



Consulting
Engineers and
Scientists

Wetland and Waterbodies Delineation Report Borrego Solar Systems, Inc.

153 YMCA Road
Amsterdam, New York

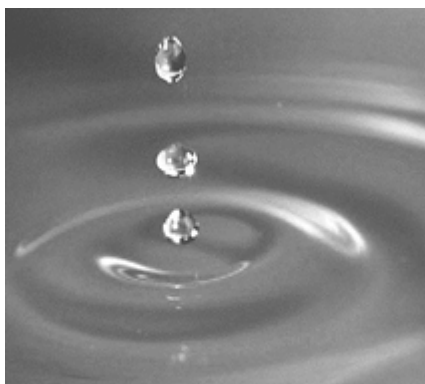
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Project No. 2003593



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Abbreviations and Acronyms

CWA	Clean Water Act
FEMA	Federal Emergency Management Act
FIRM	Flood Insurance Rate Map
GEI	GEI Consultants, Inc., P.C.
JD	Jurisdictional Determination
MSL	Mean Sea Level
NHD	National Hydrography Dataset
NRCC	Northeast Regional Climate Center
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
NYSDEC	New York State Department of Environmental Conservation
OHWM	Ordinary High-Water Mark
PFO	Palustrine Forested
PEM	Palustrine Emergent
PSS	Palustrine Scrub-Shrub
USACE	United States Army Corps of Engineers
USACE Manual	1987 United States Army Corps of Engineers Wetlands Delineation Manual
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WOTUS	Waters of the United States
WSS	Web Soil Survey

Executive Summary

The site located at 153 YMCA Road, Amsterdam, New York is being assessed for development of a ground-mounted wind power generation system. GEI Consultants, Inc., P.C. (GEI) was contracted to complete a wetland and waterbody delineation for all wetlands and waters of the United States (WOTUS). This wetland and waterbody delineation included a database review of U.S. Geologic Survey (USGS) Topographic Map Series and National Hydrography Dataset (NHD), U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI), New York State Department of Environmental Conservation (NYSDEC) Environmental Resource Mapper (ERM), U.S. Department of Agriculture Natural Resources Conservation Service (USDA NRCS) Soil Survey, and Federal Emergency Management Act (FEMA) Floodplain Data. After database review, onsite field surveys were conducted using the Routine On-Site Determination method as described in the 1987 U.S. Army Corps of Engineers Wetlands Delineation Manual (USACE Manual) and Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region.

The database review identified no wetlands within the Site listed on NWI or NYSDEC Wetland mapper. Six different soils were identified within the Site, two of which are considered hydric.

The field surveys revealed six scrub/shrub wetland systems, one forested wetland system, and one pond surrounded by an emergent wetland system. From the database review and field surveys, Wetlands AB, C, D, GH, and I are anticipated to be under the jurisdiction of the USACE. If development is pursued, a Jurisdictional Determination (JD) should be requested from the USACE. An Approved JD could be appropriate in this case as Wetlands E, F, and J may not be under the jurisdiction of the USACE. None of the wetlands are anticipated to be under the jurisdiction of the NYSDEC.

1. Introduction

1.1 Site Location and Setting

The property located at 153 YMCA Road, Amsterdam, New York (Site) is 135.6 acres; the delineation area that is being considered for potential development of a wind farm is 95.9 acres. The Site is located in the Town of Amsterdam, New York, south of YMCA Road and ½ mile north of Shellstone Road (Figure 1). The Site consists mostly of undeveloped successional shrubland. Small areas of mature forest are also present in the eastern and southern portions. The surrounding land use consists of a mix of residential, undeveloped, and agricultural parcels.

Elevations at the Site range from approximately 1030 to 1200 feet above mean sea level. The topography of the Site generally slopes downward to the north and northeast (United States Geological Survey [USGS] Topographic Map).

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) (<http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>), with the exception of one woodland pocket of Varick silt loam (0 to 3 percent slopes) located on the northeast portion of the Site and three woodland pockets of Varick silt loam (3 to 8 percent slopes) located on the southwestern portion of the Site, none of the other soils are classified as hydric. The Site is primarily mapped as Arnot-Angola channery silt loam (3 to 8 percent slopes), Arnot channery silt loam (8 to 15 percent slopes, rocky), and Tuller channery silt loam.

