ENVIRONMENTAL ASSESSMENT

PROPOSED

SOUTHINGTON SOLAR ONE, LLC

SOLAR PROJECT

1012 EAST STREET

SOUTHINGTON, CONNECTICUT

HARTFORD COUNTY

Prepared for:

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July 2020

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1 Introduction

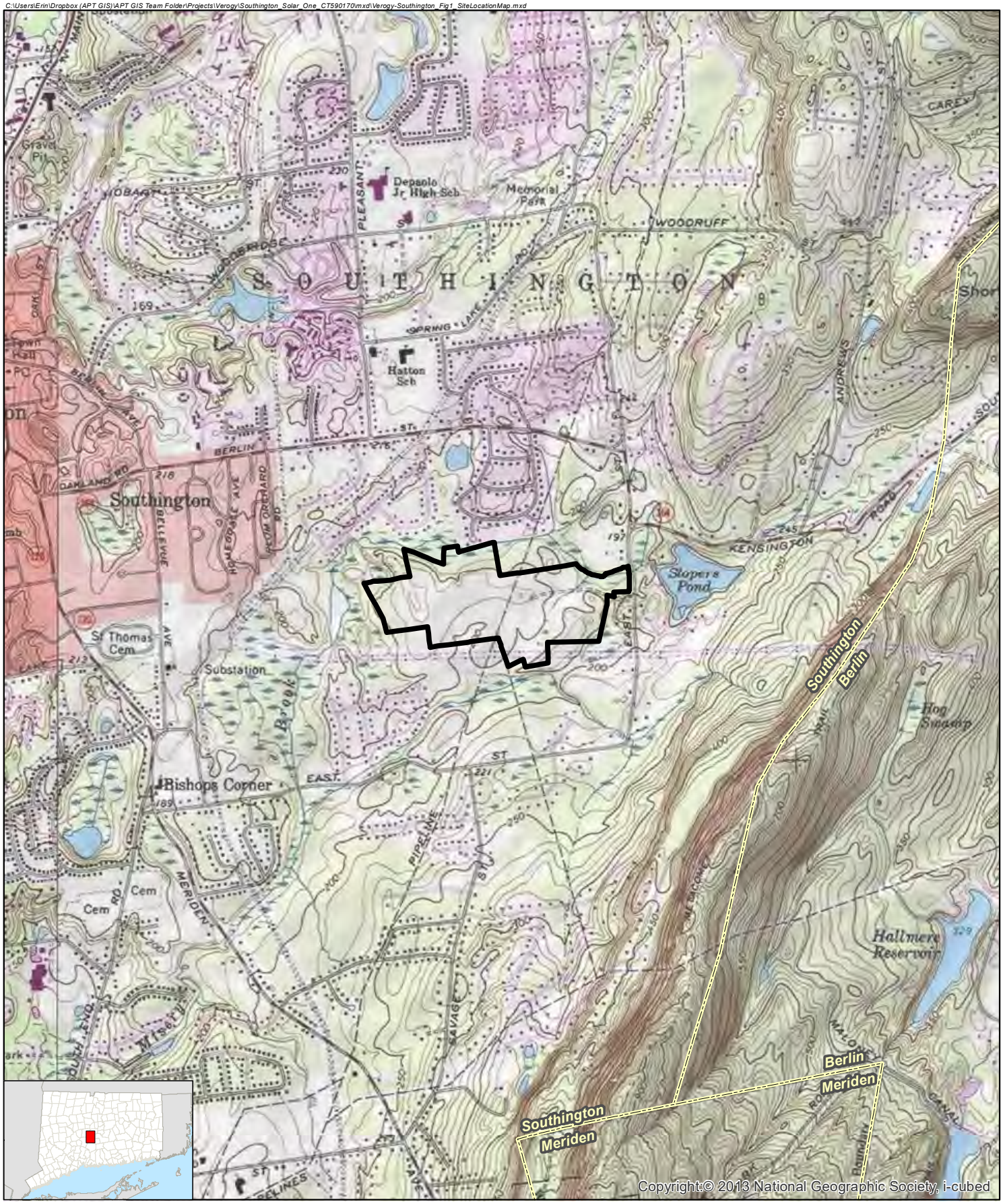
All-Points Technology Corporation, P.C. ("APT") prepared this Environmental Assessment ("EA") on behalf of Southington Solar One, LLC (hereinafter referred to as the "Petitioner") for the proposed installation of a solar-based electric generating facility having an output of ±4.725 megawatts[1] ("Project") located in the Town of Southington, Connecticut ("Town"). This EA has been completed to support the Petitioner's submission to the Connecticut Siting Council ("Council") of a petition for declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the construction, maintenance, and operation of the electric generating facility.

The results of this assessment demonstrate that the proposed development will comply with the Connecticut Department of Energy and Environmental Protection's ("DEEP") air and water quality standards and will not have an undue adverse effect on the existing environment and ecology.

The Project will be located at 1012 East Street, Southington, Connecticut ("Site"). The Site is an irregularly shaped parcel that consists of approximately 102.5 acres. The Site is mostly undeveloped active agricultural land. It is encumbered with multiple utility easements: two gas lines running roughly in a north/south direction within the central portion of the Site; an aboveground electrical transmission corridor running in an east/west direction along the southern property line; a gas easement along the north site of the electrical transmission corridor running in an east/west direction; and a Town of Southington ("Town") sewer line running in a north/south direction within the western extent of the Site. A small portion of the western and northern extents of the Site is wooded. The Site is privately-owned and zoned Residential (R-40).

Figure 1, *Site Location Map*, depicts the location of the Site and surrounding area.

[1] The output referenced is Alternating Current (AC).



Legend

Site

Figure 1
Site Location Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

Southington Solar One, LLC

N
W E
S

2,000 1,000 0 2,000
Feet

Map Notes:
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps: Meriden (1984), CT
Map Scale: 1 inch = 2,000 feet
Map Date: April 2020

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2 Proposed Project

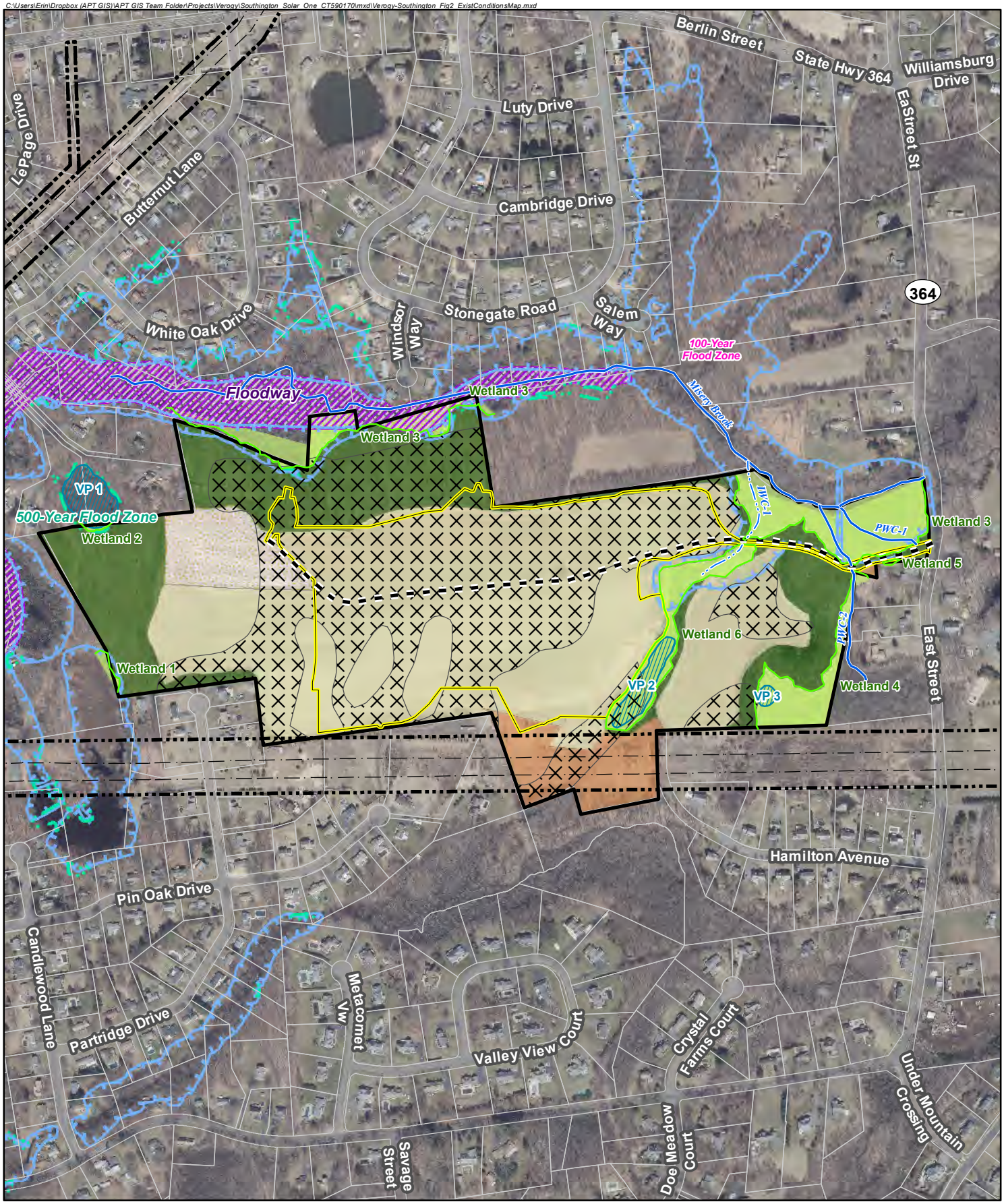
2.1 Project Setting

The Project will be primarily located within an existing agricultural field centrally located on the Site. Misery Brook flows generally east to west through a wooded corridor immediately north of the Site. Wooded land also abuts the Site to the north and west. Residential development bounds the Site to the south and east.

The Site's existing topography varies throughout with the agricultural fields being of gradual grades and the wooded areas more steeply sloped. The grades within the Project Area drop gently from north to south/southeast, with ground elevations ranging from approximately 210 feet above mean sea level ("AMSL") in the northwest to 190 feet AMSL to the southeast.

Figure 2, *Existing Conditions Map*, depicts current conditions on the Site.

The surrounding land use is characterized by residential development and undeveloped forested land with utility infrastructure located to the south and slightly farther away west of the Site. Commercial development becomes more prevalent farther to the northwest. The undeveloped expanses of the Metacomet Trail and Hubbard Park are located to the south and southeast.



Legend

- Site
- Approx. Parcel Boundary (CTDEEP)
- Utility ROW
- Transmission Line
- Project Area
- Perennial Stream
- Intermittent Stream
- Delineated Wetland Boundary
- Vernal Pool
- 100-Year Flood Zone
- 500-Year Flood Zone
- Floodway
- Access
- Prime Farmland Soils

Habitat Cover Type

- Cropland
- Hay Field
- Mixed Hardwood Forest
- Old Field
- Wetland

600 300 0 600 Feet

N W E S

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 600 feet
Map Date: July 2020

Figure 2
Existing Conditions Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

Southington Solar One, LLC

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2.2 Project Development and Operation

Upon its completion, the solar electric energy generating facility ("Facility") will consist of a total of 18,798 photovoltaic modules ("panels"), 15,678 Trina TSM-DE15MC 390W and 3,120 Risen RSM144-6 380W; 37 Solectria Solar's XGI 1500-125/125 inverters; one (1) Chint CPS SCH100KTL-DO/US-600 inverter; three (3) pad mounted switchgears; three (3) transformers[2], and one (1) service interconnection line. A ground-mounted racking system will be used to secure the panel arrays. The Facility is bisected by two existing gas easements splitting it into three sections, each of which will be surrounded by a six (6)-foot tall chain-link security fence. The proposed electrical interconnection line will follow an existing gravel access road from East Street, extending above ground from the proposed entrance to the Site, then transitioning to underground. The Facility will occupy approximately 26.4 acres of the Site with an additional ±11.05 acres of improvements beyond the fenced Facility limits, for a total of ±37.45 acres ("Project Area").

Proposed development drawings are provided in Appendix A, *Project Plans*.

The leading edge of the panels will be approximately thirty-six (36) inches above the existing ground surface, which will provide adequate room for any accumulating snow to "sheet" off. Any production degradation due to snow build-up has already been modeled into the annual system output and performance calculations. The Petitioner does not envision requiring any "snow removal" operations; rather, the snow will be allowed to melt or slide off.

Construction activities within the Project Area will include limited tree clearing; grading to incorporate stormwater best management practices; installing of erosion and sedimentation (E&S") control measures; visual screening (plantings), habitat enhancement areas, racking and module installation; electrical trenching; overhead utility interconnection, and new access road development. Approximately 0.95 acre of tree clearing will be required, most of which will be along the existing access road to accommodate the installation of underground lines and seven (7) new overhead electric utility poles for interconnection to the existing distribution system by Eversource. The remainder will be in the northwest of the Facility to accommodate stormwater management features.

[2] The proposed transformers are one (1) 250 kVA, one (1) 1,000 kVA and one (1) 2,000 kVA.

Existing grades throughout the Project Area will remain except in areas of the stormwater management features, which will require some manipulation (cuts/fills) and regrading.

The Facility is unstaffed; after construction is complete and the Facility is operable, traffic at the Site will be minimal. It is anticipated that the Facility will require mowing and routine maintenance of the electrical equipment one (1) time per year. Annual maintenance will typically involve two (2) technicians for a day. Repairs will be made on an as-needed basis.

2.2.1 Access

The Facility will be accessed from the east, utilizing an existing gravel farm road originating off of East Street and extending into the open field.

Approximately 900 feet of the existing farm road will need to be improved while an additional ±3,170 feet of new gravel roads will be constructed to provide service and maintenance vehicles access within and around the Facility and to accommodate construction. Both the improvements to the farm road and the development of new access roads will require minimal grading and gravel resurfacing and will allow for continued access to the remainder of the property.

2.2.2 Public Health and Safety

The Project will meet or exceed applicable local, state, national and industry health and safety standards and requirements related to electric power generation. The Facility will not consume any raw materials, will not produce any by-products and will be unstaffed during normal operating conditions. The Facility will be enclosed by a six (6)-foot tall chain-link fence. The entrances to the Facility will be gated, limiting access to authorized personnel only. All Town emergency response personnel will be provided access via a Knox Pad lock. The Facility will be remotely monitored and will have the ability to remotely de-energize in the case of an emergency. One (1) gate will be installed along the northern fence line of each of the three (3) fenced areas and four (4) secondary grates will be installed on southern fence lines to provide access for maintenance of stormwater management basins.

2.2.3 State, Federal and Local Land Use Plans

The Project is consistent with state and federal policies and will support the state's energy goals by developing a renewable energy resource while not having a substantial adverse environmental

effect. Although local land use requirements do not apply to this Project, it has been designed to meet the intent of the Town's land use regulations, to the extent feasible. The Site is located within the Town's Residential (R-40) Zone.

Additionally, the Project meets the goal of Chapter 7 (Page 45) of the Town's 2016 Plan of Conservation and Development which states *"…in the future, Southington should encourage and implement energy reduction, energy conservation and clean power options…".*

The Project will benefit the local community by improving electrical service for existing and future development in the Town through the availability of enhanced local generating capacity that does not rely on the congested regional electrical transmission networks.

3 Environmental Conditions

This section provides an overview of the current environmental conditions at the Site and an evaluation of the Project's potential impacts on the environment. The results of this assessment demonstrate that the Project will comply with the DEEP air and water quality standards and will not have an undue adverse effect on the existing environment and ecology.

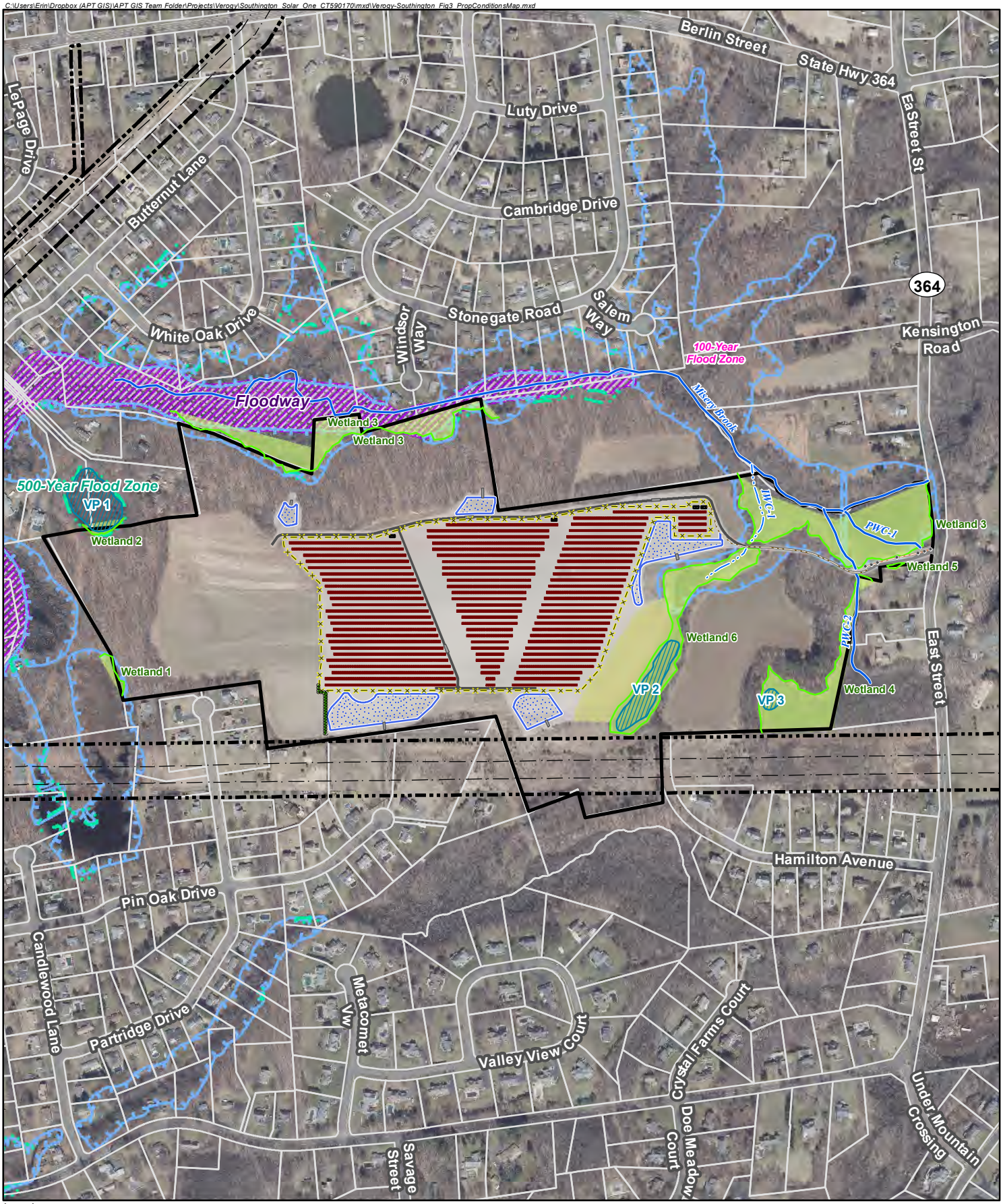
Please refer to Figure 3, *Proposed Conditions Map* for a depiction of the Project and its compatibility with the Site resources discussed herein.

3.1 Habitat and Wildlife

Five (5) habitat types (vegetative communities) have been identified on the Site. Transitional ecotones separate these distinct habitat types. Wetlands introduced in this section are described in detail in Section 3.3.1 of this report.

The varied habitats, which have the ability to support several species, are as follows:

- Cropland;
- Hay Field;
- Mixed Hardwood Forest;
- Old Field; and
- Wetland.



Legend

- Site
- Approx. Parcel Boundary (CTDEEP)
- Utility ROW
- Transmission Line
- Perennial Stream
- Intermittent Stream
- Delineated Wetland Boundary
- Delineated Wetlands Area
- Vernal Pool
- 100-Year Flood Zone
- 500-Year Flood Zone
- Floodway
- Limit of Disturbance
- Treeline (Clearing Limit)
- Perimeter Fence
- Interconnection Path (Overhead)
- Interconnection Path (Underground)
- Interconnection Utility Pole
- Solar Modules
- Conc. Equipment Pad
- Gravel Access Road
- Gravel Access Road to be Improved
- Stormwater Basin
- Stormwater Basin Outlet Gravel
- Vernal Pool Mitigation Area
- Landscape Screening

600 300 0 600 Feet

N W E S

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 600 feet
Map Date: July 2020

Figure 3
Proposed Conditions Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

Southington Solar One, LLC

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3.1.1 Habitat Types

Cropland

Northwestern extents of the Site consist of a small crop field/garden. During site inspections performed during the spring of 2020, a cover crop of rye grass dominated this regularly cultivated field.

A narrow edge of the Project Area lies within the Cropland habitat. As these cultivated fields experience routine management activities, the installation of the Project should not result in a significant impact to the functions provided by this habitat type.

Hay Field

The Hay Field habitat consists of complexes of grasses and forbs. This habitat is largely dominated by orchard grass (*Dactylis glomerata*). Other noted species include goldenrods (*Solidago spp.*), clover (*Trifolium spp.*), mugwort (*Artemesia vulgaris*), bedstraw (*Galium spp.*) and wild carrot (*Daucus carota*). Generally occurring on the central hilltop and easterly facing slope above Wetland 6, this habitat is maintained through routine mowing to harvest the hay crop. One-ton bales of hay are stored along the margins of the Hay Field area.

The majority of the Project Area lies within the Hay Field habitat. As this habitat is composed of complexes of cool season grasses maintained through routine mowing/haying, the installation of the Project should not result in a significant alteration to the ground underlying the Facility components. Minor modifications to existing conditions will result from shading beneath the panel arrays; however, post-construction vegetation maintenance will mimic or improve the current management activities within this habitat. Potential impacts resulting from the installation of the Facility include changes in density and/or species composition of cool season grasses and clovers.

Mixed Hardwood Forest

The Mixed Hardwood Forest habitat consists predominantly of mature second growth hardwoods. The forest is characterized by mostly closed canopy conditions resulting in moderate understory growth. Common tree species include black cherry (*Prunus serotina*), black oak (*Quercus velutina*), red oak (*Quercus rubra*), white oak (*Quercus alba*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*) and musclewood (*Carpinus caroliniana*). The shrub and

midstory species include burning bush (*Euonymus alatus*) and crabapple (*Malus spp.*). Coniferous trees present include scattered white pine (*Pinus strobus*), with eastern red cedar (*Juniperus virginiana*) common along the field-forest transition zone.

Groundcover and vine species include Christmas fern (*Polystichum acrostichoides*), Asiatic bittersweet (*Celastrus orbiculatus*), grapevine (*Vitis spp.*), garlic mustard (*Alliaria petiolata*), and clubmosses (*Lycopodium spp.*).

Invasive non-native species, including multiflora rose (*Rosa multiflora*), winged euonymus (*Euonymus alatus*), autumn olive (*Elaeagnus umbellata*) and Japanese honeysuckle (*Lonicera japonica*), are common where the forest borders the agricultural areas. .

Marginal Project activities are proposed only along the northernmost fringe of the existing 'edge' upland forest habitat, including the removal of select trees for shading mitigation. Therefore, the Project is not expected to result in a significant negative impact to Forested Habitat.

Old Field

Late Old Field habitat occupies areas south of the Hay Field and the southern lobe of Wetland 6. The electrical transmission corridor extends through this area. The invasive non-native autumn olive dominates; other species present include crabapple, Asiatic bittersweet, goldenrods, eastern red cedar and mugwort.

As this feature is dominated by invasive, non-native species, the wildlife value of this habitat area is heavily diminished. In addition, the Project will result in minimal impacts to this habitat. Therefore, the Project is not expected to result in a significant negative impact to Old Field habitat.

Wetland

Six (6) wetland areas were identified on the Site. As these wetlands consist of a complex of habitat types, a more detailed discussion of each wetland is provided in Section 3.3.1.

Table 1, *Habitat Assessment and Impacts Table* provides calculations of the total on-Site areas for each of the referenced habitat types and the area proposed to be impacted by the Project.

Table 1: Habitat Assessment and Impacts Table

Table 1: Habitat Assessment and Impacts Table		
Habitat Type	Total Area On-Site (+/- ac.)	Area Affected by Project (+/- ac.)
Cropland	4.5	0.06
Hay field	55.5	35.65
Mixed Hardwood Forest	25.9	1.54
Old Field	5.5	0.15
Wetlands	11.1	0.06

3.1.2 Wildlife

While a diversity of habitats is present on the Site, in general the size of each habitat and surrounding land uses create a limiting factor for utilization by wildlife. Habitat specialists, including mammals and birds, that require large contiguous habitat blocks are not supported by the existing environment on the Site. With the exception of the Hay Field, the habitat blocks are less than 10 acres in size. Mixed Hardwood Forest habitat totals more than 10 acres, but it is comprised of fragmented blocks, each less than 10 acres in size.

The Hay Field habitat, dominated by cool season grasses and forbs, is generally sufficient in size and geometry to potentially support grassland nesting birds. However, because the field is routinely hayed, it is unclear if the mowing schedule prohibits the use of this habitat by ground nesting bird species. Regardless, the mechanical manipulation undoubtably limits the utilization of these open fields by all wildlife species.

The complexity of habitats on Site provides a higher quality environment for species that are more tolerant of human disturbance, habitat fragmentation and 'edge' effects. Generalist wildlife species, including several songbirds and mammals such as raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), grey squirrel (*Sciurus carolinensis*), Virginia opossum (*Didelphus virginiana*), and eastern chipmunk (*Tamias striatus*), could be expected to use portions of the Site. The Project is not anticipated to have a significant negative impact to these generalist wildlife species.

Misery Brook is a substantial riparian corridor with intact bordering wetlands/uplands and a diversity of habitat types. As such, it has potential for supporting many diverse wildlife species. Dense residential development to the north somewhat diminishes its quality. However, Misery Brook likely represents an important migratory pathway for wildlife. Nonetheless, the Project will not encroach within 300+ feet of Misery Brook and therefore will not have a significant negative impact to this resource.

3.1.3 Core Forest Determination

APT evaluated the size and extent of the contiguous interior forest block (or "core forest") present within and adjacent to the Site using two (2) publicly available GIS-based datasets designed to assess impacts to core forest habitat. In addition, an independent evaluation was performed (based on GIS analysis of 2016 leaf-off aerial photography, field observations and professional experience). The first dataset, the Department's *Forestland Habitat Impact Mapping* [3], does not include the Site within an area mapped as core forest. The second dataset, UConn's Center for Land Use Education and Research's ("CLEAR") Forest Fragmentation Analysis ("FFA")[4] study, designates "core forest" as greater than 300 feet from non-forested habitat. This 300-foot zone is referred to as the "edge width" and represents sub-optimal breeding habitat for forest-interior birds due to decreased forest quality, increased levels of disturbance, and increased rates of nest predation and brood parasitism within this transitional forest edge ("edge effect"). The FFA study identifies three categories of core forest: small (< 250 acres); medium (250-500 acres); and large (>500 acres). Based on the FFA criteria, the Site does not contain any forested habitats identified as "core" forest. This is consistent with APT's independent analysis, which indicates that no interior forest block is located on Site. While limited forested habitat does exist on the northern and western side of the Site, this forested habitat is entirely influenced by "edge" effects and is not considered core forest habitat.

Approximately 0.95 acres of tree clearing to the northwest of the Facility and along the existing access road will be required to accommodate the installation of stormwater management features

[3] Source: http://ctdeep.maps.arcgis.com/apps/webappviewer/index.html?id=7b81844bab634281b544c20bf2d7bfb8: This spatial screening layer identifies prime contiguous and connected core forestland blocks. If the project intersects with the Forestland Habitat Impact Map there is a potential for material effects to core forest.

[4] CLEAR's FFA: http://clear.uconn.edu/projects/landscape/forestfrag/forestfrag_public%20summary.pdf

and the installation of the interconnection line; therefore, based on the assessment provided above, the proposed tree removal will not have any impacts to core forests.

In accordance with Connecticut General Statutes §16-50k(a), the Petitioner sent correspondence to DEEP Forestry in May, 2020 to demonstrate that the Project will not materially affect core forest. The Petitioner received electronic correspondence confirming that the Project will not "…have a material impact to core forest..." from DEEP Forestry on May 21, 2020.

3.2 Rare Species

3.2.1 Natural Diversity Data Base

The DEEP Natural Diversity Data Base ("NDDB") program performs hundreds of environmental reviews each year to determine the impact of proposed development projects on state listed species and to help landowners conserve the state's biodiversity. In furtherance of this endeavor, the DEEP also developed maps to serve as a pre-screening tool to help applicants determine if there is the potential project-related impact to state-listed species.

The NDDB maps represent approximate locations of (i) endangered, threatened and special concern species and, (ii) significant natural communities in Connecticut. The locations of species and natural communities depicted on the maps are based on data collected over the years by DEEP staff, scientists, conservation groups, and landowners. In some cases, an occurrence represents a location derived from literature, museum records and/or specimens. These data are compiled and maintained in the NDDB. The general locations of species and communities are symbolized as shaded (or cross-hatched) areas on the maps. Exact locations have been masked to protect sensitive species from collection and disturbance and to protect landowner's rights whenever species occur on private property.

APT reviewed the most recent DEEP NDDB mapping (December 2019[5]) to determine if any such species or habitats occur on or within 0.25-mile of the Site. The NDDB mapping reveals the Site is located within an area potentially containing Threatened, Endangered, or Special Concern species and/or critical habitats.

[5] APT subsequently reviewed updated DEEP NDDB from June of 2020 and determined that it was consistent their original review.

3.2.2 NDDB Consultation

In conformance with DEEP and Council requirements, APT submitted a review request to the NDDB with respect to this Project on February 23, 2020. APT received a response from DEEP on March 9, 2020, stating that records indicate that known extant populations of two State-listed Special Concern species exist in the vicinity of the Site: Spotted turtle (*Clemmys guttata*) and Purple milkweed (*Asclepias purpurascens*). DEEP recommended that species surveys be undertaken. Copies of APT's submission and DEEP's response are provided in Appendix B, *DEEP NDDB Correspondence.*

Spotted Turtle

The spotted turtle is a State-listed species of special concern. Spotted turtles use a variety of wetland and upland habitat types during their annual life cycle. Hibernation occurs in permanently flooded forested or scrub-shrub wetlands with emergent woody vegetation (including hummocks) that support trees and shrubs with underlying root masses. Spotted turtles generally emerge from hibernation from mid-March through early April. Movement between wetland systems throughout the year is common. In the late winter-early spring, turtles often move to vernal pools which provide sunshine for thermal gain along with an abundance of food sources, including amphibian egg masses and larvae, as well as aquatic invertebrates. Aestivation[6] occurs during the warmest periods of the summer. During this period of relative dormancy, they burrow into the leaf litter or under tangles of brush/woody debris in upland old field or forest, or within drawn-down forested wetlands. Upland early-successional herbaceous/shrubland habitats are used for nesting, particularly within areas of coarse-textured friable soils with sparse vegetation.

DEEP recommended that a formal species survey be performed. Eric Davison, of Davison Environmental, performed a spotted turtle survey on March 18th, April 7th and May 19th

A few spotted turtles were observed within a vernal pool (associated with Wetland 6) in the southeast portion of the Site. This wetland represents optimal habitat for the species, with abundant food sources (e.g., amphibian larvae, aquatic invertebrates), along with ample open water and a high degree of vegetation interspersion and hummocky microtopography for safe basking within the interior of the pool. On March 18th, a single female turtle was found basking

[6] A state of animal dormancy, similar to hibernation, although taking place in the summer rather than the winter.

on a hummock in the central portion of the pool. On April 7th, two (2) spotted turtles were observed, again basking on hummocks in the central and southern portions of the pool. The first (a second female) was captured in-hand, while the second was observed but disappeared into deep water before it could be examined. Therefore, it is unknown whether this second turtle was the female observed on March 18th, or a third individual. A spotted turtle was also observed on May 19th, but the turtle could not be captured in-hand for identification. If both the March 18th and May 19th turtles were new (as opposed to recaptured) individuals, the total number observed would be four (4) turtles.

Beyond this vernal pool, it is anticipated that these turtles utilize the old field habitat to the south of the pool (within the utility right-of-way), as well as the large forested wetland system located south of the right-of-way (offsite). Suitable nesting habitat is present in areas of the hayfield perimeter, as well as within the utility right-of-way.

In addition to a formal species survey, DEEP NDDB recommended a series of construction-related protection strategies be implemented, including: seasonal construction restrictions; providing awareness/identification training to contractors/workers prior to initiation of construction activities; establishing exclusion zones to prevent unintentional mortality to migrating spotted turtles; and compliance monitoring with these protection measures. APT has incorporated protective measures for this species within Appendix C, *Resources Protection Plan*.

Additionally, the Petitioner has committed to implementing wildlife management strategies by designing the bottom of the security fence six (6) inches above final grade. This gap will allow for unimpeded turtle (and any other small wildlife) migration and prevent individuals from being trapped within the fence line. See Appendix A, *Project Plans* for fencing details.

Key habitats utilized by the spotted turtle will remain largely intact post-development of the Project. In addition, the proposed protection measures are designed to mitigate inadvertent impact to spotted turtles during construction. As such, the Project will not a have a significant negative impact on the spotted turtle populations utilizing the Site.

Purple Milkweed

Purple milkweed's habitat typically consists of moist to dry soil types and can be found along roadsides, fields, and the borders of wooded areas. The blooming period for this species is typically between June and July. While routine farming activities have likely precluded successful propagation of purple milkweed in the past, historical records show that there is a potential for this plant species to be located on or near the Site. DEEP recommended surveying the Project Area by a botanist or plant ecologist to determine if any suitable habitats or plant species exist, and the Petitioner is in the process of conducting the surveys. If any species or suitable habitat is found to exist within the Project Area, the Petitioner has agreed to work with its botanist to develop specific protection measures and a management plan to minimize direct impacts. The results of this survey and any associated protection measures or management plans will be provided upon completion.

3.2.3 USFWS Consultation

The northern long-eared bat ("NLEB"; *Myotis septentrionalis*) is a federally-listed[7] threatened species also known to occur in the vicinity of the Site. The NLEB's range encompasses the entire State of Connecticut and suitable NLEB roost habitat includes trees (live, dying, dead, or snag) with a diameter at breast height ("DBH") of three (3) inches or greater.

The *Northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance map* (March 6, 2019) was reviewed to determine the locations of any known maternity roost trees or hibernaculum in the state. This map reveals that there are currently no known NLEB maternity roost trees in Connecticut. The nearest NLEB habitat resource to the Site is located in North Branford, approximately 14.5 miles to the South.

The Project will result in the removal of 0.95 acre of trees (some greater than three (3) inches DBH[8]) along the existing access road. Since tree removal activities can potentially impact NLEB habitat, APT completed a determination of compliance with Section 7 of the Endangered Species Act of 1973 for the Project.

[7] Listing under the federal Endangered Species Act

[8] Suitable NLEB roost habitat includes trees (live, dying, dead, or snag) with a diameter a DBH of three (3) inches or greater.

In compliance with the US Fish and Wildlife Service ("USFWS") criteria for assessing NLEB, the Project will not likely result in an adverse effect or incidental take[9] of NLEB and does not require a permit from USFWS. A letter confirming compliance was received from USFWS on January 9, 2020. Thus, no further consultation with USFWS is required.

A full review of the *Endangered Species Act (ESA) Compliance Determination* is provided in Appendix D, *USFWS and NDDB Compliance Statement*.

3.3 Water Resources

3.3.1 Wetlands and Watercourses

Professional Soil Scientists of Davison Environmental identified portions of six (6) wetlands, two (2) perennial watercourses and one (1) intermittent watercourse on or proximate to the Site during a field inspection and wetland delineation completed on December 20, 2019. The results of the field delineation are summarized below. The locations of these resources are depicted on Figure 2, *Existing Conditions Map*. In addition, three (3) vernal pools were identified on the Site, as discussed in Section 3.3.3.

Wetland 1

Wetland 1 is located in the southwest corner of the Site. The wetland has a hydrology ranging from saturated along the wetland-upland interface to permanently flooded within the central portions of the wetland. The wetland extends west and south off the Site, ultimately draining to Misery Brook. Cover types present include open water (shallow pond), emergent marsh, scrub-shrub and forested. The portions of the wetland located on/immediately adjacent to the Site are forested. Vegetation is typical of forested wetlands in the region; the tree canopy is dominated by red maple and black gum (*Nyssa sylvatica*). The shrub layer is dominated by highbush blueberry (*Vaccinium corymbosum*), winterberry (*Ilex verticillata*), meadowsweet (*Spirea spp.*) and sweet pepperbush (*Clethra alnifolia*).

[9] "Incidental take" is defined by the Endangered Species Act as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." For example, harvesting trees can kill bats that are roosting in the trees, but the purpose of the activity is not to kill bats.

Wetland 2

Wetland 2 is an isolated, permanently saturated to seasonally flooded shrub swamp that is located predominantly off-Site. The wetland is flanked by residences to the east and west. Dominant vegetation includes sparse red maple in the overstory, with a dense and nearly continuous shrub layer comprised of winterberry and highbush blueberry.

Wetland 3

Wetland 3 is a permanently saturated to seasonally flooded forested and scrub-shrub wetland bordering Misery Brook along the Site's northern and northeast boundary. Misery Brook is a low-gradient stream with a meandering flow path and low vertical banks, resulting in regular overbank flooding into the bordering wetland. Dominant vegetation includes red maple and American elm (*Ulmus americana*) in the overstory, with silky dogwood (*Cornus amomum*), winterberry, and spicebush (*Lindera benzoin*) in the shrub layer. Sensitive fern (*Onoclea sensibilis*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*) and tussock sedge (*Carex stricta*) are abundant in the herb layer. Along the wetland fringes near the access road, there are areas of dense multiflora rose. Several feeder watercourses are present within this wetland, consisting of one intermittent watercourse (IWC-1) and two perennial streams (PWC-1 and PWC-2) that drain into Misery Brook.

Wetland 4

Wetland 4 is located in the southeast corner of the Site and consists of a large wetland with an embedded headwater perennial stream (PWC-2). The stream drains north, flowing through a culvert under the access road and into Wetland 3/Misery Brook. Cover types present include forested, emergent marsh and scrub-shrub. The portions of the wetland located on-Site are largely forested, except for the northern section close to the access road. The southern limits lie within the maintained utility right-of-way and are predominantly scrub-shrub. The hydrology within the wetland ranges from saturated along the upland-wetland interface to permanently flooded within the deeper central portions.

Emergent wetland areas close to the access drive consist of a nearly continuous stand of the invasive non-native reed canarygrass (*Phalaris arundinacea*), along with the invasive purple loosestrife (*Lythrum salicaria*), and patches of arrow tearthumb (*Persicaria sagittata*). Forested

portions of the wetland consist of red maple dominated swamp, with spicebush and highbush blueberry dominating the shrub layer, and cinnamon fern, tussock sedge, and dense sphagnum moss abundant in the herb layer.

Wetland 5

Wetland 5 is a small isolated scrub-shrub wetland located immediately south of the access drive in the eastern portion of the Site. The wetland is seasonally flooded and captures surface runoff from the road and adjacent residential yard. The vegetation consists of a dense growth of silky dogwood (*Cornus amomum*), spicebush, reed canarygrass and common reed (*Phragmites australis*).

Wetland 6

Wetland 6 consists of a permanently saturated to seasonally flooded forested wetland. The wetland extends into the adjacent hayfield, particularly on the west side. It drains from the southwest to the northeast, to a 12" culvert beneath the existing gravel access road into Wetland 3. This is a low-gradient wetland system, particularly in its southern portion. Distinct hummocks are common throughout this portion of wetland. Dominant vegetation includes red maple in the overstory, with highbush blueberry, winterberry, buttonbush (*Cephalanthus occidentalis*), sweet pepperbush, silky dogwood, and spicebush in the shrub layer. Tussock sedge and sphagnum moss is common in the herb layer, with skunk cabbage (*Symplocarpus foetidus*) and sensitive fern along the saturated fringes of an embedded vernal pool. An intermittent watercourse (IWC-1) was noted within interior portions of the wetland as it drains north under the existing gravel access road eventually discharging to Wetland 3/Misery Brook.

3.3.2 Wetland Impacts

No direct impacts to wetlands or watercourses are proposed in association with developing the fenced Facility. Limited impacts to these resources will occur as part of the Project's electrical interconnection work. Wetlands are close to both sides of the existing access road, where interconnection activities are proposed. A combination of underground and overhead lines will be utilized, with seven (7) utility poles installed. To facilitate this utility line, limited tree clearing is required within and adjacent to wetland areas. Tree clearing and trenching for the underground portion of the line will result in a temporary impact, as any disturbed areas will be seeded with a

native wetland seed mix to reestablish vegetative cover. The only permanent direct impacts will be the installation of the utility poles. If staging is required within wetlands, construction matting or a similar alternative will be used to protect the wetland soil surface from significant disturbance. For details of the interconnection design, please Sheet SP-1 of Appendix A – Project Plans.

Other portions of the Project Area will require construction activity proximate to these resources, including fencing installation, solar modules, and installation of stormwater features. While improvements to the existing access road off East Street and the associated electrical interconnection work occur within or adjacent to wetlands, clearing and grading limits for the Facility's primary infrastructure (solar arrays, associated equipment and fencing) would maintain a minimum setback of approximately ±125 feet to wetlands. Table 2, *Wetlands Impacts Table* provided below details all direct impacts to wetlands, and distances to wetland resources.

To promote protection of wetlands and watercourses during construction, safeguards have been developed to avoid unintentional impacts to these resources, including a Project-specific protection measure and the installation and maintenance of E&S controls in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. See Appendix C, *Resources Protection Plan*. By implementing these management techniques throughout the duration of construction, potential adverse impacts to wetland resources will be mitigated.

Potential long-term secondary impacts to wetland resources associated with the operation of this Facility are minimized by several factors. The development will be unstaffed (generating negligible traffic), use an existing gravel/dirt access drive (reducing the creation of impervious surfaces) and treat the majority of the ground beneath the solar arrays with native grass/vegetation (providing ample opportunity for surface water to infiltrate or slow prior to discharge to surrounding resources). As such, the Project will not have a likely adverse impact to wetland resources.

Table 2: Wetlands Impacts Table

Table 2: Wetland Impacts		
Direct Impacts to Wetland 1 (ac.)	0	
Direct Impacts to Wetland 2 (ac.)	0	
Direct Impacts to Wetland 3 (ac.)	0.05	
Direct Impacts to Wetland 4 (ac.)	0	
Direct Impacts to Wetland 5 (ac.)	0	
Direct Impacts to Wetland 6 (ac.)	0.004	
Total Direct Impacts to Wetlands (ac.)	0	
Project Area Proximity to Wetlands (from limit of disturbance)	Distance (+/-ft.)	Direction (of wetland/water from LOD)
Project Area Proximity to Wetland 1	895	West
Project Area Proximity to Wetland 2	685	Northwest
Project Area Proximity to Wetland 3	0	North
Project Area Proximity to Wetland 4	1	South
Project Area Proximity to Wetland 5	0	South
Project Area Proximity to Wetland 6	0	South & East
Project Area Proximity to Misery Brook	175	North
Project Area Proximity to PWC-1	1	North
Project Area Proximity to PWC-2	0	North & South
Project Area Proximity to IWC-1	0	North & South
Facility Proximity to Wetlands (from perimeter fence)	Distance (+/-ft.)	Direction (of wetland/water from perimeter fence)
Facility Proximity to Wetland 1	905	West
Facility Proximity to Wetland 2	745	West
Facility Proximity to Wetland 3	125	East
Facility Proximity to Wetland 4	695	East
Facility Proximity to Wetland 5	825	East
Facility Proximity to Wetland 6	125	East
Facility Proximity to Misery Brook	255	Northeast
Facility Proximity to PWC-1	610	East
Facility Proximity to PWC-2	520	East
Facility Proximity to IWC-1	150	Southeast

3.3.3 Vernal Pools

Three vernal pools are present on the Site. Vernal pool surveys were conducted on March 19 and April 7, 2020 to identify both species richness and abundance of indicator species. Survey methods included audial surveys to record chorusing frogs, visual surveys to search for adults, egg masses and larvae, and dip-netting to identify species within the water column and benthic material. Egg mass searches were conducted by slowly and methodically wading through the open water in a parallel transect-like pattern using polarized sunglasses under bright sunny skies.

Vernal Pool 1

Vernal Pool 1 is located primarily off-Site, along the northwest property boundary within Wetland 2. This is a cryptic pool located over 850 feet from the Project area. Due to the distance of this pool from the Project area, and the fact that it is located largely off-Site, detailed surveys were not conducted. Rather, an initial audial survey was conducted on March 18th and a robust chorus of wood frog (*Lithobates sylvaticus*) was heard. Numerous individuals were chorusing across the entire pool so that individual frog choruses were not easily distinguishable from one another. This suggests a large population is present. Spring peeper (*Pseudacris crucifer*) were also heard chorusing within this wetland.

Vernal Pool 2

Vernal Pool 2 is located in the southern portions of Wetland 6. The pool is long and narrow, and deeply flooded (maximum water depth was observed at approximately 2 feet). The pool contains an abundance of hummocks. Water conditions at the time of the inspection were tannic. The pool is dominated by mature forest, with canopy dominated by red maple. The shrub layer is dominated by highbush blueberry, winterberry and buttonbush. Tussock sedge hummocks are abundant throughout the pool.

There is only a narrow (<50ft) vegetated buffer between the boundary of the vernal pool and the bordering hayfields to the east and west. This buffer consists of red maple, spicebush, winterberry, dense multiflora rose, silky dogwood and dense autumn olive. The narrowness of the forested buffer results in low-quality fossorial habitat for amphibians due to a lack of developed leaf litter, minimal woody debris and soil duff, and limited shade.

Vernal Pool 2 supports two indicator species, the wood frog and the spotted salamander (*Ambystoma maculatum*). Both species are common and occur in all the biogeographical regions of the State. An estimated 425 wood frog egg masses were observed in two large communal rafts, one located at the southern end of the pool, and the second at the northern end of the pool. A few individual masses were also observed scattered throughout the pool. A total of 11 spotted salamander egg masses were observed. Due to the large expanse of deep water coupled with the tannic color of the water at the time of inspections, egg masses were difficult to locate. Therefore, this total should be considered a conservative estimate of the total breeding output. However, the sub-optimal condition of the surrounding wetland buffer, and lack of overall forest cover in proximity to the pool are likely limiting factors for spotted salamander productivity.

