelium clandestinum*
crabgrass	*Digitaria sp.*
spotted spurge	*Euphorbia maculata*
fescue	*Festuca* sp.
bedstraw	*Galium* sp.
wintergreen	*Gaultheria procumbens*
yellow hawkweed	*Hieracium caespitosum*
path rush	*Juncus tenuis*
Canada lettuce	*Lactuca canadensis*
slender bush-clover	*Lespedeza virginica*
ryegrass	*Lolium* sp.
stiff aster	*Lonactis linarifolius*
bird's-foot trefoil	*Lotus corniculatus*
Japanese stiltgrass	*Microstegium vimineum*
witchgrass	*Panicum capillare*
switch grass	*Panicum virgatum*
lady's thumb	*Persicaria maculosa*
timothy	*Phleum pretense*
common reed	*Phragmites australis*
pokeweed	*Phytolacca americana*
narrowleaf plantain	*Plantago lanceolata*
broadleaf plantain	*Plantago major*
bluegrasses	*Poa* sp.
common cinquefoil	*Potentilla simplex*
bracken fern	*Pteridium aquilinum*
curly dock	*Rumex crispus*
little bluestem	*Schizachyrium scoparium*
wool grass	*Scirpus cyperinus*
annual sow thistle	*Sonchus oleraceus*
giant foxtail	*Setaria faberi*

green foxtail	*Setaria viridis*
tall goldenrod	*Solidago altissima*
gray goldenrod	*Solidago nemoralis*
rough-stemmed goldenrod	*Solidago rugosa*
bushy aster	*Symphyotrichum dumosum*
slender leaved goldenrod	*Solidago tenuifolia*
many-flowered aster	*Symphyotrichum ericoides*
common dandelion	*Taraxacum officinale*
purpletop	*Tridens flavus*
rabbits foot clover	*Trifolium arvense*
red clover	*Trifolium pratense*
white clover	*Trifolium repens*
common mullein	*Verbascum thapsus*

Wildlife

In addition to the field inspections, and in order to further investigate the potential on-site species assemblage, VHB consulted with the NYNHP and performed research of NYSDEC and USFWS records regarding the potential presence or absence of particular species at and in the vicinity of the subject property. Based upon these resources and the field inspections, a summary of the birds, mammals and herpetofauna (amphibians and reptiles) observed or expected on the subject property follows.

Birds

Avian species are the most common form of wildlife observed and expected at the subject property. The 31 species listed below were observed at or over the subject property during the field inspections.

red-winged blackbird	*Agelaius phoeniceus*
red-tailed hawk	*Buteo jamaicensis*
northern cardinal	*Cardinalis cardinalis*
eastern wood-peewee	*Contopus virens*
American crow	*Corvus brachyrhynchos*
blue jay	*Cyanocitta cristata*
gray catbird	*Dumetella carolinensis*
common yellowthroat	*Geothlypis trichas*
house finch	*Haemorhous mexicanus*
dark-eyed junco	*Junco hyemalis*
red-bellied woodpecker	*Melanerpes carolinus*
song sparrow	*Melospiza melodia*
northern mockingbird	*Mimus polyglottos*
black-and-white warbler	*Mniotilta varia*
house sparrow	*Passer domesticus*

downy woodpecker	*Picoides pubescens*
hairy woodpecker	*Picoides villosus*
rufous-sided towhee	*Pipilo erythrophthalmus*
black-capped chickadee	*Poecile atricapillus*
common grackle	*Quiscalus quiscula*
ovenbird	*Seiurus aurocapilla*
yellow-rumped warbler	*Setophaga coronata*
pine warbler	*Setophaga pinus*
white-breasted nuthatch	*Sitta carolinensis*
golden-crowned kinglet	*Regulus satrapa*
yellow warbler	*Setophaga petechia*
European starling	*Sturnus vulgaris*
Carolina wren	*Thryothorus ludovicianus*
American robin	*Turdus migratorius*
blue-winged warbler	*Vermivora cyanoptera*
mourning dove	*Zenaida macroura*

In order to provide a detailed estimate of other avian species potentially utilizing the site, *The New York State Breeding Bird Atlas*[27] (NYSBBA) was consulted. According to this resource, a total of 66 bird species were identified between 2000 and 2005 within the NYSBBA survey block in which the subject property is located (Block 6752D). Of these species, 25 are confirmed as breeding, 28 are listed as probable breeders and 13 are listed as possibly breeding (a copy of the atlas report for Block 6752D is included in Appendix D). It is noteworthy that NYSBBA Block 6752D totals 9 square miles in area and includes a diverse range of habitats that are not supported at the subject property, including agricultural fields, ponds, streams and freshwater wetlands. As such, some of the avian species recorded for Block 6752D require breeding and non-breeding habitats that are not supported at the subject property, and, therefore, these birds are not expected to utilize the site, except perhaps as occasional transients. Accordingly, it is not anticipated that birds on the atlas block list such as killdeer (*Charadrius vociferus*), American kestrel (*Falco sparverius*), osprey (*Pandion haliaetus*), fish crow (*Corvus ossifragus*), spotted sandpiper (*Actitis macularius*), mallard (*Anas platyrhynchos*), and other habitat specialist species associated with these communities regularly use the subject property.

Rather, based upon the existing site conditions, the subject property is best-suited to those avian species adapted to coniferous and mixed-deciduous woodlands. Given the extent of the Pitch Pine-Oak Forest variants that occur at the subject property, the site provides significant habitat area for characteristic birds of these communities (as listed by ECNYS), including pine warbler, common yellowthroat rufous-sided

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[27] McGowan, K.J. and K. Corwin, eds. 2008. *The Atlas of Breeding Birds in New York State*. Cornell University Press. Data also available online at http://www.dec.ny.gov/animals/51030.html . Accessed October 19, 2014.

towhee and blue jay. These four species were observed at the subject property during the field inspections.

The on-site wooded habitats also provide potential habitat for other forest interior species noted that were recorded within NYSBBA Block 6752D, including ovenbird (*Seiurus aurocapilla*), black-and white warbler (*Mniotilta varia*), eastern wood-peewee (*Contopus virens*) and brown thrasher (*Toxostoma rufum*). The former three birds were observed at the subject property during the field inspections.

Given the residential development to the west of the subject property and in the surrounding area in general, a number of common songbirds typically associated with suburban settings were also noted during the field inspections (e.g., house sparrow, song sparrow, European starling, northern cardinal, American robin, mourning dove, etc.), particularly along the western and northern site boundaries. The species are also included on the *List of Common Suburban Birds that Occur in the Town of Brookhaven* (copy included in Appendix D)[28].

Three woodpecker species that commonly occur within both wooded and suburban settings were noted on-site during the 2014 field inspections (downy woodpecker, hairy woodpecker and red-belied woodpecker).

The subject property also provides potential breeding and/or non-breeding habitat for several species of owls and raptors recorded in NYSBBA Block 6752D, including great horned owl (*Bubo virginianus*) and red-tailed hawk. The latter species was also observed over the site during the field inspections.

As identified by the Town of Brookhaven, the subject property also provides potential habitat for three New York State Special Concern avian species: Cooper's hawk (*Accipter cooperii*), sharp-shinned hawk (*Accipter striatus*) and whip-poor-will (*Caprimulgus vociferous*). Species accounts, breeding records and habitat assessments for these three birds are included below (see subsection entitled, *Rare/Protected Species and Communities*).

Mammals

Multiple sightings of whitetail deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*) and eastern chipmunk (*Tamias striatus*) occurred at the subject property during the field inspections. Additionally, eastern cottontail (*Sylvilagus floridanus*) was observed within the recharge basin located immediately to the west of the subject property.

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[28] Wade, M.C., Griffen, N.R., et. al. 1990. *Town of Brookhaven New York 1990 Natural Resources Inventory*, p. 119 Town of Brookhaven.

In order to determine other mammal species that may utilize the site, existing surveys of Long Island mammalian populations, including *The Mammals of Long Island, New York*[29] (Connor, 1971) and the *List of Mammals that Occur in the Town of Brookhaven*[30] (copy included in Appendix D) were consulted. Based upon these resources, as well as an evaluation of existing ecological conditions, the following mammal species have been identified as potentially utilizing the subject property. However, this list is not intended to be an all-inclusive inventory of on-site mammals.

short-tailed shrew	*Blarina brevicauda*
bats	Chiroptera spp.
star-nosed mole	*Condylura cristata*
Virginia opossum	*Didelphis virginialis*
southern flying squirrel	*Glaucomys volans*
woodchuck	*Marmota monax*
striped skunk	*Mephitis mephitis*
meadow vole	*Microtus pennsylvanicus*
house mouse	*Mus musculus*
long-tailed weasel	*Mustela frenata*
whitetail deer*	*Odocoileus virginianus*
white-footed mouse	*Peromyscus leucopus*
pine mouse	*Pitymys pinetorum*
raccoon	*Procyon lotor*
Norway rat	*Ratus norvegicus*
eastern mole	*Scalopus aquaticus*
eastern gray squirrel*	*Sciurus carolinensis*
masked shrew	*Sorex cinerus*
eastern cottontail*	*Sylvilagus floridanus*
eastern chipmunk*	*Tamias striatus*
red fox	*Vulpes vulpes*

*Indicates species was observed at or adjacent to the subject property during the field inspections.

The smaller rodent species listed above (e.g., mice, moles and shrews) are expected to be the most abundant mammals at the subject property. However, due to their diminutive sizes and predominantly subterranean life histories, these species are not easily observed. Primarily nocturnal mammals such as raccoon and Virginia opossum are also expected to be common on-site. Red fox is likely the top mammalian predator present at the subject property. The three species observed at during the field inspections are expected to be among the most commonly observed mammal species at the subject property.

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[29] Connor, Paul F. 1971. *The Mammals of Long Island. New York* State University of New York, New York Museum and Science Service.
[30] Wade, M.C., Griffen, N.R., et. al. 1990. *Town of Brookhaven New York 1990 Natural Resources Inventory*, p. 133. Town of Brookhaven.

Given its central location between contiguous forested habitats to the south and east, as well as 662 acres of primarily forested habitat to the north of Moriches-Middle Island Road, the subject property functions as an important habitat corridor that facilitates the movement of mammals and other wildlife between these surrounding communities.

Herpetofauna

An eastern box turtle (*Terrapene carolina*) carapace (shell) was noted at the subject property during the field inspections, indicating that this New York State Special Concern reptile species occurs on-site. Additional discussion of this species is provided below in the *Rare/Protected Species and Communities* subsection.
In order to identify other herpetofauna that may utilize the subject property, an evaluation of existing site conditions was performed. Additionally, the 1990-1995 New York State Amphibian and Reptile Atlas Project (NYSARAP) database[31] was consulted (copy included in Appendix D). According to this resource, a total of 24 herpetofauna species were identified within the United States Geological Survey (USGS) Moriches, New York Quadrangle between 1990 and 1995. However, as the subject property does not provide the necessary habitat requirements for many of these species, it is not expected that the subject property is utilized by all of the herpetofauna included on the list.

More specifically, due to the absence of permanent surface waters at or immediately adjacent to the subject property, the site would not support the highly- or fully-aquatic herpetofauna on the list. These are: American bullfrog (*Rana catesbeiana*), green frog (*Rana clamitans*), southern leopard frog (*Rana utricularia*), pickerel frog (*Rana palustris*), eastern painted turtle (*Chrysemys picta*), common musk turtle (*Sternotherus oderatus*) and common snapping turtle (*Chelydra serpentina*).

The vegetation and sandy, xeric soils at the subject property are most conducive to those terrestrial herpetofuana species adapted to upland wooded conditions, including the aforementioned eastern box turtle. Given the lack of permanent surface waters at or in the immediate vicinity of the subject property, none of the other turtle species on NYSARAP database would be expected to occur other at the site.
The dry, upland site conditions represent potential habitat for several species of colubrid snakes noted on the NYSARAP database, including eastern garter snake (*Thamnophis sirtalis*), northern black racer (*Coluber c.* constrictor) and eastern milk snake (*Lampropeltis triangulum*). Smooth green snake (*Opheodrys vernalis*) may also occur on-site, particularly within the grassy forest edge habitats with the neighboring residential properties to the north and west of the subject property. Northern ringneck snake (*Diadophis punctatus*) may also be present at the subject property,

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[31] New York State Department of Environmental Conservation. 2014. New York State Amphibian and Reptile Atlas Project. Available online at: http://www.dec.ny.gov/animals/7140.html. Accessed November 17, 2014.

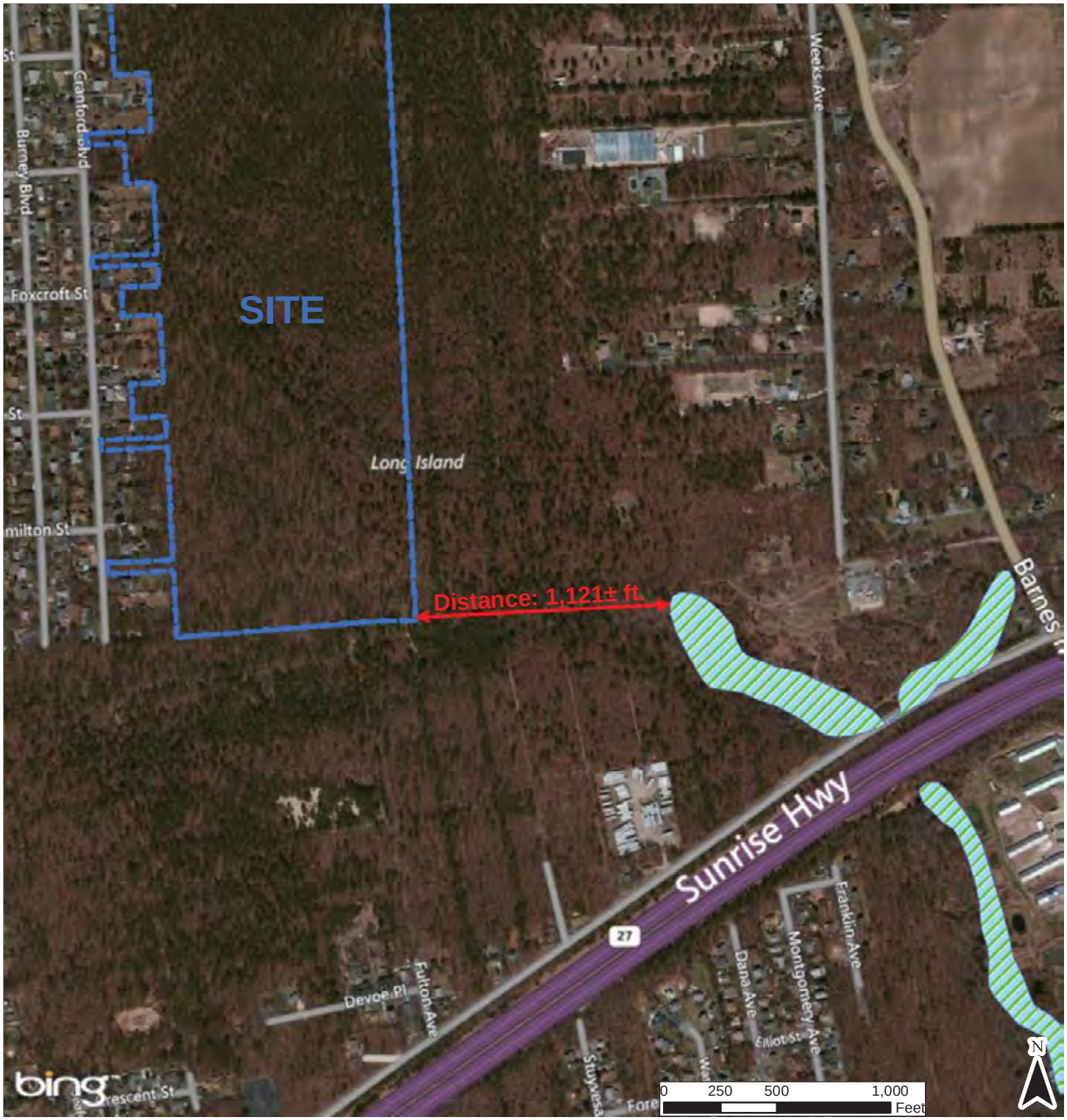
although this species is typically associated with wetter soil conditions than those found over the majority of the site.

The subject property provides potential habitat for the highly terrestrial northern redback salamander (*Plethodon cinereus*). Most of the other amphibian species (i.e., salamanders, frogs and toads) included on the NYSARAP database require semi-permanent surface waters as breeding pools during the spring, summer and/or fall months. No such waters were observed at the subject property during the 2014 field inspections. However, a groundwater recharge basin located immediately to the west of the site may serve as potential seasonal breeding habitat for some amphibians, depending on the presence of saturated condition during the breeding seasons for these species. In addition, as observed during the field inspections, an off-site wetland feature associated with the headwaters of the Forge River is located approximately 1,121± feet to the southeast of the subject property (see Figure 12). The two aforementioned features may serve as breeding pools in certain years for some amphibians that may utilize nearby portions the subject property as terrestrial habitat following metamorphosis to their adult life stages. These include four species that are included on the NYSARAP database: Fowler's toad (*Bufo fowleri*), gray tree frog (*Hyla versicolor*), spring peeper (*Pseudacris crucifer*) and/or the vernal pool obligate species, wood frog (*Rana sylvatica*). However, field inspections during the spring of 2015 did not identify surface water or amphibian breeding activity within the two aforementioned features.

Based upon the foregoing observations and the NYSARAP database, the following species have been identified as the most likely herpetofauna to potentially use the subject property as habitat. However, this list is not intended to be an all-inclusive inventory of on-site herpetofauna.

Fowler's toad	*Bufo fowleri*
northern black racer	*Coluber c. constrictor*
northern ringneck snake	*Diadophis punctatus*
gray treefrog	*Hyla versicolor*
eastern milk snake	*Lampropeltis triangulum*
smooth green snake	*Opheodrys vernalis*
northern redback salamander	*Plethodon cinereus*
northern spring peeper	*Pseudacris crucifer*
wood frog	*Rana sylvatica*
eastern box turtle*	***Terrapene carolina***
eastern garter snake	*Thamnophis sirtalis*

* Indicates evidence of this species was observed during VHB's field inspections.
Bolding indicates New York State Special Concern status.



Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Distance to Nearest Wetland

Figure # 12

Approximate Site Boundary
NYSDEC Freshwater Wetland M-7
Approximate Distance to Nearest Wetland

Sources:
1. Image courtesy of USGS Earthstar Geographics SIO © 2015 Microsoft Corporation © 2015 HERE © AND
2. New York State Department of Environmental Conservation. New York State Regulatory Freshwater Wetlands for Suffolk County (2013). Accessed from: http://cugir.mannlib.cornell.edu/bucketinfo.jsp?id=488

Based upon the forested habitat and dry upland conditions at the subject property and in the general surrounding area, northern redback salamander, gray treefrog and Fowler's toad are expected to be the most abundant herpetofuana at the site.

Rare/Protected Species and Communities

The 10 species that appear on the United States Fish and Wildlife Service (USFWS) Federally Endangered and Threatened and Candidate Species List for Suffolk County (copy included in Appendix D) include five sea turtles and two marine shorebirds.[32] The remaining three species, sandplain gerardia (*Agalinis acuta*), seabeach amaranth (*Amaranthus pumilus*) and small whorled pogonia (*Isotria medeoloides*), are plants of undisturbed native grass prairies, marine shorelines and moist, deciduous forests, respectively. As suitable habitat to support these ten species does not exist at the subject property, they would not be expected to occur at the site and were not observed during the field inspections.

In addition to the ten aforementioned federally-listed species, the northern long-eared bat (*Myotis septenrionalis*) was listed as Federally Threatened by the USFWS on April 2, 2015. The listing, which took effect on May 4, 2015, was issued under section 4(d) of the Endangered Species Act (ESA), due to significant population declines as a result of the white-nose syndrome fungal disease.[33] Specific provisions of the listing under the interim 4(d) rule are the subject of a public comment period set to end July 1, 2015. The interim 4(d) rule includes exemptions from incidental take for certain activities (e.g., forest management practices, maintenance or limited expansion of transportation or utility line rights-of-way, prairie habitat management and limited tree removal projects of one acre or less etc.). Subsequent to the public comment period, the USFWS will issue a final 4(d) rule.

No northern long-eared bat records specific to the subject property were reviewed during this existing conditions assessment. However, according to the most recent USFWS range map[34] (copy included in Appendix D), Suffolk County is located within the known range of northern long-eared bat, and hibernacula infected with white-nose syndrome have been identified within the County. Furthermore, northern long-eared bat was identified during 2011 acoustical surveys conducted at and in the vicinity of Brookhaven National Laboratory.[35]

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[32] United States Fish and Wildlife Service. 2014. Federally Endangered and Threatened and Candidate Species List for Suffolk County. Available online at: http://www.fws.gov/northeast/nyfo/es/CoListCurrent.pdf. Accessed November 17, 2014.

[33] Federal Register Vol. 80, No. 63. Thursday April 2, 2015.

[34] United States Fish and Wildlife Service. April 30, 2015. Northern Long-Eared Bat Interim 4(d) Rule WhiteNose Syndrome Buffer Zone around WNS/Pd Positive Counties/Districts. Available online at: http://www.fws.gov/midwest/endangered/mammals/nlba/. Accessed May 15, 2015.

[35] White. C., Green, T. 2011. A Preliminary Species Census of Chiroptera in Central Suffolk County, New York. United States Department of Energy.

According to the USFWS Northern Long-Eared Bat Fact Sheet[36] (copy included in Appendix D), the northern long-eared bat is a brown colored, medium-sized bat, ranging in size from 3.0-to-3.7 inches, with a wingspan of 9-to-10 inches. Winter hibernating habitat for this species occurs within caves or mines, while summer roosting habitat occurs either singly or in colonies, underneath the bark or in cavities or crevices of living or dead trees. At dusk, the bats emerge from roosts to feed on insects, which they catch in flight using echolocation or glean from vegetation and water surfaces. Foraging habitat includes forested understories, as well as the surfaces of aquatic habitats. Based upon these considerations, potential summer roosting habitat and foraging habitat for northern long-eared bat is supported within the wooded habitat of the subject property.

As indicated previously, an eastern box turtle carapace was noted at the subject property during the field inspections, indicating that this New York State Special Concern reptile species occurs on-site. New York State Special Concern species are defined in 6 NYCRR §182.2(u) as:

> *"…native species of fish and wildlife found by the department to be at risk of becoming threatened in New York based on the criteria for listing in section 182.4(a) of this Part and that are listed species of special concern in subdivision (c) of section 182.5 of this Part. Species of special concern do not qualify as either endangered or threatened, as defined in subdivisions (e) and (y) of this section, but have been determined by the department to require some measure of protection to ensure that the species does not become threatened. Species of special concern are listed in subdivision (c) of section 182.5 of this Part and are protected wildlife pursuant to Environmental Conservation Law section 11-0103(5)(c)."*

The eastern box turtle is a small-to-medium sized, mostly terrestrial turtle with a highly-domed carapace featuring varying patterns of yellow, orange or olive markings over a dark brown or black background.[37] Habitat for eastern box turtle includes open woodlands, meadows, old fields and power line cuts, where it forages for a variety of food sources, including slugs, earthworms, wild strawberries and mushrooms.[20] As such, the entire subject property, as well as the adjoining woodlands to the east and south, represent eastern box turtle habitat.

No other New York State or federally-listed endangered, threatened, special concern or rare plants or wildlife, or significant natural communities, were observed at the subject property at the time of the field inspections.

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[36] United States Fish and Wildlife Service. 2014. Northern Long-Eared Bat (*Myotis septenrionalis*) Fact Sheet. Available online at: http://www.fws.gov/midwest/endangered/mammals/nlba/nlbaFactSheet.html. Accessed November 17, 2014.

[37] Gibbs, J.P., et. al. 2007. The Amphibians and Reptiles of New York State. Oxford University Press.

As part of this existing conditions assessment, consultations were undertaken with the NYNHP to determine whether records exist for known occurrences of rare or New York State-listed animals, plants or significant natural communities on or in the immediate vicinity of the subject property. In correspondence dated November 14, 2014, the NYNHP indicated that an historical record exists for the New York State endangered plant species silvery aster (*Symphyotrichum concolor var. concolor)* (a copy of the NYNHP correspondence included in Appendix D).

Pursuant to 6 NYCRR §193.3, New York State endangered plants are defined as:

> "*…species in danger of extirpation throughout all or a significant portion of their ranges within the state and requiring remedial action to prevent such extinction*."

New York State Endangered plants receive the following protection under New York State Environmental Conservation Law (ECL) Section 9-1503:

> "*It is a violation for any person, anywhere in the state to pick, pluck, sever, remove, damage by the application of herbicides or defoliants, or carry away, without the consent of the owner, any protected plant. Each protected plant so picked, plucked, severed, removed, damaged or carried away shall constitute a separate violation*."

As indicated above, it is not a violation of New York State law for a property owner or those authorized by the property owner to remove or otherwise disturb New York State-protected plants growing at their property.

The NYNHP correspondence indicates that the historical record for silvery aster indicates that this species was observed growing within dry sandy woods in the hamlet of Mastic in 1934. According to NYNHP, historical records are those records dated from 1979 or earlier. The NYNHP Silvery Aster Conservation Guide[38] (copy included in Appendix D) indicates that the only known extant population for this perennial herbaceous plant in New York State occurs along a trail "*through a sandy grassland that is succeeding to pine woods*." Silvery aster was not observed during the field inspections of the subject property, two of which occurred during the flowering and fruiting season (October), when the plant is most easily recognized. Based upon the foregoing information and site observations, it is not expected that silvery aster currently occurs at the subject property.

New York State Exploitably Vulnerable Plants

Pursuant to 6 NYCRR 193.3(d) exploitably vulnerable plant species are defined as:

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[38] New York Natural Heritage Program. Silvery Aster Conservation Guide. 2014. Available online at: http://www.acris.nynhp.org/report.php?id=8841. Accessed November 17, 2014.

"…vulnerable native plants likely to become threatened in the near future throughout all or a significant portion of their range within the state if causal factors continue unchecked."

The exploitably vulnerable category contains plants that are likely to be picked for commercial and personal purposes and affords the property owner extra protection ability. Similar to New York State Endangered plant category described above, it is a violation of New York State law for those other than the property owner or those authorized by the property owner to remove or otherwise disturb exploitably vulnerable plants growing at their property.

Five New York State exploitably vulnerable shrubs and herbaceous plants were observed at the subject property during the field inspections: American holly, inkberry, northern bayberry, sheep laurel and striped wintergreen. All five species were noted at multiple locations at the subject property and are relatively common in the broader area surrounding the site and central Suffolk County in general.

New York State Special Concern Species

Three New York State Special Concern avian species known to occur in New York State have been identified by Town of Brookhaven as potentially occurring at the subject property: Cooper's hawk (*Accipter cooperii*), sharp-shinned hawk (*Accipter striatus*) and whip-poor-will (*Caprimulgus vociferous*). Species accounts, breeding records and habitat assessments for these three birds are included below:

Cooper's Hawk

According to the *Second Atlas of Breeding Birds in New York State*,[39] Cooper's hawk (*Accipiter cooperii)* is a secretive woodland raptor that specializes in avian prey, which it takes through ambushes or rapid, low-level attacks. The short, rounded wings and long tail of this this hawk enable it to maneuver at full speed through most forest cover. The species is known to tolerate human activity well and has shown a propensity to utilize backyard feeders in suburban areas as hunting grounds, particularly during winter. Although not identified within Block 6752D during the 2000-2005 NYSBBA survey, Cooper's hawk is listed as either a confirmed, probable or possible breeder in the surrounding survey blocks. Breeding habitat for Cooper's hawk includes deciduous, mixed, and evergreen forests and woodlots, including mixed forests with extensive canopy cover in the more mature trees.[40]

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[39] McGowan, K.J. and K. Corwin, eds. 2008. *The Second Atlas of Breeding Birds in New York State*. Cornell University Press.

[40] Curtis, Odette E., R. N. Rosenfield and J. Bielefeldt. 2006. Cooper's Hawk (Accipiter cooperii), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Available online at: http://bna.birds.cornell.edu/bna/species/075. Accessed November 17, 2014.

Although not noted on-site during the field inspections, based upon the above information, the wooded habitat of the subject property represents potential breeding and foraging habitat for Cooper's hawk.

Sharp-Shinned Hawk

Sharp-shinned hawk is a small raptor with short wings and a rudder-like tail that uses its high maneuverability to ambush its prey, which consists almost exclusively of songbirds.[5] In New York, this species nests in mixed, coniferous and deciduous forests, with nests occurring most frequently in wooded areas with dense canopy cover and a high number of small-diameter trees. The species was not recorded within Block 6752D during the 1980-1985 NYSBBA survey, and was only recorded within eight scattered atlas survey blocks on Long Island during that time period. Sharp-shinned hawk was not recorded on Long Island during the 2000-2005 NYSBBA survey.

Based upon the foregoing information, the mixed woodland habitat of the subject property represents potential breeding and foraging habitat for sharp-shinned hawk. However, given the absence of this species from Long Island during the most recent NYSBBA survey, it is considered unlikely that sharp-shinned hawk currently utilizes the subject property as breeding habitat.

Whip-Poor-Will

According to the NYSDEC Whip-Poor-Will Fact Sheet,[41] (copy included in Appendix D), the whip-poor-will is a medium-sized (8-to-10 inches in length) bird with a very short bill and long, rounded tail and wings. Cryptic coloration consisting of gray, black or brown upper parts and pale under parts with gray and black spotting contributes to the ability of this ground nesting bird to blend in with its surroundings. As a crepuscular bird, whip-poor-will is most active at dawn and dusk, when it feeds on night-flying insects. During the day, whip-poor-will roosts on the lower limbs of trees. The species breeds in dry, deciduous or mixed forests with sparse underbrush near open areas for foraging. Breeding is synchronized with the lunar cycle so that eggs hatch before a full moon, in order to provide maximum foraging time for parents feeding the newly-hatched young. On Long Island, whip-poor-will seems to prefer pitch pine/scrub habitats for breeding. The species was listed as a probable breeder within Block 6752D during the 2000-2005 NYSBBA survey and was recorded in multiple survey blocks within the general surrounding area of the subject property during the 1980-1985 and 2000-2005 NYSBBA surveys.

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[41] New York State Department of Environmental Conservation. Whip-Poor-Will Fact sheet. 2014. Available online at: http://www.acris.nynhp.org/report.php?id=7860. Accessed November 17, 2014.

Based upon the forgoing information and survey results, the wooded habitat of the subject property represents potential breeding habitat for whip-poor-will and the species is known to occur within the general surrounding area of the site.

Wetlands

Based upon a review of the NYSDEC Environmental Resource Mapper (ERM) website[42] and the NYSDEC Freshwater Wetland Map of Suffolk County, Moriches, New York Quadrangle (Map No. 29 of 39),[43] there are no New York State-regulated freshwater wetlands located at or adjacent to the subject property (see Figure 8 on Page 42 of this DEIS). The nearest New York State-regulated freshwater wetland is NYSDEC Freshwater Wetland M-7 (Forge River headwaters), located approximately 1,121 feet to the southeast of the subject property.

According to the USFWS National Wetlands Inventory (NWI) Mapper website,[44] there are no surface water features (including potential federally-regulated wetlands) located at or adjacent to the subject property (see Figure 9 on Page 43 of this DEIS). The nearest NWI wetland is the aforementioned Forge River headwaters, located approximately 1,121± feet to the southeast of the subject property (see Figure 12 on Page 74 of this DEIS).

No wetland communities were observed at the subject property during the field inspections.

Interconnection

The proposed solar farm will be interconnected to the power grid to distribute electricity generated by the PV arrays, and NYISO/PSEG Long Island will be responsible for locating, designing and installing the power line(s) for the distribution of power generated by the proposed facility. This DEIS evaluates a theoretical interconnection route that extends from the northern property boundary eastward to an existing substation at the southern terminus of Weeks Avenue. Existing ecological conditions along the potential interconnection route identified on the *Conceptual Interconnection Route* plan (see Appendix C) were assessed through a review of USFWS, NYSDEC and NYNHP maps and records. In addition, field inspections of the route were performed by VHB on October 20, 2014, November 2, 2014 and May 5, 2015.

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[42] New York State Department of Environmental Conservation. Environmental Resource Mapper. Available online at: http://www.dec.ny.gov/imsmaps/ERM/viewer.htm Accessed November 17, 2014.

[43] New York State Department of Environmental Conservation. 1975. New York State Freshwater Wetland Map No. 20 of 39, Suffolk County.

[44] United States Fish and Wildlife Service National Wetlands Inventory. Available online at: http://www.fws.gov/wetlands/Data/mapper.html. Accessed November 17, 2014.

Habitats/Vegetation

This conceptual interconnection route would occur within the shoulder area of Moriches-Middle Island Road. This grass-dominated habitat is best described according to the ECNYS Mowed Roadside/Pathway community description.

Mowed Roadside/Pathway

> *"A narrow strip of mowed vegetation along the side of a road, or a mowed pathway through taller vegetation (e.g., meadows, old fields, woodlands, forests), or along utility right-of-way corridors (e.g., power lines, telephone lines, gas pipelines). The vegetation in these mowed strips and paths may be dominated by grasses, sedges and rushes; or it may be dominated by forbs, vines and low shrubs that can tolerate infrequent mowing"*

According to the NYNHP, the Mowed Roadside/Pathway community is distributed throughout New York State and has been assigned rarity rankings of G5, S5. As indicated previously, G5 indicates a community that is considered "demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery," while the S5 ranking refers to a community that is considered to be "demonstrably secure in New York State."

The Mowed Roadside/Pathway community to the north of the subject property includes existing overhead utility lines supported on wooden utility poles. Similar to the ECNYS description, this community appears to be periodically mowed and is dominated by grasses and forbs (non-grassy herbaceous plants), including crabgrasses, fescues, dandelions, plantains and clovers. Some common shrubs and vines occur along the community edge with the neighboring Pitch Pine-Oak Forest community at the subject property.

To the east of the subject property, the interconnection route would be expected to occupy an existing overhead power line route along the east side of Weeks Avenue. The existing route occurs within ECNYS Mowed Roadside/Pathway and Mowed Lawn communities located at the neighboring residential and undeveloped properties. The ECNYS Mowed Lawn community is described below.

Mowed Lawn

> *"Residential, recreational, or commercial land, or unpaved airport runways in which the groundcover is dominated by clipped grasses and there is less than 30% cover of trees. Ornamental and/or native shrubs may be present, usually with less than 50% cover. The groundcover is maintained by mowing…"*

According to the NYNHP, the Mowed Lawn community is distributed throughout New York State and is ranked as G5, S5.

Wildlife

Based upon the existing ecological communities (Mowed Roadside/Pathway and Mowed Lawn), as well as the adjacent roadways and suburban development, the limited wildlife habitat along the route is best suited to wildlife species that are tolerant of human activity and adapted to developed and otherwise disturbed habitats.

Common suburban birds (e.g., mourning dove, song sparrow, northern cardinal) and birds adapted to lawns and woodland edge habitats (e.g., American robin, field sparrow, and gray catbird) are the most commonly observed and expected wildlife species along the route. Common rodent species (e.g., mice, moles and shrews) are expected to be the most abundant mammals within the route, although larger mammals such as eastern gray squirrel, eastern cottontail and whitetail deer would be more commonly observed. Given that the route is comprised primarily of mowed/maintained grasses, this existing power line route does not represent a significant habitat for herpetofauna.

Rare/Protected Species and Communities

No New York State or federally-listed endangered, threatened, special concern or rare plants or wildlife, or significant natural communities, were observed within or adjacent to the interconnection route at the time of the field inspections.

Furthermore, as indicated above, this route does not include any significant wooded habitat, and is comprised primarily of mowed/maintained lawn areas located adjacent to roadways and suburban development. As such, this route does not represent significant habitat for the federal- and New York State-listed species discussed with respect to the subject property and proposed action (e.g., northern long-eared bat, eastern box turtle, Cooper's hawk, whip-poor-will, etc.).

Wetlands

Based upon a review of the NWI and NYSDEC maps, there are no wetlands or surface water features located at or adjacent to the interconnection route.

3.3.2 Potential Impacts

An impact assessment of the proposed project with respect to the existing ecological resources at the subject property follows.

Habitats/Vegetation

As described in detail in Section 3.3.1, the entire subject property supports the ECNYS Pitch Pine-Oak Forest ecological community. This community occurs commonly within the central Long Island region and the immediate surrounding area of the site, and the community is considered apparently secure in New York State by the NYNHP. Based upon site observations and similar to the ECNYS community description, a wide variation exists across the subject property in the relative proportions of the tree and shrub species that define the Pitch Pine-Oak Forest community (i.e., pitch pine, oaks and heath shrubs). However, the overall plant species assemblage is relatively homogeneous across the subject property. Similar to the ECNYS community description, overall vegetative diversity within the Pitch Pine-Oak Forest community was observed to be low and the flora is dominated by common native tree, shrub and herbaceous plant species that typically comprise this community type. Some atypical native and non-native/invasive plant species are present along the community edges, unpaved trails and within disturbed openings, and evidence of historical fires is evident at several locations at the subject property.

Due to the implementation of the proposed action, 60.83± percent (61.03± acres) of the subject property would be cleared and graded prior to development, while the remaining 39.17± percent (39.30± acres) of the site would be preserved. As detailed on the Proposed Site Plan, clearing would occur primarily within interior portions of the subject property, with buffer areas comprised of existing uncleared vegetation to remain along the site perimeter (except in areas of the proposed access and emergency access). The vegetated buffers would range in size from a minimum of 50 feet to 211 feet in width.

Accordingly, the chief impact of the proposed action would be the clearing of 61.03± acres of Pitch Pine-Oak Forest. Removal of the forest overstory would represent a permanent impact, as the solar farm would be maintained free of trees to prevent shading of the solar panel arrays. However, substantial on-site areas of Pitch Pine-Oak Forest would remain as a result of the preservation of 39.30± acres of this community. Significantly, the acreage of Pitch Pine-Oak Forest to be preserved would occur in perimeter areas, allowing for connectivity with similar forested habitat on adjoining parcels. In particular, the vegetated buffers to be preserved along the eastern and southern subject property boundaries would form large contiguous habitat blocks with, and allow habitat connectivity to, extensive off-site areas of Pitch Pine-Oak Forest.

As noted on the *Planting Plan* (see Appendix C), following installation of the solar equipment at the subject property, the areas beneath the solar panel arrays would be planted with native heath shrubs, including Lowbush Blueberry, black huckleberry and dwarf huckleberry (*Gaylussacia dumosa*). The former two species currently occur extensively throughout all portions of the subject property and are integral

components of the existing ecology of the site. The latter plant is a related heath shrub that typically occurs within or near tree- or shrub-dominated wetland habitats on Long Island.[45] In addition, Pennsylvania sedge would be planted by seed underneath the solar arrays in all areas where the aforementioned shrubs are planted. As noted in the existing ecological conditions summary, this native, grass-like herbaceous plant currently occurs commonly at the subject property as an understory groundcover species. The areas located in between the rows of solar panel arrays would be planted with a seed mixture comprised of common fescues, rye grasses and yellow sweet clover (*Melilotus officinalis*). Finally, a native evergreen screen consisting of 350 eastern red cedar (*Juniperus virginiana*) and 350 American holly plantings would be installed along the western fence line of the solar farm. Both of the aforementioned native trees currently occur at the subject property. In total, 54.00 percent (54.18± acres) of the subject property (i.e., nearly 90 percent of all areas to be cleared) would be re-vegetated with the aforementioned native species.

In addition to the aforementioned plantings, "plant rescue" techniques will be utilized during clearing of the site to the maximum extent practicable to excavate and replant existing native plants of species that are appropriate for the proposed development area.

Following development, ongoing vegetation management activities would occur periodically within the solar farm. These activities would include pruning of overhead vegetation to maintain unshaded conditions above the solar arrays, pruning of shrubs beneath the solar arrays and mowing of the grasses to be planted between the solar array rows. The maintenance activities would also likely include the removal of colonizing trees and shrubs from adjacent habitats and replacement of non-surviving plantings. As a result, the native vegetation within the solar farm would be maintained in an early-to-mid successional state, providing some of the ecological functions and benefits of old field and shrubland habitats.

With respect to individual plant species, given the relatively homogenous vegetative on-site species assemblage detailed in the Existing Ecological Conditions section of this report, it is anticipated that the preservation of 39.30± acres of existing site habitat would result in the preservation of the vast majority of the existing flora. In addition, the *Planting Plan* is comprised of representative species from the existing flora, including the two species that dominate the shrub stratum across the subject property (Lowbush Blueberry and black huckleberry). As detailed above, the vegetative species assemblage across most of the subject property is comprised of native tree, shrub, vine and herbaceous plant species that are typical of the Pitch Pine-Oak Forest community and occur commonly within the central Long Island

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[45] New York Natural Heritage Program. Dwarf Huckleberry Conservation Guide. 2014. Available online at: http://www.acris.nynhp.org/guide.php?id=9012. Accessed December 9, 2014.

region. Additional common non-native/invasive plants are present along the community edges, unpaved trails and within disturbed openings. Furthermore, no New York State or federally-listed endangered, threatened or rare plant species were observed at the subject property at the time of the 2014-2015 field inspections. Based upon the foregoing, no significant adverse impacts to local or regional populations of the existing plant species at the subject property are anticipated as a result of the proposed action.

In summary, although the clearing of 60.83± percent of existing forested habitat would represent a significant impact to the ecology of the subject property, a substantial portion of on-site forested habitat would remain following development, due to the proposed preservation of the remaining 39.30± acres of on-site Pitch Pine-Oak Forest community. Significantly, this remaining forested area would be preserved as a contiguous habitat block, both with itself, and with adjacent forested communities. Furthermore, although the interior portion of the site would no longer support forested habitat, the post-development flora of the solar farm would be planted with native trees, shrubs and grasses representative of the tree, shrub and groundcover strata within the existing Pitch Pine-Oak Forest community at the subject property. To the maximum extent practicable, existing site vegetation would be harvested during clearing and replanted within the solar farm. The vegetation within the solar farm would be maintained (minimally, as needed) by pruning and/or mowing. As a result, the native vegetation within the solar farm would be maintained in an early-to-mid successional state, providing some of the ecological functions and benefits of old field and shrubland habitats. Based upon the foregoing, following implementation of the proposed action, 93.17± percent (93.48± acres) of the subject property would be vegetated with a combination of existing preserved vegetation and plantings of native species that are representative of the existing site flora. Therefore, as compared to existing conditions, an overall net loss of 6.83± percent (6.85± acres) of vegetated cover would occur as a result of the proposed action. Overall, following implementation of the proposed action, the subject property would continue to support the Pitch Pine-Oak Forest community in perimeter areas, while functioning ecologically as a location of native successional vegetation and partially-developed conditions within the site interior.

Wildlife

The primary impact of the proposed action on wildlife would be the clearing of 61.03±-acres of Pitch Pine-Oak Forest habitat. The immediate effect of clearing would be the direct elimination of individuals of some wildlife species, (i.e., less-mobile animals, underground dwelling mammals and reptiles, eggs and juveniles of certain species) and the displacement of other wildlife. Impacts due to direct elimination can be minimized by avoiding clearing and/or conducting wildlife sweeps prior to clearing activities (in order to identify and remove certain less mobile species from

the targeted areas) during the late spring and summer, when breeding/nesting occurs for most resident wildlife, most notably avian species.

The majority of wildlife present within or expected to utilize the subject property are considered to be generally more mobile (e.g., most birds and mammals), and, therefore, would avoid elimination and be displaced to adjacent and nearby areas of undisturbed habitat. In analyzing the overall potential impacts of the proposed project on local and regional wildlife populations due to displacement, it is important to note that considering resource availability as the only limiting factor controlling wildlife carrying capacity (density) on the subject property and in the general surrounding area is an oversimplification, as many other factors influence wildlife population densities (i.e. disease, parasites, predation, weather, human disturbances, etc.). Therefore, it is possible that wildlife species populations may already be below the theoretical carrying capacities of the site and surrounding properties due to one or more of these limiting factors. For example, human activity, development disturbance and the presence of non-native/invasive vegetation at and adjacent to the properties abutting the site to the west and north may be limiting factors for wildlife species at the subject property. Nevertheless, under the assumption that resource availability is the only limiting factor affecting population density, in the short-term, it is anticipated that the habitats on and surrounding the site would experience a temporary increase in wildlife populations during the clearing and construction phases of the proposed project, due to emigration of individuals from the portions of the subject property undergoing clearing and construction. Subsequently, it is anticipated that inter- and intra-specific competition for available resources within these surrounding habitats would result in an insignificant net decrease in local population size for most species, until equilibrium between wildlife populations and available resources is achieved.

Based upon the foregoing, it is anticipated that wildlife displaced from the cleared areas of Pitch Pine-Oak Forest within the subject property interior would be displaced to the 39.30± acres of on-site Pitch Pine-Oak Forest to be preserved in perimeter areas of the site, as well as to the extensive contiguous areas of this habitat located to the south and east. Additional emigration of more mobile species (e.g., birds and some mammals) would likely occur to the 662± acres of pine- and oak-dominated habitat located across Moriches-Middle Island Road to the north of the subject property.

Overall, the individual population densities of some resident wildlife species are expected to decrease correspondingly with the proposed decrease in forested habitat, while increases in population densities are anticipated for other resident wildlife species due to the creation of vegetated, but non-wooded habitat within the site interior. A discussion of the proposed action on the three faunal groups described in this DEIS is provided below.

Birds

With respect to avian species, as detailed in the Existing Ecological Conditions Section of this DEIS, the subject property is best-suited to birds adapted to coniferous and mixed-deciduous forest, as well as forest interior birds that are generally less tolerant of human activity and disturbance. Following implementation of the proposed action, it is anticipated that the majority of these resident species would continue to utilize the preserved forested areas of the subject property, though at decreased densities due to the decrease in available on-site habitat. These species would also persist within the forest interior habitats to the north, south and east of the site.

Given the residential development to the west of the subject property and in the surrounding area in general, the subject property is also utilized by a number of common songbirds typically associated with suburban settings, particularly along the western and northern site boundaries. Many of these species are habitat generalists that are known to occur within both undeveloped and developed settings. These birds are expected to continue utilizing the site during and after clearing and development, possibly at increased densities due to the creation of vegetated, partially-developed conditions within the site interior.

The creation of vegetated, early-to-mid successional conditions with no forest canopy within the site interior and the associated edge habitats with the surrounding forest would likely attract birds that favor these conditions for breeding and/or foraging, including diverse species such as field sparrow (*Spizella pusilla*), red-tailed hawk, Carolina wren and eastern bluebird (*Sialia sialis*). With respect to the latter species, post-development opportunities to attract and create breeding habitat for eastern bluebird and other selected species could occur by the placement of breeding boxes around the perimeter of the solar farm.

As identified by the Town of Brookhaven, the subject property also provides potential habitat for three New York State Special Concern avian species: Cooper's hawk, sharp-shinned hawk and whip-poor-will. Species accounts, breeding records and habitat assessments for these three birds were provided in the Existing Ecological Conditions section of this DEIS and an impact assessment of the proposed action on each species is provided below (see subsection entitled, *Rare/Protected Species and Communities*).

Mammals

All of the observed and expected mammal species at the subject property identified in the Existing Ecological Conditions Section of this DEIS are expected to persist at the subject property following implementation of the proposed action. The proposed site security fencing plan includes a double row fencing to be installed around the

perimeter of the cleared site interior/solar farm, with intermittent, small openings along the bases of the fence to allow animals to pass. This design would facilitate the movement of smaller mammals within and through the site. It is anticipated that the double row of fencing (including an eight-foot-high outer fence with two-foot tip out) would act as an impediment to deer movement to and from the subject property, though not completely excluding this species from the subject property. Self-closing gates will be installed at the eastern and western property boundaries (in addition to proposed primary and emergency entrances) to facilitate the herding of any deer which become entrapped within the facility. As a consequence of the proposed improvements, displaced whitetail deer would temporarily place increased stress on surrounding forest habitats (i.e., through over browsing) and would experience increased stress due to resource limitations until population/habitat equilibrium is reached. It is noteworthy that, due to the placement of security fencing around the solar farm area rather than surrounding the entire site, the subject property would continue to function as an important habitat corridor facilitating movement of mammals and other wildlife between surrounding forested habitats to the north, south and east.

It is anticipated that the clearing of portions of the forested habitat would also result in a decrease in the density of mammals species adapted these conditions (e.g., eastern chipmunk, pine mouse). As compared to existing conditions, the creation of vegetated early-to-mid successional conditions within the solar farm and the surrounding edge habitats would likely result in an increase in mammal species that favor these conditions, including eastern cottontail, woodchuck and red fox.

As identified in the Existing Ecological Conditions Section of this DEIS, the subject property supports habitat for bats, including potential roosting and foraging habitat for the northern long-eared bat, which is a federally Threatened species. An impact assessment of the proposed action on this species is provided below (see subsection entitled, *Rare/Protected Species and Communities*).

Herpetofauna

As detailed in the *Existing Ecological Conditions* section of this DEIS, the vegetation and sandy, xeric soils at the subject property are most conducive to those terrestrial herpetofauna species adapted to upland wooded conditions, including gray treefrog, northern redback salamander and Fowler's toad. If present, the clearing of the site interior would decrease the available habitat for these species, resulting in decreased population densities. However, due to the preservation of 39.30± acres of on-site Pitch Pine-Oak Forest community, abundant on-site habitat area would remain these three species.

Additionally, the subject property also currently provides potential habitat for five species of colubrid snakes that are known as habitat generalists, but most often occur

in successional grass and shrub-dominated habitats and edge communities. These five snakes and their preferred habitats are: northern black racer (shrubby grasslands, old fields), northern ringneck snake (forest edges, clearings, canopy gaps), eastern milk snake (old fields, brushy forest edges, rights-of-way), eastern garter snake (edges, clearings, suburban/developed settings) and smooth green snake (grassy edges, shrubs, meadows, old fields).[46] Accordingly, the proposed establishment of grass- and shrub-dominated community and edge habitats within 54.18± acres of the subject property interior would create additional habitat for the aforementioned snakes.

Additionally, the subject property provides habitat for the New York State Special Concern species eastern box turtle, and evidence of this species was noted at the subject property during the field inspections. A species account and habitat assessment eastern box turtle was provided in the Existing Ecological Conditions section of this DEIS and an impact assessment of the proposed action on this species is provided below in the subsection entitled, *Rare/Protected Species and Communities*.

Similar to the mammal species discussed previously, it is anticipated that the proposed security fence design (with intermittent cut-outs at ground level) and location (within the wooded buffers to be retained) would facilitate the movement of herpetofauna throughout the subject property, and continue to provide connectivity between the site and adjacent habitats to the south and east.

In summary, following implementation of the proposed action, the overall area of forested wildlife habitat at the subject property would be reduced by 60.83± percent (61.03± acres). However, through the preservation of 39.17± percent (39.30± acres) of on-site the Pitch Pine-Oak Forest community, it is anticipated that the subject property would continue to provide habitat for most resident wildlife species, though reduced densities for species adapted to forested habitats exclusively. The creation of grass- and shrub-dominated successional communities, edge habitats and partially-developed conditions within the site interior would favor local avian, mammal and herpetofuana adapted to these conditions, including many habitat generalist species that are equally at home within forested, successional and developed settings.

As a result of the proposed security fence design and location, the post-development subject property would continue to function as a wildlife habitat corridor by providing for connectivity with adjacent wildlife habitats and facilitating movement of wildlife, both within the site and to adjacent properties.

[46] Gibbs, J.P., et. al. 2007. The Amphibians and Reptiles of New York State. Oxford University Press.

Rare/Protected Species and Communities

As detailed in the Existing Ecological Conditions section of this DEIS, the subject property provides habitat for the New York State Special Concern species eastern box turtle, and evidence of this species was noted at the subject property during the field inspections. Due to their territorial behavior and low mobility, individuals of this species may suffer direct elimination during clearing and grading of the solar farm area. However, these impacts could be minimized by avoiding these activities during the breeding season (April through August) and/or conducting wildlife sweeps prior to clearing activities, in order to identify and remove individual of this species from the targeted areas. With respect to potential impacts due to habitat loss, as noted previously, habitat for eastern box turtle includes open woodlands, meadows, old fields and power line cuts. Accordingly, although implementation of the proposed action would significantly reduce on-site forested habitat, the post-development subject property would continue to support extensive forested (39.30± acres or 39.17± percent of total site coverage) and meadow/old field (54.18± acres or 54.00± percent of total site coverage) habitats suitable for use by this species. This proposed habitat could be enhanced by the establishment of an eastern box turtle nesting site(s) along the perimeter of the solar farm, pursuant to the eastern box turtle nesting site guidelines established by Massachusetts Natural Heritage Program[47] (copy included in Appendix D).

As detailed above, no other New York State or federally-listed endangered, threatened, special concern or rare plants or wildlife, or significant natural communities, were observed at the subject property at the time of the 2014-2015 field inspections. Furthermore, as suitable habitat to support the ten species that appear on the USFWS Federally Endangered and Threatened and Candidate Species List for Suffolk County does not exist at the subject property, these species would not be expected to occur at the site.

In addition to the ten aforementioned federally-listed species, the northern long-eared bat was recently listed as federally Threatened under section 4(d) of the ESA. As summarized in the Existing Ecological Conditions Section of this DEIS, although no northern long-eared bat records specific to the subject property were reviewed during the existing conditions assessment, according to the most recent USFWS range map (copy included in Appendix D), Suffolk County is located within the known range of northern long-eared bat, and hibernacula infected with white-nose syndrome have been identified within the County. Furthermore, northern long-eared bat was identified during 2011 acoustical surveys conducted at and in the vicinity of Brookhaven National Laboratory. Based upon the 2014-2015 field

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[47] Massachusetts Natural Heritage Program. Advisory Guidelines for Creating Turtle Nesting Habitat (Draft). 2009. Available online at: http://www.mass.gov/eea/agencies/dfg/dfw/natural-heritage/species-information-and-conservation/rare-reptiles-and-amphibians/the-eastern-box-turtle-conservation-plan.html. Accessed December 10, 2014.

inspections, potential roosting habitat and foraging habitat for this species is supported within the Pitch Pine-Oak Forest community that occurs across the entire subject property. Pursuant to the aforementioned USFWS listing any potential direct impact to northern long-eared bat would be avoided by restricting clearing during the pup-rearing season (June 1-July 31).

With respect to clearing of potential northern long-eared bat habitat at the subject property, the clearing of 60.83± percent (61.03± acres) of forested habitat at the subject property would not qualify for interim 4(d) rule exemptions from incidental take (e.g., forest management practices, maintenance or limited expansion of transportation or utility line rights-of-way, prairie habitat management and limited tree removal projects of one acre or less etc.).

Impacts due to the loss of roosting habitat could be partially mitigated by the placement of bat roosting boxes at various on-site locations. Further, the preservation of 39.17± percent (39.30± acres) of Pitch Pine-Oak Forest would ensure that substantial on-site habitat for this species would remain following development. However, given that the remaining 60.83± percent (61.03± acres) of this habitat would be cleared as a result of the proposed action, potential habitat impacts to this species are possible. As such, consultations with the USFWS would be necessary to determine if known hibernacula occur in the vicinity of the subject property, and to discuss potential impacts to northern long-eared bat, including additional potential measures to avoid, minimize or mitigate for such impacts.

According to NYNHP, an historical record (i.e., from 1979 or earlier) exists for the New York State endangered plant species, silvery aster. As detailed in the Existing Ecological Conditions Section of this DEIS, pursuant to New York State ECL §9-1503, it is not a violation of New York State law for a property owner or those authorized by a property owner to remove or otherwise disturb New York State-protected plants growing on their property. The historical record for silvery aster indicates that this species was observed growing within dry sandy woods in the hamlet of Mastic in 1934. According to the NYNHP Silvery Aster Conservation Guide, the only known extant population for this perennial herbaceous plant in New York State occurs along a trail "*through a sandy grassland that is succeeding to pine woods*." Silvery aster was not observed during the three field inspections of the subject property, which occurred during the flowering and fruiting season (October), when the plant is most easily recognized. Based upon the foregoing information and site observations, it is not expected that silvery aster currently occurs at the subject property. Accordingly, no significant adverse impacts to silvery aster are anticipated as a result of the proposed action.

Five New York State exploitably vulnerable shrubs and herbaceous plants were observed at the subject property during the 2014-2015 field inspections. The exploitably vulnerable category contains plants that are likely to be picked for

commercial and personal purposes and affords the property owner extra protection ability. Similar to New York State Endangered plant category described above, it is a violation of New York State law for those other than the property owner or those authorized by the property owner to remove or otherwise disturb exploitably vulnerable plants growing at their property.

The five New York State exploitably vulnerable shrubs and herbaceous plants noted during the 2014-2015 field inspections are: American holly, inkberry, northern bayberry, sheep laurel and striped wintergreen. All five species were noted at multiple locations at the subject property and are relatively common in the general surrounding area of the site and central Suffolk County in general. Accordingly, no significant adverse impacts to overall populations of these five plant species are anticipated as a result of the proposed action.
As detailed in the Existing Ecological Conditions Section of this DEIS, three New York State Special Concern avian species known to occur in New York State have been identified by Town of Brookhaven as potentially occurring at the subject property: Cooper's hawk (*Accipter cooperii*); sharp-shinned hawk (*Accipter striatus*); and whip-poor-will (*Caprimulgus vociferous*). A summary of the potential impacts to these species as a result of the proposed action follows.

Cooper's Hawk

Breeding habitat for Cooper's hawk includes deciduous, mixed, and evergreen forests and woodlots, including mixed forests with extensive canopy cover in the more mature trees. Cooper's hawk was not identified in the survey block within which the subject property is located during the 2000-2005 NYSBBA survey. However, this raptor is listed as either a confirmed, probable or possible breeder in the surrounding survey blocks. Although not observed on-site during the 2014-2015 field inspections, based upon the above information, the wooded habitat of the subject property represents potential breeding and foraging habitat for Cooper's hawk. As destruction of Cooper's hawk nests could occur if clearing is conducted during the breeding season, this direct impact can be minimized by restricting clearing during this time period. Although clearing of forested habitat associated with the proposed action would result in potential habitat reduction for Cooper's hawk, preservation of 39.30± acres of Pitch Pine-Oak Forest would ensure that substantial on-site habitat for this species would remain following development.

Sharp-Shinned Hawk

In New York, sharp-shinned hawk species nests in mixed, coniferous and deciduous forests, with nests occurring most frequently in wooded areas with dense canopy cover and a high number of small-diameter trees. The species was not recorded within Block 6752D during the 1980-1985 NYSBBA survey, and was only recorded within eight scattered atlas survey blocks on Long Island during that time period. Sharp-shinned hawk was not recorded on Long Island during the 2000-2005

NYSBBA survey. Based upon the foregoing information, the mixed woodland habitat of the subject property represents potential breeding and foraging habitat for sharp-shinned hawk. However, given the absence of this species from Long Island during the most recent NYSBBA survey, it is considered unlikely that sharp-shinned hawk currently utilizes the subject property as breeding habitat. As such, no significant adverse impacts to this species are anticipated as a result of the proposed action.

Notwithstanding the above, as described above in the discussion regarding Coopers' hawk, avoidance of clearing during the breeding season would minimize any potential direct impacts to this species, and potential on-site habitat would remain following development, due to the preservation of 39.30± acres of Pitch Pine-Oak Forest.

Whip-Poor-Will

As detailed previously, whip-poor-will breeds in dry, deciduous or mixed forests with sparse underbrush near open areas for foraging. On Long Island, whip-poor-will seems to prefer pitch pine/scrub habitats for breeding. The species was listed as a probable breeder in the survey block within which the subject property is located during the 2000-2005 NYSBBA survey and was recorded in multiple survey blocks within the general surrounding area of the subject property during the 1980-1985 and 2000-2005 NYSBBA surveys. Based upon the forgoing information and survey results, the wooded habitat of the subject property represents potential breeding habitat for whip-poor-will, and the species is known to occur within the general surrounding area of the site. Similar to the two previous avian species, avoidance of clearing during the breeding season would minimize any potential direct impacts to whip-poor-will, and potential on-site habitat would remain following development due to the preservation of 39.30± acres of Pitch Pine-Oak Forest. Furthermore, as whip-poor-will is known to forage within open areas near their breeding habitat, the proposed creation of 54.18± acres of successional habitat within the subject property interior may provide a net benefit to this species by increasing the on-site area of available foraging habitat.

Wetlands

As detailed in the Existing Ecological Conditions section of this DEIS, no wetland habitats were observed at or adjacent to the subject property at the time of the 2014-2015 field inspections. In addition, there are no New York State- or federally-regulated wetlands mapped at or adjacent to the subject property. As such, no impacts to wetlands are anticipated as a result of the proposed action.

Interconnection

As indicated throughout this DEIS, the details of location and design of the interconnection to the grid will be determined in the future, as NYISO/PSEG Long Island will be responsible for locating, designing and installing the power line(s) for the distribution of power generated by the proposed facility. Notwithstanding this, an impact assessment of a conceptual interconnection route (see the *Conceptual Interconnection Route* plan in Appendix C) with respect to ecological resources follows.

Habitats/Vegetation

The interconnection route would occur primarily within an existing overhead power line route located adjacent to roadways and residential properties. The route is characterized by mowed/maintained turf grass habitats that are considered to be demonstrably secure in New York State by the NYSDEC. No significant loss or disturbance to these existing communities would occur due to the interconnection improvements, although some limited vegetative clearing and/or trimming may be required. As such, no significant adverse impacts to habitats and vegetation would be anticipated.

Wildlife

Based upon the existing ecological communities (Mowed Roadside/Pathway and Mowed Lawn), as well as the adjacent roadways and suburban development, the limited wildlife habitat along this route is best suited to wildlife species that are tolerant of human activity and adapted to developed and otherwise disturbed habitats, including common suburban birds and mammals. As no substantial disturbance to or loss to existing habitats would be expected to result from implementation of the interconnection, no significant adverse impacts to resident wildlife would be anticipated.

