

**SIEMENS INDUSTRY, INC.**

**STORMWATER POLLUTION  
PREVENTION PLAN (SWPPP)**

**COLUMBIA UNIVERSITY/SUN EDISON  
REMOTE METERING SOLAR ENERGY PROJECT  
JOHNSON FARM, 121 JOHNSON ROAD  
CHESTER, NEW YORK 10918**



**TAX LOT SECTION 1, BLOCK 1, LOT 14, 83.8 ACRES+/-  
TOWN OF CHESTER, ORANGE COUNTY, NEW YORK**

**PREPARED BY:**  
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22 MULBERRY STREET SUITE 2A  
MIDDLETOWN, NEW YORK 10940  
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PROJECT 15-255

**REPRESENTING:**  
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**JANUARY 22, 2016**

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### TABS:

A. USDA WEB SOIL SURVEY

## **NARRATIVE**

Columbia University operates the Lamont-Doherty Earth Observatory (LDEO) at their campus located at 61 Route 9W, Palisades, New York 10964. To reduce the cost of electrical power purchased from Orange & Rockland Utilities, they propose to construct a ground-mounted, remotely metered, 2MW photovoltaic solar array on the Johnson Farm located at 121 Johnson Road in the Town of Chester, Orange County, New York.

The project site is an 83.8 acre parcel owned by Johnson Realty and is located to the east of Johnson Road in the Town of Chester, New York. The lot is listed as Town of Chester Tax Lot Section 1, Block 1, Lot 4.

Total project disturbance will be less than an acre and will not increase runoff over pre-development levels, water quality control measures and water quantity control measures are not required and the Stormwater Pollution Prevention Plan (SWPPP) will consist of an Erosion & Sediment Control Plan.

### **EXISTING SITE –**

- 83.8 acres agricultural farm
- Various Farm Buildings
- Existing stormwater system

**PROPOSED SITE –** Our client proposes to improve the site in the following way:

- 2MW photovoltaic solar energy array
- Slow growth grasses underneath the array
- 6' high chain link fencing and gate along the perimeter of the array
- Pad-mounted electrical equipment
- Underground electrical cable
- Overhead poles and primary electrical cable

The total area of disturbance is less than one acres. No trees are proposed to be cleared for the construction of the array. No areas are proposed to be regraded for the construction of the array.

## SOILS

The soils map for the area indicated that the lot was is composed of Class C and D hydrological soils with the following characteristics. See Tab A for a more detailed breakdown of soil types and areas.

## WATER MANAGEMENT

- Slow Drainage

## WATER FEATURES

Hydrologic Group: C and D

Flooding:

- Frequency – outside the 500 year flood plain as shown on FEMA flood map
- Potential Frost Action - moderate to high

## SPDES

The SPDES General Permit for Stormwater Discharges during Construction GP-0-10-000 covers disturbances of up to 5 acres

The following sections will identify a methodology for mitigating post construction site conditions, erosion and sediment control and construction practices, existing and post construction hydrologic data, and Erosion & Sediment Control objectives to address during construction activity. These implemented practices should limit erosion & sediment runoff and discharge impacts within the project site and the area surrounding the project site to the maximum extent practicable.

While the final plan may vary somewhat from this initial design, the values will be updated but the methodology will remain the same. The amount of impervious surface that is removed shall be updated to maintain the post-development peak flow at or below the pre-development peak flow rate.

## **EROSION AND SEDIMENT CONTROL**

The erosion and sediment control practices and the design of erosion and sediment control plans were prepared in accordance with “New York State Standards and Specifications for Erosion and Sediment Control, 8/05 ed.”

### 1. Planned Erosion and Sedimentation Control Practices

#### a. Overall Objectives:

- (1) The overall objective of any erosion and sediment control plan is to control erosion to the maximum extent practicable at the source.
- (2) Existing vegetative cover shall be maintained to the maximum extent practicable and site disturbance shall be controlled to prevent soil disturbance beyond the “limits of disturbance” indicated on the site grading plans.
- (3) Where necessary, appropriate sediment control measures shall be installed at all existing project area drainage ways or stormwater management structures prior to the installation of erosion control measures within the project site.
- (4) All temporary erosion and sediment control measures shall be installed prior to any disturbance in any portion of the project site.

(5) All permanent erosion and sediment control measures shall be installed as early as possible or as directed by the site engineer. The only permanent measure proposed is permanent seeding.

(6) Unless specified elsewhere below, during construction activities at the project site, all erosion and sediment control measures shall be inspected and, if necessary, maintenance performed, on a weekly basis.

b. Existing Stormwater Management Facilities:

(1) All existing stormwater management facilities, if present, shall be protected at all times. Maintenance of existing facilities is the responsibility of the owner of record.

c. Limits of Disturbance and Tree Preservation and Protection:

(1) Site disturbance shall be limited to the maximum extent practicable to "Limits of Disturbance" identified on the plans.