Per the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 36057C0380E (effective date January 19, 2018), the Site is located in an area of minimal flood hazard (Zone X). This is defined as an area determined to be outside of the 0.2% annual chance of flood (i.e. outside of the 500-year flood plain).

2. Methodology

Before a site visit was conducted, GEI reviewed several resource reference maps covering the Site. These included: the USGS Duanesburg Quadrangle Topographic Map; the USDA NRCS Soils Map, the NYSDEC Environmental Resource Mapper; and the USFWS NWI map. These maps identify potential drainageways, soil units, wetlands, and streams within the Site.

GEI walked the Site on October 28, 29, 30 and November 19 and 20, 2020 to determine the extent and regulatory status of any wetlands and streams present on site. Wetland areas were identified and delineated in accordance with the USACE Manual (Environmental Laboratory, 1987) and the Northcentral and Northeast Regional Supplement (USACE, 2012).

Soils, vegetation, and hydrology were observed and recorded to determine the potential presence of wetland habitats. A soil test pit was dug at representative wetland areas to examine soils for evidence of hydric soil indicators. The soil profile was described, and key characteristics including color and presence of redox concentrations were recorded. Soil colors were determined using Munsell Soil Color Charts (Munsell Color, 2010). Vegetation was evaluated at each soil pit location to determine the presence of hydrophytic plant communities. Wetland indicator status was obtained for each species referring to the USACE Northcentral and Northeast 2016 Regional Wetland Plant List (Lichvar, et al. 2016). Wetland hydrology indicators were also assessed at each soil pit location, including the presence of standing water, soil saturation within 12 inches of the surface, and/or evidence suggesting episodes of past inundation. Direct observations and indicators of wetland hydrology were evaluated and recorded. A Cowardin classification identification code was assigned to each wetland area based upon the representative wetland features and the Cowardin classification system definitions (Cowardin, et al. 1979).

The wetland boundary and data points were then mapped with a Trimble GNSS receiver to facilitate sub-meter accuracy. Representative photographs of the wetlands and project area were taken and are included in this report (Appendix A).

3. Findings

3.1 Database Review

During the database review, various data sources were consulted to identify potential drainageways, soil units, wetlands, streams, and floodplains within the Site. The NRCS soil survey maps indicated six different soil types, two being rated hydric. No potential wetlands were mapped on the Site via NYSDEC ERM or via NWI maps (Figure 1). Per the FEMA FIRM 36057C0380E (effective date January 19, 2018), the Site is located in an area of minimal flood hazard (Zone X). This is defined as an area determined to be outside of the 0.2% annual chance of flood (i.e. outside of the 500-year flood plain).

3.2 Wetlands

GEI assessed the site on October 28, 29, and 30, 2020 and November 19 and 20, 2020 and found approximately nine (9) percent of the Site (8.2-acres) consists of wetlands (Figure 1). Eight (8) wetlands were delineated on the Site, labelled Wetlands AB, C, D, E, F, GH, I, and J. The wetland areas identified within the Site and their Cowardin description is summarized in Table 1 below and a summary of each of these wetlands follows.

Table 1 – Delineated Wetlands

Feature ID	On-Site Acreage	Cowardin Classification	Description
Wetland AB	1.79	PFO1E	Forested wetland dominated by American elm. Connected to Wetland C through a culvert.
Wetland C	1.65	PSS1E	Scrub/shrub wetland dominated by silky dogwood and connected to Wetland AB through a culvert.
Wetland D	0.22	PUB4F/PEM1E	Unconsolidated, semi-permanent pond wetland dominated by jewelweed and sensitive fern.
Wetland E	1.69	PSS1E	Scrub/shrub wetland dominated by silky dogwood and gray dogwood.
Wetland F	0.08	PSS1E	Scrub/shrub wetland dominated by dogwoods and sensitive fern.