Vernal Pool 3

Vernal Pool 3 is a cryptic pool located over 780 feet from the Project area. The pool is located in the southeast corner of the Site, embedded within Wetland 6. The pool consists of a small concentric pool of open water that appears to have been historically excavated, perhaps for livestock or water collection/extraction. The pool contains shallow open water (<1 foot in depth), and very deep muck, making the pool physically inaccessible. Observations from the shoreline confirmed the presence of spotted salamander, with a small communal mass totaling approximately 20 individual masses. The pool had a covering of duckweed (*Lemna spp.*), indicating that the pool is likely permanently ponded.

3.3.3.1 Vernal Pool Evaluation

Construction and operation of the Facility would not result in direct physical impact to vernal pools. It is widely documented that vernal pool dependent amphibians are not solely reliant upon the actual vernal pool habitat for breeding (i.e., egg and larval development) but do require surrounding upland forest habitat for most of their adult lives. Accepted studies recommend protection of adjacent habitat up to 750 feet from the vernal pool edge for obligate pool-breeding amphibians.[10]

[10] Calhoun, A.J.K. and M.W. Klemens. 2002. Best Development Practices (BDPs): Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States. WCS/MCA Technical Paper No. 5.

In order to evaluate potential impacts to the vernal pools and surrounding upland habitat, these resources were assessed using methodology developed by Calhoun and Klemens[11] (2002). This methodology assesses vernal pool ecological significance based on two parameters: 1) biological value of the vernal pool; and 2) conditions of the critical terrestrial habitat. The biological rating is based on the presence of state-listed species and abundance and diversity of vernal pool indicator species. The terrestrial habitat is assessed based on the integrity of the vernal pool envelope (within 100 feet of the pool's edge; "VPE") and the critical terrestrial habitat (within 100-750 feet of the pool's edge; "CTH").

The landscape condition of each vernal pool was then evaluated to determine the existing and proposed quality of the terrestrial (non-breeding) habitat. Pools with 25% or less developed areas in the CTH are identified as having high priority for maintaining this development percentage (including site clearing, grading and construction). Based on the results of the landscape analysis, the existing area of development within the CTH of all three vernal pools is less than the 25% threshold.

The Project will not impact the VPE associated with any of the three (3) vernal pools.

The Project will increase development within the CTH of Vernal Pool 1. However, these proposed impacts will be minimal and isolated to the far southeast edge of the CTH within suboptimal cultivated field habitat. As such, the proposed Project will not result in a likely adverse impact to this vernal pool.

The Project will increase development within the CTH of Vernal Pool 2. While this increase will exceed the 25% conservation threshold, the proposed development will occur entirely within sub-optimal Hay Field habitat (note that a portion of this pool's VPE is also located within the Hay Field). Hay Field habitat areas occupied by the Facility will remain largely dominated by similar grassland/open field species. In addition, the Petitioner is proposing to establish a Habitat Enhancement Plan to improve the quality of intervening habitat peripheral to the Facility and the vernal pool. This area will be cleared of undesirable vegetation, soil scarified, and seeded with a mix of conservation and semi-shade tolerant species. It will remain un-mowed and allowed to naturally vegetate to reestablish more optimal habitat within both the pool's VPE and CTH.

[11] Ibid

Project impacts within the CTH will occur entirely within sub-optimal habitat and the proposed Habitat Enhancement Plan will improve conditions within both the CTH and VPE of Vernal Pool 2. Therefore, it is APT's opinion that the proposed Project will not result in a likely adverse impact to this vernal pool.

The Project will also increase development within the CTH of Vernal Pool 3. Increased development within the CTH is limited to locations outside the fenced Facility in the far western extremities of this conservation zone, thus minimizing its effects. This increase in development will not exceed the 25% threshold. Due to the de minimis increase in development within the CTH of Vernal Pool 3, it is APT's opinion that the proposed Project will not result in a likely adverse impact to this vernal pool.

Results of the vernal pool impact analysis are graphically depicted in *Figure 4, Vernal Pool Analysis Map*. Table 3 summarizes the results of the impact analysis, comparing existing conditions and proposed impact calculations within the CTH.

Table 3: Vernal Pool Impact Table

Vernal Pool 1 Impact Analysis		
Vernal Pool 1 Area: +/- 1.12 ac.		
Total Vernal Pool Envelope (VPE) Area: +/- 2.63 ac. Project Area Within VPE Area: None Total 100'-750' Critical Terrestrial Habitat (CTH) Area: +/- 52 ac. Project Area Within CTH Area: +/- 0.15 ac.		
Existing VPE Areas: (+/- ac.) (no proposed habitat changes to VPE Areas)		
Developed	0.42	16%
Mixed Hardwood Forest	1.93	73%
Wetland	0.28	11%
Existing CTH Areas: (+/- ac.)		
Cropland	3.89	7%
Developed	12.8	25%
Hayfield	3.1	6%
Mixed Hardwood Forest	32.3	62%
Wetland	0.01	0%
Proposed CTH Areas: (+/- ac.)		
Cropland	3.87	7%
Developed	13.0	25%
Hayfield	3.1	6%
Mixed Hardwood Forest	32.2	62%
Wetland	0.01	0%

Vernal Pool 2 Impact Analysis		
Vernal Pool 2 Area: +/- 0.86 ac.		
Total Vernal Pool Envelope (VPE) Area: +/- 3.17 ac. Project Area Within VPE Area: +/- 1.03 ac. Total 100'-750' Critical Terrestrial Habitat (CTH) Area: +/- 55.7 ac. Project Area Within CTH Area: +/- 16.9 ac.		
Existing VPE Areas: (+/- ac.)		
Hayfield	1.75	55%
Mixed Hardwood Forest	0.45	15%
Old Field	0.39	12%
Wetland	0.58	18%
Proposed VPE Areas: (+/- ac.)		
Vernal Pool Mitigation Area	1.03	33%
Hayfield	0.75	24%
Mixed Hardwood Forest	0.41	13%
Old Field	0.39	12%
Wetland	0.58	18%
Existing CTH Areas: (+/- ac.)		
Developed	3.1	6%
Hayfield	25.9	46%
Mixed Hardwood Forest	13.2	24%
Old Field	9.9	18%
Wetland	3.4	6%
Proposed CTH Areas: (+/- ac.)		
Developed	18.5	33%
Vernal Pool Mitigation Area	1.5	3%
Hayfield	9.4	17%
Mixed Hardwood Forest	13.1	24%
Old Field	9.8	17%
Wetland	3.4	6%

Vernal Pool 3 Impact Analysis		
Vernal Pool 3 Area: +/- 0.13 ac.		
Total Vernal Pool Envelope (VPE) Area: +/- 1.35 ac. Project Area Within VPE Area: None Total 100'-750' Critical Terrestrial Habitat (CTH) Area: +/- 44 ac. Project Area Within CTH Area: +/- 3 ac.		
Existing VPE Areas: (+/- ac.) (no proposed habitat changes to VPE Areas)		
Hayfield	0.01	1%
Mixed Hardwood Forest	0.55	41%
Wetland	0.79	58%
Existing CTH Areas: (+/- ac.)		
Developed	8.3	19%
Hayfield	11.6	26%
Mixed Hardwood Forest	12.1	28%
Old Field	7.5	17%
Wetland	4.4	10%
Proposed CTH Areas: (+/- ac.)		
Developed	9.3	21%
Vernal Pool Mitigation Area	2.1	5%
Hayfield	8.9	20%
Mixed Hardwood Forest	11.8	27%
Old Field	7.5	17%
Wetland	4.4	10%

Legend

- Site
- Perennial Stream
- Intermittent Stream
- Utility ROW
- Transmission Line
- Vernal Pool
- 100' Vernal Pool Envelope (VPE)
- 100'-750' Critical Terrestrial Habitat (CTH)
- Solar Modules
- Conc. Equipment Pad
- Gravel Access Road
- Gravel Access Road to be Improved
- Stormwater Basin
- Stormwater Basin Outlet Gravel
- Treeline (Clearing Limit)
- Perimeter Fence
- Interconnection Path (Overhead)
- Interconnection Path (Underground)
- Interconnection Utility Pole
- Vernal Pool Mitigation Area
- Landscape Screening
- Limit of Disturbance

Habitat Cover Type

- Cropland
- Developed
- Hayfield
- Mixed Hardwood Forest
- Old Field
- Wetland

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 800 feet
Map Date: July 2020

800 400 0 800 Feet

N W E S

Figure 4
Vernal Pool Analysis Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

Southington Solar One, LLC

Potential short-term impacts to herpetofauna associated with nearby vernal pool habitats are possible should migrating individuals enter the Project Area during construction. Any short-term impacts associated with the proposed development within vernal pools' CTH's would be minimized/avoided by proper installation and maintenance of erosion and sedimentation controls in accordance with *2002 Connecticut Guidelines for Soil Erosion and Sediment Control* combined with implementation of the proposed Resource Protection Plan provided in *Appendix C*.

3.3.4 Habitat Enhancement Plan

Two areas of the Site are proposed for habitat enhancement.

Vernal Pool Mitigation Area

A Habitat Enhancement Area is proposed along the southeast side of the Facility within the VPE associated with Vernal Pool 1. This area will be cleared, scarified, and re-seeded; it will remain un-mowed and allowed to naturally revegetate over time. The proposed enhancements will improve the habitat quality of this important buffer zone. As revegetation occurs, it will transition to more optimal habitat for vernal pool dependent species.

3.3.5 Floodplain Areas

APT reviewed the United States Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Map ("FIRM") for the Site. A FIRM is the official map of a community on which FEMA has delineated both the special hazard areas and risk premium zones applicable to the community. The majority of the Site and the entire Project Area is depicted on FIRM PANEL #09003C 0603 G, dated May 16, 2017. The extreme eastern portion of the Site is depicted on FIRM PANEL #09003C 0604 F, dated September 26, 2008. Based upon the FIRM, the majority of the Project Area is located in an area designated as Zone X, which is defined as an area of minimal flooding. Special Flood Hazard Areas (including Zone A and Zone AE areas[12]) are mapped on other areas of the Site and, with the exception of the eastern-most portion of the existing access road, are outside the Project Area.

[12] Zone A is defined by FEMA as areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies (base flood elevations are not shown). Zone AE is defined by FEMA as Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. Base Flood Elevations (BFEs) are shown.

The Facility will be located outside the influence of 100- and 500-year floodplains and no additional fill will be placed within the 100-year flood plain as part of the reconstruction of the existing access road, and thus, will have no effect on either resource. As such, no special considerations or precautions relative to flooding are required for the Project.

3.4 Water Quality

Once operative, the Facility will be unstaffed and no potable water uses or sanitary discharges are planned. No liquid fuels are associated with the operation of the Facility. Stormwater generated by the proposed development will be properly handled and treated in accordance with the 2004 *Connecticut Stormwater Quality Manual*.

3.4.1 Groundwater

Groundwater underlying the Site is classified by DEEP as "GA".[13] This classification indicates groundwater within the area is presumed to be suitable for human consumption without treatment. Based on DEEP mapping, the ground water classification changes to GAA[14] approximately 75' west of the Site as a result of the presence of nearby public water supply wells.

The entire Site is located within an Aquifer Protection Area ("APA") identified as "Well 7, 8 A 126" Level A - Final Adopted APA. As stated previously, no potable water uses or sanitary discharges are planned and no liquid fuels will be stored on Site or are associated with the operation of the Facility. To promote protection of water resources during construction and operation of the Facility, the Petitioner has developed an Aquifer Protection Plan (see Appendix C, *Resources Protection Plan*).

Given the proposed protective measures and the Facility characteristics, the Project will have no adverse environmental effect on ground water quality.

[13] Designated uses in GA classified areas include existing private and potential public or private supplies of drinking water and base flow or hydraulically connected surface water bodies.

[14] Designated uses in GAA Classified areas include existing or potential public supply of water suitable for drinking without treatment; baseflow for hydraulically connected surface water bodies.

3.4.2 Surface Water

Based upon DEEP mapping, the Site is located in Major Drainage Basin 5 (South Central Coastal), Regional Drainage Basin 52 (Quinnipiac River), and Sub regional Drainage Basin 5203 (Misery Brook). The majority of the Site and the northern portion of the Project Area are located in Local Drainage Basin 5203-00 (Misery Brook above unnamed brook). The southern portion of the Site and the southern portion of the Project Area are located in Local Drainage Basin 5203-01 (Unnamed brook at mouth above Misery Brook).

A portion of Misery Brook is located on the eastern portion and along the northern boundary of the Site. Misery Brook is classified by the DEEP as a Class A surface waterbody. Designated uses for Class A surface waterbodies include habitat for fish and other aquatic life and wildlife; potential drinking water supplies; recreation; and water supply for industry and agriculture.

The Project will have no adverse environmental effect on surface water quality as sufficient setbacks have been established from water resources. During construction, E&S controls will be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. Once operative, stormwater will be managed in accordance with the 2004 *Connecticut Stormwater Quality Manual*.

3.4.3 Stormwater Management

The Project has been designed to meet the current draft of DEEP's *Appendix I, Stormwater Management at Solar Array Construction Projects*. As a result of Site grading, there will be an increase in stormwater runoff within the Project Area. That increase will require mitigation through the installation of stormwater management basins; four (4) grass-lined stormwater management basins with outflow control devices and overflow weirs are proposed at strategic locations on the periphery of the Facility. See Figure 3, *Proposed Conditions Map.* While the change in post-development drainage characteristics from existing conditions is not considered significant, *Appendix I* requires a reduction of on-Site soils Hydrologic Soil Group class by one step and results in a substantial increase to the size of the stormwater management basins.

For additional details regarding stormwater management, please refer to the Stormwater Management Report submitted under separate cover.

As previously introduced, the southwest and southeast extents of the Project Area will be seeded with habitat-specific blends of grasses and wildflowers to enhance these areas. Beyond these two Habitat Enhancement Areas, other portions of the Project Area that are disturbed during construction will be stabilized with low-growing grasses and forbs as well as pollinator-friendly species

To safeguard water resources from potential impacts during construction, the Petitioner is committed to implementing protective measures in the form of a Stormwater Pollution Control Plan ("SWPCP") to be finalized and submitted to the Council, pending approval by DEEP Stormwater Management. The SWPCP will include monitoring of established E&S controls that will be installed and maintained in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. The Petitioner will also apply for a *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities* from DEEP.

Therefore, with the incorporation of these protective measures, stormwater runoff from Project development will not result in an adverse impact to water quality associated with nearby surface water bodies.

3.5 Air Quality

The Site is currently undeveloped and as such, no air emissions are generated.

Due to the nature of a solar energy generating facility, no air emissions will be generated during operations and, therefore, the operation of the Facility will have no adverse effects on air quality and no permit is required.

Temporary, potential, construction-related mobile source emissions will include those associated with construction vehicles and equipment. Any potential air quality impacts related to construction activities can be considered de minimis. Such emissions will, nonetheless, be mitigated using available measures, including, inter alia, limiting idling times of equipment; proper maintenance of all vehicles and equipment; and, watering/spraying to minimize dust and particulate releases. In addition, all on-site and off-road equipment will meet the latest standards for diesel emissions, as prescribed by the United States Environmental Protection Agency.

3.6 Soils and Geology

The construction of the eastern two stormwater management basins will generate some excess material. That will be used to construct the southwestern basin. Any remaining material will be distributed on site. The reuse of this material will result in approximately 0 cubic yards net cut/fill for the Site. Prior to the removal or placement of fill material, the topsoil will be stripped and stockpiled for use on disturbed areas.

Once the proposed stormwater best management features are installed, minimal grading is required for construction of the remainder of the Project. Some minor grading may be required in conjunction with the improvements to the existing access road and the installation of the new interior gravel access road and concrete equipment pads. This material has been accounted for and will be distributed on site. The topsoil will be spread over the disturbed areas being seeding. See *Appendix A, Project Plans.*

All exposed soils resulting from construction activities will be properly and promptly treated in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control*.

Surficial materials on the majority of the Site are classified as deposits of sand overlying fines. Surficial materials on the extreme eastern portion of the Site are comprised of deposits of sand and gravel.

Soils located on and within the vicinity of the Site are identified as follows.

- Manchester gravelly sandy loam - identified as an excessively drained sandy and gravelly glaciofluvial deposited soil derived from sandstone and shale and/or basalt parent material.
- Hartford sandy loam - a somewhat excessively drained sandy glaciofluvial deposited soil derived from sandstone and/or basalt parent material.
- Ellington silt loam - a moderately well-drained coarse-loamy eolian over sandy and gravelly glaciofluvial deposited soil derived from sandstone and shale and/or basalt parent material.

- Raypol silt loam - a poorly drained coarse-loamy eolian over sandy and gravelly glaciofluvial deposited soil derived from granite and/or schist and/or gneiss parent material.
- Branford silt loam - a well-drained coarse-loamy eolian over sandy and gravelly glaciofluvial deposited soil derived from sandstone and shale and/or basalt parent material.
- Saco silt loam - a very-poorly drained soil derived from coarse-silty alluvium parent material.
- Scarboro muck - a very-poorly drained sandy glaciofluvial deposited soil derived from schist and/or gneiss and/or granite parent material.

Bedrock geology beneath the Site is identified as New Haven Arkose. New Haven Arkose is described as a red, pink, and gray coarse-grained, locally conglomeratic, poorly sorted and indurated arkose, interbedded with brick-red micaceous, locally shaly siltstone and fine-grained feldspathic clayey sandstone.

The Petitioner does not anticipate encountering bedrock during Project development.

3.6.1 Prime Farmland Soils

In accordance with the Code of Federal Regulations, CFR Title 7, part 657, farmland soils include land that is defined as prime, unique, or farmlands of statewide or local importance based on soil type. They represent the most suitable land for producing food, feed, fiber, forage, and oilseed crops.

According to the Connecticut Environmental Conditions Online Resource Guide,[15] the Project Area contains Prime Farmland Soils, (See Figure 2, *Existing Conditions Map.)*

The Site has remained largely undeveloped and used primarily as agricultural land over the past century. These continued activities have subjected the majority of the Project Area to routine disturbances associated with plowing and crop rotation, and more recently compaction from equipment and vehicles for haying.

[15] Connecticut Environmental Conditions Online (CTECO) Resource Guide www.cteco.uconn.edu.

Recognizing that the Project has a useful life and could be considered temporary in nature, the Petitioner has proposed using minimally intrusive methods for construction of the Facility. The use of pile-driven mounts for installation of the solar panels and associated equipment minimizes the need for substantial grading. Construction of the stormwater management basins, access road, and equipment pads will require excavations within areas mapped as Prime Farmland Soils. Any topsoil removed during construction will be segregated from underlying horizons and either stockpiled for reuse or spread elsewhere as top dressing for reestablishing vegetation. No topsoil will leave the Site.

After its useful life, the Facility will be decommissioned and all of the disturbed areas will be returned to their existing conditions with the exception of the access roads, which the owner may decide to retain. Implementation of these proposed design strategies demonstrates that the Project will not materially affect Prime Farmland Soils.

In accordance with Connecticut General Statutes §16-50k(a), the Petitioner initiated consultation with the Connecticut Department of Agriculture ("DOA") on April 27, 2020, at which time the Petitioner met with representatives of the agency to present the Project and discuss the presence of Prime Farmland Soils on the Site. As a result of the consultation, the Petitioner intends to implement a grazing program for vegetation maintenance within the fenced perimeter of the Project. A company that specializes in such services will provide a flock of sheep, which will be maintained on the Site under the care of a local farmer annually from April/May to October/November. The area will be seeded with low-growing grasses and forbs suitable for sheep as well as pollinator-friendly species. In addition, the remaining portions of the field will be retained for agricultural use. The Petitioner is awaiting a written response from DOA.

Table 3, *Farmland Soils Assessment and Impacts Table* provided below details the amount of farmland soils located on the Site and the proposed impact from the Project.

Table 4: Farmland Soils Assessment and Impacts Table

Farmland Soils Assessment and Impacts Table		
Farmland Soil Classification	Total Area On-Site (+/- ac.)	Area within Project Limits (+/- ac.)
Prime Farmland Soil Area	48.7	26.6

3.7 Historic and Archaeological Resources

Heritage Consultants LLC ("Heritage Consultants") of Newington, Connecticut, reviewed relevant historic and archaeological information to determine whether the Site holds potential cultural resource significance. Their review of historic maps and aerial images of the Site, examination of files maintained by the Connecticut State Historic Preservation Office ("SHPO"), and a pedestrian survey of the Site revealed four (4) National Register of Historic Places ("NRHP") properties within one (1) mile of the Site, but they are not proximate to the Project Area. Due to their distances from the Site, no direct or indirect effects from the Project are anticipated.

Because the Site is located within an area of low slopes and well drained soils and situated in proximity to wetlands and the Misery Brook riparian corridor, it was determined that the Project Area has the potential to contain intact archaeological deposits in the subsoil. At the request of the Petitioner, Heritage performed a Phase 1B Professional Cultural Resources Assessment and Reconnaissance Survey.

Fieldwork for the Phase 1B assessment included a pedestrian survey, photo-documentation, and the excavation of 187 shovel tests across the Project Area, none of which yielded any cultural materials, cultural features, or soil anomalies. Based on the results, no additional testing prior to construction of the proposed Project is deemed necessary.

On behalf of APT, Heritage Consultants submitted Project and Site historic/cultural information, as well as copies of the Phase 1A and 1B reports to the SHPO for agency review and comment on July 8, 2020. A response from SHPO is pending.

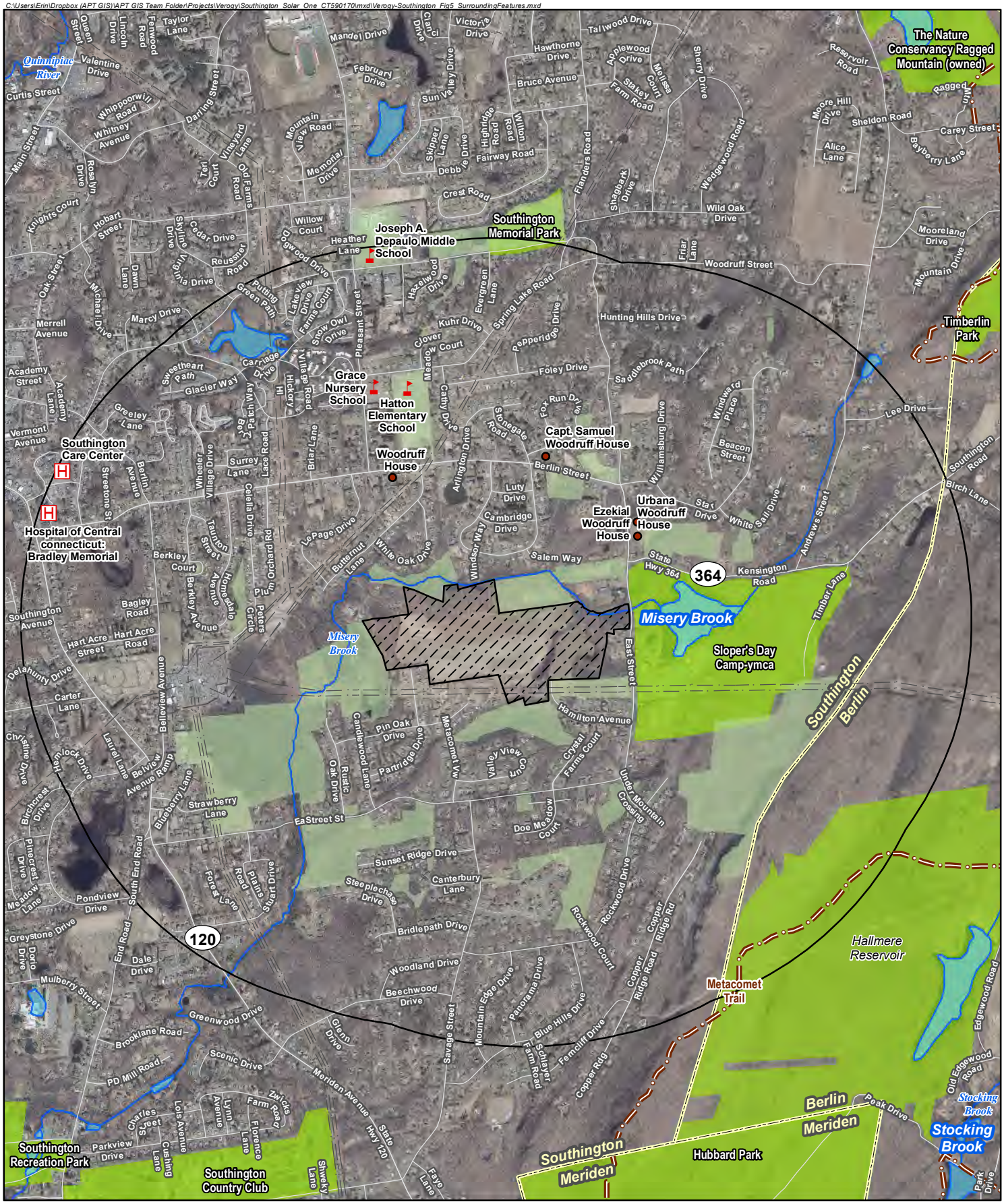
Copies of the Phase 1A and Phase 1B reports are included in Appendix E, *Cultural Resources Reconnaissance Survey Reports.*

3.8 Scenic and Recreational Areas

No state designated scenic roads or recreational areas will be physically or visually impacted by development of the Project.

No state or local designated scenic roads or scenic areas are located near the Site. The nearest recreational area is the Sloper's Day YMCA Camp located immediately east of the Site. See Figure 5, *Surrounding Features Map,* for other resources located within one mile of the Site.

The Metacomet Trail, a CT Blue Blaze Hiking Trail, is located approximately one (1) mile to the southeast of the Project Area. While the elevation of the trail may afford limited views of the Facility from some areas along the ridgeline, the trail is of sufficient distance from the proposed Facility that significant visual impacts are not anticipated.



Legend

- Site
- 1-mile Radius
- Municipal Boundary
- Transmission Line
- Trail
- Watercourse (CTDEEP)

SurroundingFeatures

- Hospital
- National Register Area - Historic Places
- School
- Municipal and Private Open Space Property (CTDEEP GIS)
- Town Managed Open Space Property (Southington GIS)

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 2,000 feet
Map Date: May 2020

2,000 1,000 0 2,000 Feet

N W E S

Figure 5
Surrounding Features Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

Southington Solar One, LLC

ALL-POINTS TECHNOLOGY CORPORATION

3.9 Noise

The Site is entirely undeveloped; besides the noise associated with farming activities that happen periodically at the Site, no unusual noise sources presently exist.

Construction noise is exempted under the Town's Code, Chapter 300 Noise, §300-6 - Exemptions. During construction of the Facility, the temporary increase in noise would likely raise localized ambient sound levels immediately surrounding the Project Area. Standard types of construction equipment would be used for the Project. In general, the highest noise level from this type of equipment (e.g., backhoe, bulldozer, crane, trucks, etc.) is approximately 88 dBA at the source.

Once operational, noise from the Project will be minimal and meet applicable Town noise standards for a Residential Daytime/Nighttime Zone.[16] The Site is located within a Class A Residential Zone and conservatively, the Facility would be considered a Class B noise emitter to Class A receptors.[17] As such, it is subject to noise standards of 61 dBA during the daytime and 51 dBA at night.

The only noise generating equipment planned at the Facility are the inverters and transformers. Based on the most conservative information provided by specified equipment manufacturers, the loudest piece of proposed equipment is a 2,000 kVA transformer that will generate a maximum sound level of approximately 68 dBA.

Sound reduces with distance and the inverters and transformers generally are inactive at night. The closest property line relative to the nearest inverter/transformer is approximately 575 feet to the north, 38 Windsor Way. This residentially developed parcel is zoned Residential (R-40).

APT applied the Inverse Square Law[18] to evaluate the relative sound level of the largest transformer at the nearest property lines. Based on these calculations, nearby receptors are of

[16] Town's Code, Chapter 300, §300-5 – Noise Zone Standards.

[17] Town's Code, Chapter 300, §300-4 – Classifications of Noise Zones by Land Use - Class A noise zone/uses. Lands designated class A shall generally be residential areas where human beings sleep or areas where serenity and tranquility are essential to the intended use of the land. Class B noise zone/uses. Lands designated class B shall generally be commercial in nature.

[18] Inverse Square Law states that *the intensity of a force is inversely proportional to the square of the distance from that force*. With respect to sound, this means that any a noise will have a drastic drop-off in volume as it moves away from the source and then shallows out.

sufficient distances from the proposed Project-related equipment and noise levels during Facility operation will be below 51 dBA at surrounding property lines.

Please refer to the inverter specification sheet provided in Appendix F, *Product Information Sheets*.

3.10 Lighting

The Site is undeveloped; no light sources currently exist.

No exterior lighting is planned for the Facility. There will be some small, non-intrusive lighting fixtures within the equipment to aid in maintenance.

3.11 FAA Determination

APT submitted relevant Project information to the Federal Aviation Administration ("FAA") for an aeronautical study to evaluate potential hazards to air navigation. The FAA provided Determinations of No Hazard to Air Navigation on June 12, 2020. See Appendix G, *FAA Determination*. Based on this determination, there is no need to conduct a glare analysis.

3.12 Visibility

The Facility will consist of 18,798 non-reflective solar panels measuring approximately 10 feet above final grade surrounded by a six (6) foot tall security fence. The proposed electrical interconnection to the existing electrical distribution line located on East Street will require the installation of seven (7) new utility poles located along the existing access drive.

Year-round visibility of the proposed Facility will be primarily confined to areas generally south of the Site, largely from abutting properties along the northern ends of Partridge Drive, Pin Oak Drive and Hamilton Avenue. Narrow windrows of trees currently separate these adjacent parcels from the Project Area and, with the exception of a few properties north of the electrical transmission corridor on Partridge Drive[19], are of sufficient density to effectively screen most of

[19] The shortest distance of the Facility's components (fence & panels) to the nearest property line is approximately 140 and 164 feet, respectively.

the Facility. Additional year-round visibility from elevated locations farther to the southeast (approximately 0.75 mile) along Copper Ridge Road may also be possible.

Views from the southwest along Partridge Drive will be further minimized by the planting of a row of Spartan Junipers along the Facility's opposing fence line. The remaining area will continue to be used for agricultural use.

Limited seasonal views, when the leaves are off of the deciduous trees, could extend up to ±600 feet in all directions, with increased visibility from select locations farther to the southeast where elevations rise. In general, views beyond the immediate area would be minimized by a combination of the Facility's relatively low height and the presence of intervening vegetation and infrastructure.

As stated in Section 3.8, The Metacomet Trail, a CT Blue Blaze Hiking Trail, is located approximately one (1) mile to the southeast. The elevation of the trail and select western vistas will afford views of the Facility from the ridgeline. Due the Facility's distance from these locations, an adverse visual impact is not anticipated.

The solar modules are designed to absorb incoming solar radiation and minimize reflectivity, such that only a small percentage of incidental light will be reflected off the panels. This incidental light is significantly less reflective than common building materials, such as steel, or the surface of smooth water. The panels will be tilted up toward the southern sky at a fixed angle of 30 degrees, thereby further reducing reflectivity.

A viewshed analysis map developed for this Project depicts areas of potential visibility surrounding the Facility. Representative photo-simulations from two (2) nearby, publicly-accessible locations have also been prepared. Please see Appendix H, *Viewshed Maps* and *Photo-simulations*.

4 Conclusion

As demonstrated in this Environmental Assessment, the Project will comply with the DEEP air and water quality standards. Further, it will neither have an undue adverse effect on the existing environment and ecology nor will it affect the scenic, historic and recreational resources in the vicinity of the Project. Once operative, the Facility will be unstaffed and generate minimal traffic.

No core forest will be materially affected by the Project. The Project will result in the removal of approximately 0.95 acre of trees along the existing access road to accommodate the installation of the interconnection line. This area is entirely located within existing "edge" forest habitat and is not expected to result in a significant negative impact to this habitat or to wildlife.

Portions of the Project Area are located within mapped prime farmland soils. The Petitioner has designed the Project to limit disturbances to these soils by proposing minimally intrusive methods for construction and installation of Facility components, restricting the amounts of cuts/fills and grading to the extent feasible, and ensuring that no soil will be exported off the Site. Farming activities will continue on-Site; the Petitioner will utilize sheep grazing for vegetation maintenance within the fenced area, and the remainder of the existing field will continue to be hayed as it is currently. Once the Facility has reached the end of its projected useful life, the panels and equipment can be removed, and the Project Area restored.

No direct impacts to wetlands or watercourses are proposed in association with developing the fenced Facility and only minor impacts to these resources will occur as part of the Project's electrical interconnection work along the existing access road. The Petitioner has minimized impacts to these resources to the extent feasible. While there are three (3) vernal pools located on the Site, the Project will not have any direct impacts to these resources. To promote protection of these resources during construction, a Habitat Enhancement Plan and a Resources Protection Plan have been developed. In addition, E&S controls will be installed and maintained throughout construction in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*. Implementing these management techniques will mitigate the potential for adverse impacts to wetland resources.

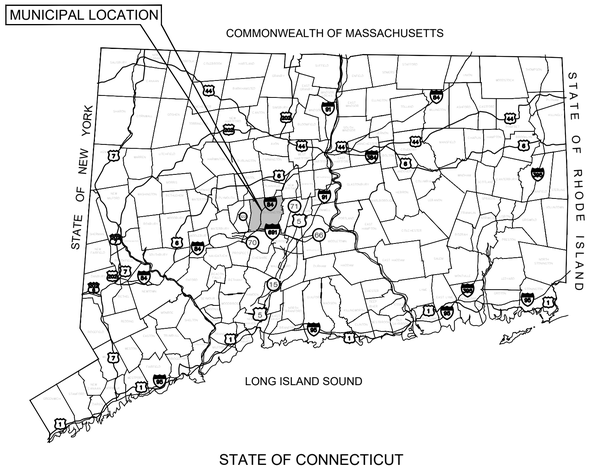
While two State-listed and one federally-listed species have been identified as potentially occurring within the vicinity of the Site, protection measures will be implemented during construction to minimize potential impacts to these species.

Portions of the Facility will likely be seen from surrounding areas, including adjoining residential properties and nearby public roadways. The planting of landscape screening to the southwest will help to minimize views from abutting properties. The majority of views of the Facility would occur from locations within 500 feet to the south of the Site with additional views extending up one (1) mile to the southeast where ground elevations increase. Views from within 500 feet would be minimized by a combination of the Facility's relatively low height and the presence of intervening vegetation and infrastructure, while the visual impacts from beyond these locations would be lessened due to their distance from the Site.

Overall, the Project's design minimizes the creation of impervious surfaces. The Project has been designed to adequately handle stormwater runoff through the creation of multiple stormwater infiltration basins proposed at peripheral locations around the Facility. Some Site manipulation (cuts/fills) and regrading will be required to allow for stormwater management basin and interior access road development, but the majority of the Project Area will maintain existing grades for the installation of the solar arrays. The Project has been designed in accordance with the DEEP's *General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities*. The Petitioner will implement a SWPCP, in accordance with the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control*, that will include provisions for monitoring of development activities and the establishment of E&S controls to be installed and maintained throughout construction.

APPENDIX A

PROJECT PLANS



SOUTHINGTON SOLAR ONE, LLC

"SOUTHINGTON SOLAR ONE, LLC"

1012 EAST STREET
SOUTHINGTON, CT

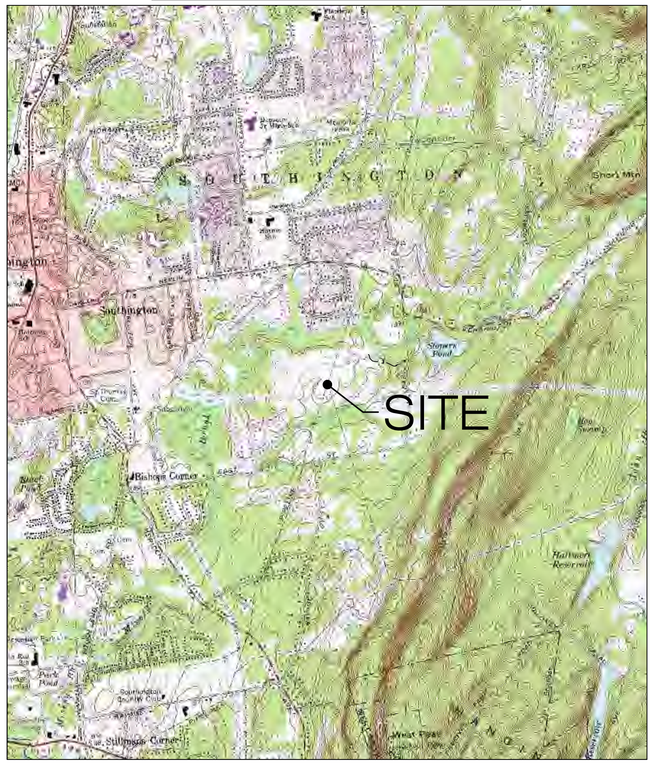
PERMIT APPLICATION DRAWINGS
JULY 23, 2020

LIST OF DRAWINGS

SITE INFORMATION

SITE NAME:	"SOUTHINGTON SOLAR ONE, LLC"
LOCATION:	1012 EAST STREET SOUTHINGTON, CT
SITE TYPE/DESCRIPTION:	ADD (1) GROUND MOUNTED SOLAR PANEL ARRAY W/ ASSOCIATED EQUIPMENT.
PROPERTY OWNER:	CATHOLIC CEMETERIES ASSOCIATION OF THE ARCHDIOCESE OF HARTFORD, INC. 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473
APPLICANT:	SOUTHINGTON SOLAR ONE, LLC 150 TRUMBULL STREET, 4TH FLOOR HARTFORD, CT 06103
ENGINEER CONTACT:	BRADLEY J. PARSONS, P.E. (860) 663-1697 x208
LATITUDE:	41° 35' 22" N
LONGITUDE:	72° 51' 4" W
ELEVATION:	190-220'± AMSL
MAP-LOT:	079-023
ZONE:	R40
EXISTING LAND USE:	AGRICULTURAL
PROPOSED LAND USE:	ENERGY PRODUCTION
TOTAL SITE ACREAGE:	102.45± AC.
TOTAL DISTURBED AREA:	37.45± AC.
APPROX. VOLUME OF CUT:	8,920± CY
APPROX. VOLUME OF FILL:	10,810 ± CY
APPROX. NET VOLUME:	1,890 ± CY OF FILL (ACCESS ROAD GRAVEL)
PROP. GRAVEL ACCESS ROAD:	3,630± LINEAR FEET
PROP. SILT FENCE:	8,520± LINEAR FEET
TREE CLEARING AREA:	0.95± ACRE
EFFECTIVE IMPERVIOUS AREA:	51,935± SQUARE FEET

USGS TOPOGRAPHIC MAP



SCALE : 1-IN = 2000-FT SOURCE: NRCS GEOSPATIAL GATEWAY

SOUTHINGTON
SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CSC PERMIT SET

NO	DATE	REVISION
0	07/23/20	FOR PERMIT: BJP
1		
2		
3		
4		
5		
6		

NOT FOR CONSTRUCTION

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHALL ST EXT - STE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: KAM

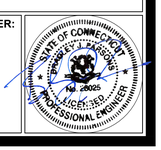
DATE: 07/07/2020 CHECKED BY: BJP

SHEET TITLE:

TITLE SHEET & INDEX

SHEET NUMBER:

T-1



PROPERTY LINE TABLE

LINE	BEARING	DISTANCE
L1	N 83°40'27" E	60.40'
L2	S 06°40'45" E	187.75'
L3	S 09°03'15" W	28.02'
L4	S 86°26'55" W	237.18'
L5	S 06°10'05" E	69.80'
L6	N 76°51'15" W	108.50'
L7	S 02°57'09" W	155.03'
L8	S 12°20'39" W	568.04'
L9	S 88°15'23" W	788.59'
L10	S 01°24'34" E	153.56'
L11	S 02°18'34" E	164.33'
L12	S 79°10'37" W	365.94'
L13	N 15°19'16" W	119.15'
L14	S 69°40'14" W	246.42'
L15	N 19°02'36" W	464.60'
L16	S 81°58'28" W	1069.67'
L17	N 06°36'34" W	313.01'
L18	S 82°09'26" W	638.26'

PROPERTY LINE TABLE CONTINUED

LINE	BEARING	DISTANCE
L19	N 15°17'14" W	224.51'
L20	N 30°00'50" W	625.80'
L21	N 79°49'56" E	113.30'
L22	N 77°11'46" E	45.10'
L23	N 85°10'36" E	250.40'
L24	N 76°27'16" E	55.50'
L25	N 78°38'06" E	121.90'
L26	N 84°47'46" E	136.00'
L27	N 11°25'54" W	433.00'
L28	S 74°00'14" E	170.03'
L29	S 66°42'24" E	321.00'
L30	S 69°31'44" E	170.30'
L31	N 02°29'26" E	250.00'
L32	N 82°53'26" E	211.35'
L33	S 08°46'59" E	86.28'
L34	N 73°52'42" E	550.58'
L35	N 81°04'12" E	22.00'
L36	S 08°52'19" E	522.85'
L37	N 82°11'26" E	1031.54'
L38	N 79°35'26" E	191.68'

PROPERTY CURVE TABLE

CURVE	RADIUS	ARC LENGTH	DELTA ANGLE	CHORD LENGTH	CHORD BEARING
C1	600.00'	164.76'	15°44'00"	164.24'	S 01°11'16" W

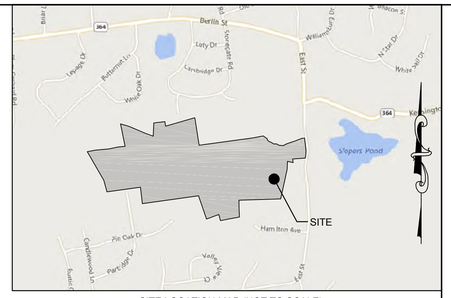
MAP NOTES:

1. THIS MAP AND SURVEY HAVE BEEN PREPARED PURSUANT TO THE REGULATIONS OF CONNECTICUT STATE AGENCIES SECTIONS 20-300b-1 THROUGH 20-300b-20 AND "THE MINIMUM STANDARDS FOR SURVEYS AND MAPS IN THE STATE OF CONNECTICUT" ADOPTED JUNE 21, 1996; AMENDED OCTOBER 26, 2018.
2. THE TYPE OF SURVEY PERFORMED AND THE MAPPED FEATURES DEPICTED HEREON ARE IN ACCORDANCE WITH THE REQUIREMENTS OF A PROPERTY & TOPOGRAPHIC SURVEY AND IS INTENDED TO DEPICT FEATURES UPON THE SUBJECT PARCEL FOR THE PURPOSE OF DESIGNING A SOLAR FIELD .
3. THE PROPERTY/BOUNDARY OPINION/DETERMINATION DEPICTED HEREON IS BASED UPON A RESURVEY OF MAP REFERENCE "A".
4. THE HORIZONTAL BASELINE CONFORMS TO A CLASS A-2 ACCURACY.
   THE VERTICAL BASELINE CONFORMS TO A CLASS V-2 ACCURACY.
   THE TOPOGRAPHIC FEATURES CONFORM TO A CLASS T-3 ACCURACY.

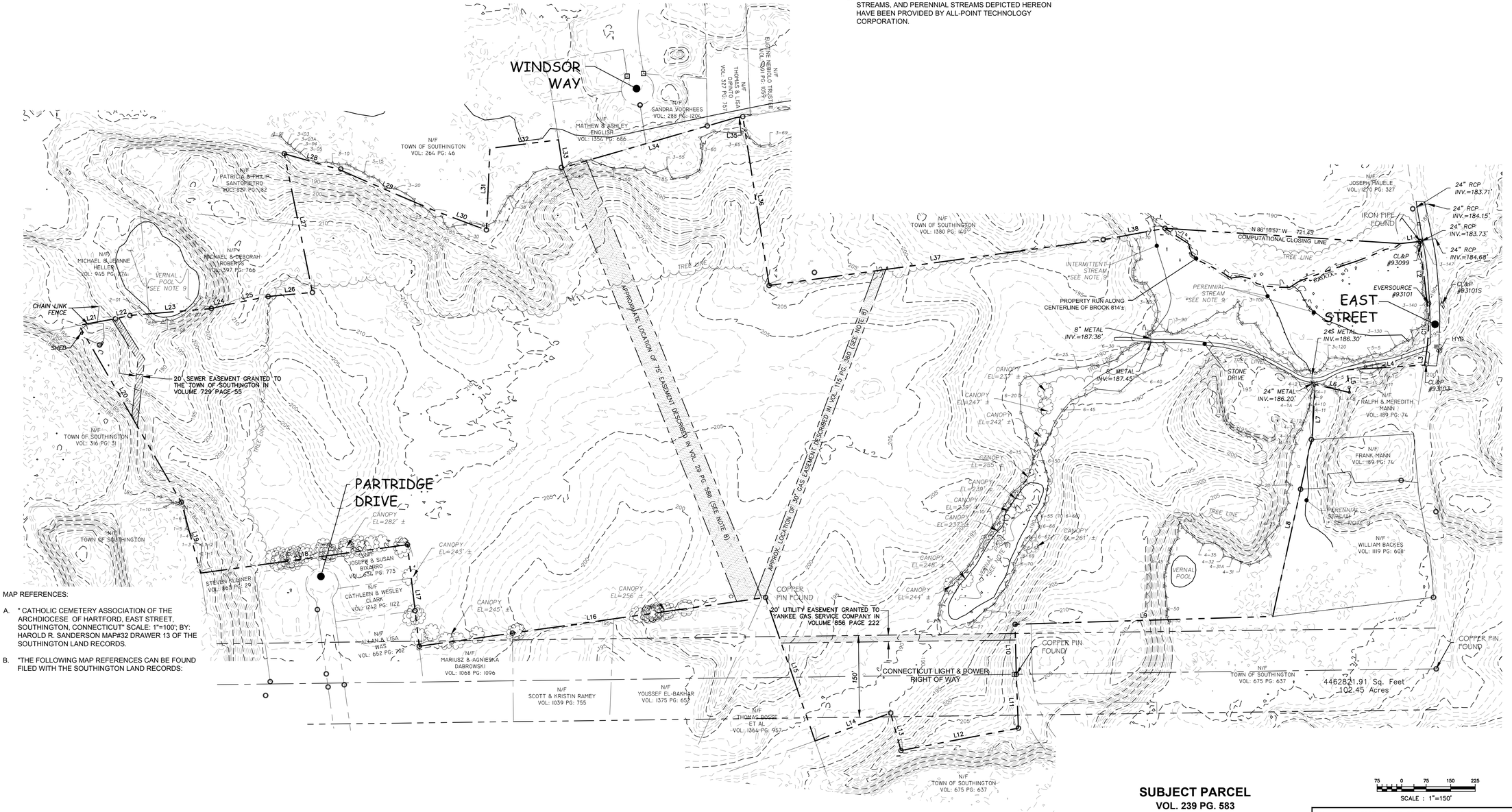
MAP NOTES (CONTINUED):

5. THE CONTOURS DEPICTED HEREON ARE BASED UP THE ORTHOPHOTOGRAPHY AND LIDAR DATA SET OF 2016 BY THE STATE OF CONNECTICUT AVAILABLE AT CTECO.UCONN.EDU.
6. THE EXISTING FEATURES DEPICTED HEREON ARE BASED UPON A FIELD SURVEY CONDUCTED IN MARCH, 2020.
7. THE NORTH ARROW AND BEARINGS ARE BASED UPON THE CONNECTICUT STATE COORDINATE SYSTEM N.A.D. 1983 (2011). THE ELEVATIONS ARE BASED UPON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88) USING GEOID 12B. COORDINATES AND ELEVATIONS WERE DETERMINED FROM RTK GPS OBSERVATIONS MADE ON MARCH 11, 2020 USING THE CT DOT RTK NETWORK KNOWN AS ACORN (CTNE BASE), HAVING THE FOLLOWING VALUES:

   LATITUDE = N 41° 40' 24.71719"
   LONGITUDE = W 72° 42' 52.25224"
   ELLIPSOID HEIGHT = 41.746M
8. THE GAS EASEMENT DESCRIBED IN VOLUME 115 PAGE 360 AND 239 PAGE 586 ARE TOGETHER WITH AND RIGHT OF INGRESS AND EGRESS OVER AND ACROSS LANDS FOR THE PURPOSE OF EXERCISING SAID EASEMENTS.
9. THE WETLAND DELINEATION, VERNAL POOL, INTERMITTENT STREAMS, AND PERENNIAL STREAMS DEPICTED HEREON HAVE BEEN PROVIDED BY ALL-POINT TECHNOLOGY CORPORATION.