Rare/Protected Species and Communities

No New York State or federally-listed endangered, threatened, special concern or rare plants or wildlife, or significant natural communities, were observed within or adjacent to the interconnection route at the time of the field inspections. Moreover, the route does not include any significant wooded habitat, and is comprised primarily of mowed/maintained lawn areas located adjacent to roadways and suburban development. As such, the route does not represent significant habitat for the federal- and New York State-listed species discussed with respect to the subject property and proposed action, and no significant adverse impacts to same would be anticipated.

Wetlands

Based upon a review of the NWI and NYSDEC maps, there are no wetlands or surface water features located at or adjacent to the interconnection route. Accordingly, no significant adverse impacts to wetlands would be anticipated.

3.3.3 Proposed Mitigation

The following ecological mitigation measures are proposed:

- Minimization of potential adverse impacts for project-related clearing would occur through implementation of an extensive planting plan proposed for the solar farm area. The areas beneath the solar panel arrays would be planted with approximately 45,000 native heath shrubs, including Lowbush Blueberry, black huckleberry and dwarf huckleberry. The former two species currently occur extensively throughout all portions of the subject property and are integral components of the existing ecology of the site. The latter plant is a related heath shrub that typically occurs within or near tree- or shrub-dominated wetland habitats on Long Island. In addition, Pennsylvania sedge would be planted by seed underneath the solar arrays in all areas where the aforementioned shrubs are planted. As noted in the existing ecological conditions summary, this native, grass-like herbaceous plant currently occurs commonly at the subject property as an understory groundcover species. The areas located in between the rows of solar panel arrays would be planted with a seed mixture comprised of common fescues, rye grasses and yellow sweet clover. Common Milkweed (*Asclepias syriaca L.*) would be planted along all roadside edges on-site to provide habitat, including for migrating monarch butterflies which utilize Long Island during migration. Finally, a native evergreen screen consisting of approximately 350 eastern red cedar and 350 American holly plantings would be installed along the western fence line of the solar farm. Both of the aforementioned native trees currently occur at the subject property. In total, 54.00± percent (54.18± acres) of the subject property would be re-vegetated with the aforementioned native species.

- In addition to the aforementioned plantings, "plant rescue" techniques would be utilized during clearing of the site to the maximum extent practicable to excavate and replant existing native plants of species that are appropriate for the proposed solar farm area.

- Minimization of potential adverse impacts to wildlife movement due to development would occur through the placement of security fencing around the solar farm area, rather than surrounding the entire site. As such, the subject property would continue to function as an important habitat corridor facilitating

the movement of wildlife between surrounding forested habitats to the north, south and east.

- Potential adverse impacts to on-site movement of herpetofuana and small mammals would be partially mitigated by the proposed site security fencing design, which would include intermittent openings along the fence bases. This proposed design would facilitate the movement of wildlife between the solar farm and the surrounding forested habitat.

- Potential adverse impacts to migratory songbirds would be partially mitigated by the placement of breeding boxes for bluebird and other avian species around the perimeter of the solar farm.

- Pursuant to USFWS guidelines potential direct elimination of northern long-eared bat would be avoided by restricting clearing during the pup-rearing season for this species (June 1-July 31). Potential adverse impacts due to the clearing of roosting habitat could be minimized by the placement of bat roosting boxes at various on-site locations.

- Potential adverse impacts to eastern box turtle would be partially mitigated by the establishment of an eastern box turtle nesting site(s) along the perimeter of the solar farm, pursuant to the eastern box turtle nesting habitat guidelines established by Massachusetts Natural Heritage Program or similar guidance. Furthermore, the proposed security fencing design would facilitate the movement of eastern box turtle between the solar farm and the surrounding forested habitat.

- Avoidance and minimization of direct elimination of wildlife would be accomplished by avoiding clearing and/or conducting wildlife sweeps prior to clearing during the late spring and summer seasons, when breeding/nesting occurs for most resident wildlife species.

3.4 Air Resources

3.4.1 Existing Conditions

This section of the DEIS presents existing air quality conditions and background information and assesses compliance of the proposed action with state and federal air quality requirements, and the 1990 Clean Air Act Amendments (CAAA), following the relevant respective policies and procedures of the NYSDEC, the NYSDOT, and the USEPA.

Background

The 1990 CAAA resulted in states being divided into attainment and non-attainment areas, with classifications based upon the severity of their air quality problems. Areas of the country where air pollution levels persistently exceed the National Ambient Air Quality Standards (NAAQS) may be designated as "non-attainment areas." Carbon monoxide (CO), particulate matter ($PM_{2.5}$ and PM_{10}), ozone, lead (Pb), and greenhouse gases (GHG) are the project-level pollutants of concern. The subject property is currently located in an attainment area for CO.

Suffolk County is a “Previous Nonattainment Area” which is no longer subject to the one-hour ozone standard as of June 15, 2005.[48] As far as the eight-hour ozone standard, Suffolk County is designated as a non-attainment area for eight-hour ozone. Suffolk County is also in non-attainment for $PM_{2.5}$ (for the 2007 standard) as of June 7, 2010. Suffolk County is in “attainment” for all of the remaining criteria pollutants (i.e., PM_{10}, lead, nitrogen oxide, and sulfur dioxide) for ambient (outdoor) air.

Air Quality Standards

The USEPA, through the 1970 Clean Air Act, has established NAAQS for a number of pollutants. Currently, USEPA and NYSDEC enforce ambient air quality standards for the following eight pollutants: nitrogen dioxide (NO_2); CO; sulfur dioxide (SO_2); PM_{10}; $PM_{2.5}$; ozone (O_3), which is controlled through limiting of nitrogen oxides (NOx) and volatile organic carbon (VOC) emissions; and lead (Pb). The 1977 and 1990 CAAA reinforced attainment and maintenance of these standards. There are no major stationary sources emitting significant quantities of pollutants as part of the

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[48] The Green Book Nonattainment Areas for Criteria Pollutantshttp://www.epa.gov/oar/oaqps/greenbk/index.html

proposed action, thus only vehicular emissions of CO, NOx, VOC, Pb, and $PM_{2.5}$ were of concern for this study.

Carbon monoxide emissions from vehicles are associated with incomplete fuel combustion. Impacts from vehicles generally are localized and can cause elevated concentrations within a relatively short distance from heavily traveled traffic light signals and intersections. Consequently, it is appropriate to focus on CO emissions from motor vehicles on a localized or microscale basis.

Nitrogen oxides combine with hydrocarbons to produce ozone and other compounds in the atmosphere that can cause potential health effects including eye and lung irritation. Nitrogen oxides, generally nitric oxide (NO), are formed from high temperature fuel combustion and within a few hours of release are converted to NO2 in the atmosphere. Further complex reactions occur with VOC in the atmosphere to produce ozone. Since these reactions occur several hours after the initial NOx release, the pollutant effects occur some distance downwind from the release. Thus, NO2 impacts are normally studied within the context of a large-scale analysis or mesoscale basis.

Emissions of VOC occur from many processes including stationary fuel combustion sources and process sources (e.g., dry cleaning, painting, and coating), as well as mobile sources. VOC emissions contribute to the formation of smog and when reacted with other chemicals (such as NOx) in the atmosphere and ultimately produce ozone and other photochemical oxidants. As discussed previously for nitrogen oxides, studies of VOC emissions usually entail mesoscale evaluations of large areas accounting for many emission sources including vehicles.

Up until the 1970s, lead emissions were associated with vehicular fuel combustion. At that time, Federal clean air legislation prompted the conversion of lead-based gasoline to lead-free fuels, which began a systematic phase-out of the sale of leaded gasoline. Emissions of lead from motor vehicles have decreased significantly as a result of lead being phased out as an additive in motor vehicle fuels. The Federal Highway Administration (FHWA) has advised that microscale lead analyses for highway projects are not needed or warranted. Lead emissions from highways have been virtually eliminated as a result of the regulation and legislation prohibiting the manufacture, sale, or introduction into commerce of any engine requiring leaded gasoline since model year 1992, sale of only unleaded gasoline, and the requirement for reformulated gasoline to contain no heavy metals (such as lead).

In 1997, USEPA codified its decision to revise the NAAQS for particulate matter. As part of this revision, new 24-hour and annual $PM_{2.5}$ standards were added. $PM_{2.5}$ can be emitted as a primary pollutant directly from stationary and mobile sources and can be formed in the ambient air through secondary formation. Secondary $PM_{2.5}$ formation is a long-term process taking hours and days and is due to multiple gases

(e.g., oxygen, water vapor, and SO2) chemically reacting in the atmosphere. Because secondary $PM_{2.5}$ formation is a large-scale phenomenon, it would be studied within the context of a large-scale analysis or mesoscale basis.

Primary $PM_{2.5}$ emissions from gasoline powered vehicles are negligible due to the low ash content of gasoline. Most of the $PM_{2.5}$ emissions from vehicle traffic are due to diesel powered vehicles. However, the proposed action will have limited diesel vehicle traffic (mainly local deliveries). Furthermore, the majority of the Suffolk County Transit bus operations are fueled by compressed natural gas (CNG), and USEPA's Heavy-Duty Highway Diesel rule (the "2007 Highway Rule") has regulations to control the emissions from diesel trucks that would reduce the particulate matter emissions by 90 percent. The new diesel regulations have been enacted by the expected completion date of the proposed project and therefore, the proposed project will have negligible $PM_{2.5}$ impacts on the surrounding area. Table 5 presents the NAAQS for criteria pollutants.

Table 5 – National (and Federal) State of New York Ambient Air Quality Standards

	National (Federal) Standards				State of New York Standards	
	Primary Standards		Secondary Standards			
Pollutant	**Level**	**Averaging Time**	**Level**	**Averaging Time**	**Level**	**Averaging Time**
Carbon Monoxide	9 ppm (10 mg/m3)	eight-hour[1]	None		9 ppm	eight-hour
	35 ppm (40 mg/m3)	one-hour[1]	None		35 ppm	one-hour
Lead	0.15 µg/m3	Quarterly average	Same as Primary		None[2]	
Nitrogen Dioxide	53 ppb (0.053 ppm)[3]	Annual (Arithmetic mean)	Same as Primary		0.05 ppm	Annual
	100 ppb	one-hour	None			
Total Suspended Particulates (TSP)	None	12 consecutive months	None		75 µg/m3	12 consecutive months
	None		None		250 µg/m3	24-hour
Particulate Matter (PM_{10})	150 µg/m3	24-hour[3]	Same as Primary		None[4]	
Particulate Matter ($PM_{2.5}$)	15 µg/m3	Annual (Arithmetic Mean) [5]	Same as Primary		None	
	35 µg/m3	24-hour[6]	Same as Primary		None	
Ozone	0.075 ppm (2008 std)	eight-hour[7]	Same as Primary		None[8]	
	0.08 ppm (1997 std)	eight-hour[9]	Same as Primary		0.08 ppm	eight-hour
	0.12 ppm	one-hour[10]	Same as Primary		0.12 ppm	one-hour
Sulfur Dioxide	0.03 ppm	Annual			0.03 ppm	Annual
	0.14 ppm	24-hour[1]	0.5 ppm	3-hour[1]	0.14 ppm	24-hour
	75 ppb[11]	one-hour			0.50 ppm	3-hour
Hydrocarbons (non-methane)	None		None		0.24	3-hour (6-9 am)

Sources: U.S. Environmental Protection Agency and State of New York Department of Environmental Conservation.

(1) Not to be exceeded more than once per year.

(2) Federal standard for Lead has not yet been adopted by NYS, but is currently being applied to determine compliance status. The 0.15 µg/m3 standard is effective 1/12/2009 &replaces the previous level of 1.5 µg/m3.

(3) The 0.100 ppm standard is effective 1/22/2010. To attain this standard, the 3-year average of the 98th percentile of the daily maximum one-hour average within an area must not exceed 0.100 ppm.

(4) Federal standard for PM10 not yet officially adopted by NYS, but it is currently being applied to determine compliance status. The 0.15 ug/m3 standard is effective 1/12/2009 and replaces the previous level of 1.5 ug/m3.

(5) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0µg/m3.

(6) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).

(7) To attain this standard, the 3-year average of the fourth-highest daily maximum eight-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 parts per million ("ppm"). (Effective 60 days after publication in the Federal Register)

(8) Former NYS Standard for Ozone of 0.08 PPM was not officially revised via regulatory process to coincide with the Federal standard of 0.12 PPM which is currently being applied by NYS to determine compliance status.

(9) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum eight-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as USEPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

(10) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005 USEPA revoked the one-hour ozone standard in all areas except the eight-hour ozone nonattainment Early Action Compact (EAC) Area

(11) Final rule signed June 2, 2010. To attain this standard, the 3-year average of the 99th percentile of the daily maximum one-hour average at each monitor within an area must not exceed 75ppb.

3.4.2 Potential Impacts

Construction and demolition activities associated with implementation of the proposed action would result in a slight, short-term increase in air pollution emissions. The primary source of potential emissions is from fugitive dust resulting from construction operations (e.g., clearing, grading). Fugitive dust consists of soil particles that become airborne when disturbed by heavy equipment operations or through wind erosion of exposed soil after groundcover is removed. To minimize fugitive dust emissions, as described below, mitigation measures will be employed to control dust. This construction-related air-quality impact (i.e., fugitive dust) would be of relatively short duration. Also, during construction, emission controls from construction vehicles and machinery would include proper maintenance and reduced idling on-site. Therefore, the impacts on ambient air quality from construction activities associated with site-specific development are not expected to be significant.

Overall, construction activities would not be expected substantially affect air quality due to the implementation of emission control procedures and the temporary nature of construction activities. Emissions from the operation of construction machinery CO, NOx, PM, VOCs, and greenhouse gases) are short-term and not generally considered substantial.

Subsequent to construction, MISF is expected to include minimal stationary sources of air emissions specifically in the maintenance building, such as a heating boiler, hot water heater, and emergency generator. As the design process moves forward and specific equipment is chosen, the proposed development would obtain operating permits for appropriate equipment under the State of NYSDEC Division of Air Resources regulations (6 NYCRR Part 201), as may be required. The NYSDEC Division of Air Resources regulatory process would ensure that these emission sources meet the NAAQS.

No significant sources of mobile air emissions were identified with respect to the operational phase of the proposed project.

Interconnection

The conceptual interconnection of the proposed solar farm to the local electric grid would not include the establishment of any new air emissions sources. Construction-related emissions (e.g., from the operation of construction vehicles or equipment) would occur during a relatively short duration and would cease upon completion of

the conceptual interconnection improvements. Overall, no significant adverse air quality impacts are expected to result from interconnection improvements.

3.4.3 Proposed Mitigation

As noted above, emissions from the operation of construction machinery (CO, NOx, PM, VOCs, and GHGs) are short-term and not generally considered substantial. Implementation of the following mitigation measures are expected to minimize construction-related air quality impacts:

- During construction emission controls for construction vehicle emissions would be employed and will include, as appropriate, proper maintenance of all motor vehicles, machinery, and equipment associated with construction activities, such as, the maintenance of manufacture's muffler equipment or other regulatory-required emissions control devices.
- During construction, dust control measures would be implemented during dry or windy periods. The appropriate methods of dust control would be determined by the surfaces affected (i.e., roadways or disturbed areas) and would include, as necessary, the application of water, the use of stone in construction roads, and vegetative cover.
- Regular sweeping of pavement of adjacent roadway surfaces during construction will be conducted to minimize the potential for vehicular traffic to create airborne dust and particulate matter.

As no long term adverse air quality impacts were identified with respect to the operational phase of the proposed project (from both stationary and mobile sources), no mitigation is proposed.

3.4.4 Greenhouse Gas Emissions and Carbon Sequestration

Introduction

The proposed action would result in the establishment of a clean, renewable source of power generation, which would reduce the need for power generation by conventional power plants that produce electricity by burning fossil fuels. Accordingly, implementation of the proposed action will result in a net reduction in the emission of greenhouse gases (and other air pollutants) generated by power sources that supply electricity to Long Island. It should be noted that carbon dioxide and greenhouse gases are used interchangeably within this analysis where greenhouse gases include, carbon dioxide, methane, nitrous oxide, ozone,

chlorofluorocarbons, hydrochlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride.[49] Carbon dioxide (CO_2) is the major greenhouse which is a product of fossil fuel combustion.

Another consideration is the impact on carbon dioxide emissions from clearing the vegetation to provide for the installation of the solar farm. As part of the proposed action, a total of 61.03± acres of existing vegetated area would be cleared at the 100.33±-acre subject property to accommodate development of the proposed solar farm. The loss of vegetation would result in a reduction of the quantity of carbon dioxide removed from the air (sequestered) by natural processes, at a quantity that can be estimated.

The following discusses estimates of the quantity of carbon dioxide that is sequestered by 61.03± acres of existing wooded area to be removed by the proposed action, as well as estimates of the quantity of carbon dioxide that would be emitted through the burning of fossil fuels (coal, natural gas and petroleum [oil]) to generate an equivalent quantity of electricity as the proposed solar farm, using conventional power plants.

The greenhouse emissions (CO_2) impacts assessment has been broken in three parts as follows:

- *The Greenhouse Gas Sequestered by Forestation*: Represents the impacts of the deforestation of the site on greenhouse emissions.

- *The Greenhouse Gas Emissions from Fossil Fuel Consumption*: Represents the impacts (savings) of greenhouse gas emissions with the installation of a solar farm on the area power generation. This assessment is the amount of greenhouse gas emissions saved with the replacement of energy (electricity) generation, through solar versus the fuel type to produce local power generation.

- *Overall Greenhouse Gas Emissions*: Represents the total greenhouse gas emissions savings projected with the installation of the solar power farm. This is a total of the previous two assessments.

[49] http://unfccc.int/resource/cd_roms/na1/ghg_inventories/english/8_glossary/Glossary.htm

Greenhouse Gas Sequestered by Forestation

The following provides an assessment of the projected greenhouse gas emissions related to the removal of vegetation as part of the proposed project that would have otherwise been sequestered. Carbon sequestration is the process by which trees and plants absorb carbon dioxide, release the oxygen, and store the carbon.

Methodology

The United States Environmental Protection Agency (US EPA) provides guidance on greenhouse gas calculation via the Greenhouse Gas Equivalencies Calculator[50]. The calculator converts greenhouse gas emissions into terms that users can understand and was utilized for the carbon sequestration calculations.

According to US EPA, the net change in forest carbon stocks and forest area is based on data developed by the USDA Forest Service for the *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010*. The average annual sequestration per acre is - 1.345 tons CO_2 per acre per year which was used to estimate the carbon sequestration of the clearing of 61.03 acres of wooded area for this project.

Results

The proposed project includes the clearing of 61.03 acres of wooded area for the development of a 19.6 MW solar PV farm, which would negate the amount of carbon that would otherwise been sequestered by the vegetation. The amount of carbon sequestered is calculated using the average annual sequestration per area rate of 1.345 tons CO_2 per acre per year.

Terrestrial carbon sequestration, (which is the type of carbon sequestration that is being referred to in the clearing of the vegetation of this site for the construction of the solar farm), means using plants to capture CO_2 from the atmosphere and then storing it as carbon in the stems and roots of the plants, as well as in the soil[51]. In photosynthesis, plants take in CO_2 and give off the oxygen (O_2) to the atmosphere as a waste gas. The plants retain and use the carbon to live and grow. When the plant winters or dies, part of the carbon from the plant is preserved (stored) in the soil. It is important to remember that terrestrial sequestration does not store CO_2 as a gas, but stores the carbon portion of the CO_2 (the C in the CO_2). If the soil is disturbed and the soil carbon comes in contact with oxygen in the air, the exposed soil carbon can combine with O_2 to form CO_2 gas and reenter the atmosphere, reducing the amount of carbon in storage. In total, it is estimated that the clearing of 61.03 acres of vegetation would negate 82.1 tons per year of CO_2 that would have otherwise been sequestered. In the following section, this potential increase of CO_2 into the

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[50] Greenhouse Gas Equivalencies Calculator. U.S. Environmental Protection Agency. 2014.

[51] Plains CO_2 Reduction Partnership , http://www.undeerc.org/pcor/sequestration/whatissequestration.aspx

environment is compared to the CO_2 savings that is gained with the use of the solar farm, as an alternative energy source.

It is important to note that, for the purposes of conservative analysis, no credit is taken for the 54.18± acres of land that would be re-vegetated following clearing. Nearly 90 percent of all areas to be cleared would be established in native shrubs and grasses, thereby partially off-setting the effects of clearing on the carbon sequestration value of the property.

Comparison of Greenhouse Gas Emissions from Fossil Fuel Consumption

The following presents an assessment of the projected greenhouse gas (CO_2) emissions that will be saved with the use of the solar farm instead of traditional power sources. The greenhouse gas emissions that will be emitted through fuel consumption to generate an equivalent quantity of electricity as the proposed solar farm was assessed. This estimation of greenhouse gas emissions is a two-step process:

- Determine the relationship between power plant heat rate and electricity generated currently through local power sources.
- Based on the estimated local fuel usage for power, estimate greenhouse gas emissions for each possible fuel source.

The proposed solar farm is projected to generate between 38,000 to 44,000 megawatt-hours (MWh) per year. With the projected electricity generation, Table 6 shows the amount of fuel that would be consumed by possible fuel types to generate 38,000 MWh and 44,000 MWh of electricity as well as the U.S. EIA estimated 34,854 MWh. The applicant anticipates that actual electricity generation by the solar farm will range between 38,000 MWh and 44,000 MWh.[52] The U.S. EIA estimate is also included as a conservative estimate. Table 6 presents estimates of the quantities of common fuels used to generate electricity (i.e., coal, natural gas and petroleum) that would be consumed to generate each electricity threshold (34,854 MWh, 38,000 MWh and 44,000 MWh).

[52] The specific technology to be implemented at the subject property has not yet been selected, and will be determined by the applicant based on the latest technology available at the time of final design. However, the applicant proposes to construct a state-of-the-art facility, with higher-rated solar PV panels and with significantly lower loss factors than many other solar PV facilities, such that the actual output is expected to be higher than the average published within the U.S. EIA's 2012 report.

Table 6 – Fuel Consumption

Fuel Type	Power Plant Heat Rate (Btu/kWh)[1]	Fuel Consumption (MMBtu per year) (For each solar power output level for each possible fuel type)		
		US EIA Estimate 34,854 MWh	Lower Threshold: 38,000 MWh	Upper Threshold: 44,000 MWh
Coal	10,089	351,642	383,382	443,916
Natural Gas	10,354	360,878	393,452	455,576
Petroleum	10,334	360,181	392,692	454,696

[1] U.S. Energy Information Administration[53], the heat rate per kilowatt-hour of electricity generated.

- The second step of estimating greenhouse gas emissions is to determine the amount of emissions per unit of fuel used. Based on the estimated fuel consumptions determined in Table 6, the equivalent greenhouse gas (CO_2) emissions that would be projected to be generated, based on each fuel use, are presented in Table 7. The fuel emission factors are based on information from the U.S. EIA.

Table 7 – Greenhouse Gas Emissions from Fossil Fuel

Fuel Type	Fuel Consumption (MMBtu)[1]			Conversion Factor (kg CO_2/MMBtu)[2]	CO_2 Emissions (tons per year)[2]		
	34,854 MWh	38,000 MWh	44,000 MWh		34,854 MWh	38,000 MWh	44,000 MWh
Coal	351,642	383,382	443,916	95.52	36,948	40,283	46,643
Natural Gas	360,878	393,452	455,576	53.06	21,063	22,964	26,590
Petroleum	360,181	392,692	454,696	73.15	28,982	31,598	36,587

1. Based on Table 6
2. U.S. Energy Information Administration (EIA) provided fuel emission factors for stationary combustion : *Instruction for Voluntary Reporting of Greenhouse Gases*
3. Conversion factor for 1 kg = 0.0011 short tons

The amount of greenhouse gas (CO_2) emissions saved with the replacement of energy (electricity) generation through solar, versus the typical fuel used for local power generation, is shown in Table 7. The CO_2 savings are estimated to range from 21,063 tons per year (tpy) to 46,643 tpy of CO_2, depending on the final energy output of the solar farm and the type of fuel that would have been used to produce the equivalent energy.

Specifically, the CO_2 emissions from coal, natural gas and petroleum used to generate 38,000 MWh of electricity is estimated at 40,283 tons, 22,964 tons and 31,598 tons, respectively. Similarly, the CO_2 emissions from fuel used to generate 44,000 MWh of electricity by coal, natural gas and petroleum is estimated at 46,643 tons, 26,590 tons and 36,587 tons, respectively. The CO_2 emissions from fuel used to generate the U.S.

[53] How much coal, natural gas, or petroleum is used to generate a kilowatt hour of electricity? U.S. Energy Information Administration. 2014. http://www.eia.gov/tools/faqs/faq.cfm?id=667&t=2

EIA estimate of 34,854 MWh of electricity by coal, natural gas and petroleum is estimated at 36,948 tons, 21,063 tons, and 28,982 tons per year, respectively.

Overall Greenhouse Gas Emissions

The proposed action is planned to remove approximately 61.03 acres of wooded area in order to install a 19.6 MW solar photovoltaic farm. To estimate the net difference in CO_2 emissions with and without the proposed solar farm (and associated clearing), the CO_2 emissions associated with the amount of fossil fuel used to generate the lower and upper limits of electricity, as well as the amount of carbon that would have otherwise been sequestered by the 61.03 acres of vegetation were considered. Table 8 presents the total CO_2 emissions savings with the construction of the proposed solar farm, adjusted to reflect the loss of carbon sequestration by the wooded areas to be cleared.

Table 8 – Summary of CO_2 Emissions Savings due to Proposed Solar Farm

	CO_2 Emissions Savings (tons per year)[1]		
	USEIA Estimate 34,854 MWh	Project Estimate: Lower Threshold 38,000 MWh	Project Estimate: Upper Threshold 44,000 MWh
CO_2 Impacts: Loss of Carbon Sequestration[1]			
	-82.1	-82.1	-82.1
CO_2 Savings: Replacement of Fossil Fuel Usage with Proposed Solar Farm (By Fuel Type)			
Coal	36,948	40,283	46,643
Natural Gas	21,063	22,964	26,590
Petroleum	28,982	31,598	36,587
Net CO_2 Project Emissions Savings[2]			
Coal	36,866	40,201	46,561
Natural Gas	20,981	22,882	26,508
Petroleum	28,900	31,516	36,505

1 The estimated carbon sequestered by the 61.03 acres of vegetation that will be removed for the construction of the solar farm
2 Total CO_2 Emissions = the amount of CO_2 emissions from fossil fuel consumption + the carbon sequestered by the 61.03 acres of vegetation.

Based on the foregoing, the proposed solar farm will result in a significant net benefit with respect to CO_2 emissions. According to LIPA's *Electric Resource Plan 2010-2020* (June 2011), 28 percent of LIPA's available power generation capacity relies on oil (petroleum); and another 42 percent relies on oil and natural gas as dual fuel (Section 2, page 14). When comparing the proposed solar farm to petroleum as a fuel source, Table 8 indicates that the proposed action would result in a significant net benefit of up to 36,505 tons of CO_2 per year - - this equates to the CO_2 emissions from just under 7,000 vehicles on the road during the year.[54] If making the same comparison to coal, the CO_2 savings would equate to approximately 8,900 passenger vehicles, or 5,000 vehicles for natural gas, as the fuel source for the energy production.

It is important to note that for the purposes of conservative analysis, no credit is taken for the 54.18± acres of land that would be re-vegetated following clearing. Nearly 90 percent of all areas to be cleared would be established in native shrubs and grasses, thereby partially off-setting the effects of clearing on the carbon sequestration value of the property.

It should also be noted that any clearing of existing vegetation that may be required based on the ultimate design of the off-site conceptual interconnection improvements (e.g., an estimated 0.79± acre if a 30-foot right-of-way is cleared, along the route of the existing cleared path [which has an average existing cleared width of approximately 15 feet]) would result in a nominal reduction in carbon sequestration. The significant air quality benefits expected to result from the proposed action, as described herein, would be expected to far outweigh the nominal potential effect of the aforesaid clearing, if same is ultimately required.

Overall, the proposed MISF is expected to result in a significant net benefit to air quality, as the generation of 19.6 MW of electricity from a clean, renewable source reduces the reliance on conventional energy sources.

[54] US EPA Greenhouse Gas Equivalencies Calculator, http://www.epa.gov/cleanenergy/energy-resources/calculator.html#results

3.5 Land Use, Zoning and Plans

3.5.1 Existing Conditions

Land Use

The 100.33±-acre subject property, located south of Moriches-Middle Island Road, is currently vacant and unimproved, and predominantly wooded.

Land uses within a one-quarter-mile radius surrounding the subject property include a mixture of single-family residential, open space, vacant land, community facility, agricultural, and industrial uses. Photographs documenting the nature and character of surrounding land uses are provided in Appendix E, and the pattern of land uses is illustrated by Figure 13. Surrounding land uses are more particularly described as follows:

- **North:** Land uses to the north of the subject property predominantly include privately-owned vacant/wooded land[55] and publicly-owned wooded open space along the north and south sides of Moriches-Middle Island Road. There is also a Town of Brookhaven Highway Yard and a wireless communications facility present on the north side of Moriches-Middle Island Road. In addition, land uses along the west side of Weeks Avenue, north of Moriches-Middle Island Road and the subject property include a mixture of single-family residential, vacant and agricultural uses (which, based on site reconnaissance, do not appear to be active).

- **East:** Immediately east of the subject property is publicly-owned, wooded open space. A mixture of single-family residential, agricultural and industrial uses follows along the west side of Weeks Avenue, south of Moriches-Middle Island Road. An electric substation is situated at the southern terminus of Weeks Avenue, just beyond the one-quarter-mile radius.

▼

[55] A portion of the privately-owned vacant (wooded) land to the north is the subject of a proposed land division and solar energy production facility development, as described in Section 4.1.6 of this DEIS.

Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Existing Land Use

Figure # 13

Subject Property

Land Use
- Agriculture
- Commercial
- Community Services
- Industrial
- Recreation & Open Space
- Residential
- Transportation
- Utilities
- Vacant
- Waste Handling & Management
- Unknown

- Long Island Expressway
- Parkway, major road
- Town/City
- Incorp. Village (underlined)
- Unincorporated village

Not all items in the legend may be visible on the map

- **South:** The area to the south of the subject property is publicly-owned wooded open space with unofficial walking trails. In addition, a trailer storage yard on the north side of the Sunrise Highway Service Road is present within the one-quarter-mile radius. There are also single-family residences present along the north side of the Sunrise Highway Service Road, just beyond the one-quarter-mile radius.

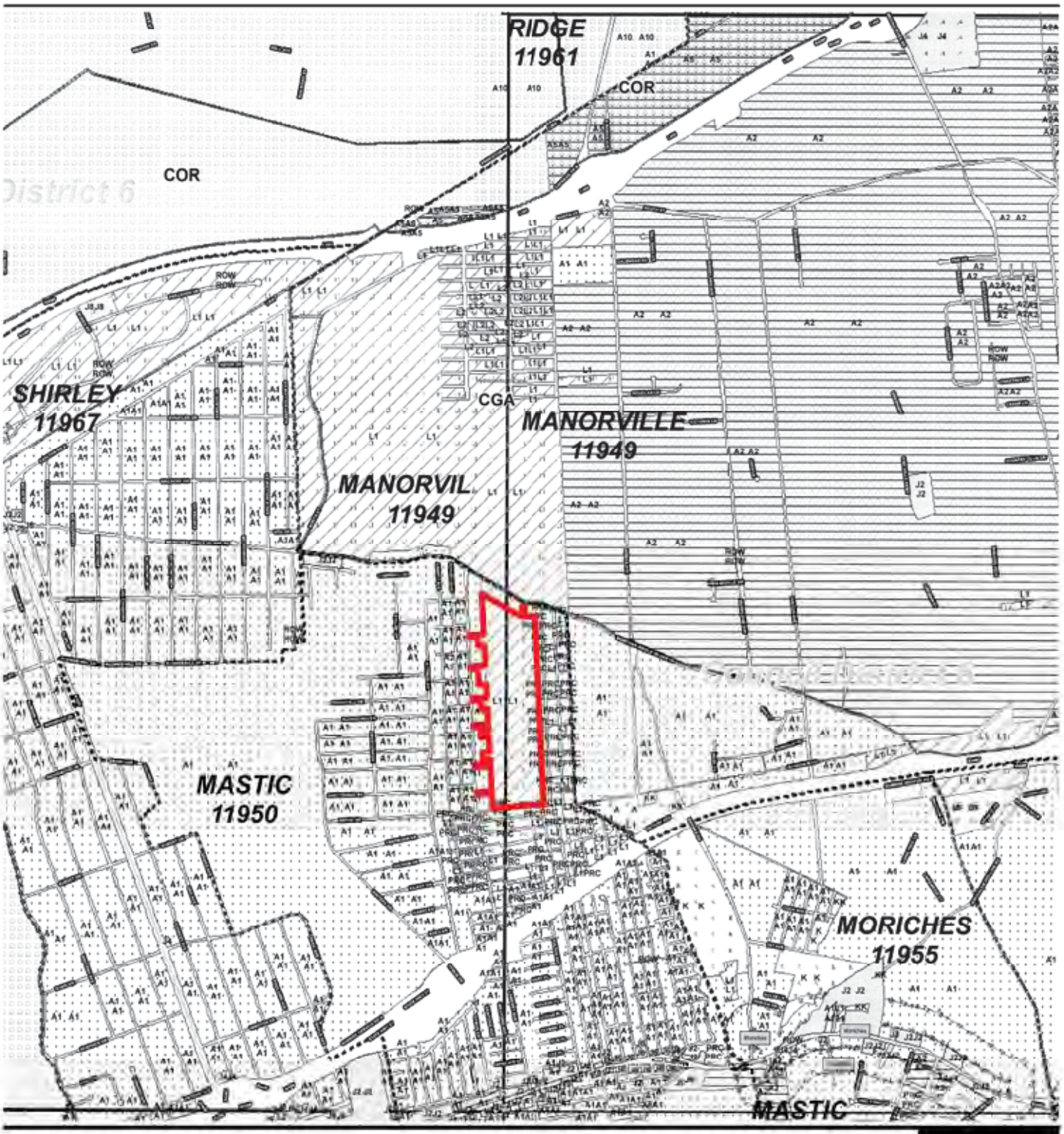
- **West:** Single-family residences represent the predominant land use to the west of the subject property. There are also several vacant properties and recharge basins in this area. A Manorville Fire Department fire station is present on Cranford Boulevard. The Brookhaven Calabro Airport is present just beyond the one-quarter-mile radius.

Zoning

The subject property is situated within the L Industrial 1 and A Residence 1 zoning districts of the Town of Brookhaven (see Figure 14). Approximately 93.89 percent of the site (i.e., 94.20± acres) is within the L Industrial 1 District, and the remaining 6.11 percent (i.e., 6.13± acres) is within the A Residence 1 District (see Figure 14). The Code of the Town of Brookhaven (hereinafter the "Town Code") sets forth that, if the less restrictive zoning classification (i.e., L Industrial 1) occupies more than 75 percent of the parcel, the less restrictive zoning shall prevail, provided that all development, including access, be situated within the less restrictive district. The more restrictive zone (i.e., A Residence 1) shall not be utilized for yield in such instances (§85-136A(7)). As the proposed action would adhere to these provisions, the following zoning discussion will focus on the L Industrial 1 District.

The permitted uses within the L Industrial 1 District include, but are not limited to, the following (§85-560):

- Agricultural or nursery use, including the retail sale of products raised on the premises
- Bank
- Commercial laundry establishment
- Day-care facility
- Health club
- Manufacturing
- Office
- Printing plants
- Research and development uses, including laboratories for scientific or industrial research, testing and development
- Warehouse



Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Town of Brookhaven Zoning Map

Figure # 14

Subject Property

Historic Dist | Transition

CGA, COR, A, A1, A10, A2, A5, B1, B, C, CD, CR, D, HF, J, J2, J4, J5, J6, J8, K, L1, L2, L4, MF, NHH, OF, PC, PDD, PRC, PRCHC, RD, ROW, VIL, WAT

Sources: Town of Brookhaven zoning General Reference Map, March 6, 2014

As a solar energy production facility, pursuant to §85-813(C), the proposed action requires a special permit from the Planning Board. In addition, the subject property is located within the Hydrogeologic Sensitive Zone, as set forth in §85-571. Development of the subject property is also subject to the land development standards set forth at §85-843. The dimensional criteria for the L Industrial 1 zoning district and Hydrogeologic Sensitive Zone, as well as the land development standards, are represented in Table 9, followed by a list of the special permit criteria for solar energy production facilities.

Table 9 – Bulk and Dimensional Zoning Requirements

Regulation	L Industrial 1	Land Development Standards
Minimum lot area (hydrogeologic sensitive zone)	120,000 SF (2.75 acres)	
Minimum width of lot throughout (hydrogeologic sensitive zone)	200 feet	
Minimum front yard setback (parcels five acres or more in size)	100 feet	
Minimum side yard setback (parcels five acres or more in size)	50 feet	
Minimum rear yard setback	50 feet	
Maximum permitted floor area ratio (FAR) (hydrogeologic sensitive zone)	30 percent	
Maximum permitted height	50 feet / 3 stories	
Minimum landscaped or natural area (industrial use >5 acres)		30 percent
Minimum natural area/landscaping in front yard		50 percent of 30 percent required
Minimum natural area/landscaping along street frontage (industrial use >5 acres)		50 feet
Minimum buffer adjacent to residential use or zone (industrial use >5 acres)		75 feet

The special permit criteria for solar energy production facilities, set forth in §85-815, are presented below.

A. Minimum lot area.

(1) The minimum lot area for a solar energy production facility shall be a minimum of 10 acres.

B. *Maximum lot coverage.*

(1) *The total coverage of a lot with freestanding solar panels cannot exceed sixty-percent lot coverage. Lot coverage shall be defined as the area measured from the outer edge(s) of the arrays, inverters, batteries, storage cells and all other mechanical equipment used to create solar energy, exclusive of fencing and roadways.*

C. *Height and setback restrictions.*

(1) *The maximum height for freestanding solar panels located on the ground or attached to a framework located on the ground shall not exceed 20 feet in height above the ground.*

D. *Buffer and setback restrictions.*

(1) *A minimum 35% shall be preserved as natural and undisturbed open space. Site plans shall be developed that provide for the preservation of natural vegetation in large unbroken blocks that also allow contiguous open spaces to be established when adjacent parcels are developed.*

(2) *A minimum seventy-five-foot perimeter buffer, consisting of natural and undisturbed vegetation, supplemented with evergreen plantings in accordance with Town standards, as needed, shall be provided around all mechanical equipment and solar panel arrays to provide screening from adjacent residential properties and Town, county and state roads.*

(3) *A minimum setback for a solar energy production facility and equipment used in conjunction with the solar energy production facility shall be located at least 100 feet from any residential dwelling or zone.*

(4) *A minimum twenty-five-foot perimeter buffer, consisting of natural and undisturbed vegetation, supplemented with evergreen plantings in accordance with Town standards, as needed, shall be provided around all mechanical equipment and solar panel arrays to provide screening to adjacent commercial or industrial properties.*

A minimum setback for a solar energy production facility and equipment used in conjunction with the solar energy production facility shall be located at least 50 feet from any adjacent commercial or industrial properties.

The consistency of the proposed action with the dimensional criteria for the L Industrial 1 zoning district and hydrogeologic sensitive zone, land development standards, and special permit criteria for solar energy production facilities is discussed in detail in Section 3.5.2 of this DEIS.

Several zoning districts exist in the immediate area surrounding the subject property, as follows (see Figure 14 on Page 112 of this DEIS):

North: L Industrial 1, A Residence 2 (northeast)

East: Planned Retirement Community Residence (PRC), L Industrial 1, A Residence 1

South: PRC, L Industrial 1, A Residence 1

West: A Residence 1

As identified on the Town's Zoning Map (see Figure 14), and as described above, the zoning pattern in the vicinity of the subject property is such that light industrial zoning is the dominant classification on the subject property and to the north. The western portion of the site is zoned A Residence 1; however, as stated above, given that the L Industrial 1 district occupies more than 75 percent of the site, the L Industrial 1 district prevails. Residential zoning districts, including PRC, A Residence 1 and A Residence 2, are the dominant classifications within the remainder of the one-quarter-mile study area. Small pockets of light industrial zoning are present to the east and south of the subject property.

Relevant Comprehensive Land Use Plans

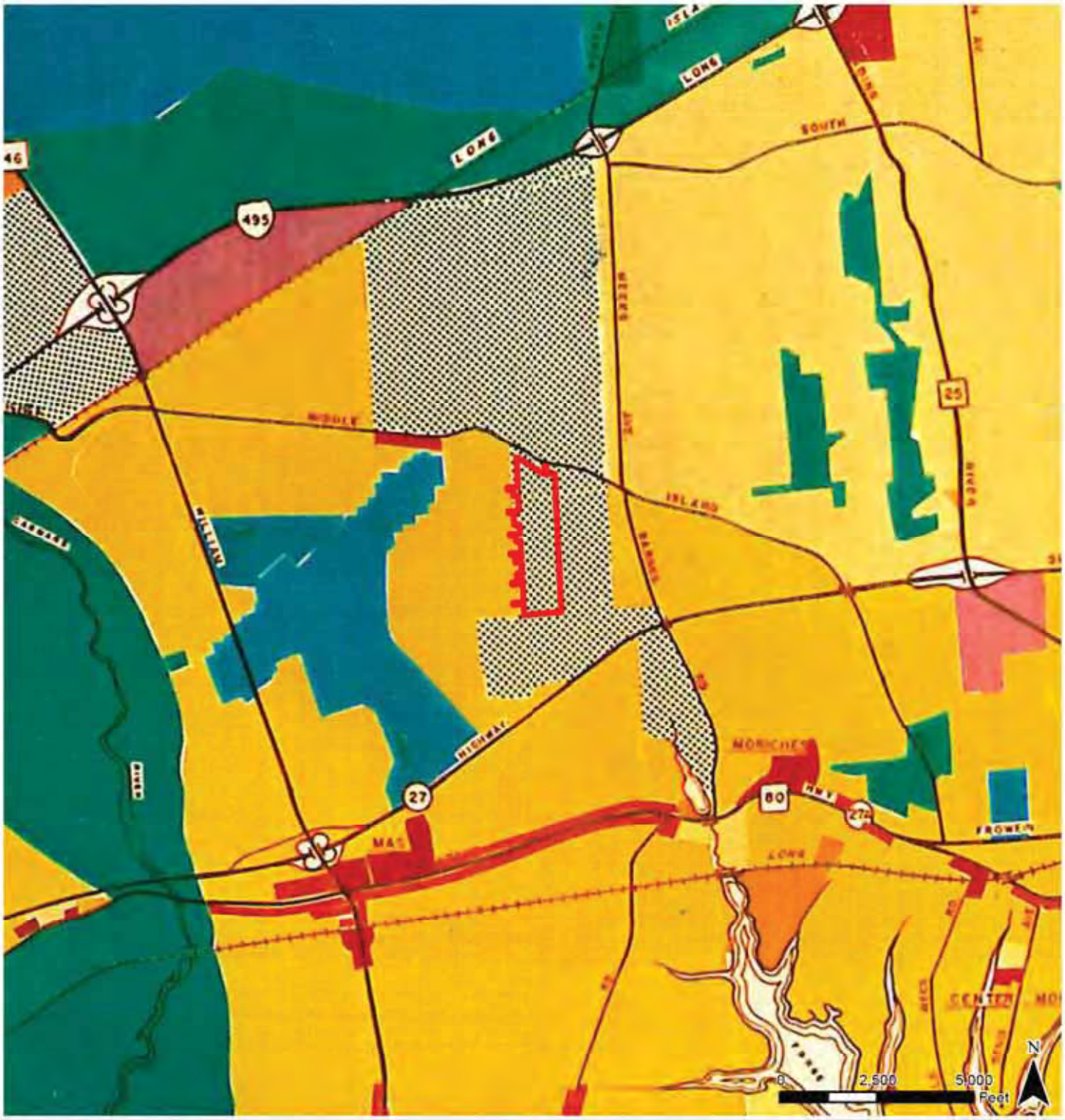
Brookhaven 1996 Comprehensive Land Use Plan

The Brookhaven 1996 Comprehensive Land Use Plan (*1996 Comprehensive Plan*), the currently effective plan, includes an assessment of existing land uses; existing zoning and related codes; demographic data depicting population, housing, social and economic conditions in the Town; historical and cultural facts; previous land use plans; community services and facilities; circulation and transportation infrastructure; and environmental resources. It also identifies existing problems, deficiencies and needs, as well as community strengths and assets, and sets forth goals and objectives to be achieved. Lastly, alternatives and implementation programs for achieving the plan goals and objectives were proposed. The goals and objectives identified in the *1996 Comprehensive Plan* include the following (see p.43-44):

- *Create strong economic activity to provide jobs and an adequate tax base.*
- *Establish a spatial relationship between land use, population and transportation.*
- *Develop appropriate zoning regulations to insure proper development.*

- *Bring zoning into compliance with the Comprehensive Land Use Plan including the elimination of excess commercial zoning and addressing existing and future commercial and industrial zoning problems and needs.*
- *Develop innovative land development techniques to insure maintenance of open space.*
- *Provide receiving sites for the transfer of developed rights for the "core areas".*
- *Provide open space and recreational facilities throughout the Town.*
- *Concentrate activity whenever possible to encourage public transportation usage.*
- *Support appropriate roadway improvements to adequately serve adjacent land use.*
- *Continue to provide affordable housing for all segments of the population.*
- *Eliminate deterioration and obsolescence.*
- *Protect and enhance the environmental heritage of the Town.*
- *Improve the enforcement of Town Codes and Regulations.*
- *Develop a greater "sense of place" in communities.*
- *Expand historic preservation.*

In addition, the *1996 Comprehensive Plan* includes a Land Use Plan map that generally defines recommended future land uses for all areas of the Town. On this map, the subject property is within an area designated as 'Planned Development" (see Figure 15). This designation is reflected in the recommended industrial land use and zoning changes of the *1996 Comprehensive Plan*, wherein it is suggested that "underutilized or inactive industrially-zoned parcels should be considered for rezoning," and "where large industrial zoned parcels or assemblages of parcels exist, the Town should consider rezoning to a PDD district [Planned Development District] to promote future flexible development."



Middle Island Solar Farm DEIS
Mastic, Suffolk County, New York

Brookhaven Comprehensive Plan
Future Land Use

Figure # 15

Subject Property

- VERY LOW DENSITY
- LOW DENSITY
- ONE ACRE OR LESS
- HIGH DENSITY
- PLANNED DEVELOPMENT
- PARKS AND OPEN SPACE
- PUBLIC AND SEMI PUBLIC
- COMMERCIAL
- INDUSTRIAL

LOCAL ROAD
COUNTY ROAD
STATE ROAD
INTERSTATE

Source: Town of Brookhaven Land Use Plan 2005

The Tri-Hamlet Comprehensive Plan

The Tri-Hamlet Comprehensive Plan for Mastic, Mastic Beach and Shirley (i.e., the Tri-Hamlet area in which the subject project is located) was prepared in June 1995 as a component of the *1996 Comprehensive Plan*. Community input was garnered to develop specific recommendations for the future of the Tri-Hamlet area. Industrial development is the recommended land use for the subject property in *The Tri-Hamlet Comprehensive Plan*.

The goals set forth in *The Tri-Hamlet Comprehensive Plan* include (see p. 3):

- *Create strong economic activity to provide jobs and an adequate tax base.*
- *Develop appropriate zoning regulations to ensure proper development.*
- *Bring zoning into compliance with the Tri-Hamlet Comprehensive Plan.*
- *Enforce existing codes and ordinances.*
- *Provide open space and recreational facilities.*
- *Concentrate activity whenever possible to encourage public transportation usage.*
- *Support appropriate roadway improvements to adequately serve adjacent land use while ensuring that improved roadways are aesthetically attractive.*
- *Maintain affordable housing for all segments of the population particularly senior citizens.*
- *Eliminate deterioration and obsolescence.*

The recommendations of *The Tri-Hamlet Comprehensive Plan* relevant to the subject property include the following:

> *"The Sunrise Highway L-1 Industrial site should be developed as an Industrial PDD]. The Town Board should consider rezoning this site to a PDD. An industrial subdivision is essential in order to conform to the specifications of the Town Code. This site should not be developed in a piecemeal fashion, but should be developed with a high-tech industrial, office, or R&D as desirable uses. Consideration should be given to a coordinated development with the other industrial properties directly to the north* [this includes the subject property], *across Grove Drive, in order to provide alternate access to the Sunrise Highway parcel without going through any of the existing residential development. In no case should the industrial development of either of these parcels utilize existing roadways which are developed as residential in nature. An alternative use would be a Planned Retirement Community (PRC).*
>
> *Similar development criteria and planning tools should be utilized to develop the Breslin property running south from the LIE to Moriches-Middle Island Avenue and the site running south from Moriches-Middle Island Avenue to Grove Street* [i.e., the subject property]. *All industrial development should be well buffered (100 Feet +) from nearby residential development."* (Page 29)

"An industrial development such as the Stony Brook Tech Park, with naturally vegetated front and side yards, recharge ponds as opposed to standard recharge basins, and the typical uses found in the park, is exactly what this community is looking for. Therefore, to meet these needs, development of these industrial parcels should meet Hydrogeological Sensitive Zone criteria set forth in the Town Code, i.e., 30% building area, 3-acre average lot size, in addition to retaining 30% or more in natural vegetation, 50 foot natural and/or revegetated front yard buffers and 100 foot + residential buffers. In addition, as per the Town Code, the parking and loading areas should not be located within the front yards but within the side and rear yards, and well screened from the adjoining properties." (Page 30)

3.5.2 Potential Impacts

Land Use

The proposed action would result in a change of use from existing undeveloped/wooded land to an electric generating solar farm—a use that would be allowed by special permit from the Planning Board within the L Industrial 1 district of the Town of Brookhaven. In addition to the installation of solar arrays, the proposed action would include construction of a 4,032-square-foot maintenance building to be situated southeast of the proposed entrance drive. This maintenance building would be surrounded by a five-foot-wide concrete sidewalk. Within the southern portion of the subject property, electrical equipment and switchgear would be constructed to collect the energy generated by the solar arrays and allow its transmission onto the power grid. The equipment is proposed to be situated within a 100-foot-by-100-foot fenced area, set back from the southern property line 270± feet.

A comparison of existing site coverages and those that would result from implementation of the proposed action is presented in Table 10, below. As presented within Table 10, a total of 61.03± acres (60.83± percent of the subject property) of existing wooded area would be removed to accommodate the proposed MISF. Of the 61.03± acres to be cleared, 54.18± acres would be re-vegetated with native species of trees, grasses and shrubs, beneath and between the proposed solar arrays, as well as at drainage areas on the southern portion of the site and along the perimeter of the area to be cleared. The 39.30± acres to remain undeveloped and wooded would serve as a visual buffer from surrounding roads and land uses. Overall, the proposed action would result in a total of 0.55± acres of paved surfaces, including the maintenance building, concrete sidewalk, equipment pads, substation surface, and a brief, 1,000-square-foot section of asphalt driveway at the site entrance. Beyond the 93.48 acres dedicated to wooded and re-vegetated areas, the remainder of the site acreage would be comprised of gravel driveways and parking areas, totaling 6.30± acres. The gravel parking lot would be situated south and southeast of the proposed

maintenance building. The gravel driveways would run along the perimeter of the operational portion of the site and north-to-south between the solar arrays.

Table 10 – Site Coverage: Existing and Proposed Conditions (in Acres)

Type of Coverage	Existing Conditions	Proposed Conditions
Vacant/Wooded	100.33±	39.30±
Area Re-Vegetated Back to Natural (native landscape trees, grasses and shrubs)	0.00±	54.18±
Gravel Driveways and Parking Lot	0.00±	6.30±
Roads, Buildings and Other Paved Surfaces	0.00±	0.55±
TOTAL	100.33±	100.33±

The area surrounding the proposed MISF is developed with a mixture of single-family residential, community facility, agricultural, and industrial uses, along with vacant land and open space. The proposed action would not introduce a unique use within this portion of the Town of Brookhaven. A 200±-acre, 37 MW solar array was recently constructed at the United States Department of Energy Brookhaven National Laboratory property, approximately two miles north of the subject property. Although the proposed use differs from the immediately adjacent uses, it is not expected that operation of a solar farm would result in significant adverse land use impacts upon these uses, particularly given the natural buffers that would remain within the subject property as well as to the north, east and south (see discussion of visual impacts in Section 3.7 of this DEIS entitled, *Aesthetics, Visual Resources and Noise*). Additionally, the extremely low level of activity associated with the proposed use (e.g., traffic, noise, occupancy, water use, etc.) significantly limits the potential for the proposed action to adversely impact surrounding land uses.

Regarding the life cycle of the proposed project, the project sponsor anticipates that the solar PV arrays would have an estimated lifetime of 40± years (assuming no upgrades). It is expected that an initial 20-year lease would be signed with LIPA with an option to extend or transfer the lease to another entity. At the end of the operational lifespan of the solar PV arrays, the arrays would be dismantled and disposed of as part of a planned decommissioning process. All support structures, fencing, and associated electrical hardware would also be removed. The subject property would then be available for future reuse or restoration.

Zoning

As described in detail in Section 3.5.1, the subject property is situated within the L Industrial 1 (94.20± acres) and A Residential 1 (6.13± acres) zoning districts. As the L Industrial 1 district occupies more than 75 percent of the site, it is considered the prevailing zoning of the subject property, and development must be restricted to

same. As stated, the portion of the subject property within the A Residence 1 district cannot be used for yield calculations.

As discussed in Section 3.5.1, above, the Town of Brookhaven requires a special permit for solar energy production facilities within the L Industrial 1 zoning district. The proposed action is also subject to the Land Development Standards set forth at §85-843. A comparison of the dimensional criteria for the L Industrial 1 zoning district and hydrogeologic sensitive zone, and the Land Development Standards with the proposed Middle Island Solar Farm is provided in Table 11, below.

Table 11 – Project Consistency with Bulk and Dimensional Zoning Requirements

Regulation	L Industrial 1	Land Development Standards	Proposed Middle Island Solar Farm
Minimum lot area (hydrogeologic sensitive zone)	120,000 SF (2.75 acres)		94.20± acres (L Industrial 1 portion)
Minimum width of lot throughout (hydrogeologic sensitive zone)	200 feet		50± feet*
Minimum front yard setback (parcels five acres or more in size)	100 feet		265± feet
Minimum side yard setback (parcels five acres or more in size)	50 feet		106± feet
Minimum rear yard setback	50 feet		270± feet
Maximum permitted floor area ratio (FAR) (hydrogeologic sensitive zone)	30 percent		0.10± percent**
Maximum permitted height	50 feet / 3 stories		24 feet / 1 story
Minimum landscaped or natural area (industrial use >5 acres)		30 percent	92.73± percent
Minimum natural area/landscaping in front yard		50 percent of 30 percent required	***
Minimum natural area/landscaping along street frontage (industrial use >5 acres)		50 feet	56± feet
Minimum buffer adjacent to residential use or zone (industrial use >5 acres)		75 feet	77± feet

* The subject property is 50± feet wide at the entrance on Moriches-Middle Island Road; however, the majority of the subject property is 1,000± feet wide. An area variance would be required due to the dimensions of the subject property at the entrance.
** Calculated as percentage of L Industrial 1 zoned portion of subject property.
*** Planning Board relief required.

As stated above, the proposed action requires the issuance of a special permit for a solar energy production facility by the Planning Board. A discussion of the consistency of the proposed action with the special permit criteria follows.

Special Permit – Solar Energy Production Facilities

Article XXXI of the Town Code (Renewable Energy Systems) sets forth the permitted locations and special permit requirements for solar energy production facilities as principal uses at §§85-813 and 815. This ordinance is the model utility solar code developed by the SCPC and adopted by the Town Board. As demonstrated below, the proposed MISF would comply with all relevant provisions of the ordinance, which allows for the needed development of a renewable source of energy while being protective of the environment and surrounding properties.

According to the aforementioned location requirements, solar energy production facilities are not permitted in certain areas of potential sensitivity without a special permit from the Town Board. These areas of potential sensitivity include the following:

(1) *One-hundred-year flood hazard zones considered a V or AE Zone on the FEMA Flood Maps.*

The subject property is depicted on the FEMA Flood Insurance Rate Map Number 36103C0730H as being entirely within Zone X (unshaded). As such, the subject property is not within a one-hundred-year flood hazard zone considered a V or AE Zone.

(2) *Historic and/or culturally significant resources, in an historic district, or historic district transition zone.*

According to the New York State Office of Parks, Recreation & Historic Preservation (OPRHP) Cultural Resource Information System,[56] the subject property is not located within or adjacent to any resources listed in, or eligible for listing in, the State or National Registers of Historic Places. Moreover, there are no Town-designated historic sites, districts or transition zones located at or adjacent to the subject property.

(3) *Within 100 feet landward of a tidal or freshwater wetlands.*

The United States Fish and Wildlife Service National Wetlands Inventory (NWI) Wetlands Mapper was examined, and does not indicate the presence of any surface water features (including potential federally-regulated wetlands) on or adjacent to the subject property.

[56] http://parks.ny.gov/shpo/online-tools/, accessed November 2015.

According to the NYSDEC's Freshwater Wetlands Map of Suffolk County, Map No. 29 of 39, Moriches Quadrangle, there are no freshwater wetlands situated on or adjacent to the subject property. The nearest wetland mapped by the NYSDEC is Freshwater Wetland M-7 (headwaters associated with the Forge River), located approximately 1,121 feet to the east of the southeast corner of the subject property, and extending southeast to the Forge River (see Figure 8 on Page 42 of this DEIS, and Figure 12 on Page 74 of this DEIS).

The NYSDEC's Tidal Wetlands Inventory Map Index was also examined. No individual Tidal Wetlands Inventory Map has been produced for the location of the subject property, indicating that no tidal wetlands exist on or adjacent to the subject property.

Additionally, field investigations were conducted by VHB on October 20 and November 2, 2014. No wetlands were identified at the subject property during these field investigations.

(4) *Adjacent to, or within, the control zone of any airport, subject to approval by the Federal Aviation Administration.*

The subject property is located approximately 0.5-to-1.0 mile east of the runways of the Town of Brookhaven Calabro Airport, and is not within an associated controlled area requiring construction notification to the Federal Aviation Administration (FAA). The solar panels are engineered to be light absorptive, reflecting as little as two percent of sunlight (as noted within the Federal Aviation Administration's *Technical Guidance for Evaluating Selected Solar Technologies on Airports* – November 2010). As such, the proposed facility is outside of the associated aircraft approach surfaces and would not present an obstruction to airport functions.

(5) *Within the Manorville Farm Protection Area, Eastport Farm Protection Area.*

The subject property is not located within the Manorville or Eastport Farm Protection Areas.

The dimensional requirements that must be met for a special permit for a solar energy production facility, set forth at §85-815 include the following:

E. *Minimum lot area.*

(2) *The minimum lot area for a solar energy production facility shall be a minimum of 10 acres.*

The subject property consists of 94.20± acres within the L Industrial 1 district and 6.13± acres within the A Residence 1 district, for a total of 100.33± acres.

F. *Maximum lot coverage.*

(2) *The total coverage of a lot with freestanding solar panels cannot exceed sixty-percent lot coverage. Lot coverage shall be defined as the area measured from the outer edge(s) of the arrays, inverters, batteries, storage cells and all other mechanical equipment used to create solar energy, exclusive of fencing and roadways.*

The proposed equipment used to create solar energy at the subject property would cover approximately 26.9 percent of the subject property.

G. *Height and setback restrictions.*

(2) *The maximum height for freestanding solar panels located on the ground or attached to a framework located on the ground shall not exceed 20 feet in height above the ground.*

The proposed solar panels would be installed to a maximum top height of 17± feet agl.

H. *Buffer and setback restrictions.*

(5) *A minimum 35% shall be preserved as natural and undisturbed open space. Site plans shall be developed that provide for the preservation of natural vegetation in large unbroken blocks that also allow contiguous open spaces to be established when adjacent parcels are developed.*

The proposed action would maintain 33.17± acres (35.21± percent) of natural (wooded) area within the 94.20± acre, L Industrial 1-zoned portion of the subject property.

(6) *A minimum seventy-five-foot perimeter buffer, consisting of natural and undisturbed vegetation, supplemented with evergreen plantings in accordance with Town standards, as needed, shall be provided around all mechanical equipment and solar panel arrays to provide screening from adjacent residential properties and Town, county and state roads.*

The subject property is adjoined by residentially-zoned (Planned Retirement Community and A Residential 1) properties on the east, south and west sides. The proposed minimum natural buffers to these properties are as follows:

- East: 77± feet
- South: 220± feet
- West: 211± feet

In addition, a staggered row of evergreen species would be planted along the entire western fence line of the proposed facility to provide additional screening from the existing residences along Cranford Boulevard. The natural wooded buffer to remain between the proposed solar arrays and Cranford Boulevard (at the limited "finger"-like projections where the subject property has frontage along same) is approximately 500 feet in depth. Additionally, the proposed facility would be buffered from Moriches-Middle Island Road by well in excess of 75 feet of natural vegetation, including a 50-foot natural buffer to be provided on the site, and by wooded parcels owned by the Town on either side of the "flagpole" driveway to the site.

(7) *A minimum setback for a solar energy production facility and equipment used in conjunction with the solar energy production facility shall be located at least 100 feet from any residential dwelling or zone.*

The subject property is adjoined by residentially-zoned (Planned Retirement Community and A Residential 1) properties on the east, south and west sides. The proposed minimum setbacks of the solar array and associated equipment from these properties are as follows:

- East: 106± feet
- South: 270± feet
- West: 239± feet

(8) *A minimum twenty-five-foot perimeter buffer, consisting of natural and undisturbed vegetation, supplemented with evergreen plantings in accordance with Town standards, as needed, shall be provided around all mechanical equipment and solar panel arrays to provide screening to adjacent commercial or industrial properties.*

The subject property is situated adjacent to undeveloped (wooded) L Industrial 1-zoned properties to the north. A minimum 50±-foot natural buffer would be maintained from the northern subject property line to the proposed fence to surround the entire facility, including all mechanical equipment and solar panel arrays.