Feature ID	On-Site Acreage	Cowardin Classification	Description
Wetland GH	2.46	PSS1E	Scrub/shrub wetland dominated by silky dogwood and Morrow's honeysuckle.
Wetland I	0.25	PSS1E	Scrub/shrub wetland dominated by silky dogwood, box elder, and giant goldenrod.
Wetland J	0.06	PSS1E	Scrub/shrub wetland dominated by silky dogwood, gray dogwood, and giant goldenrod.
Total Acreage	8.2		

Notes:

*Acreage within Site based on approximate site boundary lines

PFO1E = palustrine forested broad-leaved deciduous system, seasonally flooded/saturated

PSS1E = palustrine scrub/shrub wetland, seasonally flooded/saturated

PUB4F = palustrine unconsolidated bottom semi-permanent pond

PEM1E = palustrine emergent wetland, seasonally flooded/saturated

Wetland AB is a forested wetland located in the northeastern corner of the Site (Figure 1 and Appendix A, Photos 1 and 2). The forested wetland consists of a canopy of American elm (*Ulmus americana*) with a sparse understory of staghorn sumac (*Rhus typhina*) and gray dogwood (*Cornus racemosa*). The herbaceous layer within the wetland is dominated by wrinkle-leaf goldenrod (*Solidago rugosa*) and flat-top goldenrod (*Euthamia graminifolia*). The soil layer from 0 to 9 inches deep in Wetland AB exhibits the hydric soil indicator Redox Dark Surface (F6), a hue of 10YR with a matrix/chroma of 3/2 and 8 percent redox concentrations of color 5YR 3/4. The wetland sample point also exhibits positive wetland hydrology due to the presence of drainage patterns and geomorphic position. This wetland is thought to be hydrologically connected to Wetland C via a culvert that passes under the road.

Wetland C is a scrub/shrub wetland located in the northern portion of the Site (Figure 1 and Appendix A, Photos 3 and 4). The wetland consists of a sparse canopy of American elm (*Ulmus americana*) with a dense understory of gray dogwood (*Cornus racemosa*) and silky dogwood (*Cornus amomum*). The herbaceous layer within the wetland is dominated by wrinkle-leaf goldenrod (*Solidago rugosa*) and flat-top goldenrod (*Euthamia graminifolia*). Soils within the wetland display the Redox Dark Surface (F6) hydric indicator in the soil layer from 0 to 9 inches deep, a hue of 10YR with a matrix/chroma of 3/2 and 8 percent redox concentrations of color 5YR 3/4. The wetland sample point also exhibits positive wetland hydrology due to the presence of drainage patterns and geomorphic position. This

wetland was observed to drain into a drainage ditch along the road which drains into the culvert connected to Wetland AB.

Wetland D is an isolated, semi-permanent depression surrounded by emergent wetland plants located in the central-eastern portion of the Site (Figure 1 and Appendix A, Photos 5 and 6). Herbaceous cover within the wetland is dominated by sensitive fern (*Onoclea sensibilis*), spotted jewelweed (*Impatiens capensis*), and duckweed (*Lemna minor*) was found floating on the surface. Wetland D exhibits the Depleted Matrix (F3) hydric soil indicator in the soil layer from 0 to 6 inches deep, a hue of 10YR with a matrix/chroma of 4/2, and 10 percent prominent redox concentrations. Wetland hydrology indicators are also present in the form of geomorphic position and saturation visible on aerial imagery. Surface water is present in the southern portion of Wetland D. This wetland is thought to be hydrologically isolated.

Wetland E is a scrub/shrub wetland situated in the northwestern portion of the Site (Figure 1 and Appendix A, Photos 7 and 8). Understory cover within the wetland is dominated by gray dogwood (*Cornus racemosa*) and silky dogwood (*Cornus amomum*). Herbaceous cover within the wetland includes sensitive fern (*Onoclea sensibilis*) and giant goldenrod (*Solidago gigantea*). Soils within the wetland display the Redox Dark Surface (F6) hydric indicator in the soil layer from 8 to 12 inches deep, a hue of 10YR with a matrix/chroma of 3/2 and 5 percent redox concentrations of color 7.5YR 3/4. The wetland sample point also exhibits positive wetland hydrology due to geomorphic position and passing the FAC-Neutral Test.