SITE LOCATION MAP (NOT TO SCALE)



MAP REFERENCES:

A. " CATHOLIC CEMETERY ASSOCIATION OF THE ARCHDIOCESE OF HARTFORD, EAST STREET, SOUTHINGTON, CONNECTICUT" SCALE: 1"=100'; BY: HAROLD R. SANDERSON MAP#32 DRAWER 13 OF THE SOUTHINGTON LAND RECORDS.

B. "THE FOLLOWING MAP REFERENCES CAN BE FOUND FILED WITH THE SOUTHINGTON LAND RECORDS:

SUBJECT PARCEL
VOL. 239 PG. 583
EXCEPTING VOL. 316 PG. 31
AREA=4,462,822± S.F.
102.45± ACRES

SCALE : 1"=150'

TO MY KNOWLEDGE AND BELIEF, THIS MAP IS SUBSTANTIALLY CORRECT AS NOTED HEREON.

DEAN MARTIN — 70147 LICENSE NO.

THIS DOCUMENT AND COPIES THEREOF ARE VALID ONLY IF THEY BEAR THE SIGNATURE AND EMBOSSED SEAL OF THE DESIGNATED LICENSED PROFESSIONAL. UNAUTHORIZED ALTERATIONS TO THIS PLAN RENDER THE DECLARATION HEREON NULL AND VOID.

LEGEND:

- IRON PIN (FOUND)
- Rebar/Drill Hole (To Be Set)
- MONUMENT (FOUND)
- MANHOLE
- DRAINAGE MANHOLE
- SANITARY MANHOLE
- ELEC. MANHOLE
- TELE. MANHOLE
- "C" CATCH BASIN
- "C-L" CATCH BASIN
- DECIDUOUS TREES
- EVERGREEN TREES
- SHRUB/BUSH
- FLAG POLE
- TRAFFIC CONTROL BOX
- SIGN
- POST
- LIGHT POLE
- GUY ANCHOR
- UTILITY POLE
- WATER GATE
- WATER METER
- GAS VALVE
- GAS METER
- TRANSFORMER
- ELEC. METER
- MAIL BOX
- HAND HOLE
- BUTTON BOX
- A.C. UNIT
- TRAFFIC LIGHT POLE
- BOUNDARY LINE
- GUARD RAIL
- UNDERGROUND PIPING (San.,Stm.)
- U/G GAS LINE
- U/G ELEC. LINE
- WATER LINE
- OVERHEAD UTILITIES
- U/G TELE. LINE
- CHAIN LINK FENCE
- TREE LINE

martin
Surveying Associates, LLC
201 CHRISTIAN LANE BERLIN, CT 06037
860-832-9328 860-357-4604 (FAX)

REVISIONS:

PROPERTY & TOPOGRAPHIC SURVEY
LAND OF
CATHOLIC CEMETERIES ASSOCIATION

PREPARED FOR
SOUTHINGTON SOLAR ONE, LLC
1012 EAST STREET
SOUTHINGTON, CONNECTICUT

MSA PROJECT NO: 20-015

SCALE: 1"=150'	DRAWN BY: G.S.D.
DATE: 3/25/20	CHECKED BY: D.G.M.
	SHEET: 1 OF 1

GENERAL NOTES

1. ALL CONSTRUCTION SHALL COMPLY WITH PROJECT DEVELOPER STANDARDS, CITY OF SOUTHINGTON STANDARDS, CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARDS AND SPECIFICATIONS IN THE ABOVE REFERENCED INCREASING HIERARCHY. IF SPECIFICATIONS ARE IN CONFLICT, THE MORE STRINGENT SPECIFICATION SHALL APPLY.
2. IF NO PROJECT CONSTRUCTION SPECIFICATION PACKAGE IS PROVIDED BY THE PROJECT DEVELOPER OR THEIR REPRESENTATIVE, THE CONTRACTOR SHALL COMPLY WITH THE MANUFACTURE, CITY OF SOUTHINGTON, OR CONNECTICUT DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS, AND BE IN ACCORDANCE WITH ALL APPLICABLE OSHA, FEDERAL, STATE AND LOCAL REGULATIONS.
3. THE PROJECT DEVELOPER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY ZONING AND STORMWATER PERMITS REQUIRED BY GOVERNMENT AGENCIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN ALL CITY OF SOUTHINGTON CONSTRUCTION PERMITS. THE CONTRACTOR SHALL POST ALL BONDS, PAY ALL FEES, PROVIDE PROOF OF INSURANCE AND PROVIDE TRAFFIC CONTROL NECESSARY FOR THIS WORK.
4. REFER TO PLANS, DETAILS AND REPORTS PREPARED BY ALL-POINTS TECHNOLOGY CORPORATION FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL VERIFY ALL SITE CONDITIONS IN THE FIELD AND CONTACT THE PROJECT DEVELOPER IF THERE ARE ANY QUESTIONS OR CONFLICTS REGARDING THE CONSTRUCTION DOCUMENTS AND/OR FIELD CONDITIONS SO THAT APPROPRIATE REVISIONS CAN BE MADE PRIOR TO BIDDING/CONSTRUCTION. ANY CONFLICT BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE CONFIRMED WITH THE PROJECT DEVELOPERS CONSTRUCTION MANAGER PRIOR TO CONSTRUCTION.
5. THE CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF ALL PRODUCTS, MATERIALS PER PLANS AND SPECIFICATIONS TO THE PROJECT DEVELOPER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OR DELIVERY TO THE SITE. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
6. SHOULD ANY UNKNOWN OR INCORRECTLY LOCATED EXISTING PIPING OR OTHER UTILITY BE UNCOVERED DURING EXCAVATION, CONSULT THE PROJECT DEVELOPER IMMEDIATELY FOR DIRECTIONS BEFORE PROCEEDING FURTHER WITH WORK IN THIS AREA.
7. DO NOT INTERRUPT EXISTING UTILITIES SERVICING FACILITIES OCCUPIED AND USED BY THE PROJECT DEVELOPER OR OTHERS DURING OCCUPIED HOURS, EXCEPT WHEN SUCH INTERRUPTIONS HAVE BEEN AUTHORIZED IN WRITING BY THE PROJECT DEVELOPER AND THE LOCAL MUNICIPALITY. INTERRUPTIONS SHALL ONLY OCCUR AFTER ACCEPTABLE TEMPORARY SERVICE HAS BEEN PROVIDED.
8. THE CONTRACT LIMIT IS THE PROPERTY LINE UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.
9. THE CONTRACTOR SHALL ABIDE BY ALL OSHA, FEDERAL, STATE AND LOCAL REGULATIONS WHEN OPERATING CRANES, BOOMS, HOISTS, ETC. IN CLOSE PROXIMITY TO OVERHEAD ELECTRIC LINES. IF CONTRACTOR MUST OPERATE EQUIPMENT CLOSE TO ELECTRIC LINES, CONTACT POWER COMPANY TO MAKE ARRANGEMENTS FOR PROPER SAFEGUARDS. ANY UTILITY COMPANY FEES SHALL BE PAID FOR BY THE CONTRACTOR.
10. THE CONTRACTOR SHALL COMPLY WITH OSHA CFR 29 PART 1926 FOR EXCAVATION TRENCHING AND TRENCH PROTECTION REQUIREMENTS.
11. THE ENGINEER IS NOT RESPONSIBLE FOR SITE SAFETY MEASURES TO BE EMPLOYED DURING CONSTRUCTION. THE ENGINEER HAS NO CONTRACTUAL DUTY TO CONTROL THE SAFEST METHODS OR MEANS OF THE WORK, JOB SITE RESPONSIBILITIES, SUPERVISION OF PERSONNEL OR TO SUPERVISE SAFETY AND DO NOT VOLUNTARILY ASSUME ANY SUCH DUTY OR RESPONSIBILITY.
12. THE CONTRACTOR SHALL RESTORE ANY DRAINAGE STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, LANDSCAPED AREAS OR SIGNAGE DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION OR BETTER, AS APPROVED BY THE PROJECT DEVELOPER OR CITY OF SOUTHINGTON.
13. THE CONTRACTOR SHALL PROVIDE AS-BUILT RECORDS OF ALL CONSTRUCTION (INCLUDING UNDERGROUND UTILITIES) TO THE PROJECT DEVELOPER AT THE END OF CONSTRUCTION.
14. ALTERNATIVE METHODS AND PRODUCTS, OTHER THAN THOSE SPECIFIED, MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCY PRIOR TO INSTALLATION DURING THE BIDDING/CONSTRUCTION PROCESS.
15. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE SYSTEMS HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE SYSTEMS ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE AND THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE SYSTEMS INCLUDING SERVICES. PRIOR TO DEMOLITION OR CONSTRUCTION, THE CONTRACTOR SHALL CONTACT "DIG SAFE" 72 HOURS BEFORE COMMENCEMENT OF WORK AT "811" AND VERIFY ALL UTILITY AND STORM DRAINAGE SYSTEM LOCATIONS.
16. NO CONSTRUCTION OR DEMOLITION SHALL BEGIN UNTIL APPROVAL OF THE FINAL PLANS IS GRANTED BY ALL GOVERNING AND REGULATORY AGENCIES.

SITE PLAN NOTES

1. THE SURVEY WAS PROVIDED BY MARTIN SURVEYING ASSOCIATES, LLC DATED MARCH 25, 2020.
2. THERE ARE WETLANDS AND WATERWAYS LOCATED ON THE SITE AS INDICATED ON THE PLANS. BOUNDARIES WERE FLAGGED AND LOCATED VIA GPS BY APT, IN JANUARY 2020 AND APRIL 2020.
3. THE CONTRACTOR SHALL FOLLOW THE RECOMMENDED SEQUENCE OF CONSTRUCTION NOTES PROVIDED ON THE EROSION CONTROL PLAN OR SUBMIT AN ALTERNATE PLAN FOR APPROVAL BY THE ENGINEER AND/OR PERMITTING AGENCIES PRIOR TO THE START CONSTRUCTION. ALLOW A MINIMUM OF 14 WORKING DAYS FOR REVIEW.
4. PROPER CONSTRUCTION PROCEDURES SHALL BE FOLLOWED ON ALL IMPROVEMENTS WITHIN THIS PARCEL SO AS TO PREVENT THE SILTING OF ANY WATERCOURSE OR BVWS IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL REGULATIONS. IN ADDITION, THE CONTRACTOR SHALL ADHERE TO "EROSION CONTROL PLAN" CONTAINED HEREIN. THE CONTRACTOR SHALL BE RESPONSIBLE TO POST ALL BONDS AS REQUIRED BY GOVERNMENT AGENCIES WHICH WOULD GUARANTEE THE PROPER IMPLEMENTATION OF THE PLAN.
5. ALL SITE WORK, MATERIALS OF CONSTRUCTION, AND CONSTRUCTION METHODS FOR EARTHWORK AND STORM DRAINAGE WORK, SHALL CONFORM TO THE SPECIFICATIONS AND DETAILS AND APPLICABLE SECTIONS OF THE PROJECT SPECIFICATIONS MANUAL. OTHERWISE THIS WORK SHALL CONFORM TO THE STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION AND PROJECT GEOTECHNICAL REPORT IF THERE IS NO PROJECT SPECIFICATIONS MANUAL. ALL FILL MATERIAL UNDER STRUCTURES AND PAVED AREAS SHALL BE PER THE ABOVE STATED APPLICABLE SPECIFICATIONS, AND/OR PROJECT GEOTECHNICAL REPORT, AND SHALL BE PLACED IN ACCORDANCE WITH THE APPLICABLE SPECIFICATIONS UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL ENGINEER. MATERIAL SHALL BE COMPACTED IN 8" LIFTS TO 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 1557 AT 95% PERCENT OF OPTIMUM MOISTURE CONTENT.
6. ALL DISTURBANCE INCURRED TO PUBLIC, MUNICIPAL, COUNTY, STATE PROPERTY DUE TO CONSTRUCTION SHALL BE RESTORED TO ITS PREVIOUS CONDITION OR BETTER, TO THE SATISFACTION OF THE CITY OF SOUTHINGTON AND STATE OF CONNECTICUT.
7. IF IMPACTED OR CONTAMINATED SOIL IS ENCOUNTERED BY THE CONTRACTOR, THE CONTRACTOR SHALL SUSPEND EXCAVATION WORK OF IMPACTED SOIL AND NOTIFY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPER'S ENVIRONMENTAL CONSULTANT PRIOR TO PROCEEDING WITH FURTHER WORK IN THE IMPACTED SOIL LOCATION UNTIL FURTHER INSTRUCTED BY THE PROJECT DEVELOPER AND/OR PROJECT DEVELOPER'S ENVIRONMENTAL CONSULTANT.

UTILITY NOTES

1. CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE CITY OF SOUTHINGTON TO SECURE CONSTRUCTION PERMITS AND FOR PAYMENT OF FEES FOR STREET CUTS AND CONNECTIONS TO EXISTING UTILITIES.
2. REFER TO DRAWINGS BY PROJECT DEVELOPER FOR THE ONSITE ELECTRICAL DRAWINGS AND INTERCONNECTION TO EXISTING ELECTRICAL GRID. SITE CONTRACTOR SHALL SUPPLY AND INSTALL PIPE ADAPTERS AS NECESSARY AT BUILDING CONNECTION POINT OR AT EXISTING UTILITY OR PIPE CONNECTION POINT. THESE DETAILS ARE NOT INCLUDED IN THESE PLANS.
3. UTILITY LOCATIONS AND PENETRATIONS ARE SHOWN FOR THE CONTRACTOR'S INFORMATION AND SHALL BE VERIFIED WITH THE ELECTRICAL ENGINEER AND THE PROJECT DEVELOPER'S CONSTRUCTION MANAGER PRIOR TO THE START OF CONSTRUCTION.
4. THE CONTRACTOR SHALL VISIT THE SITE AND VERIFY THE ELEVATION AND LOCATION OF ALL UTILITIES BY VARIOUS MEANS PRIOR TO BEGINNING ANY EXCAVATION. TEST PITS SHALL BE DUG AT ALL LOCATIONS WHERE PROP. SANITARY SEWERS AND WHERE PROP. STORM PIPING WILL CROSS EXISTING UTILITIES, AND THE HORIZONTAL AND VERTICAL LOCATIONS OF THE UTILITIES SHALL BE DETERMINED. THE CONTRACTOR SHALL CONTACT THE PROJECT DEVELOPER IN THE EVENT OF ANY DISCOVERED OR UNFORESEEN CONFLICTS BETWEEN EXISTING AND PROPOSED SANITARY SEWERS, STORM PIPING AND UTILITIES SO THAT AN APPROPRIATE MODIFICATION MAY BE MADE.
5. UTILITY CONNECTION DESIGN AS REFLECTED ON THE PLAN MAY CHANGE SUBJECT TO UTILITY PROVIDER AND GOVERNING AUTHORITY STAFF REVIEW.
6. THE CONTRACTOR SHALL ENSURE THAT ALL UTILITY PROVIDERS AND GOVERNING AUTHORITY STANDARDS FOR MATERIALS AND CONSTRUCTION METHODS ARE MET. THE CONTRACTOR SHALL PERFORM PROPER COORDINATION WITH THE RESPECTIVE UTILITY PROVIDER.
7. THE CONTRACTOR SHALL ARRANGE FOR AND COORDINATE WITH THE RESPECTIVE UTILITY PROVIDERS FOR SERVICE INSTALLATIONS AND CONNECTIONS. THE CONTRACTOR SHALL COORDINATE WORK TO BE PERFORMED BY THE VARIOUS UTILITY PROVIDERS AND SHALL PAY ALL FEES FOR CONNECTIONS, DISCONNECTIONS, RELOCATIONS, INSPECTIONS, AND DEMOLITION UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATIONS MANUAL AND/OR GENERAL CONDITIONS OF THE CONTRACT.
8. ALL EXISTING PAVEMENT WHERE UTILITY PIPING IS TO BE INSTALLED SHALL BE SAW CUT. AFTER UTILITY INSTALLATION IS COMPLETED, THE CONTRACTOR SHALL INSTALL TEMPORARY AND/OR PERMANENT PAVEMENT REPAIR AS DETAILED ON THE DRAWINGS OR AS REQUIRED BY THE CITY OF SOUTHINGTON.
9. ALL PIPES SHALL BE LAID ON STRAIGHT ALIGNMENTS AND EVEN GRADES USING A PIPE LASER OR OTHER ACCURATE METHOD.
10. RELOCATION OF UTILITY PROVIDER FACILITIES, SUCH AS POLES, SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY PROVIDER.
11. THE CONTRACTOR SHALL COMPACT PIPE BACKFILL IN 8" LIFTS ACCORDING TO THE PIPE BEDDING DETAILS. TRENCH BOTTOM SHALL BE STABLE IN HIGH GROUNDWATER AREAS. A PIPE FOUNDATION SHALL BE USED PER THE TRENCH DETAILS AND IN AREAS OF ROCK EXCAVATION.
12. CONTRACTOR TO PROVIDE STEEL SLEEVES AND ANNULAR SPACE SAND FILL FOR UTILITY PIPE AND CONDUIT CONNECTIONS UNDER FOOTINGS.
13. ALL UTILITY CONSTRUCTION IS SUBJECT TO INSPECTION FOR APPROVAL PRIOR TO BACKFILLING, IN ACCORDANCE WITH THE APPROPRIATE UTILITY PROVIDER REQUIREMENTS.
14. A ONE-FOOT MINIMUM VERTICAL CLEARANCE BETWEEN WATER, GAS, ELECTRICAL, AND TELEPHONE LINES AND STORM PIPING SHALL BE PROVIDED. A SIX-INCH MINIMUM CLEARANCE SHALL BE MAINTAINED BETWEEN STORM PIPING AND SANITARY SEWER. A 6-INCH TO 18-INCH VERTICAL CLEARANCE BETWEEN SANITARY SEWER PIPING AND STORM PIPING SHALL REQUIRE CONCRETE ENCASEMENT OF THE PROP. SANITARY PIPING.
15. THE CONTRACTOR SHALL RESTORE ANY UTILITY STRUCTURE, PIPE, CONDUIT, PAVEMENT, CURBING, SIDEWALKS, DRAINAGE STRUCTURE, SWALE OR LANDSCAPED AREAS DISTURBED DURING CONSTRUCTION, TO THEIR ORIGINAL CONDITION OR BETTER TO THE SATISFACTION OF THE PROJECT DEVELOPER AND CITY OF SOUTHINGTON.
16. INFORMATION ON EXISTING UTILITIES AND STORM DRAINAGE HAS BEEN COMPILED FROM AVAILABLE INFORMATION INCLUDING UTILITY PROVIDER AND MUNICIPAL RECORD MAPS AND/OR FIELD SURVEY, AND IS NOT GUARANTEED CORRECT OR COMPLETE. UTILITIES AND STORM DRAINAGE ARE SHOWN TO ALERT THE CONTRACTOR TO THEIR PRESENCE. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DETERMINING ACTUAL LOCATIONS AND ELEVATIONS OF ALL UTILITIES AND STORM DRAINAGE INCLUDING SERVICES. CONTACT "DIG SAFE" AT 811 72 HOURS PRIOR TO CONSTRUCTION AND VERIFY ALL UNDERGROUND AND OVERHEAD UTILITY AND STORM DRAINAGE LOCATIONS. THE CONTRACTOR SHALL EMPLOY THE USE OF A UTILITY LOCATING COMPANY TO PROVIDE SUBSURFACE UTILITY ENGINEERING CONSISTING OF DESIGNATING UTILITIES AND STORM PIPING ON PRIVATE PROPERTY WITHIN THE CONTRACT LIMIT AND CONSISTING OF DESIGNATING AND LOCATING WHERE PROP. UTILITIES AND STORM PIPING CROSS EXISTING UTILITIES AND STORM PIPING WITHIN THE CONTRACT LIMITS.
17. THE CONTRACTOR SHALL ARRANGE AND COORDINATE WITH UTILITY PROVIDERS FOR WORK TO BE PERFORMED BY UTILITY PROVIDERS. THE CONTRACTOR SHALL PAY ALL UTILITY FEES UNLESS OTHERWISE STATED IN THE PROJECT SPECIFICATION MANUAL AND GENERAL CONDITIONS, AND REPAIR PAVEMENTS AS NECESSARY.
18. ELECTRIC DRAWINGS AND REQUIREMENTS ARE NOT INCLUDED AS PART OF THIS DRAWING SET AND SHOULD BE OBTAINED FROM THE PROJECT DEVELOPER.
19. ALTERNATIVE METHODS AND PRODUCTS OTHER THAN THOSE SPECIFIED MAY BE USED IF REVIEWED AND APPROVED BY THE PROJECT DEVELOPER, ENGINEER, AND APPROPRIATE REGULATORY AGENCIES PRIOR TO INSTALLATION.
20. THE CONTRACTOR SHALL MAINTAIN ALL FLOWS AND UTILITY CONNECTIONS TO EXISTING BUILDINGS WITHOUT INTERRUPTION UNLESS/UNTIL AUTHORIZED TO DISCONNECT BY THE PROJECT DEVELOPER, CITY OF SOUTHINGTON, UTILITY PROVIDERS AND GOVERNING AUTHORITIES.

GENERAL LEGEND

	EXISTING	PROPOSED
PROPERTY LINE		
BUILDING SETBACK		
SOLAR SETBACK		
EASEMENT		
TREE LINE		
WETLAND		
WETLAND BUFFER		
VERNAL POOL		
VERNAL POOL BUFFER		
WATERCOURSE		
WATERCOURSE BUFFER		
MAJOR CONTOUR		
MINOR CONTOUR		
UNDERGROUND ELECTRIC		E E
OVERHEAD ELECTRIC	OH OH	OH OH
GAS LINE		
WATER LINE	W W	W W
WATER QUALITY SWALE		
FENCE		X X X
LIMIT OF DISTURBANCE		LOD
SILT FENCE	SF SF	

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CSC PERMIT SET

NO	DATE	REVISION
0	07/23/20	FOR PERMIT: BJP
1		
2		
3		
4		
5		
6		

NOT FOR CONSTRUCTION

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHALL ST EXT - STE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: KAM
DATE: 07/07/2020 CHECKED BY: BJP

SHEET TITLE:

GENERAL NOTES

SHEET NUMBER:

GN-1

STATE OF CONNECTICUT · BRADLEY J. PARSONS · No. 28025 · LICENSED PROFESSIONAL ENGINEER

ENVIRONMENTAL NOTES - RESOURCE PROTECTION MEASURES

WETLAND, VERNAL POOL, SPOTTED TURTLE AND AQUIFER PROTECTION PROGRAM

THE PROPOSED SOLAR FACILITY IS LOCATED PROXIMATE TO SENSITIVE HABITATS INCLUDING WETLAND RESOURCE AREAS, VERNAL POOLS, RARE SPECIES. IN ADDITION, THE PROPOSED FACILITY IS LOCATED WITHIN THE TOWN OF SOUTHINGTON WATER DEPARTMENT'S (PWSID #CT1310011) AQUIFER PROTECTION AREA ("APA") FOR WELLS #7 AND #8. AS A RESULT, THE FOLLOWING PROTECTIVE MEASURES SHALL BE FOLLOWED TO HELP AVOID DEGRADATION OF NEARBY WETLAND/WATERCOURSES, AVOID INCIDENTAL IMPACT TO VERNAL POOL INDICATOR SPECIES AND AVOID IMPACT TO THE APA.

IN ADDITION, SPOTTED TURTLE (*CLEMMYS GUTTATA*), A STATE SPECIAL CONCERN SPECIES AFFORDED PROTECTION UNDER THE CONNECTICUT ENDANGERED SPECIES ACT, IS KNOWN TO OCCUR ON THE SUBJECT PROPERTY IN PROXIMITY TO THE PROPOSED FACILITY. THE TURTLE PROTECTION MEASURES INCLUDED HEREIN SATISFY REQUIREMENTS FROM THE CONNECTICUT DEPARTMENT OF ENERGY AND ENVIRONMENTAL PROTECTION ("DEEP") WILDLIFE DIVISION IN ACCORDANCE WITH THEIR NATURAL DIVERSITY DATA BASE ("NDDB") DETERMINATION LETTER (NO. 202002717) DATED MARCH 9, 2020. THIS DETERMINATION IS VALID UNTIL MARCH 9, 2021 PROVIDED THE SCOPE OF THE PROJECT HAS NOT CHANGED AND WORK HAS BEGUN ON THE PROJECT PRIOR TO THE EXPIRATION DATE.

IT IS OF THE UTMOST IMPORTANCE THAT THE CONTRACTOR COMPLIES WITH THE REQUIREMENT FOR IMPLEMENTATION OF THESE PROTECTIVE MEASURES AND THE EDUCATION OF ITS EMPLOYEES AND SUBCONTRACTORS PERFORMING WORK ON THE PROJECT SITE. THE WETLAND PROTECTION MEASURES SHALL BE IMPLEMENTED AND MAINTAINED THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES UNTIL PERMANENT STABILIZATION OF SITE SOILS HAS OCCURRED. VERNAL POOL PROTECTION MEASURES SHOULD BE IMPLEMENTED DURING PEAK AMPHIBIAN MOVEMENT PERIODS (EARLY SPRING BREEDING [MARCH 1ST TO MAY 15TH] AND LATE SUMMER DISPERSAL [JULY 15TH TO SEPTEMBER 15TH]) IF CONSTRUCTION CANNOT BE AVOIDED DURING THESE PERIODS. THE TURTLE PROTECTION MEASURES WITHIN THIS PLAN SHALL BE IMPLEMENTED IF WORK WILL OCCUR DURING EITHER THE TURTLE'S ACTIVE PERIOD (MARCH 15TH TO NOVEMBER 1ST) OR DORMANT PERIOD (NOVEMBER 1ST TO MARCH 15TH).

ALL-POINTS TECHNOLOGY CORPORATION, P.C. ("APT") WILL SERVE AS THE ENVIRONMENTAL MONITOR FOR THIS PROJECT TO ENSURE THAT THESE PROTECTION MEASURES ARE IMPLEMENTED PROPERLY. APT WILL PROVIDE AN EDUCATION SESSION FOR THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION ACTIVITIES ON SPOTTED TURTLE AND NEARBY SENSITIVE WETLAND RESOURCESVERNAL POOLS THAT MAY BE ENCOUNTERED DUE TO THE PROJECT'S LOCATION WITHIN POTENTIALLY SENSITIVE HABITAT. THE CONTRACTOR SHALL CONTACT DEAN GUSTAFSON, SENIOR BIOLOGIST AT APT, AT LEAST 5 BUSINESS DAYS PRIOR TO THE START OF ANY CONSTRUCTION ACTIVITIES TO SCHEDULE A PRE-CONSTRUCTION MEETING. MR. GUSTAFSON CAN BE REACHED BY PHONE AT (860) 552-2033 OR VIA EMAIL AT DGUSTAFSON@ALLPOINTSTECH.COM.

THE TOWN OF SOUTHINGTON WATER DEPARTMENT WILL BE CONTACTED AT LEAST 3 BUSINESS DAYS PRIOR TO THE PRE-CONSTRUCTION MEETING WITH AN INVITATION TO ATTEND.

THIS PROTECTION PROGRAM CONSISTS OF SEVERAL COMPONENTS: EDUCATION OF ALL CONTRACTORS AND SUB-CONTRACTORS PRIOR TO INITIATION OF WORK ON THE SITE; PROTECTIVE MEASURES; PERIODIC INSPECTION OF THE CONSTRUCTION PROJECT; AND, REPORTING.

1. CONTRACTOR EDUCATION

   a. PRIOR TO WORK ON SITE, THE CONTRACTOR SHALL ATTEND AN EDUCATIONAL SESSION AT THE PRE-CONSTRUCTION MEETING WITH APT. THIS ORIENTATION AND EDUCATIONAL SESSION WILL CONSIST OF AN INTRODUCTORY MEETING WITH APT PROVIDING PHOTOS OF SPOTTED TURTLE EMPHASIZING THE NON-AGGRESSIVE NATURE OF THESE SPECIES, THE ABSENCE OF NEED TO DESTROY ANIMALS THAT MIGHT BE ENCOUNTERED AND THE NEED TO FOLLOW PROTECTIVE MEASURES AS DESCRIBED IN SECTIONS BELOW. WORKERS WILL ALSO BE PROVIDED INFORMATION REGARDING THE IDENTIFICATION OF OTHER TURTLES, SNAKES AND COMMON HERPETOFAUNA SPECIES THAT COULD BE ENCOUNTERED. THE IMPORTANCE OF PROTECTING NEARBY WETLAND AND VERNAL POOL RESOURCES WILL ALSO BE STRESSED AS PART OF THIS EDUCATIONAL SESSION.

   b. DURING THE PRE-CONSTRUCTION MEETING, THE CONTRACTOR WILL ALSO BE MADE AWARE OF THE SPECIAL PROTECTIVE PRECAUTIONS THAT ARE REQUIRED DUE TO THE PROJECT'S LOCATION IN THE APA.

   c. THE EDUCATION SESSION WILL ALSO FOCUS ON MEANS TO DISCRIMINATE BETWEEN THE SPECIES OF CONCERN AND OTHER NATIVE SPECIES TO AVOID UNNECESSARY "FALSE ALARMS". ENCOUNTERS WITH ANY SPECIES OF TURTLES, SNAKES AND AMPHIBIANS WILL BE DOCUMENTED.

   d. THE CONTRACTOR WILL BE PROVIDED WITH CELL PHONE AND EMAIL CONTACTS FOR APT PERSONNEL TO IMMEDIATELY REPORT ANY ENCOUNTERS WITH SPOTTED TURTLE OR OTHER SPECIES. EDUCATIONAL POSTER MATERIALS WILL BE PROVIDED BY APT AND DISPLAYED ON THE JOB SITE TO MAINTAIN WORKER AWARENESS AS THE PROJECT PROGRESSES.

   e. IF A SPOTTED TURTLE IS ENCOUNTERED, THE CONTRACTOR SHALL IMMEDIATELY CEASE ALL WORK, AVOID DISTURBANCE OF THE TURTLE, AND CONTACT APT.

2. ISOLATION MEASURES & SEDIMENTATION AND EROSION CONTROLS

   a. PLASTIC NETTING USED IN A VARIETY OF EROSION CONTROL PRODUCTS (I.E., EROSION CONTROL BLANKETS, FIBER ROLLS [WATTLES], REINFORCED SILT FENCE) HAS BEEN FOUND TO ENTANGLE WILDLIFE, INCLUDING REPTILES, AMPHIBIANS, BIRDS, AND SMALL MAMMALS, BUT PARTICULARLY SNAKES. NO PERMANENT EROSION CONTROL PRODUCTS OR REINFORCED SILT FENCE WILL BE USED ON THE PROJECT. TEMPORARY EROSION CONTROL PRODUCTS WILL USE EITHER EROSION CONTROL BLANKETS AND FIBER ROLLS COMPOSED OF PROCESSED FIBERS MECHANICALLY BOUND TOGETHER TO FORM A CONTINUOUS MATRIX (NETLESS) OR NETTING COMPOSED OF PLANAR WOVEN NATURAL BIODEGRADABLE FIBER TO AVOID/MINIMIZE WILDLIFE ENTANGLEMENT.

   b. INSTALLATION OF SEDIMENTATION AND EROSION CONTROLS, REQUIRED FOR EROSION CONTROL COMPLIANCE AND CREATION OF A BARRIER TO POSSIBLE MIGRATING/DISPERSING TURTLES, SHALL BE PERFORMED BY THE CONTRACTOR FOLLOWING CLEARING ACTIVITIES AND PRIOR TO ANY EARTHWORK. THE ENVIRONMENTAL MONITOR WILL INSPECT THE WORK ZONE AREA PRIOR TO AND FOLLOWING EROSION CONTROL BARRIER INSTALLATION TO ENSURE THE AREA IS FREE OF SPOTTED TURTLE AND DOCUMENT BARRIERS HAVE BEEN SATISFACTORILY INSTALLED. THE INTENT OF THE BARRIER IS TO SEGREGATE THE MAJORITY OF THE WORK ZONE AND ISOLATE IT FROM NESTING/FORAGING/MIGRATING/DISPERSING TURTLES, SNAKES AND OTHER HERPETOFAUNA. OFTENTIMES COMPLETE ISOLATION OF A WORK ZONE IS NOT FEASIBLE DUE TO ACCESSIBILITY NEEDS AND LOCATIONS OF STAGING/MATERIAL STORAGE AREAS, ETC. ALTHOUGH THE BARRIERS MAY NOT COMPLETELY ISOLATE THE WORK ZONE, THEY WILL BE POSITIONED TO DEFLECT MIGRATING/DISPERSAL ROUTES AWAY FROM THE WORK ZONE TO MINIMIZE POTENTIAL ENCOUNTERS WITH TURTLES, SNAKES AND OTHER HERPETOFAUNA.

   c. EXCLUSIONARY FENCING FOR TURTLES SHALL BE AT LEAST 20 INCHES TALL AND MUST BE SECURED TO AND REMAIN IN CONTACT WITH THE GROUND AND BE REGULARLY MAINTAINED BY THE CONTRACTOR (AT LEAST BI-WEEKLY AND AFTER MAJOR WEATHER EVENTS) TO SECURE ANY GAPS OR OPENINGS AT GROUND LEVEL THAT MAY LET ANIMAL PASS THROUGH.

   d. THE CONTRACTOR IS RESPONSIBLE FOR DAILY INSPECTIONS OF THE SEDIMENTATION AND EROSION CONTROLS FOR TEARS OR BREECHES AND ACCUMULATION LEVELS OF SEDIMENT, PARTICULARLY FOLLOWING STORM EVENTS THAT GENERATE A DISCHARGE. APT WILL PROVIDE PERIODIC INSPECTIONS OF THE SEDIMENTATION AND EROSION CONTROLS THROUGHOUT THE DURATION OF CONSTRUCTION ACTIVITIES ONLY AS IT PERTAINS TO THEIR FUNCTION AS ISOLATION MEASURES FOR THE PROTECTION OF RARE SPECIES. THIRD PARTY MONITORING OF SEDIMENTATION AND EROSION CONTROLS WILL BE PERFORMED BY OTHER PARTIES, AS NECESSARY, UNDER APPLICABLE LOCAL, STATE AND/OR FEDERAL REGULATIONS.

   e. THE EXTENT OF THE SEDIMENTATION AND EROSION CONTROLS WILL BE AS SHOWN ON THE SITE PLANS. THE CONTRACTOR SHALL HAVE ADDITIONAL SEDIMENTATION AND EROSION CONTROLS STOCKPILED ON SITE SHOULD FIELD OR CONSTRUCTION CONDITIONS WARRANT EXTENDING THE CONTROLS AS DIRECTED BY APT OR OTHER REGULATORY AGENCIES.

   f. NO EQUIPMENT, VEHICLES OR CONSTRUCTION MATERIALS SHALL BE STORED OUTSIDE OF THE SEDIMENTATION AND EROSION CONTROLS WITHIN 100 FEET OF WETLANDS OR WATERCOURSES.

   g. ALL SEDIMENTATION AND EROSION CONTROLS SHALL BE REMOVED WITHIN 30 DAYS OF COMPLETION OF WORK AND PERMANENT STABILIZATION OF SITE SOILS SO THAT REPTILE AND AMPHIBIAN MOVEMENT BETWEEN UPLANDS AND WETLANDS IS NOT RESTRICTED.

3. PETROLEUM MATERIALS STORAGE AND SPILL PREVENTION

   a. CERTAIN PRECAUTIONS ARE NECESSARY TO STORE PETROLEUM MATERIALS, REFUEL AND CONTAIN AND PROPERLY CLEAN UP ANY INADVERTENT FUEL OR PETROLEUM (I.E., OIL, HYDRAULIC FLUID, ETC.) SPILL TO AVOID POSSIBLE IMPACT TO NEARBY RESOURCES AND THE APA.

   b. A SPILL CONTAINMENT KIT CONSISTING OF A SUFFICIENT SUPPLY OF ABSORBENT PADS AND ABSORBENT MATERIAL WILL BE MAINTAINED BY THE CONTRACTOR AT THE CONSTRUCTION SITE THROUGHOUT THE DURATION OF THE PROJECT. IN ADDITION, A WASTE DRUM WILL BE KEPT ON SITE TO CONTAIN ANY USED ABSORBENT PADS/MATERIAL FOR PROPER AND TIMELY DISPOSAL OFF SITE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL LAWS.

   c. THE FOLLOWING PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING RESTRICTIONS AND SPILL RESPONSE PROCEDURES WILL BE ADHERED TO BY THE CONTRACTOR.

   i. PETROLEUM AND HAZARDOUS MATERIALS STORAGE AND REFUELING

1. REFUELING OF VEHICLES OR MACHINERY SHALL OCCUR A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES AND SHALL TAKE PLACE ON AN IMPERVIOUS PAD WITH SECONDARY CONTAINMENT DESIGNED TO CONTAIN FUELS.
2. ANY FUEL OR HAZARDOUS MATERIALS THAT MUST BE KEPT ON SITE SHALL BE STORED ON AN IMPERVIOUS SURFACE UTILIZING SECONDARY CONTAINMENT A MINIMUM OF 100 FEET FROM WETLANDS OR WATERCOURSES.
3. THE CONTRACTOR SHALL INSPECT ALL EQUIPMENT AT THE BEGINNING AND END OF EACH DAY FOR ANY FUEL OR HYDRAULIC LEAKS AND IF DISCOVERED SHALL TAKE IMMEDIATE STEPS TO MAKE REPAIRS AND CLEAN UP ANY DISCHARGES AS DETAILED IN THE FOLLOWING SECTIONS.

   ii. INITIAL SPILL RESPONSE PROCEDURES

1. STOP OPERATIONS AND SHUT OFF EQUIPMENT.
2. REMOVE ANY SOURCES OF SPARK OR FLAME.
3. CONTAIN THE SOURCE OF THE SPILL.
4. DETERMINE THE APPROXIMATE VOLUME OF THE SPILL.
5. IDENTIFY THE LOCATION OF NATURAL FLOW PATHS TO PREVENT THE RELEASE OF THE SPILL TO SENSITIVE NEARBY WATERWAYS OR WETLANDS.
6. ENSURE THAT FELLOW WORKERS ARE NOTIFIED OF THE SPILL.

   iii. SPILL CLEAN UP & CONTAINMENT

1. OBTAIN SPILL RESPONSE MATERIALS FROM THE ON-SITE SPILL RESPONSE KIT. PLACE ABSORBENT MATERIALS DIRECTLY ON THE RELEASE AREA.
2. LIMIT THE SPREAD OF THE SPILL BY PLACING ABSORBENT MATERIALS AROUND THE PERIMETER OF THE SPILL.
3. ISOLATE AND ELIMINATE THE SPILL SOURCE.
4. CONTACT THE APPROPRIATE LOCAL, STATE AND/OR FEDERAL AGENCIES, AS NECESSARY, INCLUDING THE TOWN OF SOUTHINGTON WATER DEPARTMENT AT (860) 628-5593.
5. CONTACT A DISPOSAL COMPANY TO PROPERLY DISPOSE OF CONTAMINATED MATERIALS IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

   iv. REPORTING

1. COMPLETE AN INCIDENT REPORT.
2. SUBMIT A COMPLETED INCIDENT REPORT TO THE TOWN OF SOUTHINGTON WATER DEPARTMENT, CONNECTICUT SITING COUNCIL, AND OTHER APPLICABLE LOCAL, STATE, AND FEDERAL OFFICIALS.
4. VERNAL POOL PROTECTIVE MEASURES

   a. A THOROUGH COVER SEARCH OF THE CONSTRUCTION AREA WILL BE PERFORMED BY APT'S ENVIRONMENTAL MONITOR FOR HERPETOFAUNA (AMPHIBIANS AND REPTILES) PRIOR TO AND FOLLOWING INSTALLATION OF THE SILT FENCING BARRIER TO REMOVE ANY SPECIES FROM THE WORK ZONE PRIOR TO THE INITIATION OF CONSTRUCTION ACTIVITIES. ANY HERPETOFAUNA DISCOVERED WOULD BE CAREFULLY TRANSLOCATED OUTSIDE THE WORK ZONE IN THE GENERAL DIRECTION THE ANIMAL WAS ORIENTED. PERIODIC INSPECTIONS WILL BE PERFORMED BY APT'S ENVIRONMENTAL MONITOR THROUGHOUT THE DURATION OF THE CONSTRUCTION.

   b. ANY STORMWATER MANAGEMENT FEATURES, RUTS OR ARTIFICIAL DEPRESSIONS THAT COULD HOLD WATER CREATED INTENTIONALLY OR UNINTENTIONALLY BY SITE CLEARING/CONSTRUCTION ACTIVITIES WILL BE PROPERLY FILLED IN AND PERMANENTLY STABILIZED WITH VEGETATION TO AVOID THE CREATION OF VERNAL POOL "DECOY POOLS" THAT COULD INTERCEPT AMPHIBIANS MOVING TOWARD THE VERNAL POOLS. STORMWATER MANAGEMENT FEATURES SUCH AS LEVEL SPREADERS WILL BE CAREFULLY REVIEWED IN THE FIELD TO ENSURE THAT STANDING WATER DOES NOT ENDURE FOR MORE THAN A 24-HOUR PERIOD TO AVOID CREATION OF DECOY POOLS AND MAY BE SUBJECT TO FIELD DESIGN CHANGES. ANY SUCH PROPOSED DESIGN CHANGES WILL BE REVIEWED BY THE DESIGN ENGINEER TO ENSURE STORMWATER MANAGEMENT FUNCTIONS ARE MAINTAINED.

5. TURTLE PROTECTIVE MEASURES - ACTIVE PERIOD (MARCH 15TH TO NOVEMBER 1ST)

   a. PRIOR TO CONSTRUCTION AND FOLLOWING INSTALLATION OF ISOLATION BARRIERS, THE CONSTRUCTION AREA WILL BE SWEPT BY APT AND ANY TURTLES OCCURRING WITHIN THE WORK AREA WILL BE RELOCATED TO SUITABLE HABITAT OUTSIDE OF THE ISOLATION BARRIERS.

   a. PRIOR TO THE START OF CONSTRUCTION EACH DAY, THE CONTRACTOR SHALL SEARCH THE ENTIRE WORK AREA FOR TURTLES.

   b. IF A TURTLE IS FOUND DURING THE ACTIVE PERIOD, IT SHALL BE IMMEDIATELY MOVED, UNHARMED, BY CAREFULLY GRASPED IN BOTH HANDS, ONE ON EACH SIDE OF THE SHELL, BETWEEN THE TURTLE'S FORELIMBS AND THE HIND LIMBS, AND PLACED JUST OUTSIDE OF THE ISOLATION BARRIER IN THE SAME APPROXIMATE DIRECTION IT WAS HEADING. THESE ANIMALS ARE PROTECTED BY LAW AND NO TURTLES SHOULD BE RELOCATED FROM THE PROPERTY.

   c. SPECIAL CARE SHALL BE TAKEN BY THE CONTRACTOR DURING EARLY MORNING AND EVENING HOURS SO THAT POSSIBLE BASKING OR FORAGING TURTLES ARE NOT HARMED BY CONSTRUCTION ACTIVITIES.

   d. THE CONTRACTOR SHALL BE PARTICULARLY DILIGENT DURING THE MONTHS OF MAY AND JUNE WHEN TURTLES ARE ACTIVELY SELECTING NESTING SITES WHICH RESULTS IN AN INCREASE IN TURTLE MOVEMENT ACTIVITY.

   e. BEFORE MAY 15, POTENTIALLY SUITABLE TURTLE NESTING AREAS WITHIN THE PROPOSED FACILITY'S LIMITS OF DISTURBANCE WILL BE FENCED TO EXCLUDE FEMALES FROM ENTERING AND LAYING EGGS TO AVOID POTENTIAL IMPACT.

   f. NO HEAVY MACHINERY OR VEHICLES MAY BE PARKED IN ANY TURTLE HABITAT.

   g. SPECIAL PRECAUTIONS MUST BE TAKEN TO AVOID DEGRADATION OF WETLAND HABITATS INCLUDING ANY WET MEADOW HABITAT AND VERNAL POOLS.

6. TURTLE PROTECTIVE MEASURES - DORMANT PERIOD (NOVEMBER 1ST TO MARCH 15TH)

   a. DO NOT CONDUCT LAND DISTURBANCE ACTIVITIES WITHIN 100 FEET OF WETLANDS DURING THE TURTLE'S DORMANT PERIOD.

   b. AVOID AND LIMIT ANY EQUIPMENT USE WITHIN 100 FEET OF WETLANDS AND NO HEAVY MACHINERY OR VEHICLES MAY BE PARKED IN ANY TURTLE HABITAT OR WITHIN 100 FEET OF WETLANDS.