(2) Site conditions encountered during construction activities that point toward a need to disturb areas beyond the "Limits of Disturbance" shall be brought to the attention of the site engineer before undertaken. Engineer shall verify that the appropriate erosion & sediment control measures and BMPs are in place prior to start of work.

d. Filter Fabric Silt Fence or Silt Socks:

(1) Silt fences with woven wire backing for added support to prevent collapse are to be installed prior to the disturbance of any upslope areas, and around the entire perimeter of soil stockpiles at the end of the work day to prevent sediment from entering the drainage courses.

(2) A silt fence may be used subject to the following conditions:

a) Maximum allowable slope lengths contributing runoff to a silt fence placed on a slope are:

Slope Maximum	Steepness Length (ft.)
2:1	25
3:1	50
4:1	75
5:1 or flatter	100

b) Maximum drainage area for overland flow to a silt fence shall not exceed  $\frac{1}{4}$  acre per 100 feet of fence, with maximum ponding depth of 1.5 feet behind the fence;

c) Erosion would occur in the form of sheet erosion;

d) There is no concentration of water flowing to the barrier.

(3) Inspection and maintenance shall be performed on a weekly basis and sediment material removed when “bulges” develop.

(4) Silt fences shall be removed when they are no longer needed or as directed by the site engineer.

e. Dust Control:

- (1) At site access and other disturbed areas surface dust movement and dust blowing shall be controlled to the maximum extent practicable, and especially where off-site damage may occur or create a nuisance condition if dust is not controlled.
- (2) Construction operations should be scheduled to minimize the amount of area disturbed at one time.
- (3) Buffer areas of vegetation should be left where practical.
- (4) Temporary or permanent stabilization measures shall be installed.
- (5) Should excessive dust be generated, it should be controlled by sprinkling.
- (6) Dust control measures shall be continue through dry weather periods and/or until all disturbed areas are stabilized.

f. Stabilized Construction Entrance:

- (1) A stabilized construction entrance(s) is/are to be completed prior to the start of construction activities.
- (2) Installation Criteria:
  - a) Aggregate Size: Use a matrix of 1-4 inch stone, or reclaimed or recycled concrete equivalent.
  - b) Thickness: Not less than six (6) inches.
  - c) Width: 24-foot minimum
  - d) Length: Not less than 50 feet or as directed by the site engineer



- e) Geotextile: To be placed over the entire area to be covered with aggregate. Piping of surface water under entrance shall be provided as required. If piping is impossible, a mountable berm with 5:1 slopes will be permitted.
- (3) The entrance shall be maintained in a condition which will prevent the tracking or flowing of sediment onto public rights-of-way or streets. This may require periodic top dressing with addition aggregate.
- (4) All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately.
- (5) When necessary, wheels must be cleaned to remove sediment prior to entrance onto public rights-of-way.
- (6) When washing is required, it shall be done on an area stabilized with aggregate, which drains into an approved sediment-trapping device.
- (7) All sediment shall be prevented from entering storm drains, ditches, or watercourses.
- (8) Inspection shall be performed weekly and needed maintenance shall be made promptly.
- (9) The stabilized construction entrance shall be removed when it is no longer needed or as directed by the site engineer.
- g. Diversion Swales, none are proposed at this time, but if required by the construction period engineer:
  - (1) Temporary swales are to be constructed to:

- a) To divert flows from entering a disturbed area.
  - b) Intermittently across disturbed areas to shorten overland flow distances.
  - c) To direct sediment laden water along the base of slopes to a trapping device.
  - d) To transport offsite flows across disturbed areas such as rights-of-way.
- (2) Swales collecting runoff from disturbed areas shall remain in place until the disturbed areas are permanently stabilized.
- (3) Where necessary, diversion swales are to be installed prior to the disturbance of areas.
- (4) Stabilization of the swale shall be completed within 7 days of installation in accordance with the appropriate standard and specifications for vegetative stabilization or stabilization with mulch as determined by the time of year.
- (5) The flow channel shall be stabilized as per the following criteria:

Channel Grade	Type of Treatment
0.5 - 5.0%	Seed and straw mulch
5.0 – 8.0%	Seed and cover with RECP, sod, or line with plastic or 2 in. stone
8.1 to 20%	Line with 4-8 in. stone or or geotextile

- (6) Inspection and maintenance shall be performed on a weekly basis and repairs made promptly.

- (7) Swales shall be filled in or graded when they are no longer needed or as directed by the site engineer.

