

Conceptual Master Plan and Special Use Permit Narrative



GD Johnston Winsor III

Assessor's Plat 59 Lot 15

Located in Johnston, Rhode Island

Applicant: Johnston Winsor III, LLC

2000 Chapel View Blvd, Suite 500, Cranston, RI 02920

Revised May, 2023

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1. Executive Summary

Green Development, LLC (Green) has coordinated with the project team to prepare this Conceptual Master Plan and Special Use Permit Plan Narrative with Supporting Material for review and comments. Green is committed to understand and abide by all applicable regulations of the Town of Johnston, the checklists, and the ordinance guiding solar development.

GD Johnston Winsor III is a proposed solar array development. The project area is bounded to the north by Winsor Avenue, to the east and west by residential lots, and to the south by vacant woodlands. The proposed development has been designed using the following criteria:

- 1. Maximize the efficiency of the proposed solar facility while providing grassland, pollinator habitat areas, and shrub habitat areas to promote wildlife benefits.**
- 2. Attentively design the solar system components to eliminate or reduce impacts to neighboring properties.**
- 3. Maximize the existing natural buffers between the proposed development and adjacent properties and supplement the natural buffers with berms, additional planting, and screening as needed.**
- 4. Upon completion of all permitting necessary and property closing, provide for immediate open space dedication to the Town.**

The proposal for GD Johnston Winsor III has been designed to be consistent with the guidelines established in the zoning ordinance with specific consideration of *Article V Section 340-27.E* (Guidelines for Site Plan Review). GD Johnston Winsor III is proposed in upland areas outside of RIDEM wetlands, perimeter wetlands, and riverbank wetlands. The solar project encompass approximately 67.7 acres, or 42.6% of the total property area. Development of the project has included a design team of professionals in the fields of civil engineering, surveying, environmental science, wetlands biology, real estate and electrical engineering.

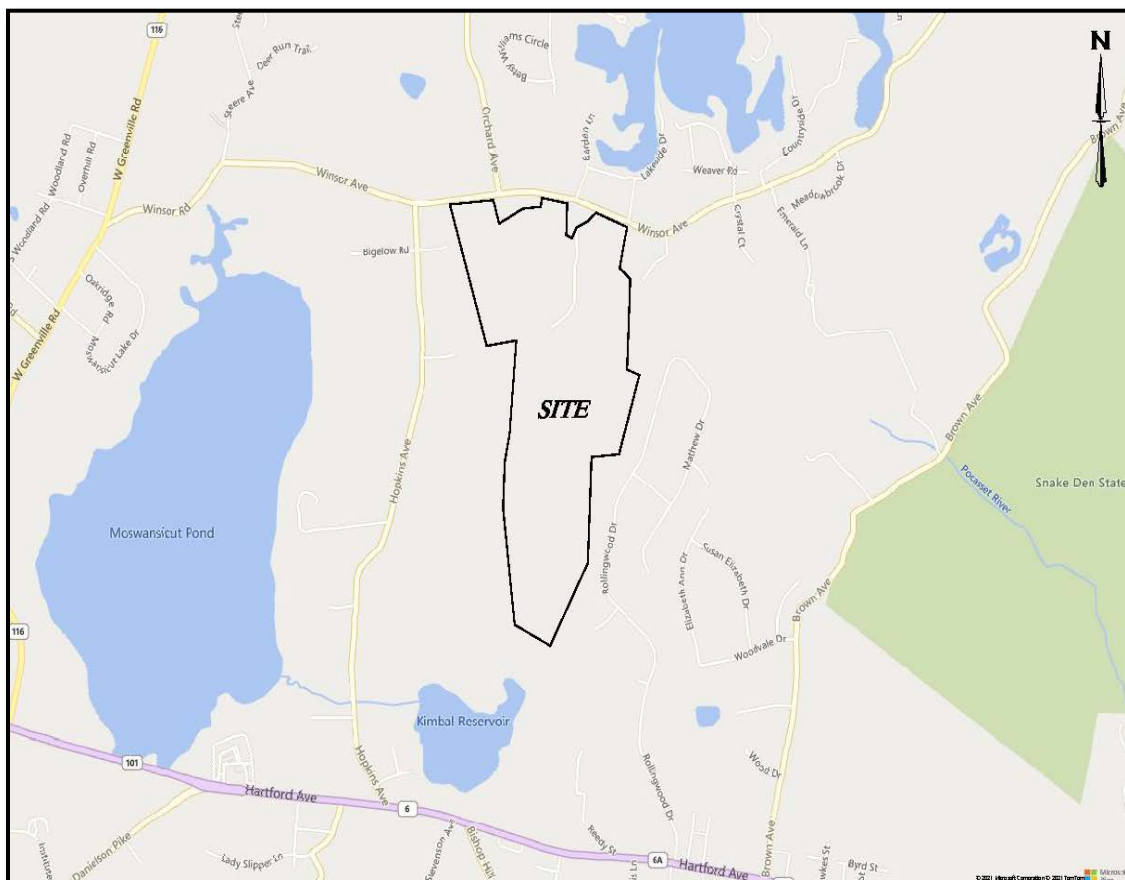
This narrative is intended to accompany the submitted conceptual plan set and to explain the evolution of the design, technical parameters of the Site, and provide additional information not included on the plans. It also illustrates what the designers and the applicant believe are key features and amenities of the plan.