(9) *A minimum setback for a solar energy production facility and equipment used in conjunction with the solar energy production facility shall be located at least 50 feet from any adjacent commercial or industrial properties.*

The proposed maintenance building to be located on the northern portion of the subject property would be setback a minimum of 70± feet from the adjacent L Industrial 1 zoned property.

As demonstrated above, the proposed facility has been designed to meet every one of the Town's relevant standards for Solar Energy Production Facilities set forth at §§85-813 and 815 of the Town Code.

As identified in Table 11, above, an area variance would be required from the Town of Brookhaven Zoning Board of Appeals for lot width (see §85-563(B)(3) of the Town Code). This variance is related to the existing shape of the subject parcel - - a width of 50 feet is provided at the measured setback distance from Moriches-Middle Island Road. However, the lot width through the portion of the site to be developed is approximately 1,000 feet, which significantly exceeds the minimum lot width requirement of 200 feet. Along either side of the site's frontage on Moriches-Middle Island Road are vacant, naturally-vegetated parcels owned by the Town of Brookhaven, such that the insufficient lot width is not apparent to passers-by, and does not adversely affect the character of the neighborhood. Accordingly, this area variance is not expected to result in any significant adverse zoning impact.

As also identified above, the applicable Land Development Standards of the Town require that 50 percent of the required natural area/landscaping (i.e., 50 percent of 30 percent of the total site area) be provided in the front yard. The proposed site plan would require relief from this requirement at the time of site plan review by the Planning Board (see §85-843(A)(2) and (6)of the Town Code). The configuration of the subject property and presence of vacant, naturally-vegetated property at either side of the 50-foot-wide "flagpole" driveway along Moriches-Middle Island Road, is such that views of the front yard from the public roadway is significantly limited. Therefore, the requested relief is not expected to be perceptible from surrounding areas, and would not result in significant adverse environmental impacts or impacts on the established neighborhood character.

Based on the foregoing, the proposed action is substantially consistent with the bulk and dimensional requirements of the L Industrial 1 zoning district and the applicable land development standards. Moreover, the proposed MISF facility has been designed to meet all of the special permit criteria applicable to Solar Energy Production Facilities. Where relief is sought, no significant adverse zoning impacts are expected to result.

Relevant Comprehensive Land Use Plans

Brookhaven 1996 Comprehensive Land Use Plan

The *1996 Comprehensive Plan* includes several relevant goals and objectives that are intended to guide future development in the Town. As demonstrated below, the proposed Middle Island Solar Farm would achieve a number of the recommendations set forth in this plan, including creating strong economic activity

to provide jobs and an adequate tax base. Specifically, the relevant goals and the consistency of the proposed action therewith include:

- *Create strong economic activity to provide jobs and an adequate tax base.*

  It is expected that implementation of the proposed action would result in the creation of 32 jobs during the construction phase and 6 permanent jobs during the operational phase.

- *Develop innovative land development techniques to insure maintenance of open space.*

  The subject property is located in the vicinity of publicly-owned open space to the north, east and south. Although the proposed action is an industrial development on previously undisturbed land, 39.17± percent of the subject property would remain natural and undisturbed. The areas to remain natural and undisturbed would be contiguous with the surrounding open space.

Finally, the *1996 Comprehensive Plan* designates the subject property as "Planned Development." As noted within the plan, "underutilized or inactive industrially-zoned parcels should be considered for rezoning," and "where large industrial zoned parcels or assemblages of parcels exist, the Town should consider rezoning to a PDD district to promote future flexible development." However, the Town has not rezoned the subject property to PDD in the 18 years since the *1996 Comprehensive Plan* was published. The proposed action is a permitted use within the existing L Industrial 1 zoning district as long as it meets the special permit criteria set forth at §85-815. As discussed in this section, above, the proposed action meets all of the special permit criteria.

The Tri-Hamlet Comprehensive Plan

The relevant recommendations of *The Tri-Hamlet Comprehensive Plan* to the proposed action are presented below, along with analyses of the consistency of the proposed action therewith.

- *The Sunrise Highway L-1 Industrial site should be developed as an Industrial PDD. The Town Board should consider rezoning this site to a PDD. An industrial subdivision is essential in order to conform to the specifications of the Town Code. This site should not be developed in a piecemeal fashion, but should be developed with a high-tech industrial, office, or R&D as desirable uses. Consideration should be given to a coordinated development with the other industrial properties directly to the north, across Grove Drive, in order to provide alternative access to the Sunrise Highway parcel without going through any of the existing residential development. In no case should the industrial development of either of these parcels utilize existing roadways which are developed as*

residential in nature. An alternative use would be a Planned Retirement Community (PRC).

The land between the subject property and Sunrise Highway is zoned PRC, L Industrial 1 and A Residence 1. Much of this land has been acquired by Suffolk County and the Town of Brookhaven, and contains natural wooded areas. As such, coordinated development between the subject property and the properties to the south is not a relevant goal. Notwithstanding same, the proposed action would avoid the use of existing residential roadways. Primary access would be provided from the north at Moriches-Middle Island Road with access at Grove Drive for emergency vehicles only. Thus, the proposed action would be consistent with this recommendation.

- *Similar development criteria and planning tools should be utilized to develop the Breslin property running south from the LIE to Moriches-Middle Island Avenue and the site running south from Moriches-Middle Island Avenue to Grove Street* [this includes the subject property]. *All industrial development should be well buffered (100 feet +) from nearby residential development.*

  It is noted in *The Tri-Hamlet Comprehensive Plan* that "the Town adopted findings on the North Shore Properties GEIS which designated the industrially zoned properties running from the LIE south to Moriches-Middle Island Avenue, to be developed for high-tech industrial/office usage" (p. 29). The property north of the subject property across Moriches-Middle Island Road is currently undeveloped, and there are currently no planned developments. Nonetheless, the proposed MISF would be buffered from the residential development to the west by a minimum 211 feet of natural (wooded) area, and thus would be consistent with this recommendation.

- *An industrial development such as the Stony Brook Tech Park, with naturally vegetated front and side yards, recharge ponds as opposed to standard recharge basins, and the typical uses found in the park, is exactly what this community is looking for. Therefore, to meet these needs, development of these industrial parcels should meet the Hydrogeological Sensitive Zone criteria set forth in the Town Code, i.e., 30% building area, 3-acre average lot size, in addition to retaining 30% or more in natural vegetation, 50 foot natural and/or revegetated front yard buffers and 100 foot + residential buffers. In addition, as per the Town Code, the parking and loading areas should not be located within the front yards but within the side and rear yards, and well screened from adjoining properties.*

  Although the proposed action does not propose a tech park similar to that described above, same has been designed to meet the criteria set forth in the above recommendation. Specifically, the proposed 4,032±-square-foot maintenance building would result in a floor area ratio of 0.10± percent, well below the 30 percent recommendation. In addition, the proposed action

significantly exceeds the recommended minimum lot area of 120,000 square feet for the Hydrogeologic Sensitive Zone, retains 39.17± percent natural area, includes a front yard setback of 265± feet, and a 211-foot minimum vegetated buffer from the residential development to the west (with additional fencing with privacy slats and a row of evergreen screen plantings). The proposed parking and loading spaces would be located at the rear of the maintenance building and would be amply screened from all adjoining properties by the existing natural vegetation to remain around the perimeter of the subject property. Thus, the proposed action would be consistent with this recommendation.

As noted in Section 3.5.2 of this DEIS, industrial development is the recommended land use for the subject property in *The Tri-Hamlet Comprehensive Plan*. Moreover, the proposed action would be consistent with the overall goals and the relevant recommendations of *The Tri-Hamlet Comprehensive Plan* by creating jobs, adding a new tax base, complying with existing zoning, and maintaining a portion of the subject property as open space.

Based on the above, the proposed action is consistent with the relevant recommendations of the *1996 Comprehensive Plan* and *The Tri-Hamlet Comprehensive Plan*.

Interconnection

The conceptual interconnection route identified on the *Conceptual Interconnection Route* plan in Appendix C would establish an interconnection between the subject property and the nearby existing electric substation located at the southern terminus of Weeks Avenue, within existing roadway rights-of-way. Electrical transmission facilities are present throughout the surrounding neighborhood (e.g., along Cranford Boulevard, Moriches-Middle Island Road, along Weeks Avenue, etc. – see photographs in Appendix E), such that the installation of the proposed conceptual interconnection would not introduce a new land use to the area. With respect to land use and zoning, the erection, construction, alteration or maintenance by public utilities of electrical transmission and distribution systems (defined as "essential services" pursuant to §85-1 of the Code of the Town of Brookhaven) is a permitted use in all zoning districts (see §85-893 of the Town Code), such that no adverse zoning impacts are anticipated. However, as previously noted, the final interconnection will be designed and implemented by the utility.

3.5.3 Proposed Mitigation

The proposed action is not expected to result in significant adverse impacts to land use and zoning, such that no mitigation measures are proposed. Nonetheless, in order to minimize potential land use and zoning impacts, the following measures have been incorporated into the proposed action:

- The areas beneath and between the proposed solar panels would be planted with native species, and a natural buffer would be maintained along the perimeter of the subject property. This would result in an overall natural/landscaped area of 93.48± acres, of which 39.30± acres would be undisturbed. The Town's land development standards for industrial properties greater than five acres requires 30 percent of the site to be kept as natural area/landscaping. The special permit criteria for solar energy production facilities are more restrictive in requiring 35 percent of the site to remain undisturbed. In complying with this special permit criterion, the proposed action would have a lesser impact upon the existing land coverage as opposed to an as-of-right L Industrial 1 development.

- The proposed action would require a variance from the Town of Brookhaven Zoning Board of Appeals for lot width, due to the existing flag lot shape of the subject property. However, the location and dimensions of the subject property would mitigate the potential impacts associated with not meeting these requirements. Specifically, the dimensional criteria requires a minimum lot width of 200 feet. The only portion of the subject property that does not meet this requirement is the 50±-foot frontage on Moriches-Middle Island Road, which is surrounded on the east and west by wooded land. The remainder of the subject property is at least 1,000± feet wide, consistent with the 200-foot lot width requirement.

- The subject property is required by the land development standards to provide 9.42± acres of landscaping in the front yard. The proposed action would require relief of this requirement from the Planning Board at the time of site plan review, due to the size and shape of the subject property. However, it is noted that wooded property owned by the Town of Brookhaven exists along the front yard of the subject property, providing a buffer along Moriches-Middle Island Road such that the proposed land use would not be significantly noticeable to passing traffic. Further, an additional 50-foot natural buffer would be maintained on-site. [57]

[57] The minimum 50' buffer in this area would exceed the minimum 25-foot buffer requirement applicable to industrial properties in accordance with §85-815(D)(4).

- The special permit criteria for solar energy production facilities requires a 75-foot minimum vegetated buffer and 100-foot setback adjacent to residential properties. The proposed natural buffer adjacent to the residential properties along Cranford Boulevard is 211-to-500 feet in depth, and additional evergreen screening would be provided along the proposed internal western fence line in order to mitigate potential impacts to these residential properties.

- The proposed action is designed to be consistent with the goals and objectives of the Town of Brookhaven's *1996 Comprehensive Plan* and *Tri-Hamlet Comprehensive Plan*.

3.6 Transportation

3.6.1 Existing Conditions

The subject property is currently undeveloped and does not generate traffic, nor are any formal access points or parking areas established at the site. The property has frontage along Moriches-Middle Island Road to the north and Cranford Boulevard to the west. The frontage along Moriches-Middle Island Road is limited to an 86±-foot stretch (the rest of the northern property boundary is set back approximately 175 feet, separated from Moriches-Middle Island Road by Town of Brookhaven-owned property). The road frontage along Cranford Boulevard consists of six separate 50±-foot segments at the property's "finger" extensions.

3.6.2 Potential Impacts

Construction Phase

Construction traffic associated with the proposed action will include trucks and equipment for performing operations on the site, as well as the delivery and removal of materials, and worker's vehicles. The number and types of construction vehicles will vary depending on the phase of construction and the particular operations underway at any given time.

Construction activities during the 12±-month construction phase would be scheduled to occur between 7:30 AM and 6:00 PM, Monday through Saturday. During this period, it is expected that routine traffic would include:

- Equipment/material deliveries: approximately 4-6 per day
- Coffee truck: 2 per day
- Employee vehicles: 15 cars per day

The anticipated construction vehicles include:

- 2-3 excavators
- 4 trenchers
- 1 dump truck

All construction vehicles will arrive and depart via Moriches-Middle Island Road. A construction entrance will be established on Moriches-Middle Island Road, as

depicted on the *Clearing and Erosion & Sediment Control Plan* (see Appendix C). The final design of the construction entrance will be determined in consultation with the Town of Brookhaven.

Materials deliveries will be scheduled to occur at off-peak hours, so as not to coincide with peak commuter traffic times, to the extent practicable. Nonetheless, the total number of vehicles travelling to and from the site (i.e., approximately 30 vehicles per day) is not substantial, and is not expected to result in a significant adverse impact upon traffic conditions during the construction phase.

Operational Phase

Upon completion of construction of the proposed solar farm, primary site access will consist of an asphalt driveway, transitioning to gravel, extending from the south side of Moriches-Middle Island Road. One emergency access point will be provided near the southwestern portion of the subject property, connecting to Grove Drive. A gravel parking area, adjacent to the proposed maintenance and operations building on the northeast portion of the subject property, will be provided to accommodate site operations and maintenance staff (up to six employees to be present on-site at any given time). This parking area would have 17 parking spaces (including 1 handicapped space) and 1 loading space.

As site occupancy would be low (e.g., up to six employees at any given time), the number of vehicular trips to-and-from the subject property during the operational phase would be nominal. These trips would coincide with the work day for operations and maintenance.

As noted above, emergency access would be provided via connection to Grove Drive (see *Proposed Site Plan* in Appendix C). The emergency access route would be locked with a double set of crash gates, and only authorized personnel (e.g., first responders) would have access. Continuous site security monitoring would further restrict unauthorized use of the proposed emergency access drive.

Overall, the proposed action is expected to result in a minimal increase to traffic during the operational phase. As such, no significant adverse impacts are expected.

Interconnection

The conceptual interconnection would extend from the north side of the subject property east to an existing substation (see *Conceptual Interconnection Route* plan in Appendix C). Implementation of this interconnection route would locate improvements along the Moriches-Middle Island Road and Weeks Avenue corridors, between the northern extent of the subject property and the existing substation at the southern extent of Weeks Avenue. Other than construction-related traffic, which

would be temporary and would cease upon project completion, there would be no vehicular trip generation on area roadways as a result of the conceptual interconnection. Improvements associated with the interconnection may result in traffic impacts while improvements are undertaken within the Moriches-Middle Island Road and/or the Weeks Avenue roadway rights-of-way. Such construction-related impacts are expected to be of relatively short duration, and would cease upon project completion. Therefore, no significant adverse transportation impacts are anticipated.

3.6.3 Proposed Mitigation

The proposed action is not expected to result in any significant adverse transportation-related impacts. As such, no mitigation measures are proposed. Nonetheless, the applicant intends to schedule materials deliveries to occur at off-peak hours (during the construction phase), so as not to coincide with peak commuter traffic times, to the extent practicable.

3.7 Aesthetics, Visual Resources and Noise

3.7.1 Existing Conditions

Aesthetics and Visual Resources

Views of the subject property from surrounding areas are significantly limited by the minimal street frontage, and due to presence of undeveloped, vacant properties to the east and south. A portion of the subject property is visible at the site's 86± feet of road frontage on Moriches-Middle Island Road (to the north). Views toward the site from elsewhere along this roadway are obscured by the Town-owned properties that exist at either side of the site's frontage, which are wooded and vacant and provide a visual buffer of approximately 175 feet. The site has six segments of frontage along Cranford Boulevard (to the west) measuring approximately 50 feet each. As such, portions of the subject property are visible from Cranford Boulevard, and from the residential and undeveloped properties along the east side of Cranford Boulevard. There is an informal trail within the undeveloped, publicly-owned property to the south from which the subject property is visible. Views from these vantage points are reflective of the subject property's undeveloped, wooded character, and include only wooded areas. The area bordering the subject property to the east is also publicly-owned, wooded land, which provides an extensive visual buffer between the subject property and the predominantly residential uses along the west side of Weeks Avenue.

Photographs documenting the visual character of the subject property from within, and from publicly accessible vantage points, are provided in Appendix E.

Noise

Under existing conditions, the subject property is undeveloped. Thus, no significant sources of noise are present at the subject property, nor are any sensitive noise receptors present. The nearest sensitive receptors are the single-family residences along the east side of Cranford Boulevard, to the west of the subject property.

3.7.2 Potential Impacts

Aesthetics and Visual Resources

The proposed development of a solar PV farm (and associated improvements) at the subject property is designed such that the perimeter of the subject property is proposed to remain natural (i.e., wooded), minimizing the potential for the alteration of views from surrounding areas. Specifically, along the northern property boundary, a 50-foot minimum natural buffer is proposed (excluding the main driveway connecting to Moriches-Middle Island Road), adjacent to the existing 175±-foot-deep properties owned by the Town of Brookhaven that further separate the proposed solar PV farm from the Moriches-Middle Island Road corridor. A 77-foot (minimum) natural buffer is proposed along the eastern property boundary, adjacent to publicly-owned natural areas. Along the southern property boundary, adjacent to wooded vacant land, a 220-foot minimum natural buffer is proposed. Finally, along the western property boundary, where the subject property abuts single-family residential uses, recharge basins, vacant land, and Cranford Boulevard, a natural buffer 211 feet in depth is proposed (increasing to approximately 500 feet in places).

Based on the above, the portions of the subject property to be developed would be separated by wooded areas a minimum of 225 feet in depth along Moriches-Middle Island Road, 211 feet along the residentially-developed properties to the west, and approximately 500 feet from Cranford Boulevard (other adjacent properties are vacant and undeveloped). These proposed natural buffers will serve as visual screening from surrounding properties, thus limiting impacts to the aesthetic character of the surrounding area, including the residences to the west and the informal trail located within the off-site vacant land to the south.

The western fence line surrounding the proposed limits of development on the site extends north-to-south for a distance of approximately 3,520 feet. Notwithstanding that the nearest residences (i.e., residences along Cranford Boulevard) would be separated from the proposed solar PV facility by a minimum 211-foot on-site wooded buffer (and any wooded or landscaped areas that may exist on the adjacent residential properties), the applicant proposes to install evergreen plantings along the exterior of the western fence (see *Planting Plan* in Appendix C) and privacy slats within the fence. The supplemental screen planting would further obscure the proposed solar arrays and other site improvements from view, thereby minimizing the potential for adverse aesthetic impacts upon the existing residences. Should there be any visibility through the 211-foot (minimum) wooded buffer, the evergreen plantings would screen the solar facility, even in winter months.

The proposed action includes the establishment of an emergency access connection to Grove Drive at the southwestern portion of the subject property (see *Proposed Site*

Plan in Appendix C). Associated clearing of vegetation to establish the emergency access may result in a minor visual impact upon the immediate adjoining properties (i.e., at the southern terminus of Cranford Boulevard, east side). It is noted, however, that the emergency access clearing would be limited to a 20-foot-wide span, and existing wooded areas along either side of the drive would be retained to the maximum extent practicable.

With respect to outdoor lighting, the proposed action includes the installation of approximately 94 LED light fixtures (see *Middle Island Solar Farm – LED Cutoff Lighting* in Appendix F). The fixtures would be downward-facing, and all fixtures along the outer gravel drives (i.e., the "Type B" fixtures) would be fitted with shields to direct all light toward the center of the site. As shown on the *Middle Island Solar Farm – LED Cutoff Lighting*, an analysis of lighting levels was performed by the project engineer to determine the anticipated light levels at all developed portions of the property and the property boundaries, based on the specific characteristics of the proposed lighting fixtures. The photometric analysis indicates that light from these fixtures would not reach beyond the natural buffer surrounding the perimeter of the subject property, as indicated by a value of zero foot-candles along the entire site perimeter. Therefore, there would be no impact to adjacent properties due to lighting upon implementation of the proposed action.

Interconnection

It should be noted that the interconnection of the proposed facility to the LIPA utility grid, which would be designed and implemented by NYISO/PSEG Long Island, may have the potential to result in aesthetic impacts. The specific location and design of such interconnection cannot be determined at this time. Implementation of this interconnection route would locate improvements along the Moriches-Middle Island Road and Weeks Avenue corridors, between the northern extent of the subject property and the existing substation at the southern extent of Weeks Avenue. It is expected that this interconnection may result in the installation of additional utility cables and/or supports along the route. Such improvements would be visible to travelers of the aforementioned roadways, and from the developed properties that have frontage along same. However, it is noted that overhead utility cables and supports are an established element of the visual environment along these corridors (see Photograph Nos. 13, 14, 19 and 21 in Appendix E), such that the impacts of such improvements (based on final design by others) would be incremental to the existing conditions. Overall, significant adverse visual impacts are not expected to result from the conceptual interconnection.

Glare

The Federal Aviation Administration's (FAA) *Technical Guidance for Evaluating Selected Solar Technologies on Airports* (November 2010) was reviewed to determine the potential for the proposed action to produce glare impacts on the operations of the nearby Town of Brookhaven Calabro Airport. This report includes several case

studies from airports that have implemented solar energy projects, as well as guidance for consultation with the FAA with respect to off-airport solar projects.

The technical guidance notes that solar PV panels "are designed to maximize absorption and minimize reflection to increase electricity production efficiency." In fact, while vegetated surfaces reflect approximately 50 percent of sunlight, PV solar panels reflect as little as 2 percent of sunlight. Furthermore, none of the airport case studies indicated "serious complaints from pilots or air traffic control due to glare impacts from existing airport solar PV installations." Based on the airports studied, this report concludes,

> *…either significant glare is not occurring during times of operation or if glare is occurring, it is not a negative effect and a minor is* [sic] *part of the landscape to which pilots and tower personnel are exposed.*

The project site is located east of the Town of Brookhaven Calabro Airport's runway and well outside of the aircraft approach surfaces and, therefore, will not penetrate any restricted air space. Also, the solar panels are engineered to be light absorptive and, therefore, do not pose a light reflective or glare concern to pilots.

With respect to off-airport solar projects, the technical guidance indicates that there are "no defined thresholds for project size, type, or distance from the airport… that automatically trigger FAA airspace review." However, as the proposed action consists of light-absorptive solar PV technology, the tallest proposed structure is 24± feet (the maintenance building), and the proposed facility would be located approximately 0.5-to-1-mile from the runways of the Brookhaven Calabro airport at its closest point, it is unlikely that FAA airspace review of the proposed action would be necessary.

Based on the above, no significant adverse impacts to aesthetics and visual resources are anticipated as a result of the proposed action.

Noise

The Town of Brookhaven adopted Chapter 50 – Noise Control to, "prevent excessive sound that may jeopardize the health, welfare or safety of the citizens or degrade the quality of life" in the Town (see §50-1(A) of the Town Code). Relevant restrictions are set forth within the Town Code to prevent noise impacts from construction activities, as well as operations.

In accordance with the relevant provisions of Chapter 50, construction activities would not be undertaken between the hours of 6:00 p.m. and 7:00 a.m. the following day; or on weekends or legal holidays. Proposed construction activities may generate sound in connection with clearing, earth moving, construction of the proposed

maintenance building, etc. However, these impacts would be of relatively short duration, and would cease upon project completion. Moreover, construction activities would not occur outside of the proposed limits of clearing, which incorporate a minimum 211-to-500-foot densely vegetated buffer from the nearest sensitive receptors (i.e., residential uses along the western site boundary).

The level of activity at the subject property would be extremely low, and there would be no substantial noise sources established at the site as a result of the proposed action. There are no moving parts or motors associated with operation of the proposed solar panels. Occasional maintenance activities would be conducted during non-sensitive time periods, only. Additionally, as indicated above, the proposed facility would be significantly buffered from the nearest sensitive receptor. Overall, no significant adverse noise impacts are expected to result from implementation of the proposed action.

Interconnection

With the exception of temporary construction noise, which would cease upon project completion, the interconnection is not expected to include the establishment of any new significant noise sources, such that adverse noise impacts would not be anticipated.

3.7.3 Proposed Mitigation

No significant adverse aesthetic, visual resource or noise impacts are expected to result from implementation of the proposed action. Various mitigation measures have been incorporated into the design of the proposed MISF to minimize or preclude potential impacts, including:

- Significant natural buffers will be retained along site perimeters to obscure views of the proposed facility.
- Evergreen screen plantings will be installed along the length of the western project limit, and privacy slats would be installed in the adjacent fence. Should there be any visibility through the 211-foot wooded buffer, the evergreen plantings would screen the solar facility, even in winter months.
- Construction activities would not be undertaken during sensitive time periods.
- Significant natural buffers would also minimize the potential for noise impacts.

3.8 Energy

3.8.1 Existing Conditions

Energy Use/Generation

As the subject property is presently vacant and undeveloped, no energy is currently utilized or generated.

Energy Plans and Initiatives

Provided below is a summary of identified state, town and local utility plans as they pertain to the proposed project.

Town of Brookhaven Clean Energy Action Plan for 2006 (February 2006)

In order to provide information regarding the energy needs of the Town of Brookhaven, consultations were undertaken with the Town's Department of Planning and Environment. The Department of Planning and Environment indicated that the *Clean Energy Action Plan for 2006* (*CEA*) and Town Resolution 9-2006, adopting the *CEA* illustrate the Town's goals with respect to energy needs. It should be noted that the Town hired a consultant who is currently preparing an updated energy plan addressing renewable energy and energy efficiency initiatives for the Town. However, at this time, the plan is not available for review. Objectives contained in the aforementioned *CEA* and associated Town Resolution that are relevant to the proposed project are presented below:

- To implement initiatives that utilize clean energy within the Town.
- To utilize available technologies to achieve critical goals of reducing air pollution, improving energy efficiency, fighting global climate change, increasing energy independence, and reducing long term operating costs associated with energy use.
- To identify municipal facilities to target for energy audits and renewable energy generation.
- To evaluate which municipal facility might be best suited for an installation of solar panels and prepare applications for funding or a solar project.

LIPA Electric Resource Plan 2010-2020 (February 2010)

LIPA' *Electric Resource Plan 2010-2020* (the "*Electric Resource Plan*") was prepared to provide "…the analytical support and policy framework necessary to enable LIPA to continue providing safe and reliable electricity service to its customers at stable costs." The *Electric Resource Plan* notes that LIPA projects a need for 200 MW of new electric generation or efficiency and demand response resources in 2020 to meet demand in the service area, which includes the subject property. The plan further states that LIPA may need to select new generation with acceptable environmental impacts, as LIPA is dedicated to promoting a healthy environment and will need to meet the anticipated growth in electricity demand.

The LIPA Board of Trustees passed a resolution on February 25, 2010, adopting the *Electric Resource Plan*. Within the resolution, five strategic objectives of the plan are identified, as follows:

- Meet the reliability requirements established by the NYS Reliability Council and the NY Independent System Operator.
- Improve operating efficiencies and attract funding to reduce customer bills and support economic development on Long Island.
- Pursue cost-effective energy efficiency programs and assistance to reduce electric use.
- Pursue cost-effective renewable energy resources.
- Pursue the reduction of greenhouse gas emissions.

The plan indicates initiatives LIPA is currently undertaking, or is planning to undertake, to meet its goals. Those relevant to the proposed project are listed below.

- Continue efforts to further diversify LIPA's generation portfolio toward cleaner non-combustion based energy resources, including renewable energy, etc.
- Reduce the land, water, and air pollutant impacts associated with power generation and operation of the LIPA bulk transmission and distribution systems, implementing cost effective policies, practices, and technologies for preserving and protecting the environment.

As is detailed in the *Electric Resource Plan*, in an effort to diversify its portfolio of electricity sources, LIPA contracted with various solar facilities for electricity purchase agreements. According to the plan, purchases from renewable sources, including solar, assist in LIPA's goal to lessen air emissions related to its contracted power supply resources.

LIPA's power planning process includes balancing long-term forecasts of customer electricity requirements with the strategic objectives mentioned above. To meet its goal to pursue renewable energy, consistent with the New York State goal of 30%

renewable energy by 2015, LIPA intends to procure its share of renewable energy resources to help the Sate achieve its goal. In order to address greenhouse gas emissions resulting from the generation of electricity it buys, the *Electric Resource Plan* indicates that LIPA plans to take cost-effective actions to reduce CO_2 emissions 20 percent from 2005 levels by the year 2020.

The Planning for the *Electric Resource Plan* considered almost one hundred different alternative technologies for inclusion in the ultimate plan. Technologies were grouped into resource types, such as efficiency, supply, renewable, repowering, transmission and retirement options. The renewable options selected for inclusion are solar pioneer (typically private residential installations), solar installation, photovoltaic roof, on-shore wind, offshore wind and off-island renewable energy.

In addition to meeting its strategic objectives, the *Electric Resource Plan* aims to promote a healthy environment, which the plan states is supported by environmental initiatives, including an investment in utility scale renewable energy projects.

PSEG Long Island Utility 2.0 Long Range Plan Update Document (2014)

PSEG Long Island's *Utility 2.0 Long Range Plan* (*Utility 2.0 Update*) was submitted in July 2014 and proposed "investments in direct load control demand response, energy efficiency, distributed generation, advanced metering infrastructure and other initiatives to enhance the customer experience, contribute to clean energy policy goals, and cost-effectively defer the need for power resources and, in some cases, transmission and distribution infrastructure. The *Utility 2.0 Update* reflects stakeholder feedback and discussions with LIPA and the New York State Department of Public Service. The *Utility 2.0 Update* notes that the existing renewable energy programs make progress toward clean energy and environmental goals, but the *Utility 2.0 Update* expands those offerings. Specifically, the plan states that PSEG is prepared to invest in utility scale solar PV projects. The program design would target solar installations that contribute a greater share of their output during peak load conditions in the summer between 2:00 and 8:00 p.m.

2014 Draft New York State Energy Plan (2014)

The 2014 Draft New York State Energy Plan (*NYS Energy Plan*) provides key initiatives and actionable policy recommendations "to guide the State's efforts to advance new energy technologies that foster an innovative clean energy economy. The *NYS Energy Plan* states that it will track progress to reduce the intensity of its carbon emissions from the energy sector by 50 percent below 2010 levels by 2030, which will put the State on a pathway to achieve an 80 percent reduction in total emissions by 2050.

The *NYS Energy Plan* indicates that an important need for the future is to attract greater private sector financing for clean energy technologies. The State is establishing the New York Green Bank to mobilize private sector capital to invest in New York's clean energy economy. The *NYS Energy Plan* also directs the State to coordinate its renewable energy policies to incentivize further development of renewable sources, such as solar, to improve portfolio diversity and contribute to the State's environmental goals.

The *NYS Energy Plan* notes that the State has already implemented various initiatives that are helping the State to meet its goal for a cleaner energy system. Those relevant to the proposed project are included, below.

- New York Energy Highway – an initiative to upgrade and modernize New York's electric grid, including moving power from where it is generated to where it is used.
- Regional Greenhouse Gas Initiative – a cooperative effort among Northeast and Mid-Atlantic states, which has capped emissions from the power sector.
- Renewable Portfolio Standard – A policy to increase the amount of electric energy that comes from renewable sources, such as solar, to 30 percent by 2015.

In order to measure the effectiveness of the State Energy Plan, the State will track metrics to determine how the State is progressing in achieving its vision of empowered customers and a clean, reliable, and affordable energy system. Those relevant to the proposed project are identified below.

- Increase renewable energy deployment (MW, MWh, dollars/resource)
- Increase leverage ratio of private capital to public investment (dollars of private investment/dollars of public investment)
- Increase New York energy dollars retained in the State
- Increase clean energy business activity, such as number of new start-ups
- Decrease greenhouse gas emissions in New York
- Reduce the carbon intensity of the energy system (MWh/CO_2)
- Reduce health and economic impacts associated with air pollution from fossil fuel use in the energy sector

The *NYS Energy Plan* indicates that based on State Energy Plan electricity modeling, it is projected that in 2020, electricity displaced by new renewable resources will be 30 percent imports from other states, and thus, use of renewable resources can increase New York energy dollars that remain in-state. It also notes that increasing the amount of energy generated by renewable resources will, in general, decrease the health risks associated with energy use, as many renewable resources do not emit air pollutants at the site of electricity generation. Wind and solar resources and noted as providing the greatest potential for growth in contributing to New York's energy needs.

Solar PV in New York is identified in the *NYS Energy Plan* as having grown from less than 1 MW in 2002 to 60 MW in 2012, with a cumulative capacity of approximately 180 MW by the end of 2011. Approximately 30 percent of the capacity is installed on Long Island. Long Island is noted as being an advantageous location for the technology because of its southernmost location, high electricity rates and availability of customer incentives.

3.8.2 Potential Impacts

Energy Use/Generation

As discussed throughout this DEIS, the proposed project consists of the development of a solar PV energy farm. As a renewable, "green" source of energy, the completed project will benefit the Town of Brookhaven area by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, the facility will be interconnected to the LIPA power grid supplying 19.6 MW of electricity to the system for use by LIPA's customers. In order to estimate the total annual megawatt hours (MWh) the proposed solar farm would generate, the United States Energy Information Administration's (U.S. EIA) 2012 annual capacity factor for utility scale solar photovoltaic generators (the most recent final year available)[58] of 20.3 percent was used. It should be noted that the U.S. EIA has indicated that solar capacity factors may have been slightly underestimated prior to August 2014, and the EIA is in the process of revising those factors prior to August 2014.[59] However, this DEIS will use the 2012 factor, as revised annual factors are not currently available, and the proposed facility could potentially generate more electricity on an annual basis than is estimated in this DEIS. According to the U.S. EIA, the average household in New York State consumes 6,578 kilowatt-hours (kWh), or approximately 6.6 MWh annually,[60] and, therefore, the proposed project would generate sufficient electricity to power approximately 5,281 homes. Based on the 2014 generation of the solar PV farm at Brookhaven National Laboratory and other preliminary design projections, the applicant anticipates that the proposed MISF would generate between 38,000 to 44,000 MWh annually,[61] which would be enough electricity to power up to approximately 6,666 homes.

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[58] United States Energy Information Administration, *Table 6.7.b* from *Electric Power Monthly with Data from May 2014*, July 2014 (accessed December 2014); available from http://www.eia.gov/electricity/monthly/current_year/july2014.pdf.

[59] United States Energy Information Administration, *Table 6.7.b* from *Electric Power Monthly with Data from August 2014*, October 2014 (accessed December 2014); available from http://www.eia.gov/electricity/monthly/current_year/october2014.pdf.

[60] United States Energy Information Administration, *Table CE2.2* from *2009 Residential Energy Consumption Survey (RECS)* (accessed December 2014); available from http://www.eia.gov/consumption/residential/data/2009/index.cfm?view=consumption.

[61] The specific technology to be implemented at the subject property has not yet been selected, and will be determined by the applicant based on the latest technology available at the time of final design. However, the applicant proposes to construct a state-of-the-art facility, with higher-rated solar PV panels and with significantly lower loss factors than many other solar PV facilities, such that the actual output is expected to be higher than the average published within the U.S. EIA's 2012 report.

The solar arrays would be interconnected, ground mounted, fixed position, photovoltaic solar collection panels. The arrays would be connected to a metal frame supported on piles for stability. The piles would be either helical steel piles or pre-cast concrete piles, depending on results of future soil sampling. The array strings would be oriented east to west at an angle that faces the sun. The low end of an array will be approximately eight feet agl and the high end of an array will be approximately 17 feet agl.

The array strings would be parallel to one another, each separated by a 12-foot-wide grassed (pervious) pathway. Access to the arrays would be via a 20-foot-wide perimeter roadway running around the entire site at the edge of the array field, as well as a 20-foot-wide centerline roadway separating two banks of arrays. Connection to the LIPA grid for electrical service would be necessary for power required for activities occurring in the Maintenance & Operations building. In addition, NYISO/PSEG Long Island is responsible for determining and installing the power line route to the site for collection of power generated by the proposed facility. At this time a route has not been identified, however, NYISO/PSEG Long Island will conduct its own environmental review of the connection and the route that are ultimately chosen.

The solar panels would require little maintenance as no moving parts or motors are associated with their operation. Periodically, some light cleaning of the panels may need to be conducted. This would be accomplished using a truck mounted wash station. The proposed project would require a connection to an existing substation, which would need to be updated in order to accommodate the increased electricity generated.

It is expected that any power purchase agreement between the applicant and another entity to operate the solar PV arrays would be for 20 years. At the end of 20 years:

- The agreement could be extended for an additional time period.
- The agreement could end as scheduled, whereupon the solar project could then be transferred to another entity to operate or upgrade.
- The agreement could end as scheduled, whereupon the solar facility would be dismantled and the property would be restored or apply for modified use within zoning regulations.

The proposed solar PV arrays have an estimated lifetime of approximately 40 years. At the end of operational life, or substantially reduced efficiency, the arrays would be dismantled and disposed of as part of a planned decommissioning process in accordance with the requirements of §85-816 of the Town zoning code, which would ensure the following:

- Removal of aboveground and belowground equipment, structures and foundations (including support structures, fencing and associated electrical hardware (wiring, conduit, towers, etc.).
- Restoration of the surface grade and soil after removal of equipment.
- Re-vegetation of restored soil areas with native seed mixes, excluding any invasive species.
- Completion of site restoration work within a time frame specified in the decommissioning plan.

Upon implementation of the proposed project, the solar facility would generate 19.6 MW of energy that would be transmitted to the grid and be available to existing LIPA customers, thereby assisting the utility in meeting demand. Moreover, as indicated in LIPA's *Electric Resource Plan*, above, the electric system will require an additional 200 MW of electric generation in 2020 to meet customer demand in the service area. Therefore, it is likely that the electricity generated by the proposed project would help meet this identified need, and would not encourage further development. Should there be no need for additional generation, the proposed facility would continue to help accomplish the various goals of the *NYS Energy Plan* for increasing renewable energy deployment, decreasing greenhouse gas emissions, etc., as discussed below.

Energy Plans and Initiatives

This section of the DEIS provides a consistency analysis with those energy plans and initiatives described in Section 3.8.1, above.

Clean Energy Action Plan for 2006 (February 2006)

The *CEA* and Town Resolution 9-2006 demonstrate the Town's recognition of the need to deploy less carbon-intense energy facilities and its desire to pursue renewable energy and energy efficiency initiatives. While these documents include objectives that were directed at Town actions, the proposed project would be consistent with the Town's intent for increased use of clean energy within the Town. As the proposed solar farm is a utility-scale facility to be located within the Town that would generate 19.6 MW electricity from a renewable source, it would further the Town's goals of helping to reduce air pollution and fight global climate change. While the proposed solar farm would not be a municipal facility, it would involve siting a solar installation within the Town. In addition, the proposed project would increase energy independence as it would utilize a clean, domestic source of energy to produce electricity. Based on the above analysis, the proposed project would be consistent with the intent of the *CEA* and the associated Town Resolution.

LIPA Electric Resource Plan 2010-2020 (February 2010)

As summarized above, the *Electric Resource Plan* was prepared to demonstrate LIPA's strategy to provide reliable electric service to its customers through 2020. As discussed previously in this section, the *Electric Resource Plan* indicates that LIPA projected a need for 200 MW of new electric generation or efficiency and demand response resources in 2020 to meet demand in the service area. As the proposed project would result in 19.6 MW of new electricity generation from a PV solar facility, which does not involve greenhouse gas emissions, it would be consistent with this identified need. The plan further states that LIPA seeks new sources of generation with acceptable environmental impacts. As a utility-scale renewable energy project, the proposed solar farm would aid in increasing the electric grid's share of renewable energy resources and in reducing CO_2 emissions toward its goal of a 20 percent reduction below 2005 levels by 2020. Four of LIPA's strategic goals are relevant to the proposed project and a consistency analysis follows.

- Meet the reliability requirements established by the NYS Reliability Council and the NY Independent System Operator.

  As the proposed project would add 19.6 MW of new electricity generation to the system, it would contribute toward the reliability of electric service for the utility's customers, and, therefore, be consistent with this goal.

- Improve operating efficiencies and attract funding to reduce customer bills and support economic development on Long Island.

  The proposed project would locate a clean electricity generating facility on Long Island, thereby creating jobs and contributing to economic development on Long Island, in keeping with the intent of this goal.

- Pursue cost-effective renewable energy resources.

  The proposed solar farm would produce electricity generation from PV solar panels, a renewable energy source, and therefore be consistent with this goal.

- Pursue the reduction of greenhouse gas emissions.

  PV solar technology does not involve the combustion of greenhouse gas-emitting fuels. Therefore, the proposed project would add to the capacity of the electric system, without a related increase in greenhouse gas emissions, in keeping with this goal.

Additional initiatives indicated in the *Electric Resource Plan* include:

- Continue efforts to further diversify LIPA's generation portfolio toward cleaner non-combustion based energy resources, including renewable energy, etc.

  As the proposed project would add 19.6 MW of electricity generated by PV solar panels, it would assist in diversifying the utility's generation portfolio with electricity from a renewable resource.

- Reduce the land, water, and air pollutant impacts associated with power generation and operation of the LIPA bulk transmission and distribution systems, implementing cost effective policies, practices, and technologies for preserving and protecting the environment.

  The proposed project would result in the generation of 19.6 MW of electricity to be transmitted to the existing grid. As PV solar technology does not involve greenhouse gas emissions, it would not result in air pollution. Further, it would not result in significant impacts on land or water resources. As such, the proposed project is in keeping with this goal.

PSEG Long Island Utility 2.0 Long Range Plan Update Document (2014)

The proposed project is a utility-scale solar PV project, which, as the *Utility 2.0 Update* indicates, is the type of project PSEG is looking to invest in order to further progress toward clean energy and environmental goals. PSEG specifically would like to target solar installations that contribute a greater share of their output during peak load conditions in the summer between 2:00 and 8:00 p.m. According to a National Renewable Energy Laboratory study, peak solar output strongly correlates to peak afternoon electricity demand loads, resulting in higher capacity factors during this time period.[62] Therefore, it is anticipated that the proposed solar PV facility would be consistent with PSEG's objective for greater electricity output during peak load conditions.

2014 Draft New York State Energy Plan (2014)

As a clean energy technology, the proposed PV solar farm would be a step toward the State's goal to advance the use of such technologies in New York. Further, by adding 19.6 MW of electricity from a non-carbon emitting generating source, the proposed project would help to reduce the intensity of carbon emissions in the State's energy sector, in keeping with the stated goal in the *NYS Energy Plan* to such

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[62] Augustine, C., et. al., *Renewable Electricity Generation and Storage Technologies, Vol. 2 of Renewable Electricity Futures Study* (Golden, CO: National Renewable Energy Laboratory, 2012); available at http://www.nrel.gov/docs/fy12osti/52409-2.pdf.

emissions by 50 percent below 2010 levels by 2030, and ultimately to achieve an 80 percent reduction in total emissions by 2050.

The *NYS Energy Plan* identified metrics that it will track to measure progress toward its goal of empowered customers and a clean, reliable, and affordable energy system A consistency analysis of the proposed project with same is provide below.

- Increase renewable energy deployment (MW, MWh, $/resource)

  The proposed project involves the deployment of a utility-scale PV solar farm that would add 19.6 MW of capacity to the electric system, in keeping with this goal.

- Increase leverage ratio of private capital to public investment ($ private investment/$ public investment)

  The proposed project involves a significant private investment, and would not utilize public resources, in keeping with this goal.

- Increase New York energy dollars retained in the State

  As stated in the NYS Energy Plan, it is projected that in 2020, electricity displaced by new renewable resources will be 30 percent imports from other states, and thus, use of renewable resources can increase New York energy dollars that remain in-state. The proposed PV solar farm would be located on Long Island and generate electricity from a renewable resource, and, therefore, would keep State energy dollars in-state, in keeping with this goal.

- Increase clean energy business activity, such as number of new start-ups

  The applicant is proposing to install a utility-scale PV solar farm, thereby increasing clean energy business activity, in keeping with the spirit of this goal.

- Decrease greenhouse gas emissions in New York

  The proposed project could obviate the need for electricity generation from sources that cause greenhouse gas emissions, and thus, would assist in decreasing greenhouse gas emissions in New York, in keeping with this goal.

- Reduce the carbon intensity of the energy system (MWh/CO2)

  By adding 19.6 MW of electric capacity to the system, without a related increase in greenhouse gas emissions, the proposed project would be consistent with this goal.

- Reduce health and economic impacts associated with air pollution from fossil fuel use in the energy sector.

As previously stated, the proposed project would result in electricity generation from a non-greenhouse gas-emitting source. Therefore, it would not result in air pollution or related health and economic impacts, and would be consistent with this goal.

3.8.3 Proposed Mitigation

No significant adverse impacts to energy have been identified, such that no mitigation measures are proposed. Moreover, the proposed project would result in positive energy impacts, including the generation of 19.6 MW of energy from a renewable source (reducing reliance on fossil fuels), and an increase in clean energy business activity within the Town.

4.0

Other Required Sections

4.1 Cumulative Impacts

Cumulative Impacts are the potential impacts of a proposed action taken in conjunction with those of other active or anticipated nearby developments projects. Cumulative impacts are analyzed with other pending applications in the area, as identified in consultation with the Town of Brookhaven Planning Department, and in the Positive Declaration which includes references to a public scoping session previously undertaken by the applicant and the Town of Brookhaven on a nearly identical proposal. Below is a discussion of the other planned development projects in the area.

4.1.1 Brookhaven National Laboratory (BNL) Solar Farm

The BNL Solar Farm (also known as the Long Island Solar Farm [LISF]) is an existing 32-megawatt solar PV facility built through a collaboration including BP Solar, the Long Island Power Authority (LIPA), and the Department of Energy. The LISF, located on the Brookhaven National Laboratory site in Upton, began delivering power to the LIPA grid in November 2011, and is helping New York State meet its clean energy and carbon reduction goals.[63]

The LISF is located on approximately 200 acres, of which approximately 135 acres were cleared to accommodate the proposed solar farm (other portions of the site were previously cleared). This represents approximately three percent of the overall Brookhaven National Lab property, and only four percent of that property's forested area. Accordingly, thousands of acres of natural habitat remain on that property following the implementation of LISF. Moreover, thousands more acres of natural area exist to the north, east, south and west of the BNL property, between the subject

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[63] http://www.bnl.gov/SET/LISF.php/ accessed on December 24, 2014

property and the BNL property, and within areas east and south of the subject property. Accordingly, the clearing that occurred at the BNL site and the proposed clearing of 61.03± acres would not be expected to have a significant adverse cumulative effect on ecological resources, including any rare species.

Due to the separation distance between the subject property and the BNL property, and the extremely low intensity of the solar farm uses at each property, no other cumulative environmental impacts are expected to result (e.g., impacts on soils, water, traffic, noise, or visual resources). Cumulative positive impacts would be expected to result from the increased availability of a renewable energy source, including, but not limited to, impacts on air quality, as the renewable energy source replaces the need to generate electricity by traditional power plants that burn fossil fuels.

4.1.2 sPower Solar Farm

The sPower Solar Farm (sPower) is located on the south side of Route 25A, north of Cooper Street and approximately 300 feet east of Miller Avenue in the hamlet of Shoreham. Construction of the sPower facility recently commenced in December 2014. Located on a 59.84 acre sod farm, the facility will have the capacity to produce 9.5 MW of solar energy which is enough to serve the electrical needs of about 1,100 homes per year. This project did not require the clearing of natural vegetation, and thus, no significant adverse cumulative ecological impacts would result from that implementation of that project and the proposed action. Similar to the BNL project discussed above, no cumulative impacts on soils, water, traffic, noise, or visual resources would result from the two projects. Similar beneficial cumulative impacts would also be anticipated (e.g., beneficial air quality impacts).

4.1.3 Brookhaven Town Solar Project

Per the Town of Brookhaven Planning Department, the proposed project to be located at Calabro Airport within the Town of Brookhaven is in the preliminary planning phase and no additional details (e.g., as to the size, location, etc.) are available currently.

4.1.4 Shoreham Solar Commons (Tall Grass Solar Project)

An application has been submitted to the Town of Brookhaven for a 24.9 MW solar farm, known as Shoreham Solar Commons, on a 150±-acre property, currently occupied by the Tallgrass Golf Course in Shoreham, approximately 7.5 miles north of the proposed Middle Solar Farm. The site is located directly south of the sPower

Solar Farm, discussed above. The design of Shoreham Solar Commons precludes the removal of any existing trees from the property, and all disturbance activities would take place on the developed portion of the golf course consisting of grassland and typical golf course conditions (fairways, greens, sand traps, etc.). As with the proposed action, Shoreham Solar Commons would revegetate cleared areas with native grasses, herbaceous plants and short shrub species. Thus, no significant adverse cumulative ecological impacts would result from implementation of this project and the proposed action. Similarly, no cumulative impacts on soils, water, traffic, noise, or visual resources would result from the two projects. Similar beneficial cumulative impacts would also be anticipated (e.g., beneficial air quality impacts).

4.1.5 Caithness Long Island II

The proposed Caithness Long Island II power plant is located on an 81±-acre property in Yaphank, approximately 4.75 miles west of the proposed Middle Island Solar Farm. Caithness Long Island II would be a 750-MW, natural-gas-fired, combined-cycle electric generating plant, which was selected by LIPA in July 2013 to meet the regions energy needs.[64] The site is located adjacent to the existing Caithness Long Island Energy Center, which is a 350-MW, natural-gas fueled facility. Development of Caithness Long Island II would involve the clearing of approximately 23.5 acres of pitch pine-oak forest. However, the area between the Caithness Long Island II property and the subject property is interspersed with natural areas as well as expansive residential, industrial and commercial development, such that there is no direct connection between the existing wooded areas upon each of the sites. Accordingly, the clearing associated with the Caithness Long Island II site and the proposed clearing of 61.03± acres at the subject property would not be expected to have a significant adverse cumulative effect on ecological resources, including any rare species. It is noted that, as with other planned developments evaluated herein, there is uncertainty as to when or whether the Caithness Long Island II power plant might be developed.

4.1.6 Bayou Hotel Corporation and Moriches-Middle Island Solar Park

According to the Town of Brookhaven Planning Department, the "Hotel Bayou Corporation" parcel (also known as the Rose-Breslin Associates parcel) has not submitted a land development application for the overall site at this time. Accordingly, no meaningful cumulative impact assessment may be performed. Any future application for the development of this property would be subject to a site

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[64] http://www.caithnesslongisland.com/caithness-long-island-ii/ Accessed January 2016

specific review, providing a means for control over and comprehensive environmental review of any potential impacts (including cumulative impacts).

The Town of Brookhaven Planning Department has identified an application for a land division and construction of a 10MW solar energy production facility known as "Moriches-Middle Island Solar Park" on a portion of the site, which is in the beginning stages of review. The proposed facility is proposed on 106± acres to be subdivided from a 444±-acre lot within the Hotel Bayou Corporation property, which is located on the north side of Moriches-Middle Island Road and 200± feet east of North Street in the hamlet of Manorville, north of the proposed Middle Island Solar Farm. The referenced parcel is primarily zoned for industrial use. The parcel is located within the Long Island Central Pine Barrens Compatible Growth Area (CGA), the development of which is subject to the restrictive CGA Land Use Standards set forth at Section 5.3 of the Central Pine Barrens Comprehensive Land Use Plan (CLUP). For example, CLUP Standard No. 5.3.3.6.1 strictly limits the clearance of natural vegetation to 65 percent of the lot area for industrially-zoned properties. Additional CLUP Standards relate to the creation of unfragmented open space and the protection of species and communities of special concern. As provided at Section 5.3.3 of the CLUP, these Standards are intended to be consistent with the water resource protection and habitat preservation goals provided for the CGA in the Long Island Pine Barrens Protection Act, including the goal to:

> *"(d) encourage appropriate patterns of compatible residential, commercial, agricultural and industrial development in order to accommodate regional growth influences in an orderly way while protecting the Pine Barrens environment from the individual and cumulative adverse impacts thereof."* NY ECL 57-0121(3)

Improvements associated with the Moriches-Middle Island Solar Park would be located on approximately 61 acres of the total 106±-acre site, which would be cleared of trees and shrubbery, and maintained as pervious grass area. Of those approximately 61 acres, approximately seven acres considered "cleared" would be maintained in a natural state with minimal tree trimming, as required to prevent shading. Approximately 45 acres of the site surrounding the proposed arrays would remain in an undisturbed, natural state. Connection to the power grid would be via a LIPA/PSEG Long Island metering station, which will be made through a proposed 15-foot wide easement to be cleared in order to construct the connection. Three areas for drainage totaling approximately four acres are proposed within the cleared area of development.

As the Moriches-Middle Island Solar Park application would retain approximately 45 acres of land in its existing natural state, and would be subject to the restrictive CLUP Standards (which are protective against cumulative ecological impacts), the clearing that would occur at the Moriches-Middle Island Solar Park would not be expected to have a significant adverse cumulative effect on ecological resources when considered together with the proposed Middle Island Solar Farm.

Furthermore, similar to the BNL, sPower and Tall Grass solar farm projects discussed above, no cumulative impacts on soils, water, traffic, noise, or visual resources are expected. Similar beneficial cumulative impacts would also be anticipated (e.g., beneficial air quality impacts).

4.1.7 Conclusions

Both LISF and sPower are existing solar farms, with a combined capacity of 41.5 MW of solar energy. The proposed project would provide an additional 19.6 MW of solar energy. Cumulative impacts from this increase in power being supplied in conjunction with other current projects, providing the same form of clean energy, would result in a total increase in clean energy provided within the Town of Brookhaven, which would not spur development, but would provide a renewable, resilient, clean form of energy to meet a portion of the existing and future demand by residents of the Town of Brookhaven.

Therefore, other than a temporary increase in vehicle fuel usage during the construction phase, the proposed project would require either none or minimal fuel or water resources. When considered along with previously developed solar projects, the cumulative impacts would have a negligible effect on the environment since there are no reasonably foreseeable projects planned for the area surrounding the proposed project.

Overall, based on the foregoing, the proposed action taken together with the above-referenced projects (that could be defined) would not be expected to have any significant adverse cumulative effects on the environment. Cumulative beneficial impacts associated with the increased availability of clean, renewable energy sources in the area are expected (e.g., beneficial air quality impacts).

4.2 Unavoidable Adverse Impacts

4.2.1 Short Term Impacts

The environmental impacts associated with the proposed project and relevant mitigation measures have been described in Section 3.0 of this DEIS, in detail. Those impacts that cannot be either entirely avoided or fully mitigated are described below.

Based upon the analysis provided in this DEIS, there would be several temporary construction-related impacts that cannot be completely mitigated. These impacts are associated with the site preparation and development (including clearing and

grading, excavation of foundations, installation of utilities and construction of building and parking facilities). It is anticipated that these impacts would cease upon completion of the construction phase of the project. Specific impacts are identified below:

1. Soils would be disturbed by grading, excavation, and mounding activities during site redevelopment;

2. Despite the use of extensive and strategically-placed erosion and sediment control measures, minor occurrences of erosion may occur;

3. Clearing and development activities may result in the direct elimination of individuals of some wildlife species (e.g., less-mobile animals, underground dwelling mammals and reptiles, eggs and juveniles of certain species);

4. There is the potential for minor releases of air contaminants that would occur from construction equipment and emissions of fugitive dust during dry periods, although dust would, for the most part, be controlled by covering of soil piles and watering down of the site;

5. Operation of construction equipment, trucks and worker vehicles may temporarily impact traffic in the area of the project site;

6. The visual quality of the area may be temporarily degraded by the presence and operation of construction equipment on the project site (to the minimal extent they may be visible from surrounding areas); and

7. Increases in noise levels at the site boundaries may result from construction activities. However, construction would occur only during hours permitted by the Town of Brookhaven.

It is anticipated that these impacts would be of short duration, that is, they would cease upon project completion.

4.2.2 Long Term Impacts

Long-term impacts associated with project implementation have been identified. Mitigation measures have been proposed to reduce or eliminate most of these long-term adverse impacts. Those adverse long-term impacts that cannot be fully mitigated are set forth below, namely:

1. Site development would result in the removal of woodland and other natural vegetation. The use of native vegetation and the replanting of a significant portion of all areas to be cleared would minimize these impacts.

2. The introduction of a limited quantity of impervious surface area at the subject property (e.g., building area, equipment pads) would increase stormwater runoff. However, runoff would be contained and recharged on-site via the proposed comprehensive stormwater management system.

3. The visual character of the site would be minimally modified.

4. Development and continuation of the proposed use would preclude the establishment of other land uses, such as the various other industrial land uses permitted in the L Industrial 1 zoning district.

4.3 Irreversible and Irretrievable Commitment of Resources

The proposed project would require a commitment of natural and manmade resources, as well as time. Specifically, approximately 61.03± acres of natural vegetation is proposed to be removed from the site. Approximately 0.55± acres would be covered by impervious surfaces including buildings, asphalt paving, concrete walkways, inverter stations and a substation (i.e., an increase of 0.55± acres), approximately 6.30± acres would be covered with pervious material such as gravel, and approximately 54.18± acres would be revegetated with native plantings. The planted the areas beneath the solar panel arrays would be planted with native heath shrubs, including Lowbush Blueberry, black huckleberry and dwarf huckleberry. In addition, Pennsylvania sedge would be planted by seed underneath the solar arrays in all areas where the aforementioned shrubs are planted. The areas located in between the rows of solar panel arrays would be planted with a seed mixture comprised of common fescues, rye grasses and yellow sweet clover. Finally, a native evergreen screen consisting of 350 eastern red cedar and 350 American holly plantings would be installed along the western fence line of the solar farm. In total, 54.00± percent of the subject property would be re-vegetated with the aforementioned native species.

Certain additional resources related to the construction aspects of the development would be committed. These resources include, but are not limited to, concrete, asphalt, lumber, paint and topsoil. Mechanical equipment resources would be committed to assist personnel in the construction at the property. The operation of construction equipment would require electricity, water resources and fossil fuels. Furthermore, the construction phase of the proposed project would require the commitment of manpower resources as well as time.

In addition, during the operational phase of the proposed development, minimal electricity, water resources and fossil fuels would be used for heating, cooling and other purposes.

4.4 Growth-Inducing Aspects

Growth-inducing aspects are generally described as the long-term secondary effects of the proposed action. Specifically, with respect to growth inducement, *The SEQR Handbook – 3rd Edition* (NYSDEC, 2010)[65] indicates:

> *"Some activities will encourage or lead to further increases in population or business activity. This type of secondary impact is called growth inducement…it is important to recognize activities which may induce growth because a consideration of the whole action must examine likely impacts of such growth, such as the need for additional sewer, water and other services; increased traffic congestion; or accelerated loss of open space."* (p. 88)

The proposed project consists of the development of a PV solar energy farm for the production of a "green" source of electricity. As a source of renewable energy, the completed project will benefit the Town of Brookhaven by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, it is expected that the proposed facility would be interconnected to the LIPA power grid supplying 19.6 MW of electricity to the system for use by LIPA's customers. As indicated in LIPA's *Electric Resource Plan*, the electric system will require an additional 200 MW of electric generation by 2020 to meet customer demand in the service area. Therefore, it is likely that the electricity generated by the proposed project would help meet this identified existing and future need, which is expected to occur even absent the proposed action.

As demonstrated herein, implementation of the proposed project is not expected to induce additional growth within the community.

4.5 Effects on the Use and Conservation of Energy Resources

The proposed project consists of the development of a PV solar energy farm for the production of a "green" source of electricity. Upon completion, the facility will be interconnected to the LIPA power grid supplying 19.6 MW of electricity to the system for use by LIPA's customers. The proposed project would serve to meet the projected energy demand forecasted for the Town of Brookhaven. Locating an

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[65] Accessible at http://www.dec.ny.gov/permits/6188.html.

additional solar farm in the region is an appropriate response to the increased demands for power supply, clean energy sources and delivery thereof on Long Island. Moreover, the proposed project would improve system reliability by adding a renewable source of energy that would function independent of the existing electric utilities that currently serve the Town of Brookhaven.

The proposed project would not have an adverse effect on the distribution, generation, and maintenance of existing energy facilities nor would it create a significant demand for additional electric energy (a nominal quantity of energy would be required to power and/or heat the proposed maintenance building and site lighting). In fact, the proposed project would have a positive effect on energy distribution and generation and would decrease dependence on local electric generation capacity.

Based upon the foregoing, it is not expected that the project would result in adverse impacts to the use and conservation of energy. Rather, a significant beneficial impact upon the increased availability of clean energy sources and a decreased dependency upon power supplies that burn fossil fuels would result.

5.0

Alternatives and Their Impacts

This section examines four alternatives to the proposed action, as follows[66]:

- SEQRA-Mandated "No Action" Alternative
- Sale/Transfer of Land to a Government Entity for Preservation
- Solar Farm Development without Variance Relief
- Development in Accordance with Existing L Industrial 1 / A Residence 1 District Zoning

The following sections evaluate the potential impacts of each of the aforementioned alternatives to the proposed action.

5.1 No-Action Alternative

The No-Action alternative involves leaving the subject property in its present state. Specifically, the property would remain wooded and vacant.

Implementation of the No-Action alternative would forego the various beneficial impacts of the proposed action discussed throughout this DEIS. Most notably, the proposed alternative energy source would reduce the demand for electricity generated by the burning of fossil fuels (e.g., oil, natural gas) at traditional power plants that produce air emissions of greenhouse gases. Without the proposed renewable "green" source of energy, the energy demands of the surrounding community would continue to rely on traditional sources to provide enough electricity to power up to an estimated 6,666 homes.

[66] These alternatives were laid out in the Town Board Final Scope for the nearly identical previous application, which the Planning Board elected to consider for the purposes of the SEQRA review process, rather than conduct a new public scoping process.

If the No-Action alternative is implemented, there would be no construction-related impacts. Among such impacts are potential positive impacts, including construction job generation and investment in the local "green" economy, etc.

Because no physical improvements would occur in connection with the implementation of this alternative, there would be no potential impacts to geologic resources, or ecological resources, nor would land use or zoning impacts result. Further, because the site would remain vacant and unimproved, there would be no impacts associated with traffic generation, nor would there be any adverse impacts upon groundwater (e.g., water use, sanitary waste generation), surface water, or stormwater runoff.