Wetland F is a small, isolated scrub/shrub wetland situated in the central-eastern portion of the Site (Figure 1 and Appendix A, Photo 9). The understory cover within the wetland consists of gray dogwood (*Cornus racemosa*) and silky dogwood (*Cornus amomum*). Herbaceous cover within the wetland includes sensitive fern (*Onoclea sensibilis*) and giant goldenrod (*Solidago gigantea*) and flat-top goldenrod (*Euthamia graminifolia*). Soils within the wetland display the Redox Dark Surface (F6) hydric indicator in the soil layer from 8 to 12 inches deep, a hue of 10YR with a matrix/chroma of 3/2 and 5 percent redox concentrations of color 7.5YR 3/4. The wetland sample point also exhibits positive wetland hydrology due to geomorphic position and passing the FAC-Neutral Test.

Wetland GH is a scrub/shrub wetland along the eastern edge of the Site (Figure 1 and Appendix A, Photo 10). The wetland consists of a sparse canopy of green ash (*Fraxinus pennsylvanica*) and red oak (*Quercus rubra*) with a dense understory of silky dogwood (*Cornus amomum*) and Morrow's honeysuckle (*Lonicera morrowii*). The herbaceous layer within the wetland is dominated by giant goldenrod (*Solidago gigantea*). Soils within the delineated wetland display the Depleted Matrix (F3) hydric indicator in the soil layer from 8 to 14 inches deep, a hue of 10YR with a matrix/chroma of 4/2 and 5 percent redox concentrations of color 7.5YR 3/3. The wetland sample point also exhibits positive wetland hydrology due to geomorphic position. This wetland continues off site to the northeast where

it drains through a culvert under a driveway. Topographic maps indicate this is the head of a tributary to South Chuctanunda Creek.

Wetland I is a scrub/shrub wetland in the central western portion of the Site (Figure 1 and Appendix A, Photo 11). The wetland consists of a sparse canopy of box elder (*Acer negundo*) and red maple (*Acer rubrum*) with a dense understory of silky dogwood (*Cornus amomum*). The herbaceous layer within the wetland is dominated by giant goldenrod (*Solidago gigantea*). Soils within the delineated wetland display the Depleted Matrix (F3) hydric indicator in the soil layer from 0 to 8 inches deep, a hue of 10YR with a matrix/chroma of 3/2. The wetland sample point also exhibits positive wetland hydrology due to geomorphic position and drainage patterns. This wetland continues off site to the west. Topographic maps indicate this wetland would drain to a tributary of Schoharie Creek.

Wetland J is an isolated scrub/shrub wetland in the central southern portion of the Site (Figure 1 and Appendix A, Photo 12). The wetland consists of a sparse canopy of green ash (*Fraxinus pennsylvanica*) with a dense understory of silky dogwood (*Cornus amomum*) and gray dogwood (*Cornus racemosa*). The herbaceous layer within the wetland is dominated by giant goldenrod (*Solidago gigantea*). Soils within the delineated wetland display the Depleted Matrix (F3) hydric indicator in the soil layer from 0 to 12 inches deep, a hue of 2.5Y with a matrix/chroma of 5/2 and 15 percent redox concentrations of color 10YR 3/6. The wetland sample point also exhibits positive wetland hydrology due to geomorphic position and passing the FAC-Neutral Test. This wetland is thought to be hydrologically isolated.

4. Conclusions

Wetlands AB, C, E, I, and GH exhibit hydrologic connections to other resources either on or off-site. Based on field surveys and database review information, these wetlands are anticipated to be a jurisdictional USACE wetland. If development is pursued, a Jurisdictional Determination (JD) should be requested from the USACE. An Approved JD would allow the USACE to determine if Wetlands D, E, F, and J are truly isolated and therefore not under their jurisdiction. Alternatively, a Preliminary JD would assume all identified resources are under their jurisdiction.

Wetlands AB, C, D, E, F, GH, I, and J are not mapped NYSDEC Freshwater Wetlands nor are they associated with any mapped NYSDEC Freshwater Wetlands. As such, these wetlands are not anticipated to be regulated by the NYSDEC.