2. Location

GD Johnston Winsor III is located on the Town of Johnston's Assessor's Plat 59 Lot 15. The site is located within the northwest portion of Johnston, approximately 1/2 mile from the Smithfield and Scituate town lines. Winsor Avenue abuts the parcel to the north.

The site is the location of a historic farmstead surrounded by agricultural fields to the north, south, and east and is situated on the top of Sikkibunkiaut Hill. The remainder of the lot is vacant and forested. The site is generally situated between two swamp wetlands associated with intermittent streams, one to the west and one to the east. Additionally, three pockets of isolated wetland are also present on the site; they are classified as forested wetlands. A Rhode Island Historical Cemetery is located on the site. The property is zoned Residential R-40 on the Town's zoning map and the parcel has frontage on and will be accessed from Winsor Avenue, a two-lane roadway in good condition.

The area surrounding the site is comprised of single-family homes to the east and west, Winsor Avenue to the north, and vacant woodlands to the south. Residential uses make up the frontage along Winsor Avenue. The zoning classification of the parcels surrounding the site to the north, south, east and west is Residential R-40.



3. Site Analysis

Agricultural Lands: The lot has remained relatively unchanged since the earliest aerials in 1939. Historically, the agricultural fields extended further south; however, since the late 1980s the southernmost field, once an orchard, has been left fallow. In recent history, the open fields appear to be used for growing hay.

Topography: Steep to moderately rolling terrain characterizes the site's topography. The highest elevations are located near the central portion of the site (elevation 450+/-). The lower elevations are located at the southern portion of the site (elevation 350+/-). The range of slopes on the site varies between 0% and greater than 25%. Much of the area proposed to be developed ranges from approximately 0% to 25%.

Existing Vegetation: Most of the upland ground cover on the site consists of diverse scattered mature trees, saplings, and shrubs.

FEMA Floodplain: According to FEMA Map 44007C0281G (eff. March 2, 2009) the site is located within Zone X-Unshaded, an area of minimal flooding.

Structures: Two existing dwellings are located on the site as well as several accessory and abandoned structures. A Rhode Island Historic Cemetery is located on the site (Rev. Samuel Winsor Lot #JN047). All proposed development maintains a minimum 25' buffer from the cemetery.

Visual Features: The site is mainly surrounded by wooded uplands.

Wetlands: The majority of the central portion of the site is upland situated on the summit of the hill. As the land slopes downward to the north, west, east, and south wetlands are present. Additionally, there are two waterbodies that flow through the property. There is a wetland associated with an intermittent stream to the west. This wetland exceeds the regulatory size threshold of three (3) acres and is defined as a swamp. There is a second swamp wetland associated with the river to the east. Lastly, there are three isolated pockets of wetlands. These do not meet the regulatory size threshold for classification as a swamp and are classified as forested wetlands. Natural Resource Services, Inc. (NRS) has completed the freshwater wetland delineations.

Past and Present Use of the Site: The area of the solar project proposed for development is presently wooded, vacant fields, or existing homes planned for removal.

Road Networks: The subject parcel has direct access from Winsor Avenue to the north.

Natural Heritage Area: A portion of the lot is mapped by the RIDEM Environmental Resource Map as being within a Natural Heritage Area. The species of state concern in this area is the

Squaw or Cancer Root (*Conopholis Americana*). The Squaw root is a fully parasitic plant that occurs only where it can grow attached to the roots of some species of oak. It occurs over a wide geographic range in most of the eastern half of the U.S. and Canada. Across its range, it grows on sites that are relatively rich with deep soils and a thick forest canopy where at least some oak trees are present. This species is listed as being of special concern in Rhode Island.