The No-Action alternative would not have adverse impacts upon air quality or energy. However, the positive impacts of the proposed action related to air quality and energy would be foregone.

It is important to note that the No-Action alternative does not meet the objectives of the applicant, including its objective to develop the subject property with a solar PV farm as a renewable "green" source of energy.

5.2 Sale/Transfer of Land to a Government Entity for Preservation

Because this alternative considers the preservation of the subject property in its current wooded and vacant state, the environmental impacts of this alternative would generally be equivalent to that of the No-Action alternative.

It is important to note that the subject property has been controlled by the applicant for greater than 30 years. During that time, no reasonable offer has been received or made by any parties, either private or municipal, to acquire the subject property for alternative uses or preservation. Additionally, early in the application process of the subject special use permit, the applicant pursued the opportunity for the preservation of the subject property by public acquisition, or by other means such as a "land swap" whereby the subject property would be preserved in exchange for the development of other available land (to meet the objectives of the applicant). No alternatives came forward. Accordingly, as of the date of preparation of this DEIS, implementation of this alternative is not feasible.

5.3 Solar Farm Development without Variance Relief

The Final Scope calls for the consideration of a solar farm development at the subject property that does not require variance relief as an alternative to the proposed action. As detailed in Section 3.5 of this DEIS, the proposed action requires a lot width variance. The lot width variance would be required no matter what is developed at the subject property, and is not a condition that the applicant has created. Specifically, the bulk requirements of the L Industrial 1 zoning district include a minimum lot width of 200 feet (see §85-568[b][3] of the Code of the Town of Brookhaven). The subject property has a width of approximately 50 feet at the location of the proposed site access from Moriches-Middle Island Road (i.e., at the flag pole portion of the lot), and, therefore, does not meet the minimum lot width requirement of the L Industrial 1 district. Because this variance is required to implement the proposed action, and it is related to the shape of the subject property, there is no change to the design of the proposed MISF project that could avoid the need for the variance. Therefore, implementation of this alternative is not feasible.

5.4 Development in Accordance with Existing L Industrial 1 / A Residence 1 District Zoning (As-of-Right)

This section examines an alternative development, whereby the subject property would be developed "as-of-right" (as described in the Final Scope) in accordance with the use, bulk and dimensional regulations of the prevailing L Industrial 1 zoning district.[67] As detailed below, and depicted on the *Yield Map Plan* included in Appendix G, the prevailing L Industrial 1 zoning would allow for the development of an intensive, industrial land use(s), resulting in clearing of the subject property to a greater extent than the proposed action, and resulting in the generation of significantly greater quantities of vehicular trips on area roadways and sanitary waste to be discharged to groundwater, among other things.

Specifically, under this alternative, the portion of the subject property that is currently zoned L Industrial 1 (94.20± acres) would be developed in accordance with prevailing zoning. To evaluate this alternative, a yield map has been developed that depicts the maximum potential development of the subject property in accordance with the use, bulk and dimensional requirements of the L Industrial 1 zoning district, among other considerations (e.g., sanitary density) (see *Yield Map Plan* in Appendix G).

▼

[67] A lot width variance would be required due to the existing shape of the property, which would be required no matter what is developed at the subject property.

As explained in Section 3.5 of this DEIS, the subject property is situated within the L Industrial 1 and A Residence 1 zoning districts of the Town of Brookhaven (see Figure 14). Approximately 93.89 percent of the site (i.e., 94.20± acres) is within the L Industrial 1 District, and the remaining 6.11 percent (i.e., 6.13± acres) is within the A Residence 1 District (see Figure 14 on Page 112 of this DEIS). The Town Code sets forth that, if the less restrictive zoning classification (i.e., L Industrial 1) occupies more than 75 percent of the parcel, the less restrictive zoning shall prevail, provided that all development, including access, be situated within the less restrictive district. The more restrictive zone (i.e., A Residence 1) shall not be utilized for yield in such instances (§85-136A(7)). The project engineer has developed the *Yield Map Plan* to reflect the permitted development yield of the subject property.

As shown on the above-referenced *Yield Map Plan*, development in accordance with this alternative could include approximately 752,250± square feet of industrial building space, 39.83± acres of surface parking and other paved areas, and 10.05± acres of landscaped area. Various uses could potentially occupy the 752,250± square feet of building area (shown among three buildings on the *Yield Map Plan*), in whole or in combination, as permitted in the L Industrial 1 district. Pursuant to §85-560 of the Code of the Town of Brookhaven, allowable uses in the L Industrial 1 zoning district include, but are not limited to, the following:

- Agricultural or nursery use, including the retail sale of products raised on the premises
- Bank
- Commercial laundry establishment
- Day-care facility
- Health club
- Manufacturing
- Office
- Printing plants
- Research and development uses, including laboratories for scientific or industrial research, testing and development
- Warehouse

The environmental impacts associated with the range of uses permitted within the L Industrial 1 zoning district can vary from one use to another. For the purposes of this analysis, as indicated on the *Yield Map Plan*, the proposed building space is assumed to be occupied by industrial warehouse use.

Site data for the subject property under existing conditions, and for the as-of-right alternative development as depicted by the *Yield Map Plan* (see Appendix G) is presented in Table 12, below:

Table 12 – Site Coverage: Existing and As-of-Right Alternative (in Acres)

Type of Coverage	Existing Conditions	Proposed Action	As-of-Right Alternative
Vacant/Wooded	100.33±	39.30±	29.73±
Area Re-Vegetated Back to Natural (native landscape trees, grasses and shrubs)	0.00±	54.18±	0.00±
Landscaped Area (grass)	0.00±	0.00±	6.73±
Gravel Driveways and Parking Lot	0.00±	6.30±	0.00±
Roads, Buildings and Other Paved Surfaces	0.00±	0.55±	57.10±
TOTAL	100.33±	100.33±	100.33±

The environmental impacts of this alternative are discussed in the various subsections below, with respect to the impact topics that the proposed action is analyzed for in this DEIS.

5.4.1 Geological Resources

Development of the subject property in accordance with this alternative would require disturbance of land surfaces across much of the subject property. With the exception of perimeter buffers, and other areas at the northern and southern extents of the property, the *Yield Map Plan* would result in the clearing of vegetation and grading of land surfaces across the site. The *Yield Map Plan* presents a theoretical development of the site, wherein 70.60± acres of land would be disturbed for development. As with the proposed action, such land disturbances would increase the potential for adverse erosion and sedimentation impacts, and control measures would be required.

As compared to the proposed action, this alternative would result in the disturbance of a greater land surface area (i.e., 70.60± acres instead of 61.03± acres). Additionally, as discussed at Section 3.1.2 of this DEIS, the proposed action has been designed to retain the existing site topography to the maximum extent practicable, to minimize excavation, and to balance cut and fill at the site such that no natural material would require removal. By comparison, for this alternative, the development of 752,250± square feet of buildings with foundations, over 1.7 million square feet of paved parking and concrete walkway area, and various supporting infrastructure (e.g., sanitary disposal facilities, underground stormwater containment piping and structures, etc.), could result in significantly greater disturbances to on-site soils and topography than the proposed action, and may require material removal for off-site disposal (and potential adverse impacts associated therewith [e.g., truck traffic]). The period of disturbance from construction activity could be greater than the estimated 12-month construction period for the proposed action, and thus, the potential for erosion and sedimentation impacts could be greater.

Water Use and Sanitary Waste Generation

With respect to water use and sanitary waste discharge, the actual quantities of each that would be associated with development of the subject property under this alternative would be dependent upon the specific uses that ultimately occupy the site, as permitted in the L Industrial 1 zoning district. As discussed in Section 3.2.1 of this DEIS, the total quantity of sanitary waste that may be permitted to be discharged to on-site sanitary systems is limited pursuant to Article 6 of the SCSC. For the 100.3±-acre subject property, the maximum permitted discharge to on-site systems (at a density of 300 gpd/acre in Groundwater Management Zone VI) would be 30,090± gpd. Uses that may generate greater quantities would be required to connect to a community sewerage system, of which none exist in the immediate vicinity of the site; or to construct an on-site sewage treatment plant discharging to groundwater. For the purposes of this assessment, it is reasonable to expect that this alternative could discharge up to 30,090 gpd of sanitary waste to on-site systems, and utilize a similar quantity of potable water. For reference purposes, it is noted that SCDHS calculates general industrial use (such as an industrial warehouse use, permitted in the L Industrial 1 zoning district) to generate approximately 0.04 gpd of sanitary waste per square foot. As such, if the entire 752,250± square feet of industrial building space were to be occupied by said use, a total of 30,090± gpd of sanitary waste would be generated at the subject property and discharged to groundwater. As discussed in detail in Section 3.2 of this DEIS, sanitary effluent contributes nitrogen to groundwater (among other things), which can ultimately impact surface waters (e.g., the Forge River) (see further discussion in the below subsection entitled, *Surface Water, Wetlands and Floodplains*). Based on the foregoing, this alternative has a significantly greater potential to affect groundwater quality and available water supplies than the proposed action, which would utilize only 161± gpd of potable water and generate an equivalent quantity of sanitary waste for discharge to on-site systems.

Toxic and Hazardous Materials

With respect to the storage, use or handling of toxic and hazardous materials, and its potential to result in adverse groundwater impacts, it would be speculative to assume the degree to which an allowable industrial use that would occupy the 752,250± square feet of industrial development under this alternative would do so. All such activities would be required to comply with the relevant provisions of Article 12 of the SCSC. Nonetheless, development of the subject property in accordance with this alternative may theoretically store or use greater quantities of hazardous materials than would the proposed action, which is only expected to

include the installation of two, 2,500-gallon LP gas tanks for emergency backup purposes.

Nitrogen Mass Balance

A mass balance calculation was performed for this alternative to determine the total quantity of nitrogen that would be generated by the subject property, based on the site coverage and sanitary waste generation assumptions presented above. Relevant contributing sources of nitrogen include atmospheric deposition, sanitary waste discharge to on-site waste treatment systems (referred to as OWTS within the Town of Brookhaven's *Forge River Plan*), and fertilized landscaped areas.
To estimate atmospheric deposition, the infiltration capabilities of the stormwater runoff must be analyzed. Because this is a worst case scenario calculation, it is assumed that the precipitation that falls on impervious surfaces is collected and discharged into stormwater system without infiltrations BMPs. To calculate the nitrogen loads, the *Forge River Plan* used an average nitrogen areal loading rate of 0.0234 lbs/acre/day.

$$57.10\ acres\ X\ \frac{0.0234\frac{lbs\ N}{acre}}{day} = 1.34\ \frac{lbs\ N}{day} = 489.10\ \frac{lbs\ N}{year} \qquad \text{(Eq. 1)}$$

For vegetated areas, the *Forge River Plan* assumed a 65 percent removal rate between the source and receiving water due to plant uptake for land with stormwater recharge. Under the proposed conditions, 43.23 acres of stormwater will be able to infiltrate before reaching groundwater and therefore the 65 percent removal rate is applicable.

$$43.23\ acres\ X\ \frac{0.0234\frac{lbs\ N}{acre}}{day} X\ (1 - 0.65) = 0.35\ \frac{lbs\ N}{day} = 127.75\ \frac{lbs\ N}{year} \qquad \text{(Eq. 2)}$$

The nitrogen contribution for the yield map due to atmospheric deposition is 616.85 lbs/year.

$$127.75\ \frac{lbs\ N}{year} +\ 489.10\ \frac{lbs\ N}{year} + = 616.85\ \frac{lbs\ N}{year} \qquad \text{(Eq. 3)}$$

The proposed yield map also includes an OWTS. To estimate the nitrogen load for the OWTS, the nitrogen concentration of 0.0006 lbs/gal for commercial/industrial OWTS from the *Forge River Plan* was used. The proposed site's sanitary flow is estimated to be 30,090 gpd.

$$30090\frac{gal}{day}\ X\ 0.000623\ \frac{lbs\ N}{gal} = 18.75\ \frac{lbs\ N}{day} = 6{,}843.75\ \frac{lbs\ N}{year} \qquad \text{(Eq. 4)}$$

The nitrogen concentrations were also calculated for fertilizer, which was assumed to be used at all landscaped areas. For industrial parcels, the *Forge River Plan* used a

fertilization rate of 2.4 lbs N/year/1000 sq. ft, (0.286 lbs N/acre/day) and it was assumed that 35 percent of the nitrogen in the fertilizer reaches groundwater.

$$10.05\ acres\ X\ \frac{0.286\frac{lbs\ N}{acre}}{day} X\ (1-0.65) = 1.01\ \frac{lbs\ N}{day} = 368.65\ \frac{lbs\ N}{year} \qquad \text{(Eq. 5)}$$

The total nitrogen contribution for the proposed solar farm is the sum of the atmospheric deposition, OWTS sources, and fertilizer loads which sums to 7,829.25 lbs N/year.

$$616.85\ \frac{lbs\ N}{year} + 6843.75\ \frac{lbs\ N}{day} + 368.65\ \frac{lbs\ N}{day} = 7829.25\ \frac{lbs\ N}{year} \qquad \text{(Eq. 6)}$$

Under this alternative, the site would have an estimated nitrogen load of 7,829.25 lbs N/year, which is a 2,226.0 percent increase compared to the proposed solar farm. As will be discussed below (with respect to the Forge River), this alternative would increase the nitrogen contribution of the West Mill Pond subwatershed by an estimated 7.4 percent and increase the total watershed's contribution by 2.6 percent.

Stormwater

This alternative would disturb a large portion of the subject property in connection with the establishment of industrial uses. The *Yield Map Plan* in Appendix G depicts a development that would disturb a total of 70.6± acres at the subject property, which would have a similar potential to result in adverse stormwater-related impacts during construction as would the proposed action. It is expected that, as required pursuant to Chapter 86 of the Town Code, measures would be implemented in accordance with a SWPPP to preclude or minimize adverse stormwater-related impacts during construction, similar to those that would be implemented under the proposed action (e.g., minimizing the total area of exposed soil, stockpile and inlet protection, etc.).

Upon implementation of this alternative, a total of 57.10± acres of roads, buildings and other paved surfaces would be constructed at the site, where none are present under current conditions. This area of impervious surfaces would require an extensive stormwater management system that may include, but that may not necessarily be limited to, underground leaching structures, drainage swales, and/or one or more recharge basins, to contain stormwater runoff at the site. Depending upon the design capacities of such a system(s), and site constraints, the significant increase in impervious surface area associated with this alternative could result in increased stormwater runoff onto natural areas on-site and/or onto surrounding properties, particularly during intense storm events. The development of the proposed solar PV farm will create only a minimal area of impervious surfaces (i.e., 0.55± acre) at the subject property, such that these impacts would not occur under the

proposed action. Additionally, the quality of any stormwater runoff generated under this alternative from paved parking and loading areas, landscaped areas, etc., may be reduced as compared with runoff from the re-vegetated areas to be established beneath the proposed solar arrays. Ultimately, stormwater runoff quality may also be adversely affected by the specific use(s) of the site under this alternative, whereas the proposed solar arrays are not expected to have any measurable direct impact on stormwater quality.

Surface Water, Wetlands and Floodplains

As with the proposed action, there are no surface waters at or adjacent to the subject property, nor is the subject property within a Special Flood Hazard Area. Accordingly, this alternative is not expected to have a significant adverse impact upon such resources.

With respect to the Forge River watershed, it is expected that this alternative could be designed to be consistent with some of the relevant goals of the Town's *Forge River Plan*. However, for the purposes of comparing the salient impacts of the proposed action with those of this alternative, it is important to note that several of the goals of the *Forge River Plan* relate to minimizing the nitrogen contributions to the watershed, including those from on-site sanitary systems. As discussed in Section 3.2.2 of this DEIS, the proposed action would be expected to result in a total nitrogen contribution of only 336.5 lbs N/year – a *de minimis* increase from the subject property's contribution under existing conditions. This is due to the extremely low quantity of sanitary waste that would be generated by the proposed solar PV farm, and the re-vegetation of most areas to be cleared using native, low-maintenance species that do not require fertilization. This alternative, by contrast, would be expected to generate a significantly greater quantity of sanitary waste, and would include an estimated 10.05± acres of landscaped area (which could consist of fertilizer-dependent vegetation). As indicated by the nitrogen mass balance calculations discussed above, this alternative would contribute an estimated 7,829.25 lbs N/year, or over 23 times the quantity of nitrogen that the proposed action would contribute to the Forge River watershed (due largely to the contribution from sanitary waste discharge to groundwater). Moreover, this alternative would increase the total nitrogen contribution of the West Mill Pond subwatershed by an estimated 7.4 percent, and the total Forge River watershed's contribution by 2.6 percent.

5.4.3 Ecological Resources

Development of the subject property in accordance with this alternative would result in the establishment of the vacant, wooded site in industrial use. The site design presented by the *Yield Map Plan* in Appendix G would result in the clearing of 70.60 acres of naturally-vegetated areas. This is a greater total area of clearing than the

proposed action (70.60± acres instead of 61.03± acres, or 9.57± additional acres), and, therefore, marginally increased direct ecological impact to natural resources would be expected to result. Therefore, many of the same adverse ecological impacts would result as expected under the proposed action (see detailed discussion in Section 3.3.2 of this DEIS) including the reduction in available habitat at the site, and the direct elimination of individuals of some species. The proposed action has incorporated several measures to minimize, preclude and mitigate potential ecological impacts (e.g., conducting wildlife sweeps, strategic scheduling of construction activity, etc.). It is expected that this alternative may incorporate some of these or similar measures.

The proposed action includes the re-vegetation of 54.18± acres at the subject property, following the installation of the proposed solar PV arrays. This significant area of vegetation, to consist of various native and low-maintenance grasses and low shrubs, etc., would create habitat at the subject property for various species (including Species of Special Concern) and therefore off-set and minimize impacts of the proposed action. This alternative, by contrast, would create 57.10± acres of buildings and paved areas, which provide no ecological value. Another 10.05± acres would be landscaped (which would not necessarily be expected to be limited to native vegetation).

5.4.4 Air Resources

As discussed in Section 3.4.1 of this DEIS, with respect to air quality impacts, criteria pollutants such as CO, NO_X, VOCs, Pb, SO_2 and particulate matter may come from a variety of sources. Several of the most prevalent sources include fossil fuel combustion (including but not limited to vehicular fuel combustion), as well as dry cleaning, coating, and various other industrial processes.

This development alternative would establish 752,250± square feet of industrial building space at the subject property, which could be occupied by a wide variety of permitted light industrial uses. Construction-related air emissions would be generated under this alternative by the myriad construction equipment and vehicles that would be required to prepare the property, construct and fit-out the large buildings. The industrial use(s) that would occupy the site may generate operational-phase emissions, such as (for example) emissions from manufacturing equipment, fuel combustion for heating, electricity use (directly or indirectly) or other emissions sources. Additionally, depending upon the ultimate use of the property, several vehicular trips to-and-from the subject property may be generated by employees, delivery and/or distribution trucks, customers or patrons, etc. (see Transportation subsection, below), representing mobile emissions sources.

The quantities of air emissions that may be generated as a result of implementation of this alternative, during construction and operation, would vary considerably depending upon the specific use or mix of uses that would ultimately occupy the site.

As detailed in Section 3.4.2 of this DEIS, air quality impacts associated with the proposed action would be minimal, as construction activity would be of short duration, control measures would be implemented to reduce construction-related emissions, and no significant stationary or mobile emissions sources would be associated with the proposed solar farm. By contrast, this alternative would have the potential to generate significant air emissions, particularly if the subject property were to be occupied by an industrial use using major processing equipment, and/or a use that generates a significant number of vehicular trips.

The above provides a qualitative comparison of source emissions associated with this alternative, and with the proposed action. However, it is important to note that among the benefits of the proposed action is that a renewable "green" source of energy would be established, eliminating the need to continue using conventional power plants that burn fossil fuels to generate electricity for up to an estimated 6,666 homes in the region. The proposed renewable energy source would obviate significant quantities of air emissions, as discussed in Section 3.4.4 of this DEIS. This alternative would not be expected to result in a similar benefit to air quality, and such benefit would be foregone (although it is noted that energy efficiency measures and rooftop solar installations could offset a portion of the energy demand of any industrial facility constructed).

5.4.5 Land Use, Zoning and Plans

By definition, this alternative is intended to consider the development of the subject property in accordance with prevailing zoning and land use controls, including, but not limited to, the use, bulk and dimensional regulations of the L Industrial 1 zoning district.

The development of the subject property under this alternative would result in the establishment of an industrial land use(s), resulting in clearing of the vacant, wooded subject property (to a greater extent than the proposed action). It is noted that the surrounding area predominantly contains single-family residential uses and undeveloped land, although some industrial development is present in the vicinity of the subject property (e.g., along Moriches-Middle Island Road and Weeks Avenue). As this alternative has been designed to be "as of right" it conforms to the use, bulk and dimensional regulations of the L Industrial 1 zoning district, with the exception of the minimum lot width requirement (200 feet required, 50 feet provided) due to the parcel shape. Accordingly, a zoning variance for lot width would be required for implementation of this alternative.

Notwithstanding the above, it should be noted that the development of the subject property with 752,250± square feet of light industrial land use would be expected to generally result in greater environmental impacts with respect to water use, sanitary

waste discharge, transportation, energy, and possibly aesthetics and noise, as discussed throughout this section of the DEIS.

5.4.6 Transportation

Development of the subject property under prevailing zoning would be expected to generate several vehicular trips to-and-from the subject property. The specific number of trips would vary dramatically depending upon the nature of the use(s) that would ultimately occupy the site. The *Yield Map Plan* in Appendix G depicts that 752,250± square feet of industrial warehouse space, as is permitted in the L Industrial 1 zoning district. Pursuant to the Institute of Transportation Engineers (ITE) *Trip Generation Manual – 8th Edition*, development in accordance with this alternative would generate vehicular trips on surrounding roadways as follows:

Table 13 – Trip Generation: As-of-Right Alternative Development

Proposed Use/ITE Land Use Code	Building Area	Peak Hour Trips		
		AM	PM	SAT
Warehouse	Rate	0.30 trips/1000 SF	0.32 trips/1000 SF	0.13 trips/1000 SF
	752,250 SF	**226**	**241**	**98**

As shown above, development of the subject property under this alternative would result in the generation of a far greater number of vehicular trips to-and-from the subject property than would the proposed action, which would have nominal vehicular activity associated with the six (or fewer) persons that would occupy the site at any given time (see Section 3.6.2 of this DEIS). It is noted that the trip generation numbers presented above reflect a theoretical development scenario, and that even greater trip generation numbers may result from development of the entire site with a permitted higher traffic generating use(s) (e.g., office use).

Due to the site's configuration, and as shown on the *Yield Map Plan* in Appendix G, it is expected that a single vehicular access point would be established under this alternative to accommodate all entering and exiting traffic. A detailed traffic analysis would be required to determine the significance of traffic impacts of this alternative, the need for mitigation (e.g., installation of a traffic signal), etc. However, it is clear that from the perspective of trip generation on area roadways, this alternative would have a far greater potential to result in an adverse traffic impact than would the proposed action.

5.4.7 Aesthetics, Visual Resources and Noise

Similar to the proposed action, development in accordance with this alternative would not significantly alter views of the subject property from the adjacent roadways (i.e., Moriches-Middle Island Road and Cranford Boulevard). Views from these areas would retain their established wooded character.

As required pursuant to §85-843(B)(2)(c) of the Town Code, this alternative provides for a minimum 75-foot wooded buffer to be provided along all property boundaries that abut residentially-zoned land. These buffers would be expected to reduce (but may not necessarily eliminate) visibility of industrial development that would be established at the site under this alternative, as well as light spill.

The vegetated buffers required under this alternative are greater than those provided under the proposed action, with respect to the eastern and southern property boundaries where the subject property abuts publicly-owned natural areas. However, along the western site boundary, where the subject property abuts several existing residences, the minimum 75-foot buffer would provide less screening than the minimum 210-foot (up to 500± feet) natural vegetated buffer and 3,520±-foot row of evergreen plantings that the applicant will install along the western limit of the solar PV farm to be installed as part of the proposed action.

With respect to noise, operations at the subject property would continue to be governed by the relevant provisions of Chapter 50 of the Town Code (entitled, "Noise Control") under this alternative, similar to the proposed action. The noise environment at the subject property would be altered as a result of the development and operation of 752,250± square feet of industrial use(s) at the site, to a degree that would be dependent upon the specific uses that occupy the site. Operational noise may be associated with rooftop equipment, manufacturing equipment, vehicular activity (including truck deliveries), and other similar noise sources from permitted uses. By comparison, there will be no measureable activity occurring at the subject property (with the exception of occasional maintenance or security-related activity), such that there would be limited operational noise (if any) under the proposed action.

5.4.8 Energy

This alternative would establish an energy demand at the subject property, where, currently, the vacant, wooded site does not require an energy supply or use energy. The potential demand for electricity and the potential demand for fossil fuel for heating or other purposes cannot be estimated, as the demand would vary significantly based on the specific light industrial use established at the site in accordance with prevailing zoning. Allowable uses within the L Industrial 1 zoning

district may be energy-intensive (e.g., refrigerated storage, manufacturing), such that the operation of the large industrial use provided for on the *Yield Map Plan* could represent a significant energy demand. It is recognized that any such development of the site could utilize energy efficiency measures and/or incorporate rooftop solar facilities, etc., to offset a portion of the energy demand.

By comparison, the proposed action is expected to result in only minimal on-site energy demands associated with the operation of the proposed 4,032±-square-foot maintenance building and site lighting. Moreover, the proposed action would establish a solar PV farm at the subject property and would represent a renewable, "green" source of energy capable of powering up to 6,666 homes in the region (thereby reducing reliance on fossil fuels). As discussed in detail in Section 3.8 of this DEIS, the proposed action would further the goals of various energy plans of the Town of Brookhaven, New York State and the local utility provider. These energy-related benefits would be foregone under this alternative.

5.4.9 Other Considerations

It is noted that this alternative would not necessitate an interconnection to the electric utility grid for the distribution of energy generated at the site, which is contemplated as part of the proposed action. Accordingly, implementation of this alternative would preclude potential impacts of an interconnection, which will vary depending upon the ultimate design (by others), but which may include impacts related to clearing and ground disturbance, wetland/ecological resources, and visual resources, as identified throughout this DEIS.

6.0

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14-12-9 (3/99)-9c

SEQR

State Environmental Quality Review
Notice of Completion of Draft
and
Notice of SEQR Hearing

Lead Agency: Town of Brookhaven Planning Board **Project Number** 15SP0044

Address: One Independence Hill, Farmingville 11738 **Date** 2/10/16

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review Act) of the Environmental Conservation Law. (and local law # _____ if any)

A Draft Environmental Impact Statement has been completed and accepted for the proposed action described below. Comments are requested and will be accepted by the contact person until April 6th, 2016 A public hearing on the Draft EIS will be held on March 21, 2016 (date and time) at Brookhaven Town Hall Auditorium (2nd floor) (place).

Name of Action:

Middle Island Solar Farm, LLC
Special Use Permit and Site Plan – Solar Energy Production Facility
15SP0044

Description of Action:

The proposed project consists of the development of a photovoltaic solar energy production facility for the creation of a "green" source of electricity. As a source of renewable energy, the completed project will benefit the Long Island area by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, the facility will provide approximately 19.2 MW of electricity, which may be utilized by LIPA/PSEG (no letter of intent has been filed at this time). The proposed project will include a field of solar panel arrays, maintenance & operations building, perimeter and centerline access roadways, array access pathways, site fencing and security, vegetated and screened surrounding buffer areas. Approximately 61.03 acres of the parcel will be cleared (60.98%) for site development needs (or a total of 64.95% of the 94.2 acres of property zoned L-1).

Location: (Include street address and the name of the municipality/county. A location map of appropriate scale is also recommended.)

S/S/o Moriches Middle Island Road, 1260' E/o Cranford Blvd., Mastic

0200 71200 0900 001000

Potential Environmental Impacts:

Natural Resources:
The applicant is proposing to clear and grade nearly 61 acres of woods on the roughly 100 acre parcel. Bounded to the east and south by open space (owned by the Town of Brookhaven and Suffolk County jointly), the clearing of the subject parcel will have significant impacts on the natural resources including on-site vegetation and wildlife.
Ecological Resources:
The proposed plan will permanently remove nearly 61 acres of pitch pine-oak heath forest. The property and surrounding areas are utilized by a diverse number of species including special concern species and a federally listed species of bat.
Energy:
The proposed project will create approximately 20 MW of energy that may be fed into the grid and may be available for use by LIPA customers. While the energy being created is "green", the additional energy available for purchase may result in increased development and energy usage within the Township.
Cumulative Impacts:
The proposed site plan estimates the clearing of approximately 61 acres and the production of nearly 20 MW of energy. Other properties within the eastern portion of Brookhaven Town, which are privately owned, could potentially accommodate similar scale projects. Additionally, there is an existing solar facility located at Brookhaven National Lab (less than two [2] miles due north) covering approximately 200 acres. A collection of wooded parcels totaling over 500 acres and zoned Light-Industrial-1 is located directly between the subject property and the BNL property – however this is no indication that the site will be used for solar energy production. Lastly, the Town of Brookhaven has approved a solar energy production facility in Shoreham and is currently reviewing an application for another such facility in Shoreham on an existing 150-acre golf course. The impacts associated with the project are therefore potentially cumulative to the region and Township due to the recent increase in solar energy production facilities, particularly in eastern Brookhaven Town.

A copy of the Draft / Final EIS may be obtained from:

Contact Person: Luke Ormand, Environmental Analyst

Address: One Independence Hill, Farmingville, NY 11738

Telephone Number: 631-451-6455

A copy of this notice must be sent to:

Department of Environmental Conservation, 625 Broadway Albany, New York 12233-1750

Chief Executive Officer, Town/City/Village of Brookhaven

Any person who has requested a copy of the Draft / Final EIS

Any other involved agencies

Environmental Notice Bulletin 625Broadway Albany, NY 12233-1750

Copies of the Draft EIS must be distributed according to 6NYCRR 617.12(b).

Reset

The ENB SEQRA Notice Publication Form - *Please check all that apply*

Reset Form

Deadline: Notices must be received by **6 p.m. Wednesday** to appear in the following Wednesday's ENB

____ Negative Declaration - Type I

____ Conditioned Negative Declaration

____ Draft Negative Declaration

____ Positive Declaration
____ with Public Scoping Session

✔ Draft EIS
✔ with Public Hearing
____ Generic
____ Supplemental

____ Final EIS
____ Generic
____ Supplemental

DEC Region # 1 County: Suffolk Lead Agency: Town of Brookhaven Planning Board

Project Title: Middle Island Solar Farm - Solar Energy Production Facility - 15SP0044

Brief Project Description: The action involves . . .

The proposed project consists of the development of a photovoltaic solar energy production facility for the creation of a "green" source of electricity. As a source of renewable energy, the completed project will benefit the Long Island area by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, the facility will provide approximately 19.2 MW of electricity, which may be utilized by LIPA/PSEG (no letter of intent has been filed at this time). The proposed project will include a field of solar panel arrays, maintenance & operations building, perimeter and centerline access roadways, array access pathways, site fencing and security, vegetated and screened surrounding buffer areas. Approximately 61.03 acres of the parcel will be cleared (60.98%) for site development needs (or a total of 64.95% of the 94.2 acres of property zoned L-1).

Project Location (include street address/municipality): Brookhaven

Contact Person: Luke Ormand, Environmental Analyst

Address: One Independence Hill City: Farmingville State: NY Zip: 11783

Phone: 631-451-6455 Fax: ____ E-mail: lormand@brookhaven.org

For Draft Negative Declaration / Draft EIS: Public Comment Period ends: 04 / 06 / 2016

For Public Hearing or Scoping Session: Date: 03 / 21 / 2016 Time: 04 : 00 am/pm

Location: Brookhaven Town Hall Auditorium (2nd floor)

A hard copy of the DEIS/FEIS is available at the following locations:
Town of Brookhaven - Town Clerk (1st floor), Department of Planning (2nd floor). Moriches/Mastic/Shirley Library (Shirley)

The online version of the DEIS/FEIS is available at the following publically accessible web site:

For Conditioned Negative Declaration: In summary, conditions include:

Appendix A

STATE ENVIRONMENTAL QUALITY REVIEW (SEQR)
POSITIVE DECLARATION
Notice of Intent to Prepare a Draft Environmental Impact Statement (DEIS)

LEAD AGENCY: **Town of Brookhaven Planning Board**
One Independence Hill
Farmingville, NY 11738

TITLE OF ACTION:
Middle Island Solar Farm, LLC
Special Use Permit – Solar Energy Production Facility
Mastic, Town of Brookhaven, NY

APPLICANT:
Howard Rosengarten & Associates
88 University Place, 8th Floor
New York, NY 10003

SEQR STATUS: **Type I**

DESCRIPTION OF ACTION:
The proposed project consists of the development of a photovoltaic solar energy production facility for the creation of a "green" source of electricity. As a source of renewable energy, the completed project will benefit the Long Island area by helping to provide for growing energy needs in a non-polluting fashion. Upon completion, the facility will provide approximately 19.2 MW of electricity, which may be utilized by LIPA/PSEG (no letter of intent has been filed at this time). The proposed project will include a field of solar panel arrays, maintenance & operations building, perimeter and centerline access roadways, array access pathways, site fencing and security, vegetated and screened surrounding buffer areas. Approximately 61.18 acres of the parcel will be cleared (60.98%) for site development needs (or a total of 64.95% of the 94.2 acres of property zoned L-1).

LOCATION: S/S/o Moriches Middle Island Road, 1260' E/o Cranford Blvd., Mastic

S.C.T.M. #: 0200 71200 0900 001000

This notice is issued pursuant to Part 617 of the implementing regulations pertaining to Article 8 (State Environmental Quality Review) of the Environmental Conservation Law.

The Planning Board of the Town of Brookhaven, as the SEQR Lead Agency, has determined that the proposed action described above may have a significant impact on the environment and that a Draft Environmental Impact Statement (DEIS) should be prepared.

Scoping will not be conducted as scoping was previously conducted for a nearly identical proposal on July 22, 2014, at the Town Hall Auditorium. Due to the fact that no significant material changes have been made to the applicant's proposal, all of the information gathered from the previous scoping session will apply during the review process.

REASONS SUPPORTING THIS DETERMINATION:

The Planning Board in reviewing the proposed Plan in accordance with SEQR Parts 617.3 and 617.6, using the information available and comparing it with the thresholds set forth in Part 617.4, has determined that the proposed action is a Type I action. A coordinated review for Type I actions involving more than one agency was completed on September 21, 2015, as set forth in SEQR Part 617.6 (b), in order to inform and allow other regulatory agencies to participate in the decision making process.

The Planning Board as Lead Agency and after review and analysis of the proposed Plan, the Environmental Assessment Form Parts I, II and III prepared for the proposed Plan, various land use studies, the issues and relevant areas of environmental concern identified and as enumerated below, the criteria contained in Part 617.7, and other supporting information finds that the proposed action may have a significant effect upon the environment and that a Draft Environmental Impact Statement (DEIS) should be prepared.

The Board has considered that the purpose of the DEIS is to inform the public and other public agencies as early as possible that the project may significantly affect the quality of the environment, and to solicit comments which will assist the agency in determining the environmental consequences of the proposed action.

Significant impacts to the environment are anticipated, including but not limited to:

Natural Resources:
The applicant is proposing to clear and grade nearly 62 acres of woods on the roughly 100 acre parcel. Bounded to the east and south by open space (owned by the Town of Brookhaven and Suffolk County jointly), the clearing of the subject parcel will have significant impacts on the natural resources including on-site vegetation and wildlife. The parcel is likely utilized by a wide array of animals including potentially four (4) species listed by New York State as species of Special Concern. Removal of the vegetation will eliminate food sources, shelter and nesting habitat for the special concern and other species. While the applicant proposes to re-vegetate the majority of the cleared area with grasses and other low growing vegetation, the community type which currently exists will be irreparably changed.

Ecological Resources:
The proposed plan will permanently remove nearly 62 acres of pitch pine-oak heath forest. The property and surrounding areas are utilized by a diverse number of species including potentially four (4) species which are on New York State's Special Concern list. These species utilize the subject property for feeding and nesting and could be significantly impacted by the removal of habitat. The site will be almost entirely re-vegetated with low growing grasses and or shrubs which will create an extensive area of new habitat on-site, similar to habitat at the nearby Calabro Airport and Brookhaven National Lab's solar facility. Additionally, removal of such a large forested area will impact rainwater and stormwater runoff with the potential to impact the Forge

River which is located less than 1,000 feet southeast of the site in the general direction of groundwater and surface water flow. The removal of nearly 62 acres of woods could have impacts on surrounding areas (pushing wildlife from the woods into adjacent and nearby residentially developed properties), especially when combined with the potential for similar projects to the north and the impacts associated with the 200 acre solar farm at BNL which is located two (2) miles north of the subject property.

Agriculture and Open Space:
There are no impacts to agricultural lands expected from this project. The parcel is bounded on the south and east by open space properties owned jointly by the Town of Brookhaven and Suffolk County. There is an informal trail which borders the southern end of the subject property that is popular among joggers, bikers and hikers. The proposed project may impact the scenic qualities of this trail and surrounding open space if adequate vegetative screening is not kept in place during development. Additionally, if the transmission lines are installed overhead through the open space area, significant impacts to the scenic qualities and the natural vegetation within open space will occur.

Visual Resources:
The proposal will be sited on a parcel that is bounded by open space owned by Suffolk County and the Town of Brookhaven jointly on the south and east. Directly to the south of the subject property is an informal trail, which is actively used by hikers, bikers, joggers and others. The proposed site plan, with associated clearing could result in impacts to the scenic and visual qualities of this trail and the surrounding open space. Additionally, construction and installation of transmission lines from the proposed solar farm to the nearby substation, if routed near this trail through open space would have significant impacts on the visual resources of the existing parkland.

Energy:
The proposed project will create approximately 20 MW of energy that may be fed into the grid and may be available for use by LIPA customers. While the energy being created is "green", the additional energy available for purchase may result in increased development and energy usage within the Township.

Cumulative Impacts:
The proposed site plan estimates the clearing of approximately 62 acres and the production of nearly 20 MW of energy. Other properties within the eastern portion of Brookhaven Town, which are privately owned, could potentially accommodate similar scale projects. Additionally, there is an existing solar facility located at Brookhaven National Lab (less than two [2] miles due north) covering approximately 200 acres. A collection of wooded parcels totaling over 500 acres and zoned Light-Industrial-1 is located directly between the subject property and the BNL property – however this is no indication that the site will be used for solar energy production. Lastly, the Town of Brookhaven has approved a solar energy production facility in Shoreham and is currently reviewing an application for another such facility in Shoreham on an existing 150-

acre golf course. The impacts associated with the project are therefore potentially cumulative to the region and Township due to the recent increase in solar energy production facilities, particularly in eastern Brookhaven Town.

Cumulative impacts could also occur from the increase in power available to the grid. The proposed project will add nearly 20 MW to the grid for customer consumption. This project, combined with the BNL solar production facility, the proposed Caithness II gas powered plant, the proposed Tall Grass solar energy production facility and any projects which may be submitted in the near future, have the potential to increase the amount of energy available for use within the Town of Brookhaven which could then spur increased development – though LIPA and PSEG have publically stated conflicting reports regarding the amount of energy needed for the Long Island Region.

REVIEW AGENCY:	**The Town of Brookhaven Planning Board**
CONTACT PERSON:	**Luke Ormand, Environmental Analyst, Division of Environmental Protection**
ADDRESS:	**One Independence Hill, Farmingville, NY 11738**
PHONE NO.:	**631-451-6455**
EMAIL:	**lormand@brookhaven.org**

COPIES OF THIS NOTICE SENT TO:
Applicant
Environmental Notice Bulletin
Kim Kennedy, S.C.W.A.
James L. Tomarken, MD, S.C.D.H.S.
Andrew Freleng, Suffolk County Planning
Mike Carrara, NYSDEC Region 1
Michael Deering, L.I.P.A.
Marie Jenet, F.A.A., Eastern Region
Town of Brookhaven:
Councilperson Daniel Panico – Council District 6
Tullio Bertoli, AICP, Commissioner, PELM
Leigh Rate, Town Attorney's Office

THIS DETERMINATION IS NOT COMPLETE UNTIL AUTHORIZED AS FOLLOWS:

ADOPTED BY RESOLUTION ON: September 21, 2015

Eileen McCallion, Planning Board Secretary: Eileen McCallion

FINAL SCOPE FOR THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR PROPOSED MIDDLE ISLAND SOLAR FARM ELECTRIC GENERATING FACILITY

MORICHES-MIDDLE ISLAND ROAD, MANORVILLE TOWN OF BROOKHAVEN, SUFFOLK COUNTY, NEW YORK

September 16, 2014

Overview:
This document is the Final Scope for the Draft Environmental Impact Statement (DEIS) for the proposed Middle Island Solar Farm. The proposed action involves, in part, a request for a special permit for an electric generating facility on property located along Moriches-Middle Island Road in the hamlet of Manorville, Town of Brookhaven, known on the Suffolk County Tax Map as District 0200 – Section 712.00 – Block 09.00 – Lot 001.000 (the "subject property"), comprising approximately 100 acres.

To ensure that the DEIS will address all significant issues, the Town of Brookhaven Town Board, as lead agency, has issued a Positive Declaration and has conducted a formal scoping meeting on July 22, 2014 pursuant to 6 NYCRR §617.8 (Scoping) of the implementing regulations of the New York State Environmental Quality Review Act (SEQRA). This Final Scope provides a description of the proposed action and the requested content of the DEIS, as determined through the public scoping session and associated written comments from members of the public as well as interested and involved agencies. This Final Scope has been prepared in accordance with 6 NYCRR §617.8(f) and sets forth the following:

- Brief description of the proposed action;
- The potentially significant adverse impacts identified both in the positive declaration and as a result of consultation with the other interested agencies and the public, including an identification of those particular aspect(s) of the environmental setting that may be impacted;
- The extent and quality of information needed for the preparer to adequately address each impact, including an identification of relevant existing information, and required new information, including the required methodology(ies) for obtaining new information;
- An initial identification of mitigation measures;
- The reasonable alternatives to be considered;

- An identification of the information/data that should be included in an appendix rather than the body of the draft EIS; and Those prominent issues that were raised during scoping and determined to be not relevant or not environmentally significant or that have been adequately addressed in a prior environmental review.

Brief Description of the Proposed Action:

Special Permit and Conceptual Plan:
The proposed action consists of the development of a photovoltaic (PV) solar energy farm capable of generating approximately 19.2 megawatts (MW) of renewable electricity for distribution onto the PSEG Long Island power grid. The 100.33-acre, vacant subject property would be improved with a field of solar PV arrays, a 4,032±-square-foot maintenance and operations building (with office, storage, security, monitoring and repair spaces), gravel internal circulation drives, pad-mounted inverters and transformers, and a gravel parking area. A septic system, a drywell, and water service would also be installed. Vehicular access would be provided via a single driveway extending from Moriches-Middle Island Road, with additional emergency access also provided. The proposed facility would be surrounded by a double-row of six-foot-high, chain-link fencing, and dense natural buffers ranging in minimum depths from 50 feet (east and north), to 110 feet (south), to 200 feet (west). The facility would be manned, with up to approximately six operations and maintenance personnel present on site at any given time.

The preliminary design of the solar PV structures includes interconnected ground-mounted fixed-position solar PV panels mounted on a metal frame with helical steel or pre-cast concrete piles. The low end of the arrays will be four feet above grade, and the high end will be approximately 13 feet above grade. PSEG Long Island will be responsible for determining and installing the interconnection line route to the site for connection to the local electric grid.

The proposed solar farm, a renewable, “green” source of energy, would have a substantial environmental benefit. This alternative energy source would reduce the demand for electricity generated by the burning of fossil fuels (e.g., oil, natural gas) at traditional power plants that produce air emissions of greenhouse gases. Further, the proposed action has been designed to incorporate various measures that will minimize, preclude or mitigate potential environmental impacts, including, but not limited to, the retention of substantial natural buffers (totaling approximately 31.7 acres); the planting native plants and grasses across approximately 61.4 acres of area to be cleared (beneath the proposed solar arrays); design of security lighting to minimize potential impacts on surrounding properties; and the implementation of erosion and sediment controls during construction in accordance with an approved Stormwater Pollution Prevention Plan. It should be noted that vehicular trip generation, water use, and sanitary waste generation associated with the day-to-day operation of the proposed facility would be minimal, and no odor or air emissions would be generated by the proposed solar PV arrays. Additionally, the proposed action is expected to have various benefits (in addition to those associated with

the proposed renewable energy source), including construction and operational job generation.

The "*Description of the Proposed Action*" section of the DEIS will describe the proposed action in greater detail and will also include, but not be limited to, detailed site data; project purpose, needs and benefits; required permits and approvals (including, but not limited to, the requested Special Permit for an electric generating facility); solid waste management; and anticipated construction period and phasing.

The information prepared in conformance with this scope and the SEQRA process is intended to provide comprehensive input in the decision-making process for use by involved agencies in preparing their own findings and issuing decisions on their respective permits. The DEIS will be concise but thorough, well documented, accurate and consistent. Figures and tables will be presented in support of the discussions and analyses contained in the DEIS. Where appropriate, technical information will be summarized in the body of the DEIS and attached in their entirety in separate appendices.

The Town Board, as lead agency under SEQRA, issued its Positive Declaration on June 24, 2014 requiring the preparation of a DEIS. As required by SEQRA, the contents of the DEIS are determined as a result of a process known as "scoping". The Draft Scope was submitted to the Town on July 18, 2014 to facilitate scheduling of a scoping meeting to occur subsequent to the issuance of the Positive Declaration and has been subject to public and agency input. A Public Scoping Meeting was held on July 22, 2014 where public concerns were voiced and written comments were received for ten (10) days subsequent to the public hearing.

This has resulted in the issuance of this Final Scope by the Town Board of the Town of Brookhaven as lead agency. Town Board issuance of the Final Scope completes the scoping process, in conformance with 6NYCRR, Part 617.8.

The written comments that were received during the open comment period are attached as Appendix A of this Final Scoping Document and shall be addressed in the DEIS.

Potentially Significant Adverse Impacts:
Based upon review of the Positive Declaration issued by the Town Board of the Town of Brookhaven, and the Part III Full Environmental Assessment Form (FEAF) prepared by the Town of Brookhaven Department of Planning, Environmental Protection and Land Management (*Appendices B and C*), potential adverse impacts to the following elements of the environment warrant evaluation in the DEIS: land; water resources; ecological resources, air resources; land use, zoning and plans; transportation, aesthetics, visual resources and noise; and energy. In addition, cumulative impacts from related projects will be addressed. The following is a description of the potential significant adverse impacts that may occur as a result of the proposed project, as listed in the Positive Declaration and identified through the scoping process:

Geological Resources: The subject parcel, being approximately 100 acres in size, may need regarding during site development to insure optimal efficiency from the installed solar panels. Concerns related to cut/fill during development were raised during scoping. Additionally, the proposed project will be absent of vegetation for an extended period of time, and environmental impacts from fugitive dust and/or erosion may occur.

Water Resources: The proposed development will remove a significant amount of native vegetation which currently absorbs stormwater and runoff from adjacent areas. Water not absorbed by the vegetation is filtered through the soil before entering the Forge River, as the headwaters are located directly southeast (in the direction of groundwater flow) from the subject parcel. Removal of this vegetation may alter groundwater and surface water flow with respect to the Forge River and could impact water quality. This was a major concern expressed during the public scoping process. Additionally, the public was concerned about stormwater runoff from the panels during severe storm events, the potential for erosion and mitigation measures that the developer may implement related to stormwater.

Ecological Resources:
The proposed plan will permanently remove nearly 70 acres of pitch pine-oak heath forest. The property and surrounding areas are utilized by a diverse number of species including four (4) species which are on New York State's Special Concern list. Removal of the vegetation will eliminate food sources, shelter and nesting habitat for the special concern and other species. While the applicant proposes to revegetate the majority of the cleared area with grasses and other low growing vegetation, the community type which currently exists will be irreparably changed.

Additionally, removal of such a large forested area will impact rainwater and stormwater runoff with the potential to impact the Forge River which is located less than 1,000 feet southeast of the site in the general direction of groundwater and surface water flow. Concerns related to the Forge River (and conformance with the Forge River Watershed Management Plan) were raised during the public scoping session. The removal of nearly 70 acres of woods could have impacts on surrounding areas (pushing wildlife from the woods into adjacent and nearby residentially developed properties), especially when combined with the potential for similar projects to the north and the impacts associated with the 200 acre solar farm at BNL which is located two (2) miles north of the subject property.

During the public scoping process, several members of the public as well as organizations raised concerns regarding the potential impacts to groundwater if the subject parcel was developed with as-of-right zoning in a "worst-case" scenario. As the proposed action for the subject parcel is a solar farm, the only waste water generated will be from a small (approximately 4,000 square foot) facility and a low number of employees. Furthermore, the public comments were interested in the potential nitrogen flow from the site would be if developed under existing zoning. Potential adverse impacts related to removing native vegetation to construct a solar farm were also mentioned.

Air Resources:
The proposed application seeks a special permit to allow an electric generating facility to be constructed on a 100 acre parcel which will require approximately 70 acres of vegetation to be removed. The public voiced concerns during the public scoping process of impacts on air quality related to the removal of this significant amount of vegetation compared to the benefits provided by the generation of "green" energy (which utilizes zero fossil fuels). Specifically, the several members of the public and groups were interested in the carbon sequestration of existing vegetation and the emissions which would be offset from existing (fossil-fuel powered) power plants in the region as a result of the solar farm being constructed.

Land Use, Zoning and Plans:
The parcel is bounded on the south and east by open space properties owned jointly by the Town of Brookhaven and Suffolk County. There is an informal trail which borders the southern end of the subject property that is popular among joggers, bikers and hikers. The proposed project may impact the scenic qualities of this trail and surrounding open space if adequate vegetative screening is not kept in place during development.

Potential impacts from using the land for a solar farm which may become technologically inefficient over time is a concern expressed during the scoping process. Additionally, concerns related to development of the subject property with respect to the Forge River Watershed Management Plan were raised during public scoping.

Transportation:
Impacts to local, neighborhood roads may occur if the proposed emergency access routes are frequented by unauthorized users and/or used as ingress/egress to the site.

Aesthetics, Visual Resources and Noise:
The proposal will be sited on a parcel that is bounded by open space owned by Suffolk County and the Town of Brookhaven jointly on the south and east. Directly to the south of the subject property is an informal trail which is actively used by hikers, bikers, joggers and others. The proposed site plan, with associated clearing could result in impacts to the scenic and visual qualities of this trail and the surrounding open space. Additionally, construction and installation of transmission lines from the proposed solar farm to the nearby substation, if routed near this trail through open space would have significant impacts on the visual resources of the existing parkland. During the scoping process, residents to the west of the subject property expressed concerns about visual impacts (from removal of vegetation and lighting) to their neighborhood as well as the potential for glare to interfere with the nearby airport and other regulated FAA traffic.

Energy:
The proposed project will create approximately 20 MW of energy that will be fed into the grid and available for use by LIPA customers. While the energy being created is

"green", the additional energy available for purchase may result in increased development and energy usage within the Township.

Cumulative Impacts:
The proposed site plan estimates the clearing of approximately 70 acres and the production of nearly 20 MW of energy. There are other properties within the eastern portion of Brookhaven Town that are privately owned that could accommodate similar scale projects. Additionally, there is an existing solar farm located at Brookhaven National Lab (less than two [2] miles due north) covering approximately 200 acres. A collection of wooded parcels totaling over 500 acres and zoned Light-Industrial-1 is located directly between the subject property and the BNL property. Additionally, LIPA has in place a Request for Proposal (RFP) for renewable energy with which the applicant is seeking to take advantage of. This outstanding RFP has created a demand for solar projects. The impacts associated with the project are therefore potentially cumulative to the region and Township.

Cumulative impacts could also occur from the increase in power being supplied to the grid. The proposed project will add nearly 20 MW to the grid for customer consumption. This project, combined with the BNL solar farm, the proposed "Spower" solar farm (Shoreham), the proposed solar project at Calabro Airport, and any projects which may be submitted in the near future on the "Hotel Bayou Copr" parcel sited between BNL and the subject property have the potential to increase the amount of energy available for use within the Town of Brookhaven which could then spur increased development. Additionally, these proposed projects are all located within a north/south corridor extending eight (8) miles from the subject parcel to the Spower solar farm proposal. Within this corridor, due to the existing, proposed or potential projects listed above, hundreds of acres of vegetation will be removed and or altered which could have a cumulative effect on air quality, groundwater, stormwater absorption and wildlife habitat (particularly with respect to migratory birds and species which require grassland habitat).

Organization and Overall Content of the DEIS:
The DEIS will conform to the basic content requirements as contained in 6NYCRR Part 617.9(b)(3). The document will include the following sections:

Cover Sheet:
Pursuant to SEQRA Part 617, §617.9(b) (3), the DEIS will be preceded by a cover sheet stating:

- Title identifying that the document is a DEIS
- Name of the project and type of application under review
- Hamlet, Town, County and State in which project is located
- The Brookhaven Town Board will be identified as the Lead Agency for the project and the name and telephone number of the Lead Agency contact will also be provided.
- The name and address of the project sponsor as well as the name and address of a contact person representing the project sponsor.

- The name and address of the primary and all secondary preparers, as well as contact names and telephone numbers of each preparer.
- Month and year submitted
- Date of acceptance of the DEIS (to be inserted later)
- Deadline by which comments on the DEIS are due (to be inserted later)

Table of Contents:
Table of contents will provide all headings, page numbering, list of figures, list of tables, list of appendix items and additional volumes, if any.

Summary:
Contents of the summary will include the following:

- Brief description of the proposed action
- Brief summaries of the significant beneficial and adverse impacts
- Brief summaries of the mitigation measures
- Brief summaries of the cumulative impacts
- List of public benefits.
- List of the alternative development scenarios considered
- List of the permits and approvals required

The specific Table of Contents for the proposed DEIS will be as follows:

1.0 EXECUTIVE SUMMARY

2.0 DESCRIPTION OF PROPOSED ACTION

2.1 Introduction
2.2 Existing Conditions
2.3 Site and Project History
2.4 Project Description
2.5 Purpose, Benefit and Need
2.6 Construction and Phasing
2.7 Required Permits and Approvals

3.0 EXISTING CONDITIONS, POTENTIAL IMPACTS AND PROPOSED MITIGATION

3.1 Geological Resources
3.1.1 Existing Conditions
3.1.2 Potential Impacts
3.1.3 Proposed Mitigation

3.2 Water Resources and Plans
3.2.1 Existing Conditions
3.2.2 Potential Impacts

3.2.2.1 Conditions without the proposed Action
3.2.2.2 Conditions with the proposed Action
3.2.3 Proposed Mitigation

3.3 Ecological Resources
3.3.1 Existing Conditions
3.3.2 Potential Impacts
3.3.3 Proposed Mitigation

3.4 Air Resources
3.4.1 Existing Conditions
3.4.2 Potential Impacts
3.4.3 Proposed Mitigation

3.5 Land Use, Zoning and Plans
3.5.1 Existing Conditions
3.5.2 Potential Impacts
3.5.3 Proposed Mitigation

3.6 Transportation
3.6.1 Existing Conditions
3.6.2 Potential Impacts
3.6.3 Proposed Mitigation

3.7 Aesthetics, Visual Resources and Noise
3.7.1 Existing Conditions
3.7.2 Potential Impacts
3.7.3 Proposed Mitigation

3.8 Energy
3.8.1 Existing Conditions
3.8.2 Potential Impacts
3.8.3 Proposed Mitigation

4.0 OTHER REQUIRED SECTIONS

4.1 Cumulative Impacts
4.2 Adverse Impacts That Cannot Be Avoided
4.3 Irreversible and Irretrievable Commitment of Resources
4.4 Growth-Inducing Aspects
4.5 Effects on the Use and Conservation of Energy Resources

5.0 UNAVOIDABLE ADVERSE IMPACTS

5.1 Short-Term Impacts
5.2 Long-Term Impact

6.0 ALTERNATIVES

- **6.1 No-Action**
- **6.2 Sale/Transfer of Land to a Government Entity for Preservation**
- **6.3 Alternative Interconnection Routes**
- **6.4 Solar Farm development without variances**
- **6.5 Development in Accordance with Prevailing Zoning (As-of-Right)**

7.0 REFERENCES

Extent and Quality of Information Needed to Adequately Address Potentially Significant Adverse Impacts:

As required under SEQRA, the DEIS should include *"a statement and evaluation of potential significant adverse impacts at a level of detail that reflects the severity of the impacts and the reasonable likelihood of their occurrence"*. Included in this evaluation should be reasonably related short-term and long-term impacts, with other required sections identified in this scoping document. This section further describes the level of analysis and the type of analysis expected with respect to the key environmental impacts of the project as outlined in the Positive Declaration. Each major section is followed by a description of the extent and quality of information needed to perform the evaluation of each of the impacted resources.

The following describes the information to be obtained and analyses provided in the DEIS to address each of the potential adverse environmental impacts identified in the Positive Declaration:

> Description of the Proposed Project – Project Background, Objectives and Benefits – a description of the history/evolution of the subject site. The intended use of the site for electric generation will be established through a summary of previously submitted land use documents (application, FEAF, etc.)
>
> A brief history of the evolution of the proposed application will be provided; this will relate the proposed project to Town goals for the site and the surrounding area; discuss the community's need for the project; provide discussion of the applicant's goals in pursuing proposed project; and provide listing/discussion of the benefits to accrue to the community from the proposed project. The objectives of the project sponsor will be included and discussed. The goals of the project sponsor in pursuing the proposed project will be discussed. Provide discussion of the benefits to accrue from the proposed project including public benefits, carbon emissions/toxins offset, taxes and jobs; provide detail on types/quality of jobs anticipated. The benefit of producing "green" energy and development in relation to the Forge River Watershed Management Plan (March, 2012) will be established.
>
> Project Location and Current Site Conditions – Describe and map location of site in terms of roadway access and adjacent/nearby significant properties, districts

and services; identify tax parcels; provide a description of the existing site condition and surrounding land uses and roadway network.

Project Design and Layout – Based on Conceptual Plan, describe layout of project; describe/discuss: structures and solar panels proposed; anticipated electric generation, site access, internal roadways and parking; conceptual grading and drainage, limits of clearing; sanitary disposal and water supply systems; landscaping and other amenities proposed; describe open space areas. Provide Comparison Table of current and anticipated future conditions of site.
The anticipated conceptual grading for the site will be described in terms of the anticipated excess grading materials. The Town lighting requirements will be provided and described. Information on the general type, amount and location of landscaping anticipated will be provided as well as information on maintenance requirements such as irrigation and fertilization under operation and maintenance. An account of the expected height of the buildings in relation to the surrounding area and Town Code restrictions will be included. Zoning conformance will be done on a point-by-point basis per Town Code requirements. Discuss compliance to other applicable development regulations.

Construction Schedule and Operations – Provide phasing information and describe construction process and anticipated schedule, phasing and operations (note that phasing and construction scheduling are estimates and are subject to change based on market conditions; include a discussion of site preparation, construction materials storage/staging area and construction schedule/estimated duration; workers' parking, hours of operations, truck routes, facility use, occupancy and operation, protection of natural and sensitive areas, and related construction and operations). Include a discussion of conformance to SPDES stormwater and erosion control regulations for construction and post-construction conditions. Provide anticipated sequence and duration of construction phases, and maintenance and operation of the facility. Discuss the type, duration and extent of the anticipated impacts associated with the construction period for the proposed project and measures to mitigate such impacts, particularly noise and dust.

Permits and Approvals Required – Provide brief discussion of SEQRA process and review stages required for the proposed project; list all required permits, reviews and approval, and note the administrative status of each.

Geological Resources – The site's existing topographic character will be discussed and mapped based on available topographic data, to include the general elevation trends of the site, the existing high and low elevations and locations, previous modifications made for the project, and site drainage characteristics. The proposed project plan will be used to discuss/analyze the anticipated grading program for the proposed project, with respect to the possibility of excess grading material. Discuss compliance with Town/SPDES permitting and Town Chapter 86 Stormwater Management and Erosion Control requirements. Discuss conformance to SPDES GP-0-10-001.

The site's existing soil types and their distribution pattern will be described; a discussion of the limitations to development of each soil type found [the SCSC (1975) will be referenced for this information and a map will be provided]. Site-specific soil information will be presented and discussed, if available; soil limitations will be presented in tabular form. Provide information on the existing soil quality with respect to proposed uses. Potential impacts will be assessed based on proposed use of site and soil limitations outlined above. Discuss mitigation measures, including corrective measures necessary to overcome soil limitations.

Water Resources and Plans – Identify SCDHS Groundwater Management Zone; discuss existing surface water and identify proximity to flood plains. Discuss the sites existing on-site drainage patterns. The site's existing groundwater-related characteristics will be provided; the water table elevation and direction of flow beneath the site will be determined, described and depicted with a Groundwater Flow Map, and the quality of groundwater in the region will be characterized by use of the most recent available monitoring or supply well test results from the SCWA, SCDHS and/or NYSDEC. Figures and tables will be provided as appropriate, including a water table map and water quality test results.

The site's existing and anticipated groundwater recharge rates and nitrogen levels will be estimated by use of mass balance methods designed for nitrogen and recharge budget analysis. Changes in these values from those of the existing conditions will be quantified and discussed, model results will be presented in an appendix. Additionally, an analysis should be conducted for the subject parcel if it were to be developed under a "worst-case" scenario under existing zoning, with the results also located in the appendix.

Sources of potential adverse impacts to groundwater quality will be described and discussed in particular; the anticipated nitrogen concentration will be referenced to the NYS Drinking Water standards. Identify water supply wells and systems and sanitary wastewater systems serving the site. The proximity of the site to surface waters and wetlands and the headwaters of the Forge River will be discussed and mapped. Identify goals of the SGPA established pursuant to the New York State Environmental Conservation Law, Article 55 and the aquifers sole source designation, with respect to the subject site. Identify the goals of the 208 Study with respect to the subject site. Additionally, an analysis of the proposed development and it's conformance with the Forge River Watershed Management Plan (March, 2012) will be required. Concerns regarding the impacts of the proposed project on the headwaters of the Forge River were continually voiced during the public scoping session.