7. HERBICIDE, PESTICIDE AND SALT RESTRICTIONS

   a. THE USE OF HERBICIDES AND PESTICIDES AT THE FACILITY SHALL BE RESTRICTED. IN THE EVENT HERBICIDES AND/OR PESTICIDES ARE REQUIRED AT THE FACILITY (I.E., TO ASSIST IN MANAGEMENT OF INVASIVE SPECIES WITHIN HABITAT ENHANCEMENT AREAS), THEIR USE WILL BE USED IN ACCORDANCE WITH INTEGRATED PEST MANAGEMENT ("IPM") PRINCIPLES WITH PARTICULAR ATTENTION TO MINIMIZE APPLICATIONS WITHIN 100 FEET OF WETLAND OR WATERCOURSE RESOURCES. NO APPLICATIONS OF HERBICIDES OR PESTICIDES ARE ALLOWED WITHIN ACTUAL WETLAND OR WATERCOURSE RESOURCES.

   b. MAINTENANCE OF THE FACILITY DURING THE WINTER MONTHS SHALL NOT INCLUDE THE APPLICATION OF SALT OR SIMILAR PRODUCTS FOR MELTING SNOW OR ICE.

8. REPORTING

   c. DAILY COMPLIANCE MONITORING REPORTS (BRIEF NARRATIVE AND APPLICABLE PHOTOS) DOCUMENTING EACH APT INSPECTION WILL BE SUBMITTED BY APT TO THE CONTRACTOR AND FACILITY OWNER FOR COMPLIANCE VERIFICATION. ANY OBSERVATIONS OF SPOTTED TURTLES, VERNAL POOL INDICATOR SPECIES, WETLAND IMPACTS, OR CORRECTIVE ACTIONS WILL BE INCLUDED IN THE REPORTS.

   d. FOLLOWING COMPLETION OF THE CONSTRUCTION PROJECT, APT WILL PROVIDE A COMPLIANCE MONITORING SUMMARY REPORT TO THE FACILITY OWNER DOCUMENTING IMPLEMENTATION OF THIS WETLAND, VERNAL POOL, SPOTTED TURTLE, AND AQUIFER PROTECTION PROGRAM, MONITORING AND ANY SPECIES OBSERVATIONS. THE FACILITY OWNER SHALL PROVIDE A COPY OF THE COMPLIANCE MONITORING SUMMARY REPORT TO THE CONNECTICUT SITING COUNCIL FOR COMPLIANCE VERIFICATION.

   e. ANY OBSERVATIONS OF SPOTTED TURTLE WILL BE REPORTED TO DEEP BY APT ON THE APPROPRIATE SPECIAL ANIMAL REPORTING FORM, WITH PHOTO-DOCUMENTATION (IF POSSIBLE) AND SPECIFIC INFORMATION ON THE LOCATION AND DISPOSITION OF THE ANIMAL.

VERNAL POOL MITIGATION AREA

1. THIS MITIGATION AREA IS DIVIDED INTO TWO MAIN SECTIONS: THE LOWER HALF CLOSEST TO WETLAND AND VERNAL POOL RESOURCES AND THE UPPER HALF CLOSEST TO THE SOLAR FACILITY.
2. PREPARE VERNAL POOL MITIGATION AREA SEED BED BY TILLING UNDER EXISTING SOD TO CREATE A BARE SOIL SURFACE SUITABLE FOR SEEDING.
3. IN THE LOWER HALF, SEED WITH NEW ENGLAND ROADSIDE MATRIX UPLAND SEED MIX (NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUIVALENT; REFER TO SPEC SHEET FOR SPECIES LIST).
4. IN THE UPPER HALF, SEED WITH NEW ENGLAND NATIVE WARM SEASON GRASS MIX (NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUIVALENT, REFER TO SPEC SHEET FOR SPECIES LIST).
5. IF HYDROSEEDING IS PERFORMED, A BONDED FIBER MATRIX AND MULCH SHALL BE INCLUDED TO TEMPORARILY STABILIZE THE EXPOSED SOIL SURFACE WHILE VEGETATION IS BEING ESTABLISHED.
6. IF MECHANICAL OR HAND SEEDING IS PERFORMED, APPLY CLEAN STRAW MULCH AFTER SEEDING TO TEMPORARILY STABILIZE THE EXPOSED SOIL SURFACE WHILE VEGETATION IS BEING ESTABLISHED.
7. THE UPPER HALF WILL SUPPORT POTENTIAL TURTLE NESTING HABITAT DUE TO THE GROWTH HABITAT OF THE NATIVE WARM SEASON GRASSES WHICH PROMOTES SMALL AREAS OF EXPOSED SOIL.
8. THE UPPER HALF WILL ALSO ALLOW FOR INCORPORATION OF PURPLE MILKWEED MITIGATION SHOULD BOTANICAL SURVEYS REVEAL THIS STATE-LISTED PLANT WITHIN THE PROPOSED SOLAR FACILITY'S LIMIT OF DISTURBANCE.
9. ALL MITIGATION WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A BIOLOGIST TO ALLOW FOR MINOR ADJUSTMENTS TO ACTUAL FIELD CONDITIONS.

WILDFLOWER POLLINATOR AREA

1. PREPARE WILDFLOWER POLLINATOR AREA SEED BED BY TILLING UNDER EXISTING SOD TO CREATE A BARE SOIL SURFACE SUITABLE FOR SEEDING.
2. SEED WITH NEW ENGLAND SHOWY WILDFLOWER SEED MIX (NEW ENGLAND WETLAND PLANTS, INC., OR APPROVED EQUIVALENT; REFER TO SPEC SHEET FOR SPECIES LIST).
3. IF HYDROSEEDING IS PERFORMED, A BONDED FIBER MATRIX AND MULCH SHALL BE INCLUDED TO TEMPORARILY STABILIZE THE EXPOSED SOIL SURFACE WHILE VEGETATION IS BEING ESTABLISHED.
4. IF MECHANICAL OR HAND SEEDING IS PERFORMED, APPLY CLEAN STRAW MULCH AFTER SEEDING TO TEMPORARILY STABILIZE THE EXPOSED SOIL SURFACE WHILE VEGETATION IS BEING ESTABLISHED.
5. ALL MITIGATION WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF A BIOLOGIST TO ALLOW FOR MINOR ADJUSTMENTS TO ACTUAL FIELD CONDITIONS.

SOUTHINGTON
SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CSC PERMIT SET

NO	DATE	REVISION
0	07/23/20	FOR PERMIT: BJP
1		
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3		
4		
5		
6		

NOT FOR CONSTRUCTION

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHALL ST EXT - STE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON
SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: KAM

DATE: 07/07/2020 CHECKED BY: BJP

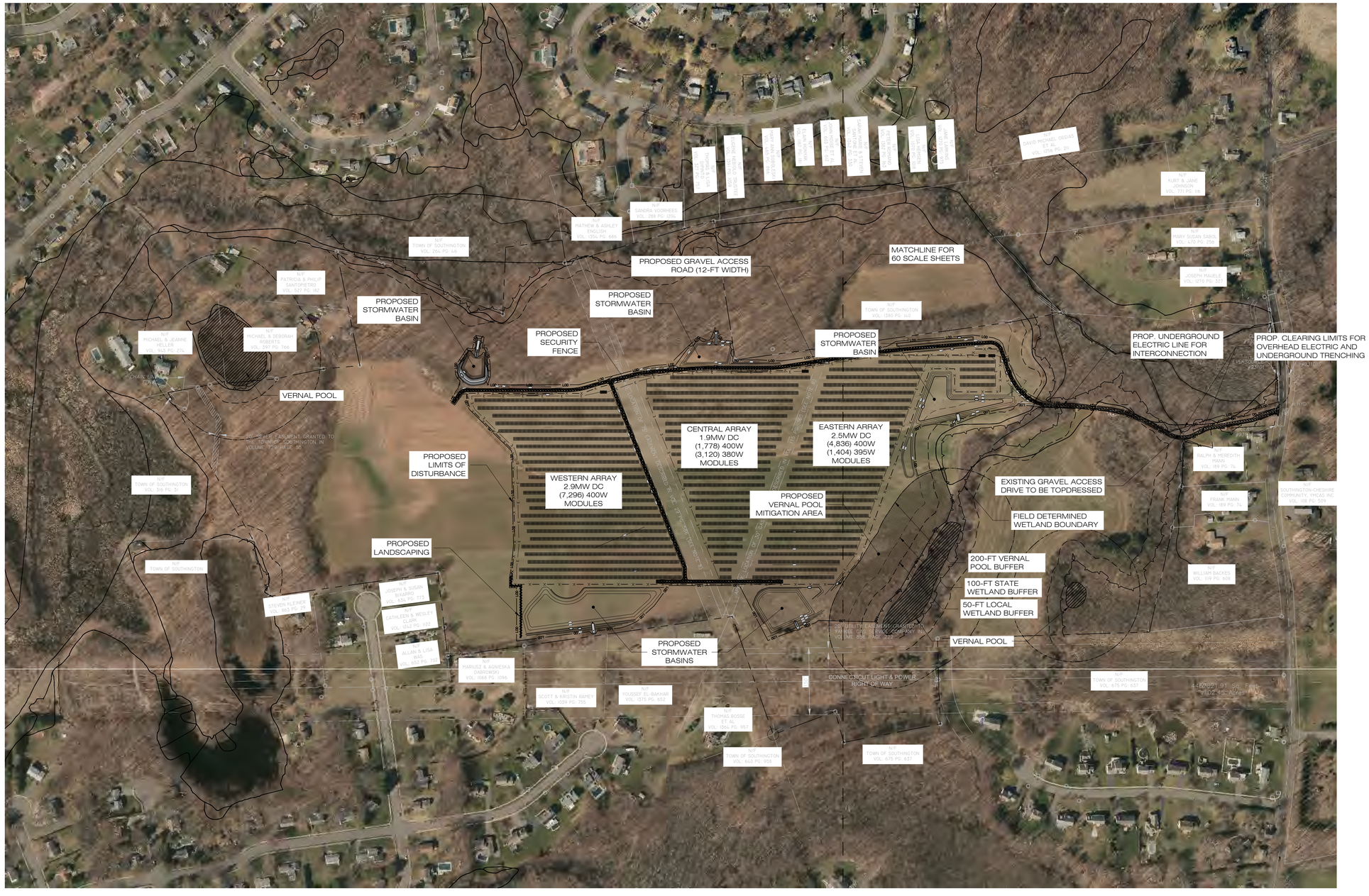
SHEET TITLE:

ENVIRONMENTAL NOTES

SHEET NUMBER:

EN-1

STATE OF CONNECTICUT · BRADLEY J. PARSONS · No. 28025 · LICENSED PROFESSIONAL ENGINEER



DESIGN TABLE:

MODULE MODEL - TRINA (395W&400W) & RISEN (380W)

PROP. TILT - 30 DEGREES

INTER-ROW SPACING - 17.1 FEET

PROP. AZIMUTH - ±0 DEGREES

OVERALL SITE PLAN

200 0 100 200 400

(IN FEET) 1 inch = 200 ft.

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SHEET TITLE:

OVERALL SITE PLAN

SHEET NUMBER:

OP-1

STATE OF CONNECTICUT BRADLEY J. PARSONS No. 26025 LICENSED PROFESSIONAL ENGINEER

EROSION CONTROL NOTES

EROSION AND SEDIMENT CONTROL PLAN NOTES

1. THE CONTRACTOR SHALL CONSTRUCT ALL SEDIMENT AND EROSION CONTROLS IN ACCORDANCE WITH THE 2002 CONNECTICUT GUIDELINES FOR SOIL EROSION AND SEDIMENT CONTROL, LATEST EDITION, IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND AS DIRECTED BY THE CITY OF SOUTHINGTON, PERMITTEE, AND/OR SWPCP MONITOR. ALL PERIMETER SEDIMENTATION AND EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF CLEARING AND GRUBBING AND DEMOLITION OPERATIONS.

2. THESE DRAWINGS ARE ONLY INTENDED TO DESCRIBE THE SEDIMENT AND EROSION CONTROL MEASURES FOR THIS SITE. SEE CONSTRUCTION SEQUENCE FOR ADDITIONAL INFORMATION. ALL TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE EROSION & SEDIMENT CONTROL PLAN ARE SHOWN AS REQUIRED BY THE ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL EROSION CONTROL MEASURES ARE CONFIGURED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION OF SOILS AND PREVENT THE TRANSPORT OF SEDIMENTS AND OTHER POLLUTANTS TO STORM DRAINAGE SYSTEMS AND/OR WATERCOURSES. ACTUAL SITE CONDITIONS OR SEASONAL AND CLIMATIC CONDITIONS MAY WARRANT ADDITIONAL CONTROLS OR CONFIGURATIONS, AS REQUIRED, AND AS DIRECTED BY THE PERMITTEE AND/OR SWPCP MONITOR. REFER TO SITE PLAN FOR GENERAL INFORMATION AND OTHER CONTRACT PLANS FOR APPROPRIATE INFORMATION.

3. A BOND OR LETTER OF CREDIT MAY BE REQUIRED TO BE POSTED WITH THE GOVERNING AUTHORITY FOR THE EROSION CONTROL INSTALLATION AND MAINTENANCE.

4. THE CONTRACTOR SHALL APPLY THE MINIMUM EROSION & SEDIMENT CONTROL MEASURES SHOWN ON THE PLAN IN CONJUNCTION WITH CONSTRUCTION SEQUENCING, SUCH THAT ALL ACTIVE WORK ZONES ARE PROTECTED. ADDITIONAL AND/OR ALTERNATIVE SEDIMENT AND EROSION CONTROL MEASURES MAY BE INSTALLED DURING THE CONSTRUCTION PERIOD IF FOUND NECESSARY BY THE CONTRACTOR, OWNER, SITE ENGINEER, MUNICIPAL OFFICIALS, OR ANY GOVERNING AGENCY. THE CONTRACTOR SHALL CONTACT THE OWNER AND APPROPRIATE GOVERNING AGENCIES FOR APPROVAL IF ALTERNATIVE CONTROLS OTHER THAN THOSE SHOWN ON THE PLANS ARE PROPOSED BY THE CONTRACTOR.

5. THE CONTRACTOR SHALL TAKE EXTREME CARE DURING CONSTRUCTION SO AS NOT TO DISTURB UNPROTECTED WETLAND AREAS OR INSTALLED SEDIMENTATION AND EROSION CONTROL MEASURES. THE CONTRACTOR SHALL INSPECT ALL SEDIMENT AND EROSION CONTROLS WEEKLY AND WITHIN 24 HOURS OF A STORM WITH A RAINFALL AMOUNT OF 0.25 INCHES OR GREATER TO VERIFY THAT THE CONTROLS ARE OPERATING PROPERLY AND MAKE REPAIRS AS NECESSARY IN A TIMELY MANOR.

6. THE CONTRACTOR SHALL KEEP A SUPPLY OF EROSION CONTROL MATERIAL (SILT FENCE, COMPOST FILTER SOCK, EROSION CONTROL BLANKET, ETC.) ON-SITE FOR PERIODIC MAINTENANCE AND EMERGENCY REPAIRS.

7. ALL FILL MATERIAL PLACED ADJACENT TO ANY WETLAND AREA SHALL BE GOOD QUALITY, WITH LESS THAN 5% FINES PASSING THROUGH A #200 SIEVE (BANK RUN), SHALL BE PLACED IN MAXIMUM ONE FOOT LIFTS, AND SHALL BE COMPACTED TO 95% MAX. DRY DENSITY MODIFIED PROCTOR OR AS SPECIFIED IN THE CONTRACT SPECIFICATIONS.

8. PROTECT EXISTING TREES THAT ARE TO BE SAVED BY FENCING, ORANGE SAFETY FENCE, CONSTRUCTION TAPE, OR EQUIVALENT FENCING/TAPE. ANY LIMB TRIMMING SHOULD BE DONE AFTER CONSULTATION WITH AN ARBORIST AND BEFORE CONSTRUCTION BEGINS IN THAT AREA; FENCING SHALL BE MAINTAINED AND REPAIRED DURING CONSTRUCTION.

9. CONSTRUCTION ENTRANCES (ANTI-TRACKING PADS) SHALL BE INSTALLED PRIOR TO ANY SITE EXCAVATION OR CONSTRUCTION ACTIVITY AND SHALL BE MAINTAINED THROUGHOUT THE DURATION OF ALL CONSTRUCTION IF REQUIRED. THE LOCATION OF THE TRACKING PADS MAY CHANGE AS VARIOUS PHASES OF CONSTRUCTION ARE COMPLETED. CONTRACTOR SHALL ENSURE THAT ALL VEHICLES EXITING THE SITE ARE PASSING OVER THE ANTI-TRACKING PADS PRIOR TO EXISTING.

10. ALL CONSTRUCTION SHALL BE CONTAINED WITHIN THE LIMIT OF DISTURBANCE, WHICH SHALL BE MARKED WITH SILT FENCE, SAFETY FENCE, HAY BALES, RIBBONS, OR OTHER MEANS PRIOR TO CLEARING. CONSTRUCTION ACTIVITY SHALL REMAIN ON THE UPHILL SIDE OF THE SEDIMENT BARRIER UNLESS WORK IS SPECIFICALLY CALLED FOR ON THE DOWNHILL SIDE OF THE BARRIER.

11. NO CUT OR FILL SLOPES SHALL EXCEED 2:1 EXCEPT WHERE STABILIZED BY ROCK FACED EMBANKMENTS OR EROSION CONTROL BLANKETS. ALL SLOPES SHALL BE SEEDED AND BANKS WILL BE STABILIZED IMMEDIATELY UPON COMPLETION OF FINAL GRADING UNTIL TURF IS ESTABLISHED.

12. DIRECT ALL DEWATERING PUMP DISCHARGE TO A SEDIMENT CONTROL DEVICE CONFORMING TO THE GUIDELINES WITHIN THE APPROVED LIMIT OF DISTURBANCE IF REQUIRED. DISCHARGE TO STORM DRAINS OR SURFACE WATERS FROM SEDIMENT CONTROLS SHALL BE CLEAR AND APPROVED BY THE PERMITTEE OR MUNICIPALITY.

13. THE CONTRACTOR SHALL MAINTAIN A CLEAN CONSTRUCTION SITE AND SHALL NOT ALLOW THE ACCUMULATION OF RUBBISH OR CONSTRUCTION DEBRIS ON THE SITE. PROPER SANITARY DEVICES SHALL BE MAINTAINED ON-SITE AT ALL TIMES AND SECURED APPROPRIATELY. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID THE SPILLAGE OF FUEL OR OTHER POLLUTANTS ON THE CONSTRUCTION SITE AND SHALL ADHERE TO ALL APPLICABLE POLICIES AND REGULATIONS RELATED TO SPILL PREVENTION AND RESPONSE/CONTAINMENT.

14. MINIMIZE LAND DISTURBANCES. SEED AND MULCH DISTURBED AREAS WITH TEMPORARY MIX AS SOON AS PRACTICABLE (2 WEEK MAXIMUM UNSTABILIZED PERIOD) USING PERENNIAL RYEGRASS AT 40 LBS PER ACRE. MULCH ALL CUT AND FILL SLOPES AND SWALES WITH LOOSE HAY AT A RATE OF 2 TONS PER ACRE. IF NECESSARY, REPLACE LOOSE HAY ON SLOPES WITH EROSION CONTROL BLANKETS OR JUTE CLOTH. MODERATELY GRADED AREAS, ISLANDS, AND TEMPORARY CONSTRUCTION STAGING AREAS MAY BE HYDROSEEDED WITH TACKIFIER.

15. SWEEP AFFECTED PORTIONS OF OFF SITE ROADS ONE OR MORE TIMES A DAY (OR LESS FREQUENTLY IF TRACKING IS NOT A PROBLEM) DURING CONSTRUCTION. FOR DUST CONTROL, PERIODICALLY MOISTEN EXPOSED SOIL SURFACES WITH WATER ON UNPAVED TRAVELWAYS TO KEEP THE TRAVELWAYS DAMP. CALCIUM CHLORIDE MAY ALSO BE APPLIED TO ACCESS ROADS. DUMP TRUCK LOADS EXITING THE SITE SHALL BE COVERED.

16. VEGETATIVE ESTABLISHMENT SHALL OCCUR ON ALL DISTURBED SOIL, UNLESS THE AREA IS UNDER ACTIVE CONSTRUCTION, IT IS COVERED IN STONE OR SCHEDULED FOR PAVING WITHIN 30 DAYS. TEMPORARY SEEDING OR NON-LIVING SOIL PROTECTION OF ALL EXPOSED SOILS AND SLOPES SHALL BE INITIATED WITHIN THE FIRST 7 DAYS OF SUSPENDING WORK IN AREAS TO BE LEFT LONGER THAN 30 DAYS.

17. MAINTAIN ALL PERMANENT AND TEMPORARY SEDIMENT CONTROL DEVICES IN EFFECTIVE CONDITION THROUGHOUT THE CONSTRUCTION PERIOD. UPON COMPLETION OF WORK SWEEP CONCRETE PADS, CLEAN THE STORMWATER MANAGEMENT SYSTEMS AND REMOVE ALL TEMPORARY SEDIMENT CONTROLS ONCE THE SITE IS FULLY STABILIZED AND APPROVAL HAS BEEN RECEIVED FROM PERMITTEE OR THE MUNICIPALITY.

18. SEEDING MIXTURES SHALL BE NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX (SEE SITE DETAILS SHEET DN-1), OR APPROVED EQUAL BY OWNER.

CONSTRUCTION OPERATION AND MAINTENANCE PLAN - BY CONTRACTOR

E&S MEASURE	INSPECTION SCHEDULE	MAINTENANCE REQUIRED
CONSTRUCTION ENTRANCE	DAILY	PLACE ADDITIONAL STONE, EXTEND THE LENGTH OR REMOVE AND REPLACE THE STONE. CLEAN PAVED SURFACES OF TRACKED SEDIMENT.
COMPOST FILTER SOCK	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED.
SILT FENCE	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR/REPLACE WHEN FAILURE OR DETERIORATION IS OBSERVED. REMOVE SILT WHEN IT REACHES 1/2 THE HEIGHT OF THE FENCE.
TOPSOIL/BORROW STOCKPILES	DAILY	REPAIR/REPLACE SEDIMENT BARRIERS AS NECESSARY.
TEMPORARY SEDIMENT BASIN (W/ BAFFLES)	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.5"	REMOVE SEDIMENT ONCE IT HAS ACCUMULATED TO ONE HALF OF MINIMUM REQUIRED VOLUME OF THE WET STORAGE, DEWATERING AS NEEDED. RESTORE TRAP TO ORIGINAL DIMENSIONS. REPAIR/REPLACE BAFFLES WHEN FAILURE OR DETERIORATION IS OBSERVED.
TEMPORARY SEDIMENT TRAP (W/ BAFFLES)	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.5"	REMOVE SEDIMENT ONCE IT HAS ACCUMULATED TO ONE HALF OF MINIMUM REQUIRED VOLUME OF THE WET STORAGE, DEWATERING AS NEEDED. RESTORE TRAP TO ORIGINAL DIMENSIONS. REPAIR/REPLACE BAFFLES WHEN FAILURE OR DETERIORATION IS OBSERVED.
TEMPORARY SOIL PROTECTION	WEEKLY & WITHIN 24 HOURS OF RAINFALL > 0.25"	REPAIR ERODED OR BARE AREAS IMMEDIATELY. RESEED AND MULCH.

SEDIMENT & EROSION CONTROL NARRATIVE

1. THE PROJECT INVOLVES THE CONSTRUCTION OF A GROUND MOUNTED SOLAR PANEL FACILITY WITH ASSOCIATED EQUIPMENT, INCLUDING THE CLEARING, GRUBBING AND GRADING OF APPROXIMATELY 37.45± ACRES OF EXISTING LOT.

THE PROPOSED PROJECT INVOLVES THE FOLLOWING CONSTRUCTION:

A. CLEARING, GRUBBING, AND GRADING OF EXISTING LOT.
B. CONSTRUCTION OF 18,434 GROUND MOUNTED SOLAR PANELS AND ASSOCIATED EQUIPMENT.
B. THE STABILIZATION OF DISTURBED AREAS WITH PERMANENT VEGETATIVE TREATMENTS.

2. FOR THIS PROJECT, THERE ARE APPROXIMATELY 37.45± ACRE OF THE SITE BEING DISTURBED WITH NEGLIGIBLE INCREASE IN THE IMPERVIOUS AREA OF THE SITE, AS ALL ACCESS THOUGH THE SITE WILL BE GRAVEL. IMPERVIOUS AREAS ARE LIMITED TO THE CONCRETE PADS FOR ELECTRICAL EQUIPMENT.

3. THE PROJECT SITE, AS MAPPED IN THE SOIL SURVEY OF STATE OF CONNECTICUT (NRCS, VERSION 19, SEP 13, 2019), CONTAINS MAP UNITS 33 AND 37 (HYDROLOGIC SOIL GROUP A), 20 (HYDROLOGIC SOIL GROUP B), AND 12 (HYDROLOGIC SOIL GROUP D) SOILS. A GEOTECHNICAL ENGINEERING REPORT HAS NOT BEEN COMPLETED.

4. IT IS ANTICIPATED THAT CONSTRUCTION WILL BE COMPLETED IN APPROXIMATELY 3-4 MONTHS.

5. REFER TO THE CONSTRUCTION SEQUENCING AND EROSION AND SEDIMENTATION NOTES FOR INFORMATION REGARDING SEQUENCING OF MAJOR OPERATIONS IN THE ON-SITE CONSTRUCTION PHASES.

6. STORMWATER MANAGEMENT DESIGN CRITERIA UTILIZES THE APPLICABLE SECTIONS OF THE 2004 CONNECTICUT STORMWATER QUALITY MANUAL AND THE CITY OF SOUTHINGTON STANDARDS, TO THE EXTENT POSSIBLE AND PRACTICABLE FOR THIS PROJECT ON THIS SITE. EROSION AND SEDIMENTATION MEASURES ARE BASED UPON ENGINEERING PRACTICE, JUDGEMENT AND THE APPLICABLE SECTIONS OF THE CONNECTICUT EROSION AND SEDIMENT CONTROL GUIDELINES FOR URBAN AND SUBURBAN AREAS, LATEST EDITION.

7. DETAILS FOR THE TYPICAL STORMWATER MANAGEMENT AND EROSION AND SEDIMENTATION MEASURES ARE SHOWN ON THE PLAN SHEETS OR PROVIDED AS SEPARATE SUPPORT DOCUMENTATION FOR REVIEW IN THIS PLAN.

8. CONSERVATION PRACTICES TO BE USED DURING CONSTRUCTION:

A. STAGED CONSTRUCTION;
B. MINIMIZE THE DISTURBED AREAS TO THE EXTENT PRACTICABLE DURING CONSTRUCTION;
C. STABILIZE DISTURBED AREAS WITH TEMPORARY OR PERMANENT MEASURES AS SOON AS POSSIBLE, BUT NO LATER THAN 7-DAYS FOLLOWING DISTURBANCE;
D. MINIMIZE IMPERVIOUS AREAS;
E. UTILIZE APPROPRIATE CONSTRUCTION EROSION AND SEDIMENTATION MEASURES.

9. THE FOLLOWING SEPARATE DOCUMENTS ARE TO BE CONSIDERED A PART OF THE EROSION AND SEDIMENTATION PLAN:

A. STORMWATER MANAGEMENT REPORT DATED MAY 2020.
B. SWPCP DATED MAY 2020

SUGGESTED CONSTRUCTION SEQUENCE:
THE FOLLOWING SUGGESTED SEQUENCE OF CONSTRUCTION ACTIVITIES IS PROJECTED BASED UPON ENGINEERING JUDGEMENT AND BEST MANAGEMENT PRACTICES. THE CONTRACTOR MAY ELECT TO ALTER THE SEQUENCING TO BEST MEET THE CONSTRUCTION SCHEDULE, THE EXISTING SITE ACTIVITIES AND WEATHER CONDITIONS. SHOULD THE CONTRACTOR ALTER THE CONSTRUCTION SEQUENCE OR ANY EROSION AND SEDIMENTATION CONTROL MEASURES THEY SHALL MODIFY THE STORMWATER POLLUTION CONTROL PLAN ("SWPCP") AS REQUIRED BY THE GENERAL PERMIT. MAJOR CHANGES IN SEQUENCING AND/OR METHODS MAY REQUIRE REGULATORY APPROVAL PRIOR TO IMPLEMENTATION.

1. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING. PHYSICALLY FLAG THE LIMITS OF DISTURBANCE IN THE FIELD AS NECESSARY TO FACILITATE THE PRE-CONSTRUCTION MEETING.

2. CONDUCT A PRE-CONSTRUCTION MEETING TO DISCUSS THE PROPOSED WORK AND EROSION AND SEDIMENTATION CONTROL MEASURES. THE MEETING SHOULD BE ATTENDED BY THE OWNER, THE OWNER'S REPRESENTATIVE(S), THE GENERAL CONTRACTOR, DESIGNATED SUB-CONTRACTORS AND THE PERSON, OR PERSONS, RESPONSIBLE FOR THE IMPLEMENTATION, OPERATION, MONITORING AND MAINTENANCE OF THE EROSION AND SEDIMENTATION MEASURES. THE CONSTRUCTION PROCEDURES FOR THE ENTIRE PROJECT SHALL BE REVIEWED AT THIS MEETING.

3. NOTIFY CALL BEFORE YOU DIG AT 1-800-922-4455, AS REQUIRED, PRIOR TO THE START OF CONSTRUCTION.

4. REMOVE EXISTING IMPEDIMENTS AS NECESSARY AND PROVIDE MINIMAL CLEARING AND GRUBBING TO INSTALL THE REQUIRED CONSTRUCTION ENTRANCE/S.

5. CLEAR ONLY AS NEEDED TO INSTALL THE PERIMETER EROSION AND SEDIMENTATION CONTROL MEASURES AND, IF APPLICABLE, TREE PROTECTION. ALL WETLAND AREAS SHALL BE PROTECTED BEFORE MAJOR CONSTRUCTION BEGINS.

6. INSTALL PERIMETER EROSION CONTROL.

7. INSTALL EROSION CONTROL BELOW EQUIPMENT AREA AND INSTALL CONCRETE EQUIPMENT PADS AND CONDUITS PROTECTED BY THESE CONTROLS.

8A. INSTALL TEMPORARY SEDIMENT TRAP 1 AND ASSOCIATED SWALES. UPON COMPLETION INSTALLATION AND STABILIZATION OF THE BASIN AND SWALES, WORK UP GRADIENT CAN PROCEED.

8B. INSTALL TEMPORARY SEDIMENT TRAP 2 AND ASSOCIATED SWALES. UPON COMPLETION INSTALLATION AND STABILIZATION OF THE BASIN AND SWALES, WORK UP GRADIENT CAN PROCEED.

8C. INSTALL TEMPORARY SEDIMENT BASIN 3 AND ASSOCIATED SWALES. UPON COMPLETION INSTALLATION AND STABILIZATION OF THE BASIN AND SWALES, WORK UP GRADIENT CAN PROCEED.

8D. INSTALL TEMPORARY SEDIMENT TRAP 4 AND ASSOCIATED SWALES. UPON COMPLETION INSTALLATION AND STABILIZATION OF THE BASIN AND SWALES, WORK UP GRADIENT CAN PROCEED.

8E. INSTALL TEMPORARY SEDIMENT BASIN 5 AND ASSOCIATED SWALES. UPON COMPLETION INSTALLATION AND STABILIZATION OF THE BASIN AND SWALES, WORK UP GRADIENT CAN PROCEED.

9. UPON COMPLETION OF THE INSTALLATION OF EACH OF THE TEMPORARY SEDIMENT BASINS; THE AREA ABOVE THE BASIN CAN HAVE THE REMAINING ARRAY AREA CLEARING AND GRUBBING COMPLETED AS REQUIRED. REMOVE AND DISPOSE OF DEMOLITION DEBRIS OFF-SITE IN ACCORDANCE WITH APPLICABLE LAWS.

10. TEMPORARILY SEED DISTURBED AREAS NOT UNDER CONSTRUCTION FOR THIRTY (30) DAYS OR MORE.

11. INSTALL REMAINING ELECTRICAL CONDUIT.

12. INSTALL RACKING POSTS FOR GROUND MOUNTED SOLAR PANELS.

13. INSTALL GROUND MOUNTED SOLAR PANELS AND COMPLETE ELECTRICAL INSTALLATION.

14. AFTER SUBSTANTIAL COMPLETION OF THE INSTALLATION OF THE SOLAR PANELS, COMPLETE REMAINING SITE WORK, INCLUDING ANY REQUIRED LANDSCAPE SCREENING, AND STABILIZE ALL DISTURBED AREAS.

15. FINE GRADE, RAKE, SEED AND MULCH ALL REMAINING DISTURBED AREAS.

16. AFTER THE SITE IS STABILIZED AND WITH THE APPROVAL OF THE PERMITTEE AND CITY OF SOUTHINGTON AGENT, REMOVE PERIMETER EROSION AND SEDIMENTATION CONTROLS.

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

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PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHALL ST EXT - STE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

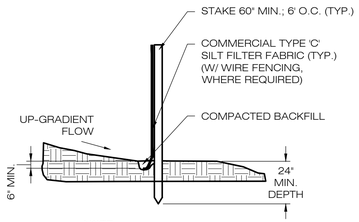
DRAWN BY: KAM

DATE: 07/07/2020 CHECKED BY: BJP

SHEET TITLE:
SEDIMENTATION & EROSION CONTROL NOTES

SHEET NUMBER:
EC-1

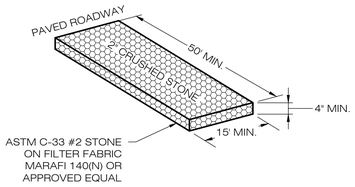
STATE OF CONNECTICUT · BRADLEY J. PARSONS · No. 28025 · LICENSED PROFESSIONAL ENGINEER



NOTE:
SILT FENCE SHALL BE LAPPED ONLY WHEN NECESSARY PER THE MANUFACTURER RECOMMENDATIONS.

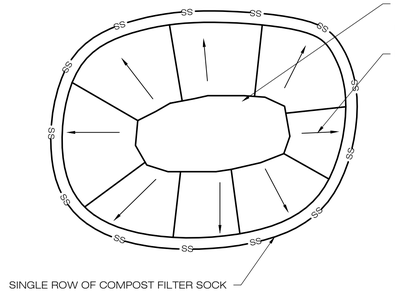
1 EC-2 SILT FENCE DETAIL

SCALE : N.T.S.



2 EC-2 CONSTRUCTION ENTRANCE DETAIL

SCALE : N.T.S.



NOTES:
1. ALL EXISTING EXCAVATED MATERIAL THAT IS NOT TO BE REUSED IN THE WORK IS TO BE IMMEDIATELY REMOVED FROM THE SITE AND PROPERLY DISPOSED OF.

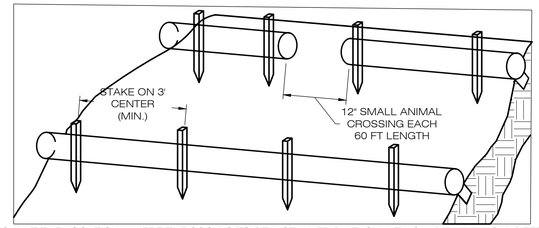
2. SOIL/AGGREGATE STOCKPILE SITES TO BE WHERE SHOWN ON THE DRAWINGS.

3. RESTORE STOCKPILE SITES TO PRE-EXISTING PROJECT CONDITION AND RESEED AS REQUIRED.

4. STOCKPILE HEIGHTS MUST NOT EXCEED 35'. STOCKPILE SLOPES MUST BE 2:1 OR FLATTER.

3 EC-2 MATERIALS STOCKPILE DETAIL

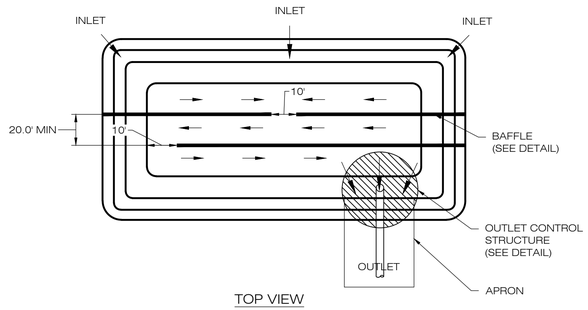
SCALE : N.T.S.



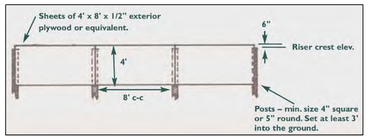
1. BEGIN AT THE LOCATION WHERE THE SOCK IS TO BE INSTALLED BY EXCAVATING A 2-3" (5-7.5 CM) DEEP X 9" (22.9 CM) WIDE TRENCH ALONG THE CONTOUR OF THE SLOPE. EXCAVATED SOIL SHOULD BE PLACED UP SLOPE FROM THE ANCHOR TRENCH.
2. PLACE THE SOCK IN THE TRENCH SO THAT IT CONTOURS TO THE SOIL SURFACE. COMPACT SOIL FROM THE EXCAVATED TRENCH AGAINST THE SOCK ON THE UPHILL SIDE. SOCKS SHALL BE INSTALLED IN 60 FT CONTINUOUS LENGTHS WITH ADJACENT SOCKS TIGHTLY ABUT. EVERY 60 FT THE SOCK ROW SHALL BE SPACED 12 INCHES CLEAR, END TO END, FOR AMPHIBIAN AND REPTILE TRAVEL. THE OPEN SPACES SHALL BE STAGGERED MID LENGTH OF THE NEXT DOWN GRADIENT SOCK.
3. SECURE THE SOCK WITH 18-24" (45.7-61 CM) STAKES EVERY 3-4' (0.9 -1.2 M) AND WITH A STAKE ON EACH END. STAKES SHOULD BE DRIVEN THROUGH THE MIDDLE OF THE SOCK LEAVING AT LEAST 2-3" (5-7.5 CM) OF STAKE EXTENDING ABOVE THE SOCK. STAKES SHOULD BE DRIVEN PERPENDICULAR TO THE SLOPE FACE.

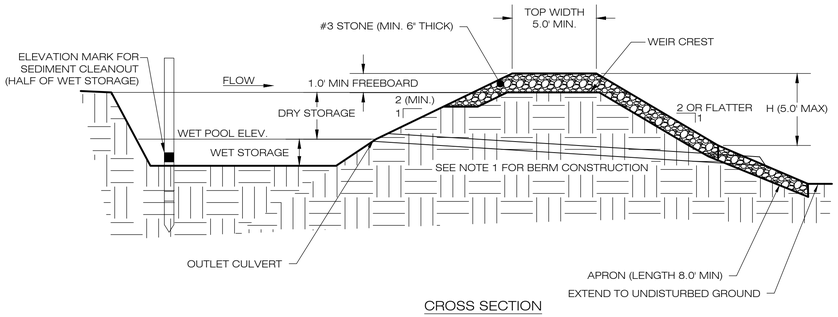
4 EC-2 COMPOST FILTER SOCK SEDIMENTATION CONTROL BARRIER

SCALE : N.T.S.



TOP VIEW





CROSS SECTION

NOTES:
1. CONSTRUCT TEMPORARY SEDIMENT BASIN BERMS AND SIDEWALLS PER THE GRASS LINED BASIN DETAIL.
2. SEDIMENT BAFFLES SHALL BE INSTALLED AS SHOWN ON EC-3 TO EC-6.
3. SEE TSB SIZING TABLE FOR WET AND DRY STORAGE VOLUMES.

5 EC-2 TEMPORARY SEDIMENT BASIN

SCALE : N.T.S.

6 EC-2 SEDIMENT TRAP BAFFLE

SCALE : N.T.S.

TEMPORARY SEDIMENT BASIN SIZING TABLE

BASIN NAME	DRAINAGE AREA (AC)	REQ. DRY VOLUME (CF)	REQ. WET VOLUME (CF)	PROP. BTM. ELEV. (FT)	PROP. CULVERT ELEV. (FT)	PROP. WEIR CREST ELEV. (FT)	PROP. TOP ELEV. (FT)	DRY VOL. PROVIDED (CF)	WET VOL. PROVIDED (CF)	TOTAL VOL. PROVIDED (CF)
TSB-1	8.68	6,946	13,892	190.00	190.50	190.75	192.00	9,410	14,784	24,194
TSB-2	3.34	2,668	5,337	201.00	201.33	201.83	203.00	4,718	8,086	12,804
TSB-3	0.93	745	1,490	192.00	193.00	193.75	195.00	3,732	4,240	7,972
TSB-4	11.50	9,202	18,404	197.00	198.00	198.50	200.00	25,071	41,504	66,575
TSB-5	4.57	3,660	7,319	196.00	197.00	197.75	199.00	16,182	18,655	34,837

SOUTHINGTON SOLAR ONE, LLC
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WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

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OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
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SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

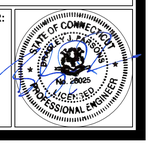
APT FILING NUMBER: CT590170

DRAWN BY: KAM

DATE: 07/07/2020 CHECKED BY: BJP

SHEET TITLE:
SEDIMENTATION & EROSION CONTROL DETAILS

SHEET NUMBER:
EC-2



1 EC-2 PERIMETER SILT FENCE TO BE INSTALLED PRIOR TO SITE WORK. TO BE STAKED BY SURVEYOR.

2 DN-2 PROP. OVERFLOW WEIR ACROSS ACCESS ROAD INVERT EL. = 196.0' LENGTH = 40-FT

3 DN-2 GRASS LINED SWALE

4 DN-1 (2) PROP. CONCRETE EQUIPMENT PADS. 24-FT X 10-FT EA.

3 EC-2 PROP. STOCKPILE AREA WITH DOUBLE ROW SILT FENCE (TYP.) (AS REQUIRED)

3 DN-1 PROP. GRAVEL ACCESS DRIVE. TO BE PLACED FOLLOWING INSTALLATION OF EROSION CONTROLS AND DRAINAGE MANAGEMENT.

FEMA 100-YEAR FLOODPLAIN

8-IN METAL INV. = 187.36

8-IN METAL INV. = 187.45'

24-IN METAL INV. = 186.30'

24-IN METAL INV. = 186.20'

1 EC-2 PERIMETER SILT FENCE TO BE INSTALLED PRIOR TO SITE WORK. TO BE STAKED BY SURVEYOR. SET ALONG EACH SIDE OF EXISTING ACCESS ROAD.

LIMITS OF CLEARING FOR ELECTRIC LINE

5 EC-2 PROP. TEMPORARY SEDIMENT BASIN (TSB-1)
BOTTOM ELEV. = 190.00'
WET ELEV. = 190.50'
WEIR ELEV. = 190.75'

2 DN-2 PROP. OVERFLOW WEIR INVERT EL. = 190.75' LENGTH = 10-FT

5 EC-2 6 EC-2 PROP. SEDIMENT BASIN (TYP.) (SEE DETAIL FOR LAYOUT DIMENSIONS)

4 DN-2 5 DN-2 PROP. OUTLET CULVERTS WITH PLUNGE POOL. (3) 8-IN DIAM. HDPE, 24-LF. 3-FT SEPARATION.
U/S INVERT = 190.50'
D/S INVERT = 190.00'

EXISTING DRIVEWAY TO BE RESURFACED WITH ~3-IN DEPTH OF CRUSHED GRAVEL. REMOVE EQUAL DEPTH PRIOR TO PLACEMENT FOR AREAS WITHIN FLOODPLAIN.

INSTALL STABILIZED CONSTRUCTION ENTRANCE 2 EC-2

WETLAND DELINEATED BY ALL POINTS TECHNOLOGY JANUARY 2020

200-FT VERNAL POOL BUFFER

5 EC-2 6 EC-2 PROP. SEDIMENT BASIN (TYP.) (SEE DETAIL FOR LAYOUT DIMENSIONS)

7 DN-1 PROP. SITE PREPARATION WITHIN THE LIMITS OF DISTURBANCE. PRESERVE EXISTING GROUND COVER TO PROVIDE STABILITY. CROSS-HATCHED AREA TO BE SCARIFIED AND SEEDED WITH NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX FOLLOWING SITE PREPARATION.

100-FT STATE WETLAND BUFFER (TYP)

50-FT LOCAL WETLAND BUFFER (TYP)

SHEET EC-4

TOWN OF SOUTHINGTON VOL: 1380 PG: 140

CL&P #93099

EVERSOURCE #93101

N/F SOUTHINGTON COMMUNITY, INC.

N/F FRANK MANN VOL: 189 PG: 74

N/F WILLIAM BACKES VOL: 1119 PG: 608

(IN FEET) 1 inch = 60 ft.

1 EC-3 **SEDIMENTATION & EROSION CONTROL PLAN 1**
SCALE : 1-IN = 60-FT

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
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COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHALL ST EXT - STE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET, SOUTHINGTON, CT
APT FILING NUMBER: CT590170
DRAWN BY: KAM
DATE: 07/07/2020
CHECKED BY: BJP

SHEET TITLE:
SEDIMENTATION & EROSION CONTROL PLAN (1 OF 2)

SHEET NUMBER:
EC-3

STATE OF CONNECTICUT BRADLEY J. PARSONS No. 28025 LICENSED PROFESSIONAL ENGINEER

PROP. OUTLET CULVERT WITH PLUNGE POOL. 12-IN DIAM. HDPE, 30-LF. U/S INVERT = 193.00' D/S INVERT = 192.00'

PROP. OVERFLOW WEIR INVERT EL. = 193.75' LENGTH = 10-FT

LIMITS OF CLEARING FOR STORMWATER MANAGEMENT

EXIST. TREE LINE (TYP.)

PROP. RIPRAP SLOPE PROTECTION

PROP. SEDIMENT BAFFLE (TYP.) (SEE DETAIL FOR LAYOUT DIMENSIONS)

PROP. TEMPORARY SEDIMENT BASIN (TSB-3) BOTTOM ELEV. = 192.00' WET ELEV. = 193.00' WEIR ELEV. = 193.75'

PROP. GRAVEL ACCESS DRIVE. TO BE PLACED FOLLOWING INSTALLATION OF EROSION CONTROLS AND DRAINAGE MANAGEMENT.

GRASS LINED SWALE

PROP. STOCKPILE AREA WITH DOUBLE ROW SILT FENCE (TYP.) (AS REQUIRED)

PROP. OVERFLOW WEIR INVERT EL. = 201.83' LENGTH = 10-FT

PROP. OUTLET CULVERT WITH PLUNGE POOL. 8-IN DIAM. HDPE, 40-LF. U/S INVERT = 201.33' D/S INVERT = 201.00'

PROPERTY LINE (TYP.)

PROP. OVERFLOW WEIR ACROSS ACCESS ROAD INVERT EL. = 204.50' LENGTH = 40-FT

PROP. SEDIMENT BAFFLE (TYP.) (SEE DETAIL FOR LAYOUT DIMENSIONS)

PROP. TEMPORARY SEDIMENT BASIN (TSB-2) BOTTOM ELEV. = 189.00' WET ELEV. = 201.50' WEIR ELEV. = 201.83'

PROP. CONCRETE EQUIPMENT PAD. 24-FT X 10-FT.

PROP. CONCRETE EQUIPMENT PAD. 24-FT X 10-FT.