Historic Area: The Site is not located within a historic district or otherwise designated area. A Rhode Island Historic Cemetery is located on the site (Rev. Samuel Winsor Lot #JN047). All proposed development maintains a minimum 25' buffer from the cemetery. The following comment is provided on the Rhode Island Historical Cemetery Commission website:

“On Winsor Road in full view and in a southwesterly direction from the Slack Reservoir is a burial yard of the Winsor family and relatives a faced wall on west side and 3 sides protected by granite posts and iron rails in excellent condition.”

Soils: The soils on the Site have been mapped by United States Department of Agriculture Web Soil Survey. The soil survey depicts the site as being comprised of twelve (12) different soils. Note that no removal of topsoil or prime agricultural soil is proposed as part of this project. Topsoil will be preserved and re-used on site. Soil evaluation test holes are proposed for Fall of 2023.



Map Unit Symbol	Map Unit Name
CaC	Canton-Charlton-Rock outcrop complex, 3 to 15 percent slopes
CaD	Canton-Charlton-Rock outcrop complex, 15 to 35 percent slopes, very stony
CdB	Canton and Charlton fine sandy loams, 3 to 8 percent slopes
CeC	Canton and Charlton fine sandy loams, 3 to 15 percent slopes, very rocky
ChB	Canton and Charlton fine sandy loams, 0 to 8 percent slopes, very stony
Efb	Enfield silt loam, 3 to 8 percent slopes
MmB	Merrimac fine sandy loam, 3 to 8 percent slopes
PaB	Paxton fine sandy loam, 3 to 8 percent slopes
Re	Ridgebury fine sandy loam, 0 to 3 percent slopes
Rf	Ridebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony
SwA	Swansea muck, 0 to 1 percent slopes
WoB	Woodbridge fine sandy loam, 0 to 8 percent slopes, very stony

4. Proposed Development

Project Evolution

This project was previously submitted for Master Plan review and Special Use Permit in May of 2022. The Master Plan was unanimously approved by the Town Planning Board. The Zoning Board voted 3-2 for granting the Special Use Permit; however, a 4-1 vote was required for approval and therefore the project was denied. Of particular concern was the cutting and clearing of existing trees, construction disturbance and duration, unease for surface runoff and erosion potential, and visual degradation of the natural landscape aesthetic.

Green has considered these concerns and modified the original Master Plan proposal to address them. In an effort to globally address all concerns, Green has reduced the proposed solar development from 24 MW to 19 MW, a 20% reduction in overall panel surface area. Panels were selectively removed from areas in proximity to neighboring properties as well as the Scituate Reservoir watershed, which reduces the overall impact of the proposed solar site, and increases the distance from panels to existing homes. Green also proposes supplementing the existing natural buffers with earthen berms, additional landscape plantings and screening via slatted or stockade fencing in areas where natural existing buffers are considered insufficient.

The following subsection further details the proposed design approach. Narrative *Sections 5 through 9* discuss the measures taken to address common development concerns regarding solar system installations and *Section 10* details how this project meets the Town of Johnston's standards for industrial site plan review.

General Design Information

The following is a brief description of the goals, objectives and planning criteria utilized as a guide in developing plans for GD Johnston Winsor III. The applicant (GD Johnston Winsor III, LLC) proposes to construct a 19 MW (AC) solar project on the site. The proposed solar project is comprised of 3 interconnections: (2) 7.5 MW AC & (1) 4.0 MW AC.

The proposed solar installation primarily consists of ground-mounted solar panel modules and the necessary transformers, inverters, switchgear, an underground electrical cable connecting the solar panels to the electrical equipment, and newly installed utilities to interconnect with the Rhode Island Energy circuit. Additionally, the project will include battery energy storage, most likely lithium iron phosphate, which will be integrated into the typical electrical equipment area. The dimensions of each solar panel are approximately 90" tall by 45" wide. The panels will be mounted on ground screw supports at a height typically between 9' and 12'. Final design and terrain will dictate the final installed height.

The special use concept plan depicts the interconnection location, access roads, solar panel locations and preliminary drainage design. A 16' wide access gate and 6' high chain link security fence will be used to control access. The access driveway will be 20' wide and comprised of clean washed crushed stone. The plan includes conceptual stormwater management areas for runoff control.