- h. Check Dams

- i. Soil Stockpile Areas:

- (1) Soil stockpile areas shall be established as soon as erodible material is excavated or collected.
- (2) Soil stockpile areas shall be located where shown on the plans or as directed by the site engineer.
- (3) Silt filter fencing shall be in place around the entire perimeter of the stockpile at the end of each workday.
- (4) Depending on time of year stockpiles shall be stabilized by seeding or mulch as directed by the site engineer.

- j. Stabilization of Disturbed Areas:

- (1) Temporary stabilization of disturbed areas: depending on time of year shall include seeding and/or mulching applied to disturbed areas as soon as practicable or as directed by the site engineer.
- (2) Temporary stabilization of disturbed areas: type of seed and the application rates for seeding and mulching shall be as specified on the plans.

- (3) Temporary stabilization of disturbed areas: must be used on areas not under construction that will be exposed for more than 14 days.
  - (4) Permanent stabilization of disturbed areas: shall include seeding and mulching, and may include soil augmentation and the application of fertilizer as directed by the site engineer.
  - (5) Permanent stabilization of disturbed areas: type of seed and the application rates for seeding and mulching shall be as specified on the plans, and soil augmentation and the application rate of fertilizer shall be as directed by the site engineer.
  - (6) Permanent stabilization of disturbed areas: shall be completed as soon as possible after construction activities in an area are completed.
  - (7) Permanent stabilization of disturbed areas with seed and mulch should be undertaken from March to May and September to October 15, and temporary stabilization can be utilized through November.
- k. Permanent Erosion and Sediment Control Measures:
- (1) Permanent erosion and sediment control measure to stabilize the project site (stabilization seeding) as indicated on the site development plans should be performed as soon as possible after completion of grading.
  - (2) All permanent erosion and sediment control measures designed and implemented must be properly maintained in order to remain functional.

**1. Construction Schedule**

- a. Obtain plan approval and other applicable permits.
- b. Hold pre-construction conference at least one week prior to starting construction, which is to be attended by the owner and the owner's contractor and site engineer.
- c. At least 7 days before starting any earth disturbance activities, all contractors involved in those activities shall notify the New York One Call System Incorporated at 1-800-962-7962 for buried utilities locations.
- d. Construct stabilized construction entrance(s), as required.
- e. Sediment control measures shall be installed at all existing project area drainage ways or stormwater management structures prior to the installation of erosion control measure within the project site.
- f. Flag the limits of disturbance and vegetation to be preserved and protected.
- g. Install filter fabric silt fencing or silt soxx.
- h. Installation of driven pile foundations for solar module racking system.
- i. Construction of proposed solar array.
- j. Inspections as required.
- k. Construction of underground and overhead utility services.

- l. Permanently vegetate, landscape, and mulch.
- m. Install fencing and gate.
- n. After the site is stabilized, remove all temporary measures
- o. Estimated time before final stabilization—6 months.

NOTES:

1. The operator shall assure that the approved stormwater management plan is properly and completely implemented.
2. Construction vehicles and equipment may neither enter directly nor exit directly from the site without a construction entrance. Measures must be taken to prevent soil and sediment from a vehicle's tires from being deposited onto the public road.
3. Before initiating any revisions to the approved stormwater management plan or revisions to other plans that may affect the effectiveness of the approved plan, the operator must receive approval of the revisions from the design engineer
5. The operator shall assure that the stormwater management plan has been prepared, approved by the design engineer, and is being implemented and maintained for all soil and/or rock spoil and borrow areas, regardless of their locations.
6. The stormwater management plan mapping must display a NY ONE CALL SYSTEM INCORPORATED symbol including the site identification number. (This is a numbered symbol not a note.)