PROP. STOCKPILE AREA WITH DOUBLE ROW SILT FENCE (TYP.) (AS REQUIRED)

SET TEMPORARY CONSTRUCTION FENCING ALONG EASEMENT BOUNDARIES PRIOR TO ANY SITE WORK

PROP. SITE PREPARATION WITHIN THE LIMITS OF DISTURBANCE. PRESERVE EXISTING GROUND COVER TO PROVIDE STABILITY. CROSS-HATCHED AREA TO BE SCARIFIED AND SEEDED WITH NEW ENGLAND SEMI-SHADE GRASS AND FORBS MIX FOLLOWING SITE PREPARATION.

PERIMETER SILT FENCE TO BE INSTALLED PRIOR TO SITE WORK. TO BE STAKED BY SURVEYOR.

PROP. STOCKPILE AREA WITH DOUBLE ROW SILT FENCE (TYP.) (AS REQUIRED)

PROP. OVERFLOW WEIR ACROSS ACCESS ROAD INVERT EL. = 202.50' LENGTH = 40-FT

PROP. STOCKPILE AREA WITH DOUBLE ROW SILT FENCE (TYP.) (AS REQUIRED)

PROP. TEMPORARY SEDIMENT BASIN (TSB-4) BOTTOM ELEV. = 197.00' WET ELEV. = 198.00' WEIR ELEV. = 198.50'

PROP. SEDIMENT BAFFLE (TYP.) (SEE DETAIL FOR LAYOUT DIMENSIONS)

PROP. STOCKPILE AREA WITH DOUBLE ROW SILT FENCE (TYP.) (AS REQUIRED)

PROP. OVERFLOW WEIR INVERT EL. = 198.50' LENGTH = 10-FT

PROP. OUTLET CULVERT WITH FES & PLUNGE POOL. 12-IN DIAM. HDPE, 30-LF. U/S INVERT = 198.00' D/S INVERT = 196.00'

PROP. TEMPORARY SEDIMENT BASIN (TSB-5) BOTTOM ELEV. = 196.00' WET ELEV. = 197.00' WEIR ELEV. = 197.75'

PROP. OUTLET CULVERT WITH FES & PLUNGE POOL. 12-IN DIAM. HDPE, 32-LF. U/S INVERT = 197.00' D/S INVERT = 196.00'

PROP. OVERFLOW WEIR INVERT EL. = 197.75' LENGTH = 10-FT

60 0 30 60 120
(IN FEET) 1 inch = 60 ft.

SEDIMENTATION & EROSION CONTROL PLAN 2

SCALE : 1-IN = 60-FT

SHEET EC-3

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
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SOUTHINGTON SOLAR ONE, LLC

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APT FILING NUMBER: CT590170

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DATE: 07/07/2020 CHECKED BY: BJP

SHEET TITLE:
SEDIMENTATION & EROSION CONTROL PLAN (2 OF 2)

SHEET NUMBER:
EC-4

STATE OF CONNECTICUT BRADLEY J. PARSONS No. 28025 LICENSED PROFESSIONAL ENGINEER

TOWN OF SOUTHINGTON
VOL: 1380 PG: 140

3 DN-2 GRASS LINED SWALE

3 DN-1 PROP. 12-FT WIDTH GRAVEL ACCESS DRIVE.

2 DN-2 PROP. OVERFLOW WEIR ACROSS ACCESS ROAD
INVERT EL. = 196.0'
LENGTH = 40-FT

1 DN-2 PROP. GRASS LINED BASIN (1)

MAINTAIN EXISTING DRAINAGE PATTERNS

2 DN-2 PROP. OVERFLOW WEIR
INVERT EL. = 190.75'
LENGTH = 10-FT

4 DN-2 / 5 DN-2 PROP. OUTLET CULVERTS WITH PLUNGE POOL.
(3) 8-IN DIAM. HDPE, 24-LF.
3-FT SEPARATION.
U/S INVERT = 190.50'
D/S INVERT = 190.00'

1 EN-2 PROP. VERNAL POOL MITIGATION AREA

CONTRACTOR SHALL SEED AND MULCH OR HYDROSEED ALL DISTURBED AREAS

FEMA 100-YEAR FLOODPLAIN

8-IN METAL
INV. = 187.36'

8-IN METAL
INV. = 187.45'

24-IN METAL
INV. = 186.30'

24-IN METAL
INV. = 186.20'

LIMITS OF CLEARING FOR ELECTRIC LINE

EXISTING DRIVEWAY TO BE RESURFACED WITH ~3-IN DEPTH OF CRUSHED GRAVEL. REMOVE EQUAL DEPTH PRIOR TO PLACEMENT FOR AREAS WITHIN FLOODPLAIN.

WETLAND DELINEATED BY ALL POINTS TECHNOLOGY JANUARY 2020

200-FT VERNAL POOL BUFFER

50-FT LOCAL WETLAND BUFFER (TYP)

100-FT STATE WETLAND BUFFER (TYP)

CL&P #93099

EVERSOURCE #93101

N/F RALPH & MEREDITH MANN VOL: 189 PG: 74

N/F FRANK MANN VOL: 189 PG: 74

N/F SOUTHINGTON-CHI COMMUNITY, YM INC.

N/F WILLIAM BACKES VOL: 1119 PG: 608

SHEET GP-2

60 0 30 60 120
(IN FEET) 1 inch = 60 ft.

1 GP-1 **GRADING AND DRAINAGE PLAN 1**
SCALE : 1-IN = 60-FT

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

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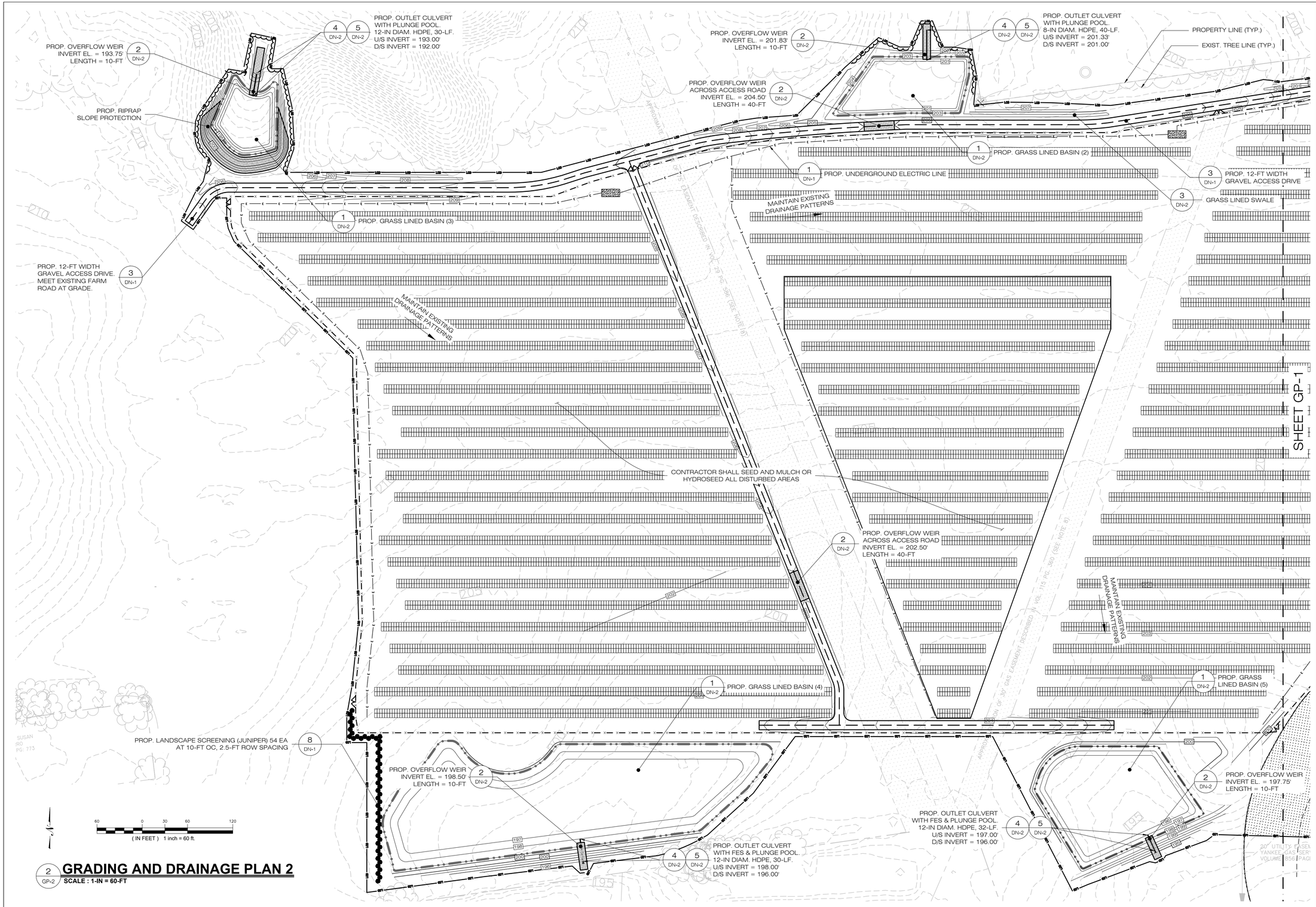
SHEET TITLE:
GRADING AND DRAINAGE PLAN (1 OF 2)

SHEET NUMBER:
GP-1

STATE OF CONNECTICUT BRADLEY J. PARSONS No. 28025 LICENSED PROFESSIONAL ENGINEER



2 GP-2 **GRADING AND DRAINAGE PLAN 2**

SCALE : 1-IN = 60-FT

SHEET GP-1

SOUTHINGTON SOLAR ONE, LLC
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SHEET TITLE:
GRADING AND DRAINAGE PLAN (2 OF 2)

SHEET NUMBER:
GP-2

STATE OF CONNECTICUT · BRADLEY J. PARSONS · NO. 28025 · LICENSED PROFESSIONAL ENGINEER

N/F
TOWN OF SOUTHINGTON
VOL: 1380 PG: 140

3 DN-1 PROP. 12-FT WIDTH GRAVEL ACCESS DRIVE.

5 DN-1 PROP. CHAIN LINK FENCE

2 DN-2 PROP. OVERFLOW WEIR ACROSS ACCESS ROAD
INVERT EL. = 196.0'
LENGTH = 40-FT

5 DN-1 PROP. CHAIN LINK FENCE ACCESS GATE

1 DN-1 PROP. UNDERGROUND ELECTRIC LINE

1 DN-2 PROP. GRASS LINED BASIN (1)

4 DN-1 (2) PROP. CONCRETE EQUIPMENT PADS.
24-FT X 10-FT EA.

3-70 3-71 3-72 3-73 3-74 3-75 3-76 3-77 3-78 FEMA 100-YEAR FLOODPLAIN
3-79 3-80 3-81 3-82 3-83 3-84 3-85 3-86 3-87 3-88 3-89 3-90 3-91 3-92 3-93 3-94 3-95 3-96 3-97 3-98 3-99 3-100 3-101 3-102 3-103 3-104 3-105 3-106 3-107 3-108 3-109 3-110 3-111 3-112 3-113 3-114 3-115 3-116 3-117 3-118 3-119 3-120 3-121 3-122 3-123 3-124 3-125 3-126 3-127 3-128 3-129 3-130 3-131 3-132 3-133 3-134 3-135 3-136 3-137 3-138 3-139 3-140 3-141 3-142 3-143 3-144 3-145 3-146 3-147

8-IN METAL
INV. = 187.36'

UNDERGROUND ELECTRIC LINE
FROM ARRAY TO SWITCHGEAR
POLES & OVERHEAD LINE

OVERHEAD ELECTRIC LINE FROM
UNDERGROUND LINE TO UTILITY
INTERCONNECTION (7 POLES)
SEE INSET 1 BELOW

LIMITS OF CLEARING
FOR ELECTRIC LINE

24-IN METAL
INV. = 186.30'

11.54'
17.10'
25.00'

6-9 6-10 6-11 6-12 6-13 6-14 6-15 6-16 6-17 6-18 6-19 6-20 6-21 6-22 6-23 6-24 6-25 6-26 6-27 6-30 6-31 6-36 6-37 6-38 6-39 6-42 6-43 6-44 6-45 6-46 6-47 6-48 6-49 6-50 6-51 6-52 6-53 6-54 6-55 6-66 6-67 6-68

8-IN METAL
INV. = 187.45'

2 DN-2 PROP. OVERFLOW WEIR
INVERT EL. = 190.75'
LENGTH = 10-FT

4 DN-2 5 DN-2 PROP. OUTLET CULVERTS
WITH PLUNGE POOL.
(3) 8-IN DIAM. HDPE, 24-LF.
3-FT SEPARATION.
U/S INVERT = 190.50'
D/S INVERT = 190.00'

EXISTING DRIVEWAY TO BE RESURFACED WITH ~3-IN
DEPTH OF CRUSHED GRAVEL. REMOVE EQUAL DEPTH
PRIOR TO PLACEMENT FOR AREAS WITHIN FLOODPLAIN.

24-IN METAL
INV. = 186.20'

4-1 4-1A 4-5 4-6 4-7 4-8 4-9 4-10 4-12 4-13 4-14

18-FT WIDTH ACCESS DRIVE
ADJACENT TO INTERCONNECTION

N/F
RALPH & MEREDITH
MANN
VOL: 189 PG: 74

WETLAND DELINEATED BY
ALL POINTS TECHNOLOGY
JANUARY 2020

200-FT VERNAL POOL BUFFER

1 EN-2 PROP. VERNAL POOL
MITIGATION AREA

50-FT LOCAL WETLAND BUFFER (TYP)

100-FT STATE WETLAND BUFFER (TYP)

50'
100'

CL&P
#93099

EVERSOURCE
#93101

CL&P
#93106

BROOK

WG

SHEET SP-2

60 0 30 60 120
(IN FEET) 1 inch = 60 ft.

1 SP-1 **SITE AND UTILITY PLAN 1**
SCALE : 1-IN = 60-FT

LIMITS OF CLEARING FOR
ELECTRIC LINE INSTALLATION

THREE (3) UTILITY POLES FOR
INTERCONNECTION TO UTILITY

ONE (1) UTILITY POLE FOR
OVERHEAD SPAN

PROP. WORK IN WETLAND
APPROX. 2,316 SQ-FT

THREE (3) UTILITY POLES FOR PROJECT
SWITCHGEAR AND METERING

UNDERGROUND ELECTRIC
LINE DAYLIGHTS TO THREE
SEPARATE SERVICES

UNDERGROUND ELECTRIC
LINE INSTALLED WITHIN
ROAD CORRIDOR

N/F

30 0 15 30 60
(IN FEET) 1 inch = 30 ft.

I-1 SP-1 **INSET 1**
SCALE : 1-IN = 30-FT

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

CSC PERMIT SET

NO	DATE	REVISION
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DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHALL ST EXT - STE 311 WATERFORD, CT 06385

OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET, SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: KAM

DATE: 07/07/2020 CHECKED BY: BJP

SHEET TITLE:

SITE AND UTILITY PLAN (1 OF 2)

SHEET NUMBER:

SP-1

STATE OF CONNECTICUT
BRADLEY J. PARSONS
No. 28025
LICENSED PROFESSIONAL ENGINEER

PROP. OVERFLOW WEIR
INVERT EL. = 193.75'
LENGTH = 10-FT
2 DN-2

PROP. OUTLET CULVERT
WITH PLUNGE POOL.
12-IN DIAM. HDPE, 30-LF.
U/S INVERT = 193.00'
D/S INVERT = 192.00'
4 DN-2 5 DN-2

PROP. RIPRAP
SLOPE PROTECTION

PROP. 12-FT WIDTH
GRAVEL ACCESS DRIVE.
MEET EXISTING FARM
ROAD AT GRADE.
3 DN-1

1 DN-2 PROP. GRASS LINED BASIN (3)

PROP. OVERFLOW WEIR
INVERT EL. = 201.83'
LENGTH = 10-FT
2 DN-2

PROP. OUTLET CULVERT
WITH PLUNGE POOL.
8-IN DIAM. HDPE, 40-LF.
U/S INVERT = 201.33'
D/S INVERT = 201.00'
4 DN-2 5 DN-2

PROP. OVERFLOW WEIR
ACROSS ACCESS ROAD
INVERT EL. = 204.50'
LENGTH = 40-FT
2 DN-2

PROPERTY LINE (TYP.)

EXIST. TREE LINE (TYP.)

4 DN-1 PROP. CONCRETE
EQUIPMENT PAD.
24-FT X 10-FT.

1 DN-2 PROP. GRASS LINED BASIN (2)

1 DN-1 PROP. UNDERGROUND ELECTRIC LINE

3 DN-1 PROP. 12-FT WIDTH
GRAVEL ACCESS DRIVE

4 DN-1 PROP. CONCRETE
EQUIPMENT PAD.
24-FT X 10-FT.

5 DN-1 PROP. CHAIN LINK FENCE

APPROXIMATE LOCATION OF 30' GAS EASEMENT DESCRIBED IN VOL. 19 PG. 586 (SEE NOTE 6)

PROP. CENTRAL ARRAY SECTION
1,778 TRINA 400W MODULES
3,120 RISEN 380W MODULES
±1.9 MW DC
(STRINGING MULTIPLE OF 26)
2 DN-1
17.10'
11.49'

PROP. WESTERN ARRAY SECTION
7,296 TRINA 400W MODULES
±2.9 MW DC
(STRINGING MULTIPLE OF 26)
2 DN-1

17.10'

11.54'

25.00'

PROP. RISEN 380W SECTION
3,120 MODULES (30° TILT)
±1.19 MW DC
(STRINGING MULTIPLE OF 26)
2 DN-1

PROP. OVERFLOW WEIR
ACROSS ACCESS ROAD
INVERT EL. = 202.50'
LENGTH = 40-FT
2 DN-2

PROP. EASTERN ARRAY SECTION
4,836 TRINA 400W MODULES
1,404 TRINA 395W MODULES
±2.5 MW DC
(STRINGING MULTIPLE OF 26)
2 DN-1

5 DN-1 PROP. CHAIN LINK FENCE
ACCESS GATE (TYP.)

1 DN-2 PROP. GRASS LINED BASIN (4)

1 DN-2 PROP. GRASS
LINED BASIN (5)

APPROXIMATE LOCATION OF 30' GAS EASEMENT DESCRIBED IN VOL. 1715 PG. 35

SUSAN
RO
PG. 773

PROP. LANDSCAPE SCREENING (JUNIPER) 54 EA
AT 10-FT OC, 2.5-FT ROW SPACING
8 DN-1

PROP. OVERFLOW WEIR
INVERT EL. = 198.50'
LENGTH = 10-FT
2 DN-2

PROP. OUTLET CULVERT
WITH FES & PLUNGE POOL.
12-IN DIAM. HDPE, 30-LF.
U/S INVERT = 198.00'
D/S INVERT = 196.00'
4 DN-2 5 DN-2

PROP. OUTLET CULVERT
WITH FES & PLUNGE POOL.
12-IN DIAM. HDPE, 32-LF.
U/S INVERT = 197.00'
D/S INVERT = 196.00'
4 DN-2 5 DN-2

PROP. OVERFLOW WEIR
INVERT EL. = 197.75'
LENGTH = 10-FT
2 DN-2

20' UTILITY EASEN
YANKEE GAS SERV
VOLUME 1856 PAGE

60 0 30 60 120
(IN FEET) 1 inch = 60 ft.

2 SP-2 SITE AND UTILITY PLAN 2
SCALE : 1-IN = 60-FT

SHEET SP-1

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
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OWNER: CATHOLIC CEMETERIES OF ARCHDIOCESE OF HARTFORD
ADDRESS: 700 MIDDLETOWN AVENUE NORTH HAVEN, CT 06473

SOUTHINGTON SOLAR ONE, LLC

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: KAM

DATE: 07/07/2020 CHECKED BY: BJP

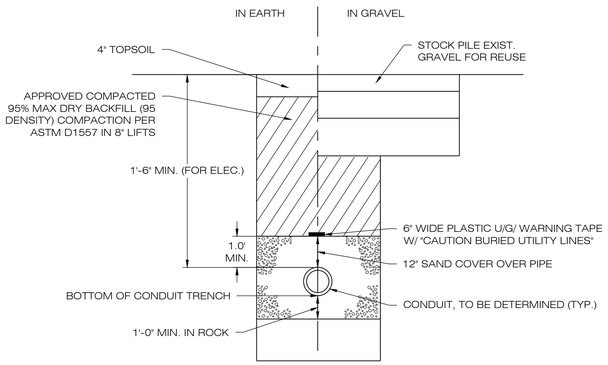
SHEET TITLE:

SITE AND UTILITY PLAN (2 OF 2)

SHEET NUMBER:

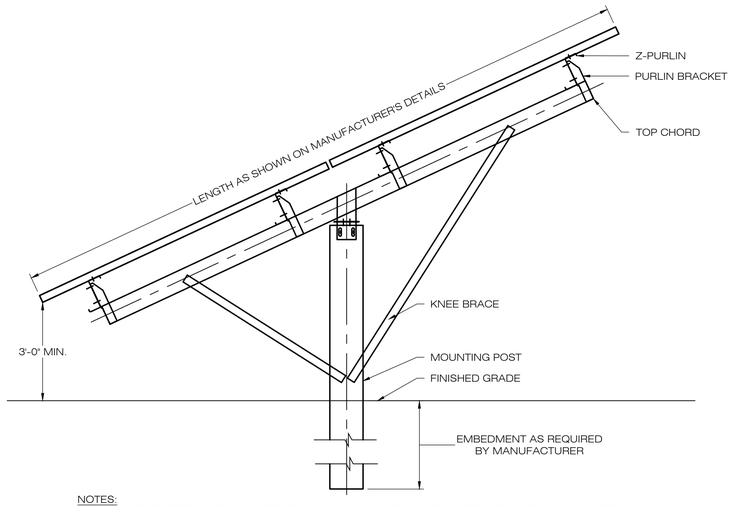
SP-2

STATE OF CONNECTICUT
BRADLEY J. PARSONS
No. 28025
LICENSED PROFESSIONAL ENGINEER



1 DN-1 ELECTRICAL TRENCH DETAIL

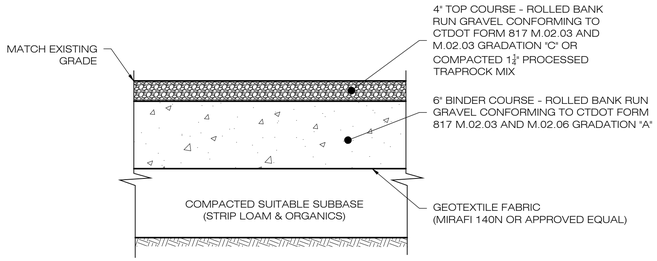
SCALE : N.T.S.



NOTES:
SEE MANUFACTURER'S DETAIL SHEETS FOR ADDITIONAL INFORMATION REGARDING RACKING SYSTEM REQUIREMENTS AND INSTALLATION PROCEDURES. RACKING SYSTEM TO BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

2 DN-1 TYPICAL POST MOUNTED RACKING SYSTEM

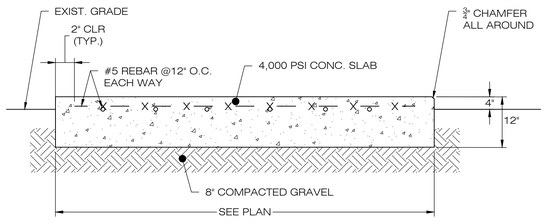
SCALE : N.T.S.



NOTES:
1. SUBBASE MAY CONSIST OF NATIVE MATERIALS IF FOUND ACCEPTABLE BY THE ENGINEER. SUBBASE TO BE COMPACTED TO 95% MAX DRY DENSITY.
2. SUBBASE IS TO BE FREE FROM DEBRIS AND UNSUITABLE MATERIALS.

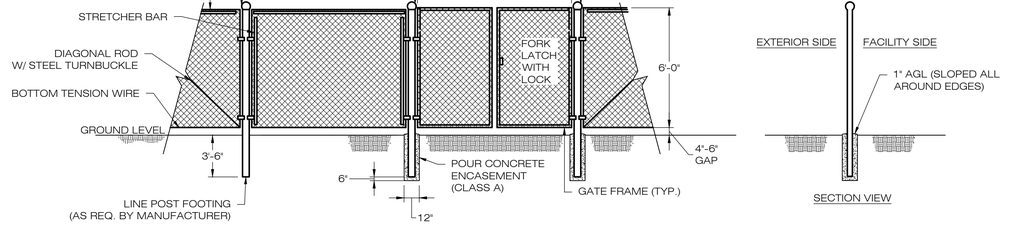
3 DN-1 GRAVEL ACCESS DRIVE SECTION

SCALE : N.T.S.



4 DN-1 CONCRETE EQUIPMENT PAD

SCALE : N.T.S.



5 DN-1 CHAIN-LINK FENCE & GATE DETAIL

SCALE : N.T.S.

SOUTHINGTON
SOLAR ONE, LLC

IN CASE OF EMERGENCY
CALL T.B.D.

NOTES:
EMERGENCY CALL NUMBER TO BE PROVIDED ONCE DETERMINED.

6 DN-1 NOTIFICATION SIGN DETAIL

SCALE : N.T.S.

NEW ENGLAND WETLAND PLANTS, INC

820 WEST STREET, AMHERST, MA 01002
PHONE: 413-548-8000 FAX 413-549-4000
EMAIL: INFO@NEWP.COM WEB ADDRESS: WWW.NEWP.COM

New England Semi-Shade Grass and Forbs Mix

Botanical Name	Common Name	Indicator
Elymus virginicus	Virginia Wild Rye	FACW-
Elymus canadensis	Canada Wild Rye	FACU+
Festuca rubra	Red Fescue	FACU
Chamaecrista fasciculata	Partridge Pea	FACU
Liatris spicata	Spiked Gayfeather/Marsh Blazing Star	FAC+
Onoclea sensibilis	Sensitive Fern	FACW
Aster prenanthoides (Symphyotrichum prenanthoide	Zigzag Aster	FAC
Eupatorium fistulosum (Eutrochium fistulosum)	Hollow-Stem Joe Pye Weed	FACW
Eupatorium perfoliatum	Boneset	FACW
Juncus tenuis	Path Rush	FAC

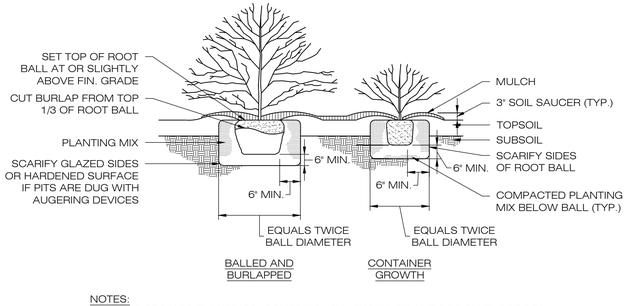
PRICE PER LB. $87.00 MIN. QUANITY 1 LBS. **TOTAL:** $87.00 APPLY: 30 LBS/ACRE :1450 sq ft/lb

The New England Semi Shade Grass & Forb Mix contains a broad spectrum of native grasses and forbs that will tolerate semi-shade and edge conditions. Always apply on clean bare soil. The mix may be applied by hydro-seeding, by mechanical spreader, or on small sites it can be spread by hand. Lightly rake, or roll to ensure proper seed to soil contact. Best results are obtained with a Spring seeding. Late Spring and early Summer seeding will benefit with a light mulching of weed-free straw to conserve moisture. If conditions are drier than usual, watering will be required. Late Fall and Winter dormant seeding require an increase in the seeding rate. Fertilization is not required unless the soils are particularly infertile. Preparation of a clean weed free seed bed is necessary for optimal results.

New England Wetland Plants, Inc. may modify seed mixes at any time depending upon seed availability. The design criteria and ecological function of the mix will remain unchanged. Price is $/bulk pound, FOB warehouse, Plus SH and applicable taxes.

7 DN-1 SEMI-SHADE MIX

SCALE : N.T.S.



NOTES:
IN AREAS OF MASS PLANTINGS, CONTINUOUSLY EXCAVATE AND MULCH ENTIRE BED..

8 DN-1 TYPICAL PLANTING DETAIL

SCALE : N.T.S.

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

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APT FILING NUMBER: CT590170

DRAWN BY: KAM

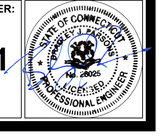
DATE: 07/07/2020 CHECKED BY: BJP

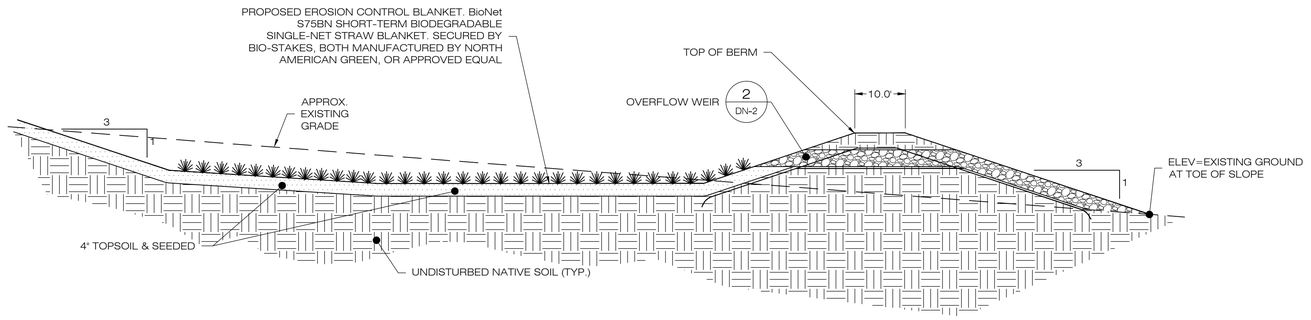
SHEET TITLE:

SITE DETAILS

SHEET NUMBER:

DN-1

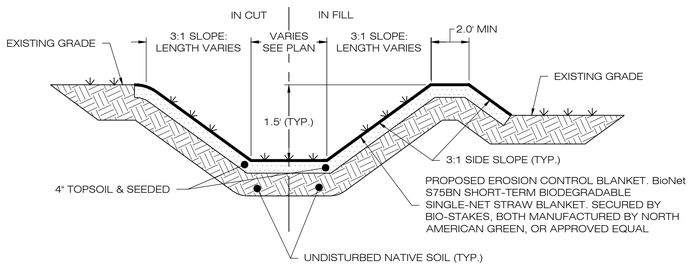




NOTES:
- SEED MIX TO BE NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES ON THE BOTTOM OF THE BASIN AND NEW ENGLAND EROSION/RESTORATION MIX FOR DRY SITES ON THE SIDE SLOPES.
- FOR CONVERTING TEMPORARY SEDIMENT BASIN TO INFILTRATION BASIN, REMOVE BAFFLES, CLEAN OUT SEDIMENT, RESHAPE AS REQUIRED. SEE PLANS FOR BASIN DEPTHS AND ELEVATIONS.
- INSPECT AND CLEAN PIPES.

1 DN-2 GRASS LINED BASIN

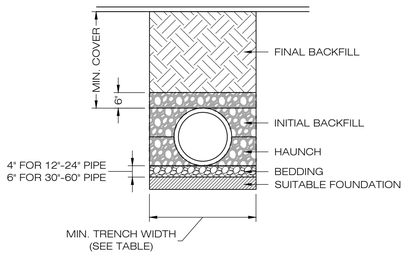
SCALE : N.T.S.



NOTES:
1. SEED MIX TO BE NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR MOIST SITES ON THE BOTTOM OF THE BASIN AND NEW ENGLAND EROSION/RESTORATION MIX FOR DRY SITES ON THE SIDE SLOPES.
2. IF DEPTH VARIES FROM 1.5', SEE PLAN CALLOUTS.

3 DN-2 GRASS LINED SWALE

SCALE : N.T.S.

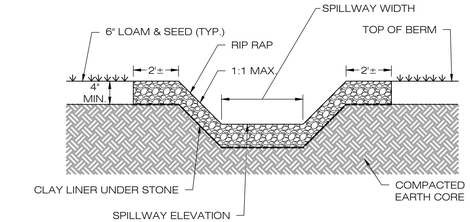


RECOMMENDED MIN. TRENCH WIDTH	
PIPE DIA.	MIN. TRENCH WIDTH
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
48"	80"
60"	96"

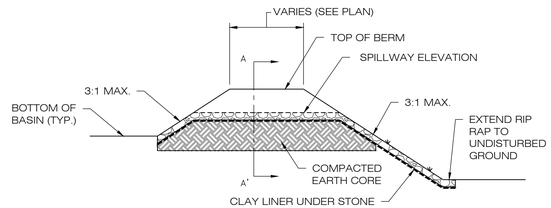
NOTES:
1. ALL PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321 , "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST ADDITION.
2. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
3. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
4. BEDDING: SUITABLE MATERIAL SHALL BE CLASS I, II OR III. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR 4"-24" (100mm-600mm); 6" (150mm) FOR 30"-60" (750mm-900mm).
5. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE CLASS I, II OR III IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION.
6. MINIMUM COVER: MINIMUM COVER, H, IN NON-TRAFFIC APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR 54"-60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE PAVEMENT OR TO TOP OF RIGID PAVEMENT.

4 DN-2 HDPE STORM DRAINAGE TRENCH DETAIL

SCALE : N.T.S.

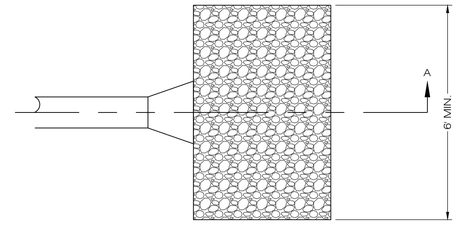


SECTION A-A' THROUGH SPILLWAY

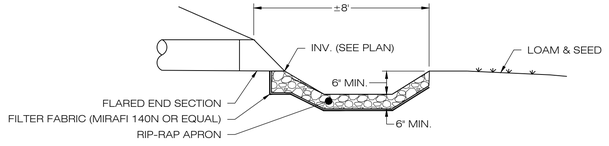


2 DN-2 OVERFLOW WEIR DETAIL

SCALE : N.T.S.



PLAN VIEW



SECTION A-A

5 DN-2 FLARED END SECTION/PLUNGE POOL

SCALE : N.T.S.

SOUTHINGTON SOLAR ONE, LLC
150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
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WATERFORD, CT 06385 PHONE: (860)-663-1697
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APT FILING NUMBER: CT590170

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DATE: 07/07/2020
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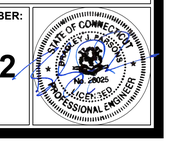
SHEET TITLE:

SITE DETAILS

SHEET NUMBER:

DN-2



APPENDIX B

DEEP NDDB CORRESPONDENCE

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

March 9, 2020

Dean Gustafson
All-Points Technology Corporation, PC
567 Vauxhall Street Ext, Suite 311
Waterford, CT 06385
dgustafson@allpointstech.com

NDDB DETERMINATION NUMBER: 202002717

Project: Installation of commercial-scale PV solar facility; SOUTHINGTON SOLAR ONE, 1012 EAST ST., SOUTHINGTON, CT

Expiration: March 9, 2021

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding this project. According to our records, the following State-listed species (RCSA Sec. 26-306) are documented in the project area.

- **Spotted turtle (*Clemmys guttata*) State Special Concern**
- **Historical records of: Purple milkweed (*Asclepias purpurascens*) State Special Concern**

Spotted turtle (*Clemmys guttata*) State Special Concern
Individuals of this species are associated with wetlands and are vernal pool obligates. Over the course of a season and lifetime, individuals will travel large distances (up to 1km) over upland forest and fields between multiple wetlands. They overwinter burrowed into the mud in wetlands between Nov 1- March 15. They do not begin to reproduce until 7-10 years old and adults can live at least 30 years. This species is threatened most by any activities that reduce adult survivorship including road kills, commercial and casual collection, increased predation in areas around commercial and residential development, mortality and injury from agricultural equipment or other mechanical equipment.

Land disturbance activities that will crush active turtles or unearth/or crush hibernating turtles or nests need to consider local habitat features and apply fencing and/or time of year restrictions as appropriate. We recommend you consult with a herpetologist familiar with preferred habitats to assist you with proper techniques to ensure the best protection strategies are employed for your site.

- Land disturbance and excavation confined to the upland (greater than 10 meters from a wetland) can be done during turtle's dormant season (November 1- March 15).

If land disturbance will occur in open fields, early successional habitat, sandy open patches nearby wetland features, and sandy roads and roadsides or other potential nesting areas designated by a qualified herpetologist you will need to take precautions to prevent female turtles from entering work area and setting up nests.

- Before May 15: Early successional areas suitable for nesting need to be fenced to exclude females from entering and laying nests.

If land disturbance activity will include significant areas within and around wetlands, you will need to take precautions to avoid crushing or killing hibernating adults.

- **Do not conduct land disturbance activities within a wetland or its 100ft buffer during the turtle's dormant period (November 1- March 15).**

In general when working in the **upland between March 15- November 1**:

- Exclusionary practices will be required to prevent any turtle access into construction areas. These measures will need to be installed at the limits of disturbance as shown on the plans.
- Exclusionary fencing be at least 20 inches tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.
- Prior to construction, all turtles occurring within fencing work area will be relocated to suitable habitat outside disturbance area. This should be performed by a qualified professional familiar with habitat requirements and behavior of the species.
- The Contractor must search the work area each morning prior to any work being done.
- All construction personnel working within the turtle habitat must be apprised of the species description and the possible presence of a listed species.
- Any turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point. These animals are protected by law and no turtles should be relocated from the site.
- In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.
- No heavy machinery or vehicles may be parked in any turtle habitat.
- Special precautions must be taken to avoid degradation of wetland habitats including any wet meadows and seasonal vernal pools.

Purple milkweed (*Asclepias purpurascens*) State Special Concern
Habitat: Dry soil. Roadsides, fields, borders of woods, on moist or dry soil. Blooms Jun, Jul.
Historical records for this plant are adjacent and nearby. We recommend where suitable habitat exists, you identify and protect suitable habitat and state listed species in your project area. You can benefit these species by seeking help from a plant ecologist who can create a management plan to enhance habitat where opportunities exist. A Botantist or Plant Ecologist will give you site specific management recommendations, but keep the following recommendations in mind as you manage your habitat:

- Minimize ground impact to sensitive habitat, and do not import other types of permanent fill.
- If sensitive habitats are disturbed, it is best to allow them to revegetate naturally or propagate only native vegetation.

This is determination is valid for two years.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Bureau of Natural Resources and cooperating units of DEEP, independent conservation groups, and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated in the NDDB as it becomes available.

Please contact me if you have any questions (shannon.kearney@ct.gov). Thank you for consulting with the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

Sincerely,

/s/ Shannon B. Kearney
Wildlife Biologist

Cc: Steven Denino (Verogy, LLC)

Connecticut Department of
Energy & Environmental Protection
Bureau of Natural Resources
Wildlife Division

CPPU USE ONLY
App #:_____
Doc #:_____
Check #: No fee required
Program: Natural Diversity Database Endangered Species
Hardcopy _____ Electronic _____

Request for Natural Diversity Data Base (NDDB) State Listed Species Review

Please complete this form in accordance with the instructions (DEEP-INST-007) to ensure proper handling of your request.
There are no fees associated with NDDB Reviews.

Part I: Preliminary Screening & Request Type

Before submitting this request, you must review the most current Natural Diversity Data Base "State and Federal Listed Species and Significant Natural Communities Maps" found on the DEEP website. These maps are updated twice a year, usually in June and December.

Does your site, including all affected areas, fall in an NDDB Area according to the map instructions:

☒ Yes ☐ No **Enter the date** of the map reviewed for pre-screening: **December 2019**

This form is being submitted for a :

☒ *New* NDDB request ☐ *Renewal/Extension* of a NDDB Request, ***without*** *modifications and within* ***two years*** *of issued NDDB determination* (no attachments required) [*CPPU Use Only - NDDB-Listed Species Determination* # 1736]	☐ *New* **Safe Harbor Determination** (optional) must be associated with an application for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities ☐ *Renewal/Extension* of an existing Safe Harbor Determination ☐ With modifications ☐ Without modifications (no attachments required) [*CPPU Use Only - NDDB-Safe Harbor Determination* # 1736]
Enter NDDB Determination Number for Renewal/Extension:	Enter Safe Harbor Determination Number for Renewal/Extension:

Part II: Requester Information

***If the requester is a corporation, limited liability company, limited partnership, limited liability partnership, or a statutory trust, it must be registered with the Secretary of State. If applicable, the name shall be stated **exactly** as it is registered with the Secretary of State. Please note, for those entities registered with the Secretary of State, the registered name will be the name used by DEEP. This information can be accessed at the Secretary of the State's database CONCORD.* (www.concord-sots.ct.gov/CONCORD/index.jsp)

If the requester is an individual, provide the legal name (include suffix) in the following format: First Name; Middle Initial; Last Name; Suffix (Jr, Sr., II, III, etc.).

If there are any changes or corrections to your company/facility or individual mailing or billing address or contact information, please complete and submit the Request to Change company/Individual Information to the address indicated on the form.

1. Requester*

Company Name: **Verogy, LLC**

Contact Name: **Steven DeNino, COO**

Address: **150 Trumbull Street, 4th Floor**

City/Town: **Hartford** State: **CT** Zip Code: **06103**

Business Phone: **(860) 288-7215** ext. **702**

E-mail: **sdenino@verogy.com

**By providing this email address you are agreeing to receive official correspondence from the department, at this electronic address, concerning this request. Please remember to check your security settings to be sure you can receive emails from "ct.gov" addresses. Also, please notify the department if your e-mail address changes

a) Requester can best be described as:

☐ Individual ☐ Federal Agency ☐ State agency ☐ Municipality ☐ Tribal

☒ *business entity (* if a business entity complete i through iii):

i) Check type ☐ corporation ☒ limited liability company ☐ limited partnership ☐ limited liability partnership ☐ statutory trust ☐ Other:

ii) Provide Secretary of the State Business ID #: 1323955 This information can be accessed at the Secretary of the State's database (CONCORD). (www.concord-sots.ct.gov/CONCORD/index.jsp)

iii) ☐ Check here if your business is **NOT** registered with the Secretary of State's office.

b) Acting as (Affiliation), pick one:

☐ Property owner ☐ Consultant ☐ Engineer ☐ Facility owner ☒ Applicant

☐ Biologist ☐ Pesticide Applicator ☐ Other representative:

2. List Primary Contact to receive Natural Diversity Data Base correspondence and inquiries, if different from requester.

Company Name: **All-Points Technology Corporation, P.C.**

Contact Person: **Dean Gustafson** Title: **Senior Biologist**

Mailing Address: **567 Vauxhall Street Extension – Suite 311**

City/Town: **Waterford** State: **CT** Zip Code: **06385**

Business Phone: **(860) 552-2033** ext.

E-mail: **dgustafson@allpointstech.com

Part III: Site Information

This request can only be completed for one site. A separate request must be filed for each additional site.

1. SITE NAME AND LOCATION

Site Name or Project Name: **Southington Solar One**

Town(s): **Southington**

Street Address or Location Description:
1012 East Street

Size in acres, or site dimensions: **Property: ±102.92 acres; Project Area: ±30 acres**

Latitude and longitude of the center of the site in decimal degrees (e.g., 41.23456 -71.68574):

Latitude: **41.589706°** Longitude: **-72.850356°**

Method of coordinate determination (check one):

☐ GPS ☒ Photo interpolation using CTECO map viewer ☐ Other (specify):

2a. Describe the current land use and land cover of the site.

The site is currently in agricultural use predominately for the production of hay along with a smaller portion of cultivated field. Forested areas, including wetlands, generally surround the open agricultural fields with smaller components of edge old field in the southern portion of the site. Misery Brook flows generally along the northern property boundary within a forested riparian corridor while an unnamed stream and wetland corridor is located in the eastern portion of the field which is crossed by a farm road.

b. Check all that apply and enter the size in acres or % of area in the space after each checked category.

☐ Industrial/Commercial _____	☐ Residential _____	☒ Forest 20%
☒ Wetland 10%	☒ Field/grassland 80%	☒ Agricultural 100%
☐ Water _____	☐ Utility Right-of-way _____	
☐ Transportation Right-of-way _____	☐ Other (specify): _____	

Part IV: Project Information

1. PROJECT TYPE:

Choose Project Type: Other , If other describe: **Commercial-scale PV Solar Facility**

2. Is the subject activity limited to the maintenance, repair, or improvement of an existing structure within the existing footprint? ☐ Yes ☒ No If yes, explain.

Part IV: Project Information (continued)

3. Give a detailed description of the activity which is the subject of this request and describe the methods and equipment that will be used. Include a description of steps that will be taken to minimize impacts to any known listed species.

   Verogy is proposing the construction of a 370W Solar Energy Generation Facility to be generally located within an existing open field located in the central portion of the subject property. An existing farm road currently provides access to this open field off East Street.

   Typical equipment anticipated to be used include trucks of varying sizes, excavators, bulldozers, forklifts, and other equipment necessary for the clearing of vegetation, installation of gravel access drive, movement of materials, installation of racking foundation system and solar panels, electrical conduits and limited grading for the solar array development footprint.

   Erosion control measures will follow the CTDEEP 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and stormwater will be treated in accordance with the CTDEEP 2004 Connecticut Stormwater Quality Manual.

4. If this is a renewal or extension of an existing Safe Harbor request *with* modifications, explain what about the project has changed.

5. Provide a contact for questions about the project details if different from Part II primary contact.

   Name:

   Phone:

   E-mail:

Part V: Request Requirements and Associated Application Types

Check *one* box from either Group 1, Group 2 *or* Group 3, indicating the appropriate category for this request.

Group 1. If you check one of these boxes, complete Parts I – VII of this form and submit the required attachments A and B.

- ☐ Preliminary screening was negative but an NDDB review is still requested
- ☐ Request regards a municipally regulated or unregulated activity (no state permit/certificate needed)
- ☐ Request regards a preliminary site assessment or project feasibility study
- ☐ Request relates to land acquisition or protection
- ☐ Request is associated with a *renewal* of an existing permit or authorization, with no modifications

Group 2. If you check one of these boxes, complete Parts I – VII of this form and submit required attachments A, B, *and* C.

- ☒ Request is associated with a *new* state or federal permit or authorization application or registration
- ☐ Request is associated with modification of an existing permit or other authorization
- ☐ Request is associated with a permit enforcement action
- ☐ Request regards site management or planning, requiring detailed species recommendations
- ☐ Request regards a state funded project, state agency activity, or CEPA request

☐ **Group 3.** If you are requesting a **Safe Harbor Determination**, complete Parts I-VII and submit required attachments A, B, and D. Safe Harbor determinations can only be requested if you are applying for a GP for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities

If you are filing this request as part of a state or federal permit application(s) enter the application information below.