The proposed panels and fencing encompass approximately 67.7 acres of the total property area of 158.71 acres. This results in a solar lot coverage of approximately 42.6%. To the west, the nearest solar panel edge is located 550' from residential homes along Hopkins Ave and Watson Ave. To the east, the nearest solar panel edge is located 475' from residential homes along Rollingwood Dr. In relation to homes to the north along Winsor Ave, the nearest solar panel edge is located 400' from residential structures. In proximity to homes south of Winsor Ave that share existing driveway access to the property, the nearest solar panel edge is located 150' from residential structures.

A fire safety access drive and 6' minimum height chain link security fence are also proposed on the property. No buildings are required for the scope of this project. Furthermore, water service, sewer service, and on-site wastewater treatment systems are not required. The proposed equipment will be manufactured and designed to comply with applicable industry standards, including the American National Standards Institute (ANSI), Underwriters Laboratories (UL), the American Society for Testing and Materials (ASTM), and other appropriate certifying organization as applicable. The solar/building permit application will include specifications for the final equipment for the project and the appropriate certifications.

Work will be sequenced and begin with the deployment of perimeter erosion control, cutting, removal, and stumping of trees; followed by construction of the crushed stone access driveway and interior erosion control. The site will then be graded, the landscape buffers installed assuming the time of year permits, the solar array constructed, and the site stabilized. All construction will be completed in accordance with local ordinances and RIDEM.

5.0 Preliminary Drainage Analysis

The site will be designed and permitted in accordance with all stormwater regulations set forth by the RI Department of Environmental Management (RIDEM) and the Town of Johnston.

6.0 Sewage Disposal

The proposed solar development does not require sewage waste disposal. Temporary facilities will be utilized and regularly maintained during the construction phase while work is ongoing.

7.0 Public Water

The proposed solar development does not require public water or private wells for the construction or operation of the facility.

8.0 Population Analysis and School Age Children

The proposed solar project will not result in an increase in population or school age children.

9.0 Impacts

Lighting: The solar facility does not require artificial lighting as part of the project, so no lighting impacts are proposed.

Landscaping: Landscaping will be designed to supplement existing vegetation to restrict views into the solar project and preserve the scenic and rural character along roadways and neighborhoods near and around the site. The landscape design will be provided at the preliminary site plan review stage.

Visual/Scenic Views: The existing vegetation along the perimeter of the site will be utilized as buffers to restrict views into the solar project and preserve the scenic and rural character along roadways and neighborhoods near and around the site. See the above response for landscaping detail.

Air Pollution: This project will not create any significant emissions of smoke, dust, fumes, or other noxious gasses. The greatest contributor to emissions will be from heavy equipment during the construction of the site. Dust produced during construction will be controlled by utilizing a water wagon and/or other means as deemed acceptable by the Town and per the Soil Erosion and Sediment Control Plan. Since dust potential is a temporary construction condition, no adverse effects to air quality are expected.

Water Quality: The impacts of the proposed development on water quality can be divided into two phases: construction and post construction/occupancy. During the construction phase, soil erosion will be controlled with silt fences, straw wattles, temporary sediment basins, and

vigorous re-vegetation. In the post construction/occupancy phases, BMP's such as grass swales and stone areas will provide water quality for the proposed gravel driveway. The proposed solar panels produce no sediments or pollutants and will be spaced adequately to distribute stormwater panel runoff. Impervious areas are limited to isolated concrete pads for equipment placement.

Wells/Blasting: Blasting may be needed to accomplish grading of the site and will be minimized to the greatest extent possible. Any blasting will be performed according to local and state requirements with the necessary permits. The use of anchor screws will allow the anchors to be drilled into rock to minimize or eliminate the need for blasting.

Police and Fire: The project will not require an on-site office or manned building. Instead, the project will be continuously monitored from a remote location and utilize periodic visits by technicians to troubleshoot and/or perform routine equipment checks. Police and fire responses will be low for this installation given it is a secure facility with locked gates and fencing. A lock box will be provided on this project in the event emergency access is needed. Green has met with the fire marshal to review the requirements for solar projects and the conceptual plans provided substantially conform. Green will provide preliminary engineering plans to the fire department for more detailed review as the project progresses.

Recreation: The site is currently private property and does not abut public recreational areas. The proposal is to donate the property to open space with a long-term lease on a portion for the installation and operation of the solar array. Approximately 47.8% of the total property area is proposed to be solar lease area, whereas approximately 52.2% will become open space.