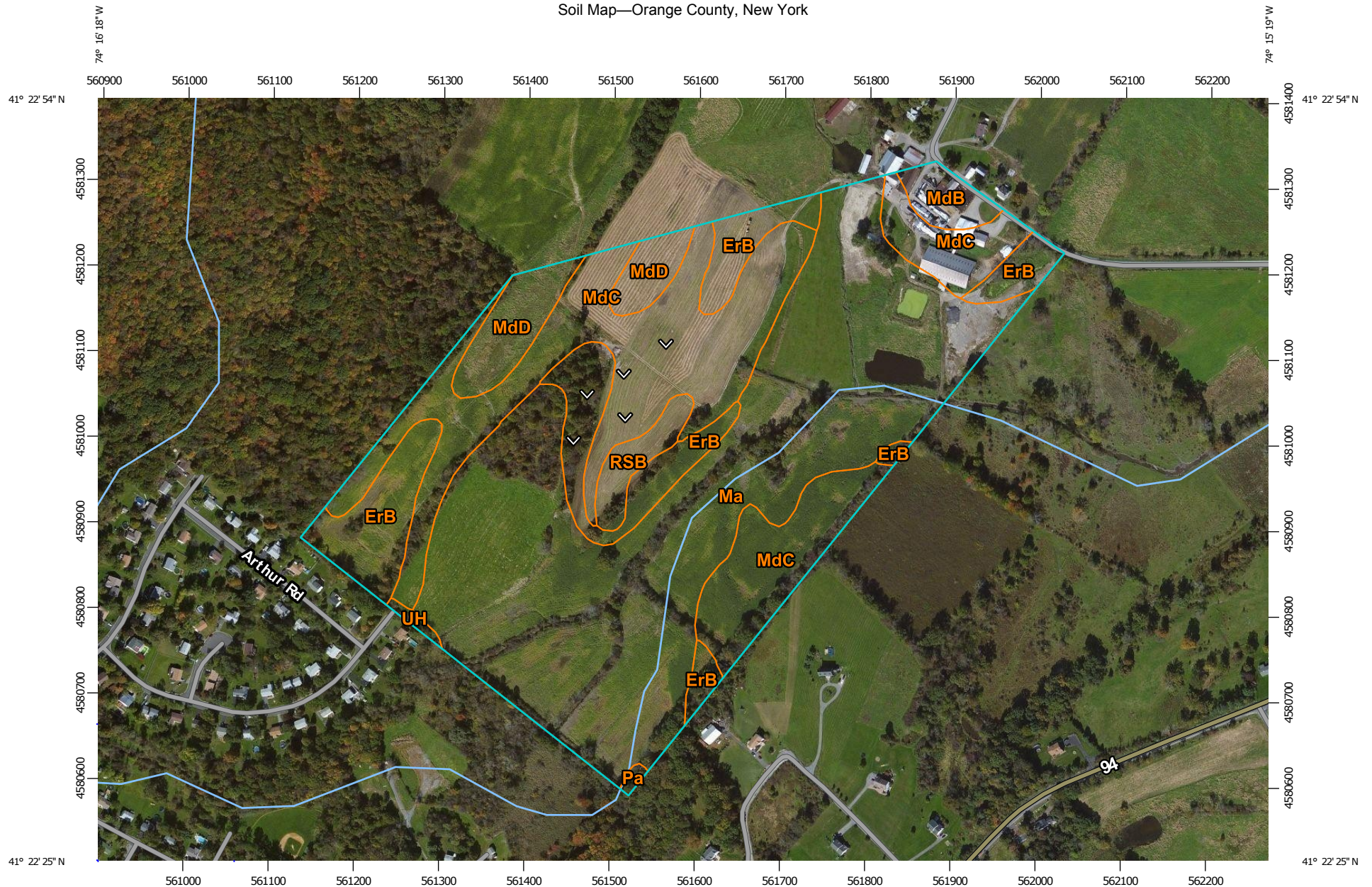
7. Immediately after earth disturbance activities cease, within 14 days, the operator shall stabilize any areas disturbed by the activities. During non-germinating periods, mulch must be applied at the specified rates. Disturbed areas which are not at finished grade and which will be redistributed within 1 year must be stabilized in accordance with the temporary vegetative stabilization specifications. Disturbed areas which are at finished grade or which will not be redistributed within 1 year must be stabilized in accordance with the permanent vegetative stabilization specifications.
8. The operator shall remove from the site, recycle, or dispose of all building materials and wastes in accordance with all applicable state and local codes. The contractor shall not illegally bury, dump, or discharge any building material or wastes at the site.

**APPENDIX A**

**WEB SOIL SURVEY**



# Soil Map—Orange County, New York



Map Scale: 1:6,280 if printed on A landscape (11" x 8.5") sheet.

0 50 100 200 300 Meters

0 300 600 1200 1800 Feet

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84



**Natural Resources  
Conservation Service**

Web Soil Survey  
National Cooperative Soil Survey

10/15/2015  
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## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>  
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Orange County, New York  
Survey Area Data: Version 15, Sep 17, 2014

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 20, 2011—Oct 10, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.



## Map Unit Legend

Orange County, New York (NY071)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
ErB	Erie gravelly silt loam, 3 to 8 percent slopes	10.9	13.2%
Ma	Madalin silt loam	41.0	49.8%
MdB	Mardin gravelly silt loam, 3 to 8 percent slopes	1.5	1.8%
MdC	Mardin gravelly silt loam, 8 to 15 percent slopes	23.1	28.1%
MdD	Mardin gravelly silt loam, 15 to 25 percent slopes	3.9	4.8%
Pa	Palms muck	0.1	0.2%
RSB	Rock outcrop-Nassau complex, undulating	1.6	1.9%
UH	Udorthents, smoothed	0.2	0.3%
<b>Totals for Area of Interest</b>		<b>82.3</b>	<b>100.0%</b>