Permitting Agency and Application Name(s):
Connecticut Siting Council, Petition for a Declaratory Ruling & CTDEEP Construction Stormwater General Permit

Related State DEEP Permit Number(s), if applicable: **N/A**

State DEEP Enforcement Action Number, if applicable: **N/A**

State DEEP Permit Analyst(s)/Engineer(s), if known: **N/A**

Is this request related to a previously submitted NDDB request? ☐ Yes ☒ No

If yes, provide the previous NDDB Determination Number(s), if known: _____

Part VI: Supporting Documents

Check each attachment submitted as verification that *all* applicable attachments have been supplied with this request form. Label each attachment as indicated in this part (e.g., Attachment A, etc.) and be sure to include the requester's name, site name and the date. **Please note that Attachments A and B are required for all new requests and Safe Harbor renewals/extensions with modifications.** Renewals/Extensions with no modifications do not need to submit any attachments. Attachments C and D are supplied at the end of this form.

☒ Attachment A:	**Overview Map:** an 8 1/2" X 11" print/copy of the relevant portion of a USGS Topographic Quadrangle Map clearly indicating the exact location of the site.
☒ Attachment B:	**Detailed Site Map:** fine scaled map showing site boundary and area of work details on aerial imagery with relevant landmarks labeled. (Site and work boundaries in GIS [ESRI ArcView shapefile, in NAD83, State Plane, feet] format can be substituted for detailed maps, see instruction document)
☒ Attachment C:	**Supplemental Information, Group 2 requirement (attached, DEEP-APP-007C)** ☐ Section i: Supplemental Site Information and supporting documents ☐ Section ii: Supplemental Project Information and supporting documents
☐ Attachment D:	**Safe Harbor Report Requirements, Group 3 (attached, DEEP-APP-007D)**

Part VII: Requester Certification

The requester *and* the individual(s) responsible for actually preparing the request must sign this part. A request will be considered incomplete unless all required signatures are provided.

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of the individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief."

Dean Gustafson Signature of Requester (a typed name will substitute for a handwritten signature)	**February 23, 2020** Date
Dean Gustafson, APT, Agent for Verogy, LLC Name of Requester (print or type)	Title (if applicable)
Dean Gustafson Signature of Preparer (if different than above)	**February 23, 2020** Date
Dean Gustafson, All-Points Technology Corp. Name of Preparer (print or type)	**Senior Biologist** Title (if applicable)

Note: Please submit the completed Request Form and all Supporting Documents to:

CENTRAL PERMIT PROCESSING UNIT
DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
79 ELM STREET
HARTFORD, CT 06106-5127

Or email request to: **deep.nddbrequest@ct.gov**

Attachment C: Supplemental Information, Group 2 requirement

Section i: Supplemental Site Information

1. Existing Conditions

Describe all natural and man-made features including wetlands, watercourses, fish and wildlife habitat, floodplains and any existing structures potentially affected by the subject activity. Such features should be depicted and labeled on the site plan that must be submitted. Photographs of current site conditions may be helpful to reviewers.

The proposed solar facility would be located within an existing maintained hayfield that will require minimial grading and vegetation removal. A dirt/gravel farm road that crosses over wetlands and through the hayfield will be used to access the proposed solar facility; some minor surface improvements will be made to eliminate existing ruts and provide a stable surface. No wetlands or watercourses will be permanently impacted by the proposed solar facility and generally a minimum 100-foot buffer would be provided from the fenced facility and nearest wetland resource. Underground utility conduits will be installed within the existing farm road, which may require temporary disturbance to an existing culvert that conveys flows from an unnamed stream.

☒ **Site Photographs (optional) attached**

☒ **Site Plan/sketch of existing conditions attached**

2. Biological Surveys

Has a biologist visited the site and conducted a biological survey to determine the presence of any endangered, threatened or special concern species ☐ Yes ☒ No

If yes, complete the following questions and submit any reports of biological surveys, documentation of the biologist's qualifications, and any NDDB survey forms.

Biologist(s) name: _____

Habitat and/or species targeted by survey: _____

Dates when surveys were conducted: _____

☐ **Reports of biological surveys attached**

☐ **Documentation of biologist's qualifications attached**

☐ **NDDB Survey forms for any listed species observations attached**

Section ii: Supplemental Project Information

1. Provide a schedule for all phases of the project including the year, the month and/or season that the proposed activity will be initiated and the duration of the activity.

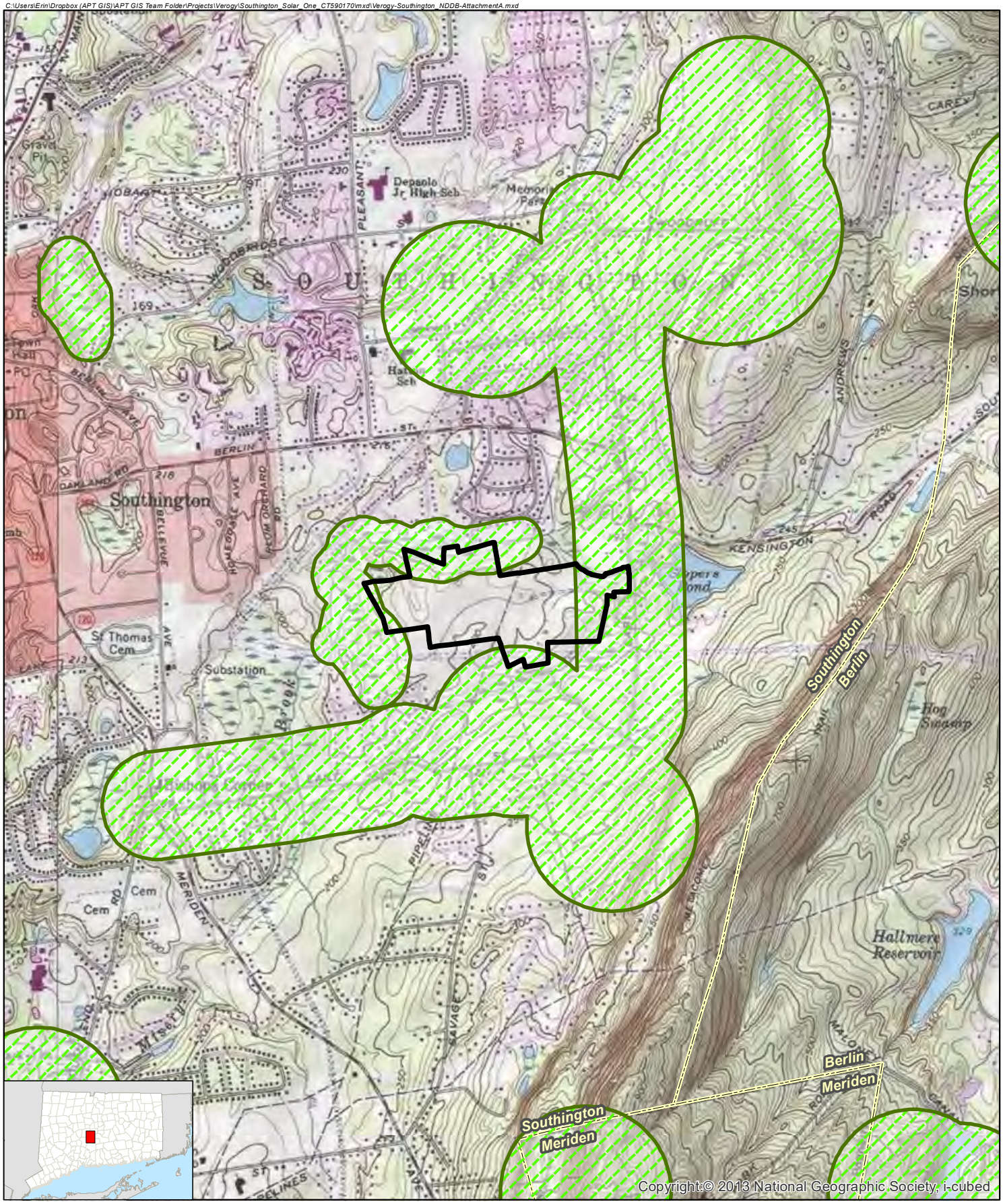
The proposed construction project is anticipated to extend over a period of 6 to 9 months. Construction would start once approval is granted by the Connecticut Siting Council, DEEP and other reviewing agencies.

2. Describe and quantify the proposed changes to existing conditions and describe any on-site or off-site impacts. In addition, provide an annotated site plan detailing the areas of impact and proposed changes to existing conditions.

With the proposed solar facility being located within a maintained hayfield, minimal grading and vegetation clearing is anticipated. The existing farm road will require minor surface upgrade with a stable gravel surface to support construction equipment and maintenance vehicles.

☒ **Annotated Site Plan attached**

C:\Users\Erin\Dropbox (APT GIS)\APT GIS Team Folder\Projects\Verogy\Southington_Solar_One_CT590170\mxd\Verogy-Southington_NDDB-AttachmentA.mxd



Legend

- Site
- Natural Diversity Database Area (Dec. 2019)

NDDB Attachment A
Overview Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

N
W E
S

2,000 1,000 0 2,000
Feet

VEROGY
ALL-POINTS TECHNOLOGY CORPORATION

Map Notes:
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps: Meriden (1984), CT
Map Scale: 1:24,000
Map Date: January 2020

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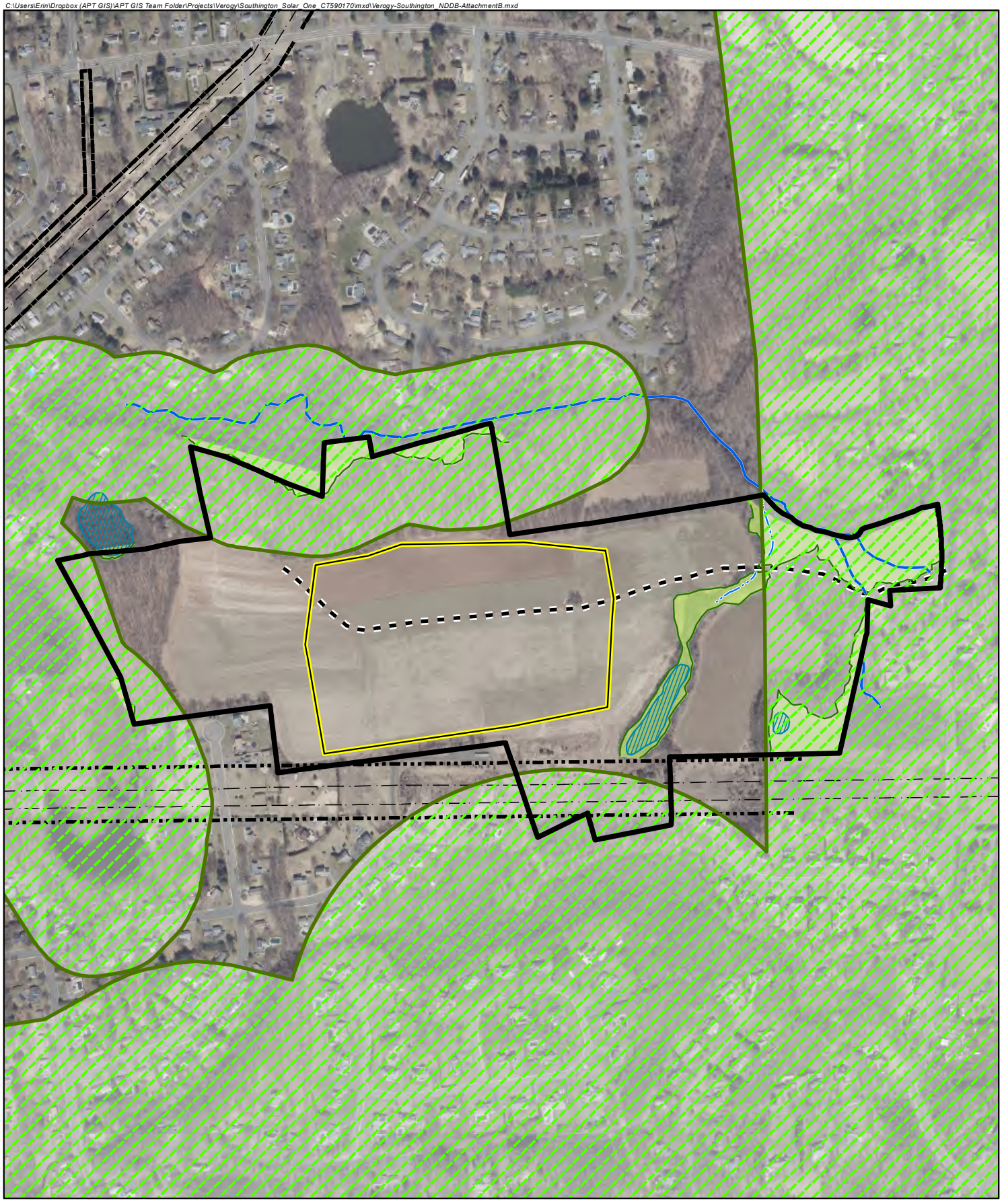


Legend

- Site
- Project Location
- Access
- Delineated Wetland Boundary
- Approx. Wetland Boundary
- Perennial Stream
- Intermittent Stream
- PotentialVernalPool
- Natural Diversity Database Area (Dec. 2019)
- Utility ROW
- Transmission Line

NDDB Attachment B
Detailed Site Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

Map Notes:
Base Map Source: CTECO 2019 Aerial Photograph
Map Scale: 1 inch = 600 feet
Map Date: January 2020

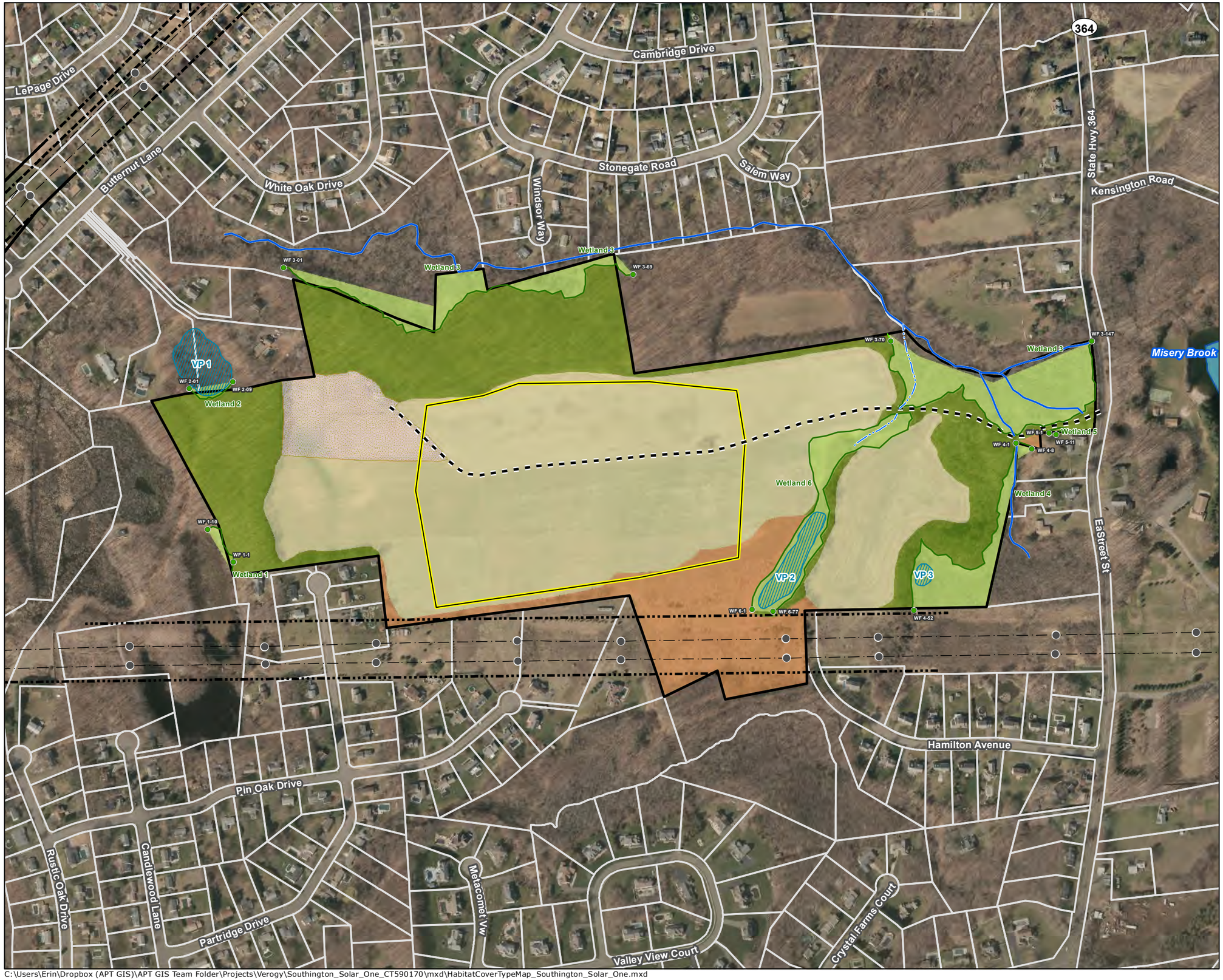
600 300 0 600 Feet

VEROGY

ALL-POINTS TECHNOLOGY CORPORATION

Habitat Cover Type Map
Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

VERGY



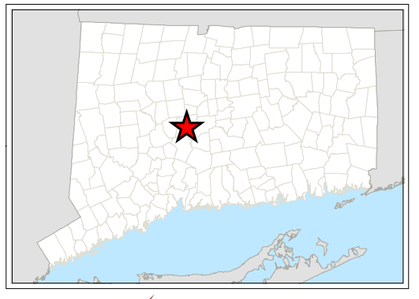
Legend

- Site
- Approximate Parcel Boundary (CTDEEP)
- Project Location
- Access
- Delineated Wetlands Flags
- Delineated Wetland Boundary
- Approx. Wetland Boundary
- Delineated Wetlands Area
- Perrenial Stream
- Intermittent Stream
- PotentialVernalPool
- Cropland
- Hay Field
- Mixed Hardwood Forest
- Old Field
- Open Water (CTDEEP)
- Utility ROW
- Transmission Line Structures
- Transmission Line

N
W E
S

400 200 0 400 Feet

1 in = 400 ft



ALL-POINTS TECHNOLOGY CORPORATION

Map Sources:

Ortho Base Map: CT ECO 2016 Aerial Imagery

Elevation contours derived from 2016 LiDAR data provided by CTECO

Wetlands field delineated by:
Eric Davidson, Registered Soil Scientist,
Date: 11/26/19, 11/27/19, 11/30/19, 12/xx/19

CTDEEP's data library (http://www.ct.gov/deep)
Data layers are maintained and updated by CTDEEP and represent the most recent publications.

Map Date: December 2019

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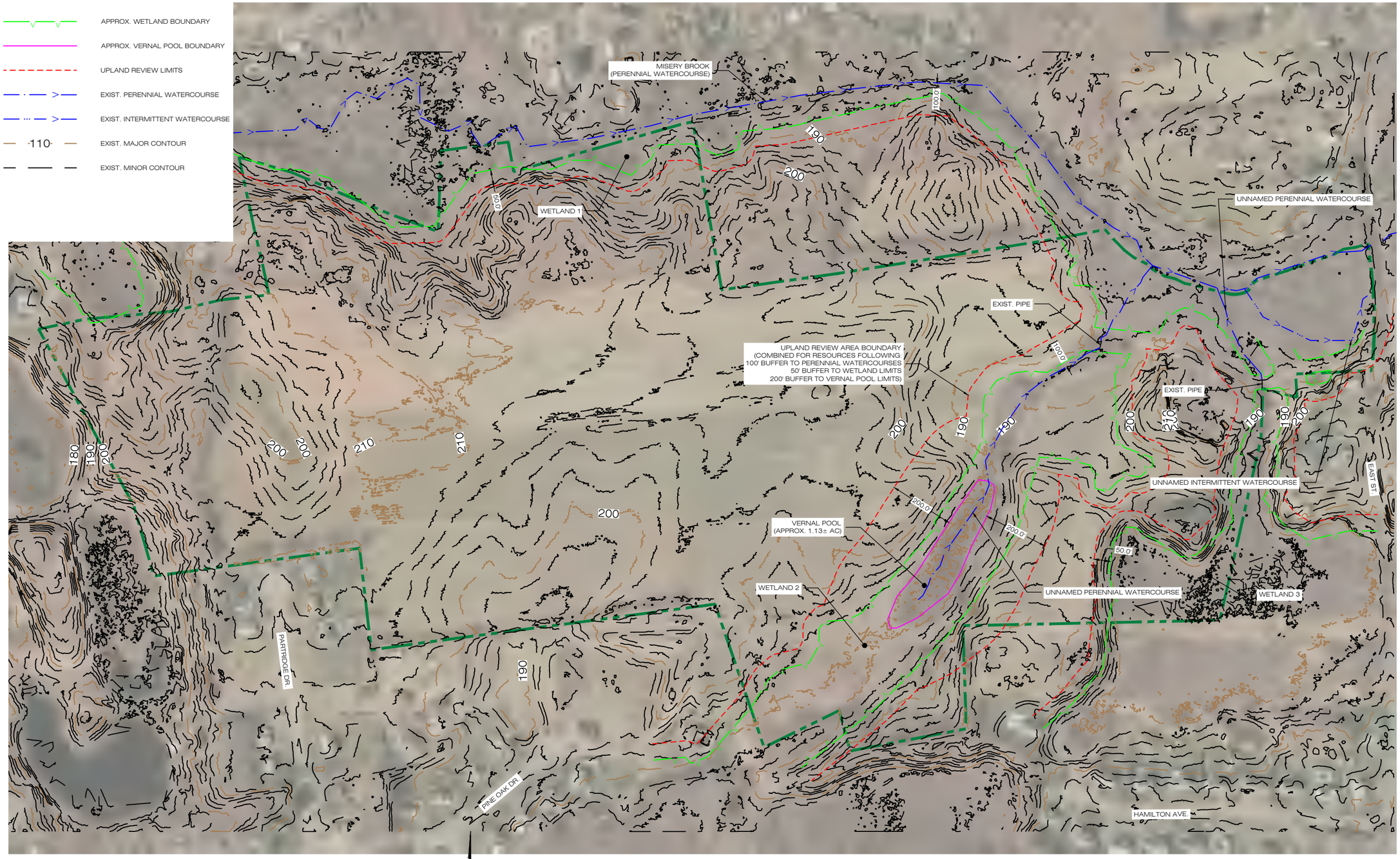
LEGEND

- PROP. PROJECT LIMITS
- APPROX. WETLAND BOUNDARY
- APPROX. VERNAL POOL BOUNDARY
- UPLAND REVIEW LIMITS
- EXIST. PERENNIAL WATERCOURSE
- EXIST. INTERMITTENT WATERCOURSE
- 110 EXIST. MAJOR CONTOUR
- EXIST. MINOR CONTOUR



1 EXH-1 **PRELIMINARY WETLAND INSPECTION MAP**
SCALE : 1" = 300'-0"

300 0 150 300 600
(IN FEET) 1 inch = 300 ft.

VERGY

ALL-POINTS TECHNOLOGY CORPORATION
3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

PERMIT SET

NO	DATE	REVISION
0	06/07/19	FOR REVIEW: BJP
1		
2		
3		
4		
5		
6		

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: ----
ADDRESS: ----

SOUTHINGTON SOLAR ONE CT

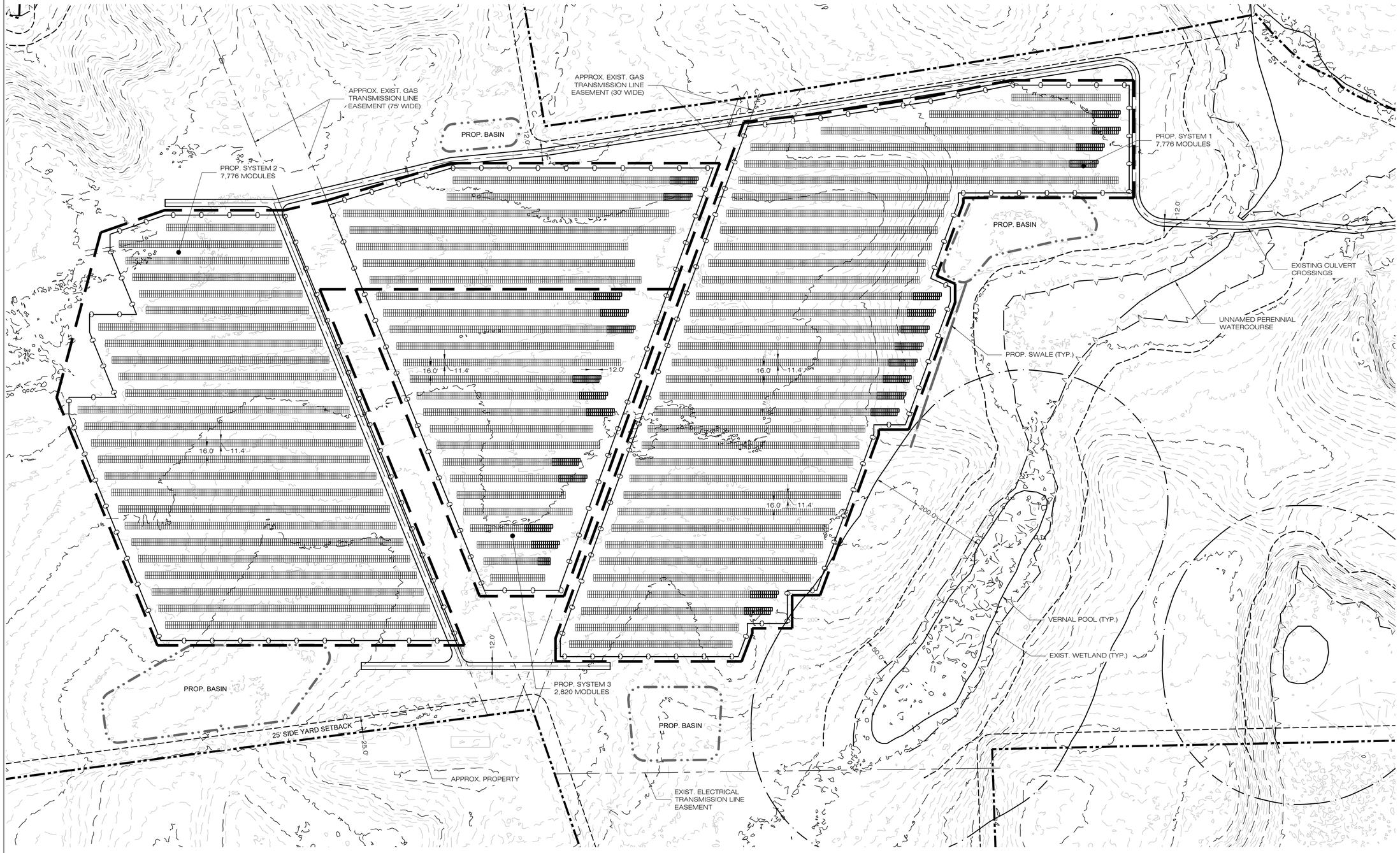
SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: JT
DATE: 06/07/19 CHECKED BY: BJP

SHEET TITLE:
PRELIMINARY WETLAND INSPECTION MAP

SHEET NUMBER:
EXH-1



DESIGN TABLE:

MODULE MODEL - EAGLE 72HM G2

MODULE WATTAGE - 370W

PROP. TILT - 30 DEGREES

INTER-ROW SPACING - 16 FEET

1 CP-1 **CONCEPT PLAN**

SCALE : 1" = 80'-0"

80 0 40 80 160

(IN FEET) 1 inch = 80 ft.

VEROGY

ALL-POINTS TECHNOLOGY CORPORATION

3 SADDLEBROOK DRIVE PHONE: (860)-663-1697
KILLINGWORTH, CT 06419 FAX: (860)-663-0935
WWW.ALLPOINTSTECH.COM

CONCEPT

NO	DATE	REVISION
0	11/15/19	FOR REVIEW: BJP
1	01/15/20	FOR REVIEW: BJP
2	01/16/20	FOR REVIEW: BJP
3	01/20/20	FOR REVIEW: BJP
4		
5		
6		

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 3 SADDLEBROOK DRIVE KILLINGWORTH, CT 06419

OWNER: ----

ADDRESS: ----

SOUTHINGTON SOLAR ONE

SITE ADDRESS: 1012 EAST STREET SOUTHINGTON, CT

APT FILING NUMBER: CT590170

DRAWN BY: JT

DATE: 11/15/19 CHECKED BY: BJP

SHEET TITLE:

CONCEPT PLAN

SHEET NUMBER:

CP-1

PHOTO DOCUMENTATION
Verogy, LLC Southington Solar One Facility
1012 East Street, Southington, CT
Photos taken on December 4, 2019

Photo 1: Overview of hayfield and proposed solar facility area looking east.

Photo 2: Overview of hayfield and proposed solar facility area looking west.

Photo 3: View of farm road within hayfield looking west at proposed solar facility area.

Photo 4: View of farm road through existing wetland crossing looking west with hayfield and proposed solar facility area in background.

APPENDIX C

RESOURCES PROTECTION PLAN

ENVIRONMENTAL NOTES - RESOURCES PROTECTION MEASURES

WETLAND, VERNAL POOL, SPOTTED TURTLE AND AQUIFER PROTECTION PROGRAM

The proposed solar facility is located proximate to sensitive habitats including wetland resource areas, vernal pools, rare species. In addition, the proposed facility is located within the Town of Southington Water Department's (PWSID #CT1310011) Aquifer Protection Area ("APA") for Wells #7 and #8. As a result, the following protective measures shall be followed to help avoid degradation of nearby wetland/watercourses, avoid incidental impact to vernal pool indicator species and avoid impact to the APA.

In addition, Spotted Turtle (*Clemmys guttata*), a State Special Concern species afforded protection under the Connecticut Endangered Species Act, is known to occur on the subject property in proximity to the proposed facility. The turtle protection measures included herein satisfy requirements from the Connecticut Department of Energy and Environmental Protection ("DEEP") Wildlife Division in accordance with their Natural Diversity Data Base ("NDDB") determination letter (No. 202002717) dated March 9, 2020; this determination is valid until March 9, 2021 provided the scope of the project has not changed and work has begun on the project prior to the expiration date.

It is of the utmost importance that the Contractor complies with the requirement for implementation of these protective measures and the education of its employees and subcontractors performing work on the project site. The wetland protection measures shall be implemented and maintained throughout the duration of construction activities until permanent stabilization of site soils has occurred. Vernal pool protection measures should be implemented during peak amphibian movement periods (early spring breeding [March 1st to May 15th] and late summer dispersal [July 15th to September 15th]) if construction cannot be avoided during these periods. The turtle protection measures within this plan shall be implemented if work will occur during either the turtle's active period (March 15th to November 1st) or dormant period (November 1st to March 15th).

All-Points Technology Corporation, P.C. ("APT") will serve as the Environmental Monitor for this project to ensure that these protection measures are implemented properly. APT will provide an education session for the Contractor prior to the start of construction activities on Spotted Turtle and nearby sensitive wetland resources/vernal pools that may be encountered due to the project's location within potentially sensitive habitat. The Contractor shall contact Dean Gustafson, Senior Biologist at APT, at least 5 business days prior to the start of any construction activities to schedule a pre-construction meeting. Mr. Gustafson can be reached by phone at (860) 552-2033 or via email at dgustafson@allpointstech.com.

The Town of Southington Water Department will be contacted at least 3 business days prior to the pre-construction meeting with an invitation to attend.

This protection program consists of several components: education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; periodic inspection of the construction project; and, reporting.

1. **Contractor Education**

    a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with APT. This orientation and educational session will consist of an introductory meeting with APT providing photos of Spotted Turtle emphasizing the non-aggressive nature of these species, the absence of need to destroy animals that might be encountered and the need to follow Protective Measures as described in sections below. Workers will also be provided information regarding the identification of other turtles, snakes and common herpetofauna species that could be encountered. The importance of protecting nearby wetland and vernal pool resources will also be stressed as part of this educational session.

b. During the pre-construction meeting, the contractor will also be made aware of the special protective precautions that are required due to the project's location in the APA.

c. The education session will also focus on means to discriminate between the species of concern and other native species to avoid unnecessary "false alarms". Encounters with any species of turtles, snakes and amphibians will be documented.

d. The Contractor will be provided with cell phone and email contacts for APT personnel to immediately report any encounters with Spotted Turtle or other species. Educational poster materials will be provided by APT and displayed on the job site to maintain worker awareness as the project progresses.

e. If a Spotted Turtle is encountered, the Contractor shall immediately cease all work, avoid disturbance of the turtle, and contact APT.

2. Isolation Measures & Sedimentation and Erosion Controls

a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds, and small mammals, but particularly snakes. No permanent erosion control products or reinforced silt fence will be used on the project. Temporary erosion control products will use either erosion control blankets and fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (netless) or netting composed of planar woven natural biodegradable fiber to avoid/minimize wildlife entanglement.

b. Installation of sedimentation and erosion controls, required for erosion control compliance and creation of a barrier to possible migrating/dispersing turtles, shall be performed by the Contractor following clearing activities and prior to any earthwork. The Environmental Monitor will inspect the work zone area prior to and following erosion control barrier installation to ensure the area is free of Spotted Turtle and document barriers have been satisfactorily installed. The intent of the barrier is to segregate the majority of the work zone and isolate it from nesting/foraging/migrating/dispersing turtles, snakes and other herpetofauna. Oftentimes complete isolation of a work zone is not feasible due to accessibility needs and locations of staging/material storage areas, etc. Although the barriers may not completely isolate the work zone, they will be positioned to deflect migrating/dispersal routes away from the work zone to minimize potential encounters with turtles, snakes and other herpetofauna.

c. Exclusionary fencing for turtles shall be at least 20 inches tall and must be secured to and remain in contact with the ground and be regularly maintained by the contractor (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.

d. The Contractor is responsible for daily inspections of the sedimentation and erosion controls for tears or breeches and accumulation levels of sediment, particularly following storm events that generate a discharge. APT will provide periodic inspections of the sedimentation and erosion controls throughout the duration of construction activities only as it pertains to their function as isolation measures for the protection of rare species. Third party monitoring of sedimentation and erosion controls will be performed by other parties, as necessary, under applicable local, state and/or federal regulations.

e. The extent of the sedimentation and erosion controls will be as shown on the site plans. The Contractor shall have additional sedimentation and erosion controls stockpiled on site should field or construction conditions warrant extending the controls as directed by APT or other regulatory agencies.

f. No equipment, vehicles or construction materials shall be stored outside of the sedimentation and erosion controls within 100 feet of wetlands or watercourses.

g. All sedimentation and erosion controls shall be removed within 30 days of completion of work and permanent stabilization of site soils so that reptile and amphibian movement between uplands and wetlands is not restricted.

3. Petroleum Materials Storage and Spill Prevention

a. Certain precautions are necessary to store petroleum materials, refuel and contain and properly clean up any inadvertent fuel or petroleum (i.e., oil, hydraulic fluid, etc.) spill to avoid possible impact to nearby resources and the APA.

b. A spill containment kit consisting of a sufficient supply of absorbent pads and absorbent material will be maintained by the Contractor at the construction site throughout the duration of the project. In addition, a waste drum will be kept on site to contain any used absorbent pads/material for proper and timely disposal off site in accordance with applicable local, state, and federal laws.

c. The following petroleum and hazardous materials storage and refueling restrictions and spill response procedures will be adhered to by the Contractor.

i. Petroleum and Hazardous Materials Storage and Refueling

1. Refueling of vehicles or machinery shall occur a minimum of 100 feet from wetlands or watercourses and shall take place on an impervious pad with secondary containment designed to contain fuels.

2. Any fuel or hazardous materials that must be kept on site shall be stored on an impervious surface utilizing secondary containment a minimum of 100 feet from wetlands or watercourses.

3. The contractor shall inspect all equipment at the beginning and end of each day for any fuel or hydraulic leaks and if discovered shall take immediate steps to make repairs and clean up any discharges as detailed in the following sections.

ii. Initial Spill Response Procedures

1. Stop operations and shut off equipment.

2. Remove any sources of spark or flame.

3. Contain the source of the spill.

4. Determine the approximate volume of the spill.

5. Identify the location of natural flow paths to prevent the release of the spill to sensitive nearby waterways or wetlands.

6. Ensure that fellow workers are notified of the spill.

iii. Spill Clean Up & Containment

1. Obtain spill response materials from the on-site spill response kit. Place absorbent materials directly on the release area.

2. Limit the spread of the spill by placing absorbent materials around the perimeter of the spill.

3. Isolate and eliminate the spill source.

4. Contact the appropriate local, state and/or federal agencies, as necessary, including the Town of Southington Water Department at (860) 628-5593.

5. Contact a disposal company to properly dispose of contaminated materials in accordance with all local, state, and federal regulations.

iv. Reporting

1. Complete an incident report.

2. Submit a completed incident report to the Town of Southington Water Department, Connecticut Siting Council, and other applicable local, state, and federal officials.

4. Vernal Pool Protective Measures

a. A thorough cover search of the construction area will be performed by APT's Environmental Monitor for herpetofauna (amphibians and reptiles) prior to and following installation of the silt fencing barrier to remove any species from the work zone prior to the initiation of construction activities. Any herpetofauna discovered would be carefully translocated outside the work zone in the general direction the animal was oriented. Periodic inspections will be performed by APT's Environmental Monitor throughout the duration of the construction.

b. Any stormwater management features, ruts or artificial depressions that could hold water created intentionally or unintentionally by site clearing/construction activities will be properly filled in and permanently stabilized with vegetation to avoid the creation of vernal pool "decoy pools" that could intercept amphibians moving toward the vernal pools. Stormwater management features such as level spreaders will be carefully reviewed in the field to ensure that standing water does not endure for more than a 24-hour period to avoid creation of decoy pools and may be subject to field design changes. Any such proposed design changes will be reviewed by the design engineer to ensure stormwater management functions are maintained.

5. Turtle Protective Measures - Active Period (March 15th to November 1st)

a. Prior to construction and following installation of isolation barriers, the construction area will be swept by APT and any turtles occurring within the work area will be relocated to suitable habitat outside of the isolation barriers.

a. Prior to the start of construction each day, the contractor shall search the entire work area for turtles.

b. If a turtle is found during the active period, it shall be immediately moved, unharmed, by carefully grasped in both hands, one on each side of the shell, between the turtle's forelimbs and the hind limbs, and placed just outside of the isolation barrier in the same approximate direction it was heading. These animals are protected by law and no turtles should be relocated from the property.

c. Special care shall be taken by the contractor during early morning and evening hours so that possible basking or foraging turtles are not harmed by construction activities.

d. The contractor shall be particularly diligent during the months of May and June when turtles are actively selecting nesting sites which results in an increase in turtle movement activity.

e. Before May 15, potentially suitable turtle nesting areas within the proposed facility's limits of disturbance will be fenced to exclude females from entering and laying eggs to avoid potential impact.

f. No heavy machinery or vehicles may be parked in any turtle habitat.

g. Special precautions must be taken to avoid degradation of wetland habitats including any wet meadow habitat and vernal pools.

6. Turtle Protective Measures – Dormant Period (November 1st to March 15th)

a. Do not conduct land disturbance activities within 100 feet of wetlands during the turtle's dormant period.

b. Avoid and limit any equipment use within 100 feet of wetlands and no heavy machinery or vehicles may be parked in any turtle habitat or within 100 feet of wetlands.

7. Herbicide, Pesticide and Salt Restrictions

a. The use of herbicides and pesticides at the facility shall be restricted. In the event herbicides and/or pesticides are required at the facility (i.e., to assist in management of invasive species within habitat enhancement areas), their use will be used in accordance with Integrated Pest Management ("IPM") principles with particular attention to minimize applications within 100 feet of wetland or watercourse resources. No applications of herbicides or pesticides are allowed within actual wetland or watercourse resources.

b. Maintenance of the facility during the winter months shall not include the application of salt or similar products for melting snow or ice.

8. Reporting

a. Daily Compliance Monitoring Reports (brief narrative and applicable photos) documenting each APT inspection will be submitted by APT to the contractor and facility owner for compliance verification. Any observations of spotted turtles, vernal pool indicator species, wetland impacts, or corrective actions will be included in the reports.

b. Following completion of the construction project, APT will provide a Compliance Monitoring Summary Report to the facility owner documenting implementation of this wetland, vernal pool, spotted turtle, and aquifer protection program, monitoring and any species observations. The facility owner shall provide a copy of the Compliance Monitoring Summary Report to the Connecticut Siting Council for compliance verification.

c. Any observations of spotted turtle will be reported to DEEP by APT on the appropriate special animal reporting form, with photo-documentation (if possible) and specific information on the location and disposition of the animal.

APPENDIX D

USFWS/NDDB COMPLIANCE STATEMENT

USFWS & NDDB Compliance Determination

May 20, 2020

Mr. Steven DeNino, COO
Verogy
150 Trumbull Street, 4th Floor
Hartford, CT 06103

Re: Southington Solar One, 1012 East Street, Southington, CT
APT Job No: CT590170

On behalf of Verogy, All-Points Technology Corporation, P.C. ("APT") performed an evaluation with respect to possible federally- and state-listed, threatened, endangered or special concern species in order to determine if the proposed referenced solar energy generation facility ("Facility") would result in a potential adverse effect to listed species.

APT understands that Verogy proposes the construction of the Facility in the central portion a ±102.5-acre agricultural property located at 1012 East Street, Southington, Connecticut ("Subject Property").

USFWS

The federal consultation was completed in accordance with Section 7 of the Endangered Species Act through the U.S. Fish and Wildlife Service's ("USFWS") Information, Planning, and Conservation System ("IPaC"). Based on the results of the IPaC review, one federally listed[1] threatened species is known to occur in the vicinity of the Subject Property documented as the northern long-eared bat ("NLEB"; *Myotis septentrionalis*). As a result of this preliminary finding, APT performed an evaluation to determine if the proposed referenced Facility would result in a likely adverse effect to NLEB.

The proposed Facility would occupy ±38.9 acres primarily within a maintained agricultural field (the fenced Facility occupies ±24.6 acres with ±14.3 acres of improvements, dominated by habitat improvements). Approximately 0.8 acre of tree clearing primarily associated with the Facility's overhead utility interconnection that will follow along the existing gravel access could potentially impact NLEB habitat. A review of the Connecticut Department of Energy & Environmental Protection ("CTDEEP") Wildlife Division Natural Diversity Data Base ("NDDB") NLEB habitat map[2] revealed that the proposed Facility is not within 150 feet of a known occupied NLEB maternity roost tree and is not within 0.25 mile of a known NLEB hibernaculum. The nearest NLEB habitat resource to the proposed Facility is located ±14.5 miles to the south in North Branford.

[1] Listing under the federal Endangered Species Act

[2] *Northern long-eared bat areas of concern in Connecticut to assist with Federal Endangered Species Act Compliance* map. February 1, 2016.

APT submitted the effects determination using the NLEB key within the IPaC system for the proposed Facility (the "Action"). This IPaC key assists users in determining whether a Federal action is consistent with the activities analyzed in the USFWS's January 5, 2016, intra-Service Programmatic Biological Opinion ("PBO") on the Final 4(d) Rule for the NLEB for Section 7(a)(2) compliance.

Based upon the IPaC submission, the Action is consistent with activities analyzed in the PBO; please refer to the enclosed February 10, 2020 USFWS letter. The Action may affect NLEB; however, any take that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). If the USFWS does not respond within 30 days from the date of the letter (March 11, 2020), one may presume that the IPaC-assisted determination was correct and that the PBO satisfies and concludes Verogy's responsibilities for this Action under ESA Section 7(a)(2) with respect to NLEB. No response was received from USFWS; therefore, the Action complies with ESA Section 7(a)(2) with respect to NLEB.

In addition, Verogy would consider the following additional USFWS voluntary conservation measures, where appropriate and as the project schedule allows, to reduce the potential impacts of activities in NLEB.

- Conduct tree removal activities outside of the NLEB pup season (June 1-July 31) and active season (April 1-October 31) to minimize impacts to pups at roosts not yet identified.
- Avoid clearing suitable spring staging and fall swarming habitat within a five-mile radius of known or assumed NLEB hibernacula during the staging and swarming seasons (April 1-May 15 and August 15-November 14, respectively). *Not applicable: site is located > 5 miles from the nearest hibernacula.*
- Maintain dead trees (snags) and large trees when possible.
- Use herbicides and pesticides only if unavoidable. If necessary, spot treatment is preferred over aerial application.
- Minimize exterior lighting, opting for down-shielded, motion-sensor security lights instead of constant illumination.

NDDB

According to the most recent DEEP NDDB maps, the proposed Facility is located within a shaded NDDB buffer area and therefore the proposed project could potentially conflict with listed rare species. Please refer to the enclosed NDDB Map. APT submitted a NDDB review request with DEEP to identify State Listed Endangered, Threatened, and Special Concern species occurring in the vicinity of the proposed Facility and if the proposed activity could potentially conflict with listed species.

DEEP issued a March 9, 2020 determination letter (No. 202002717) indicating that two State-listed Special Concern Species are known to occur in the vicinity of the Facility: Spotted Turtle (*Clemmys guttata*) and Purple Milkweed (historical record; *Asclepias purpurascens*). DEEP recommended protection strategies for Spotted Turtle and survey/habitat management for Purple Milkweed; please refer to the enclosed letter. Spotted Turtle was confirmed on the Subject Property during the vernal pool investigation of Vernal Pool 2 (Wetland 6). A survey for Purple Milkweed will be performed in July 2020 when the plant is identifiable. Verogy is committed to protecting these species during construction that is consistent with the DEEP recommendations to avoid potential impact to these State-listed species. Details of the Spotted Turtle protection measures are provided in the attached Environmental Notes – Resources Protection Measures. Should Purple Milkweed be identified within the limits of the Facility, a habitat management plan will be developed that would incorporate this species into the habitat enhancements being proposed for this Facility.

Therefore, with implementation of these protective measures for Spotted Turtle and potential Purple Milkweed habitat enhancements (should this species be identified) the proposed Facility is not anticipated to adversely impact any federal or state threatened, endangered or species of special concern.

Sincerely,
All-Points Technology Corporation, P.C.

Dean Gustafson
Senior Biologist

Enclosures

USFWS NLEB Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

IPaC Record Locator: 999-20206116 February 10, 2020

Subject: Consistency letter for the 'Verogy Southington Solar One' project indicating that any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Dear Deborah Gustafson:

The U.S. Fish and Wildlife Service (Service) received on February 10, 2020 your effects determination for the 'Verogy Southington Solar One' (the Action) using the northern long-eared bat (*Myotis septentrionalis*) key within the Information for Planning and Consultation (IPaC) system. You indicated that no Federal agencies are involved in funding or authorizing this Action. This IPaC key assists users in determining whether a non-Federal action may cause "take"[1] of the northern long-eared bat that is prohibited under the Endangered Species Act of 1973 (ESA) (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.).