Road Maintenance: The crushed stone access driveway as well as associated BMP's will be privately maintained as outlined in leases with the owners.

Traffic: There will be construction traffic for the various construction activities such as tree removal and processing, import and export of site material, general construction vehicles, and import of solar system equipment etc. After construction completion, the facility will generate very low traffic volume with only periodic site visits by technicians to check or troubleshoot equipment and/or grounds maintenance crews to maintain vegetation, etc.

Glare: *"A common misconception about solar photovoltaic (PV) panels is that they inherently cause or create "too much" glare, posing a nuisance to neighbors and a safety risk for pilots. While solar PV systems can produce glare, light absorption - rather than reflection - is central to the function of solar PV panels. This fact sheet describes the basic issues surrounding glare from solar PV panels, the new Federal Aviation Administration guidance, and the implications for local governments."*

Ref. <https://www.energy.gov/eere/solar/downloads/solar-pv-and-glare-factsheet>

“While in certain situations the glass surfaces of solar PV systems can produce glint (a momentary flash of bright light) and glare (a reflection of bright light for a longer duration), light absorption, rather than reflection, is central to the function of a solar PV panel - to absorb solar radiation and convert it to electricity. Solar PV panels are constructed of dark-colored (usually blue or black) materials and are covered with anti-reflective coatings. Modern PV panels reflect as little as two percent of incoming sunlight, about the same as water and less than soil or even wood shingles (SEIA/Sandia 2013). Some of the concern and misconception is likely due to the confusion between solar PV systems and concentrated solar power (CSP) systems. CSP systems typically use an array of mirrors to reflect sunlight to heat water or other fluids to create steam that turns an electric generator. These typically involve large ground-mounted reflectors, usually in remote desert locations, and are not installed in residential or commercial areas or near airports.”

Ref. <http://solaroutreach.org/wp-content/uploads/2014/06/Solar-PV-and-Glare-Final.pdf>

Given the site location and extensive natural wooded buffers and proposed landscaping buffers between the site and homes in the surrounding area, glare impacts are not anticipated.

Thermal: Thermal impacts resulting from the construction and operation of the solar array are not proposed. A study in the UK concluded that large solar parks cause up to 5.2 degrees C cooling under the panels during the summer and up to 1.7 degrees C warming during the winter. (Ref. IOP Publishing Environmental Research Letters “Solar park microclimate and vegetation management effects on grassland carbon cycling” by Alona Armstrong, Nicholas J Ostle, and Jeanette Whitaker published July 13, 2016.)

Likewise, the state of Massachusetts concluded that *“there is no solar ‘heat island’ effect caused by the functioning of solar arrays”*. (Ref. June 2015 Massachusetts Department of Energy Resources “Clean Energy Results Question & Answers Ground-Mounted Solar Photovoltaic Systems”)

Noise: Noise producing equipment is proposed to be strategically located to minimize noise impacts to neighboring properties. A full noise study will be provided at the preliminary stage based on detailed plans. The proposed project will conform to the requirements of the noise ordinance (less than 53 dBA at abutting property lines per Johnston General Legislation Article II, Section 224-6, Part C, Table I).

10.0 Zoning Ordinance

The following items in **Section 340.27.1.E.2 (a)-(p)** are specifically addressed:

a) Johnston natural resources shall be preserved to the maximum extent possible.

The natural resources of Johnston will be preserved to the maximum extent possible in accordance with all town ordinances and RIDEM. No trees will be removed beyond what is necessary for solar development. No alterations of freshwater wetlands or wetland buffers are proposed. A wildflower pollinator habitat is proposed within the solar array and the fence will be raised a minimum of 6" to allow small wildlife to access the array.

b) Erosion and sedimentation shall be controlled during and after construction and shall not adversely affect adjacent or neighboring property or public facilities or services.

Erosion and sedimentation will be controlled in accordance with the standards put forth by RIDEM through the use of sediment traps, sediment basins, silt fences, straw waddles, and re-vegetation measures. No adverse effects will occur on neighboring properties (additional detail will be provided at the site plan review stage).

c) Increased runoff due to the development on the site shall not be injurious to any downstream property owner or cause hazardous conditions on adjoining streets.

Runoff due to the solar development will be controlled in accordance with RIDEM standards through the use of detention basins, infiltration basins, dry swales, and other protective measures. No hazardous conditions will occur on neighboring properties or streets. Conceptual stormwater management areas are shown on the site plans (additional detail will be provided at the site plan review stage).

d) Direct discharge of untreated stormwater runoff to a wetland or watercourse from impervious surfaces, including, but not limited to, roadways, parking lots, driveways, basements, and roofs shall not be allowed.