The DEIS will provide calculations of projected water consumption for each use proposed. Potential impact on surface water bodies in proximity to the site will be assessed.

Discuss compliance with SCDHS/NYSDEC for Groundwater Management Zone VI and proposed wastewater treatment; discuss potential issues related to the sites location within multiple groundwater contribution areas to the Forge River; discuss impacts related to depth to groundwater; discuss stormwater recharge facilities; discuss water supply and water availability for the proposed project; describe impacts to surface water resources both on-site and tributary, and drainage. Potential nitrogen impacts will be assessed using a mass-balance model which computes the concentration of nitrogen in recharge. Potential for impact from site operations will be described and conformance to applicable requirements and regulations will be discussed. Conformance to requirements of SCSC Articles 6, 7 and 12 will be discussed. Conformance to the recommendations and conclusions of the Nationwide Urban Runoff Program (NURP) Study will be provided.

The potential for erosion and associated surface and groundwater impacts during the construction process will be discussed, and the requirements and conformance to the Town's Chapter 86 Stormwater Management and Erosion Control requirements will be provided.

Ecological Resources – Based on site inspections by qualified personnel, the site's existing natural resources including vegetation and wildlife species will be described and lists of species observed and/or expected will be provided; a map of the site's habitat areas will be prepared. Describe/discuss the existing vegetation resources of the site, including habitats found acreages of each habitat type, expected and observed vegetation and wildlife species identification, document any known or observed endangered or protected plant species. The Breeding Bird Atlas for site and area species will be consulted and documentation of on-site bird surveying conducted pursuant to NYSDEC protocol will be provided. Correspondence from the New York State Natural Heritage Program (NHP) will be obtained, and any information provided will be addressed, particularly with respect to species with some level of recognition or protection.

Potential impacts from loss/change of habitat area and/or displacement of species will be quantified and addressed. Quantify change in habitat quantities and types on the site; document change to ecological character and wildlife species occupying the site based on NHP findings, as well as the potential impact upon rare, threatened or endangered plant and animal species, if present. Additionally, discuss potential impacts of the newly developed habitat and potential impacts on species within the geographic area and for species known to utilize the new habitat. Lastly, the DEIS will describe what will happen to the vegetation removed from the site (i.e. mulch, paper mill, fuel, etc.).

Air Resources – Particulate matter generated during construction, combustion sources for heating, as well as the additional traffic that would be generated as a result of the proposed change of zone will be discussed. Suffolk County, NY is a

non-attainment area for ozone (O3) and PM2.5 but is an attainment area for the other criteria air pollutants SOx, PM10, CO, NO2 and lead. The reduction of a significant amount of natural vegetation currently providing an air pollution barrier for the adjacent community was a concern raised during public scoping. The potential for impacts to air quality from the removal of this vegetation, versus the benefits from creating energy from a non-combustible/non-fossil fuel source will be evaluated. Concerns regarding carbon sequestration/absorption and related toxin/emission information were firmly voiced during the public scoping meeting.

Land Use, Zoning and Plans – The DEIS will describe and map the existing land use and zoning of the site, of adjacent and nearby sites, and the patterns of land use and zoning surrounding the project site. The document will discuss the compatibility of the project with surrounding land uses (including any similar uses already established in the area, such as the "solar farm" at BNL) and the land use pattern, as well as the zoning pattern in the vicinity of the subject site. The DEIS will analyze the conformance of the project with requirements of the Town Code Section 85 for the proposed zoning. A description of the Draft Town Comprehensive Land Use Plan (1996) and relevant land use plans will be provided, and the pertinent recommendations will be described and analyzed.

Transportation – The Transportation section will include a summary of expected traffic to and from the site during the construction period and the operational period. Additionally, it will discuss emergency access gates and routes.

Aesthetics, Visual Resources and Noise – Based on site visits and the use of digital photographs (to be presented in an appendix), the existing viewscape of and across the site from adjacent roadways and other publicly accessible viewpoints (including the open-space trail to the south) will be described. Locations shall be determined through analysis of significance to the viewing public. Based on the applicant's and engineer's input in regard to building design solar facility design and material use, the anticipated visual impacts of the proposed solar array will be discussed for the same viewpoints. A glare analysis, in conformance with any guidelines provided by the FAA (if applicable) will be needed, particularly with respect to the proximity to Calabro Airport. Based on the applicant's and engineer's input in regard to proposed outdoor lighting, the anticipated impacts on adjacent properties will be evaluated. The intent will be to illuminate only areas on the interior of the site by use of dark sky compliant, low wattage and/or shielded fixtures and minimizing use of lighting to safety and security purposes.

Description of the noise environment in the area of the subject site and any potential impacts created by the proposed project will be analyzed, including noise generated during construction. In conjunction with the discussions of potential land use impacts presented in the section above, discuss potential impacts on the quality of life for residents near the subject site. Potential impacts

associated with the reduction of a significant amount of natural vegetation buffering the communities to the west and east from noise associated with the project will be discussed. Concerns of negative impacts to aesthetics, visual resources, and noise were firmly voiced at the public scoping meeting.

Energy – The DEIS will describe the proposed solar farm, the technology used to generate electricity, the type of panels used, how much electricity will be generated annually and how many homes/businesses can be powered by said electric generation. Additionally, the DEIS will describe the route that will connect the site to a substation and how this route was selected. Information related to the energy needs of Brookhaven Town and how the proposed project fits in with the goals of LIPA/PSEG will be provided. In conjunction with the above, the DEIS will describe the expected lifespan of the proposed project and provide a decommissioning and/or upgrade plan for the site once the technology is no longer economically efficient.

Other Required Sections

In addition to the key resources identified in the Positive Declaration, SEQRA identifies other required sections for a complete EIS as included in 6NYCRR Part 617.9 (b)(3). The following Other Required Sections and evaluations should be provided in the DEIS.

Cumulative Impacts – Cumulative impacts are the potential impacts of a proposed action taken in conjunction with those of other active or anticipated nearby development projects. Cumulative impacts will be analyzed with other pending applications in the area, to be provided by the Town Planning office. The other pending applications, existing projects and potential projects are as follow:

1. Brookhaven National Laboratory (BNL) Solar Farm[1]
2. SPower Solar Farm (Shoreham)[2]
3. Brookhaven Town Solar Project (Calabro Airport)[3]
4. Bayou Hotel Corp. (no application submitted – 500 + vacant acres of L1/L2 between BNL and subject parcel)[4]

The relationship between supply/demand for solar energy should be analyzed as well as the impacts associated with removal of significant amounts of native woodland vegetation or other habitat alteration within a north/south corridor extending approximately eight (8) miles from Shoreham to the subject site.

Potential impacts of the proposed project on each resource category (if any) will be addressed, with an emphasis on impacts to wildlife and natural resources. The characteristics of these projects relevant to energy, air quality and potential groundwater impacts will be ascertained from review of Town Division of

1 Existing
2 Under Review by Brookhaven Town Planning Board
3 Proposed by Brookhaven Town
4 No current proposal /application

Planning records and quantified cumulatively with those of the proposed project and these identified impacts will be discussed.

Adverse Impacts That Cannot be Avoided – A list and brief descriptions of those adverse impacts described and discussed in greater detail elsewhere in the document that cannot be avoided will be provided.

Irreversible and Irretrievable Commitment of Resources – The DEIS will identify those natural and human resources described in the Existing Conditions sections that will be consumed, converted or made unavailable for future use as a result of the proposed project.

Growth-Inducing Aspects – Growth-inducing aspects of a project include those direct and indirect effects of that project that promote additional development in the area. The nature of such anticipated growth will be described and impacts of growth (if projected) will be assessed.

Effects on the Use and Conservation of Energy Resources – Provide a discussion on those aspects of the proposed project that would contribute to an increase in energy used in the community as well as potential options for conservation of energy as a result of the proposed solar farm.

Initial Identification of Mitigation Measures:

This Final Scope includes an initial identification of mitigation measures that will be further addressed in the DEIS as required by SEQRA. These are outlined as follows:

Geological Resources:

1. Minimize the importation/exportation of fill to the extent practicable.
2. Develop and implement an erosion and sedimentation control plan.
3. Install structures and plantings as soon as possible after clearing to minimize the amount of time that soils are exposed.
4. Install silt fencing and hay bales to control erosion and prevent the siltation of drainage structures, and implement monitoring programs.
5. Fully comply with SWPPP regulations.
6. Fugitive dust control measures such as wetting of dry soils will be implemented during construction.

Water Resources:

1. Retain contiguous natural vegetation, to the maximum extent practicable.
2. Minimize or eliminate the use of fertilizer-dependent vegetation within areas proposed for replanting.

3. Adhere, to the maximum extent possible, to the relevant recommendations of the *208 Study*, *Nonpoint Source Management Handbook* and other applicable studies (e.g., *Forge River Watershed Management Plan [March, 2012]*).
4. Install drainage system components, and strategic grading, to contain and recharge stormwater runoff on-site to the extent practicable.

Ecological Resources:

1. Maintain native vegetation, to the maximum extent practicable.
2. Minimize the amount of fertilizer-dependent vegetation, and establish significant areas of native plantings within proposed areas of clearing.
3. Manage construction scheduling to accommodate nesting patterns, etc., of on-site wildlife.
4. Ensure permanent protection of open-space areas.

Air Resources:

1. Provide a discussion of any measures taken to mitigate potential impacts related to air quality during site development and removal of vegetation.

Land Use, Zoning and Plans:

1. Discuss design of the project and proposed buffers to adjacent residential areas and mitigation measures proposed.
2. Provide discussion of the proposed development in relation to the Forge River Management Plan (March, 2012).

Transportation:

1. Discuss purpose and need for emergency access and the measures that will be put in place to ensure these access points are not used for unauthorized means.

Aesthetics, Visual Resources and Noise:

1. Prepare an appropriate glare analysis and provide any correspondence with the FAA, as needed.
2. Discuss vegetative buffers to be retained adjacent to residential areas and the need for the requested variances
3. Provide measures to ensure that the site will not detract from the aesthetics and visual resources provided by the informal nature trail bordering the southern portion of the property.

Energy:

1. The proposed action would have a significant benefit as a renewable, "green" source of electricity. However, mitigation measures may be needed depending upon the proposed connection route from the subject site to the nearest substation.

Reasonable Alternatives to be Considered:
Pursuant to 6 NYCRR Part 617, the DEIS must contain a description and evaluation of reasonable alternatives to the proposed action. Thus, the DEIS will analyze the impacts of the following alternatives and quantitatively and qualitatively compare these impacts to those associated with implementation of the proposed action with an appropriate table/chart. The alternatives described and analyzed in the DEIS will include:

- Alternative 1: No Action - the site remains in its current condition.
- Alternative 2: Sale/Transfer of Land to a Government Entity for Preservation
- Alternative 3: Alternative Interconnection Routes
- Alternative 4: Solar Farm development without the need for variances
- Alternative 5: Development in Accordance with Prevailing Zoning (As-of-Right)

Information to be Included in Appendices:
All pertinent information and correspondence included, presented or discussed in the document will be included in appendices identified for ease of reference. Such appendices may include, but not be limited to: the adopted Final Scope; Traffic Impact Study information; nitrogen and water budget data; correspondence received from referral requests; water quality and associated information for the Forge River; schematic/site plan depicting route of connection to the LIPA substation; and correspondence from LIPA/PSEG regarding the need for the proposed facility.

Issues Deemed Not Relevant, Not Environmentally Significant or Adequately Addressed in Prior Environmental Review:
The intent of the Draft Generic EIS is to disclose and analyze all potential significant adverse environmental impacts associated with the proposed project. The Draft Scope has been the subject of a public scoping process in conformance with SEQRA Part 617.8, which will conclude with the issuance of this Final Scope by the lead agency. Issues identified during the scoping process that are deemed not relevant to the preparation of the Draft Generic EIS, if any, will be listed accordingly at the completion of the scoping process.

The written comments that were received after the public scoping session are attached as Appendix A of this Final Scoping Document and shall be addressed in the DEIS.

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This document is intended to fulfill the lead agency requirements for issuance of a Final Scope in accordance with SEQRA Part 617.8. The document assists the lead agency in evaluating the Draft Generic EIS for content and adequacy for public review, assists the applicant in understanding the extent and quality of information needed to evaluate the proposed project, and allows the lead agency and involved agencies to obtain the information necessary to reach an informed decision on the project.

Appendix A
Written Comments

The Middle Island Solar Farm is a win for Brookhaven August 5th 2014.

Sustainable Long Island is a nonprofit organization whose mission is to promote economic development, environmental health, and social equity for all Long Islanders. We are a catalyst and facilitator for sustainable development across Long Island, cultivating the conditions, identifying resources and providing tools to make smart growth happen in Long Island's economically distressed communities.

Since its founding 15 years ago, Sustainable Long Island has been working in Brookhaven Town and across Long Island to advance economic development, environmental health, and social equity. In 2009 Sustainable Long Island prepared the Farmingville community plan that was unanimously accepted by the Brookhaven Town Board. With partners we developed a Sustainable Community Plan for Middle Country, which was formally adopted by the Town in 2008. And since 2006, we've been working in the Town to coordinate and direct a process that will revitalize the Greater Bellport community.

Sustainable Long Island supports the development of the proposed Middle Island Solar Farm in the hamlet of Manorville. We are in favor of the Town of Brookhaven granting a special permit for a solar electric generating facility on the property.

As experts in community planning and sustainability we believe the Middle Island Solar Farm will be a benefit to the Town of Brookhaven and Long Island as a whole. The proposal for a solar farm will have a marginal impact on the surrounding community, will offer a variety of benefits to the environment, and will improve Brookhaven Town's image related to sustainability.

The Middle Island Solar Farm will be a good neighbor. Based on the current zoning of the area, the proposed use as a solar facility will fit well within the Town's plan for industrial use on the property while creating little to no impact on the surrounding community. As the land has been inactive for a number of years, development of the land as a solar collection facility will offer a benefit to the regional economy, and will be a better, cleaner use than many potentially polluting technologies for which it is currently zoned.

The Solar Farm will be environmentally beneficial. Unlike fossil fuels, solar energy doesn't produce harmful pollutants responsible for increasing greenhouse gasses which contribute to global warming. In addition, as the land is adjacent to the Pine Barrens Compatible Growth Area, development of the site as a solar facility offers a rare opportunity where technology and nature are able to co-exist peacefully.

The Middle Island Solar Farm will help demonstrate that Brookhaven is a leader and supporter of new technologies, especially those that are environmentally friendly.

Data from the US Department of Energy shows that Long Island is among the best solar prospects in New York State, with the potential to produce 420+ watts per square foot dedicated to solar per day. According to estimates from the Solar Energy Industry Association (SEIA) The Long Island Solar Farm at Brookhaven National Laboratory harnesses enough energy to power nearly 4,500 homes, and created more than 200 construction jobs. When it was built in 2011, the 32-megawatt Long Island Solar Farm was the largest solar energy generator in the eastern United States.

Currently New York is rated among the top 10 solar states, in 2013 SEIA estimated NY was able to power 10,731 homes with electricity collected from the sun. The Middle Island Solar farm when completed will add several thousand homes to that figure, and will secure Brookhaven Town as the leader in solar energy in New York State.

399 Conklin Street, Suite 202 ◆ Farmingdale, NY 11735-2614
Phone: (516) 873-0230 ◆ E-mail: info@SustainableLI.org ◆ Website: www.SustainableLI.org

Developing solar power is the right thing to do. The Middle Island Solar Farm will change the way energy is generated on Long Island, help break our reliance upon older technologies that deplete natural resources, toward a cleaner, more innovative, sustainable future.

399 Conklin Street, Suite 202 ◆ Farmingdale, NY 11735-2614
Phone: (516) 873-0230 ◆ E-mail: info@SustainableLI.org ◆ Website: www.SustainableLI.org

Dear Supervisor Romaine, and Town Council Members,

Please accept the following comments in response to the application by the Middle Island Solar Farm for a special permit for an electric generating facility on 100 acres of property located along Moriches-Middle Island Road in the Hamlet of Manorville. There are numerous critical issues related to this application which I will address in detail below.

First, members of the public were not notified of the date and time of the public scoping meeting that was held on July 22, 2014. At the Town Board meeting of June 24, 2014 the Board passed resolution number 2014-484 which adopted a SEQRA Positive Declaration for this project. In the text of the resolution, it refers to a public scoping meeting which will be held "on a date still to be determined". The only place where the date and time of the scoping meeting was actually indicated was within the SEQRA document itself which was not attached to the public version of the resolution which was posted on the Town of Brookhaven website. There was also no information regarding the meeting posted to either the Town's Environmental Notice Board or that of the DEC. As of today, August 6th, the SEQRA document remains the only location where the date and time of the meeting was noted, and it is still not included in the resolution agenda documents available to the public. In addition to the lack of notice, the meeting location was changed at the last minute from the 2nd Floor Auditorium (which can accommodate a large number of people), to the 3rd Floor Work Session Room which can only accommodate a fraction of the attendees. Finally, although the purpose of a scoping meeting is to invite members of the public to comment on the Draft Scoping document, and despite the fact that the resolution (2014-484) passed by the Town Board explicitly stated that the document would be posted on the Town's website, the document was not posted to the website nor made available to the public prior to the July 22nd public scoping session. As of today's date, that document has still not been posted to the Town of Brookhaven website. As a result of these issues, the only way that the few community members who did attend the scoping session learned of the meeting was when a member of a local environmental group who had been invited to attend contacted them privately. It is also of great concern that the resolution empowers the Commissioner of PELM to accept and approve the final scoping document. This action is before the Town Board, and therefore it should be only after their thorough review and by their authority alone that a final document can be accepted. The language in the resolution also does not clearly state whether a final scoping document would be made available to the public for review prior to final acceptance. Given the extremely limited opportunity that the public has been afforded to provide input on this proposal the Town should take extraordinary steps to invite additional public comment before any final document is accepted.

This proposal is only the most recent example of what has become a disturbing lack of transparency in the way the Town of Brookhaven conducts the peoples' business.

There are also a number of issues with the substance of the application itself. The subject parcel is 100 acres of wooded property that is located in the headwaters of the Forge River, in the West Mill Pond Subwatershed. This area has been specifically targeted for some level of preservation action in the Forge River Watershed Management Plan. The project calls for clearing 68.42% of the property. Under the current L1 zoning, the parcel is subject to a 65% clearing limit, however given the distressed nature of the Forge River, and the existence of a watershed management plan, this zoning seems inappropriate and should be changed on the Town Board's own motion to prevent this kind of development in such an environmentally sensitive location.

In their own project description, the applicant (MISF Inc.) states that the company has been proactive in its community relations in parallel to the proposed project. I live in the area surrounding the proposed location of this project, and have found a general lack of awareness of this project among my neighbors, so it would seem that their efforts have not been as effective as they may believe. The same document proposes the installation of a septic system that would serve a Maintenance and Operations building located on the premises. It is well known that nitrogen from such septic systems is directly linked to the

deterioration of water quality that has been seen in the Forge River and other local waterways. In this way, even a small amount of nitrogen from the MISF project would add to the already overwhelming nitrogen load and therefore further reduce the water quality of the river. In addition, the applicant proposes the construction of perimeter and centerline access roadways. Will these be constructed with permeable material? How will this impact of the overall drainage at the site? The applicant also proposes site security lighting. The subject parcel is located in an undisturbed area of land adjacent to two residential developments. Any lighting at the site has the potential to dramatically impact the quality of life of the surrounding residents and must be addressed in any EIS. The project description further states that the South Side of the property will be offset by a requirement to include a 60 foot wide strip of land for "future Town of Brookhaven Highway purposes" but does not explicitly state what those purposes will be. Please provide a clear description of how the Town intends to utilize this portion of the property.

The Draft Scoping Document states that PSEG will be responsible for installing the interconnection line to the site for connection to the local electric grid. Where will this line be located, and how will the potential environmental impacts of that installation be mitigated? It is critical that the impact of the interconnection line be addressed in the final scoping document as well as that it be included in the development of any Environmental Impact Statement. The scoping document also claims that the subject property is not located within a Special Groundwater Protection Area, and continues to say that, "no such impacts upon same are anticipated and same will not be included in the DEIS". Based upon the limited information that is publicly available regarding our local groundwater protection areas, it appears that the site may be located within or directly adjacent to the Central Suffolk Protection Area. As a result, please provide overlay maps of the region surrounding the proposed development with a map of the aforementioned protection area. Finally, this document claims that the development will attempt to preserve native vegetation "to the extent possible", and to comply with the Forge River Watershed Management Plan to the best of their ability. Given that more than 68% of the trees will be cleared, and the management plan targets this specific region for protection, that statement seems disingenuous.

With regard to the actual SEQRA Positive Declaration, the document states that the proposed development will have a significant impact on four species that currently occupy the parcel which are listed as NYS Species of Special Concern. It also states that the rainwater drainage from the subject parcel will have a negative impact on the Forge River, which is located less than 1,000 feet to the SE of the site in the general direction of groundwater and surface water flow. Even at this early stage, it seems clear that these serious negative impacts are likely and should indicate that the proposed location is not an appropriate site for this kind of development. Finally, the declaration statement states that the cumulative impact of this project, "other solar applications" to the North of this parcel, and the existing BNL Solar Farm which is nearby, must be considered. What other applications are pending, and how does the Town intend to mitigate these cumulative impacts?

It is worth noting that the Town has proposed Introductory Local Law # 9 of 2014 which would amend Chapter 85 of the Town Code to add specific language to address Solar Energy Production Facilities in L1 and L4 zones. This legislation has been tabled several times in recent months without explanation. If passed as proposed, the code changes would disqualify this application on the following grounds:

I. The total coverage of a lot with freestanding solar panels shall not exceed 60% lot coverage
II. Solar Energy Production Facilities shall be permitted only on those lands previously cleared prior to the enactment of this section and for lands currently used for agricultural purposes as defined in this chapter.
III. There shall be no additional clearing of trees six inches in diameter or greater.
IV. A Solar Energy Production Facility shall not be adjacent, or within, the control zone of any airport.

The above listed amendments to the code would effectively discourage projects that trade one environmental benefit for another, and encourage applicants such as MISF to locate their developments on land that is already no longer in its natural state. I commend the Town for crafting such thoughtful guidelines for Solar Energy Production and encourage the passage of this local law as soon as possible.

To be clear, Solar Energy Production Facilities such as the one proposed by MISF are an important step toward reducing our dependency on fossil fuel plants and increasing the amount of renewable energy our region produces. My opposition is not to the project itself, but to the location. There are areas in the surrounding region, such as Brookhaven Calabro Airport, where a solar farm could be located and where the community would support such a project. Placing the proposed development in this location would be asking the community to trade one environmental benefit for another, and that is unacceptable.

Thank you,

Jonathan A. Cohen
Manorville, NY

RECEIVED
2014 AUG 7 PM 1 34
TOWN CLERK
TOWN OF BROOKHAVEN

CITIZENS CAMPAIGN FOR THE ENVIRONMENT
www.citizenscampaign.org

225A Main Street • Farmingdale, NY 11735
516-390-7150
188 East Post Road, Suite #202 • White Plains, NY 10601
914-358-9840
744 Broadway • Albany, NY 12207
518-772-1862
733 Delaware Road, Box 140 • Buffalo, NY 14223
716-831-3206
2000 Teall Avenue, Suite #204 • Syracuse, NY 13206
315-472-1339
2404 Whitney Avenue, 2nd Floor • Hamden, CT 06518
203-821-7050

Empowering Communities, Advocating Solutions.

August 6, 2014

Luke Ormand
Environmental Analyst, Division of Environmental Protection
Town of Brookhaven
One Independence Hill
Brookhaven, NY 11738

Re: Middle Island Solar Farm
Public Scoping Comments on Draft Environmental Impact Statement

Dear Mr. Ormand,

Citizens Campaign for the Environment (CCE) is an 80,000 member, not-for-profit, non-partisan advocacy organization working for the protection of public health and the natural environment on behalf of our members in New York and Connecticut. CCE has a long history of working to advance clean, renewable energy and energy efficiency throughout the region.

While Citizens Campaign for the Environment supports the development of clean, emission-free renewable energy we assess each proposal on a case by case basis. CCE offers the following comments on the scope of the Draft Environmental Impact Statement:

1. **The DEIS should provide an analysis comparing emissions generated from the proposed solar farm to energy generated from natural gas and oil.** Electricity generated on Long Island is mostly generated from gas and oil. Solar creates zero emissions at the point of production. On the contrary, energy generated from fossil fuels generates emissions that are harmful to our environment and public health, including, but not limited to greenhouse gas emissions, which are responsible for climate change; nitrogen oxide and sulfur dioxides, the precursors to acid rain; mercury, a bioaccumulative, persistent, and toxic heavy metal; and particulate matter, which is linked to serious human health problems, including respiratory disease. By increasing solar capacity on Long Island, we will reduce dependence on dirty fossil fuels and subsequent emissions. Additionally, solar creates the most electricity when demand is at its highest: on hot summer days. Solar will help meet peak demand in the summer, rather than having to ramp up dirty, inefficient fossil fueled power plants. An environmental impact study needs to identify reduced emissions.

2. **The DEIS should consider the project's contribution to renewable energy and climate goals.** This project advances the goal of New York achieving the 80 x 50 greenhouse gas emission reduction goal and 45 x 15 goal for improved energy efficiency and clean renewable energy production. These important goals reflect the need for Long Island and the State of New York to move aggressively to fight climate change and advance a clean energy economy. Moving forward with large scale solar projects will reduce dependence on polluting fossil fuels, which will reduce emissions and provide significant environmental and health benefits to the region. States, counties and municipalities across the country must step up and recognize that collective change stems from independent initiatives. Home to the Brookhaven National Lab's 32 MW solar farm, the Town of Brookhaven has been on the forefront of renewable energy initiatives and should continue to set strong, aggressive precedents for environmentally sound decisions that will shape our energy future. The DEIS should illustrate the role this project can play in advancing a clean, renewable, fossil fuel-free energy economy of Long Island's future.

3. **Consider adverse environmental impacts associated with alternative uses of the property.** It is critical to recognize that the proposed site property is currently privately owned, and is zoned L1 for light industrial use within the Town of Brookhaven. Due to the current zoning of this property, there is the potential for development that may have an enhanced significant adverse impact to the Forge River. Based on existing solar farms built with best practices, CCE believes that the construction and operation of a solar farm could have minimal to no impact to the Forge River depending on specifics of the design and maintenance operations.

   If the solar project did not move forward, this property could potentially be developed and lost to a structure or project that generates far greateer negative impacts to the natural environment. For this reason, CCE believes the DEIS should evaluate potential nitrogen loading and other septic contaminates to the Forge River for 2 or 3 other scenarios that could occur under L1 compared to the proposed solar farm.

4. **The configuration of the Middle Island Solar Farm should allow for the largest area of undisturbed and contiguous vegetation.** The proposed project site is currently vegetated, with Pitch Pine-Oak woodland and a low growth shrub and sapling tree understory. The current proposal calls for 68.42% clearing of the 100 acre property. CCE believes the Draft Environmental Impact Statement (DEIS) should consider different configurations for the solar arrays that would allow for the largest contiguous areas of undisturbed vegetation to remain on the property. Designs should prioritize habitat preservation not ease of design.

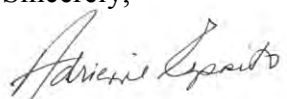
5. **The developers should declare a "Chemical Free Zone."** The project should use mechanical means for clearing any vegetation and commit to **zero** pesticide use. This is a great opportunity for the developer to declare the property a chemical free zone. Making a commitment to zero pesticide use will allow for clean groundwater recharge in this important hydrologic area and will prevent pesticide contaminated runoff from entering the Forge River.

6. **Utilize Green Methodologies for Stormwater Control**. Rainwater and snowmelt that flow across roads, parking lots, rooftops, and other impervious surfaces can pick up harmful pollutants; such as heavy metals, oil, pesticides, and sediment. Ultimately, this polluted runoff is washed into our ocean, lakes, rivers, and streams. Polluted runoff is one of the leading causes of pollution to our waters; degrading drinking water quality, killing fish and wildlife, and closing our beaches. Fortunately, there is a cost effective solution to address the problem, known as green infrastructure. Green infrastructure is a network of decentralized stormwater management practices, such as rain gardens, green roofs, trees and permeable pavement, which can capture and infiltrate rain where it falls. The Suffolk County Planning Commission's guide on "*Managing Storm Water—Natural Vegetation and Green Methodologies"* is an important resource for municipalities or government entities looking to incorporate these new environmentally sound techniques for managing stormwater runoff. Incorporating these techniques for managing stormwater in this proposal can significantly reduce or eliminate the problem of contaminated stormwater runoff from this site that could potentially impact the Forge River and our surrounding waterways.

7. **Evaluate the Carbon Offset for building the Middle Island Solar Farm.** The Draft Environmental Impact Statement should evaluate the amount of carbon that would be sequestered by vegetation if the land were left undeveloped, compared to the carbon offset achieved by developing this land for use as a solar farm.

CCE believes the Town of Brookhaven should move forward with a rigorous environmental review process for this renewable energy project and we look forward to participating in the process. If you have any questions regarding this matter please contact Annie McClelland at our Farmingdale office. 516-390-7150.

Sincerely,



Adrienne Esposito
Executive Director

Annie McClelland
Long Island Program Coordinator

Appendix B

1 inch = 100 ft. GRAPHIC SCALE (IN FEET)

(14621)- DENOTES FILED MAP LOT NUMBERS.

SURVEY NOTES:
1. UNAUTHORIZED ALTERATION OR ADDITION TO THIS SURVEY IS A VIOLATION OF SECTION 7209 OF THE NEW YORK STATE EDUCATION LAW. COPIES OF THIS SURVEY MAP NOT BEARING THE SURVEYOR'S INKED OR EMBOSSED SEAL SHALL NOT BE CONSIDERED TO BE A VALID TRUE COPY. CERTIFICATIONS INDICATED HEREON SHALL RUN ONLY TO THE PERSON/PERSONS FOR WHOM THE SURVEY IS PREPARED, AND ON HIS/HER/THEIR BEHALF TO THE TITLE COMPANY, GOVERNMENTAL AGENCY, AND LENDING INSTITUTION LISTED HEREON. CERTIFICATIONS ARE NOT TRANSFERABLE TO ADDITIONAL INSTITUTIONS OR SUBSEQUENT OWNERS.
2. THIS SURVEY IS SUBJECT TO ANY EASEMENT OF RECORD AND OTHER PERTINENT FACTS WHICH AN ABSTRACT OF TITLE MIGHT DISCLOSE.
3. OFFSETS SHOWN HEREON ARE FOR A SPECIFIC PURPOSE AND SHOULD NOT BE USED AS A BASIS FOR CONSTRUCTION OF FENCES OR OTHER STRUCTURES.
4. SUBSURFACE STRUCTURES AND/OR UTILITIES, IF ANY. NOT SHOWN.
5. HEDGE AND FENCE OFFSETS SHOWN ARE TO CENTERLINE UNLESS OTHERWISE NOTED.

I CERTIFY THAT THIS MAP REPRESENTS AN ACCURATE AND TRUE ACCOUNT OF A SURVEY, PERFORMED IN THE FIELD UNDER MY SUPERVISION ON 12/17/2007, OF THE LAND THEREIN PARTICULARLY DESCRIBED. THE RECORD DESCRIPTION OF THE SUBJECT PROPERTY FORMS A MATHEMATICALLY CLOSED FIGURE. THIS SURVEY WAS PREPARED IN ACCORDANCE WITH THE CURRENT CODE OF PRACTICE FOR LAND SURVEYORS ADOPTED BY THE NEW YORK STATE ASSOCIATION OF PROFESSIONAL LAND SURVEYORS.

T. EASON LAND SURVEYOR P.C.
304 HALLOCK AVENUE, PORT JEFFERSON STATION, N.Y. 11776
Phone (631)474-2200 /Fax (631) 899-9085 email TEASONLS@OPTONLINE.NET

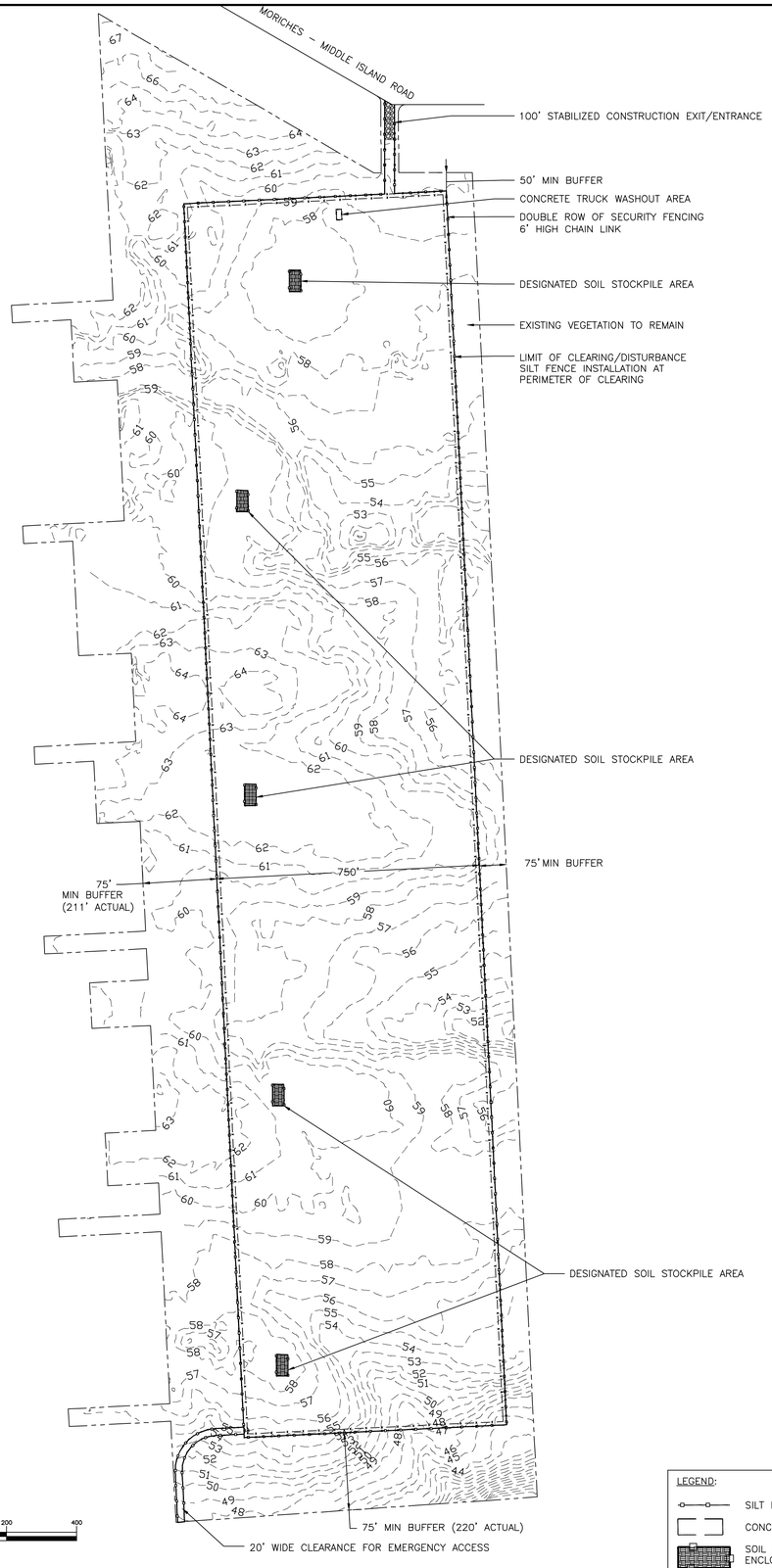
BOUNDARY SURVEY	
SURVEYED FOR:	HOWARD ROSENGARTEN
MAP OF:	LAKEVIEW PARK ADDITION "B"
LOCATION:	SHIRLEY, TOWN OF BROOKHAVEN, SUFFOLK COUNTY, NY
CERTIFIED TO:	HOWARD ROSENGARTEN

SUFFOLK COUNTY DIST. 200
SEC. 712 BLK. 09 LOT 1

DATE: 12/17/07	SCALE: 1"=100'
PROJECT NUMBER: TEA07-410	

TREIMANE A. EASON, L.S.
LIC. # 050452

Appendix C



SITE PLAN

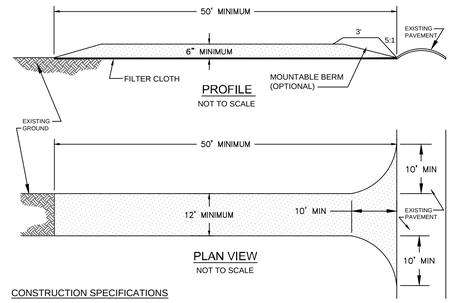
SCALE: 1" = 200'

200 0 100 200 400

LEGEND:

- SILT FENCE
- CONCRETE WASHOUT
- SOIL STOCKPILE ENCLOSURE

STABILIZED CONSTRUCTION ENTRANCE DETAILS



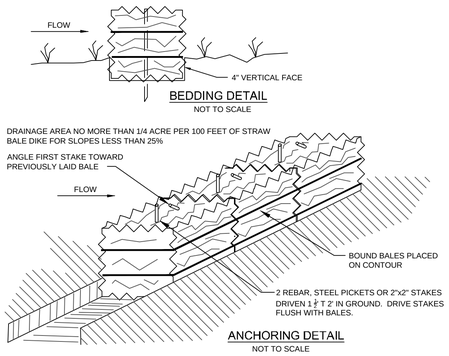
PROFILE
NOT TO SCALE

PLAN VIEW
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. AGGREGATE SIZE - USE 2 INCH STONE OR RECYCLED CONCRETE AGGREGATE.
2. LENGTH: AS REQUIRED, BUT NOT LESS THAN 50 FEET.
3. THICKNESS: NOT LESS THAN SIX (6) INCHES.
4. WIDTH: 12 FOOT MINIMUM BUT NOT LESS THAN THE FULL WIDTH OF POINTS WHERE INGRESS OR EGRESS OCCURS. 24 FOOT MINIMUM IF THERE IS ONLY ONE ACCESS TO THE SITE.
5. FILTER CLOTH: TO BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAY OR STREETS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL AGGREGATE. ALL SEDIMENT SPILLED, DROPPED, OR WASHED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

STRAW BALE DIKE DETAILS



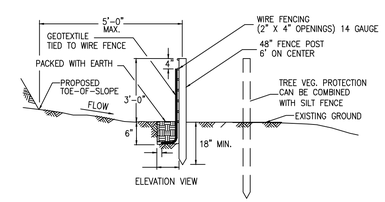
BEDDING DETAIL
NOT TO SCALE

ANCHORING DETAIL
NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. BALES SHALL BE PLACED AT THE TOE OF A SLOPE OR ON THE CONTOUR AND IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF (4) INCHES, AND PLACED SO THE BINDINGS ARE HORIZONTAL.
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY EITHER TWO STAKES OR REBAR DRIVEN THROUGH THE BALE. THE FIRST STAKE IN EACH BALE SHALL BE DRIVEN TOWARD THE PREVIOUSLY LAID BALE AT AN ANGLE TO FORCE THE BALES TOGETHER. STAKES SHALL BE DRIVEN FLUSH WITH THE BALE.
4. INSPECTION SHALL BE FREQUENT AND REPAIR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

SILT FENCE DETAILS



ELEVATION VIEW

CONSTRUCTION NOTES FOR FABRICATED SILT FENCE

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED BY SIX INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

POST: STEEL EITHER 'T' OR 'U' TYPE OR 2" HARDWOOD

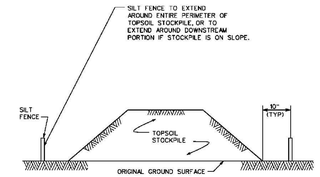
FENCE: WOVEN WIRE, 14-1/2 GAGE, 6" MAX. MESH OPENING

FILTER CLOTH: FILTER X, MIRAFI 100X, STABILINKA T140N OR APPROVED EQUAL

PREFABRICATED UNIT: SEOFAB, ENVIROFENCE, OR APPROVED EQUAL.

ALL EROSION AND SEDIMENT CONTROL MUST MEET THE CURRENT EDITION OF THE NEW YORK STATE STORMWATER DESIGN MANUAL AS WELL AS THE NEW YORK STATE STANDARDS AND SPECIFICATIONS FOR EROSION AND SEDIMENT CONTROL

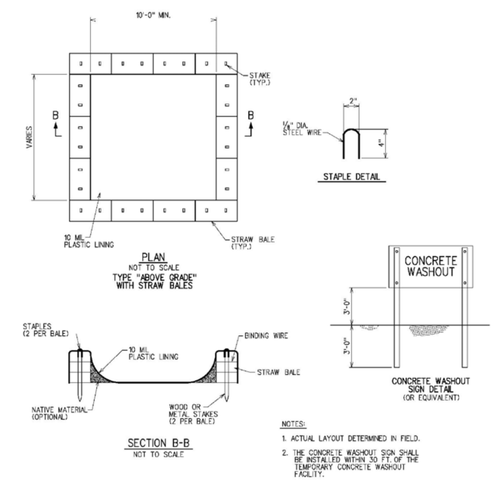
TEMPORARY SOIL STOCKPILE DETAILS



NOTES:

1. AN ON-SITE DRAINAGE SWALE SHALL BE LOCATED BETWEEN THE TOPSOIL STOCKPILE AND OFF-SITE PROPERTY.
2. SILT FENCE SHALL CONFORM TO THE SILT FENCE DETAIL FOR MATERIALS AND INSTALLATION METHODS.
3. IF THE STOCKPILE IS TO REMAIN FOR MORE THAN 14 DAYS, IT SHALL BE STABILIZED WITH BURLAP MATTING OR SEEDED WITHIN 7 DAYS OF COMPLETION TO MINIMIZE EROSION.
4. INSPECTION OF SILT FENCES SHALL BE AT LEAST ONCE PER WEEK AND AFTER EACH RAINFALL IN EXCESS OF 1/2 ". REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS NEEDED.
5. SEDIMENT TRAPPED BY THE FENCES SHALL BE REMOVED AND PROPERLY DISPOSED OF WHENEVER SIGNIFICANT ACCUMULATION OCCURS.
6. SILT FENCES SHALL BE MAINTAINED IN PLACE UNTIL TOPSOIL STOCKPILE HAS BEEN ELIMINATED AND SHALL BE REMOVED ONLY WHEN DIRECTED

CONCRETE WASHOUT AREA DETAILS



NOTES:

1. ACTUAL LAYOUT DETERMINED IN FIELD.
2. THE CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FT. OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

SCTM # 0200 71200 0900 001000
TOB LOG # 2013-030-CZ

DATE	BY	DESCRIPTION	APPROV. BY
01/19/16	MCJ	REVISIONS REQUESTED BY TOB	RGD
10/28/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD
5/5/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD

REVISIONS

LKMA

MISF, LLC
88 UNIVERSITY PLACE 8TH FLOOR, NY, NY 10003

MIDDLE ISLAND SOLAR FARM
MORICHES–MIDDLE ISLAND ROAD, MASTIC, NY

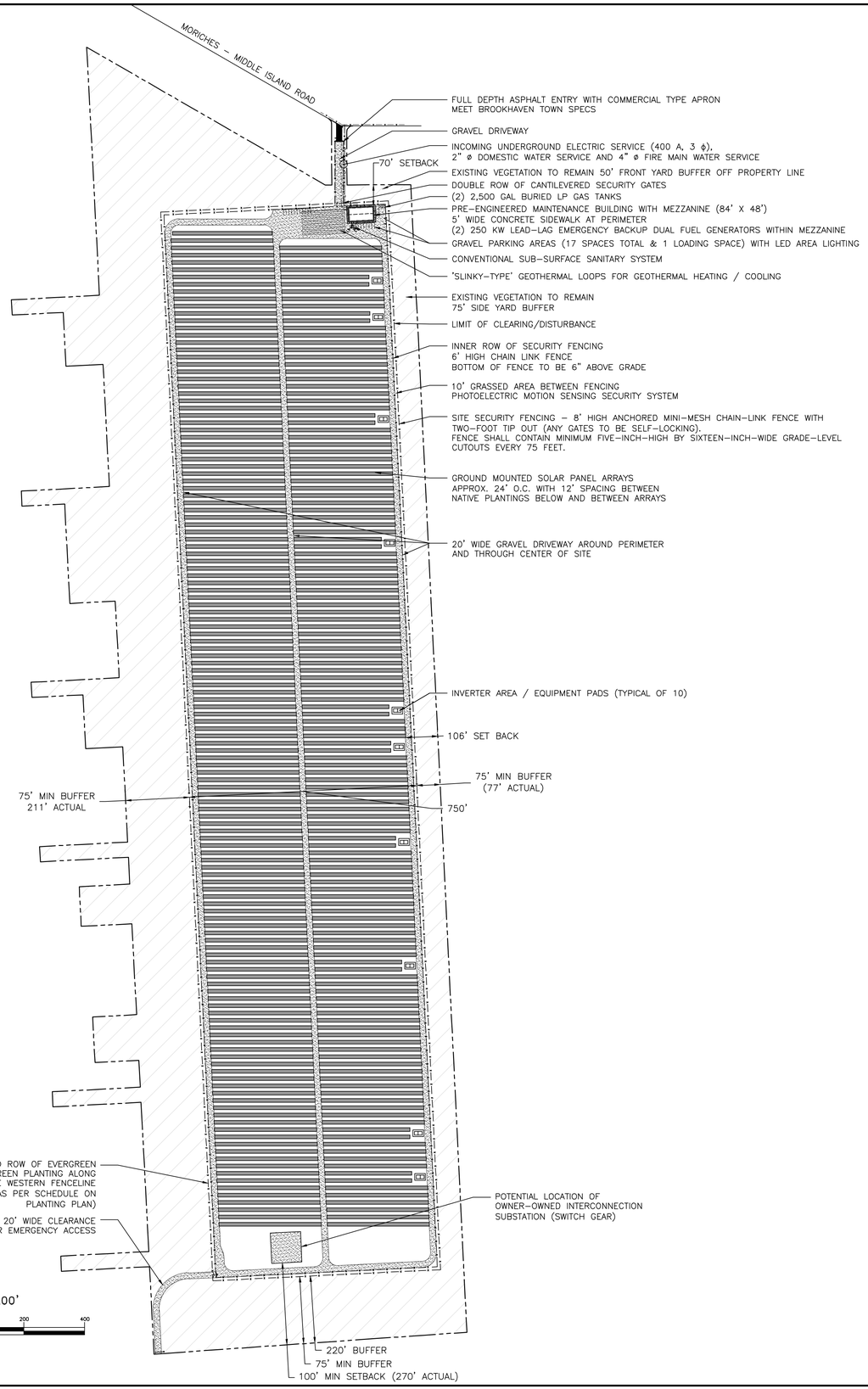
CLEARING AND EROSION & SEDIMENT CONTROL PLAN

L. K. McLEAN ASSOCIATES, P.C.
CONSULTING ENGINEERS 437 SOUTH COUNTRY RD., BROOKHAVEN, NEW YORK 11719

Designed By: MCJ	Scale: AS NOTED	Sheet No.
Drawn By: MCJ	Date: DEC. 29, 2014	C01
Approved By: RGD	File No. 13066.004	

Warning: It is a violation of the NY State Education Law for any person to alter this document in any way, unless acting under the direction of a licensed professional engineer.

Jan 20, 2016 – 09:07am
P:\13066.000 (Middle Island Solar Farm)\dwg\C01 Clearing and Erosion Control Plan.dwg
PLOT SIZE: 24 x 36



SITE PLAN

SCALE: 1" = 200'

SITE DATA

SUFFOLK COUNTY TAX NUMBER(S)	0200 71200 0900 001000
TOTAL AREA OF SITE	100.33 ACRES (4,370,336.56 SF)
TOTAL AREA OF BUILDINGS (PROPOSED)	4,032 SF
DEPTH TO GROUNDWATER	± 30 FT (AVERAGE)
ZONING	A-1 (6.13 A) & L-1 (94.20 A)
EXISTING USE	UNDEVELOPED
INTENDED USE	SOLAR ENERGY PRODUCTION FACILITY

NOTE: L-1 PORTION IS 94% OF PARCEL. BASED ON § 85-136 A (7), A-1 ZONE (6.13 A) SHALL NOT BE USED FOR YIELD.

SITE LOCATION
NTS

ZONING REQUIREMENTS

DIMENSIONAL CRITERIA
§ 85-568 L INDUSTRIAL 1 DISTRICT (LIGHT INDUSTRY) DIMENSIONAL CRITERIA:

	CODE SECTION	REQUIRED	PROPOSED
MINIMUM LOT AREA	§ 85-568 (A) (3)	120,000 SF	L1 4,103,352.0 SF (PART OF TOTAL 100.33 A PARCEL)
MINIMUM LOT WIDTH	§ 85-568 (B) (3)	200 FT	50 FT AT ENTRANCE TO FLAG LOT (± 1,000 FT THROUGHOUT MAJORITY)**
FRONT YARD SETBACK	§ 85-568 (C) (2)	100 FT	265 FT TO BLDG (TO ROADWAY PROPERTY LINE AT FLAG ENTRY)
SIDE YARD SETBACK	§ 85-568 (D) (3)	50 FT	106 FT (ON EASTERN SIDE)
REAR YARD SETBACK	§ 85-568 (E) (1)	50 FT	270 FT
MAXIMUM FLOOR AREA RATIO (F.A.R.)	§ 85-568 (F) (2)	30 % OF L1 or 1,231,006 SF	0.1 %
MAXIMUM HEIGHT	§ 85-568 (G) (1)	50 FT / 3 ST	24 FT / 1 ST

§ 85-815 SOLAR ENERGY PRODUCTION FACILITIES:

MIN. LOT AREA	§ 85-815 (A) (1)	10 A	94.2 A L1 (100.33 TOTAL)
LOT COVERAGE (WITH SOLAR EQUIPMENT)	§ 85-815 (B) (1)	60 %	26.9 % (ARRAYS, INVERTERS AND SUBSTATION)
MAX. PANEL HEIGHT	§ 85-815 (C) (1)	20 FT	17 FT
MIN. NATURAL AREA	§ 85-815 (D) (1)	35 %	35.21 % (OF 94.2 A L1 ZONE)
MIN. BUFFER FROM RESIDENTIAL	§ 85-815 (D) (2)	75 FT	77 FT
MIN. SETBACK FROM RESIDENTIAL	§ 85-815 (D) (3)	100 FT	106 FT
MIN. BUFFER FROM COMMERCIAL/INDUSTRIAL	§ 85-815 (D) (4)	25 FT	50 FT
MIN. SETBACK FROM COMMERCIAL/INDUSTRIAL	§ 85-815 (D) (5)	50 FT	70 FT

§ 85-843 LAND DEVELOPMENT STANDARDS (PERCENTAGES OF L1 ONLY)

MINIMUM NATURAL AREA / LANDSCAPING	§ 85-843 (A) (1)	20 % (18.84 A)	92.73 % (33.17 A UNCLEARED + 54.18 A LANDSCAPED / GRASS)
MIN. NATURAL AREA / LANDSCAPING IN FRONT YD	§ 85-843 (A) (2)	50 % of 20 % (9.42 A)	N/A – FLAG LOT
STREET TREES	§ 85-843 (A) (3)	MIN. 4 IN CAL. @ 30 FT O.C.	N/A – FLAG LOT
MIN. NATURAL AREA / LANDSCAPING ALONG STREET	§ 85-843 (A) (4)	15 FT	56 FT
SUP. MIN. NATURAL AREA / LANDSCAPING	§ 85-843 (A) (6) (a)	SITE > 5A, 30 % (28.26 A)	92.73 % (33.17 A UNCLEARED + 54.18 A LANDSCAPED / GRASS)
MIN. GREEN SPACE ALONG ROAD	§ 85-843 (A) (6) (c)	SITE > 5A, 50 FT	56 FT
MIN. BUFFER ADJACENT TO RESIDENTIAL	§ 85-843 (B) (2) (c)	SITE > 5A, 75 FT	211 FT (WEST); 77 FT (EAST); 220 FT (SOUTH)

§ 85-852 OFF-STREET PARKING REQUIREMENTS

PARKING MULTI-TENANT INDUSTRIAL	§ 85-852	1/250 SF GFA (17 SPACES)	17 SPACES
PARKING STALL SIZE		9 FT X 20 FT	9 FT X 20 FT
ADA PARKING		1/25 SPACES (1)	1
LANDBANKED STALLS		0	0
LOADING	§ 85-850 (A)	1	1

SIGN REQUIREMENTS

DETACHED / GROUND SIGN AREA	§ 85-815 (F) (1)	1 SIGN/2.25 SF	1 SIGN/2.25 SF

** VARIANCE REQUESTED TO REDUCE WIDTH OF LOT THROUGHOUT TO 50 FT DUE TO DIMENSIONS OF PROPERTY AT THE ENTRY AT MORICHES MIDDLE ISLAND ROAD

TOWN OF BROOKHAVEN STANDARD PAVING SPECIFICATION

6" STABILIZED BASE, $3\frac{1}{2}$" DENSE BINDER WITH $1\frac{1}{2}$" TOP WEARING COURSE

TOWN OF BROOKHAVEN STANDARD NOTES:

1. ALL CONCRETE CURBING, SIDEWALKS, AND DRAINAGE STRUCTURE SHALL CONFORM TO PLANNING BOARD STANDARD DETAIL AND SPECIFICATIONS.
2. TOWN OF BROOKHAVEN ENGINEERING INSPECTOR IN THE DEPARTMENT OF PLANNING, ENVIRONMENT AND LAND MANAGEMENT SHALL BE NOTIFIED 48 HOURS IN ADVANCE OF ALL CONSTRUCTION AT 631-451-6400 BETWEEN THE HOURS OF 9:00AM- 4:30PM MONDAY THROUGH FRIDAY.
3. PLEASE CONTACT THE DIVISION OF ENGINEERING AT (631)-451-6400 TO SCHEDULE A PRE-CONSTRUCTION MEETING 48 HRS PRIOR TO THE COMMENCEMENT OF ANY AND ALL CONSTRUCTION ACTIVITIES.
4. LOCATION AND GRADES FOR CURBS AND WALKS TO BE VERIFIED WITH THE TOWN OF BROOKHAVEN HIGHWAY DEPARTMENT, SCDPW OR NYSDOT PRIOR TO CONSTRUCTION.
5. ALL TRAFFIC CONTROL DEVICES, I.E. SIGNALS, SIGNS, AND PAVEMENT MARKINGS SHALL BE INSTALLED IN CONFORMANCE WITH THE GUIDELINES OF THE NEW YORK STATE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND AS DIRECTED BY THE TOWN OF BROOKHAVEN, DIVISION OF TRAFFIC SAFETY.
6. THE CONTRACTORS PERFORMING ANY AND ALL TRAFFIC CONTROL DEVICES LAYOUT AND INSTALLATION WORK SHALL NOTIFY THE TOWN OF BROOKHAVEN DIVISION OF TRAFFIC SAFETY, 48 HOURS IN ADVANCE OF BEGINNING SUCH WORK ALONG A TOWN ROAD.
7. ALL PAVEMENT MARKINGS REQUIRED SHALL BE THERMOPLASTIC (SUFFOLK COUNTY SPECIFICATIONS) UNLESS OTHERWISE NOTED ON PLAN.
8. STOP LINE SIGHT DISTANCE SHALL BE MAINTAINED AT ALL INTERSECTIONS IN ACCORDANCE WITH AASHTO REQUIREMENTS.

SCTM # 0200 71200 0900 001000
TOB LOG # 2013-030-CZ

ESTIMATE OF QUANTITIES

CONCRETE CURB	0
ASPHALT CURB	0
ASPHALT PAVING	1,000 SF
WALKS (CONCRETE)	1,416 SF
BUILDING	4,032 SF
GRAVEL PAVING	274,259 SF
EQUIPMENT PADS (10 INVERTERS)	7,730 SF
SUBSTATION AREA	10,000 SF
LEACHING POOLS (OPEN GRATE)	50
AREA DRAINS	0
CHAIN LINK FENCE	17,000 FT (DOUBLE ROW SECURITY PERIMETER FENCE)
SCREEN PLANTING	± 3,500 FT (ALONG WEST PERIMETER FENCE – RESIDENTIAL BUFFER)
STREET TREES	N/A – UNCLEARED
SHRUBS / BUSHES (AREA)	25 A
RECHARGE BASIN EXCAVATION	0
RECHARGE BASIN FENCING	0
RECHARGE BASIN PLANTING	0

DATE	BY	DESCRIPTION	APPROV. BY
01/30/16	MCJ	REVISIONS REQUESTED BY TOB PLANNING	RGD
01/19/16	MCJ	REVISIONS REQUESTED BY TOB	RGD
11/13/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD
11/6/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD
10/28/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD
8/17/15	MCJ	CONFORM TO NEW TOB SOLAR CODE	RGD
5/5/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD

REVISIONS

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LKMA

MISF, LLC
88 UNIVERSITY PLACE 8TH FLOOR, NY, NY 10003

MIDDLE ISLAND SOLAR FARM
MORICHES-MIDDLE ISLAND ROAD, MASTIC, NY

PROPOSED SITE PLAN

L. K. McLEAN ASSOCIATES, P.C.
CONSULTING ENGINEERS 437 SOUTH COUNTRY RD., BROOKHAVEN, NEW YORK 11719

Designed By: MCJ	Scale: AS NOTED	Sheet No.
Drawn By: MCJ	Date: DEC. 29, 2014	C02
Approved By: RGD	File No. 13066.004	

Jan 30, 2016 – 01:35pm
P:\13066.000 (Middle Island Solar Farm)\dwg\002 Proposed Site Plan.dwg
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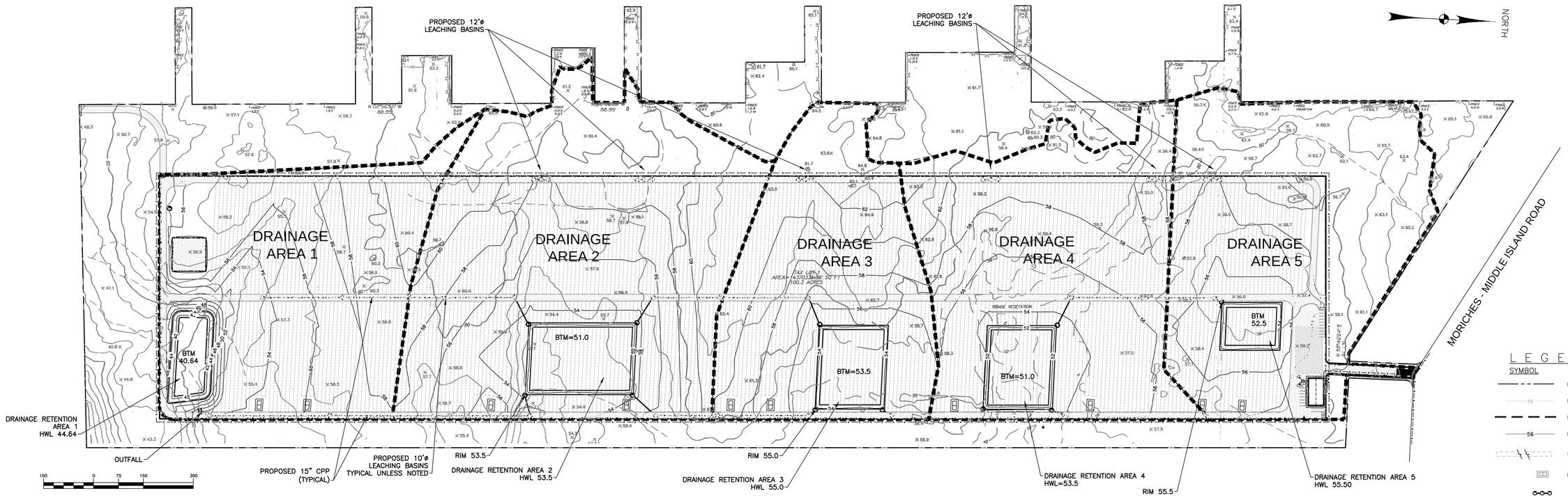


LEGEND

SYMBOL	DESCRIPTION
	PROPERTY LINE
56	EXISTING CONTOUR
	DRAINAGE AREA BOUNDARY LINE
56	PROPOSED CONTOUR
	SOLAR PANEL LOCATION
	INVERTERS / EQUIPMENT AREA
	PROPOSED 12'ø LEACHING BASINS W/ PIPE
55.50	PROPOSED SPOT ELEVATION
X 59.2 (58.50)	EXISTING SPOT ELEVATION

DRAINAGE CALCULATIONS

DRAINAGE DESIGN CRITERIA

1. STORAGE VOLUME BASED ON A 8-INCH RAINFALL FOR DRAINAGE AREA.
   STORAGE VOLUME BASED ON A 8-INCH RAINFALL FOR LEACHING BASINS.