A professional opinion of anticipated permitting requirements for impacts to state and/or federally jurisdictional wetlands and streams can be provided upon review of preliminary site plans.

5. Limitation

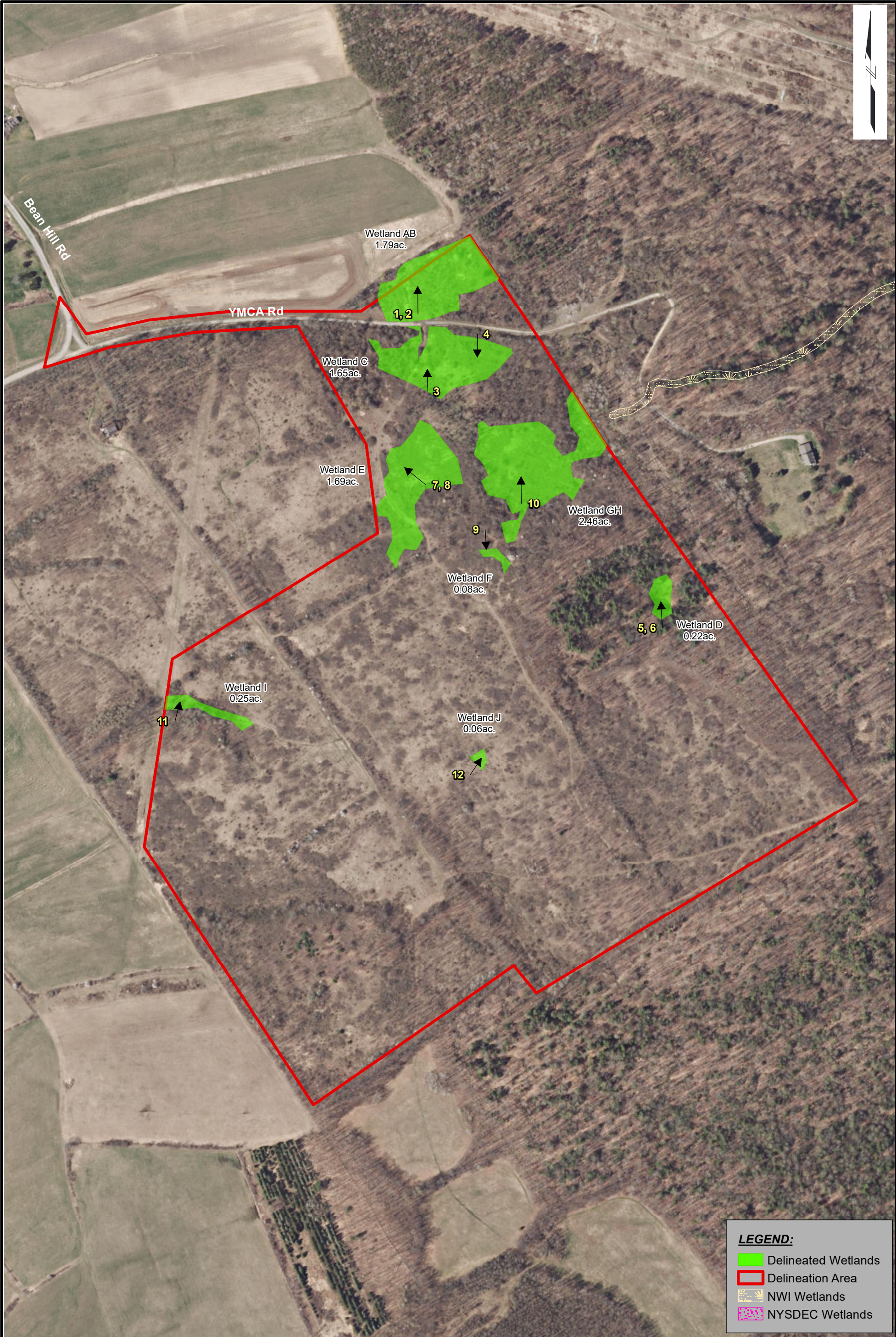
The Site investigation described in this report was conducted and prepared on behalf of and for the exclusive use of Borrego Solar Systems, Inc. No other entity may rely upon the results of the assessment or contents of this report for any reasons or purpose, whatsoever.