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o). Unless the Service advises you within 30 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that the Action is not likely to result in unauthorized take of the northern long-eared bat.

Please report to our office any changes to the information about the Action that you entered into IPaC, the results of any bat surveys conducted in the Action area, and any dead, injured, or sick northern long-eared bats that are found during Action implementation.

If your Action proceeds as described and no additional information about the Action's effects on species protected under the ESA becomes available, no further coordination with the Service is required with respect to the northern long-eared bat.

[1]Take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct [ESA Section 3(19)].

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Verogy Southington Solar One

2. Description

The following description was provided for the project 'Verogy Southington Solar One':

> Verogy is proposing the construction of a 370W Solar Energy Generation Facility to be generally located within an existing open field located in the central portion of the subject property. An existing access road currently provides access to this open field off East Street.

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/41.58995812509277N72.8500484969164W

Determination Key Result

This non-Federal Action may affect the northern long-eared bat; however, any take of this species that may occur incidental to this Action is not prohibited under the final 4(d) rule at 50 CFR §17.40(o).

Determination Key Description: Northern Long-eared Bat 4(d) Rule
This key was last updated in IPaC on **May 15, 2017**. Keys are subject to periodic revision.

This key is intended for actions that may affect the threatened northern long-eared bat.

The purpose of the key for non-Federal actions is to assist determinations as to whether proposed actions are excepted from take prohibitions under the northern long-eared bat 4(d) rule.

If a non-Federal action may cause prohibited take of northern long-eared bats or other ESA-listed animal species, we recommend that you coordinate with the Service.

Determination Key Result

Based upon your IPaC submission, any take of the northern long-eared bat that may occur as a result of the Action is not prohibited under the ESA Section 4(d) rule adopted for this species at 50 CFR §17.40(o).

Qualification Interview

1. Is the action authorized, funded, or being carried out by a Federal agency?

   No

2. Will your activity purposefully **Take** northern long-eared bats?

   No

3. Is the project action area located wholly outside the White-nose Syndrome Zone?

   Automatically answered
   No

4. Have you contacted the appropriate agency to determine if your project is near a known hibernaculum or maternity roost tree?

   Location information for northern long-eared bat hibernacula is generally kept in state Natural Heritage Inventory databases – the availability of this data varies state-by-state. Many states provide online access to their data, either directly by providing maps or by providing the opportunity to make a data request. In some cases, to protect those resources, access to the information may be limited. A web page with links to state Natural Heritage Inventory databases and other sources of information on the locations of northern long-eared bat roost trees and hibernacula is available at www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html.

   Yes

5. Will the action affect a cave or mine where northern long-eared bats are known to hibernate (i.e., hibernaculum) or could it alter the entrance or the environment (physical or other alteration) of a hibernaculum?

   No

6. Will the action involve Tree Removal?

   Yes

7. Will the action only remove hazardous trees for the protection of human life or property?

   No

8. Will the action remove trees within 0.25 miles of a known northern long-eared bat hibernaculum at any time of year?

   No

9. Will the action remove a known occupied northern long-eared bat maternity roost tree or any trees within 150 feet of a known occupied maternity roost tree from June 1 through July 31?

   No

Project Questionnaire

If the project includes forest conversion, report the appropriate acreages below. Otherwise, type '0' in questions 1-3.

1. Estimated total acres of forest conversion:

0.86

2. If known, estimated acres of forest conversion from April 1 to October 31

0.86

3. If known, estimated acres of forest conversion from June 1 to July 31

0.86

If the project includes timber harvest, report the appropriate acreages below. Otherwise, type '0' in questions 4-6.

4. Estimated total acres of timber harvest

0

5. If known, estimated acres of timber harvest from April 1 to October 31

0

6. If known, estimated acres of timber harvest from June 1 to July 31

0

If the project includes prescribed fire, report the appropriate acreages below. Otherwise, type '0' in questions 7-9.

7. Estimated total acres of prescribed fire

0

8. If known, estimated acres of prescribed fire from April 1 to October 31

0

9. If known, estimated acres of prescribed fire from June 1 to July 31

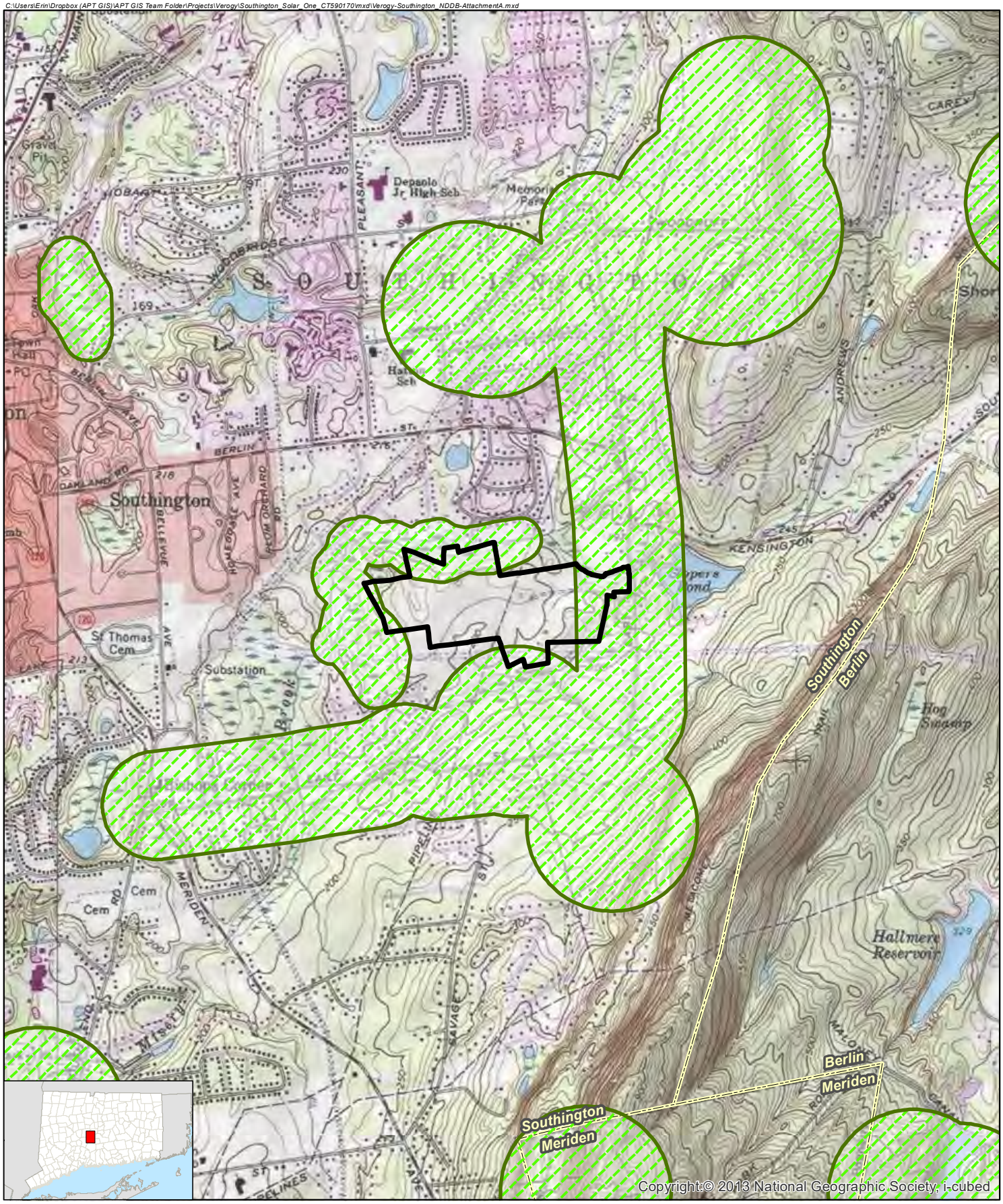
0

If the project includes new wind turbines, report the megawatts of wind capacity below. Otherwise, type '0' in question 10.

10. What is the estimated wind capacity (in megawatts) of the new turbine(s)?
0

NDDB Map

C:\Users\Erin\Dropbox (APT GIS)\APT GIS Team Folder\Projects\Verogy\Southington_Solar_One_CT590170\mxd\Verogy-Southington_NDDB-AttachmentA.mxd



Legend

- Site
- Natural Diversity Database Area (Dec. 2019)

NDDB Map

Proposed Solar Facility - Southington Solar One
1012 East Street
Southington, Connecticut

N
W E
S

2,000 1,000 0 2,000
Feet

VEROGY
ALL-POINTS TECHNOLOGY CORPORATION

Map Notes:
Base Map Source: USGS 7.5 Minute Topographic Quadrangle Maps: Meriden (1984), CT
Map Scale: 1:24,000
Map Date: January 2020

NDDB Determination Letter

Connecticut Department of
ENERGY &
ENVIRONMENTAL
PROTECTION

79 Elm Street • Hartford, CT 06106-5127 www.ct.gov/deep Affirmative Action/Equal Opportunity Employer

March 9, 2020

Dean Gustafson
All-Points Technology Corporation, PC
567 Vauxhall Street Ext, Suite 311
Waterford, CT 06385
dgustafson@allpointstech.com

NDDB DETERMINATION NUMBER: 202002717

Project: Installation of commercial-scale PV solar facility; SOUTHINGTON SOLAR ONE, 1012 EAST ST., SOUTHINGTON, CT

Expiration: March 9, 2021

I have reviewed Natural Diversity Data Base (NDDB) maps and files regarding this project. According to our records, the following State-listed species (RCSA Sec. 26-306) are documented in the project area.

- **Spotted turtle (*Clemmys guttata*) State Special Concern**
- **Historical records of: Purple milkweed (*Asclepias purpurascens*) State Special Concern**

Spotted turtle (*Clemmys guttata*) State Special Concern
Individuals of this species are associated with wetlands and are vernal pool obligates. Over the course of a season and lifetime, individuals will travel large distances (up to 1km) over upland forest and fields between multiple wetlands. They overwinter burrowed into the mud in wetlands between Nov 1- March 15. They do not begin to reproduce until 7-10 years old and adults can live at least 30 years. This species is threatened most by any activities that reduce adult survivorship including road kills, commercial and casual collection, increased predation in areas around commercial and residential development, mortality and injury from agricultural equipment or other mechanical equipment.

Land disturbance activities that will crush active turtles or unearth/or crush hibernating turtles or nests need to consider local habitat features and apply fencing and/or time of year restrictions as appropriate. We recommend you consult with a herpetologist familiar with preferred habitats to assist you with proper techniques to ensure the best protection strategies are employed for your site.

- Land disturbance and excavation confined to the upland (greater than 10 meters from a wetland) can be done during turtle's dormant season (November 1- March 15).

If land disturbance will occur in open fields, early successional habitat, sandy open patches nearby wetland features, and sandy roads and roadsides or other potential nesting areas designated by a qualified herpetologist you will need to take precautions to prevent female turtles from entering work area and setting up nests.

- Before May 15: Early successional areas suitable for nesting need to be fenced to exclude females from entering and laying nests.

If land disturbance activity will include significant areas within and around wetlands, you will need to take precautions to avoid crushing or killing hibernating adults.

- **Do not conduct land disturbance activities within a wetland or its 100ft buffer during the turtle's dormant period (November 1- March 15).**

In general when working in the **upland between March 15- November 1**:

- Exclusionary practices will be required to prevent any turtle access into construction areas. These measures will need to be installed at the limits of disturbance as shown on the plans.
- Exclusionary fencing be at least 20 inches tall and must be secured to and remain in contact with the ground and be regularly maintained (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.
- Prior to construction, all turtles occurring within fencing work area will be relocated to suitable habitat outside disturbance area. This should be performed by a qualified professional familiar with habitat requirements and behavior of the species.
- The Contractor must search the work area each morning prior to any work being done.
- All construction personnel working within the turtle habitat must be apprised of the species description and the possible presence of a listed species.
- Any turtles encountered within the immediate work area shall be carefully moved to an adjacent area outside of the excluded area and fencing should be inspected to identify and remove access point. These animals are protected by law and no turtles should be relocated from the site.
- In areas where silt fence is used for exclusion, it shall be removed as soon as the area is stable to allow for reptile and amphibian passage to resume.
- No heavy machinery or vehicles may be parked in any turtle habitat.
- Special precautions must be taken to avoid degradation of wetland habitats including any wet meadows and seasonal vernal pools.

Purple milkweed (*Asclepias purpurascens*) State Special Concern
Habitat: Dry soil. Roadsides, fields, borders of woods, on moist or dry soil. Blooms Jun, Jul.
Historical records for this plant are adjacent and nearby. We recommend where suitable habitat exists, you identify and protect suitable habitat and state listed species in your project area. You can benefit these species by seeking help from a plant ecologist who can create a management plan to enhance habitat where opportunities exist. A Botantist or Plant Ecologist will give you site specific management recommendations, but keep the following recommendations in mind as you manage your habitat:

- Minimize ground impact to sensitive habitat, and do not import other types of permanent fill.
- If sensitive habitats are disturbed, it is best to allow them to revegetate naturally or propagate only native vegetation.

This is determination is valid for two years.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Department of Energy and Environmental Protection's Bureau of Natural Resources and cooperating units of DEEP, independent conservation groups, and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the NDDB should not be substituted for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated in the NDDB as it becomes available.

Please contact me if you have any questions (shannon.kearney@ct.gov). Thank you for consulting with the Natural Diversity Data Base and continuing to work with us to protect State-listed species.

Sincerely,

/s/ Shannon B. Kearney
Wildlife Biologist

Cc: Steven Denino (Verogy, LLC)

Resources Protection Measures

ENVIRONMENTAL NOTES - RESOURCES PROTECTION MEASURES

WETLAND, VERNAL POOL, SPOTTED TURTLE AND AQUIFER PROTECTION PROGRAM

The proposed solar facility is located proximate to sensitive habitats including wetland resource areas, vernal pools, rare species. In addition, the proposed facility is located within the Town of Southington Water Department's (PWSID #CT1310011) Aquifer Protection Area ("APA") for Wells #7 and #8. As a result, the following protective measures shall be followed to help avoid degradation of nearby wetland/watercourses, avoid incidental impact to vernal pool indicator species and avoid impact to the APA.

In addition, Spotted Turtle (*Clemmys guttata*), a State Special Concern species afforded protection under the Connecticut Endangered Species Act, is known to occur on the subject property in proximity to the proposed facility. The turtle protection measures included herein satisfy requirements from the Connecticut Department of Energy and Environmental Protection ("DEEP") Wildlife Division in accordance with their Natural Diversity Data Base ("NDDB") determination letter (No. 202002717) dated March 9, 2020; this determination is valid until March 9, 2021 provided the scope of the project has not changed and work has begun on the project prior to the expiration date.

It is of the utmost importance that the Contractor complies with the requirement for implementation of these protective measures and the education of its employees and subcontractors performing work on the project site. The wetland protection measures shall be implemented and maintained throughout the duration of construction activities until permanent stabilization of site soils has occurred. Vernal pool protection measures should be implemented during peak amphibian movement periods (early spring breeding [March 1st to May 15th] and late summer dispersal [July 15th to September 15th]) if construction cannot be avoided during these periods. The turtle protection measures within this plan shall be implemented if work will occur during either the turtle's active period (March 15th to November 1st) or dormant period (November 1st to March 15th).

All-Points Technology Corporation, P.C. ("APT") will serve as the Environmental Monitor for this project to ensure that these protection measures are implemented properly. APT will provide an education session for the Contractor prior to the start of construction activities on Spotted Turtle and nearby sensitive wetland resources/vernal pools that may be encountered due to the project's location within potentially sensitive habitat. The Contractor shall contact Dean Gustafson, Senior Biologist at APT, at least 5 business days prior to the start of any construction activities to schedule a pre-construction meeting. Mr. Gustafson can be reached by phone at (860) 552-2033 or via email at dgustafson@allpointstech.com.

The Town of Southington Water Department will be contacted at least 3 business days prior to the pre-construction meeting with an invitation to attend.

This protection program consists of several components: education of all contractors and sub-contractors prior to initiation of work on the site; protective measures; periodic inspection of the construction project; and, reporting.

1. Contractor Education

a. Prior to work on site, the Contractor shall attend an educational session at the pre-construction meeting with APT. This orientation and educational session will consist of an introductory meeting with APT providing photos of Spotted Turtle emphasizing the non-aggressive nature of these species, the absence of need to destroy animals that might be encountered and the need to follow Protective Measures as described in sections below. Workers will also be provided information regarding the identification of other turtles, snakes and common herpetofauna species that could be encountered. The importance of protecting nearby wetland and vernal pool resources will also be stressed as part of this educational session.

b. During the pre-construction meeting, the contractor will also be made aware of the special protective precautions that are required due to the project's location in the APA.

c. The education session will also focus on means to discriminate between the species of concern and other native species to avoid unnecessary "false alarms". Encounters with any species of turtles, snakes and amphibians will be documented.

d. The Contractor will be provided with cell phone and email contacts for APT personnel to immediately report any encounters with Spotted Turtle or other species. Educational poster materials will be provided by APT and displayed on the job site to maintain worker awareness as the project progresses.

e. If a Spotted Turtle is encountered, the Contractor shall immediately cease all work, avoid disturbance of the turtle, and contact APT.

2. Isolation Measures & Sedimentation and Erosion Controls

a. Plastic netting used in a variety of erosion control products (i.e., erosion control blankets, fiber rolls [wattles], reinforced silt fence) has been found to entangle wildlife, including reptiles, amphibians, birds, and small mammals, but particularly snakes. No permanent erosion control products or reinforced silt fence will be used on the project. Temporary erosion control products will use either erosion control blankets and fiber rolls composed of processed fibers mechanically bound together to form a continuous matrix (netless) or netting composed of planar woven natural biodegradable fiber to avoid/minimize wildlife entanglement.

b. Installation of sedimentation and erosion controls, required for erosion control compliance and creation of a barrier to possible migrating/dispersing turtles, shall be performed by the Contractor following clearing activities and prior to any earthwork. The Environmental Monitor will inspect the work zone area prior to and following erosion control barrier installation to ensure the area is free of Spotted Turtle and document barriers have been satisfactorily installed. The intent of the barrier is to segregate the majority of the work zone and isolate it from nesting/foraging/migrating/dispersing turtles, snakes and other herpetofauna. Oftentimes complete isolation of a work zone is not feasible due to accessibility needs and locations of staging/material storage areas, etc. Although the barriers may not completely isolate the work zone, they will be positioned to deflect migrating/dispersal routes away from the work zone to minimize potential encounters with turtles, snakes and other herpetofauna.

c. Exclusionary fencing for turtles shall be at least 20 inches tall and must be secured to and remain in contact with the ground and be regularly maintained by the contractor (at least bi-weekly and after major weather events) to secure any gaps or openings at ground level that may let animal pass through.

d. The Contractor is responsible for daily inspections of the sedimentation and erosion controls for tears or breeches and accumulation levels of sediment, particularly following storm events that generate a discharge. APT will provide periodic inspections of the sedimentation and erosion controls throughout the duration of construction activities only as it pertains to their function as isolation measures for the protection of rare species. Third party monitoring of sedimentation and erosion controls will be performed by other parties, as necessary, under applicable local, state and/or federal regulations.

e. The extent of the sedimentation and erosion controls will be as shown on the site plans. The Contractor shall have additional sedimentation and erosion controls stockpiled on site should field or construction conditions warrant extending the controls as directed by APT or other regulatory agencies.

f. No equipment, vehicles or construction materials shall be stored outside of the sedimentation and erosion controls within 100 feet of wetlands or watercourses.

g. All sedimentation and erosion controls shall be removed within 30 days of completion of work and permanent stabilization of site soils so that reptile and amphibian movement between uplands and wetlands is not restricted.

3. Petroleum Materials Storage and Spill Prevention

a. Certain precautions are necessary to store petroleum materials, refuel and contain and properly clean up any inadvertent fuel or petroleum (i.e., oil, hydraulic fluid, etc.) spill to avoid possible impact to nearby resources and the APA.

b. A spill containment kit consisting of a sufficient supply of absorbent pads and absorbent material will be maintained by the Contractor at the construction site throughout the duration of the project. In addition, a waste drum will be kept on site to contain any used absorbent pads/material for proper and timely disposal off site in accordance with applicable local, state, and federal laws.

c. The following petroleum and hazardous materials storage and refueling restrictions and spill response procedures will be adhered to by the Contractor.

i. Petroleum and Hazardous Materials Storage and Refueling

1. Refueling of vehicles or machinery shall occur a minimum of 100 feet from wetlands or watercourses and shall take place on an impervious pad with secondary containment designed to contain fuels.

2. Any fuel or hazardous materials that must be kept on site shall be stored on an impervious surface utilizing secondary containment a minimum of 100 feet from wetlands or watercourses.

3. The contractor shall inspect all equipment at the beginning and end of each day for any fuel or hydraulic leaks and if discovered shall take immediate steps to make repairs and clean up any discharges as detailed in the following sections.

ii. Initial Spill Response Procedures

1. Stop operations and shut off equipment.

2. Remove any sources of spark or flame.

3. Contain the source of the spill.

4. Determine the approximate volume of the spill.

5. Identify the location of natural flow paths to prevent the release of the spill to sensitive nearby waterways or wetlands.

6. Ensure that fellow workers are notified of the spill.

iii. Spill Clean Up & Containment

1. Obtain spill response materials from the on-site spill response kit. Place absorbent materials directly on the release area.

2. Limit the spread of the spill by placing absorbent materials around the perimeter of the spill.

3. Isolate and eliminate the spill source.

4. Contact the appropriate local, state and/or federal agencies, as necessary, including the Town of Southington Water Department at (860) 628-5593.

5. Contact a disposal company to properly dispose of contaminated materials in accordance with all local, state, and federal regulations.

iv. Reporting

1. Complete an incident report.

2. Submit a completed incident report to the Town of Southington Water Department, Connecticut Siting Council, and other applicable local, state, and federal officials.

4. Vernal Pool Protective Measures

a. A thorough cover search of the construction area will be performed by APT's Environmental Monitor for herpetofauna (amphibians and reptiles) prior to and following installation of the silt fencing barrier to remove any species from the work zone prior to the initiation of construction activities. Any herpetofauna discovered would be carefully translocated outside the work zone in the general direction the animal was oriented. Periodic inspections will be performed by APT's Environmental Monitor throughout the duration of the construction.

b. Any stormwater management features, ruts or artificial depressions that could hold water created intentionally or unintentionally by site clearing/construction activities will be properly filled in and permanently stabilized with vegetation to avoid the creation of vernal pool "decoy pools" that could intercept amphibians moving toward the vernal pools. Stormwater management features such as level spreaders will be carefully reviewed in the field to ensure that standing water does not endure for more than a 24-hour period to avoid creation of decoy pools and may be subject to field design changes. Any such proposed design changes will be reviewed by the design engineer to ensure stormwater management functions are maintained.

5. Turtle Protective Measures - Active Period (March 15th to November 1st)

a. Prior to construction and following installation of isolation barriers, the construction area will be swept by APT and any turtles occurring within the work area will be relocated to suitable habitat outside of the isolation barriers.

a. Prior to the start of construction each day, the contractor shall search the entire work area for turtles.

b. If a turtle is found during the active period, it shall be immediately moved, unharmed, by carefully grasped in both hands, one on each side of the shell, between the turtle's forelimbs and the hind limbs, and placed just outside of the isolation barrier in the same approximate direction it was heading. These animals are protected by law and no turtles should be relocated from the property.

c. Special care shall be taken by the contractor during early morning and evening hours so that possible basking or foraging turtles are not harmed by construction activities.

d. The contractor shall be particularly diligent during the months of May and June when turtles are actively selecting nesting sites which results in an increase in turtle movement activity.

e. Before May 15, potentially suitable turtle nesting areas within the proposed facility's limits of disturbance will be fenced to exclude females from entering and laying eggs to avoid potential impact.

f. No heavy machinery or vehicles may be parked in any turtle habitat.

g. Special precautions must be taken to avoid degradation of wetland habitats including any wet meadow habitat and vernal pools.

6. Turtle Protective Measures – Dormant Period (November 1st to March 15th)

a. Do not conduct land disturbance activities within 100 feet of wetlands during the turtle's dormant period.

b. Avoid and limit any equipment use within 100 feet of wetlands and no heavy machinery or vehicles may be parked in any turtle habitat or within 100 feet of wetlands.

7. Herbicide, Pesticide and Salt Restrictions

a. The use of herbicides and pesticides at the facility shall be restricted. In the event herbicides and/or pesticides are required at the facility (i.e., to assist in management of invasive species within habitat enhancement areas), their use will be used in accordance with Integrated Pest Management ("IPM") principles with particular attention to minimize applications within 100 feet of wetland or watercourse resources. No applications of herbicides or pesticides are allowed within actual wetland or watercourse resources.

b. Maintenance of the facility during the winter months shall not include the application of salt or similar products for melting snow or ice.

8. Reporting

a. Daily Compliance Monitoring Reports (brief narrative and applicable photos) documenting each APT inspection will be submitted by APT to the contractor and facility owner for compliance verification. Any observations of spotted turtles, vernal pool indicator species, wetland impacts, or corrective actions will be included in the reports.

b. Following completion of the construction project, APT will provide a Compliance Monitoring Summary Report to the facility owner documenting implementation of this wetland, vernal pool, spotted turtle, and aquifer protection program, monitoring and any species observations. The facility owner shall provide a copy of the Compliance Monitoring Summary Report to the Connecticut Siting Council for compliance verification.

c. Any observations of spotted turtle will be reported to DEEP by APT on the appropriate special animal reporting form, with photo-documentation (if possible) and specific information on the location and disposition of the animal.

APPENDIX E

CULTURAL RESOURCES RECONNAISSANCE SURVEY REPORTS

FEBRUARY 2020

PHASE IA CULTURAL RESOURCES ASSESSMENT SURVEY OF THE PROPOSED SOUTHINGTON SOLAR ONE, LLC PROJECT IN SOUTHINGTON, CONNECTICUT

PREPARED FOR:

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHALL STREET EXTENSION, SUITE 311
WATERFORD, CONNECTICUT 06385

PREPARED BY:

HERITAGE CONSULTANTS
55 EAST CEDAR STREET
NEWINGTON, CONNECTICUT 06111

ABSTRACT

This report presents the results of a Phase IA cultural resources assessment survey for the proposed Southington Solar One, LLC Project in Southington, Connecticut. The project area associated with this solar center encompasses approximately 37.1 acres of land and it is situated in the central portion of a larger 102.7 acre parcel and will be accessed from a proposed access road extending to the west from East Street. The current investigation consisted of: 1) preparation of an overview of the region's prehistory, history, and natural setting; 2) a literature search to identify and discuss previously recorded cultural resources in the region; 3) a review of readily available historic maps and aerial imagery depicting the project area to identify potential historic resources and/or areas of past disturbance; 4) pedestrian survey and photo-documentation of the project area to determine their archaeological sensitivity; and 5) preparation of the current Phase IA cultural resources assessment survey report. The results of the survey indicate that all 37.1 acres of the project area retain moderate/high sensitivity for intact archaeological deposits.

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CHAPTER I
INTRODUCTION

This report presents the results of a Phase IA cultural resources assessment survey of the proposed Southington Solar One, LLC Project in Southington, Connecticut (Figure 1). All-Points Technology Corporation (AllPoints) requested that Heritage Consultants, LLC (Heritage) complete the assessment survey as part of the planning process for the proposed solar center, which will occupy approximately 37.1 acres of land. The proposed development area is hereafter referred to as the project area. The project area is situated in the central portion of a 102.7 acre parcel of land located at 1012 East Street. It is surrounded by forested areas to the north and west, while there are residences along East Street to the east and residential subdivisions to the south. Heritage completed this investigation on behalf of All-Points in February of 2020. All work associated with this project was performed in accordance with the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987) promulgated by the Connecticut State Historic Preservation Office (CT-SHPO).

Project Description and Methods Overview

The proposed project will consist of a 370-watt solar center that will include the installation of rows of solar panels spaced 4.9 m (16 ft) apart across the entirety of the above-referenced project area. The project area, which is located within a large agricultural field, is situated at elevations ranging from 61 to 64 m (200 to 210 ft) NGVD. This Phase IA cultural resources assessment survey consisted of the completion of the following tasks: 1) a contextual overview of the region's prehistory, history, and natural setting (e.g., soils, ecology, hydrology, etc.); 2) a literature search to identify and discuss previously completed cultural resources surveys and previously recorded cultural resources in the region encompassing the project area; 3) a review of readily available historic maps and aerial imagery depicting the project area in order to identify potential historic resources and/or areas of past disturbance; 4) pedestrian survey and photo-documentation of the project area in order to determine their archaeological sensitivity; and 5) preparation of the current Phase IA cultural resources assessment survey report.

Project Results and Management Recommendations Overview

The review of historic maps and aerial images of the project area, files maintained by the CT-SHPO, as well as pedestrian survey of the development area, failed to detect any previously identified archaeological sites in the vicinity of the project area. However, four National Register of Historic Places properties were identified within 1.6 km (1 mi) mile of the project area (the Woodruff House, the Capt. Samuel Woodruff House, the Ezekiel Woodruff House, and the Urbana Woodruff House). These four properties are discussed in Chapter V and demonstrate this historic use of the project region.

In addition to the cultural resources discussed above, Heritage combined data from the historic map and aerial image analysis, and the pedestrian survey to stratify the project area into zones of no/low and/or moderate/high archaeological sensitivity. Upon completion of the above-referenced analysis and pedestrian survey, it was determined that all 37.1 acres of the project area contain low slopes and well drained soils in proximity to wetlands to the west and Misery Brook to the north. As a result, it was determined that the entirety of the project area has the potential to contain intact archaeological deposits buried beneath the existing plow zone. As a result, a Phase IB cultural resources survey is recommended prior to construction of the proposed solar center.

Project Personnel

Key personnel for this project included Mr. David R. George, M.A., R.P.A, who served as Principal Investigator for this effort; he was assisted by Ms. Kelsey Tuller, M.A., and Mr. Matthew Denno, B.A., who completed the field work portion of the project. Dr. Kristen Keegan completed this historic background research of the project and contributed to the final report, while Mr. Stephen Anderson, B.A., completed all GIS tasks associated with the project. Finally, Ms. Elizabeth Correia, M.A., helped to compile the report and the associated figures.

Organization of the Report

The natural setting of the region encompassing the project area is presented in Chapter II; it includes a brief overview of the geology, hydrology, and soils of the project region. The prehistory of the project region is outlined briefly in Chapter III. The history of the region encompassing the project region and project area is chronicled in Chapter IV, while a discussion of previous archaeological investigations in the vicinity of the project area is presented in Chapter V. The methods used to complete this investigation are discussed in Chapter VI. Finally, the results of this investigation and management recommendations for the project area and the identified cultural resources are presented in Chapter VII.

CHAPTER II
NATURAL SETTING

Introduction

This chapter provides a brief overview of the natural setting of the region containing the project area. Previous archaeological research has documented that a few specific environmental factors can be associated with both prehistoric and historic period site selection. These include general ecological conditions, as well as types of fresh water sources and soils present. The remainder of this section provides a brief overview of the ecology, hydrological resources, and soils present within the project area and the larger region in general.

Ecoregions of Connecticut

Throughout the Pleistocene and Holocene Periods, Connecticut has undergone numerous environmental changes. Variations in climate, geology, and physiography have led to the "regionalization" of Connecticut's modern environment. It is clear, for example, that the northwestern portion of the state has very different natural characteristics than the coastline. Recognizing this fact, Dowhan and Craig (1976), as part of their study of the distribution of rare and endangered species in Connecticut, subdivided the state into various ecoregions. Dowhan and Craig (1976:27) defined an ecoregion as:

> "an area characterized by a distinctive pattern of landscapes and regional climate as expressed by the vegetation composition and pattern, and the presence or absence of certain indicator species and species groups. Each ecoregion has a similar interrelationship between landforms, local climate, soil profiles, and plant and animal communities. Furthermore, the pattern of development of plant communities (chronosequences and toposequences) and of soil profile is similar in similar physiographic sites. Ecoregions are thus natural divisions of land, climate, and biota."

Dowhan and Craig defined nine major ecoregions for the State of Connecticut. They are based on regional diversity in plant and animal indicator species (Dowhan and Craig 1976). Only one of the ecoregions is germane to the current investigation: South-Central Lowlands ecoregion. A brief summary of this ecoregion is presented below. It is followed by a discussion of the hydrology and soils found in and adjacent to the project area.

<u>South-Central Lowlands Ecoregion</u>

The South-Central Lowlands ecoregion consists of "a rolling area of low average elevation, crossed by several north-trending ridge systems; streams and river systems with broad, well developed flood plains, from which the land surface generally rises to the bases of the ridges" (Dowhan and Craig 1976). Elevations average less than 60 m (200 ft) but can reach approximately 300 m (1,000 ft) in height. The region's bedrock is sedimentary, consisting of sandstones, basalt, and traprock. Soils vary from "clayey glacial till in the uplands of the region, to sand, gravel, silt, and clay in the lowlands."

Hydrology in the Vicinity of the Project area

The project area is situated within a region that contains several sources of freshwater, including Sloper's Pond, Misery Brook, Black Pond, and Spring Lake, as well as unnamed streams, ponds, and wetlands. These

freshwater sources may have served as resource extraction areas for Native American and historic populations. Previously completed archaeological investigations in Connecticut have demonstrated that streams, rivers, and wetlands were focal points for prehistoric occupations because they provided access to transportation routes, sources of freshwater, and abundant faunal and floral resources.

Soils Comprising the Project area

Soil formation is the direct result of the interaction of a number of variables, including climate, vegetation, parent material, time, and organisms present (Gerrard 1981). Once archaeological deposits are buried within the soil, they are subject to a number of diagenic processes. Different classes of artifacts may be preferentially protected, or unaffected by these processes, whereas others may deteriorate rapidly. Cyclical wetting and drying, freezing and thawing, and compression can accelerate chemically and mechanically the decay processes for animal bones, shells, lithics, ceramics, and plant remains. Lithic and ceramic artifacts are largely unaffected by soil pH, whereas animal bones and shells decay more quickly in acidic soils such as those that are present in within the current project area. In contrast, acidic soils enhance the preservation of charred plant remains.

A review of the soils within the project area is presented below. The project area is characterized by the presence of four major soil types: Hartford, Manchester, Raypol, and Ellington soils (Figure 2). A review of these soils shows that they consist of well drained sandy loams; they are the types of soils that are typically correlated with prehistoric and historic use and occupation. Descriptive profiles for each soil type are presented below; they were gathered from the National Resources Conservation Service.

Hartford Soils:

A typical profile associated with Hartford soils is as follows: **Ap**--0 to 8 inches; dark reddish brown (5YR 3/4) sandy loam; weak coarse granular structure; very friable; many fine roots; 5 percent gravel; strongly acid; clear smooth boundary; **Bw1**--8 to 20 inches; yellowish red (5YR 4/6) sandy loam; weak fine granular structure; very friable; few fine roots; 5 percent gravel; strongly acid; clear wavy boundary. **Bw2**--20 to 26 inches; reddish brown (5YR 4/4) loamy sand; single grain; loose; 10 percent gravel; strongly acid; clear wavy boundary; and **2C**--26 to 65 inches; reddish brown (5YR 4/4) stratified sand and gravel; single grain; loose; 35 percent gravel; strongly acid.

Manchester Soils:

A typical profile associated with Manchester soils is as follows: **Ap**--0 to 9 inches; dark brown (7.5YR 3/2) gravelly sandy loam; weak medium granular structure; very friable; many fine and common medium roots; 20 percent gravel; strongly acid; clear smooth boundary; **Bw**--9 to 18 inches; reddish brown (5YR 4/3) gravelly loamy sand; very weak fine and medium granular structure; very friable; few fine roots; 25 percent gravel; strongly acid; clear wavy boundary; and **C**--18 to 65 inches; reddish brown (5YR 4/4) very gravelly sand; single grain; loose; 50 percent gravel; very strongly acid.

Raypol Soils:

A typical profile associated with Raypol soils is as follows: **Ap**--0 to 8 inches; very dark brown (10YR 2/2) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; common very fine, fine and medium roots; strongly acid; clear smooth boundary; **Bg1**--8 to 12 inches; grayish brown (10YR 5/2) very fine sandy loam; weak medium subangular blocky structure; friable; common very fine, fine and medium roots; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; clear wavy boundary. **Bg2**--12 to 20 inches; grayish brown (10YR 5/2) silt loam; weak medium

subangular blocky structure; friable; common fine and medium roots; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; clear wavy boundary. **Bw1**--20 to 26 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; common medium prominent yellowish brown (10YR 5/8) and common medium distinct light brownish gray (10YR 6/2) masses of iron accumulation; strongly acid; gradual wavy boundary. **Bw2**--26 to 29 inches; olive brown (2.5Y 4/4) very fine sandy loam; massive; friable; 5 percent gravel; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation and common medium distinct light brownish gray (10YR 6/2) iron depletions; strongly acid; clear wavy boundary; **2C1**--29 to 52 inches; light olive brown (2.5Y 5/4) gravelly sand; single grain; loose; 25 percent gravel; few medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; and **2C2**--52 to 65 inches; dark grayish brown (2.5Y 4/2) very gravelly sand; single grain; loose; 35 percent gravel and 5 percent cobbles; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid.

Ellington Soils:

A typical profile associated with Ellington soils is as follows: **Ap**--0 to 8 inches; dark reddish brown (5YR 3/2) silt loam; pinkish gray (7.5YR 6/2) dry; weak medium granular structure; friable; few fine roots; 5 percent gravel; slightly acid; clear smooth boundary; **Bw1**--8 to 18 inches; reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent gravel; moderately acid; gradual wavy boundary. **Bw2**--18 to 26 inches; reddish brown (5YR 4/4) very fine sandy loam; massive; friable; 10 percent gravel; common medium distinct reddish gray (5YR 5/2) iron depletions and dark red (2.5YR 3/6) masses of iron accumulation; strongly acid; abrupt smooth boundary; and **2C**--26 to 65 inches; dark reddish brown (5YR 3/4) stratified sand and gravel with a few thin lenses of sandy loam; single grain; loose; 50 percent gravel; few fine distinct reddish gray (5YR 5/2) iron depletions and few fine faint yellowish red (5YR 4/6) masses of iron accumulation; strongly acid.

Summary

The natural setting of the area containing the proposed Southington Solar One, LLC Project is common throughout the South-Central Lowlands ecoregion. Streams and rivers of this area empty into the Quinnipiac River, which in turn, drains into the Long Island Sound. Further, the landscape in general is dominated by sandy loamy soil types with some wetland soils intermixed. In addition, low slopes dominate the region. Thus, in general, the project region was well suited to Native American occupation throughout the prehistoric era. This portion of Southington was also used throughout the historic era, as evidenced by the presence of numerous historic residences and agricultural fields throughout the region; thus, archaeological deposits dating from the prehistoric and historic era may be expected near or within the proposed project area.

CHAPTER III
PREHISTORIC SETTING

Introduction

Prior to the late 1970s and early 1980s, very few systematic archaeological surveys of large portions of the state of Connecticut had been undertaken. Rather, the prehistory of the region was studied at the site level. Sites chosen for excavation were highly visible and they were located in such areas as the coastal zone, e.g., shell middens, and Connecticut River Valley. As a result, a skewed interpretation of the prehistory of Connecticut was developed. It was suggested that the upland portions of the state, i.e., the northeastern and northwestern hills ecoregions, were little used and rarely occupied by prehistoric Native Americans, while the coastal zone, i.e., the eastern and western coastal and the southeastern and southwestern hills ecoregions, were the focus of settlements and exploitation in the prehistoric era. This interpretation remained unchallenged until the 1970s and 1980s when several town-wide and regional archaeological studies were completed. These investigations led to the creation of several archaeological phases that subsequently were applied to understand the prehistory of Connecticut. The remainder of this chapter provides an overview of the prehistoric setting of the region encompassing the project area.

Paleo-Indian Period (12,000 to 10,000 Before Present [B.P.])

The earliest inhabitants of the area encompassing the State of Connecticut, who have been referred to as Paleo-Indians, arrived in the area by ca., 12,000 B.P. (Gramly and Funk 1990; Snow 1980). Due to the presence of large Pleistocene mammals at that time and the ubiquity of large fluted projectile points in archaeological deposits of this age, Paleo-Indians often have been described as big-game hunters (Ritchie and Funk 1973; Snow 1980); however, as discussed below, it is more likely that they hunted a broad spectrum of animals.

While there have been numerous surface finds of Paleo-Indian projectile points throughout the State of Connecticut, only two sites, the Templeton Site (6-LF-21) in Washington, Connecticut and the Hidden Creek Site (72-163) in Ledyard, Connecticut, have been studied in detail and dated using the radiocarbon method (Jones 1997; Moeller 1980). The Templeton Site (6-LF-21) is located in Washington, Connecticut and was occupied between 10,490 and 9,890 years ago (Moeller 1980). In addition to a single large and two small fluted points, the Templeton Site produced a stone tool assemblage consisting of gravers, drills, core fragments, scrapers, and channel flakes, which indicates that the full range of stone tool production and maintenance took place at the site (Moeller 1980). Moreover, the use of both local and non-local raw materials was documented in the recovered tool assemblage, suggesting that not only did the site's occupants spend some time in the area, but they also had access to distant stone sources, the use of which likely occurred during movement from region to region.

The only other Paleo-Indian site studied in detail in Connecticut is the Hidden Creek Site (72-163) (Jones 1997). The Hidden Creek Site is situated on the southeastern margin of the Great Cedar Swamp on the Mashantucket Pequot Reservation in Ledyard, Connecticut. While excavation of the Hidden Creek Site produced evidence of Terminal Archaic and Woodland Period components (see below) in the upper soil horizons, the lower levels of the site yielded artifacts dating from the Paleo-Indian era. Recovered Paleo-Indian artifacts included broken bifaces, side-scrapers, a fluted preform, gravers, and end-scrapers. Based

on the types and number of tools present, Jones (1997:77) has hypothesized that the Hidden Creek Site represented a short-term occupation, and that separate stone tool reduction and rejuvenation areas were present.

While archaeological evidence for Paleo-Indian occupation is scarce in Connecticut, it, combined with data from the West Athens Road and King's Road Site in the Hudson drainage and the Davis and Potts Sites in northern New York, supports the hypothesis that there was human occupation of the area not long after ca. 12,000 B.P. (Snow 1980). Further, site types currently known suggest that the Paleo-Indian settlement pattern was characterized by a high degree of mobility, with groups moving from region to region in search of seasonally abundant food resources, as well as for the procurement of high-quality raw materials from which to fashion stone tools.

Archaic Period (10,000 to 2,700 B.P.)

The Archaic Period, which succeeded the Paleo-Indian Period, began by ca., 10,000 B.P. (Ritchie and Funk 1973; Snow 1980), and it has been divided into three subperiods: Early Archaic (10,000 to 8,000 B.P.), Middle Archaic (8,000 to 6,000 B.P.), and Late Archaic (6,000 to 3,400 B.P.). These periods were devised to describe all non-farming, non-ceramic producing populations in the area. Regional archeologists recently have recognized a final "transitional" Archaic Period, the Terminal Archaic Period (3,400-2,700 B.P.), which was meant to describe those groups that existed just prior to the onset of the Woodland Period and the widespread adoption of ceramics into the toolkit (Snow 1980; McBride 1984; Pfeiffer 1984, 1990; Witthoft 1949, 1953).

Early Archaic Period (10,000 to 8,000 B.P.)

To date, very few Early Archaic sites have been identified in southern New England. As a result, researchers such as Fitting (1968) and Ritchie (1969), have suggested a lack of these sites likely is tied to cultural discontinuity between the Early Archaic and preceding Paleo-Indian Period, as well as a population decrease from earlier times. However, with continued identification of Early Archaic sites in the region, and the recognition of the problems of preservation, it is difficult to maintain the discontinuity hypothesis (Curran and Dincauze 1977; Snow 1980).

Like their Paleo-Indian predecessors, Early Archaic sites tend to be very small and produce few artifacts, most of which are not temporally diagnostic. While Early Archaic sites in other portions of the United States are represented by projectile points of the Kirk series (Ritchie and Funk 1973) and by Kanawha types (Coe 1964), sites of this age in southern New England are identified on the basis of a series of ill-defined bifurcate-based projectile points. These projectile points are identified by the presence of their characteristic bifurcated base, and they generally are made from high quality raw materials. Moreover, finds of these projectile points have rarely been in stratified contexts. Rather, they occur commonly either as surface expressions or intermixed with artifacts representative of later periods. Early Archaic occupations, such as the Dill Farm Site and Sites 6LF64 and 6LF70 in Litchfield County, are represented by camps that were relocated periodically to take advantage of seasonally available resources (McBride 1984; Pfeiffer 1986). In this sense, a foraging type of settlement pattern was employed during the Early Archaic Period.

Middle Archaic Period (8,000 to 6,000 B.P.)

By the onset of the Middle Archaic Period, essentially modern deciduous forests had developed in the region (Davis 1969). It is at this time that increased numbers and types of sites are noted in Connecticut

(McBride 1984). The most well-known Middle Archaic site in New England is the Neville Site, which is located in Manchester, New Hampshire and studied by Dincauze (1976). Careful analysis of the Neville Site indicated that the Middle Archaic occupation dated from between ca., 7,700 and 6,000 years ago. In fact, Dincauze (1976) obtained several radiocarbon dates from the Middle Archaic component of the Neville Site. The dates, associated with the then-newly named Neville type projectile point, ranged from 7,740±280 and 7,015±160 B.P. (Dincauze 1976).

In addition to Neville points, Dincauze (1976) described two other projectile points styles that are attributed to the Middle Archaic Period: Stark and Merrimac projectile points. While no absolute dates were recovered from deposits that yielded Stark points, the Merrimac type dated from 5,910±180 B.P. Dincauze argued that both the Neville and later Merrimac and Stark occupations were established to take advantage of the excellent fishing that the falls situated adjacent to the site area would have afforded Native American groups. Thus, based on the available archaeological evidence, the Middle Archaic Period is characterized by continued increases in diversification of tool types and resources exploited, as well as by sophisticated changes in the settlement pattern to include different site types, including both base camps and task-specific sites (McBride 1984:96)

Late Archaic Period (6,000 to 3,700 B.P.)

The Late Archaic Period in southern New England is divided into two major cultural traditions that appear to have coexisted. They include the Laurentian and Narrow-Stemmed Traditions (Funk 1976; McBride 1984; Ritchie 1969a and b). Artifacts assigned to the Laurentian Tradition include ground stone axes, adzes, gouges, ulus (semi-lunar knives), pestles, atlatl weights, and scrapers. The diagnostic projectile point forms of this time period in southern New England include the Brewerton Eared Notched, Brewerton Eared and Brewerton Side-Notched varieties (McBride 1984; Ritchie 1969a; Thompson 1969). In general, the stone tool assemblage of the Laurentian Tradition is characterized by flint, felsite, rhyolite and quartzite, while quartz was largely avoided for stone tool production.