2. RUNOFF COEFFICIENTS (C) FOR:

GRASS	= 0.15
WOODS	= 0.15
GRAVEL	= 1.00
INVERTER STATION	= 1.00
SUBSTATION	= 1.00
BUILDING	= 1.00
CONC. SIDEWALK	= 1.00
ASPHALT	= 1.00

DRAINAGE AREA 1

REQUIRED STORAGE VOLUME CALCULATION

	CONTRIBUTING AREA (SF)		RUNOFF C		RAINFALL (FT)		VOLUME (CF)
GRAVEL:	60,342 SF	X	1.00	X	8/12 FT	=	40,429 CF
GRASS:	489,830 SF	X	0.15	X	8/12 FT	=	49,228 CF
INVERTER STATION:	1,546 SF	X	1.00	X	8/12 FT	=	1,036 CF
SUBSTATION:	10,000 SF	X	1.00	X	8/12 FT	=	6,700 CF
WOODS:	22,057 SF	X	0.15	X	8/12 FT	=	2,217 CF

PROVIDED STORAGE VOLUME DESIGN
STORAGE PROVIDED IN DRAINAGE RETENTION AREA 1: 108,370 CF
STORAGE PROVIDED IN 10' DIA. 12 EFF. DEPTH LEACHING BASINS: 3,768 CF
STORAGE PROVIDED IN 12' DIA. 12 EFF. DEPTH LEACHING BASINS: 1,368 CF

REQUIRED STORAGE VOLUME = 99,610 CF PROVIDED STORAGE VOLUME = 113,506 CF

DRAINAGE AREA 2

REQUIRED STORAGE VOLUME CALCULATION

	CONTRIBUTING AREA (SF)		RUNOFF C		RAINFALL (FT)		VOLUME (CF)
GRAVEL:	57,559 SF	X	1.00	X	8/12 FT	=	38,565 CF
GRASS:	648,559 SF	X	0.15	X	8/12 FT	=	65,180 CF
INVERTER STATION:	1,546 SF	X	1.00	X	8/12 FT	=	1,036 CF
WOODS:	173,686 SF	X	0.15	X	8/12 FT	=	17,455 CF

PROVIDED STORAGE VOLUME DESIGN
STORAGE PROVIDED IN DRAINAGE DRAINAGE RETENTION AREA 2: 159,364 CF
STORAGE PROVIDED IN 10' DIA. 12' EFF. DEPTH LEACHING BASINS: 10,362 CF
STORAGE PROVIDED IN 12' DIA. 12' EFF. DEPTH LEACHING BASINS: 8,208 CF

REQUIRED STORAGE VOLUME = 122,236 CF PROVIDED STORAGE VOLUME = 177,934 CF

DRAINAGE AREA 3

REQUIRED STORAGE VOLUME CALCULATION

	CONTRIBUTING AREA (SF)		RUNOFF C		RAINFALL (FT)		VOLUME (CF)
GRAVEL:	33,583 SF	X	1.00	X	8/12 FT	=	22,501 CF
GRASS:	394,006 SF	X	0.15	X	8/12 FT	=	39,598 CF
INVERTER STATION:	1,546 SF	X	1.00	X	8/12 FT	=	1,036 CF
WOODS:	54,759 SF	X	0.15	X	8/12 FT	=	5,503 CF

PROVIDED STORAGE VOLUME DESIGN
STORAGE PROVIDED IN DRAINAGE DRAINAGE RETENTION AREA 3: 70,463 CF
STORAGE PROVIDED IN 10' DIA. 12' EFF. DEPTH LEACHING BASINS: 6,594 CF
STORAGE PROVIDED IN 12' DIA. 12' EFF. DEPTH LEACHING BASINS: 4,104 CF

REQUIRED STORAGE VOLUME = 68,637 CF PROVIDED STORAGE VOLUME = 81,161 CF

DRAINAGE AREA 4

REQUIRED STORAGE VOLUME CALCULATION

	CONTRIBUTING AREA (SF)		RUNOFF C		RAINFALL (FT)		VOLUME (CF)
GRAVEL:	47,168 SF	X	1.00	X	8/12 FT	=	31,603 CF
GRASS:	502,540 SF	X	0.15	X	8/12 FT	=	50,505 CF
INVERTER STATION:	1,546 SF	X	1.00	X	8/12 FT	=	1,036 CF
WOODS:	78,060 SF	X	0.15	X	8/12 FT	=	7,845 CF

PROVIDED STORAGE VOLUME DESIGN
STORAGE PROVIDED IN DRAINAGE DRAINAGE RETENTION AREA 4: 117,439 CF
STORAGE PROVIDED IN 10' DIA. 12' EFF. DEPTH LEACHING BASINS: 6,594 CF
STORAGE PROVIDED IN 12' DIA. 12' EFF. DEPTH LEACHING BASINS: 8,208 CF

REQUIRED STORAGE VOLUME = 90,989 CF PROVIDED STORAGE VOLUME = 132,241 CF

DRAINAGE AREA 5

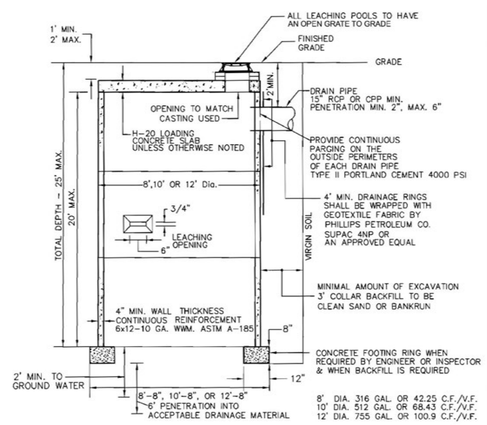
REQUIRED STORAGE VOLUME CALCULATION

	CONTRIBUTING AREA (SF)		RUNOFF C		RAINFALL (FT)		VOLUME (CF)
GRAVEL:	66,739 SF	X	1.00	X	8/12 FT	=	44,715 CF
BUILDING:	4,030 SF	X	1.00	X	8/12 FT	=	2,700 CF
GRASS:	279,647 SF	X	0.15	X	8/12 FT	=	28,105 CF
WOODS:	296,206 SF	X	0.15	X	8/12 FT	=	29,769 CF
CONCRETE SIDEWALK:	1,424 SF	X	1.00	X	8/12 FT	=	954 CF
ASPHALT:	1006 SF	X	1.00	X	8/12 FT	=	674 CF
INVERTER STATION:	1,546 SF	X	1.00	X	8/12 FT	=	1,036 CF

PROVIDED STORAGE VOLUME DESIGN
STORAGE PROVIDED IN DRAINAGE RETENTION AREA 5: 64,805 CF
STORAGE PROVIDED IN 10' DIA. 12' EFF. DEPTH LEACHING BASINS: 1,884 CF
STORAGE PROVIDED IN 12' DIA. 12' EFF. DEPTH LEACHING BASINS: 4,104 CF

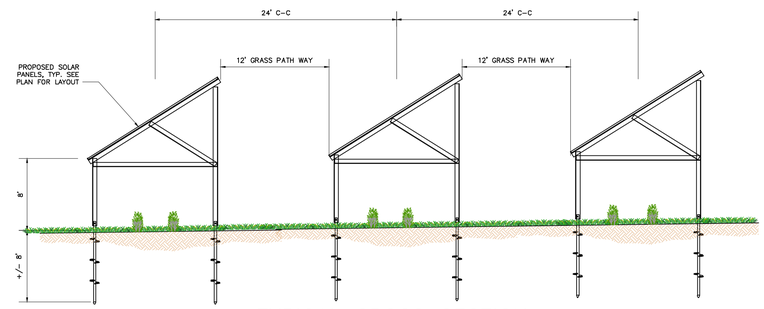
REQUIRED STORAGE VOLUME = 107,952 CF PROVIDED STORAGE VOLUME = 70,793 CF*

*OVERFLOW CONTINUES TO DRAINAGE AREA 4



LEACHING POOL DETAIL

N.T.S.



TYPICAL CROSS SECTION

N.T.S.
SCTM # 0200 71200 0900 001000
TOB LOG # 2013-030-CZ

DRAINAGE CALCULATION SUMMARY

TOTAL REQUIRED STORAGE = 489,424 CF
TOTAL PROVIDED STORAGE = 575,634 CF

ALL STORM WATER RUNOFF WILL BE BE CONTAINED WITHIN THE SITE.

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DATE	BY	DESCRIPTION	APPROV. BY
01/19/16	MCJ	REVISIONS REQUESTED BY TOB	RGD
11/2/15	BC	REV DRAINAGE TO CONFORM WITH NEW TOB SOLAR CODE	JD
5/6/15	DD	REV PER TOWN DRAINAGE COMMENTS 4/17/2015	JD
2/23/15	MCJ	REVISED ARRAY LAYOUT	RGD
12/30/14	BRC	REVISED ARRAY LAYOUT	RGD
12/29/14	BRC	UPDATE QUANTITIES FOR DEIS	RGD

REVISIONS

LKMA

MISF, LLC
88 UNIVERSITY PLACE 8TH FLOOR, NY, NY 10003

MIDDLE ISLAND SOLAR FARM
MORICHES-MIDDLE ISLAND ROAD, MASTIC, NY

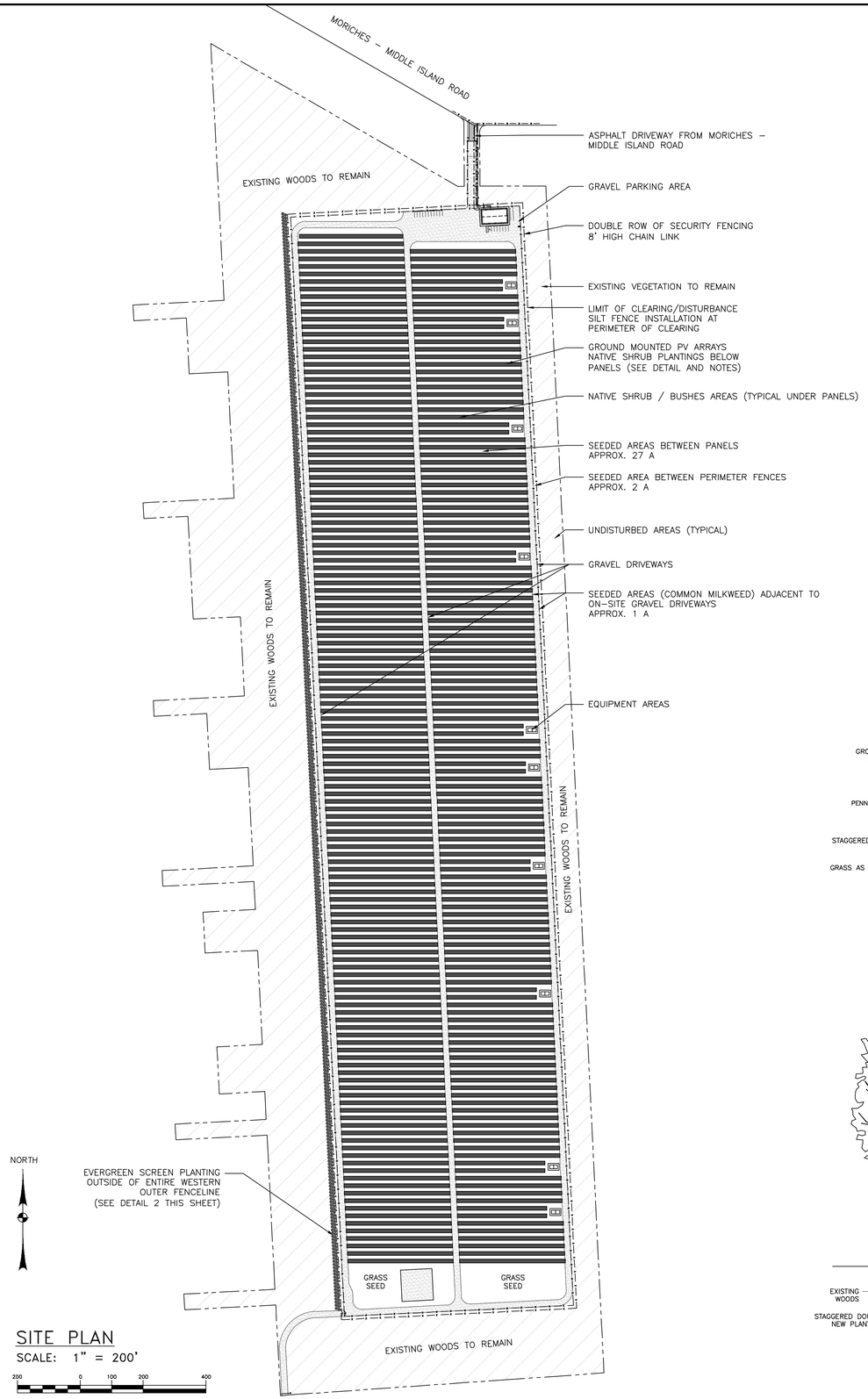
GRADING & DRAINAGE PLAN

L. K. McLEAN ASSOCIATES, P.C.
CONSULTING ENGINEERS 437 SOUTH COUNTRY RD., BROOKHAVEN, NEW YORK 11719

Designed By: MCJ. JD	Scale: AS NOTED	Sheet No.
Drawn By: BRC, DD	Date: DEC. 29, 2014	C03
Approved By: RGD	File No. 13066.004	

Jan 20, 2016 - 09:07am
J:\13066.000 (Middle Island Solar Farm)\dwg\C03 Grading & Drainage Plan.dwg

PLOT SIZE: 24 x 36



SITE PLAN

SCALE: 1" = 200'

200 0 100 200 400

PLANTING SCHEDULE:

QUANTITY	BOTANICAL NAME	COMMON NAME	SIZE	SPACING
350	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	12'–15'	10' O.C. (STAGGERED)
350	ILEX OPACA	AMERICAN HOLLY	10'–12'	10' O.C. (STAGGERED)
25 ACRE UNDER PANEL NATIVE SHRUB MIX:				
	VACCINIUM ANGUSTIFOLIUM	LOWBUSH BLUEBERRY	#3 CONTAINER	4' O.C.
	GAYLUSSACIA DUMOSA	DWARF HUCKLEBERRY	#3 CONTAINER	4' O.C.
	GAYLUSSACIA BACCATA	BLACK HUCKLEBERRY	#3 CONTAINER	4' O.C.
	MIX EVENLY BLUEBERRIES AND HUCKLEBERRIES OVER THE 25 ACRE PLANTING AREAS (ONLY AREAS UNDER PANELS AS DETAILED, SEE DETAIL 1)			
1 ACRE	ASCLEPIAS SYRIACA	COMMON MILKWEED	PURE LIVE SEED	40 LBS/ACRE

GRASS SEED AREA:

CLEARED AREA TO BE SEEDED AT A RATE OF 6 LB PER 1,000 SF.
SEED MIX PROVIDED BY THE LONG ISLAND CAULIFLOWER ASSOCIATION (LICA), 139 MARCY AVENUE, RIVERHEAD, NY 11901, PHONE: 631.727.2212

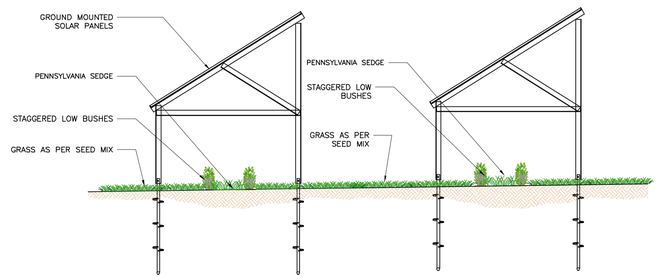
LICA MIX:

% SEED	COMMON NAME
30	CREEPING RED FESCUE
30	AZAY SHEEP FESCUE
15	SPARTAN HARD FESCUE
15	ANNUAL RYEGRASS
5	YELLOW SWEET CLOVER
5	TRANSITIONAL RYE

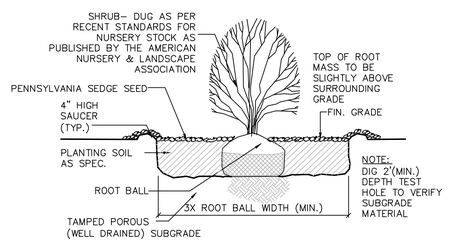
PENNSYLVANIA SEDGE SHALL BE USED TO SEED ALL AREAS WHERE THE LOW SHRUBS ARE PLANTED (25 ACRE).
THE SEED MIX HAS SEED FOR IMMEDIATE EROSION CONTROL.

PLANTING NOTES:

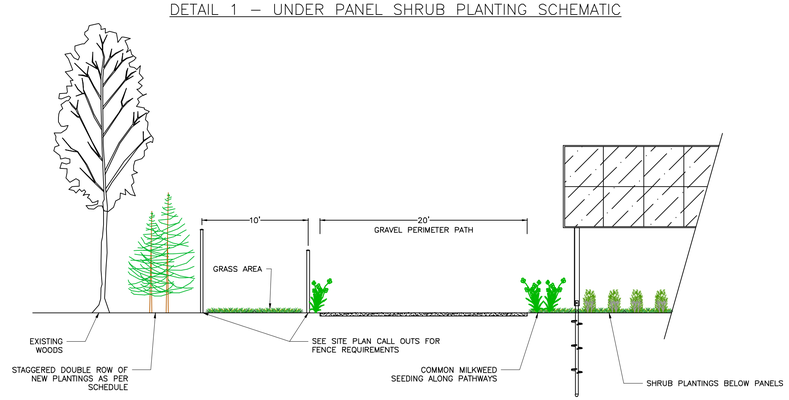
1. THE INTENT IS FOR RE–PLANTING BENEATH THE PANEL ARRAYS WITH LOW–GROWING NATIVE SHRUBS AND GRASSES.
2. USE "PLANT–RESCUE" TECHNIQUES TO EXCAVATE, STOCKPILE AND RE–PLANT AS MUCH OF THE EXISTING PLANTS ON THE SITE AS POSSIBLE.
3. AFTER SETTING PLANT IN HOLE, REMOVE AND DISCARD ALL SYNTHETIC FABRIC OR BURLAP. CUT AND REMOVE ALL STRING. CHECK FOR GIRDLING, CIRCLING ROOTS, AND IF FOUND CUT INTO ROOTMASS WITH KNIFE AT 3 EQUALLY SPACES INTERVALS AND LOOSEN ROOTS. IF TRANSPLANTING WITH MECHANICAL TREE SPADE OR AUGER, SCORE OR CULTIVATE SIDES TO REMOVE GLAZING OF SOIL.
4. PLANTING SOIL – PLANTING SOIL SHALL BE GOOD TOPSOIL WITH NO ADMIXTURE OF REFUSE OR MATERIAL TOXIC TO PLANT GROWTH AND SHALL BE FREE FROM SUBSOIL, STUMPS, ROOTS, BRUSH, STONES, CLAY, LUMPS OR SIMILAR OBJECTS LARGER THAN 2 INCHES IN GREATEST DIAMETER. THE ORGANIC CONTENT SHALL NOT BE LESS THAN 5%, NOR MORE THAN 20% AS DETERMINED BY LOSS ON IGNITION OF MOISTURE FREE SAMPLES DRIED AT 100 DEGREES. IF SOIL IS EXCESSIVELY SANDY OR CLAYEY, AMEND WITH COMPOST/PEAT MOSS.
5. ALL PLANTS SHALL HAVE A 3"–6" RAISED SAUCER AROUND PIT TO HOLD WATER.
6. ONLY PRUNE OUT DAMAGED OR DEAD BRANCHES. LEAVES OR NEEDLES SHOULD NOT BE WILTED OR BROWNED. ALL PLANT MATERIALS SHOULD BE IN GOOD HEALTH.
7. CONTRACTOR SHALL WATER PLANTINGS AND SEEDED AREAS AS SPEC.
8. THE SURVIVAL OF ALL PLANTINGS SHALL BE GUARANTEED FOR ONE YEAR. THE CONTRACTOR SHALL REPLACE ANY PLANTS THAT DIE OR BECOME DISEASED DURING THAT TIME.
9. DUE TO THE SITE LOCATION AND CONDITIONS, ALL PROPOSED PLANT MATERIALS SHALL BE RESISTANT TO SEVERE DAMAGE BY DEER AND RABBIT (NOT BE A SPECIES PREFERRED BY THEM).



DETAIL 1 – UNDER PANEL SHRUB PLANTING SCHEMATIC



DETAIL 3 – SHRUB & EVERGREEN PLANTING
NOT TO SCALE



DETAIL 2 – WEST SIDE OUTER FENCE PLANTING SCHEMATIC

SCTM # 0200 71200 0900 001000
TOB LOG # 2013–030–CZ

DATE	BY	DESCRIPTION	APPROV. BY
01/30/16	MCJ	REVISIONS REQUESTED BY TOB PLANNING	RGD
01/19/16	MCJ	REVISIONS REQUESTED BY TOB	RGD
10/30/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD
5/5/15	MCJ	REVISIONS FOR DEIS RESUBMISSION	RGD

REVISIONS

MISF, LLC
88 UNIVERSITY PLACE 8TH FLOOR, NY, NY 10003

MIDDLE ISLAND SOLAR FARM
MORICHES–MIDDLE ISLAND ROAD, MASTIC, NY

PLANTING PLAN

L. K. McLEAN ASSOCIATES, P.C.
CONSULTING ENGINEERS 437 SOUTH COUNTRY RD., BROOKHAVEN, NEW YORK 11719

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Drawn By: MCJ	Date: DEC. 29, 2014	C04
Approved By: RGD	File No. 13066.004	

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Feb 02, 2016 – 07:35am
P:\13066.000 (Middle Island Solar Farm)\dwg\C04 Planting Plan.dwg
PLOT SIZE: 24 x 36

0 250' 500'

SCTM # 0200 71200 0900 001000
TOB LOG # 2013-030-CZ

DATE	BY	DESCRIPTION	APPROV. BY
01/19/16	MCJ	REVISIONS REQUESTED BY TOB	RGD
10/30/2015	MCJ	REVISED FOR DEIS RESUBMISSION	RGD
5/5/2015	MCJ	ADDED TO DRAWINGS FOR DEIS RESUBMISSION	RGD

REVISIONS

LKMA

MISF, LLC
88 UNIVERSITY PLACE 8TH FLOOR, NY, NY 10003

MIDDLE ISLAND SOLAR FARM
MORICHES–MIDDLE ISLAND ROAD, MASTIC, NY

CONCEPTUAL
INTERCONNECTION ROUTE

L. K. McLEAN ASSOCIATES, P.C.
CONSULTING ENGINEERS 437 SOUTH COUNTRY RD., BROOKHAVEN, NEW YORK 11719

Designed By: MCJ	Scale: AS NOTED	Sheet No.
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Jan 20, 2016 – 09:08am
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PLOT SIZE: 24 x 36

Appendix D

Dredging, Bulkhead Replacement and Revetment Construction Project, East Marion, NY

Mr. Kennedy performed a wetland delineation and ecological survey at an 18-acre former oyster processing facility for a proposed dredging, bulkhead replacement and revetment construction project located on Gardiners Bay in the Town of Southold, NY. Mr. Kennedy also obtained a Tidal Wetland Permit from the New York State Department of Environmental Conservation and is currently in the process of obtaining a United States Army Corps of Engineers Individual Permit for the project. As part of the permitting process, Mr. Kennedy also prepared and Essential Fish Habitat assessment for the National Oceanographic and Atmospheric Administration (NOAA) and endangered species assessment for the United States Fish and Wildlife Service (USFWS). Additionally, Mr. Kennedy prepared a consistency analysis with New York State Department of State (NYSDOS) Coastal Policies, and subsequently received a Coastal Concurrence letter from the NYSDOS. Mr. Kennedy also prepared a consistency analysis Town of Southold Local Waterfront Revitalization Program (LWRP) Coastal Policies.

EPCAL Redevelopment Plan and Habitat Protection Plan, Town of Riverhead, NY

Mr. Kennedy performed an ecological assessment in association with the Draft Supplemental Environmental Impact Statement (DSGEIS) for the 2,323.9-acre Enterprise Park at Calverton (EPCAL) property. The subject property consists of portions of land formerly owned by the United States Department of the Navy (U.S. Navy) and known as the Naval Weapons Industrial Reserve Plant (NWIRP). The site supports extensive wooded and wetland habitats, and also includes the largest remaining native grassland habitat on Long Island. The site provides habitat for a number of rare wildlife and plant species, including several NYS-Endangered, -Threatened and Special Concern species. The ecological assessment included habitat characterization, species inventories and rare species assessments. Mr. Kennedy also performed an evaluation of potential impacts of the proposed action to on-site ecological resources and further prepared a comprehensive habitat protection plan (CHPP) for the site. The CHHP includes measures to protect and preserve existing habitats and resident wildlife and plant species, and provides for the preservation, creation, maintenance and enhancement of 596.4 acrs of native grassland habitat as a wildlife preserve for grassland birds and other species.

Northwoods Property Existing Ecological Conditions Assessment, Manorville, NY

Mr. Kennedy performed an ecological assessment on this 662-acre wooded property located within the Long Island Central Pine Barrens. The ecological assessment included plant and wildlife species inventories, habitat characterization and evaluation, and a rare/protected species survey for several New York State-listed plant and wildlife species, several of which were identified on-site.

Multi-Use Development, Town of Amenia, Dutchess County, NY

Mr. Kennedy conducted an ecological survey on this 188-acre property, which includes wooded, meadow, ridgeline, wetland and developed habitats and supports a number of New York State- and federally-protected plant and wildlife species. The ecological survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for impacts to rare species and ecological communities. Additinally, Mr. Kennedy conducted amphibian trapping surveys of on-site wetlands and vernal pools and assisted in a breeding bird survey at the site. Mr. Kennedy also performed wetland delineations and further secured a Nationwide Permit determination from the United States Army Corps of Engineers for wetland impacts associated with the construction of a golf course at the site. Mr. Kennedy further prepared and submitted a USACE permit application package for a proposed residential development at the site. The

Mr. Kennedy is a Project Scientist who conducts ecological surveys, habitat assessments, species inventories and rare species evaluations. He also performs freshwater and tidal wetland delineations and provides wetland permitting services for clients with federal, state and local government agencies. Mr. Kennedy also conducts Phase I and Phase II Environmental Site Assessments, oversees environmental remediation projects and designs and oversees soil management plans.

10 years of professional experience

application package included the preparation of habitat assessments for the United States Fish and Wildlife Service regarding four federally-listed wildlife species.

Proposed Solar Energy Generation Facility, Calverton, NY

Mr. Kennedy conducted an ecological survey of this 45-acre site, which supports agricultural, woodland and wetland/aquatic habitats. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Mr. Kennedy further performed a wetland delineation at the site and prepared a Request for Determination of Non-Jurisdiction to the New York State Department of Environmental Conservation for a proposed solar power generating facility at the site.Mr. Kennedy further conducted a Phase I Environmental Site Assessent of the property, which included an evaluation of recognized environmental conditions and recommendations for further evaluation and remedial action.

The Landmark Colony EAS, Staten Island, NY

Mr. Kennedy conducted an ecological survey for the preparation of an EAS and supplemental environmental studies for a new senior-age residential community in the Willowbrook area of Staten Island. The project site, which supports both woodland and developed habitats, is a 46-acre parcel owned by the City of New York and located within the New York City Farm Colony-Sea View Hospital Historic District. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures were also addressed. In addition, Mr. Kennedy performed a wetland delineation and prepared a request for jurisdictional determination submittedor submission to the United States Army Corps of Engineers. Mr. Kennedy is also tasked with preparing a consistency analysis with New York State Department of State Coastal Policies. Mr. Kennedy further conducted a Phase II Environmental Site Assessent, in order to evaluate the impacts of past site usage on soils and groundwater. The Phase II ESA included a geophysical survey, as well as soil, soil vapor and groundwater sampling.

The Arboretum DEIS, Farmingville, NY

Mr. Kennedy conducted an ecological survey for the preparation of a DEIS on this 65-acre property. The project site, which currently supports old field, shrubland, woodland, agricultural and developed habitats, is proposed for development with a mixed-use development . The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures were also addressed.

Phase 1 and Phase 2 Environmental Site Assessments, Tidal Wetland Permitting, Avalon at Great Neck Residential Development, Great Neck, NY

Mr. Kennedy conducted Phase I and Phase II Environmental Site Assessments in order to assess impacts to soil and groundwater due to historic site usage at this marine terminal and major oil storage facility, which is proposed for residential redevelopment. The investigation included surficial and sub-surface soil sampling, groundwater monitoring well installation and sampling and an analysis of tidal influence on water table elevation beneath the site. Mr. Kennedy also conducted a wetland investigation and prepared a New York State Department of Environmental Conservation tidal wetland permit application package for the proposed residential redevelopment. Mr. Kennedy further provided technical support in the design of a wetland mitigation and restoration plan for the site.

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NYSDOT Accelerated Bridge Program, Albany NY

As part of a $31.3 million Accelerated Bridge Program to rehabilitate bridges in the Capital District and northern New York State, the New York State Department of Transportation designated 13 bridges as below par due to deteriorating bridge decks. Listed on the deficient bridge list, the structures range from 30-foot-long, two-lane bridges in rural environments to a 2,000-foot-long, four-lane bridge in an urban environment. Mr. Kenney conducted wetland identifications and wetland permitting associated with this bridge rehabilitation project.

Town of Islip Landfill Site Investigation, Costco, Bay Shore, NY

Mr. Kennedy performed a comprehensive Phase II Environmental Site Assessment of this 24 acre inactive municipal landfill, incinerator and sewage treatment facility, which is proposed for commercial redevelopment. The investigation included soil vapor monitoring, surficial soil sampling, test pit excavation and groundwater monitoring well installation. Mr. Kennedy also conducted a freshwater wetland delineation and assisted with securing a New York State Department of Environmental Conservation freshwater wetlands permit for the Phase II investigation. He designed and oversaw the site restoration and mitigation plan following completion of the investigation. Mr. Kennedy further conducted an ecological survey of the site which included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities.

Proposed Solar Energy Generation Facility, Southold, NY

Mr. Kennedy conducted an ecological survey of this 21 acre site, which supports agricultural, successional, woodland and wetland/aquatic habitats. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Mr. Kennedy further conducted a Phase I Environmental Site Inspection of the property, to identify and assess existing environmental concerns for future redvelopment.

Country Pointe Development, Plainview, NY

Mr. Kennedy conducted an ecological survey of this 143 acre property, which supports woodland, meadow, landscaped and developed habitats. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for this proposed residential development. Existing conditions, potential impacts and mitigation measures were addressed.

LaGuardia Airport Runway Area Safety Enhancements EA, Queens, NY

Mr. Kennedy served as a project scientist for preparation of an Environmental Assessment for the construction of runway safety area improvements at LaGuardia Airport in accordance with NEPA and SEQRA requirements. The Environmental Assessment addressed the airport's unique environmental conditions along the Flushing Bay and Bowery Bay waterfronts in Queens. Mr. Kennedy performed an assessment of existing terrestrial ecological resources, including an inventory of observed and expected flora and fauna and an assessment of rare species and habitats, as well as an impact analysis on these natural resources.

Tidal Wetland Permitting and Phase I ESA, Verizon Wireless Communications Site, Captree Island, NY

Mr. Kennedy performed a wetland delineation and obtained a tidal wetland permit from the New York State Department of Environmental Conservation for the construction of a wireless

communications facility located within and adjacent to regulated tidal wetlands. Mr. Kennedy further secured permit ammendments from the New York State Department of Environmental Conservation in response to project design changes by the site engineer. Additionally, Mr. Kennedy completed a Phase I ESA of the site.

Tidal Wetland Permitting, Seaford Union Free School District, Seaford, NY

Mr. Kennedy obtained tidal wetland permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers for the construction of an access driveway on an undeveloped parcel adjacent to the Seaford Harbor School. Mr. Kennedy also conducted an ecological survey and prepared an ecology resources report for the subject property. The survey included an assessment of existing wooded and wetland habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Potential impacts of the proposed action and wetland mitigation measures were also addressed.

Cold Spring Harbor Laboratory Waterfront Project, New York

Mr. Kennedy conducted wetlands assessments for the proposed redevelopment of a waterfront property on the campus of Cold Spring Harbor Laboratory in the Village of Laurel Hollow. Mr. Kennedy further delineated on-site wetlands, designed a wetland mitigation planting plan and obtained a tidal wetland permit from the New York State Department of Environmental Conservation for the project.

Hebrew Home at Riverdale Expansion, Bronx, NY

Mr. Kennedy is conducting an ecological survey for the proposed expansion of the Hebrew Home at Riverdale campus located in the Riverdale neighborhood of the Bronx, as part of a proposed Continuing Care Retirement Community. The project involves new construction on 32 acres of both the existing campus and on a newly-acquired adjacent property. The project site supports both vegetated and developed habitats and is located proximate to the Hudson River. The ecological survey will include a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures will be addressed in accordance with City Environmental Quality Review procedures. In addition, Mr. Kennedy will perform a wetland evaluation and will prepare wetland non-jurisdiction request packages for submission to the New York State Department of Environmental Conservation and/or the United States Army Corps of Engineers, as necessary. Mr. Kennedy is also tasked with preparing a consistency analysis with New York State Department of State Coastal Policies.

Westchester County Airport Master Plan, Westchester County, NY

Mr. Kennedy performed a review of existing biological and wetland resources at Westchester County Airport, as part of the Westchester County Airport Master Plan. The review included research of government agency records and prior ecological assessments of the site. Mr. Kennedy further identified and characterized various terrestrial, palustrine and aquatic ecological communities and wildlife species during a field survey of the airport property.

Open Space Study DGEIS, City of White Plains, Westchester County, New York

As part of Draft Generic Environmental Impact Statement (DGEIS) to evaluate the potential impacts of the adoption of a new open space zoning classification within the City of White Plains, Mr. Kennedy performed an analysis of existing natural resources at five golf course properties. The analysis included field assessments and research of local, state and federal government agency records pertaining to wildlife, vegetation, protected species/habitats,

wetlands and water resourcesat the five properties. Mr. Kennedy further performed an impact assessment of the proposed action and alternatives on the aforementioned resources.

The Preserve at North Bellmore, Kabro, North Bellmore, NY

Mr. Kennedy conducted a Phase I Site Assessment to identify and assess environmental concerns at this aa-acre site. Mr. Kennedy further performed an environmental investigation and site remediation activities in accordance with a Nassau County Department of Health-approved work plan for the site, which is proposed for a residential redevelopment. Field activities included sampling of soils, groundwater, sanitary and stormwater systems, and the remediation of underground injection control structures and subsurface soils.

Port Authority of New York and New Jersey Airport Capacity Study

Mr. Kennedy performed a comprehensive assessment of existing natural resources at the five Port Authority of New York and New Jersey airport properties (John F. Kennedy, LaGuardia, Newark, Stewart and Teterboro airports. The assessment included a summary of observed and expected flora and fauna, rare/protected species and wetland resources at the five airport properties.

East Hampton Airport Environmental Assessment, Town of East Hampton, Suffolk County, New York

As part of an environmental assessment for a proposed seasonal air traffic control tower construction project, Mr. Kennedy performed field surveys and researched government agency records pertaining to flora, fauna, endangered/threatened species, wetlands, water resources, coastal resources, floodplains and farmlands. Mr. Kennedy further prepared an assessment of existing conditions and expected impacts of the proposed action on the aforementioned resources.

Center Square Development Zoumas Property, Wading River, NY

Mr. Kennedy conducted an endangered/threatened species survey of this 18 acre fallow agricultural property, which is proposed for a mixed use commercial development and open space preservation. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy prepared a summary report which included conclusions and recommendations regarding the potential impacts of the proposed action.

Proposed Retail Fuel Facility Phase I and II ESA, Staten Island, NY

Mr. Kennedy performed Phase I and II Environmental Site Assessments, to determine if onsite soils and groundwater had been impacted as a result of past usage of the site and adjacent properties. As part of the Phase II ESA, Mr. Kennedy also directed the installation of groundwater monitoring wells and soil borings and the collection of representative samples from same. Mr. Kennedy further wrote a comprehensive health and safety plan for the project and served as the site safety officer.

Verizon Wireless Communications Facility, Hylan Boulevard, Staten Island, NY

Mr. Kennedy performed a Phase I ESA and wrote a comprehensive soil management plan for the installation of a wireless communications facility at the site. Mr. Kennedy also conducted a wetland investigation in association with the Verizon Wireless equipment installation.

LA Fitness, LA Fitness International, Patchogue, NY

Continued, p. 6

Mr. Kennedy performed wetland delineation and secured New York State Department of Environmental Conservation and Town of Brookhaven freshwater wetlands permits for the construction of a health club facility on this eight-acre wooded property. Mr. Kennedy also prepared a Town of Brookhaven Part 1 Environmental Assessment Form (EAF) for the health club facility.

Brookhaven Village Square, Blumenfeld Development Group, Bellport, NY
Mr. Kennedy conducted an ecological survey of this 58 acre wooded property. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Expanded Environmental Assessment Form for this proposed commercial/industrial development. Existing conditions, potential impacts and mitigation measures were addressed.

Islip Pines, Serota Properties, Holbrook, NY
Mr. Kennedy conducted an ecological survey of this 135 acre wooded property. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for this proposed residential development. Existing conditions, potential impacts and mitigation measures were addressed.

Salzman Property, Montauk, NY
Mr. Kennedy was a contributing scientist in a delineation of over 12 acres of freshwater wetlands on this 40 acre undeveloped property.

Avalon at Mitchel Field, Avalon Bay Communities, Inc., Garden City, NY
Mr. Kennedy performed a comprehensive environmental site investigation in accordance with a Nassau County Department of Health-approved work plan for this 11 acre site, which is proposed for a residential redevelopment. The assessment included surficial and subsurface soil sampling, and bottom sediment sampling of underground injection control structures.

Proposed Wireless Communications Facility, East End Wireless, West Gilgo Beach, NY
Mr. Kennedy performed tidal wetland delineations at two proposed locations for this public utility wireless communications facility.

Ronkonkoma Hub Transit-Orientated Development, Ronkonkoma, NY
Mr. Kennedy conducted an ecological survey of this 54 acre property. The survey included an assessment of both developed and undeveloped habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Generic Environmental Impact Statement for this proposed mixed use development. Existing conditions, potential impacts and mitigation measures were addressed.

NSTAR Right-of-Way, NSTAR, Eastern MA
Mr. Kennedy was a contributing scientist in a delineation of freshwater wetlands along an approximately five-mile section of this utility company right-of-way, for which additional power transmission lines are proposed.

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Vintage Vines, Vintage Vines, LLC, Bridgehampton, NY
Mr. Kennedy was a contributing scientist in an ecological assessment and tiger salamander survey for a proposed residential development on this 49 acre undeveloped property. He co-wrote the Ecology Resources section for the Draft Environmental Impact Statement, in which existing ecological conditions, potential impacts and mitigation measures were addressed. Mr. Kennedy also responded to public comments in the Final Environmental Impact Statement for the proposed action.

Queen of Peace Cemetery, Archdiocese of Rockville Centre, Old Westbury, NY
Mr. Kennedy oversaw the installation of groundwater monitoring wells and conducted quarterly groundwater sampling on two cemetery properties. He also prepared summary reports to measure and evaluate potential groundwater impacts from the two properties.

Silver Oak Stables, Nissequogue, NY
Mr. Kennedy obtained a freshwater wetlands permit the New York State Department of Environmental for an extensive demolition and construction project at this 35 acre equestrian center and boarding facility. Mr. Kennedy also conducted an ecological survey and prepared an ecology resources report for the subject property. The survey included an assessment of existing meadow and wetland habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Potential impacts of the proposed action and wetland mitigation measures were also addressed in the report.

Proposed Gas Station/Convenience Store, Stop and Shop, Farmingville, NY
Mr. Kennedy soil borings sampled underground injection control structures and oversaw the installation of groundwater monitoring wells, in order to assess impacts from prior site uses on soils and groundwater.

Proposed Wireless Communications Facility, metroPCS, Islip, NY
Mr. Kennedy conducted freshwater wetland delineation and obtained a New York State Department of Environmental Conservation freshwater wetlands permit for this public utility wireless communications facility.

Baypoint at Woodmere, Woodmere, NY
Mr. Kennedy conducted a comprehensive environmental site investigation in order to evaluate impacts to surficial and subsurface soils from past deposition of fill material on this waterfront site, which is proposed for residential redevelopment.

Brookhaven Town Drainage Project, Stony Brook, NY
Mr. Kennedy secured tidal and freshwater permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers for the Town of Brookhaven for this highway drainage improvement project.

Passionist Monastery, Shelter Island, NY
Mr. Kennedy delineated tidal wetlands on this shorefront property in association with a proposed redevelopment project.

Highway Improvement Project, Incorporated Village of Lloyd Harbor, Lloyd Harbor, NY

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Mr. Kennedy prepared and submitted application packages and secured tidal and freshwater permits from the New York State Department of Environmental Conservation for a traffic safety improvement project along six miles of public roadways within the Incorporated Village of Lloyd Harbor.

B&C Golf, East Hampton Country Club, East Hampton, NY

Mr. Kennedy has conducted semiannual groundwater monitoring on this golf club property since 2007, in order to assess potential impacts on area groundwater from pesticides, herbicides and fertilizers.

Multiplex Cinema Property, Lowes Home Centers, Inc., Commack, NY

Mr. Kennedy conducted an ecological survey of this 22 acre property, which is currently developed with a multiplex cinema and is proposed for commercial redevelopment with a retail home improvement center. The ecological assessment included wetland evaluation of a recharge basin located at the site. Mr. Kennedy further obtained a United States Army Corps of Engineers Nationwide Permit and New York State Department of Environmental Conservation Water Quality Certificate for the proposed redevelopment. Mr. Kennedy also conducted Phase I and Phase II Environmental Site Assessments of the property, which included surficial and subsurface soil sampling, and bottom sediment sampling of underground injection control structures.

Kirmse Residence, Westhampton, NY

Mr. Kennedy engaged in consultations with Town of Southampton Environmental Division officials and secured a Town wetlands permit for the reconstruction of a single-family home on this waterfront property. He also testified in support of the project at a Town of Southampton Environmental Board hearing.

Avalon at Huntington Station, Avalon Bay Communities, Inc., Huntington, NY

Mr. Kennedy conducted an ecological survey of this 27 acre undeveloped property, which is proposed for a residential subdivision. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for the proposed action. Existing conditions, potential impacts and mitigation measures were addressed.

Malverne UFSD, Malverne, NY

Mr. Kennedy performed an ecological survey and wetland assessment and prepared a development potential review report for this 38 acre undeveloped property, which is proposed for development with a school building.

Hydrogeologist, Long Island Consulting Firm

Prior to VHB, Mr. Kennedy performed groundwater monitoring and evaluation activities at federal, state and local government sites, including the United States Department of Energy's Brookhaven National Laboratory facility.

New York State Department of Environmental Conservation Fish and Wildlife Technician

Prior to VHB, Mr. Kennedy conducted biological assessments, population surveys, water quality evaluations and fish stocking of various local waters for the New York State Department of Environmental Conservation. Mr. Kennedy also participated in endangered species surveys,

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invasive species remediation projects, environmental education workshops and public outreach events.

Visiting Scientist Position, The Nyanza Project, Tanzania, East Africa

Prior to VHB, Mr. Kennedy performed multi-disciplinary scientific research activities as a student (2003) and visiting scientist/teaching assistant (2004) with The Nyanza Project, an international tropical lakes research program held annually at Lake Tanganyika, Tanzania, East Africa.

Education

Massachusets Audobon Society Wetland Construction and Restoration Workshop, 2013

Winter Vegetation Identification for Wetland Delineation, Rutgers University, 2012

Summer Vegetation Identification for Wetland Delineation, Rutgers University, 2011

United States Army Corp of Engineers 38 Hour Wetland Delineation Training Program, 2010

Rutgers University Wetland Delineation Training Program, 2007

OSHA Hazardous Waste Operations and Emergency Response Training, 2006, 2008, 2009, 2011, 2012, 2103 and 2014

MS, Geosciences, University of Arizona, 2005

BS, Environmental Science, Paul Smith's College, 2003

Publications

Eggermont, H., Kennedy, D., Hasiotis, S.T., Verschuren D. & Cohen, A. 2008. Distribution of living larval Chironomidae (Insecta: Diptera) along a depth transect at Kigoma Bay, Lake Tanganyika: implications for palaeoenvironmental reconstruction. African Entomology 16(2): 162-184.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NYS Breeding Bird Atlas

Block 6752D

2000-2005

ATLAS 2000

Navigation Tools

- Perform Another Search
- Show All Records
- Sort by Field Card Order
- Sort by Taxonomic Order
- View 1985 Data

Block 6752D Summary

Total Species:	66
Possible:	13
Probable:	28
Confirmed:	25

Click on column heading to sort by that category.

List of Species Breeding in Atlas Block 6752D

Common Name	Scientific Name	Behavior Code	Date	NY Legal Status
Spotted Sandpiper	*Actitis macularius*	X1	5/11/2002	Protected
Red-winged Blackbird	*Agelaius phoeniceus*	FL	7/9/2004	Protected
Mallard	*Anas platyrhynchos*	D2	4/30/2003	Game Species
Gadwall	*Anas strepera*	X1	4/21/2004	Game Species
Tufted Titmouse	*Baeolophus bicolor*	FY	7/1/2001	Protected
Cedar Waxwing	*Bombycilla cedrorum*	P2	5/25/2002	Protected
Canada Goose	*Branta canadensis*	NY	5/13/2003	Game Species
Great Horned Owl	*Bubo virginianus*	T2	4/21/2002	Protected
Red-tailed Hawk	*Buteo jamaicensis*	FL	7/15/2002	Protected
Whip-poor-will	*Caprimulgus vociferus*	S2	7/9/2004	Protected-Special Concern
Northern Cardinal	*Cardinalis cardinalis*	FY	7/9/2004	Protected
House Finch	*Carpodacus mexicanus*	X1	6/1/2001	Protected
Chimney Swift	*Chaetura pelagica*	P2	6/30/2001	Protected
Killdeer	*Charadrius vociferus*	X1	6/25/2001	Protected
Yellow-billed Cuckoo	*Coccyzus americanus*	X1	6/1/2001	Protected
Northern Flicker	*Colaptes auratus*	D2	5/25/2002	Protected
Northern Bobwhite	*Colinus virginianus*	T2	7/10/2001	Game Species

Rock Pigeon	*Columba livia*	P2	6/30/2002	Unprotected
Eastern Wood-Pewee	*Contopus virens*	T2	7/7/2001	Protected
American Crow	*Corvus brachyrhynchos*	FY	7/9/2004	Game Species
Fish Crow	*Corvus ossifragus*	B2	4/21/2004	Protected
Blue Jay	*Cyanocitta cristata*	NY	6/20/2002	Protected
Mute Swan	*Cygnus olor*	X1	4/15/2003	Protected
Prairie Warbler	*Dendroica discolor*	FL	7/9/2004	Protected
Yellow Warbler	*Dendroica petechia*	T2	6/1/2001	Protected
Pine Warbler	*Dendroica pinus*	T2	6/1/2001	Protected
Gray Catbird	*Dumetella carolinensis*	T2	5/15/2001	Protected
American Kestrel	*Falco sparverius*	X1	7/9/2004	Protected
Common Yellowthroat	*Geothlypis trichas*	FY	7/9/2004	Protected
Barn Swallow	*Hirundo rustica*	FY	7/9/2004	Protected
Baltimore Oriole	*Icterus galbula*	FY	6/27/2002	Protected
Orchard Oriole	*Icterus spurius*	X1	7/9/2004	Protected
Eastern Screech-Owl	*Megascops asio*	P2	7/9/2004	Protected
Wild Turkey	*Meleagris gallopavo*	P2	7/9/2004	Game Species
Song Sparrow	*Melospiza melodia*	FL	6/25/2003	Protected
Northern Mockingbird	*Mimus polyglottos*	D2	7/10/2001	Protected
Black-and-white Warbler	*Mniotilta varia*	X1	5/15/2001	Protected
Brown-headed Cowbird	*Molothrus ater*	P2	6/20/2002	Protected
Great Crested Flycatcher	*Myiarchus crinitus*	S2	6/30/2001	Protected
Osprey	*Pandion haliaetus*	NE	4/20/2002	Protected-Special Concern
House Sparrow	*Passer domesticus*	FL	7/7/2001	Unprotected
Ring-necked Pheasant	*Phasianus colchicus*	P2	7/9/2004	Game Species
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	X1	6/26/2003	Protected
Downy Woodpecker	*Picoides pubescens*	T2	7/10/2001	Protected
Hairy Woodpecker	*Picoides villosus*	X1	7/7/2001	Protected
Eastern Towhee	*Pipilo erythrophthalmus*	FL	7/16/2001	Protected
Black-capped Chickadee	*Poecile atricapillus*	FL	7/9/2004	Protected

Blue-gray Gnatcatcher	*Polioptila caerulea*	X1	6/1/2001	Protected
Purple Martin	*Progne subis*	P2	6/30/2002	Protected
Common Grackle	*Quiscalus quiscula*	FY	6/17/2001	Protected
Eastern Phoebe	*Sayornis phoebe*	FL	6/1/2001	Protected
Ovenbird	*Seiurus aurocapilla*	T2	6/30/2001	Protected
White-breasted Nuthatch	*Sitta carolinensis*	X1	6/20/2002	Protected
American Goldfinch	*Spinus tristis*	S2	7/9/2004	Protected
Chipping Sparrow	*Spizella passerina*	FY	7/9/2004	Protected
Field Sparrow	*Spizella pusilla*	FL	7/9/2004	Protected
European Starling	*Sturnus vulgaris*	NY	6/20/2002	Unprotected
Tree Swallow	*Tachycineta bicolor*	P2	7/9/2004	Protected
Carolina Wren	*Thryothorus ludovicianus*	P2	6/1/2001	Protected
Brown Thrasher	*Toxostoma rufum*	FY	7/9/2004	Protected
House Wren	*Troglodytes aedon*	ON	7/9/2004	Protected
American Robin	*Turdus migratorius*	FY	6/18/2001	Protected
Eastern Kingbird	*Tyrannus tyrannus*	T2	6/30/2001	Protected
Blue-winged Warbler	*Vermivora pinus*	T2	5/25/2002	Protected
Red-eyed Vireo	*Vireo olivaceus*	S2	6/1/2001	Protected
Mourning Dove	*Zenaida macroura*	FY	7/9/2004	Protected

Current Date: 10/20/2014

Table 31. List of common suburban birds that occur in the Town of Brookhaven.

Killdeer (*Charadius vociferus*)
* Red-tailed Hawk (*Buteo jamaicensis*)
** American kestrel (*Falco sparverius*)
Mourning Dove (*Zenaida macroura*)
Eastern Screech Owl (*Otus asio*)
Red-bellied Woodpecker (*Melanerpes carolinus*)
Northern Flicker (*Colaptus auratus*)
Downy Woodpecker (*Picoides pubescens*)
Eastern Phoebe (*Sayornis phoebe*)
Blue Jay (*Cyanocitta cristata*)
American Crow (*Corvus brachyrhynchos*)
Tufted Titmouse (*Parus bicolor*)
Black-capped Chickadee (*Parus atricapillus*)
White-breasted Nuthatch (*Sitta carolinensis*)
House Wren (*Troglodytes aedon*)
American Robin (*Turdus migratorius*)
Gray Catbird (*Dumetella carolinensis*)
Northern Mockingbird (*Mimus polyglottos*)
European Starling (*Sturnus vulgaris*)
Red-eyed Vireo (*Vireo olivaceus*)
Northern Cardinal (*Cardinalis cardinalis*)
Song Sparrow (*Melospiza melodia*)
Chipping Sparrow (*Spizella passerina*)
Common Grackle (*Quiscalus quiscula*)
Northern Oriole (*Icterus galbula*)
Orchard Oriole (*Icterus spurius*)
Brown-headed Cowbird (*Molothrus ater*)

* Adaptable to human changes in the environment, but typically requires woodlots with adjacent agricultural or field areas.

** Readily nests near human habitation when not directly disturbed, but prefers open country for foraging.

Table 32. List of mammals that occur in the Town of Brookhaven.

MAMMALS

Masked Shrew (*Sorex cinereus*)
Short-tailed Shrew (*Blarina brevicauda*)
Least Shrew (*Cryptotis parva*)
Eastern Mole (*Scalopus aquaticus*)
Star-nosed Mole (*Condylura cristata*)
Little Brown Bat (*Myotis lucifugus*)
* Keen's Bat (*Myotis keenii*)
** Silver-Haired Bat (*Lasionycteris noctivagans*)
** Eastern Pipistrelle (*Pipistrellus subflavus*)
Big Brown Bat (*Eptesicus fuscus*)
Red Bat (*Lasiurus borealis*)
** Hoary Bat (*Lasiurus cinereus*)
Eastern Cottontail (*Sylvilagus floridanus*)
Eastern Chipmunk (*Tamias striatus*)
Woodchuck (*Marmota monax*)
Gray Squirrel (*Sciurus carolinensis*)
Southern Flying Squirrel (*Glaucomys volans*)
White-footed Mouse (*Peromyscus leucopus*)
Meadow Vole (*Microtus pennsylvanicus*)
Pine Vole (*Microtus pinetorum*)
Muskrat (*Ondatra zibethicus*)
** Black Rat (*Rattus rattus*)
Norway Rat (*Rattus norvegicus*)
House Mouse (*Mus musculus*)
** Meadow Jumping Mouse (*Zapus hudsonicus*)
Red Fox (*Vulpes vulpes*)
Eastern Raccoon (*Procyon lotor*)
** Short-tailed Weasel (*Mustela erminea*)
Long-tailed Weasel (*Mustela frenata*)
* Mink (*Mustela vison*)
* River Otter (*Lutra canadensis*)
** Striped Skunk (*Mephitis mephitis*)
Harbor Seal (*Phoca vitulina*)
White-tailed Deer (*Odocoileus virginianus*)

* Possible

** Rare

List of Species Reported for the Moriches, New York Quadrangle Topographic Map during the New York Amphibian and Reptile Atlas Project Survey (1990-1999)

American bullfrog	*Rana catesbeiana*
common snapping turtle	*Chelydra serpentina*
eastern box turtle	*Terrapene carolina*
eastern garter snake	*Thamnophis sirtalis*
eastern milk snake	*Lampropeltis triangulum*
eastern ribbon snake	*Thamnophis sauritus*
eastern spadefoot toad	*Scaphiopus holbrookii*
eastern tiger salamander	*Ambystoma tigrinum*
four-toed salamander	*Hemidactylium scutatum*
Fowler's toad	*Bufo fowleri*
gray treefrog	*Hyla versicolor*
green frog	*Rana clamitans*
marbled salamander	*Ambystoma opacum*
northern black racer	*Coluber c. constrictor*
northern redback salamander	*Plethodon cinereus*
northern ringneck snake	*Diadophis punctatus*
northern spring peeper	*Pseudacris crucifer*
eastern painted turtle	*Chrysemys picta*
pickerel frog	*Rana palustris*
red-spotted newt	*Notophthalmus viridescens*
smooth green snake	*Opheodrys vernalis*
southern leopard frog	*Rana sphenocephala*
wood frog	*Rana sylvatica*

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES IN NEW YORK (By County)

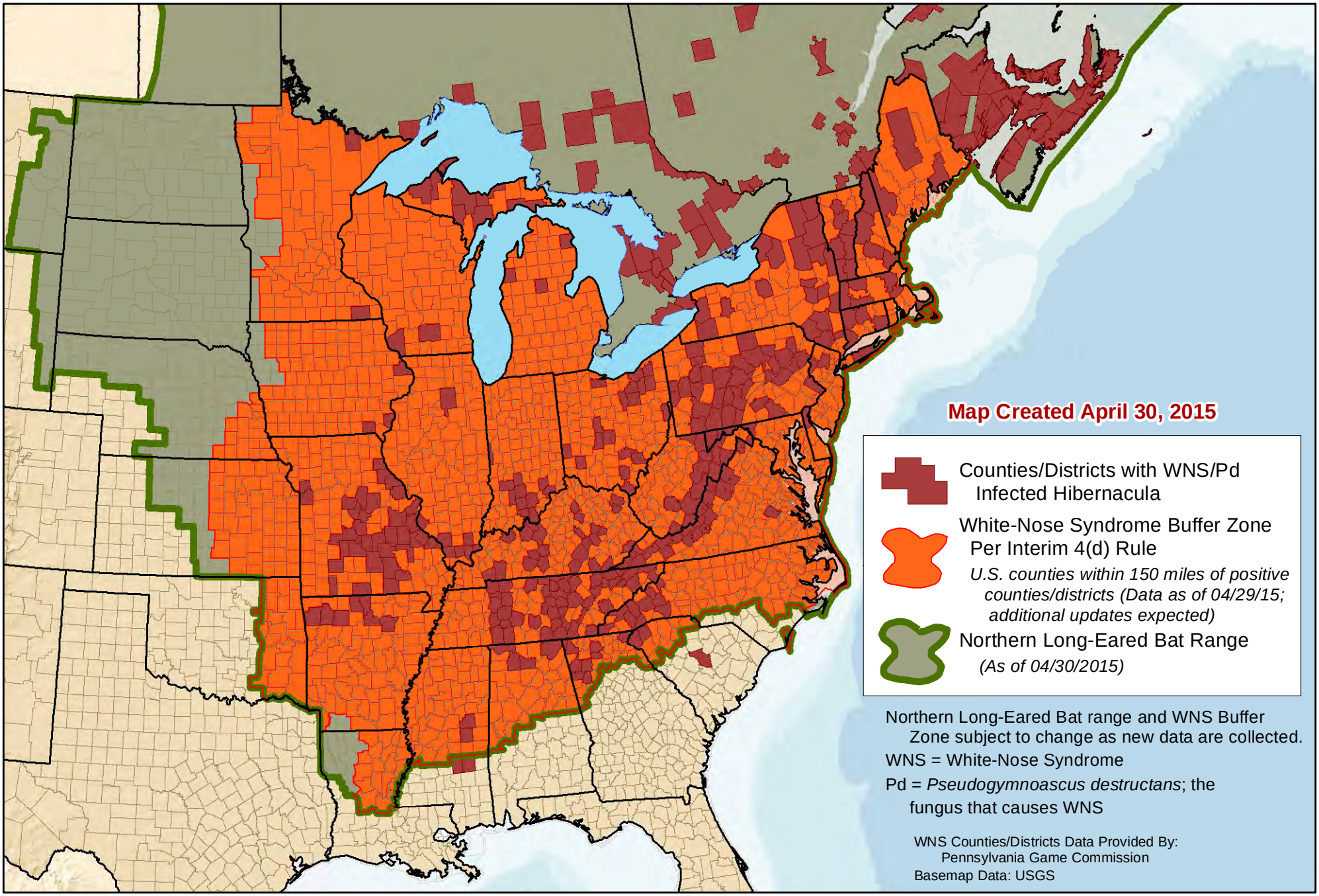
This list represents the best available information regarding known or likely County occurrences of Federally-listed and candidate species and is subject to change as new information becomes available.

COUNTY Common Name	Scientific Name	Status
SENECA		
Bald eagle	*Haliaeetus leucocephalus*	D
Bog turtle	*Clemmys [=Glyptemys] muhlenbergii*	T
Indiana bat (S)	*Myotis sodalis*	E
ST. LAWRENCE		
Bald eagle	*Haliaeetus leucocephalus*	D
Indiana bat (S)	*Myotis sodalis*	E
STEUBEN		
Bald eagle	*Haliaeetus leucocephalus*	D
Northeastern bulrush	*Scirpus ancistrochaetus*	E
SUFFOLK		
Kemp's [=Atlantic] ridley turtle[1]	*Lepidochelys kempi*	E
Green turtle[1]	*Chelonia mydas*	T
Hawksbill turtle[1]	*Eretmochelys imbricate*	E
Leatherback turtle[1]	*Dermochelys coriacea*	E
Loggerhead turtle[1]	*Caretta caretta*	T
Piping plover[4]	*Charadrius melodus*	T
Roseate tern	*Sterna dougallii dougallii*	E
Sandplain gerardia	*Agalinis acuta*	E
Seabeach amaranth	*Amaranthus pumilus*	T
Small whorled pogonia *(Historic)*	*Isotria medeoloides*	T
SULLIVAN		
Bald eagle	*Haliaeetus leucocephalus*	D
Bog turtle	*Clemmys [=Glyptemys] muhlenbergii*	T
Dwarf wedgemussel	*Alasmidonta heterodon*	E
Indiana bat (S)	*Myotis sodalis*	E
Northern wild monkshood	*Aconitum noveboracense*	T
TIOGA		
Bald eagle[2]	*Haliaeetus leucocephalus*	D

U.S. Fish & Wildlife Service

Northern Long-Eared Bat Interim 4(d) Rule

White-Nose Syndrome Buffer Zone Around WNS/Pd Positive Counties/Districts



Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat has been proposed to be federally listed as an endangered species under the Endangered Species Act. Endangered species are animals and plants that are in danger of becoming extinct. Identifying, protecting, and restoring endangered and threatened species are primary objectives of the U.S. Fish and Wildlife Service's endangered species program.

Photo by Steve Taylor; University of Illinois

This northern long-eared bat, observed during an Illinois mine survey, shows visible symptoms of white-nose syndrome.

What is the northern long-eared bat?

Appearance: The northern long-eared bat is a medium-sized bat about 3 to 3.7 inches but with a wingspan of 9 to 10 inches. Its fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*, which are actually bats noted for their small ears (Myotis means mouse-eared).

Winter Habitat: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns and sheds.

Reproduction: Breeding begins in late summer or early fall when males begin swarming near hibernacula. After copulation, females store sperm during hibernation until spring, when they emerge from their hibernacula, ovulate, and the stored sperm fertilizes an egg. This strategy is called delayed fertilization.

After fertilization, pregnant females migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies, with young, generally have 30 to 60 bats, although larger maternity colonies have been observed. Most females within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range. Young bats start flying by 18 to 21 days after birth. Adult northern long-eared bats can live up to 19 years.

Feeding Habits: Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation. This bat also feeds by gleaning motionless insects from vegetation and water surfaces.

Range: The range of the northern long-eared bat includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and

eastern British Columbia. Within the United States, this area includes the following 39 States: Alabama, Arkansas, Connecticut, Delaware, the District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Why is the northern long-eared bat in danger of extinction?

White-nose Syndrome: No other threat is as severe and immediate as the disease, white-nose syndrome. If this disease had not emerged, it is unlikely the northern long-eared population would be declining so dramatically. Since symptoms were first observed in New York in 2006, white-nose syndrome has spread rapidly from the Northeast to the Midwest and Southeast; an area that includes the core of the northern long-eared bat's range where it was most common before this disease. Numbers have declined by 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread within the species' range, it is expected to spread throughout the United States.

Other Sources of Mortality: Although significant population declines have not been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's ability to persist while experiencing dramatic declines caused by white-nose syndrome.

Impacts to Hibernacula: Gates or other structures to exclude people from caves and mines restrict bat flight and movement and change airflow and internal cave and mine microclimates. A few degrees change can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Bats use up their energy stores when aroused and may not survive the winter or females may not successfully give birth or rear young.