All stormwater runoff due to the solar development will be directed to detention and infiltration basins. Additionally, BMP's such as grass swales and pervious stone areas will provide water quality control for the proposed crushed stone access road. The proposed solar panels produce no sediments or pollutants, and the impervious areas are limited to isolated concrete pads for equipment placement.

e) The proposed development shall not result in pollution of ground or surface waters, other than that anticipated under normal development practices with adequate mitigating measures to prevent significant impacts.

BMP's such as grass swales and stone areas will provide water quality control for the proposed crushed stone access road. The proposed solar panels produce no sediments or pollutants.

f) The movement of vehicular and pedestrian traffic within the site in relation to access streets shall be safe and convenient, and adequate provision shall be made for snow removal.

During construction, a 20-foot-wide crushed stone access driveway will be constructed within the site to allow for the movement of construction vehicles. After construction is complete, the access driveway will be utilized for infrequent service, maintenance calls and emergency vehicle access if needed.

g) Vehicular entrances and exits shall not be located within 75 feet of any street intersection.

The proposed crushed stone access driveway is located on Winsor Avenue. Minimal traffic will be generated by the development once in operation. The nearest street intersection is approximately 150' from the access driveway entrance. No impact on surrounding streets is anticipated.

h) Traffic generated by the development shall not create significant congestion on the adjoining and nearby street system.

There will be construction traffic for the various construction activities such as tree removal and processing, import and export of site material, general construction vehicles, and import of solar system equipment etc. After construction completion, the facility will generate very low traffic volume with only periodic site visits by technicians to check or troubleshoot equipment and/or grounds maintenance crews to maintain vegetation, etc.

i) Adequate off-street parking and loading shall be provided to prevent on-street traffic congestion.

There will be construction traffic for various construction activities as stated above. Adequate parking will be provided within the site for all construction traffic. Once construction is complete, minimal traffic will be generated by the facility. Parking will be provided within the facility for maintenance purposes.

j) No development shall be allowed where there is unrestricted access to the public streets or where the public street must be utilized to maneuver in and out of a parking space.

The proposed crushed stone access driveway is located on Winsor Avenue. Minimal traffic will be generated by the development and will have minimal impacts on surrounding streets. No parking spaces are located on the street.

k) Buildings and the grounds adjoining them shall permit easy access and operation of fire, police and other emergency vehicles.

The 20-foot-wide crushed stone access driveway and proposed hammerhead turnarounds allow for easy fire department access. The fire department will have access to a lockbox installed on the outside of the perimeter security fence.

l) Sensitive environmental land features such as steep slopes, wetlands and large outcroppings shall be preserved and protected.

Any proposed developments shall take place outside of the required RIDEM buffers from any wetlands. Grading will be minimized to the extent practical for optimal panel efficiency. Disturbed areas will be stabilized with pollinator wildlife habitat.

m) Buffering elements in the form of architectural design and landscape design that provide a logical transition to adjoining existing or permitted uses shall be provided.

Landscaping will be designed to supplement existing vegetation to restrict views into the solar project and preserve the scenic and rural character along roadways and neighborhoods near and around the site. A full landscape plan will be provided at the site plan review stage.

n) Glare from the installation of outdoor lights and signs and from the movement of vehicles on the site shall be shielded from the view of adjacent properties in a residential zone.

The solar facility does not require artificial lighting as part of the project, so no lighting impacts are proposed. Once in operation, the movement of service vehicles on the site will be shielded by the natural buffering and landscape buffering.

o) Abutting properties and Town amenities shall not be degraded by undue disturbances caused by excessive or unreasonable noise, smoke, vapors, fumes, dust, and odors.

This project will not create any significant emissions of smoke, dust, fumes, or other noxious gasses. The greatest contributor to emissions will be from heavy equipment during the construction of the site. Dust produced during construction will be controlled by utilizing a water wagon and/or other means as deemed acceptable by the Town and per the Soil Erosion and Sediment Control Plan. Since dust potential is a temporary construction condition, no adverse effects to air quality are expected.

p) Special buffer and screening requirements for I-L Districts:

The development is located in an R-40 District; therefore, no special buffering or screening is required. However, landscaping will be designed to supplement existing vegetation to restrict views into the solar project and preserve the scenic and rural character along roadways and neighborhoods near and around the site.