GEI performed this investigation in accordance with generally accepted practices of engineers, scientists, and/or consultants providing similar services at the same time, in the same locale, and under like circumstances. No other warranty, expressed or implied, is made as to the professional opinions included by GEI in this report.

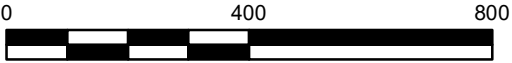
6. References

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Figure



SOURCE:
1. 2016 NYS GIS ORTHOPHOTO ACCESSED VIA ESRI
WORLD IMAGERY.



SCALE: 1" = 400'

Proposed Wind Energy Generation Site
153 YMCA Rd, Florida
Montgomery County, NY

Borrego Solar Systems, Inc.



Project 2003593

WETLAND DELINEATION
MAP

December 2020

Fig. 1

Appendix A

Photo Documentation

153 YMCA Road Inspection Photos

Date: 10/28/20 – 10/30/20 and 11/19/20 – 11/20/20

GEI Project No.: 2003593

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<i>Photo No. 1 – View of Wetland AB facing north</i>	<i>1</i>
<i>Photo No. 2 – View of soil from Wetland AB</i>	<i>1</i>
<i>Photo No. 3 – View of Wetland C facing north</i>	<i>2</i>
<i>Photo No. 4 – View of Wetland C facing south</i>	<i>2</i>
<i>Photo No. 5 – View of Wetland D facing north</i>	<i>3</i>
<i>Photo No. 6 – View of soil from Wetland D</i>	<i>3</i>
<i>Photo No. 7 – View of Wetland E facing northwest</i>	<i>4</i>
<i>Photo No. 8 – View of soil from Wetland E</i>	<i>4</i>
<i>Photo No. 9 – View of Wetland F facing south</i>	<i>5</i>
<i>Photo No. 10 – View of Wetland GH facing north</i>	<i>5</i>
<i>Photo No. 11 – View of Wetland I</i>	<i>6</i>
<i>Photo No. 12 – View of Wetland J</i>	<i>6</i>

153 YMCA Road Inspection Photos

Date: 10/28/20 – 10/30/20 and 11/19/20 – 11/20/20

GEI Project No.: 2003593

Client: Borrego Solar Systems, Inc.



Photo No. 1 – View of Wetland AB facing north



Photo No. 2 – View of soil from Wetland AB

153 YMCA Road Inspection Photos

Date: 10/28/20 – 10/30/20 and 11/19/20 – 11/20/20

GEI Project No.: 2003593

Client: Borrego Solar Systems, Inc.



Photo No. 3 – View of Wetland C facing north



Photo No. 4 – View of Wetland C facing south

153 YMCA Road Inspection Photos

Date: 10/28/20 – 10/30/20 and 11/19/20 – 11/20/20

GEI Project No.: 2003593

Client: Borrego Solar Systems, Inc.



Photo No. 5 – View of Wetland D facing north



Photo No. 6 – View of soil from Wetland D

153 YMCA Road Inspection Photos

Date: 10/28/20 – 10/30/20 and 11/19/20 – 11/20/20

GEI Project No.: 2003593

Client: Borrego Solar Systems, Inc.



Photo No. 7 – View of Wetland E facing northwest



Photo No. 8 – View of soil from Wetland E

153 YMCA Road Inspection Photos

Date: 10/28/20 – 10/30/20 and 11/19/20 – 11/20/20

GEI Project No.: 2003593

Client: Borrego Solar Systems, Inc.



Photo No. 9 – View of Wetland F facing south



Photo No. 10 – View of Wetland GH facing north

153 YMCA Road Inspection Photos

Date: 10/28/20 – 10/30/20 and 11/19/20 – 11/20/20

GEI Project No.: 2003593

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Photo No. 11 – View of Wetland I



Photo No. 12 – View of Wetland J