Loss or Degradation of Summer Habitat: Highway and commercial development, surface mining, and wind facility construction permanently remove habitat and are prevalent in many areas of this bat's range. Timber harvest and forest management can remove or alter (improving or degrading) summer roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, including northern long-eared bats, although only a small number have been documented to date. However, there are many wind projects within a large portion of the bat's range and many more are planned.

What Is Being Done to Prevent Extinction of the Northern Long-Eared Bat?

Disease Management: Actions have been taken to slow the spread of white-nose syndrome through human transmission of the fungus into caves (e.g. cave and mine closures and advisories; national decontamination protocols). A national plan was prepared by the Service and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many state and federal agencies, universities and non-governmental organizations are researching this disease to try to control its spread and address its affect.

Addressing Wind Turbine Mortality: The Service and others are working to minimize bat mortality from wind turbines on several fronts. We fund and conduct research to determine why bats are susceptible to turbines, how to operate turbines to minimize mortality and where important bat migration routes are located. The Service, state natural resource agencies, and wind energy industry are developing a Midwest Wind Energy Multi-Species Habitat Conservation Plan that will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: We are proposing to list the northern long-eared bat as an endangered species under the federal Endangered Species Act. Listing affords a species the protections of the Act and increases the priority of the species for funds, grants, and recovery opportunities.

Hibernacula Protection: Many agencies and organizations have protected caves and mines that are important hibernacula for cave-dwelling bats.

What Can I Do?

Do Not Disturb Hibernating Bats: Comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a white-nose syndrome affected state or region be used in unaffected states or regions.

Leave Dead and Dying Trees Standing: Where possible and not a safety hazard, leave dead or dying trees on your property. Northern long-eared bats and many other animals use these trees.

Install a Bat Box: Dead and dying trees are usually not left standing, so trees suitable for roosting may be in short supply and bat boxes can provide additional roost sites.

October 17, 2014

VIA ELECTRONIC MAIL

Ref: 29024.00

Ms. Andrea Chaloux
Information Services
New York Natural Heritage Program
New York State Department of Environmental Conservation
625 Broadway, 5th Floor
Albany, New York 12233-4757

Re: Proposed Middle Island Solar Farm
South Side of Moriches-Middle Island Road
Hamlet of Manorville, Town of Brookhaven
Suffolk County, New York

Dear Ms. Chaloux:

VHB Engineering, Surveying and Landscape Architecture, P.C. (VHB) is serving as environmental consultant to the Middle Island Solar Farm, LLC, which is proposing a photovoltaic solar energy farm (the "proposed action") at the above-referenced 100.33±-acre property, which is currently undeveloped with any structures and consists of pine- and oak-dominated woodlands (the "subject property", see enclosed excerpt of the USGS Topographic Map, Patchogue, NY Quadrangle). More specifically, the proposed action consists of the installation of a field of solar panel arrays, a maintenance and operations building, perimeter and centerline access roadways, array access pathways and security fencing over a 68.65±-acre portion of the subject property. Following the equipment installation, 61.40±-acres of the cleared area would be re-vegetated. The remaining 31.68±-acres of the subject property would remain as undeveloped woodlands.

VHB is currently in the process of preparing a Draft Environmental Impact Statement (DEIS) for the proposed action, with the Town of Brookhaven Town Board serving as the lead agency. In order to ensure that the DEIS will address all significant issues, we are writing to inquire whether there are any NYNHP records of rare plants, animals and/or natural communities on, or proximate to, the subject property.

Thank you in advance for your assistance. If additional information is required, or if you have any questions, please do not hesitate to contact me at (631) 787-3454 or dkennedy@vhb.com.

Sincerely,

VHB Engineering, Surveying and Landscape Architecture, P.C.

David Kennedy
Project Scientist

DK/
enc.

\\vhb\proj\LongIsland\29024.00 Middle Island Solar Farm\ProjRecords\FinalDocs\Chaloux NHP ltr 10-17-14.docx

VHB Engineering, Surveying
and Landscape Architecture, P.C.

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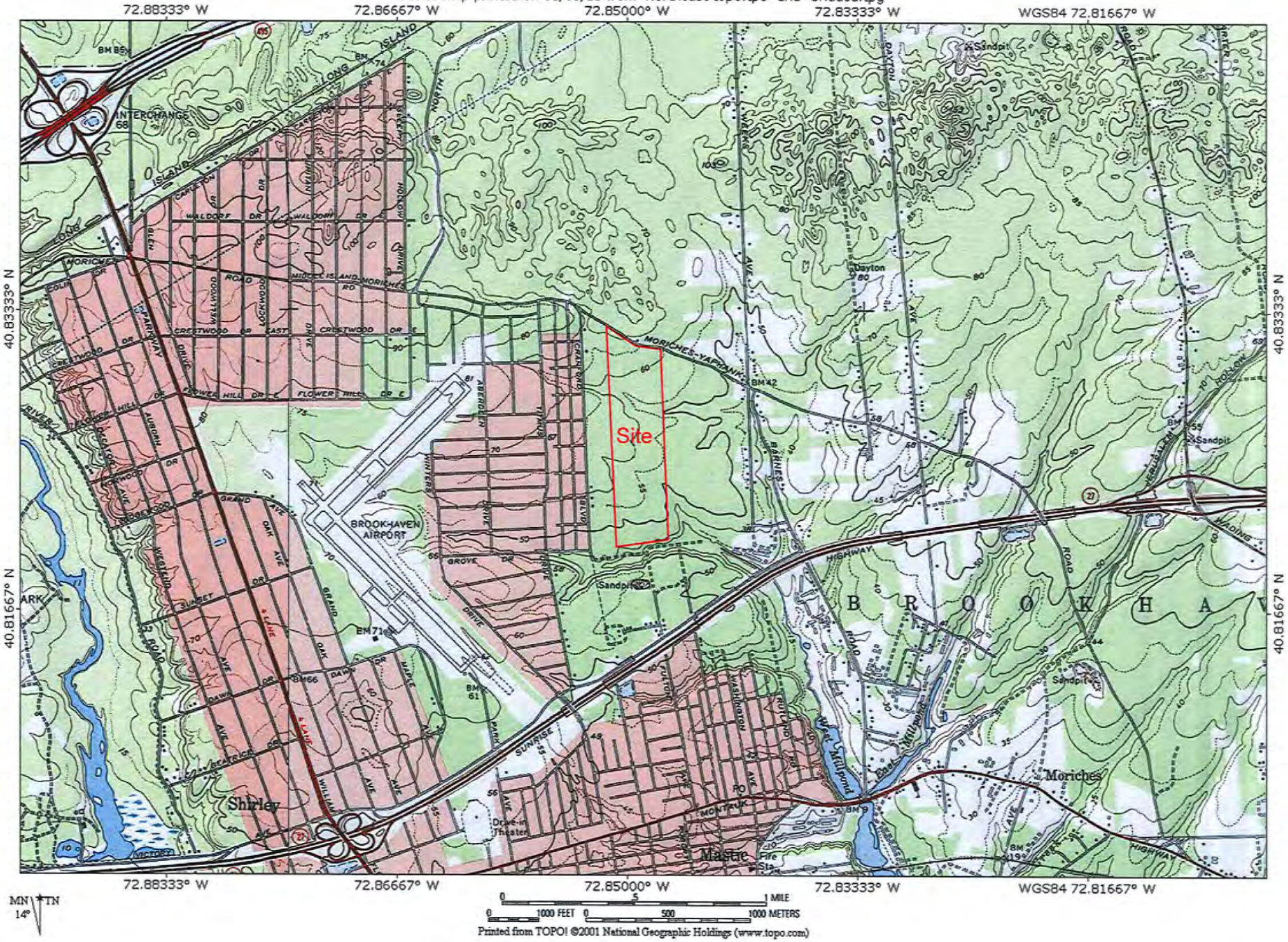

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Exhibit 5

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

November 14, 2014

David Kennedy
VHB Engineering, Surveying and Landscape Architecture, P.C.
100 Motor Parkway, Suite 135
Hauppauge, NY 11788

Dear David Kennedy:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the proposed Middle Island Solar Farm, on the south side of Moriches-Middle Island Road in the Hamlet of Manorville, Town of Brookhaven, Suffolk County.

We have no recent records of rare or state-listed animals or plants, or of significant natural communities, at this site or in its immediate vicinity.

Our database does have a historical record of a rare plant in the area of the project site: in 1934, **Silvery Aster** (*Symphyotrichum concolor var. concolor*, listed by NYS as Endangered) was collected from dry sandy woods in Mastic. We do not know the precise location where this plant was collected, we have no recent information on this population, and there is uncertainty regarding its continued presence. We provide this information for your general reference. While its current status is not known, if suitable habitat for this plant is present in the vicinity of the project site, it is possible that it may still be found there. We recommend that any field surveys to the site include a search for this species, particularly at sites that are currently undeveloped and may still contain suitable habitat. If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about Silvery Aster in New York, including habitat, biology, identification, conservation, and management, is available online in Natural Heritage's Conservation Guide at http://www.guides.nynhp.org/guide.php?id=8841.

For most sites, comprehensive field surveys have not been conducted; the above information only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities.

Sincerely,

Nicholas Conrad
Information Resource Coordinator

1111

Silvery Aster

Symphyotrichum concolor flowers

Photo credits: *Troy Weldy*

Scientific Name *Symphyotrichum concolor var. concolor*

Family Name Asteraceae
Aster Family

Did you know?
We are unsure of why this once common aster is so rare now. Plenty of suitable habitat apparently remains, although many of its former sites on western Long Island and New York City have been developed.

Summary

Protection Endangered in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ? minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5T5, S1

A global rarity rank of G5T5 means: Secure globally - Both the species as a whole and the subspecies/variety are common in the world; widespread and abundant (but may be rare in some parts of its range).
A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There is only one known population on the verge of being extirpated. There are approximately 30 historical occurrences, but despite extensive searches only one occurrence has been seen. No other records of this conspicuous aster have been reported recently. There are probably only a few other occurrences in New York.

Short-term Trends

The short-term trend is strongly negative. The only existing population has severly declined over the last 25 years and may be extirpated.

Long-term Trends

The long-term trend is strongly negative. There are about 30 historical occurrences, some probably quite large and in the larger grasslands, but despite extensive searches only one occurrence has been seen in the last 25 years. This is one of the most dramatic declines of any rare plant in New York State.

Conservation and Management

Threats

Lack of disturbance to maintain the open grassland habitat has led to succession that has reduced plant numbers.

Conservation Strategies and Management Practices

This species needs disturbance to reduce competition from woody plants and more aggressive herbaceous plants. However, too much direct disturbance to the plants will reduce or eliminate the population. Its habitat could be disturbed in the non-growing season to open it up for seed germination and colonization, but direct disturbance should be prevented during the growing season.

Research Needs

Research is needed to determine the causes of such a dramatic decline in populations even though many remnant grasslands still exist. Research is needed to determine the best management option to augment the existing population.

Habitat

The only known extant population in New York is along a trail through a sandy grassland succeeding to pine woods; historical records are all from similiarly dry, sandy, and/or pine-dominated habitats (New York Natural Heritage Program 2010). Dry sandy places, often among pines (Gleason & Cronquist 1991). Dry sandy open woods and barrens (Fernald 1970).

Associated Ecological Communities

Other Probable Associated Communities

Hempstead Plains grassland
Maritime pitch pine dune woodland
Pitch pine-heath barrens
Pitch pine-scrub oak barrens
Successional maritime forest

Associated Species

Flaxleaf Whitetop Aster (*Ionactis linariifolius*)
Pennsylvania Catchfly (*Silene caroliniana*)
Late Purple Aster (*Symphyotrichum patens var. patens*)
Lowbush Blueberry (*Vaccinium angustifolium*)

Identification Comments

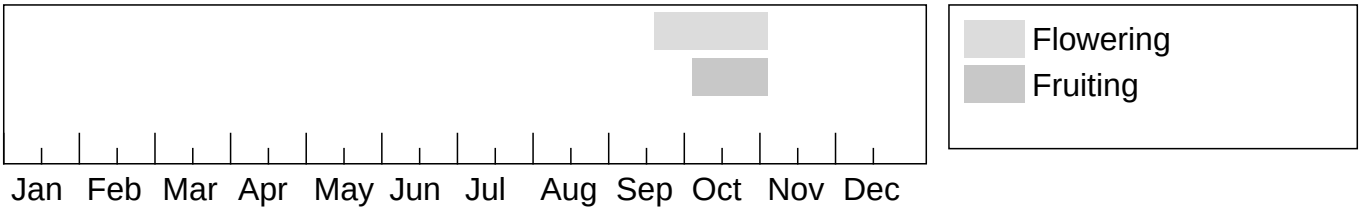
Silvery aster is a slender, upright perennial herb, growing in clumps and reaching from 30 to 100 cm tall. The lower and basal leaves are withered by flowering time. The upper leaves are entire, oblong to lanceolate with mucronate tips and 9 to 15 mm long. They are covered with short grayish-green (or silvery) hairs and usually closely appressed to the stem. As with all asters, the infloresences are arranged radially into "heads" of many separate ray and disc flowers, superficially resembling a single flower, and the arrangement of these heads is termed a capitulesence. Silvery Aster may consist of only a single head or may have a narrow panicle, with 1 to 3 heads per branch. The peduncles are densely hairy, with the upper bracts reduced and grading into the phyllaries (involucral bracts). The ray flowers are rose purple and 3 to 10 mm long, and the achenes 2.5 to 3.5 mm long and covered with silky hairs (FNA 2006, Gleason and Cronquist 1991).

Best Life Stage for Identifying This Species

The best time to identify Silvery Aster is during flowering.

The Best Time to See

Silvery Aster flowers from late September to early October.



The time of year you would expect to find Silvery Aster in New York.

Similar Species

Symphyotrichum novi-belgii has longer and broader leaves, not covered in silvery hairs, and its petal-like ray flowers are 10-19 mm long (versus 3-10 mm long for S. concolor var. concolor) (FNA 2006).

Taxonomy

Kingdom Plantae
└─ **Phylum** Anthophyta
└─

Class Dicots (Dicotyledoneae)
└─ **Order** Asterales
└─ **Family** Asteraceae (Aster Family)

Synonyms

Aster concolor (L.)
Virgulus concolor ((L.) Reveal & Keener)

Additional Resources

Links

Google Images
http://images.google.com/images?q=ASTER+CONCOLOR
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=ASTER+CONCOLOR
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=ASTER+CONCOLOR
Alabama Plants
http://www.alabamaplants.com/Pinkalt/Symphyotrichum_concolor_page.html
Nearctica - Eastern Wildflowers
http://www.nearctica.com/flowers/composit/aster/Sconcol.htm

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Phone: (518) 402-8935
acris@nynhp.org

This project is made possible with funding from:

- New York State Department of Environmental Conservation Hudson River Estuary Program
- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation

Information for this guide was last updated on Mar 19, 2013

This guide was authored by

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Whip-poor-will Fact Sheet

Whip-poor-will

Caprimulgus vociferous

New York Status: Special Concern
Federal Status: Not Listed

Description

©Philip Jeffrey Photography

The whip-poor-will, named for its distinctive call, is more commonly heard than seen. A crepuscular bird, it is most active at dawn and dusk. During the day it roosts on the low limbs of trees where it is well-camouflaged. Unlike most birds, the whip-poor-will roosts with its body parallel to the branch. A medium sized nightjar, the whip-poor-will measures 8 to 10 inches (22 - 26 cm) in length with a very short bill and long, rounded tail and wings. Cryptic coloring makes this ground-nesting bird very difficult to detect. Upper parts are mottled gray, black, and brown; while the under parts are pale with gray and black spotting. The black throat is bordered by a white necklace in males and a buff colored necklace in females. Males also have white tips on the outer tail feathers. Large eyes are used for locating prey at night. Whip-poor-wills feed exclusively on night-flying insects such as moths, beetles, and mosquitoes.

Life History

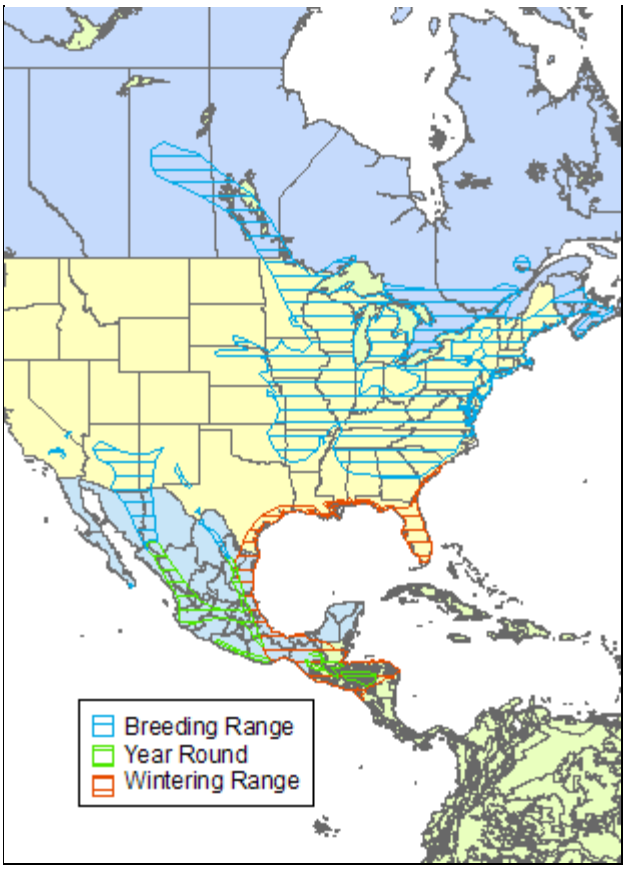
Males establish and maintain territories at the beginning of the breeding season. A clutch of 2 eggs is laid directly on leaf litter on the ground. Incubation is shared by both parents and lasts 19 to 21 days. Parents do not actively defend the nest or their territory but will remain on the nest until a disturbance comes within 1 meter. Chicks are downy and precocial at the time of hatching and nestlings fledge at 15 to 20 days. Females will occasionally leave when chicks are 7 to 9 days old to start a second brood nearby. Breeding is synchronized with the lunar cycle so that young hatch before a full moon. This maximizes foraging time for parents when the feeding demands imposed by the newly hatched young are highest.

Distribution and Habitat

The breeding range extends from central Canada east to the Atlantic coast and south to Oklahoma and Georgia. Winter range includes the southeastern United States and Central America. Breeds in dry, deciduous or mixed forests with sparse underbrush near open areas needed for foraging. Seems to prefer pitch pine/scrub oak barrens on Long Island and oak-hickory forests in upstate New York.

Status

Although rarely seen, the whip-poor-will is a locally common breeder in parts of New York that are not heavily forested, especially in Long Island and the St. Lawrence Valley. Absent in the higher elevation areas of the Adirondacks, Catskills, and Tug Hill Plateau. New York State Breeding Bird Atlas results for the state indicate a decline in



Whip-poor-will Range

detections over the last 20 years although it is important to note that survey methods used for the atlas are not conducive to detection of the whip-poor-will. The species has disappearance from many parts of New York which it has previously inhabited.

Management and Research Needs

Like many nocturnal species, the whip-poor-will is not usually detected during Breeding Bird Surveys which are normally conducted during day light hours. Therefore whip-poor-will surveys could give a better indication of the population status. Habitat loss resulting from forest succession is thought to be a major factor resulting in the decline of whip-poor-will numbers in New York. Further study is needed on the habitat characteristics of whip-poor-will habitat. Vehicle collisions also pose a danger to foraging and migrating birds.

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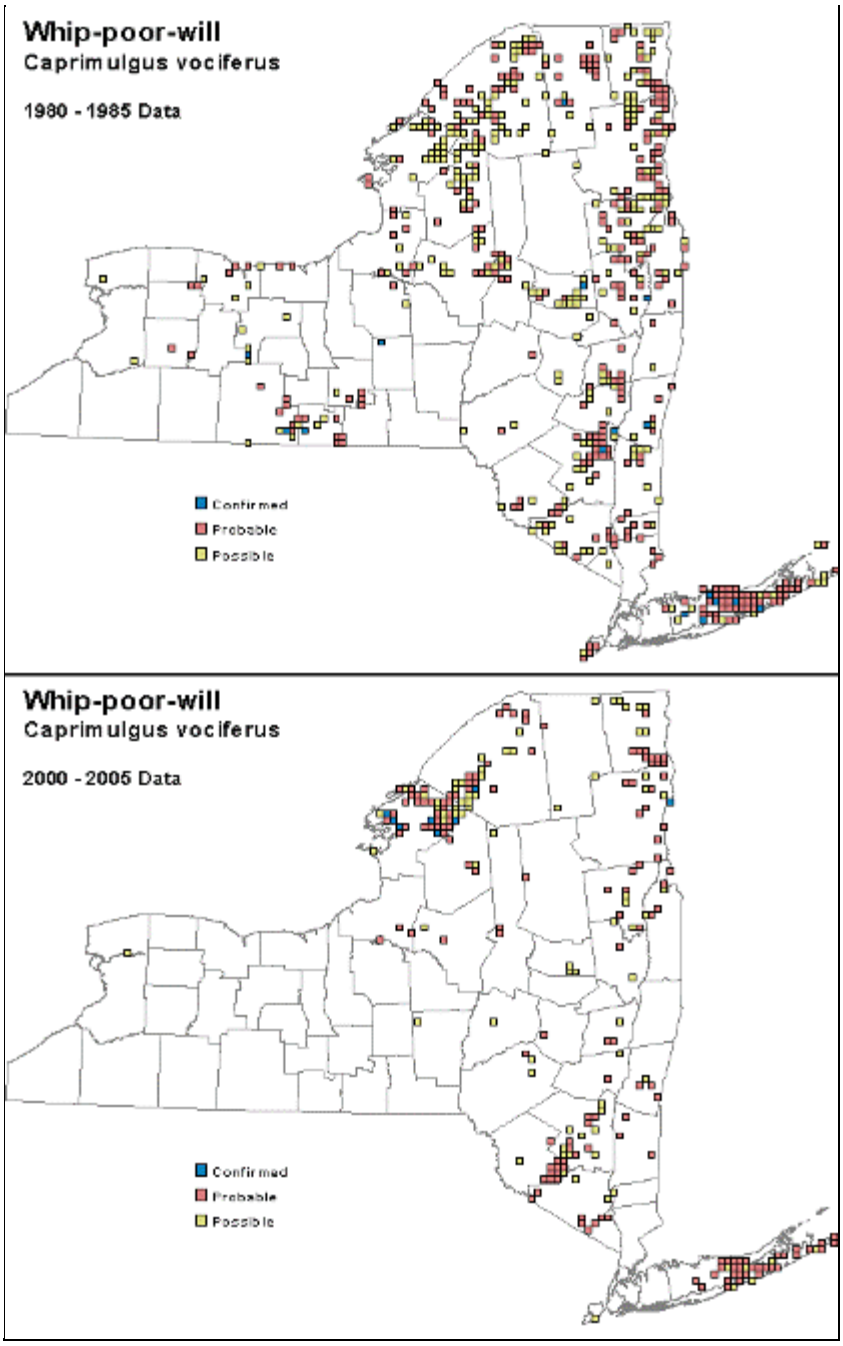

Distribution of Whip-poor-will in New York from 1st and 2nd NYS Breeding Bird Atlas Records

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ADVISORY GUIDELINES FOR CREATING TURTLE NESTING HABITAT

By
The Natural Heritage and Endangered Species Program
Massachusetts Division of Fisheries and Wildlife

Photo by Liz Willey

Open canopy areas with well-drained soils are ideal turtle nesting habitat. One of the major threats to our native turtles is habitat fragmentation and associated adult mortality due to road traffic. Female turtles often travel substantial distances from feeding wetlands to the nearest appropriate nesting habitat in order to lay their eggs. One way to reduce nesting related mortalities is to facilitate access to nesting habitat near feeding and overwintering wetlands, with roadless corridors in between. These guidelines are for creating nesting habitat for turtles on conservation land, where nesting habitat is lacking. Native plant community and all native species, particularly state-listed species, should be considered when developing management plans for conservation lands.

For more information about Wood Turtles and Box Turtles and the types of habitat they use see the NHESP Fact Sheets:
Wood Turtle http://www.mass.gov/eea/docs/dfg/nhesp/species-and-conservation/nhfacts/glyptemys-insculpta.pdf
Eastern Box Turtle http://www.mass.gov/eea/docs/dfg/nhesp/species-and-conservation/nhfacts/terrapene-carolina.pdf

An information request form can be submitted to the NHESP for persons interested in finding out if they have state-listed turtle species on their property; the form may be found at http://www.mass.gov/eea/docs/dfg/nhesp/regulatory-review/inforequform-elect.pdf

For more information on management of these habitats, land managers can refer to the recently released *Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife: a Guide for the Northeast* available for download at:
http://www.wildlife.state.nh.us/Wildlife/Northeast_Hab_Mgt_Guide.htm.

For more information about Habitat Management for Amphibians and Reptiles see the *Habitat Management guidelines for Amphibians and Reptiles of the Northeastern United States* available for order at http://www.parcplace.org/parcplace/publications/habitat-management-guidelines.html

1) Species Specific Requirements (state-listed species are in italics)

a) Freshwater/Estuary Species (*Wood Turtle, Blanding's Turtle, Red-bellied Cooter, Diamondback Terrapin,* Spotted Turtle, Snapping Turtle, Painted Turtle and Musk Turtle)

Location - Nesting habitat should be within 1000 ft of the wetland edge, with a barrier free (e.g. roadless) corridor between the wetland and nesting habitats. It is typically best to have the nesting habitat within 300 ft of the wetland edge, particularly for Red-bellied Cooters, Diamondback Terrapins, and Wood Turtles.

b) Upland Species (*Box Turtle*)

Location - Nesting habitat should be within a large forested, roadless block. Sites should be within 1000 ft of confirmed Eastern Box Turtle observations.

2) General Guidelines

Photo by Liz Willey

a) Site Factors - It is best to add to existing nesting habitat or to create nesting habitat near known nesting areas; increasing the probability that females will use the nest site immediately. Nesting sites should be on level ground with full southern exposure. The site should get sun, in a 180 degree arc from east to west, throughout most of the day. Total area of the nesting site should be greater than 20 ft in each direction and the site should be above the spring/summer flood plain. The site may need to be larger to get sun exposure throughout the day, depending on the proximity and height of adjacent forested areas. Larger nesting areas or multiple small ones will likely dilute nest predation. To minimize predation and human related mortality and collection; all nesting sites should be as isolated to the extent possible from housing developments, and human activity areas such as ATV/motorcycle trails, playgrounds, picnic areas, walking paths and other human recreational activities.

b) Substrate - The original substrate should consist of well drained soil, sand or gravel. If soil is brought to the site it should be washed sand or gravel. Washed substrate will minimize translocation of weeds or invasive plant species and impede rapid growth of vegetation. Ground vegetation should be sparse and include native sedges, grasses, and a few low growing shrubs (less than 2%-5% cover of the site). Shrubs

will provide cover for the gravid females and hatchlings once they emerge from the nest.

c) Procedure -

Step 1 –Where necessary forest cover and tall vegetation should be removed. In these cases refer to the Forestry Conservation Management Practices (http://www.mass.gov/dfwele/dfw/nhesp/cmpdraft.htm) for specific guidelines for any of the state-listed turtle species. In addition, these practices should be used to help direct forest removal activities related to the creation of nesting habitat for any common turtle species.

In most cases the surface material will need to be disturbed through scarification. Refer to the species-specific data in the Forestry CMPs for information about dates when these activities should occur. Removal of the surface material, to expose the underlying strata, may also be necessary if the area is infested with invasive and/or weedy species.

In some cases the deposition of sandy soil on top of existing vegetation is all that is necessary.

Step 2 – If the exposed native mineral soil is not acceptable, a fine sand (<5% clay and <25% gravel) should be deposited over the parent material to a depth of approximately 12 inches. A permeable tarp may be placed under the sand to reduce the reoccurance of remaining vegetation. Sand cover up to 10-12 in depth may also be used to retard growth of some existing unwanted vegetation.

Step 3 – Native, non-spreading bunch grasses (see the list of appropriate species in #5 below) should be sparsely planted; at approximately a 50 ft spacing throughout the site. Planting should not occur during dry months.

d) Maintenance - Maintenance should not be required frequently. It is recommended that the site is inspected every two years for maintenance issues. If encrusting mosses or other exotic weeds encompass >25% of the intended nesting area, those areas should be raked and accretions should be removed. Herbaceous and woody species should never occupy > 50% of the area. In addition, shrubs should be no taller than 24" in height. If this occurs most of these materials should be removed or trimmed. The removal areas should then be raked and lightly tilled. Additional vegetation plantings may be necessary.

3) Related Policy and Regulatory Process Considerations

- Habitat management/enhancement is exempt from MESA, provided that the proponent has a management plan approved in advance by the NHESP.
- If you are creating the nesting habitat within 100 ft of a wetland or 200 ft of a stream you will need a permit from the Conservation Commission. An RDA (Request for Determination of Applicability) could be filed with the local Conservation Commission. If they perceive the impact as minor and the project as beneficial, they *may* not require a Notice of Intent (NOI) filing. It would be beneficial to have a letter of support from the Natural Hertiage & Endangered Species Program before you go to the Conservation Commission.
- If the nesting area is going to be >5000 square ft in area, you will need a permit from the Army Corp of Engineers (ACOE).

- If the site is in an Area of Critical Ecological Concern (ACEC) you'll need to call the ACEC program and if it is also in a wetland buffer area you'll need to file with us. There is an ACEC GIS layer available on MassGIS to see if the site falls with in one of these areas.

Some additional things to consider: You should also plan to use a clay berm around the nesting area to avoid erosion and runoff into a local stream. Hay bales and silt fencing should not be used.

4) Research Needs

a) Size and Configuration - It is still unknown whether creating one large nesting area or multiple smaller nesting sites (spaced approximately 1-3 miles of each other) is the better arrangement to minimize nest predation.

b) Monitoring of Created Nesting Areas – Information is needed to determine the successfulness of these methods. For example, how quickly do females begin to use these sites and do we see an increase in the nesting activity at the sites over multiple years.

c) Percent Vegetation for Optimal Turtle Nesting Habitat –

5) Suggested Plant Species Appropriate for Turtle Nesting Habitat

Low Growing Plants,

Carex lucorum	Blue Ridge Sedge
Andropogon(Schizachyrium) scoparius	Little Bluestem, CT ecotype
Carex conoidea	Openfield Sedge
Carex swanii	Swan's Sedge
Chamaecrista fasciculata	Partridge Pea, PA ecotype
Danthonia spicata	Poverty Oatgrass

Shrubs

Comptonia peregrine	Sweet Fern
Vaccinium angustifolium	LowBush Blueberry
Vaccinium pallidum	LowBush Blueberry
Gaylussacia baccata	Black Huckleberry

6) References

Oxbow Associates, Inc.. 2000. Spotted turtle nesting habitat creation for the preserve at Keeney Pond. Natural Heritage and Endangered Species Program report, Westborough, MA

Buech, R. R., L. G. Hanson, and M. D. Nelson. 1997. Identification of wood turtle nesting areas for protection and management. Pages 383-391 in J. V. Abbema, editor. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – an International Conference. State University of New York, New York, NY.

Buech, R.R., and M.D. Nelson. 1991. How to create wood turtle nesting areas. USDA Forest Service, St. Paul, MN

Appendix D

Dredging, Bulkhead Replacement and Revetment Construction Project, East Marion, NY

Mr. Kennedy performed a wetland delineation and ecological survey at an 18-acre former oyster processing facility for a proposed dredging, bulkhead replacement and revetment construction project located on Gardiners Bay in the Town of Southold, NY. Mr. Kennedy also obtained a Tidal Wetland Permit from the New York State Department of Environmental Conservation and is currently in the process of obtaining a United States Army Corps of Engineers Individual Permit for the project. As part of the permitting process, Mr. Kennedy also prepared and Essential Fish Habitat assessment for the National Oceanographic and Atmospheric Administration (NOAA) and endangered species assessment for the United States Fish and Wildlife Service (USFWS). Additionally, Mr. Kennedy prepared a consistency analysis with New York State Department of State (NYSDOS) Coastal Policies, and subsequently received a Coastal Concurrence letter from the NYSDOS. Mr. Kennedy also prepared a consistency analysis Town of Southold Local Waterfront Revitalization Program (LWRP) Coastal Policies.

EPCAL Redevelopment Plan and Habitat Protection Plan, Town of Riverhead, NY

Mr. Kennedy performed an ecological assessment in association with the Draft Supplemental Environmental Impact Statement (DSGEIS) for the 2,323.9-acre Enterprise Park at Calverton (EPCAL) property. The subject property consists of portions of land formerly owned by the United States Department of the Navy (U.S. Navy) and known as the Naval Weapons Industrial Reserve Plant (NWIRP). The site supports extensive wooded and wetland habitats, and also includes the largest remaining native grassland habitat on Long Island. The site provides habitat for a number of rare wildlife and plant species, including several NYS-Endangered, -Threatened and Special Concern species. The ecological assessment included habitat characterization, species inventories and rare species assessments. Mr. Kennedy also performed an evaluation of potential impacts of the proposed action to on-site ecological resources and further prepared a comprehensive habitat protection plan (CHPP) for the site. The CHHP includes measures to protect and preserve existing habitats and resident wildlife and plant species, and provides for the preservation, creation, maintenance and enhancement of 596.4 acrs of native grassland habitat as a wildlife preserve for grassland birds and other species.

Northwoods Property Existing Ecological Conditions Assessment, Manorville, NY

Mr. Kennedy performed an ecological assessment on this 662-acre wooded property located within the Long Island Central Pine Barrens. The ecological assessment included plant and wildlife species inventories, habitat characterization and evaluation, and a rare/protected species survey for several New York State-listed plant and wildlife species, several of which were identified on-site.

Multi-Use Development, Town of Amenia, Dutchess County, NY

Mr. Kennedy conducted an ecological survey on this 188-acre property, which includes wooded, meadow, ridgeline, wetland and developed habitats and supports a number of New York State- and federally-protected plant and wildlife species. The ecological survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for impacts to rare species and ecological communities. Additinally, Mr. Kennedy conducted amphibian trapping surveys of on-site wetlands and vernal pools and assisted in a breeding bird survey at the site. Mr. Kennedy also performed wetland delineations and further secured a Nationwide Permit determination from the United States Army Corps of Engineers for wetland impacts associated with the construction of a golf course at the site. Mr. Kennedy further prepared and submitted a USACE permit application package for a proposed residential development at the site. The

Mr. Kennedy is a Project Scientist who conducts ecological surveys, habitat assessments, species inventories and rare species evaluations. He also performs freshwater and tidal wetland delineations and provides wetland permitting services for clients with federal, state and local government agencies. Mr. Kennedy also conducts Phase I and Phase II Environmental Site Assessments, oversees environmental remediation projects and designs and oversees soil management plans.

10 years of professional experience

application package included the preparation of habitat assessments for the United States Fish and Wildlife Service regarding four federally-listed wildlife species.

Proposed Solar Energy Generation Facility, Calverton, NY

Mr. Kennedy conducted an ecological survey of this 45-acre site, which supports agricultural, woodland and wetland/aquatic habitats. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Mr. Kennedy further performed a wetland delineation at the site and prepared a Request for Determination of Non-Jurisdiction to the New York State Department of Environmental Conservation for a proposed solar power generating facility at the site.Mr. Kennedy further conducted a Phase I Environmental Site Assessent of the property, which included an evaluation of recognized environmental conditions and recommendations for further evaluation and remedial action.

The Landmark Colony EAS, Staten Island, NY

Mr. Kennedy conducted an ecological survey for the preparation of an EAS and supplemental environmental studies for a new senior-age residential community in the Willowbrook area of Staten Island. The project site, which supports both woodland and developed habitats, is a 46-acre parcel owned by the City of New York and located within the New York City Farm Colony-Sea View Hospital Historic District. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures were also addressed. In addition, Mr. Kennedy performed a wetland delineation and prepared a request for jurisdictional determination submittedor submission to the United States Army Corps of Engineers. Mr. Kennedy is also tasked with preparing a consistency analysis with New York State Department of State Coastal Policies. Mr. Kennedy further conducted a Phase II Environmental Site Assessent, in order to evaluate the impacts of past site usage on soils and groundwater. The Phase II ESA included a geophysical survey, as well as soil, soil vapor and groundwater sampling.

The Arboretum DEIS, Farmingville, NY

Mr. Kennedy conducted an ecological survey for the preparation of a DEIS on this 65-acre property. The project site, which currently supports old field, shrubland, woodland, agricultural and developed habitats, is proposed for development with a mixed-use development . The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures were also addressed.

Phase 1 and Phase 2 Environmental Site Assessments, Tidal Wetland Permitting, Avalon at Great Neck Residential Development, Great Neck, NY

Mr. Kennedy conducted Phase I and Phase II Environmental Site Assessments in order to assess impacts to soil and groundwater due to historic site usage at this marine terminal and major oil storage facility, which is proposed for residential redevelopment. The investigation included surficial and sub-surface soil sampling, groundwater monitoring well installation and sampling and an analysis of tidal influence on water table elevation beneath the site. Mr. Kennedy also conducted a wetland investigation and prepared a New York State Department of Environmental Conservation tidal wetland permit application package for the proposed residential redevelopment. Mr. Kennedy further provided technical support in the design of a wetland mitigation and restoration plan for the site.

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NYSDOT Accelerated Bridge Program, Albany NY

As part of a $31.3 million Accelerated Bridge Program to rehabilitate bridges in the Capital District and northern New York State, the New York State Department of Transportation designated 13 bridges as below par due to deteriorating bridge decks. Listed on the deficient bridge list, the structures range from 30-foot-long, two-lane bridges in rural environments to a 2,000-foot-long, four-lane bridge in an urban environment. Mr. Kenney conducted wetland identifications and wetland permitting associated with this bridge rehabilitation project.

Town of Islip Landfill Site Investigation, Costco, Bay Shore, NY

Mr. Kennedy performed a comprehensive Phase II Environmental Site Assessment of this 24 acre inactive municipal landfill, incinerator and sewage treatment facility, which is proposed for commercial redevelopment. The investigation included soil vapor monitoring, surficial soil sampling, test pit excavation and groundwater monitoring well installation. Mr. Kennedy also conducted a freshwater wetland delineation and assisted with securing a New York State Department of Environmental Conservation freshwater wetlands permit for the Phase II investigation. He designed and oversaw the site restoration and mitigation plan following completion of the investigation. Mr. Kennedy further conducted an ecological survey of the site which included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities.

Proposed Solar Energy Generation Facility, Southold, NY

Mr. Kennedy conducted an ecological survey of this 21 acre site, which supports agricultural, successional, woodland and wetland/aquatic habitats. The ecological survey included a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Mr. Kennedy further conducted a Phase I Environmental Site Inspection of the property, to identify and assess existing environmental concerns for future redvelopment.

Country Pointe Development, Plainview, NY

Mr. Kennedy conducted an ecological survey of this 143 acre property, which supports woodland, meadow, landscaped and developed habitats. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for this proposed residential development. Existing conditions, potential impacts and mitigation measures were addressed.

LaGuardia Airport Runway Area Safety Enhancements EA, Queens, NY

Mr. Kennedy served as a project scientist for preparation of an Environmental Assessment for the construction of runway safety area improvements at LaGuardia Airport in accordance with NEPA and SEQRA requirements. The Environmental Assessment addressed the airport's unique environmental conditions along the Flushing Bay and Bowery Bay waterfronts in Queens. Mr. Kennedy performed an assessment of existing terrestrial ecological resources, including an inventory of observed and expected flora and fauna and an assessment of rare species and habitats, as well as an impact analysis on these natural resources.

Tidal Wetland Permitting and Phase I ESA, Verizon Wireless Communications Site, Captree Island, NY

Mr. Kennedy performed a wetland delineation and obtained a tidal wetland permit from the New York State Department of Environmental Conservation for the construction of a wireless

communications facility located within and adjacent to regulated tidal wetlands. Mr. Kennedy further secured permit ammendments from the New York State Department of Environmental Conservation in response to project design changes by the site engineer. Additionally, Mr. Kennedy completed a Phase I ESA of the site.

Tidal Wetland Permitting, Seaford Union Free School District, Seaford, NY

Mr. Kennedy obtained tidal wetland permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers for the construction of an access driveway on an undeveloped parcel adjacent to the Seaford Harbor School. Mr. Kennedy also conducted an ecological survey and prepared an ecology resources report for the subject property. The survey included an assessment of existing wooded and wetland habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Potential impacts of the proposed action and wetland mitigation measures were also addressed.

Cold Spring Harbor Laboratory Waterfront Project, New York

Mr. Kennedy conducted wetlands assessments for the proposed redevelopment of a waterfront property on the campus of Cold Spring Harbor Laboratory in the Village of Laurel Hollow. Mr. Kennedy further delineated on-site wetlands, designed a wetland mitigation planting plan and obtained a tidal wetland permit from the New York State Department of Environmental Conservation for the project.

Hebrew Home at Riverdale Expansion, Bronx, NY

Mr. Kennedy is conducting an ecological survey for the proposed expansion of the Hebrew Home at Riverdale campus located in the Riverdale neighborhood of the Bronx, as part of a proposed Continuing Care Retirement Community. The project involves new construction on 32 acres of both the existing campus and on a newly-acquired adjacent property. The project site supports both vegetated and developed habitats and is located proximate to the Hudson River. The ecological survey will include a habitat assessment, observed/expected vegetation and wildlife species inventories and an evaluation for the presence of rare/protected species and ecological communities. Existing conditions, potential impacts, and mitigation measures will be addressed in accordance with City Environmental Quality Review procedures. In addition, Mr. Kennedy will perform a wetland evaluation and will prepare wetland non-jurisdiction request packages for submission to the New York State Department of Environmental Conservation and/or the United States Army Corps of Engineers, as necessary. Mr. Kennedy is also tasked with preparing a consistency analysis with New York State Department of State Coastal Policies.

Westchester County Airport Master Plan, Westchester County, NY

Mr. Kennedy performed a review of existing biological and wetland resources at Westchester County Airport, as part of the Westchester County Airport Master Plan. The review included research of government agency records and prior ecological assessments of the site. Mr. Kennedy further identified and characterized various terrestrial, palustrine and aquatic ecological communities and wildlife species during a field survey of the airport property.

Open Space Study DGEIS, City of White Plains, Westchester County, New York

As part of Draft Generic Environmental Impact Statement (DGEIS) to evaluate the potential impacts of the adoption of a new open space zoning classification within the City of White Plains, Mr. Kennedy performed an analysis of existing natural resources at five golf course properties. The analysis included field assessments and research of local, state and federal government agency records pertaining to wildlife, vegetation, protected species/habitats,

wetlands and water resourcesat the five properties. Mr. Kennedy further performed an impact assessment of the proposed action and alternatives on the aforementioned resources.

The Preserve at North Bellmore, Kabro, North Bellmore, NY

Mr. Kennedy conducted a Phase I Site Assessment to identify and assess environmental concerns at this aa-acre site. Mr. Kennedy further performed an environmental investigation and site remediation activities in accordance with a Nassau County Department of Health-approved work plan for the site, which is proposed for a residential redevelopment. Field activities included sampling of soils, groundwater, sanitary and stormwater systems, and the remediation of underground injection control structures and subsurface soils.

Port Authority of New York and New Jersey Airport Capacity Study

Mr. Kennedy performed a comprehensive assessment of existing natural resources at the five Port Authority of New York and New Jersey airport properties (John F. Kennedy, LaGuardia, Newark, Stewart and Teterboro airports. The assessment included a summary of observed and expected flora and fauna, rare/protected species and wetland resources at the five airport properties.

East Hampton Airport Environmental Assessment, Town of East Hampton, Suffolk County, New York

As part of an environmental assessment for a proposed seasonal air traffic control tower construction project, Mr. Kennedy performed field surveys and researched government agency records pertaining to flora, fauna, endangered/threatened species, wetlands, water resources, coastal resources, floodplains and farmlands. Mr. Kennedy further prepared an assessment of existing conditions and expected impacts of the proposed action on the aforementioned resources.

Center Square Development Zoumas Property, Wading River, NY

Mr. Kennedy conducted an endangered/threatened species survey of this 18 acre fallow agricultural property, which is proposed for a mixed use commercial development and open space preservation. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy prepared a summary report which included conclusions and recommendations regarding the potential impacts of the proposed action.

Proposed Retail Fuel Facility Phase I and II ESA, Staten Island, NY

Mr. Kennedy performed Phase I and II Environmental Site Assessments, to determine if onsite soils and groundwater had been impacted as a result of past usage of the site and adjacent properties. As part of the Phase II ESA, Mr. Kennedy also directed the installation of groundwater monitoring wells and soil borings and the collection of representative samples from same. Mr. Kennedy further wrote a comprehensive health and safety plan for the project and served as the site safety officer.

Verizon Wireless Communications Facility, Hylan Boulevard, Staten Island, NY

Mr. Kennedy performed a Phase I ESA and wrote a comprehensive soil management plan for the installation of a wireless communications facility at the site. Mr. Kennedy also conducted a wetland investigation in association with the Verizon Wireless equipment installation.

LA Fitness, LA Fitness International, Patchogue, NY

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Mr. Kennedy performed wetland delineation and secured New York State Department of Environmental Conservation and Town of Brookhaven freshwater wetlands permits for the construction of a health club facility on this eight-acre wooded property. Mr. Kennedy also prepared a Town of Brookhaven Part 1 Environmental Assessment Form (EAF) for the health club facility.

Brookhaven Village Square, Blumenfeld Development Group, Bellport, NY
Mr. Kennedy conducted an ecological survey of this 58 acre wooded property. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Expanded Environmental Assessment Form for this proposed commercial/industrial development. Existing conditions, potential impacts and mitigation measures were addressed.

Islip Pines, Serota Properties, Holbrook, NY
Mr. Kennedy conducted an ecological survey of this 135 acre wooded property. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for this proposed residential development. Existing conditions, potential impacts and mitigation measures were addressed.

Salzman Property, Montauk, NY
Mr. Kennedy was a contributing scientist in a delineation of over 12 acres of freshwater wetlands on this 40 acre undeveloped property.

Avalon at Mitchel Field, Avalon Bay Communities, Inc., Garden City, NY
Mr. Kennedy performed a comprehensive environmental site investigation in accordance with a Nassau County Department of Health-approved work plan for this 11 acre site, which is proposed for a residential redevelopment. The assessment included surficial and subsurface soil sampling, and bottom sediment sampling of underground injection control structures.

Proposed Wireless Communications Facility, East End Wireless, West Gilgo Beach, NY
Mr. Kennedy performed tidal wetland delineations at two proposed locations for this public utility wireless communications facility.

Ronkonkoma Hub Transit-Orientated Development, Ronkonkoma, NY
Mr. Kennedy conducted an ecological survey of this 54 acre property. The survey included an assessment of both developed and undeveloped habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Generic Environmental Impact Statement for this proposed mixed use development. Existing conditions, potential impacts and mitigation measures were addressed.

NSTAR Right-of-Way, NSTAR, Eastern MA
Mr. Kennedy was a contributing scientist in a delineation of freshwater wetlands along an approximately five-mile section of this utility company right-of-way, for which additional power transmission lines are proposed.

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Vintage Vines, Vintage Vines, LLC, Bridgehampton, NY
Mr. Kennedy was a contributing scientist in an ecological assessment and tiger salamander survey for a proposed residential development on this 49 acre undeveloped property. He co-wrote the Ecology Resources section for the Draft Environmental Impact Statement, in which existing ecological conditions, potential impacts and mitigation measures were addressed. Mr. Kennedy also responded to public comments in the Final Environmental Impact Statement for the proposed action.

Queen of Peace Cemetery, Archdiocese of Rockville Centre, Old Westbury, NY
Mr. Kennedy oversaw the installation of groundwater monitoring wells and conducted quarterly groundwater sampling on two cemetery properties. He also prepared summary reports to measure and evaluate potential groundwater impacts from the two properties.

Silver Oak Stables, Nissequogue, NY
Mr. Kennedy obtained a freshwater wetlands permit the New York State Department of Environmental for an extensive demolition and construction project at this 35 acre equestrian center and boarding facility. Mr. Kennedy also conducted an ecological survey and prepared an ecology resources report for the subject property. The survey included an assessment of existing meadow and wetland habitats, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Potential impacts of the proposed action and wetland mitigation measures were also addressed in the report.

Proposed Gas Station/Convenience Store, Stop and Shop, Farmingville, NY
Mr. Kennedy soil borings sampled underground injection control structures and oversaw the installation of groundwater monitoring wells, in order to assess impacts from prior site uses on soils and groundwater.

Proposed Wireless Communications Facility, metroPCS, Islip, NY
Mr. Kennedy conducted freshwater wetland delineation and obtained a New York State Department of Environmental Conservation freshwater wetlands permit for this public utility wireless communications facility.

Baypoint at Woodmere, Woodmere, NY
Mr. Kennedy conducted a comprehensive environmental site investigation in order to evaluate impacts to surficial and subsurface soils from past deposition of fill material on this waterfront site, which is proposed for residential redevelopment.

Brookhaven Town Drainage Project, Stony Brook, NY
Mr. Kennedy secured tidal and freshwater permits from the New York State Department of Environmental Conservation and the United States Army Corps of Engineers for the Town of Brookhaven for this highway drainage improvement project.

Passionist Monastery, Shelter Island, NY
Mr. Kennedy delineated tidal wetlands on this shorefront property in association with a proposed redevelopment project.

Highway Improvement Project, Incorporated Village of Lloyd Harbor, Lloyd Harbor, NY

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Mr. Kennedy prepared and submitted application packages and secured tidal and freshwater permits from the New York State Department of Environmental Conservation for a traffic safety improvement project along six miles of public roadways within the Incorporated Village of Lloyd Harbor.

B&C Golf, East Hampton Country Club, East Hampton, NY

Mr. Kennedy has conducted semiannual groundwater monitoring on this golf club property since 2007, in order to assess potential impacts on area groundwater from pesticides, herbicides and fertilizers.

Multiplex Cinema Property, Lowes Home Centers, Inc., Commack, NY

Mr. Kennedy conducted an ecological survey of this 22 acre property, which is currently developed with a multiplex cinema and is proposed for commercial redevelopment with a retail home improvement center. The ecological assessment included wetland evaluation of a recharge basin located at the site. Mr. Kennedy further obtained a United States Army Corps of Engineers Nationwide Permit and New York State Department of Environmental Conservation Water Quality Certificate for the proposed redevelopment. Mr. Kennedy also conducted Phase I and Phase II Environmental Site Assessments of the property, which included surficial and subsurface soil sampling, and bottom sediment sampling of underground injection control structures.

Kirmse Residence, Westhampton, NY

Mr. Kennedy engaged in consultations with Town of Southampton Environmental Division officials and secured a Town wetlands permit for the reconstruction of a single-family home on this waterfront property. He also testified in support of the project at a Town of Southampton Environmental Board hearing.

Avalon at Huntington Station, Avalon Bay Communities, Inc., Huntington, NY

Mr. Kennedy conducted an ecological survey of this 27 acre undeveloped property, which is proposed for a residential subdivision. The survey included a habitat assessment, vegetation and wildlife species inventories and an evaluation for the presence of rare species and ecological communities. Mr. Kennedy further prepared an Ecology Resources section for the Draft Environmental Impact Statement for the proposed action. Existing conditions, potential impacts and mitigation measures were addressed.

Malverne UFSD, Malverne, NY

Mr. Kennedy performed an ecological survey and wetland assessment and prepared a development potential review report for this 38 acre undeveloped property, which is proposed for development with a school building.

Hydrogeologist, Long Island Consulting Firm

Prior to VHB, Mr. Kennedy performed groundwater monitoring and evaluation activities at federal, state and local government sites, including the United States Department of Energy's Brookhaven National Laboratory facility.

New York State Department of Environmental Conservation Fish and Wildlife Technician

Prior to VHB, Mr. Kennedy conducted biological assessments, population surveys, water quality evaluations and fish stocking of various local waters for the New York State Department of Environmental Conservation. Mr. Kennedy also participated in endangered species surveys,

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invasive species remediation projects, environmental education workshops and public outreach events.

Visiting Scientist Position, The Nyanza Project, Tanzania, East Africa

Prior to VHB, Mr. Kennedy performed multi-disciplinary scientific research activities as a student (2003) and visiting scientist/teaching assistant (2004) with The Nyanza Project, an international tropical lakes research program held annually at Lake Tanganyika, Tanzania, East Africa.

Education

Massachusets Audobon Society Wetland Construction and Restoration Workshop, 2013

Winter Vegetation Identification for Wetland Delineation, Rutgers University, 2012

Summer Vegetation Identification for Wetland Delineation, Rutgers University, 2011

United States Army Corp of Engineers 38 Hour Wetland Delineation Training Program, 2010

Rutgers University Wetland Delineation Training Program, 2007

OSHA Hazardous Waste Operations and Emergency Response Training, 2006, 2008, 2009, 2011, 2012, 2103 and 2014

MS, Geosciences, University of Arizona, 2005

BS, Environmental Science, Paul Smith's College, 2003

Publications

Eggermont, H., Kennedy, D., Hasiotis, S.T., Verschuren D. & Cohen, A. 2008. Distribution of living larval Chironomidae (Insecta: Diptera) along a depth transect at Kigoma Bay, Lake Tanganyika: implications for palaeoenvironmental reconstruction. African Entomology 16(2): 162-184.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

NYS Breeding Bird Atlas

Block 6752D

2000-2005

ATLAS 2000

Navigation Tools

Perform Another Search
Show All Records
Sort by Field Card Order
Sort by Taxonomic Order
View 1985 Data

Block 6752D Summary

Total Species:	66
Possible:	13
Probable:	28
Confirmed:	25

Click on column heading to sort by that category.

List of Species Breeding in Atlas Block 6752D

Common Name	Scientific Name	Behavior Code	Date	NY Legal Status
Spotted Sandpiper	*Actitis macularius*	X1	5/11/2002	Protected
Red-winged Blackbird	*Agelaius phoeniceus*	FL	7/9/2004	Protected
Mallard	*Anas platyrhynchos*	D2	4/30/2003	Game Species
Gadwall	*Anas strepera*	X1	4/21/2004	Game Species
Tufted Titmouse	*Baeolophus bicolor*	FY	7/1/2001	Protected
Cedar Waxwing	*Bombycilla cedrorum*	P2	5/25/2002	Protected
Canada Goose	*Branta canadensis*	NY	5/13/2003	Game Species
Great Horned Owl	*Bubo virginianus*	T2	4/21/2002	Protected
Red-tailed Hawk	*Buteo jamaicensis*	FL	7/15/2002	Protected
Whip-poor-will	*Caprimulgus vociferus*	S2	7/9/2004	Protected-Special Concern
Northern Cardinal	*Cardinalis cardinalis*	FY	7/9/2004	Protected
House Finch	*Carpodacus mexicanus*	X1	6/1/2001	Protected
Chimney Swift	*Chaetura pelagica*	P2	6/30/2001	Protected
Killdeer	*Charadrius vociferus*	X1	6/25/2001	Protected
Yellow-billed Cuckoo	*Coccyzus americanus*	X1	6/1/2001	Protected
Northern Flicker	*Colaptes auratus*	D2	5/25/2002	Protected
Northern Bobwhite	*Colinus virginianus*	T2	7/10/2001	Game Species

Rock Pigeon	*Columba livia*	P2	6/30/2002	Unprotected
Eastern Wood-Pewee	*Contopus virens*	T2	7/7/2001	Protected
American Crow	*Corvus brachyrhynchos*	FY	7/9/2004	Game Species
Fish Crow	*Corvus ossifragus*	B2	4/21/2004	Protected
Blue Jay	*Cyanocitta cristata*	NY	6/20/2002	Protected
Mute Swan	*Cygnus olor*	X1	4/15/2003	Protected
Prairie Warbler	*Dendroica discolor*	FL	7/9/2004	Protected
Yellow Warbler	*Dendroica petechia*	T2	6/1/2001	Protected
Pine Warbler	*Dendroica pinus*	T2	6/1/2001	Protected
Gray Catbird	*Dumetella carolinensis*	T2	5/15/2001	Protected
American Kestrel	*Falco sparverius*	X1	7/9/2004	Protected
Common Yellowthroat	*Geothlypis trichas*	FY	7/9/2004	Protected
Barn Swallow	*Hirundo rustica*	FY	7/9/2004	Protected
Baltimore Oriole	*Icterus galbula*	FY	6/27/2002	Protected
Orchard Oriole	*Icterus spurius*	X1	7/9/2004	Protected
Eastern Screech-Owl	*Megascops asio*	P2	7/9/2004	Protected
Wild Turkey	*Meleagris gallopavo*	P2	7/9/2004	Game Species
Song Sparrow	*Melospiza melodia*	FL	6/25/2003	Protected
Northern Mockingbird	*Mimus polyglottos*	D2	7/10/2001	Protected
Black-and-white Warbler	*Mniotilta varia*	X1	5/15/2001	Protected
Brown-headed Cowbird	*Molothrus ater*	P2	6/20/2002	Protected
Great Crested Flycatcher	*Myiarchus crinitus*	S2	6/30/2001	Protected
Osprey	*Pandion haliaetus*	NE	4/20/2002	Protected-Special Concern
House Sparrow	*Passer domesticus*	FL	7/7/2001	Unprotected
Ring-necked Pheasant	*Phasianus colchicus*	P2	7/9/2004	Game Species
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	X1	6/26/2003	Protected
Downy Woodpecker	*Picoides pubescens*	T2	7/10/2001	Protected
Hairy Woodpecker	*Picoides villosus*	X1	7/7/2001	Protected
Eastern Towhee	*Pipilo erythrophthalmus*	FL	7/16/2001	Protected
Black-capped Chickadee	*Poecile atricapillus*	FL	7/9/2004	Protected

Blue-gray Gnatcatcher	*Polioptila caerulea*	X1	6/1/2001	Protected
Purple Martin	*Progne subis*	P2	6/30/2002	Protected
Common Grackle	*Quiscalus quiscula*	FY	6/17/2001	Protected
Eastern Phoebe	*Sayornis phoebe*	FL	6/1/2001	Protected
Ovenbird	*Seiurus aurocapilla*	T2	6/30/2001	Protected
White-breasted Nuthatch	*Sitta carolinensis*	X1	6/20/2002	Protected
American Goldfinch	*Spinus tristis*	S2	7/9/2004	Protected
Chipping Sparrow	*Spizella passerina*	FY	7/9/2004	Protected
Field Sparrow	*Spizella pusilla*	FL	7/9/2004	Protected
European Starling	*Sturnus vulgaris*	NY	6/20/2002	Unprotected
Tree Swallow	*Tachycineta bicolor*	P2	7/9/2004	Protected
Carolina Wren	*Thryothorus ludovicianus*	P2	6/1/2001	Protected
Brown Thrasher	*Toxostoma rufum*	FY	7/9/2004	Protected
House Wren	*Troglodytes aedon*	ON	7/9/2004	Protected
American Robin	*Turdus migratorius*	FY	6/18/2001	Protected
Eastern Kingbird	*Tyrannus tyrannus*	T2	6/30/2001	Protected
Blue-winged Warbler	*Vermivora pinus*	T2	5/25/2002	Protected
Red-eyed Vireo	*Vireo olivaceus*	S2	6/1/2001	Protected
Mourning Dove	*Zenaida macroura*	FY	7/9/2004	Protected

Current Date: 10/20/2014

Table 31. List of common suburban birds that occur in the Town of Brookhaven.

Killdeer (*Charadius vociferus*)
* Red-tailed Hawk (*Buteo jamaicensis*)
** American kestrel (*Falco sparverius*)
Mourning Dove (*Zenaida macroura*)
Eastern Screech Owl (*Otus asio*)
Red-bellied Woodpecker (*Melanerpes carolinus*)
Northern Flicker (*Colaptus auratus*)
Downy Woodpecker (*Picoides pubescens*)
Eastern Phoebe (*Sayornis phoebe*)
Blue Jay (*Cyanocitta cristata*)
American Crow (*Corvus brachyrhynchos*)
Tufted Titmouse (*Parus bicolor*)
Black-capped Chickadee (*Parus atricapillus*)
White-breasted Nuthatch (*Sitta carolinensis*)
House Wren (*Troglodytes aedon*)
American Robin (*Turdus migratorius*)
Gray Catbird (*Dumetella carolinensis*)
Northern Mockingbird (*Mimus polyglottos*)
European Starling (*Sturnus vulgaris*)
Red-eyed Vireo (*Vireo olivaceus*)
Northern Cardinal (*Cardinalis cardinalis*)
Song Sparrow (*Melospiza melodia*)
Chipping Sparrow (*Spizella passerina*)
Common Grackle (*Quiscalus quiscula*)
Northern Oriole (*Icterus galbula*)
Orchard Oriole (*Icterus spurius*)
Brown-headed Cowbird (*Molothrus ater*)

* Adaptable to human changes in the environment, but typically requires woodlots with adjacent agricultural or field areas.

** Readily nests near human habitation when not directly disturbed, but prefers open country for foraging.

Table 32. List of mammals that occur in the Town of Brookhaven.

MAMMALS

Masked Shrew (*Sorex cinereus*)
Short-tailed Shrew (*Blarina brevicauda*)
Least Shrew (*Cryptotis parva*)
Eastern Mole (*Scalopus aquaticus*)
Star-nosed Mole (*Condylura cristata*)
Little Brown Bat (*Myotis lucifugus*)
* Keen's Bat (*Myotis keenii*)
** Silver-Haired Bat (*Lasionycteris noctivagans*)
** Eastern Pipistrelle (*Pipistrellus subflavus*)
Big Brown Bat (*Eptesicus fuscus*)
Red Bat (*Lasiurus borealis*)
** Hoary Bat (*Lasiurus cinereus*)
Eastern Cottontail (*Sylvilagus floridanus*)
Eastern Chipmunk (*Tamias striatus*)
Woodchuck (*Marmota monax*)
Gray Squirrel (*Sciurus carolinensis*)
Southern Flying Squirrel (*Glaucomys volans*)
White-footed Mouse (*Peromyscus leucopus*)
Meadow Vole (*Microtus pennsylvanicus*)
Pine Vole (*Microtus pinetorum*)
Muskrat (*Ondatra zibethicus*)
** Black Rat (*Rattus rattus*)
Norway Rat (*Rattus norvegicus*)
House Mouse (*Mus musculus*)
** Meadow Jumping Mouse (*Zapus hudsonicus*)
Red Fox (*Vulpes vulpes*)
Eastern Raccoon (*Procyon lotor*)
** Short-tailed Weasel (*Mustela erminea*)
Long-tailed Weasel (*Mustela frenata*)
* Mink (*Mustela vison*)
* River Otter (*Lutra canadensis*)
** Striped Skunk (*Mephitis mephitis*)
Harbor Seal (*Phoca vitulina*)
White-tailed Deer (*Odocoileus virginianus*)

* Possible

** Rare

List of Species Reported for the Moriches, New York Quadrangle Topographic Map during the New York Amphibian and Reptile Atlas Project Survey (1990-1999)

American bullfrog	*Rana catesbeiana*
common snapping turtle	*Chelydra serpentina*
eastern box turtle	*Terrapene carolina*
eastern garter snake	*Thamnophis sirtalis*
eastern milk snake	*Lampropeltis triangulum*
eastern ribbon snake	*Thamnophis sauritus*
eastern spadefoot toad	*Scaphiopus holbrookii*
eastern tiger salamander	*Ambystoma tigrinum*
four-toed salamander	*Hemidactylium scutatum*
Fowler's toad	*Bufo fowleri*
gray treefrog	*Hyla versicolor*
green frog	*Rana clamitans*
marbled salamander	*Ambystoma opacum*
northern black racer	*Coluber c. constrictor*
northern redback salamander	*Plethodon cinereus*
northern ringneck snake	*Diadophis punctatus*
northern spring peeper	*Pseudacris crucifer*
eastern painted turtle	*Chrysemys picta*
pickerel frog	*Rana palustris*
red-spotted newt	*Notophthalmus viridescens*
smooth green snake	*Opheodrys vernalis*
southern leopard frog	*Rana sphenocephala*
wood frog	*Rana sylvatica*

FEDERALLY LISTED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES IN NEW YORK (By County)

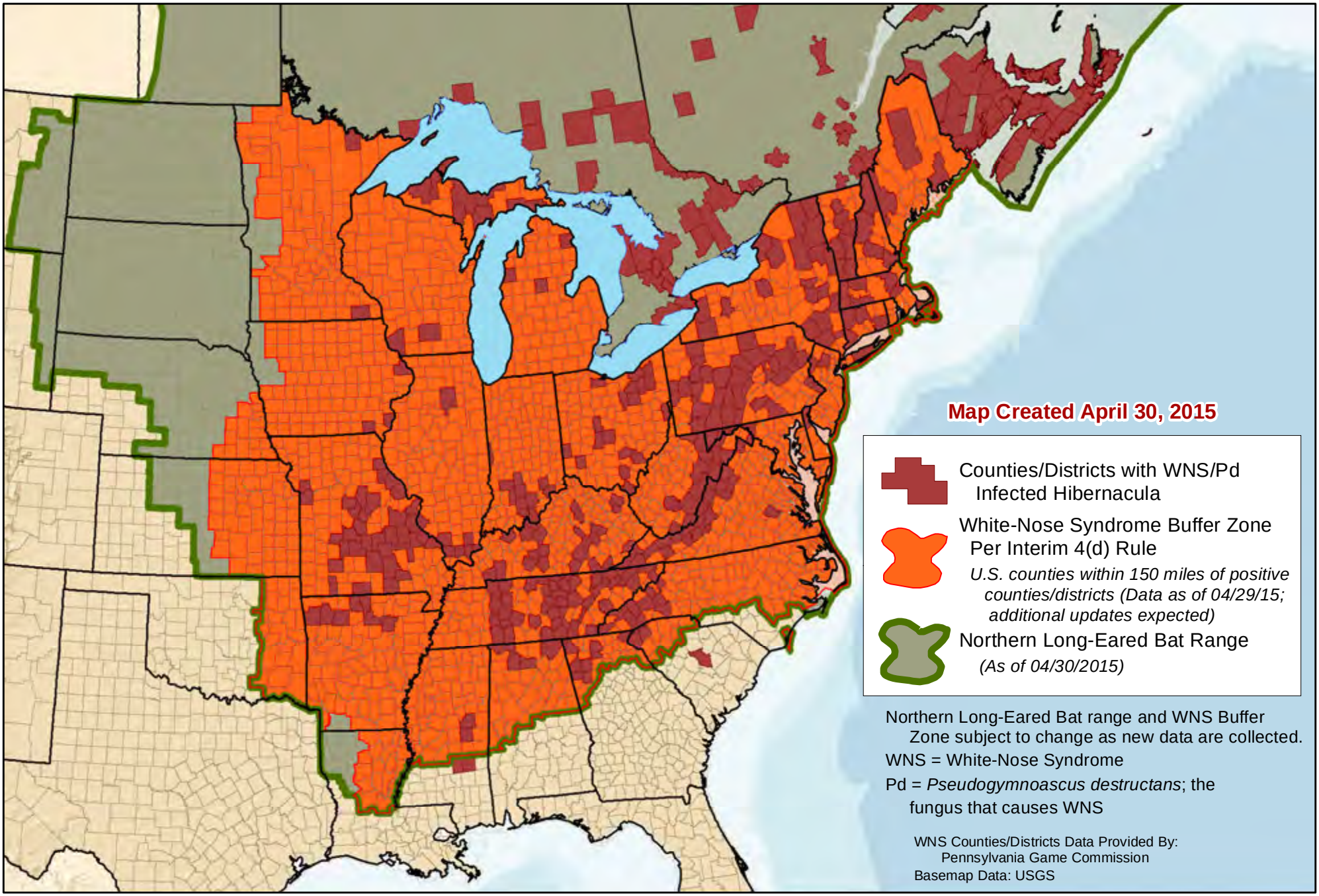
This list represents the best available information regarding known or likely County occurrences of Federally-listed and candidate species and is subject to change as new information becomes available.

COUNTY Common Name	Scientific Name	Status
SENECA		
Bald eagle	*Haliaeetus leucocephalus*	D
Bog turtle	*Clemmys [=Glyptemys] muhlenbergii*	T
Indiana bat (S)	*Myotis sodalis*	E
ST. LAWRENCE		
Bald eagle	*Haliaeetus leucocephalus*	D
Indiana bat (S)	*Myotis sodalis*	E
STEUBEN		
Bald eagle	*Haliaeetus leucocephalus*	D
Northeastern bulrush	*Scirpus ancistrochaetus*	E
SUFFOLK		
Kemp's [=Atlantic] ridley turtle[1]	*Lepidochelys kempi*	E
Green turtle[1]	*Chelonia mydas*	T
Hawksbill turtle[1]	*Eretmochelys imbricate*	E
Leatherback turtle[1]	*Dermochelys coriacea*	E
Loggerhead turtle[1]	*Caretta caretta*	T
Piping plover[4]	*Charadrius melodus*	T
Roseate tern	*Sterna dougallii dougallii*	E
Sandplain gerardia	*Agalinis acuta*	E
Seabeach amaranth	*Amaranthus pumilus*	T
Small whorled pogonia *(Historic)*	*Isotria medeoloides*	T
SULLIVAN		
Bald eagle	*Haliaeetus leucocephalus*	D
Bog turtle	*Clemmys [=Glyptemys] muhlenbergii*	T
Dwarf wedgemussel	*Alasmidonta heterodon*	E
Indiana bat (S)	*Myotis sodalis*	E
Northern wild monkshood	*Aconitum noveboracense*	T
TIOGA		
Bald eagle[2]	*Haliaeetus leucocephalus*	D

U.S. Fish & Wildlife Service

Northern Long-Eared Bat Interim 4(d) Rule

White-Nose Syndrome Buffer Zone Around WNS/Pd Positive Counties/Districts



Northern Long-Eared Bat

Myotis septentrionalis

The northern long-eared bat has been proposed to be federally listed as an endangered species under the Endangered Species Act. Endangered species are animals and plants that are in danger of becoming extinct. Identifying, protecting, and restoring endangered and threatened species are primary objectives of the U.S. Fish and Wildlife Service's endangered species program.

Photo by Steve Taylor; University of Illinois

This northern long-eared bat, observed during an Illinois mine survey, shows visible symptoms of white-nose syndrome.

What is the northern long-eared bat?

Appearance: The northern long-eared bat is a medium-sized bat about 3 to 3.7 inches but with a wingspan of 9 to 10 inches. Its fur color can be medium to dark brown on the back and tawny to pale-brown on the underside. As its name suggests, this bat is distinguished by its long ears, particularly as compared to other bats in its genus, *Myotis*, which are actually bats noted for their small ears (Myotis means mouse-eared).

Winter Habitat: Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Specific areas where they hibernate have very high humidity, so much so that droplets of water are often seen on their fur. Within hibernacula, surveyors find them in small crevices or cracks, often with only the nose and ears visible.

Summer Habitat: During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. It has also been found, rarely, roosting in structures like barns and sheds.

Reproduction: Breeding begins in late summer or early fall when males begin swarming near hibernacula. After copulation, females store sperm during hibernation until spring, when they emerge from their hibernacula, ovulate, and the stored sperm fertilizes an egg. This strategy is called delayed fertilization.

After fertilization, pregnant females migrate to summer areas where they roost in small colonies and give birth to a single pup. Maternity colonies, with young, generally have 30 to 60 bats, although larger maternity colonies have been observed. Most females within a maternity colony give birth around the same time, which may occur from late May or early June to late July, depending where the colony is located within the species' range. Young bats start flying by 18 to 21 days after birth. Adult northern long-eared bats can live up to 19 years.

Feeding Habits: Northern long-eared bats emerge at dusk to fly through the understory of forested hillsides and ridges feeding on moths, flies, leafhoppers, caddisflies, and beetles, which they catch while in flight using echolocation. This bat also feeds by gleaning motionless insects from vegetation and water surfaces.

Range: The range of the northern long-eared bat includes much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and

eastern British Columbia. Within the United States, this area includes the following 39 States: Alabama, Arkansas, Connecticut, Delaware, the District of Columbia, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, North Dakota, Ohio, Oklahoma, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Vermont, Virginia, West Virginia, Wisconsin, and Wyoming.

Why is the northern long-eared bat in danger of extinction?

White-nose Syndrome: No other threat is as severe and immediate as the disease, white-nose syndrome. If this disease had not emerged, it is unlikely the northern long-eared population would be declining so dramatically. Since symptoms were first observed in New York in 2006, white-nose syndrome has spread rapidly from the Northeast to the Midwest and Southeast; an area that includes the core of the northern long-eared bat's range where it was most common before this disease. Numbers have declined by 99 percent in the Northeast. Although there is uncertainty about the rate that white-nose syndrome will spread within the species' range, it is expected to spread throughout the United States.

Other Sources of Mortality: Although significant population declines have not been observed due to the sources of mortality listed below, they may now be important factors affecting this bat's ability to persist while experiencing dramatic declines caused by white-nose syndrome.

Impacts to Hibernacula: Gates or other structures to exclude people from caves and mines restrict bat flight and movement and change airflow and internal cave and mine microclimates. A few degrees change can make a cave unsuitable for hibernating bats. Also, cave-dwelling bats are vulnerable to human disturbance while hibernating. Bats use up their energy stores when aroused and may not survive the winter or females may not successfully give birth or rear young.

Loss or Degradation of Summer Habitat: Highway and commercial development, surface mining, and wind facility construction permanently remove habitat and are prevalent in many areas of this bat's range. Timber harvest and forest management can remove or alter (improving or degrading) summer roosting and foraging habitat.

Wind Farm Operation: Wind turbines kill bats, including northern long-eared bats, although only a small number have been documented to date. However, there are many wind projects within a large portion of the bat's range and many more are planned.

What Is Being Done to Prevent Extinction of the Northern Long-Eared Bat?

Disease Management: Actions have been taken to slow the spread of white-nose syndrome through human transmission of the fungus into caves (e.g. cave and mine closures and advisories; national decontamination protocols). A national plan was prepared by the Service and other state and federal agencies that details actions needed to investigate and manage white-nose syndrome. Many state and federal agencies, universities and non-governmental organizations are researching this disease to try to control its spread and address its affect.

Addressing Wind Turbine Mortality: The Service and others are working to minimize bat mortality from wind turbines on several fronts. We fund and conduct research to determine why bats are susceptible to turbines, how to operate turbines to minimize mortality and where important bat migration routes are located. The Service, state natural resource agencies, and wind energy industry are developing a Midwest Wind Energy Multi-Species Habitat Conservation Plan that will provide wind farms a mechanism to continue operating legally while minimizing and mitigating listed bat mortality.

Listing: We are proposing to list the northern long-eared bat as an endangered species under the federal Endangered Species Act. Listing affords a species the protections of the Act and increases the priority of the species for funds, grants, and recovery opportunities.

Hibernacula Protection: Many agencies and organizations have protected caves and mines that are important hibernacula for cave-dwelling bats.

What Can I Do?

Do Not Disturb Hibernating Bats: Comply with all cave and mine closures, advisories, and regulations. In areas without a cave and mine closure policy, follow approved decontamination protocols (see whitenosesyndrome.org/topics/decontamination). Under no circumstances should clothing, footwear, or equipment that was used in a white-nose syndrome affected state or region be used in unaffected states or regions.

Leave Dead and Dying Trees Standing: Where possible and not a safety hazard, leave dead or dying trees on your property. Northern long-eared bats and many other animals use these trees.

Install a Bat Box: Dead and dying trees are usually not left standing, so trees suitable for roosting may be in short supply and bat boxes can provide additional roost sites.

October 17, 2014

VIA ELECTRONIC MAIL

Ref: 29024.00

Ms. Andrea Chaloux
Information Services
New York Natural Heritage Program
New York State Department of Environmental Conservation
625 Broadway, 5th Floor
Albany, New York 12233-4757

Re: Proposed Middle Island Solar Farm
South Side of Moriches-Middle Island Road
Hamlet of Manorville, Town of Brookhaven
Suffolk County, New York

Dear Ms. Chaloux:

VHB Engineering, Surveying and Landscape Architecture, P.C. (VHB) is serving as environmental consultant to the Middle Island Solar Farm, LLC, which is proposing a photovoltaic solar energy farm (the "proposed action") at the above-referenced 100.33±-acre property, which is currently undeveloped with any structures and consists of pine- and oak-dominated woodlands (the "subject property", see enclosed excerpt of the USGS Topographic Map, Patchogue, NY Quadrangle). More specifically, the proposed action consists of the installation of a field of solar panel arrays, a maintenance and operations building, perimeter and centerline access roadways, array access pathways and security fencing over a 68.65±-acre portion of the subject property. Following the equipment installation, 61.40±-acres of the cleared area would be re-vegetated. The remaining 31.68±-acres of the subject property would remain as undeveloped woodlands.

VHB is currently in the process of preparing a Draft Environmental Impact Statement (DEIS) for the proposed action, with the Town of Brookhaven Town Board serving as the lead agency. In order to ensure that the DEIS will address all significant issues, we are writing to inquire whether there are any NYNHP records of rare plants, animals and/or natural communities on, or proximate to, the subject property.

Thank you in advance for your assistance. If additional information is required, or if you have any questions, please do not hesitate to contact me at (631) 787-3454 or dkennedy@vhb.com.

Sincerely,

VHB Engineering, Surveying and Landscape Architecture, P.C.

David Kennedy
Project Scientist

DK/
enc.

\\vhb\proj\Longisland\29024.00 Middle Island Solar Farm\ProjRecords\FinalDocs\Chaloux NHP ltr 10-17-14.docx

VHB Engineering, Surveying
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www.vhb.com

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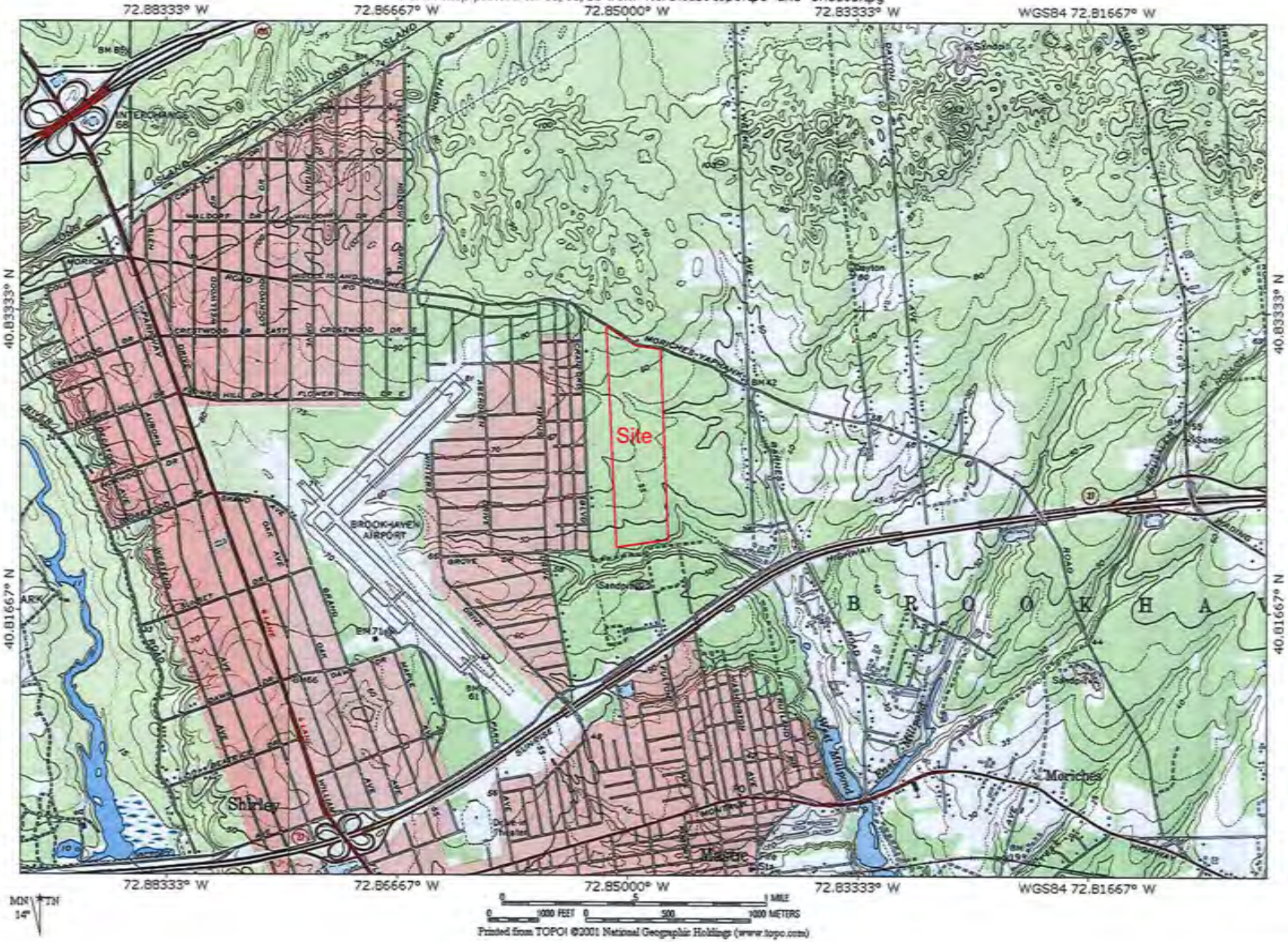

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Exhibit 5

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
New York Natural Heritage Program
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

November 14, 2014

David Kennedy
VHB Engineering, Surveying and Landscape Architecture, P.C.
100 Motor Parkway, Suite 135
Hauppauge, NY 11788

Dear David Kennedy:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to the proposed Middle Island Solar Farm, on the south side of Moriches-Middle Island Road in the Hamlet of Manorville, Town of Brookhaven, Suffolk County.

We have no recent records of rare or state-listed animals or plants, or of significant natural communities, at this site or in its immediate vicinity.

Our database does have a historical record of a rare plant in the area of the project site: in 1934, **Silvery Aster** (*Symphyotrichum concolor var. concolor*, listed by NYS as Endangered) was collected from dry sandy woods in Mastic. We do not know the precise location where this plant was collected, we have no recent information on this population, and there is uncertainty regarding its continued presence. We provide this information for your general reference. While its current status is not known, if suitable habitat for this plant is present in the vicinity of the project site, it is possible that it may still be found there. We recommend that any field surveys to the site include a search for this species, particularly at sites that are currently undeveloped and may still contain suitable habitat. If any rare plants or animals are documented during site visits, we request that information on the observations be provided to the New York Natural Heritage Program so that we may update our database.

Information about Silvery Aster in New York, including habitat, biology, identification, conservation, and management, is available online in Natural Heritage's Conservation Guide at http://www.guides.nynhp.org/guide.php?id=8841.

For most sites, comprehensive field surveys have not been conducted; the above information only includes records from our database. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities.

Sincerely,

Nicholas Conrad
Information Resource Coordinator

1111

Silvery Aster

Symphyotrichum concolor flowers

Photo credits: *Troy Weldy*

Scientific Name *Symphyotrichum concolor var. concolor*

Family Name Asteraceae
Aster Family

Did you know?
We are unsure of why this once common aster is so rare now. Plenty of suitable habitat apparantly remains, although many of its former sites on western Long Island and New York City have been developed.

Summary

Protection Endangered in New York State, not listed federally.

This level of state protection means: listed species are those with: 1) 5 or fewer extant sites, or 2) fewer than 1,000 individuals, or 3) restricted to fewer than 4 U.S.G.S. 7 ? minute topographical maps, or 4) species listed as endangered by U.S. Department of Interior.

Rarity G5T5, S1

A global rarity rank of G5T5 means: Secure globally - Both the species as a whole and the subspecies/variety are common in the world; widespread and abundant (but may be rare in some parts of its range).
A state rarity rank of S1 means: This plant is endangered/critically imperiled in New York because of extreme rarity (typically 5 or fewer populations or very few remaining individuals) or is extremely vulnerable to extirpation from New York due to biological factors.

Conservation Status in New York

There is only one known population on the verge of being extirpated. There are approximately 30 historical occurrences, but despite extensive searches only one occurrence has been seen. No other records of this conspicuous aster have been reported recently. There are probably only a few other occurrences in New York.

Short-term Trends

The short-term trend is strongly negative. The only existing population has severly declined over the last 25 years and may be extirpated.

Long-term Trends

The long-term trend is strongly negative. There are about 30 historical occurrences, some probably quite large and in the larger grasslands, but despite extensive searches only one occurrence has been seen in the last 25 years. This is one of the most dramatic declines of any rare plant in New York State.

Conservation and Management

Threats

Lack of disturbance to maintain the open grassland habitat has led to succession that has reduced plant numbers.

Conservation Strategies and Management Practices

This species needs disturbance to reduce competition from woody plants and more aggressive herbaceous plants. However, too much direct disturbance to the plants will reduce or eliminate the population. Its habitat could be disturbed in the non-growing season to open it up for seed germination and colonization, but direct disturbance should be prevented during the growing season.

Research Needs

Research is needed to determine the causes of such a dramatic decline in populations even though many remnant grasslands still exist. Research is needed to determine the best management option to augment the existing population.

Habitat

The only known extant population in New York is along a trail through a sandy grassland succeeding to pine woods; historical records are all from similiarly dry, sandy, and/or pine-dominated habitats (New York Natural Heritage Program 2010). Dry sandy places, often among pines (Gleason & Cronquist 1991). Dry sandy open woods and barrens (Fernald 1970).

Associated Ecological Communities

Other Probable Associated Communities

Hempstead Plains grassland
Maritime pitch pine dune woodland
Pitch pine-heath barrens
Pitch pine-scrub oak barrens
Successional maritime forest

Associated Species

Flaxleaf Whitetop Aster (*Ionactis linariifolius*)
Pennsylvania Catchfly (*Silene caroliniana*)
Late Purple Aster (*Symphyotrichum patens var. patens*)
Lowbush Blueberry (*Vaccinium angustifolium*)

Identification Comments

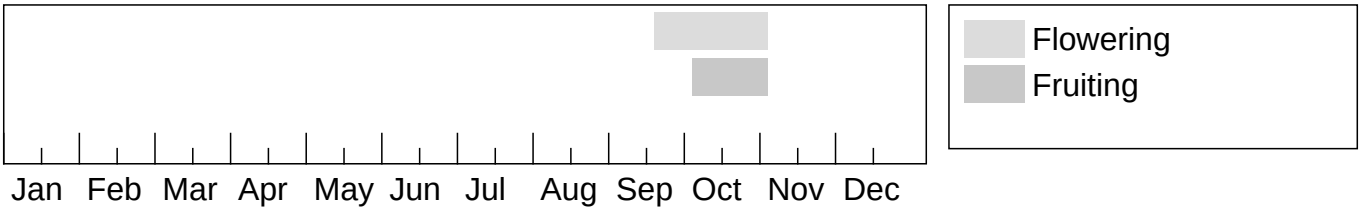
Silvery aster is a slender, upright perennial herb, growing in clumps and reaching from 30 to 100 cm tall. The lower and basal leaves are withered by flowering time. The upper leaves are entire, oblong to lanceolate with mucronate tips and 9 to 15 mm long. They are covered with short grayish-green (or silvery) hairs and usually closely appressed to the stem. As with all asters, the infloresences are arranged radially into "heads" of many separate ray and disc flowers, superficially resembling a single flower, and the arrangement of these heads is termed a capitulesence. Silvery Aster may consist of only a single head or may have a narrow panicle, with 1 to 3 heads per branch. The peduncles are densely hairy, with the upper bracts reduced and grading into the phyllaries (involucral bracts). The ray flowers are rose purple and 3 to 10 mm long, and the achenes 2.5 to 3.5 mm long and covered with silky hairs (FNA 2006, Gleason and Cronquist 1991).

Best Life Stage for Identifying This Species

The best time to identify Silvery Aster is during flowering.

The Best Time to See

Silvery Aster flowers from late September to early October.



The time of year you would expect to find Silvery Aster in New York.

Similar Species

Symphyotrichum novi-belgii has longer and broader leaves, not covered in silvery hairs, and its petal-like ray flowers are 10-19 mm long (versus 3-10 mm long for S. concolor var. concolor) (FNA 2006).

Taxonomy

Kingdom Plantae
└─ **Phylum** Anthophyta
└─

Class Dicots (Dicotyledoneae)
└─ **Order** Asterales
└─ **Family** Asteraceae (Aster Family)

Synonyms

Aster concolor (L.)
Virgulus concolor ((L.) Reveal & Keener)

Additional Resources

Links

Google Images
http://images.google.com/images?q=ASTER+CONCOLOR
NatureServe Explorer
http://natureserve.org/explorer/servlet/NatureServe?searchName=ASTER+CONCOLOR
USDA Plants Database
http://plants.usda.gov/java/nameSearch?mode=sciname&keywordquery=ASTER+CONCOLOR
Alabama Plants
http://www.alabamaplants.com/Pinkalt/Symphyotrichum_concolor_page.html
Nearctica - Eastern Wildflowers
http://www.nearctica.com/flowers/composit/aster/Sconcol.htm

Best Identification Reference

Gleason, Henry A. and A. Cronquist. 1991. Manual of Vascular Plants of Northeastern United States and Adjacent Canada. The New York Botanical Garden, Bronx, New York. 910 pp.

References

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This project is made possible with funding from:

- New York State Department of Environmental Conservation Hudson River Estuary Program
- Division of Lands & Forests, Department of Environmental Conservation
- New York State Office of Parks, Recreation and Historic Preservation

Information for this guide was last updated on Mar 19, 2013

This guide was authored by

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Whip-poor-will Fact Sheet

Whip-poor-will

Caprimulgus vociferous

New York Status: Special Concern
Federal Status: Not Listed

Description

©Philip Jeffrey Photography

The whip-poor-will, named for its distinctive call, is more commonly heard than seen. A crepuscular bird, it is most active at dawn and dusk. During the day it roosts on the low limbs of trees where it is well-camouflaged. Unlike most birds, the whip-poor-will roosts with its body parallel to the branch. A medium sized nightjar, the whip-poor-will measures 8 to 10 inches (22 - 26 cm) in length with a very short bill and long, rounded tail and wings. Cryptic coloring makes this ground-nesting bird very difficult to detect. Upper parts are mottled gray, black, and brown; while the under parts are pale with gray and black spotting. The black throat is bordered by a white necklace in males and a buff colored necklace in females. Males also have white tips on the outer tail feathers. Large eyes are used for locating prey at night. Whip-poor-wills feed exclusively on night-flying insects such as moths, beetles, and mosquitoes.

Life History

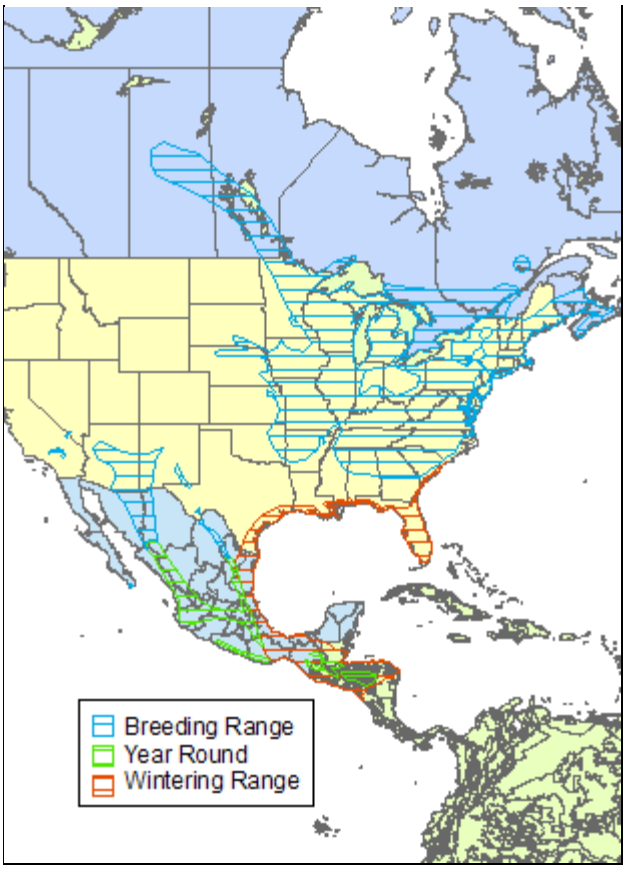
Males establish and maintain territories at the beginning of the breeding season. A clutch of 2 eggs is laid directly on leaf litter on the ground. Incubation is shared by both parents and lasts 19 to 21 days. Parents do not actively defend the nest or their territory but will remain on the nest until a disturbance comes within 1 meter. Chicks are downy and precocial at the time of hatching and nestlings fledge at 15 to 20 days. Females will occasionally leave when chicks are 7 to 9 days old to start a second brood nearby. Breeding is synchronized with the lunar cycle so that young hatch before a full moon. This maximizes foraging time for parents when the feeding demands imposed by the newly hatched young are highest.

Distribution and Habitat

The breeding range extends from central Canada east to the Atlantic coast and south to Oklahoma and Georgia. Winter range includes the southeastern United States and Central America. Breeds in dry, deciduous or mixed forests with sparse underbrush near open areas needed for foraging. Seems to prefer pitch pine/scrub oak barrens on Long Island and oak-hickory forests in upstate New York.

Status

Although rarely seen, the whip-poor-will is a locally common breeder in parts of New York that are not heavily forested, especially in Long Island and the St. Lawrence Valley. Absent in the higher elevation areas of the Adirondacks, Catskills, and Tug Hill Plateau. New York State Breeding Bird Atlas results for the state indicate a decline in



Whip-poor-will Range

detections over the last 20 years although it is important to note that survey methods used for the atlas are not conducive to detection of the whip-poor-will. The species has disappearance from many parts of New York which it has previously inhabited.

Management and Research Needs

Like many nocturnal species, the whip-poor-will is not usually detected during Breeding Bird Surveys which are normally conducted during day light hours. Therefore whip-poor-will surveys could give a better indication of the population status. Habitat loss resulting from forest succession is thought to be a major factor resulting in the decline of whip-poor-will numbers in New York. Further study is needed on the habitat characteristics of whip-poor-will habitat. Vehicle collisions also pose a danger to foraging and migrating birds.

Additional References

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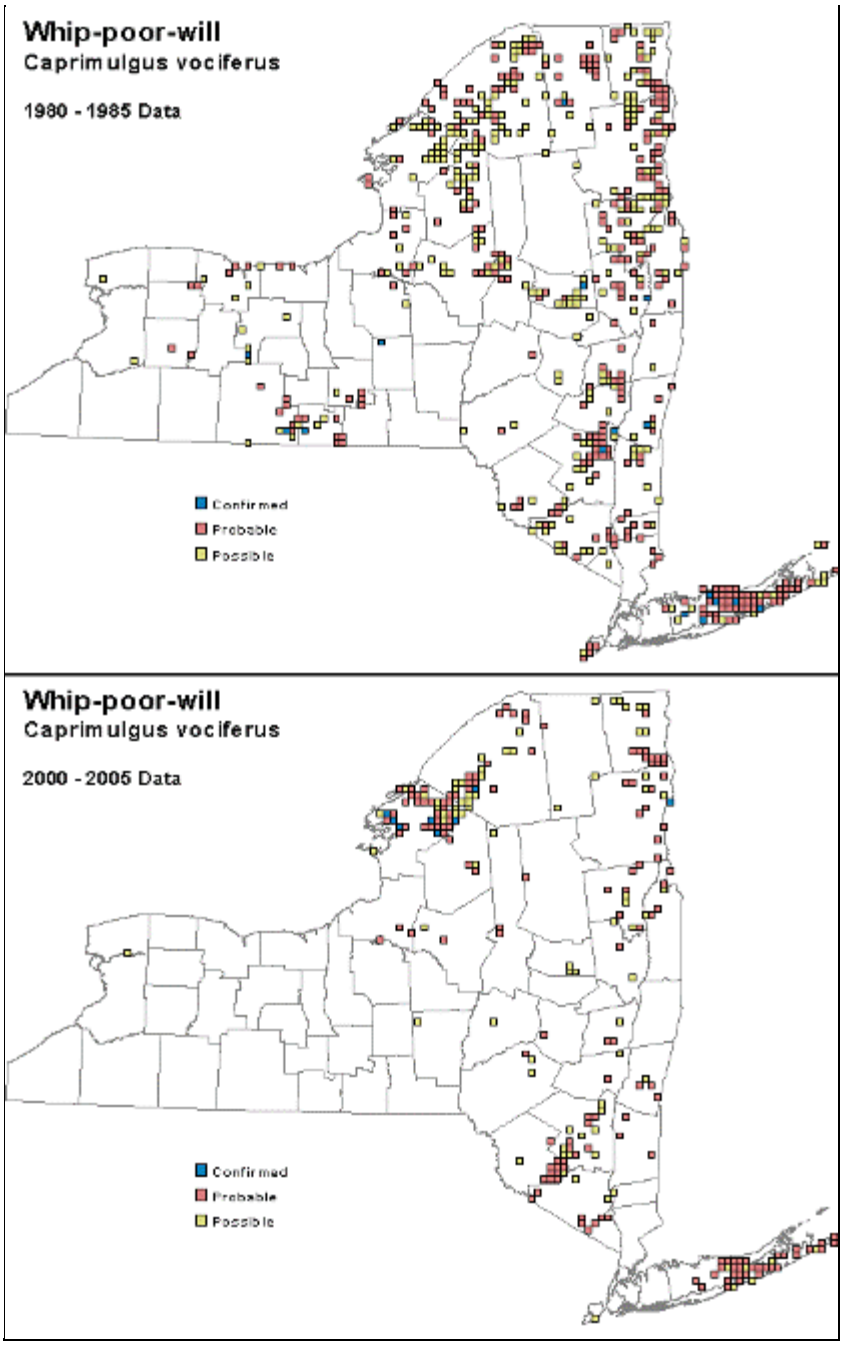

Distribution of Whip-poor-will in New York from 1st and 2nd NYS Breeding Bird Atlas Records

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Sibley, S. C. 1988. Whip-poor-will. *Caprimulgus vociferus*. Pages 218-219 in Andrle, R. F. and J. R. Carroll, eds. *The Atlas of Breeding Birds in New York State*. Cornell Univ. Press, Ithaca, NY.

ADVISORY GUIDELINES FOR CREATING TURTLE NESTING HABITAT

By
The Natural Heritage and Endangered Species Program
Massachusetts Division of Fisheries and Wildlife

Photo by Liz Willey

Open canopy areas with well-drained soils are ideal turtle nesting habitat. One of the major threats to our native turtles is habitat fragmentation and associated adult mortality due to road traffic. Female turtles often travel substantial distances from feeding wetlands to the nearest appropriate nesting habitat in order to lay their eggs. One way to reduce nesting related mortalities is to facilitate access to nesting habitat near feeding and overwintering wetlands, with roadless corridors in between. These guidelines are for creating nesting habitat for turtles on conservation land, where nesting habitat is lacking. Native plant community and all native species, particularly state-listed species, should be considered when developing management plans for conservation lands.

For more information about Wood Turtles and Box Turtles and the types of habitat they use see the NHESP Fact Sheets:
Wood Turtle http://www.mass.gov/eea/docs/dfg/nhesp/species-and-conservation/nhfacts/glyptemys-insculpta.pdf
Eastern Box Turtle http://www.mass.gov/eea/docs/dfg/nhesp/species-and-conservation/nhfacts/terrapene-carolina.pdf

An information request form can be submitted to the NHESP for persons interested in finding out if they have state-listed turtle species on their property; the form may be found at http://www.mass.gov/eea/docs/dfg/nhesp/regulatory-review/inforequform-elect.pdf

For more information on management of these habitats, land managers can refer to the recently released *Managing Grasslands, Shrublands, and Young Forest Habitats for Wildlife: a Guide for the Northeast* available for download at:
http://www.wildlife.state.nh.us/Wildlife/Northeast_Hab_Mgt_Guide.htm.

For more information about Habitat Management for Amphibians and Reptiles see the *Habitat Management guidelines for Amphibians and Reptiles of the Northeastern United States* available for order at http://www.parcplace.org/parcplace/publications/habitat-management-guidelines.html

1) Species Specific Requirements (state-listed species are in italics)

a) Freshwater/Estuary Species (*Wood Turtle, Blanding's Turtle, Red-bellied Cooter, Diamondback Terrapin,* Spotted Turtle, Snapping Turtle, Painted Turtle and Musk Turtle)

Location - Nesting habitat should be within 1000 ft of the wetland edge, with a barrier free (e.g. roadless) corridor between the wetland and nesting habitats. It is typically best to have the nesting habitat within 300 ft of the wetland edge, particularly for Red-bellied Cooters, Diamondback Terrapins, and Wood Turtles.

b) Upland Species (*Box Turtle*)

Location - Nesting habitat should be within a large forested, roadless block. Sites should be within 1000 ft of confirmed Eastern Box Turtle observations.

2) General Guidelines

Photo by Liz Willey

a) Site Factors - It is best to add to existing nesting habitat or to create nesting habitat near known nesting areas; increasing the probability that females will use the nest site immediately. Nesting sites should be on level ground with full southern exposure. The site should get sun, in a 180 degree arc from east to west, throughout most of the day. Total area of the nesting site should be greater than 20 ft in each direction and the site should be above the spring/summer flood plain. The site may need to be larger to get sun exposure throughout the day, depending on the proximity and height of adjacent forested areas. Larger nesting areas or multiple small ones will likely dilute nest predation. To minimize predation and human related mortality and collection; all nesting sites should be as isolated to the extent possible from housing developments, and human activity areas such as ATV/motorcycle trails, playgrounds, picnic areas, walking paths and other human recreational activities.

b) Substrate - The original substrate should consist of well drained soil, sand or gravel. If soil is brought to the site it should be washed sand or gravel. Washed substrate will minimize translocation of weeds or invasive plant species and impede rapid growth of vegetation. Ground vegetation should be sparse and include native sedges, grasses, and a few low growing shrubs (less than 2%-5% cover of the site). Shrubs

will provide cover for the gravid females and hatchlings once they emerge from the nest.

c) Procedure -

Step 1 –Where necessary forest cover and tall vegetation should be removed. In these cases refer to the Forestry Conservation Management Practices (http://www.mass.gov/dfwele/dfw/nhesp/cmpdraft.htm) for specific guidelines for any of the state-listed turtle species. In addition, these practices should be used to help direct forest removal activities related to the creation of nesting habitat for any common turtle species.

In most cases the surface material will need to be disturbed through scarification. Refer to the species-specific data in the Forestry CMPs for information about dates when these activities should occur. Removal of the surface material, to expose the underlying strata, may also be necessary if the area is infested with invasive and/or weedy species.

In some cases the deposition of sandy soil on top of existing vegetation is all that is necessary.

Step 2 – If the exposed native mineral soil is not acceptable, a fine sand (<5% clay and <25% gravel) should be deposited over the parent material to a depth of approximately 12 inches. A permeable tarp may be placed under the sand to reduce the reoccurance of remaining vegetation. Sand cover up to 10-12 in depth may also be used to retard growth of some existing unwanted vegetation.

Step 3 – Native, non-spreading bunch grasses (see the list of appropriate species in #5 below) should be sparsely planted; at approximately a 50 ft spacing throughout the site. Planting should not occur during dry months.

d) Maintenance - Maintenance should not be required frequently. It is recommended that the site is inspected every two years for maintenance issues. If encrusting mosses or other exotic weeds encompass >25% of the intended nesting area, those areas should be raked and accretions should be removed. Herbaceous and woody species should never occupy > 50% of the area. In addition, shrubs should be no taller than 24" in height. If this occurs most of these materials should be removed or trimmed. The removal areas should then be raked and lightly tilled. Additional vegetation plantings may be necessary.

3) Related Policy and Regulatory Process Considerations

- Habitat management/enhancement is exempt from MESA, provided that the proponent has a management plan approved in advance by the NHESP.
- If you are creating the nesting habitat within 100 ft of a wetland or 200 ft of a stream you will need a permit from the Conservation Commission. An RDA (Request for Determination of Applicability) could be filed with the local Conservation Commission. If they perceive the impact as minor and the project as beneficial, they *may* not require a Notice of Intent (NOI) filing. It would be beneficial to have a letter of support from the Natural Hertiage & Endangered Species Program before you go to the Conservation Commission.
- If the nesting area is going to be >5000 square ft in area, you will need a permit from the Army Corp of Engineers (ACOE).

- If the site is in an Area of Critical Ecological Concern (ACEC) you'll need to call the ACEC program and if it is also in a wetland buffer area you'll need to file with us. There is an ACEC GIS layer available on MassGIS to see if the site falls with in one of these areas.

Some additional things to consider: You should also plan to use a clay berm around the nesting area to avoid erosion and runoff into a local stream. Hay bales and silt fencing should not be used.

4) Research Needs

a) Size and Configuration - It is still unknown whether creating one large nesting area or multiple smaller nesting sites (spaced approximately 1-3 miles of each other) is the better arrangement to minimize nest predation.

b) Monitoring of Created Nesting Areas – Information is needed to determine the successfulness of these methods. For example, how quickly do females begin to use these sites and do we see an increase in the nesting activity at the sites over multiple years.

c) Percent Vegetation for Optimal Turtle Nesting Habitat –

5) Suggested Plant Species Appropriate for Turtle Nesting Habitat

Low Growing Plants,

Carex lucorum	Blue Ridge Sedge
Andropogon(Schizachyrium) scoparius	Little Bluestem, CT ecotype
Carex conoidea	Openfield Sedge
Carex swanii	Swan's Sedge
Chamaecrista fasciculata	Partridge Pea, PA ecotype
Danthonia spicata	Poverty Oatgrass

Shrubs

Comptonia peregrine	Sweet Fern
Vaccinium angustifolium	LowBush Blueberry
Vaccinium pallidum	LowBush Blueberry
Gaylussacia baccata	Black Huckleberry

6) References

Oxbow Associates, Inc.. 2000. Spotted turtle nesting habitat creation for the preserve at Keeney Pond. Natural Heritage and Endangered Species Program report, Westborough, MA

Buech, R. R., L. G. Hanson, and M. D. Nelson. 1997. Identification of wood turtle nesting areas for protection and management. Pages 383-391 in J. V. Abbema, editor. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles – an International Conference. State University of New York, New York, NY.

Buech, R.R., and M.D. Nelson. 1991. How to create wood turtle nesting areas. USDA Forest Service, St. Paul, MN

Appendix E

Photograph No. 1: View toward the subject property from the southern terminus of Cranford Boulevard, facing east. The subject property is not visible from this vantage point beyond intervening off-site vegetation. An unofficial trail entrance is visible at right.

Photograph No. 2: Representative view of a portion of the subject property's frontage along Cranford Boulevard, facing east between two single-family residential uses.

Photograph No. 3: View of the subject property from Cranford Boulevard, facing east.

Photograph No. 4: View of the subject property from Cranford Boulevard, facing east.

Photograph No. 5: View of the subject property and an adjacent residential property from Cranford Boulevard, facing east. Wooded areas within the subject property (to remain) abut Cranford Boulevard (at right) and the rear of the residential property.

Photograph No. 6: Representative view of the residential neighborhood west of the subject property along Cranford Boulevard, facing north.

Photograph No. 7: View of the subject property from Cranford Boulevard, facing east.

Photograph No. 8: View of the subject property from Cranford Boulevard, facing east.

Photograph No. 9: View of the Manorville Fire Department fire station located on the southwest corner of Bentnor Street and Cranford Boulevard, facing northwest.

Photograph No. 10: View of publicly owned wooded land at the southeast corner of Cranford Boulevard and Moriches-Middle Island Road, facing east.

Photograph No. 11: View along Moriches-Middle Island Road from the intersection with Cranford Boulevard, facing east.

Photograph No. 12: View of a wireless communications facility along the north side of Moriches-Middle Island Road, north of the subject property.

Photograph No. 13: View along Moriches-Middle Island Road in the vicinity of the frontage/proposed main entrance to the subject property, facing east. A Town of Brookhaven highway yard is located on the north side of the road.

Photograph No. 14: View along Moriches-Middle Island Road northeast of the subject property, facing west.

Photograph No. 15: View toward the subject property from within the wooded area to the south, facing north.

Photograph No. 16: View along the trail south of the subject property, facing east.

Photograph No. 17: Representative view within the subject property.

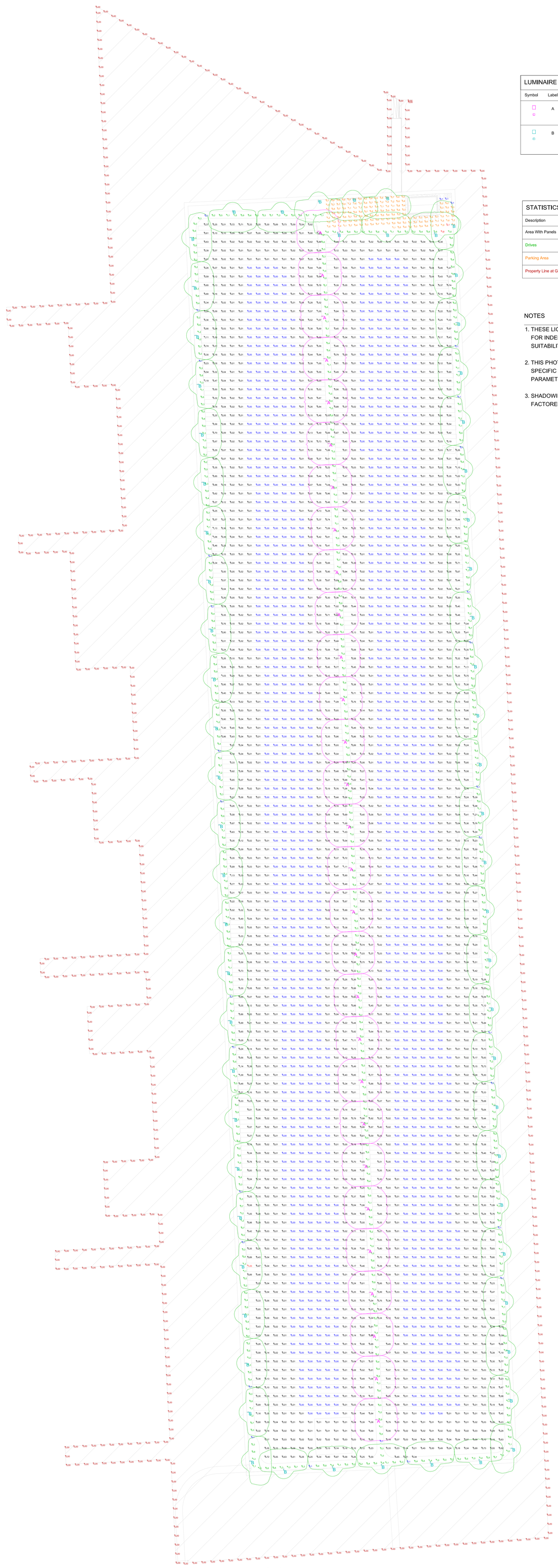
Photograph No. 18: View toward Brookhaven Calabro Airport from along Campbell Drive, facing south.

Photograph No. 19: View of an existing substation located at the southern terminus of Weeks Avenue, southeast of the subject property, facing southeast.

Photograph No. 20: View of a vacant, cleared parcel, located at the southern terminus of Weeks Avenue, west of the existing substation and east of the subject property.

Photograph No. 21: View along Weeks Avenue, east of the subject property and south of Moriches-Middle Island Road, facing north. Note the presence of existing overhead utility lines.

Appendix F



Plan View
Scale 1" = 100'

LUMINAIRE SCHEDULE

Symbol	Label	Qty	Catalog Number	Description	Lamp	File	LLF	Watts
	A	29	DSX0 LED 40C 700 30K T5M MVOLT	DSX0 LED WITH (2) 20 LED LIGHT ENGINE, TYPE T5M OPTIC, 3000K, @ 700mA	LED 3000K	DSX0_LED_40C_700_30K_T5M_MVOLT.ies	0.90	91
	B	65	DSX0 LED 40C 700 30K T4M MVOLT HS	DSX0 LED WITH (2) 20 LED LIGHT ENGINE, TYPE T4M OPTIC, 3000K, @ 700mA WITH HOUSE SIDE SHIELD	LED 3000K	DSX0_LED_40C_700_30K_T4M_MVOLT_HS.ies	0.90	91

STATISTICS

Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Area With Panels	×	0.12 fc	1.33 fc	0.00 fc	N / A	N / A
Drives	×	0.7 fc	1.8 fc	0.1 fc	18.0:1	7.0:1
Parking Area	+	0.7 fc	2.1 fc	0.1 fc	21.0:1	7.0:1
Property Line at Ground	×	0.00 fc	0.00 fc	0.00 fc	N / A	N / A

NOTES

1. THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SUITABILITY AND SAFETY.
2. THIS PHOTOMETRICS LAYOUT WAS CALCULATED USING SPECIFIC CRITERIA, ANY DEVIATION FROM STATED PARAMETERS WILL AFFECT ACTUAL PERFORMANCE.
3. SHADOWING EFFECT OF SOLAR PANEL ARRAYS WERE NOT FACTORED INTO THESE CALCULATIONS.

AcuityBrands™ Lighting

MIDDLE ISLAND SOLAR FARM - LED CUTOFF LIGHTING

20' POLES, NEW BACKGROUND - RELOCATED & ADDED POLES ACCORDINGLY
HOUSE SIDE SHIELDS EMPLOYED ON TYPE 'B' FIXTURES
CALCULATED APPROX. MAINTAINED FC AT GROUND, LLF = 0.90

Designer
Eric Perkins, LC, MIES

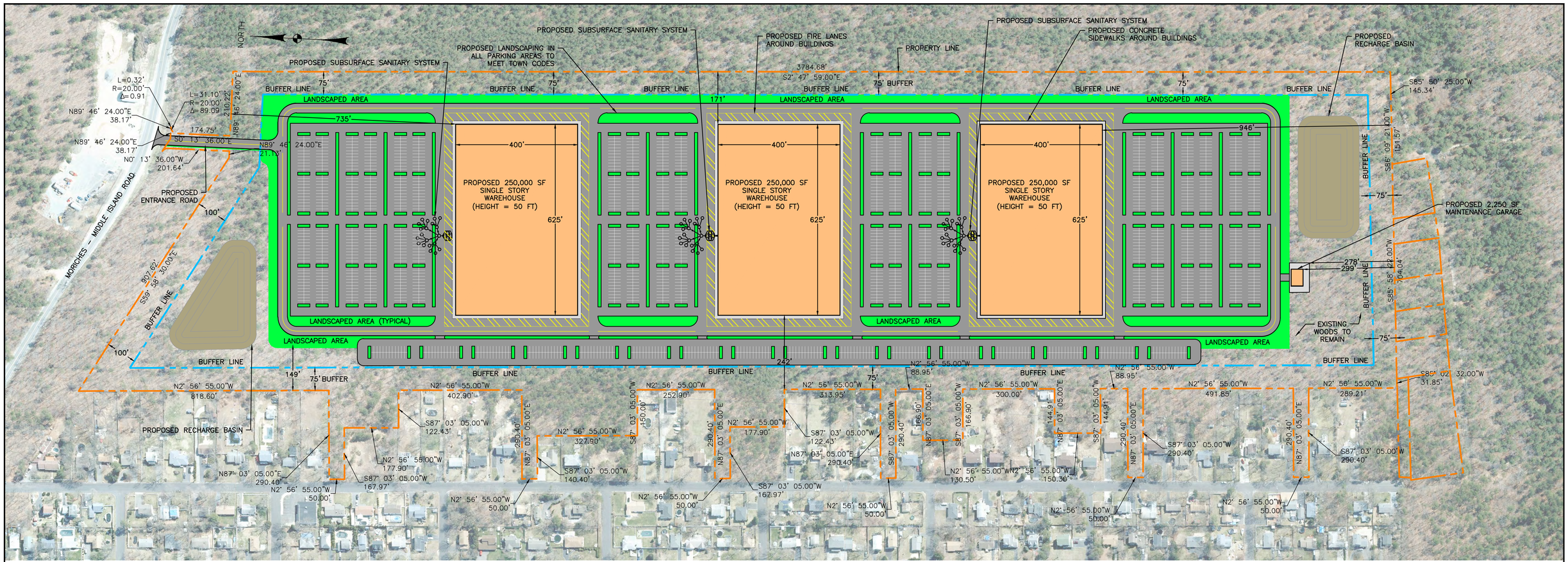
Date
Nov. 9th, 2015

Scale
As Noted

LAYOUT 4

PHOTOMETRIC PLAN

Appendix G



CONCEPTUAL SITE PLAN

SCALE: 1"=150'

0 150' 300'

SANITARY CALCULATIONS

ALLOWABLE SANITARY FLOW:

GROUND WATER MANAGEMENT ZONE VI: 300 GPD/ACRE
100.3 (300 GPD/ACRE) = 30,090 GPD (ALLOWABLE)
TOTAL SANITARY FLOW = 30,090 GPD

SEPTIC TANK:

REQUIRED: 10,030 GPD x 2 DAY FLOW = 20,060 GAL
PROVIDE: (4) 12' DIA., 7' LIQUID DEPTH, 21,000 GAL CIRCULAR TANKS

LEACHING POOLS:

REQUIRED: 10,030 GPD ÷ 1.5 GAL / SF/ DAY = 6,687 SF
6,687SF / 31.4 SF/VF (10' DIA.) = 212.96 VF
SAY 213 VF

PROVIDE:
(20) 10' DIA. x 11'-0" MIN. EFFECTIVE DEPTH PRECAST CONC.LEACHING POOLS
(20) LEACHING POOLS x 11' VF / LP = 220VF @ 31.4 SF / VF = 6,908 SF > MIN 6,687 SF

FUTURE EXPANSION

REQUIRED 50% OF LEACHING CAPACITY
PROVIDE: (10) 10'-0" DIAMETER X 11' MIN. EFFECTIVE DEPTH PRECAST CONCRETE LEACHING POOLS

ESTIMATE OF QUANTITIES

CLEARED AREA	70.60 A
UNCLEARED WOODED AREA	29.73 A
ASPHALT PAVING	1,668,520 SF (38.30 A)
WALKS (CONCRETE)	66,700 SF (1.53 A)
GRASS / LANDSCAPE	437,647 SF (10.05 A)
BUILDING	752,250 SF (17.27 A)
RECHARGE BASINS	150,218 SF (3.45 A)
CHAIN LINK FENCE	9,625 FT (SECURITY PERIMETER FENCE)
SCREEN PLANTING	0
STREET TREES	N/A – UNCLEARED ALONG ROAD

SITE DATA

SUFFOLK COUNTY TAX NUMBER(S)	0200 71200 0900 001000
TOTAL AREA OF SITE	100.33 ACRES (4,370,336.56 SF)
TOTAL AREA OF BUILDINGS (PROPOSED)	752,250 SF (650,000 SF WAREHOUSE + 100,000 SF RELATED OFFICE + 2,250 GARAGE)
DEPTH TO GROUNDWATER	± 30 FT (AVERAGE)
ZONING	A-1 (6.13 A) & L-1 (94.20 A)
EXISTING USE	UNDEVELOPED
INTENDED USE	INDUSTRIAL WAREHOUSE (NO MINI STORAGE)

NOTE: L-1 PORTION IS 94% OF PARCEL. BASED ON § 85-136 A (7), A-1 ZONE (6.13 A) SHALL NOT BE USED FOR YIELD.

ZONING REQUIREMENTS

DIMENSIONAL CRITERIA
§ 85-558 L INDUSTRIAL 1 DISTRICT (LIGHT INDUSTRY) DIMENSIONAL CRITERIA:

	CODE SECTION	REQUIRED	PROPOSED
MINIMUM LOT AREA	§ 85-568 (A) (3)	2.75 A (120,000 SF)	94.2 A L-1 (4,103,352 SF), (94.2 A + 6.13 A = 100.33 A)
MINIMUM LOT WIDTH	§ 85-568 (B) (3)	200 FT	50 FT AT ENTRANCE TO FLAG LOT (± 1,000 FT THROUGHOUT MAJORITY)*
FRONT YARD SETBACK	§ 85-568 (C) (2)	100 FT	735 FT
SIDE YARD SETBACK	§ 85-568 (D) (3)	50 FT	171 FT
REAR YARD SETBACK	§ 85-568 (E) (1)	50 FT	299 FT
MAXIMUM FLOOR AREA RATIO (F.A.R.)	§ 85-568 (F) (2)	30 % or 1,231,006 SF	18.3 % (752,250 SF)
MAXIMUM HEIGHT	§ 85-568 (G) (1)	50 FT / 3 ST	50 FT / 1 ST

* VARIANCE REQUIRED DUE TO WIDTH OF LOT AT MORICHES MIDDLE ISLAND ROAD

§ 85-843 LAND DEVELOPMENT STANDARDS

MINIMUM NATURAL AREA / LANDSCAPING	§ 85-843 (A) (6) (a)	30 % (28.26 A)	35.72 % (33.65 A – EXCLUDES 6.13 A A-1 PORTION AND RECHARGE BASINS)
MIN. NATURAL AREA / LANDSCAPING IN FRONT YD	§ 85-843 (A) (2)	50 % of 30 % (14.13 A)	N/A – FLAG LOT
MIN. GREEN SPACE ALONG ROAD	§ 85-843 (A) (6) (c)	SITE > 5A, 50 FT	56 FT
PARKING AREA LANDSCAPING	§ 85-843 (A) (8)	2292/25x400SF=36,672 SF	259,030 SF
MIN. BUFFER ADJACENT TO RESIDENTIAL	§ 85-843 (B) (2) (c)	SITE > 5A, 75 FT	75 FT

§ 85-852 OFF-STREET PARKING REQUIREMENTS

PARKING INDUSTRIAL, WAREHOUSE	§ 85-852	1/400 SF WRHS (1,625 SP) 1/150 SF OFFICE (667 SP) 2,292 SPACES	2,304 SPACES TOTAL
PARKING STALL SIZE		9 FT X 20 FT	10 FT X 20 FT
ADA PARKING		1/25 SPACES (93)	150
LANDBANKED STALLS		0	0
LOADING	§ 85-852 (A)	18	18

SIGN REQUIREMENTS

DETACHED / GROUND SIGN AREA	§ 85-57 (B) (2)	1 SIGN/18 SF PER SIDE	1 SIGN/18 SF PER SIDE
SIGN HEIGHT	§ 85-57 (B) (2)	9 FT	< 9 FT

Warning: It is a violation of the NY State Education Law for any person to alter this document in any way, unless acting under the direction of a licensed professional engineer.

SCTM # 0200 71200 0900 001000
TOB LOG # 2013-030-CZ

DATE	BY	DESCRIPTION	APPROV. BY
5/8/15	MCJ	DEIS RESUBMISSION	RGD
4/30/15	MCJ	REVISED SITE PLAN	RGD
4/28/15	MCJ	REVISED PER DEP COMMENTS DATED 4/17/15	RGD
2/19/15	MCJ	UPDATE PROPOSED NATURAL AREA	RGD
2/11/15	MCJ	CLEARING LIMITS	RGD
12/30/14	MCJ	ALTERNATE USES	RGD
12/29/14	MCJ	UPDATE QUANTITIES FOR DEIS	RGD

REVISIONS

MISF, LLC
88 UNIVERSITY PLACE 8TH FLOOR, NY, NY 10003

MIDDLE ISLAND SOLAR FARM
MORICHES-MIDDLE ISLAND ROAD, MASTIC, NY

YIELD MAP PLAN

L. K. McLEAN ASSOCIATES, P.C.
CONSULTING ENGINEERS 437 SOUTH COUNTRY RD., BROOKHAVEN, NEW YORK 11719

Designed By: MCJ	Scale: AS NOTED	Sheet No. 1of1
Drawn By: MF/MCJ	Date: DEC. 4, 2014	
Approved By: RGD	File No. 13066.004	

Nov 30, 2015 – 09:14am
P:\13066.003 (Middle Island Solar Farm)\dwg\C05 Yield Map.dwg

PLOT SIZE: 24 x 36