In terms of settlement and subsistence patterns, archaeological evidence in southern New England suggests that Laurentian Tradition populations consisted of groups of mobile hunter-gatherers. While a few large Laurentian Tradition occupations have been studied, sites of this age generally encompass less than 500 m^2 (5,383 ft^2). These base camps reflect frequent movements by small groups of people in search of seasonally abundant resources. The overall settlement pattern of the Laurentian Tradition was dispersed in nature, with base camps located in a wide range of microenvironments, including riverine as well as upland zones (McBride 1978, 1984:252). Finally, subsistence strategies of Laurentian Tradition focused on hunting and gathering of wild plants and animals from multiple ecozones.

The second Late Archaic tradition, known as the Narrow-Stemmed Tradition, is unlike the Laurentian Tradition, and it likely represents a different cultural adaptation. The Narrow-Stemmed tradition is recognized by the presence of quartz and quartzite narrow stemmed projectile points, triangular quartz Squibnocket projectile points, and a bipolar lithic reduction strategy (McBride 1984). Other tools found in Narrow-Stemmed Tradition artifact assemblages include choppers, adzes, pestles, antler and bone projectile points, harpoons, awls, and notched atlatl weights. Many of these tools, notably the projectile points and pestles, indicate a subsistence pattern dominated by hunting and fishing, as well the collection of a wide range of plant foods (McBride 1984; Snow 1980:228).

The Terminal Archaic Period (3,700 to 2,700 B.P.)

The Terminal Archaic Period, which lasted from ca., 3,700 to 2,700 BP, is perhaps the most interesting, yet confusing of the Archaic Periods in southern New England prehistory. Originally termed the "Transitional Archaic" by Witthoft (1953) and recognized by the introduction of technological innovations, e.g., broadspear projectile points and soapstone bowls, the Terminal Archaic has long posed problems for regional archeologists. While the Narrow-Stemmed Tradition persisted through the Terminal Archaic and into the Early Woodland Period, the Terminal Archaic is coeval with what appears to be a different technological adaptation, the Susquehanna Tradition (McBride 1984; Ritchie 1969b). The Susquehanna Tradition is recognized in southern New England by the presence of a new stone tool industry that was based on the use of high-quality raw materials for stone tool production and a settlement pattern different from the "coeval" Narrow-Stemmed Tradition.

The Susquehanna Tradition is based on the classification of several Broadspear projectile point types and associated artifacts. There are several local sequences within the tradition, and they are based on projectile point type chronology. Temporally diagnostic projectile points of these sequences include the Snook Kill, Susquehanna Broadspear, Mansion Inn, and Orient Fishtail types (Lavin 1984; McBride 1984; Pfeiffer 1984). The initial portion of the Terminal Archaic Period (ca., 3,700-3,200 BP) is characterized by the presence of Snook Kill and Susquehanna Broadspear projectile points, while the latter Terminal Archaic (3,200-2,700 BP) is distinguished by the use of Orient Fishtail projectile points (McBride 1984:119; Ritchie 1971).

In addition, it was during the late Terminal Archaic Period that interior cord marked, grit tempered, thick walled ceramics with conoidal (pointed) bases made their initial appearance in the Native American toolkit. These are the first ceramics in the region, and they are named Vinette I (Ritchie 1969a; Snow 1980:242); this type of ceramic vessel appears with much more frequency during the ensuing Early Woodland Period. In addition, the adoption and widespread use of soapstone bowls, as well as the implementation of subterranean storage, suggests that Terminal Archaic groups were characterized by reduced mobility and longer-term use of established occupation sites (Snow 1980:250).

Finally, while settlement patterns appeared to have changed, Terminal Archaic subsistence patterns were analogous to earlier patterns. The subsistence pattern still was diffuse in nature, and it was scheduled carefully. Typical food remains recovered from sites of this period consist of fragments of white-tailed deer, beaver, turtle, fish and various small mammals. Botanical remains recovered from the site area consisted of *Chenopodium* sp., hickory, butternut and walnut (Pagoulatos 1988:81). Such diversity in food remains suggests at least minimal use of a wide range of microenvironments for subsistence purposes.

Woodland Period (2,700 to 350 B.P.)

Traditionally, the advent of the Woodland Period in southern New England has been associated with the introduction of pottery; however, as mentioned above, early dates associated with pottery now suggest the presence of Vinette I ceramics appeared toward the end of the preceding Terminal Archaic Period (Ritchie 1969a; McBride 1984). Like the Archaic Period, the Woodland Period has been divided into three subperiods: Early, Middle, and Late Woodland. The various subperiods are discussed below.

Early Woodland Period (ca., 2,700 to 2,000 B.P.)

The Early Woodland Period of the northeastern United States dates from ca., 2,700 to 2,000 B.P., and it has been thought to have been characterized by the advent of farming, the initial use of ceramic vessels,

and increasingly complex burial ceremonialism (Griffin 1967; Ritchie 1969a and 1969b; Snow 1980). In the Northeast, the earliest ceramics of the Early Woodland Period are thick walled, cord marked on both the interior and exterior, and possess grit temper.

Careful archaeological investigations of Early Woodland sites in southern New England have resulted in the recovery of narrow stemmed projectile points in association with ceramic sherds and subsistence remains, including specimens of white-tailed deer, soft and hard-shell clams, and oyster shells (Lavin and Salwen: 1983; McBride 1984:296-297; Pope 1952). McBride (1984) has argued that the combination of the subsistence remains and the recognition of multiple superimposed cultural features at various sites indicates that Early Woodland Period settlement patterns were characterized by multiple re-use of the same sites on a seasonal basis by small co-residential groups.

Middle Woodland Period (2,000 to 1,200 B.P.)

The Middle Woodland Period is marked by an increase in the number of ceramic types and forms utilized (Lizee 1994a), as well as an increase in the amount of exotic lithic raw material used in stone tool manufacture (McBride 1984). The latter suggests that regional exchange networks were established, and that they were used to supply local populations with necessary raw materials (McBride 1984; Snow 1980). The Middle Woodland Period is represented archaeologically by narrow stemmed and Jack's Reef projectile points; increased amounts of exotic raw materials in recovered lithic assemblages, including chert, argillite, jasper, and hornfels; and conoidal ceramic vessels decorated with dentate stamping. Ceramic types indicative of the Middle Woodland Period include Linear Dentate, Rocker Dentate, Windsor Cord Marked, Windsor Brushed, Windsor Plain, and Hollister Stamped (Lizee 1994a:200).

In terms of settlement patterns, the Middle Woodland Period is characterized by the occupation of village sites by large co-residential groups that utilized native plant and animal species for food and raw materials in tool making (George 1997). These sites were the principal place of occupation, and they were positioned close to major river valleys, tidal marshes, estuaries, and the coastline, all of which would have supplied an abundance of plant and animal resources (McBride 1984:309). In addition to villages, numerous temporary and task-specific sites were utilized in the surrounding upland areas, as well as in closer ecozones such as wetlands, estuaries, and floodplains. The use of temporary and task specific sites to support large village populations indicates that the Middle Woodland Period was characterized by a resource acquisition strategy that can best be termed as logistical collection (McBride 1984:310).

Late Woodland Period (ca., 1,200 to 350 B.P.)

The Late Woodland Period in southern New England dates from ca., 1,200 to 350 B.P., and it is characterized by the earliest evidence for the use of corn in the lower Connecticut River Valley (Bendremer 1993; Bendremer and Dewar 1993; Bendremer et al. 1991; George 1997; McBride 1984); an increase in the frequency of exchange of non-local lithics (Feder 1984; George and Tryon 1996; McBride 1984; Lavin 1984); increased variability in ceramic form, function, surface treatment, and decoration (Lavin 1980, 1986, 1987; Lizee 1994a, 1994b); and a continuation of a trend towards larger, more permanent settlements in riverine, estuarine, and coastal ecozones (Dincauze 1974; McBride 1984; Snow 1980).

Stone tool assemblages associated with Late Woodland occupations, especially village-sized sites, are functionally variable and they reflect plant and animal resource processing and consumption on a large scale. Finished stone tools recovered from Late Woodland sites include Levanna and Madison projectile points; drills; side-, end-, and thumbnail scrapers; mortars and pestles; nutting stones; netsinkers; and

celts, adzes, axes, and digging tools. These tools were used in activities ranging from hide preparation to plant processing to the manufacture of canoes, bowls, and utensils, as well as other settlement and subsistence-related items (McBride 1984; Snow 1980). Finally, ceramic assemblages recovered from Late Woodland sites are as variable as the lithic assemblages. Ceramic types identified include Windsor Fabric Impressed, Windsor Brushed, Windsor Cord Marked, Windsor Plain, Clearview Stamped, Sebonac Stamped, Selden Island, Hollister Plain, Hollister Stamped, and Shantok Cove Incised (Lavin 1980, 1988a, 1988b; Lizee 1994a; Pope 1953; Rouse 1947; Salwen and Ottesen 1972; Smith 1947). These types are more diverse stylistically than their predecessors, with incision, shell stamping, punctation, single point, linear dentate, rocker dentate stamping, and stamp and drag impressions common (Lizee 1994a:216).

Summary of Connecticut Prehistory

In sum, the prehistory of Connecticut spans from ca., 12,000 to 350 B.P., and it is characterized by numerous changes in tool types, subsistence patterns, and land use strategies. For the majority of the prehistoric era, local Native American groups practiced a subsistence pattern based on a mixed economy of hunting and gathering wild plant and animal resources. It is not until the Late Woodland Period that incontrovertible evidence for the use of domesticated species is available. Further, settlement patterns throughout the prehistoric era shifted from seasonal occupations of small co-residential groups to large aggregations of people in riverine, estuarine, and coastal ecozones. In terms of the region containing the proposed project area, a variety of prehistoric site types may be expected. These range from seasonal camps utilized by Archaic populations to temporary and task-specific sites of the Woodland era.

CHAPTER IV
HISTORIC OVERVIEW

Introduction

As stated in Chapter I, the project area consists of a parcel of land containing 37.1 acres in the town of Southington in Hartford County, Connecticut. The evidence reviewed indicates that the area was part of the fields system of a farm or farms in the early twentieth century, and almost certainly for many years before that. This chapter provides an overview history of the region, as well as data specific to the project area.

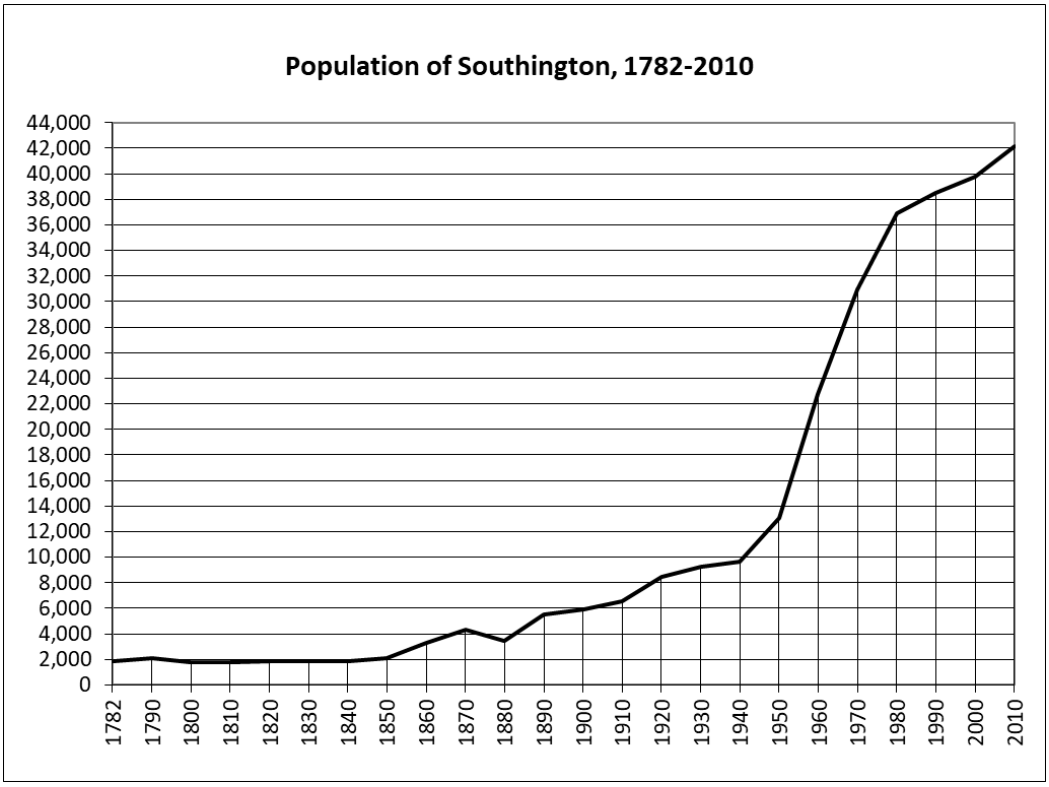
History of the Town of Southington

Hartford County is the site of one of the two earliest loci of colonial settlement in Connecticut, with three of its towns dating to the 1630s. It extends southward from the Massachusetts border and flanks the Connecticut River. The earliest colonial development of the region depended on the agricultural and transportation advantages of the river and its valley; areas further from the Connecticut River valley were colonized later and usually grew more slowly through the early nineteenth century. Thereafter, the main source of differentiation in the development of Hartford County towns' development was, first, whether they had significant levels of industrialization, and, later, whether they had significant levels of suburbanization. Southington is part of the southernmost tier of towns in Hartford County, and does not abut the Connecticut River. It did not experience the level of industrialization that would have led to the appearance of large urbanized areas. Later, however, it did experience a significant level of suburbanization. The following discussion outlines the history of the town in more detail and discusses the presence or absence of historical resources in the vicinity of the project items.

The project area is located in the southeastern quadrant of the town of Southington, inside the reverse L shape described by the course of East Street. Although the eastern edge of the larger project parcel abuts East Street, the area that is to be developed is more than 152 m (500 ft) from the roadway. Southington was incorporated in the late eighteenth century, taking territory from the older town of Farmington. At the time of colonization, the western and southern part of Farmington was the territory of the Mattabessett group of Native Americans, whose leaders Sowheage (or Sequin) and Tarramuggus sold all or most of Wethersfield and regions to its south and west to the colonists in the 1630s, 1660s, and 1670s. The Mattabessetts may have been part of a larger political grouping called the Wangunks, who moved from Wethersfield to Middletown early in the colonial period. Over time, the Wangunks' territory was reduced to reservations in Middletown and East Hampton. Some of them remained there through 1764, after which the reservation land was gradually sold off by the colonial authorities, a process that was completed in 1774 (Adams and Stiles 1904; Brandegee 1913; De Forest 1852). Some members of Native American families lingered in the Southington area until the late nineteenth century (Bickford 1982). Most of these former owners and inhabitants of the town, however, moved away in search of better opportunities, since the colonists were unwilling to treat them as good neighbors or potential citizens.

Although Farmington was incorporated in 1640 and colonized before that year, the future Southington was not colonized until Samuel Woodruff moved there in 1698. By 1720, the area was known as Panthorn, and in 1722 Farmington surveyed a large section of it and divided the land among the town's 84 proprietors (that is, residents who had rights to the land that the town entity owned). In 1724, a new

Congregational ecclesiastical society called Southington was established by the legislature; such churches, it must be remembered, were a governmental function during the colonial era. The Quinnipiac River provided a source of waterpower for early agricultural-processing industries, including a fulling mill established in 1755, which was followed by several others during the eighteenth century. In 1779, on the third request of the inhabitants, the legislature created Southington as a town (Walkley 1886). The census taken in 1782 found 1,886 inhabitants in Southington. This number changed only a little up to 1850, reaching 2,135 people in that year, and then began to grow more rapidly to 5,890 people in 1900 (see the population chart below; Keegan 2012). Through the nineteenth century, small businesses in tinware, cement, and carriage bolt manufacturing grew into a few large factories by the 1880s, while agriculture focused on rye, Indian corn, potatoes, apples, and tobacco (Crofut 1937; Walkley 1886). The Farmington Canal, built through Southington in the 1830s, was replaced by the Canal Railroad as of 1848, providing Southington's manufacturing enterprises with improved transport for materials and products (Turner and Jacobus 1989).



The town's combination of transport and manufacturing supported its modest population growth into the twentieth century, so that the town had 9,649 residents in 1940 (see the population chart above; Keegan 2012). In 1932, the town's industries included a wide range of products, including hardware, paper boxes, tools, and it also still had agricultural production (Connecticut 1932). After 1950, the town saw steep growth, such that its population reached 36,879 people in 1980 and continued growing more slowly to 42,185 residents as of 2010 (Keegan 2012). This shift is best explained by suburbanization and the construction of I-84 in the 1960s, as well as the addition of I-691 through the south end of town in 1985 and 1987 (Oglesby 2013, 2015). These limited-access highways made commuting from homes located near them more convenient, and thus encouraged the construction of new housing developments in affected towns, like Southington. As of 2016, over 12 percent of the town's jobs were still in the manufacturing

sector, although instead of agriculture, the vast majority of the rest of its employment was in retail, health care, and other tertiary-sector industries. Commuting patterns indicated that the largest group of workers stayed in town for their jobs, with the next-largest cohorts traveling to Harford, Farmington, and Bristol (CERC 2018). This indicates that as of the early twenty-first century, Southington was more of a working suburb than a stereotypical "bedroom community."

In the map of Hartford County that was published in 1855, Southington's compact industrial areas were clearly portrayed, mainly along the railroad line, and some of them named (notably Southington and "Southington Corners or Plantsville," to the west of the project area (Figure 3). Elsewhere, some places had variously dense or scattered building locations marked. Although the project area is shown on this map to be in the general vicinity of relatively dense settlement, only one building, labeled with the name Liva Barnes, was within the larger project parcel – albeit more than 152 m (500 ft) from the project area proper. It must be noted that although modern mapping shows the course of Misery Brook running to the north of this parcel, this map incorrectly portrayed it as passing through the parcel (Figure 3; Woodford 1855). The 1869 map of Southington showed effectively the same features, both across the town and near the project area, with no cultural features depicted within 152 m (500 ft) of the area to be developed and the house of Liva Barnes adjacent to East Street (Figure 4; Baker & Tilden 1869).

Although it is not certain that the Liva Barnes family owned the rear acreage on which the project area is located, researching that family has provided information on the most probable historical uses of the area. In the 1850 census, the family of Liva and Lucretia C. Barnes owned a farm valued at $3,000. The parents were 47 and 43 years old, and their three children were 18, 15, and 13 years old. Their neighbors on the census pages were almost all middling farmers, born in Connecticut, like the Barnes family (United States Census 1850a). According to the agricultural census of the same year, "Levi" Barnes owned 80 acres of improved land and 40 acres of unimproved land. This size of farm seems to have been fairly typical of his area, based on those on the same page of the return. Most of the farmers owned one or two horses (Barnes owned one), two or three milk cows (Barnes owned two), one or two teams of oxen (Barnes owned two), a few other cattle (Barnes owned two), and two or three swine (Barnes owned two). Some also owned sheep; the six that Barnes owned was toward the low end among those who did own them. These farmers all grew varying amounts of rye, corn, hay, and potatoes, and most grew some oats. None grew tobacco. Many also grew some buckwheat, peas and beans, or orchard fruit, and most produced butter and cheese (United States Census 1850b).

In 1860, the census recorded Liva and Lucretia Barnes reported a farm valued at $2,000 for the land and $1,000 in personal effects. Truman, age 25, was still in the household, though he gave his occupation as merchant; the 25-year-old Fannie Barnes was probably his wife. Like one of their neighbors, the family was earning some extra money by taking in a pauper named William Belden, who at 65 years old was working as a farm laborer. The household also included Ada Neale, age 75, relationship unknown. There was more variation in occupations among their neighbors; though most were still farmers, there was also a tailoress, a mason, a carpenter, and an iron moulder (United States Census 1860). By 1870, the Barnes family had split into two households, one headed by Liva and Lucretia and the other by Truman and Fanny. Although in his sixties, Liva was still a farmer, owning a farm valued at $6,000, with $2,000 in personal property. The only other person in their household was Ann Peck, age 38, who owned $2,500 in personal estate and quite possibly was their married or widowed daughter. Truman gave his occupation as dry goods salesman but also said he owned $3,500 in real estate and $500 in personal property. This couple had three children under 10 (named Liva, Truman, and Ann), plus a 16-year-old domestic servant (United

States Census 1870b). Only Liva Barnes was listed in the 1870 agricultural schedule, reporting 60 acres of improved land and 12 acres of woodland. He and his neighbors carried on roughly the same kind of farming as they had two decades before, except that most had given up sheep and many were growing tobacco. Barnes, however, was not among the latter group (United States Census 1870b).

As of 1880, the elder Liva Barnes had died, leaving Lucretia a widow, still living next door to her son Truman and his family. Lucretia had a store clerk and a schoolteacher boarding with her; Truman worked as a commercial traveler, while his son Liva E. (age 18) worked as a store clerk. It is possible, however, that they had moved away from the home farm, because none of their neighbors were farmers – they included a hotel keeper, a town selectman, several milliners, a bank president, and so forth. In contrast, one of their old neighbors, David R. Sloper, was still a farmer surrounded by farmers (United States Census 1880). It was never unusual for a farmer to give up that profession, especially when, as in the case of Truman Barnes, he had shown an early preference for non-farming work. As noted above, there were small industrial areas of Southington in which the Barnes families could have resettled, and although 1880 had seen a temporary population decline, these were growing areas that would continue to grow for many years to come.

In the absence of the automobile, however, this population growth mostly remained close to the nonfarm employment areas. At the time of the 1934 aerial photograph, when Southington's population had passed 9,000 residents, the project area was definitely still rural. The project area parcel was almost entirely farmed, with only a fringe of woodland, and what appear to have been two farmsteads beside East Street. In the parcel's central acreage, and within the project area proper, there were also two small barns or outbuildings (Figure 5; Fairchild 1934). Both of the latter buildings were still present in the 1951 aerial photograph, as were the farmsteads on the road to the east. The whole area was still primarily farmland, with some woods and farmsteads, and no nearby signs of housing development (Figure 6; USDA 1951). This shows that despite the town's continuing population growth, which by that time was partly inspired by suburbanization, housing development had not yet affected this area. That situation had changed by the time of the 2019 aerial photograph. Although most of the project area was still cleared fields, housing developments surrounded it in nearly every direction, and the utility line corridor that crosses its southernmost section had been built. Some areas remained wooded or cleared, especially along stream banks, and sometimes buffering the housing developments from one another. Within the project area proper, there was no sign of the southerly barn or shed that appeared in the 1934 and 1951 aerial photographs. Close inspection of the aerial image suggests that the remains of the more northerly barn may still be present, although obscured by tree growth (Figure 7; CT ECO 2019). Southington Land Records indicate that the Catholic Cemeteries Association of the Archdiocese of Hartford owned the project parcel after 1971, buying it from the Dornfried family who used it as agricultural land. However, there is no record of the area being used for human burial before the association sold the property in 2020, and the area remained open field.

Conclusions

The documentary record indicates that it is unlikely that any significant historical resources will be impacted by the proposed project. Although there certainly maybe cultural features related to its past agricultural use, such as stone walls, these are not generally considered to be historically significant. Likewise, although there are two sites that held documented outbuildings during the early twentieth century, and one of them may still be partly extant (if in a ruined state), such minor structures are also generally not considered to be historically significant.

CHAPTER V
PREVIOUS INVESTIGATIONS

Introduction

This chapter presents an overview of previous archaeological research completed within the vicinity of the project area in Southington, Connecticut. This discussion provides the comparative data necessary for assessing the results of the current Phase IA cultural resources assessment survey, and it ensures that the potential impacts to all previously recorded cultural resources located within and adjacent to the project area are taken into consideration. Specifically, this chapter reviews previously identified archaeological sites and National/State Register of Historic Places properties situated in the project region (Figures 8 and 9). The discussions presented below are based on information currently on file at the Connecticut State Historic Preservation Office in Hartford, Connecticut. In addition, the electronic site files maintained by Heritage were examined during the course of this investigation. Both the quantity and quality of the information contained in the original cultural resources survey reports and State of Connecticut archaeological site forms are reflected below.

Previously Recorded Archaeological Sites and National/State Register of Historic Places Properties/Districts in the Vicinity of the Project Area

A review of data currently on file at the Connecticut State Historic Preservation Office, as well as the electronic site files maintained by Heritage failed to detect any previously identified archaeological sites situated within 1.6 km (1 mi) of the project area (Figure 8). However, this review did reveal that four National Register of Historic Places properties are located within 1.6 km (1 mi) of the project area, all to the north (Figure 9). They are the Woodruff House, the Captain Samuel Woodruff House, the Ezekiel Woodruff House, and the Urbana Woodruff House. They are each described below.

Woodruff House

The Woodruff House is a ca., 1780 gable-roofed Greek Revival residence located at 377 Berlin Street in Southington. It occupies approximately 0.516 acres of land and is characterized by a five-bay façade with a central door. Side lights around the door, wide plain pilasters, broad window caps, and the eave returns denote the Greek Revival style and make the Woodruff House an example of an eighteenth century vernacular adaptation of the style. In addition, the Woodruff family was one of Southington's first settlers, and one of their members lived here. The house was recorded by David Ransom, a consultant, in November 1985. It was then listed on the National Register of Historic Places on January 19, 1989. This property will not be impacted by the proposed solar center development.

Captain Samuel Woodruff House

The Captain Samuel Woodruff House is located at 23 Old State Road in Southington on a 3.22-acre lot that was once part of a larger farm. Today, a mid-nineteenth century barn remains on the property, a testament to its agricultural history. The Captain Samuel Woodruff House was nominated to the National Register of Historic Places by Consultants Barbara A. Lewis and Gregory Andrews on December 8, 1988. The house represents the Greek Revival architectural style and was built in ca., 1840. It has two stories and three-bays on its main façade. The house's flush board siding was replaced by clapboards in the late

1920s. The house has a rare pyramidal hip roof, now covered in asphalt shingles, with a central chimney. In addition, there is a gable-roofed rear ell. Despite some modern alterations, the Captain Samuel Woodruff House remains an excellent example of a Greek Revival style farmhouse that is altogether well-preserved. The house was built for Captain Samuel Woodruff, a Civil War captain and a direct descendent of Samuel Woodruff, Southington's first colonial settler. This property will not be impacted by the proposed solar center development.

Ezekiel Woodruff House

The Ezekiel Woodruff House was listed on the National Register of Historic Places on January 19, 1989 for its architectural significance. It was first recorded by Consultant David Ransom in November of 1985. It is a vernacular residence that was built in ca., 1758 at 1152 East Street in Southington. The house sits on a brownstone ashlar foundation, has clapboard siding, and an asphalt-shingled gable roof. It has five bays on its main façade with a central door and is one story in height. The windows have six-over-six sashes and there is a central chimney. The Woodruff family, who occupied this residence, are the first settlers of Southington. This property will not be impacted by the proposed solar center development.

Urbana Woodruff House

The Urbana Woodruff House is located at 1096 East Street in Southington. It is a 1784 vernacular residence built for the historically significant Woodruff Family. Urbana was the son of Isaac Woodruff, one of Southington's early settlers. John Jamieson, an ice man who harvested ice from Sloper's Pond, also lived in the house in the first quarter of the twentieth century. The Urbana Woodruff House was listed on the National Register of Historic Places on January 19, 1989. It is considered significant for its architectural style and displays a five-bay façade with central door and central chimney. The door surround is simple, and all windows are two-over-two sash. It provides an example of a vernacular house from the colonial era. This property will not be impacted by the proposed solar center development.

Summary and Interpretations

The review of previously identified cultural resources in the vicinity of the proposed project area indicates that the larger project region contains historic structures from Southington's earliest settlement to the present era, in an area that was agricultural for much of its history. Though no archaeological sites have been previously identified in the area, the natural setting discussed in Chapter II suggests Native Americans may have once inhabited the area, and sites may yet be discovered.

CHAPTER VI
METHODS

Introduction

This chapter describes the research design and field methodology used to complete the Phase IA cultural resources assessment survey of the project area in Southington, Connecticut. The following tasks were completed during this investigation: 1) study of the region's prehistory, history, and natural setting, as presented in Chapters II through IV; 2) a literature search to identify and discuss previously recorded cultural resources in project region; 3) a review of historic maps, topographic quadrangles, and aerial imagery depicting the project area in order to identify potential historic resources and/or areas of past disturbance; and 4) pedestrian survey and photo-documentation of the project area in order to determine their archaeological sensitivity. These methods are in keeping with those required by the Connecticut State Historic Preservation Office in the document entitled: *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987).

Research Framework

The current Phase IA cultural resources assessment survey was designed to assess the archaeological sensitivity of the project area, as well as to visually examine the development area for any previously unidentified cultural resources during pedestrian survey. The undertaking was comprehensive in nature, and project planning considered the distribution of previously recorded cultural resources located within the project region, as well as a visual assessment of the project area. The methods used to complete this investigation were designed to provide coverage of all portions of the project area. The fieldwork portion of this undertaking entailed pedestrian survey, photo-documentation, and mapping (see below).

Archival Research & Literature Review

Background research for this project included a review of a variety of historic maps depicting the proposed project area; an examination of USGS 7.5' series topographic quadrangles; an examination of aerial images dating from 1934 through 2019; and a review of all archaeological sites and National and State Register of Historic Places on file with the CT-SHPO, as well as electronic cultural resources data maintained by Heritage. The intent of this review was to identify all previously recorded cultural resources situated within and immediately adjacent to the project area, and to provide a natural and cultural context for the project region. This information then was used to develop the archaeological context of the project area, and to assess its sensitivity with respect to the potential for producing intact cultural resources.

Background research materials, including historic maps, aerial imagery, and information related to previous archaeological investigations, were gathered from the CT-SHPO. Finally, electronic databases and Geographic Information System files maintained by Heritage were employed during the course of this project, and they provided valuable data related to the project region, as well as data concerning previously identified archaeological sites and National and State Register of Historic Places properties within the general vicinity of the project area.

Field Methodology and Data Synthesis

Heritage also performed fieldwork for the Phase IA cultural resources assessment survey of the project area associated with the solar project in Southington, Connecticut. This included pedestrian survey, photo-documentation, and mapping of the area containing the proposed solar center. During the completion of the pedestrian survey, representatives from Heritage photo-documented all potential areas of impact using digital media.

CHAPTER VII
RESULTS OF THE INVESTIGATION & MANAGEMENT RECOMMENDATIONS

Introduction

This chapter presents the results of the Phase IA cultural resources assessment survey of the project area in Southington, Connecticut. As stated in the introductory section of this report, the goals of the investigation included completion of the following tasks: 1) a contextual overview of the region's prehistory, history, and natural setting (e.g., soils, ecology, hydrology, etc.); 2) a literature search to identify and discuss previously completed cultural resources surveys and previously recorded cultural resources in the project region; 3) a review of readily available historic maps and aerial imagery depicting the project area in order to identify potential historic resources and/or areas of past disturbance; 4) pedestrian survey and photo-documentation of the project items in order to determine their archaeological sensitivity; and 5) preparation of the current Phase IA cultural resources assessment survey report.

Results of Phase IA survey

The project area measures approximately 282 m (925 ft) in length from north to south by 569 m (1,867 ft) in width from east to west, with an approximately 308 m (1,010 ft) long dirt access road connecting the northeastern edge of the project area to East Street. At the time of survey, it was characterized by open farmland (Figures 7 and 13 through 19). This project area is situated at elevations ranging from approximately 58 m (190 ft) NGVD in the east to 64 m (210 ft) NGVD in the west, and it contains a total of 37.1 acres of land. The predominant soil type located throughout the project area is Hartford fine sandy loam, which is found on slopes of 0 to 8 percent. As discussed in Chapter II of this report, this soil type is well-drained and contains small to medium sized stones throughout. The project area lies adjacent to an existing powerline corridor, which will presumably serve as the interconnect for the proposed 370-watt AC solar facility (Figures 10 through 19).

Overall Sensitivity of the Proposed Project area

The field data associated with soils, slopes, aspect, distance to water, and previous disturbance collected during the pedestrian survey and presented above was used in conjunction with the analysis of historic maps, aerial images, and data regarding previously identified archaeological sites, and National and State Register of Historic Places properties to stratify the project items into zones of no/low and/or moderate/high archaeological sensitivity. In general, historic period archaeological sites are relatively easy to identify on the current landscape because the features associated with them tend to be relatively permanent constructions that extend above the ground surface (i.e., stone foundations, pens, wells, privies, etc.). Archaeological sites dating from the prehistoric era, on the other hand, are less often identified during pedestrian survey because they are buried, and predicting their locations relies more on the analysis and interpretation of environmental factors that would have informed Native American site choices.

With respect to the potential for identifying prehistoric archaeological sites, the project area was divided into areas of no/low and/or moderate/high archaeological potential by analyzing the landform types, slope, aspect, soils contained within them, and their distance to water. In general, areas located less than 300 m (1,000 ft) from a freshwater source and that contain slopes of less than 8 percent and well drained soils possess a high potential for producing prehistoric archaeological deposits. Those areas located between 300 and 600 m (1,000 and 2,000 ft) from a freshwater source and well drained soils are considered moderate probability areas. This is in keeping with broadly based interpretations of prehistoric settlement and subsistence models that are supported by decades of previous archaeological research throughout the region. It is also expected that there may be variability of prehistoric site types found in the moderate/high sensitivity zones. For example, large Woodland period village sites and Archaic period seasonal camps may be expected along large river floodplains and near stream/river confluences, while smaller temporary or task specific sites may be expected on level areas with well drained soils that are situated more than 300 m (1,000 ft) but less than 600 m (2,000 ft) from a water source. Finally, steeply sloping areas, poorly drained soils, or areas of previous disturbance are generally deemed to retain a no/low archaeological sensitivity with respect to their potential to contain prehistoric archaeological sites.

In addition, the potential for a given area to yield evidence of historic period archaeological deposits is based not only on the above-defined landscape features but also on the presence or absence of previously identified historic period archaeological resources as identified during previous archaeological surveys, recorded on historic period maps, or captured in aerial images of the region under study. In this case, proposed project items that are situated within 100 m (328 ft) of a previously identified historic period archaeological site or a National or State Register of Historic Places district/individually listed property also may be deemed to retain a moderate/high archaeological sensitivity. In contrast, those areas situated over 100 m (328 ft) from any of the above-referenced properties would be considered to retain a no/low historic period archaeological sensitivity.

The combined review of historic maps, aerial images, land deeds, and pedestrian survey indicates that the 37.1 acre project area contains low slopes and well drained soils situated in proximity to wetlands to the west and Misery Brook to the north. Soils found throughout the project area are mainly attributed to the Hartford series, which consists of sandy loam that generally extends to ca., 65 cm (26 in) below surface. With the exception of agricultural pursuit, the area has been relatively undisturbed over the years. Based on the landscape type, proximity to freshwater, and the presence of well-drained sandy loamy soils, the entire project area appears to retain a moderate/high sensitivity for yielding archaeological deposits. As a result, it is recommended that a Phase IB cultural resources survey of the project area, excluding the access road, be conducted since it is possible that intact cultural deposits may exist beneath the plow zone.

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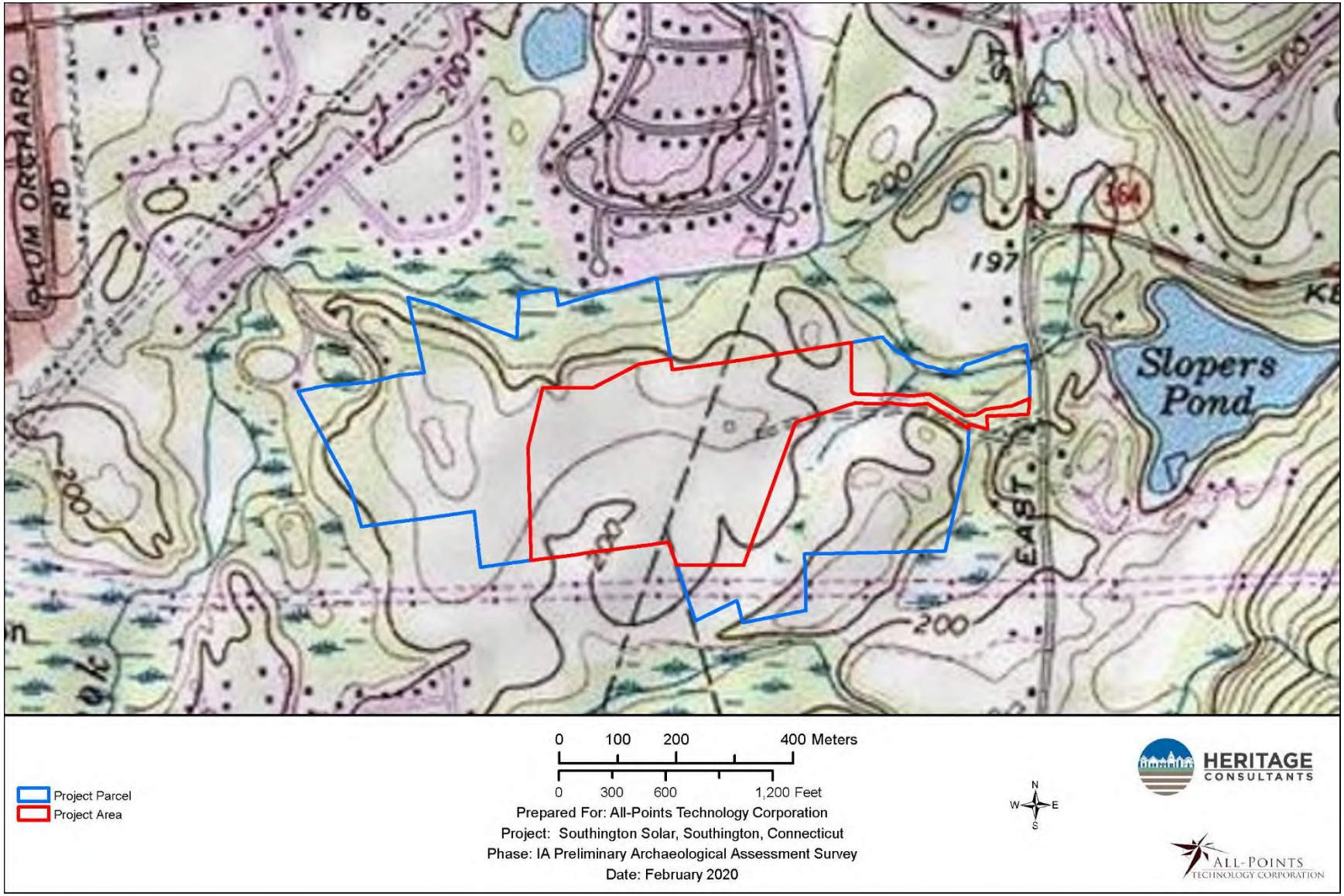

Figure 1. Excerpt from a USGS 7.5' series topographic quadrangle image showing the location of the survey area in Southington, Connecticut.

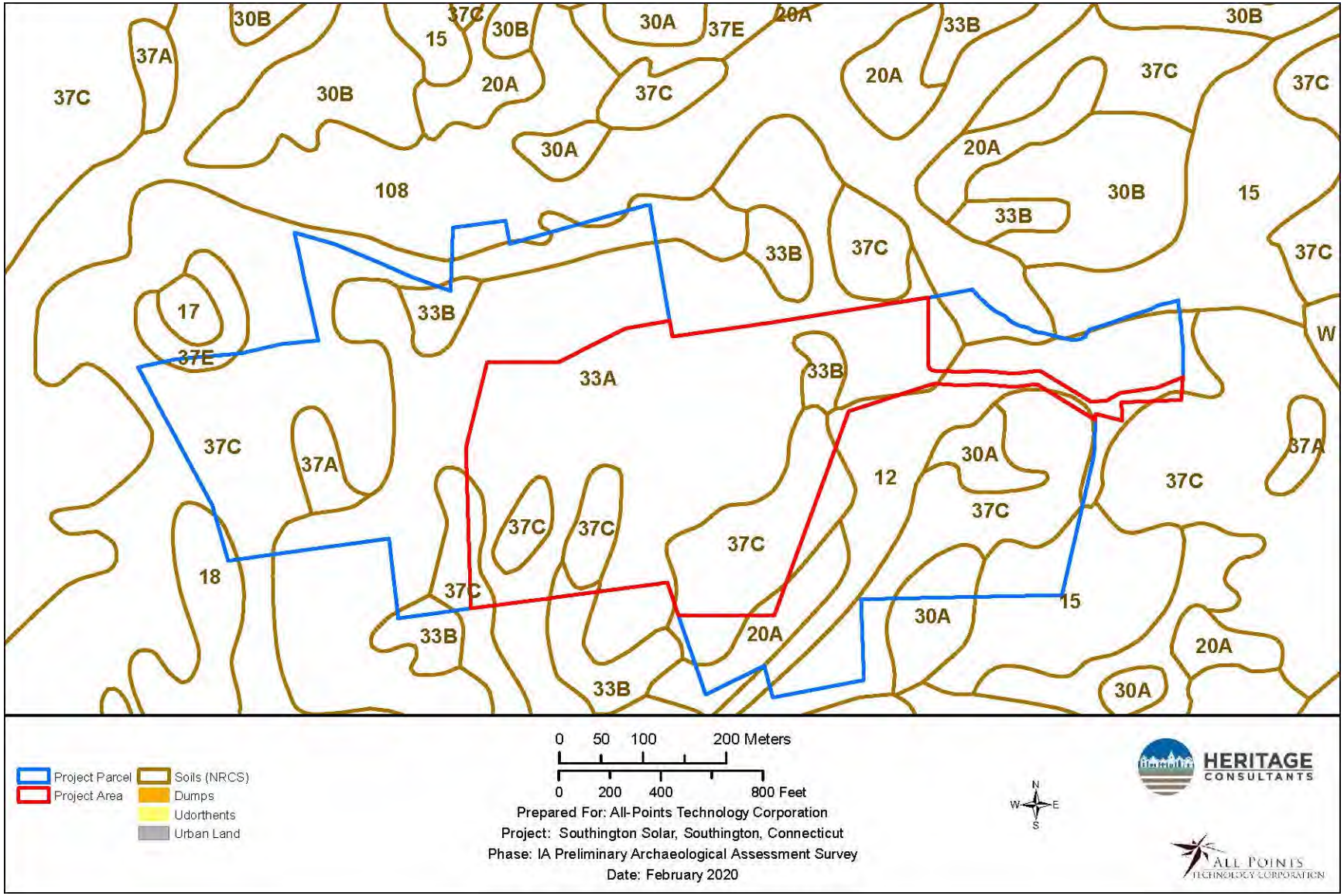

Figure 2. Map of soils located in the vicinity of the survey area in Southington, Connecticut.

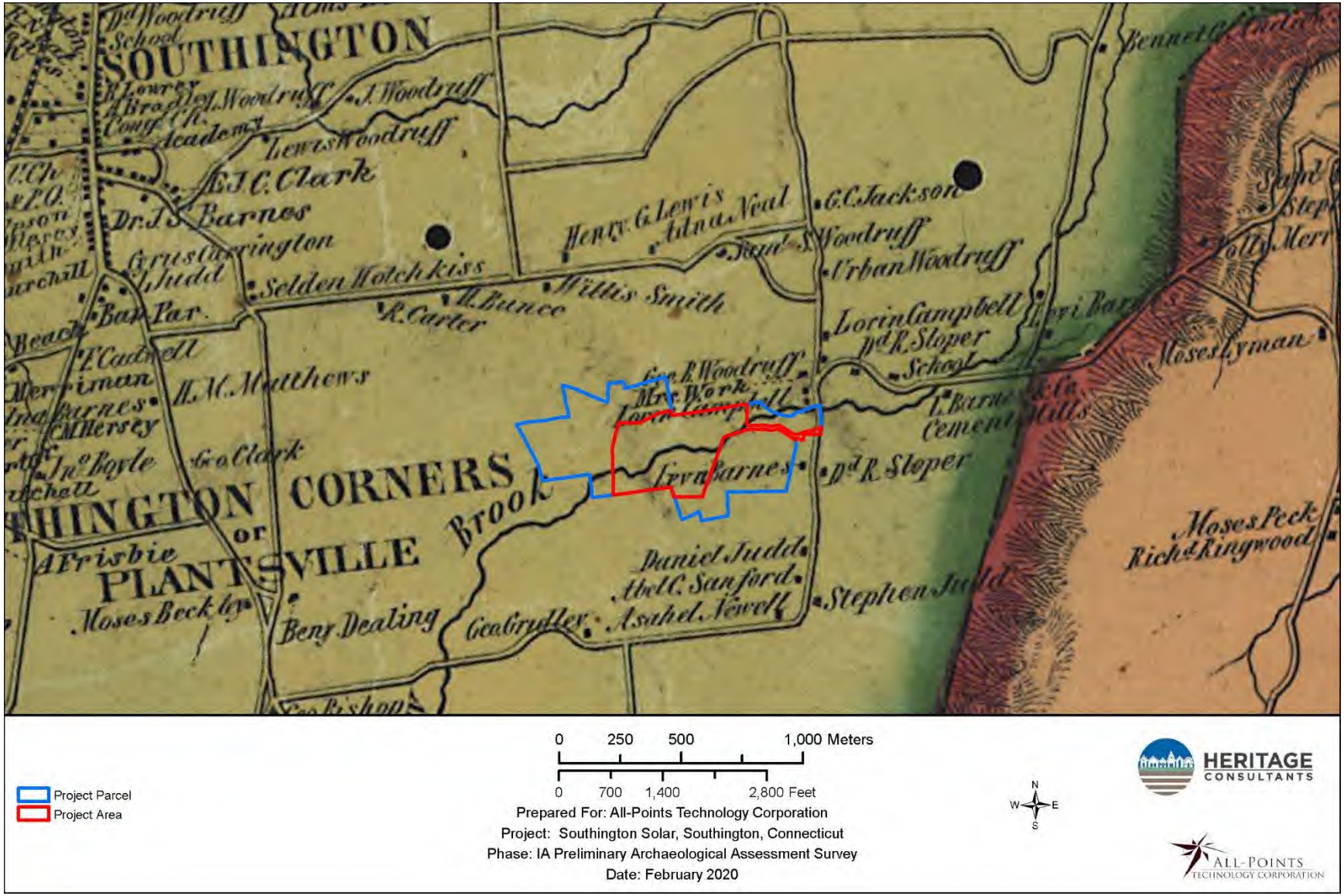

Figure 3. Excerpt from an 1855 historic map showing the location of the survey area in Southington, Connecticut.

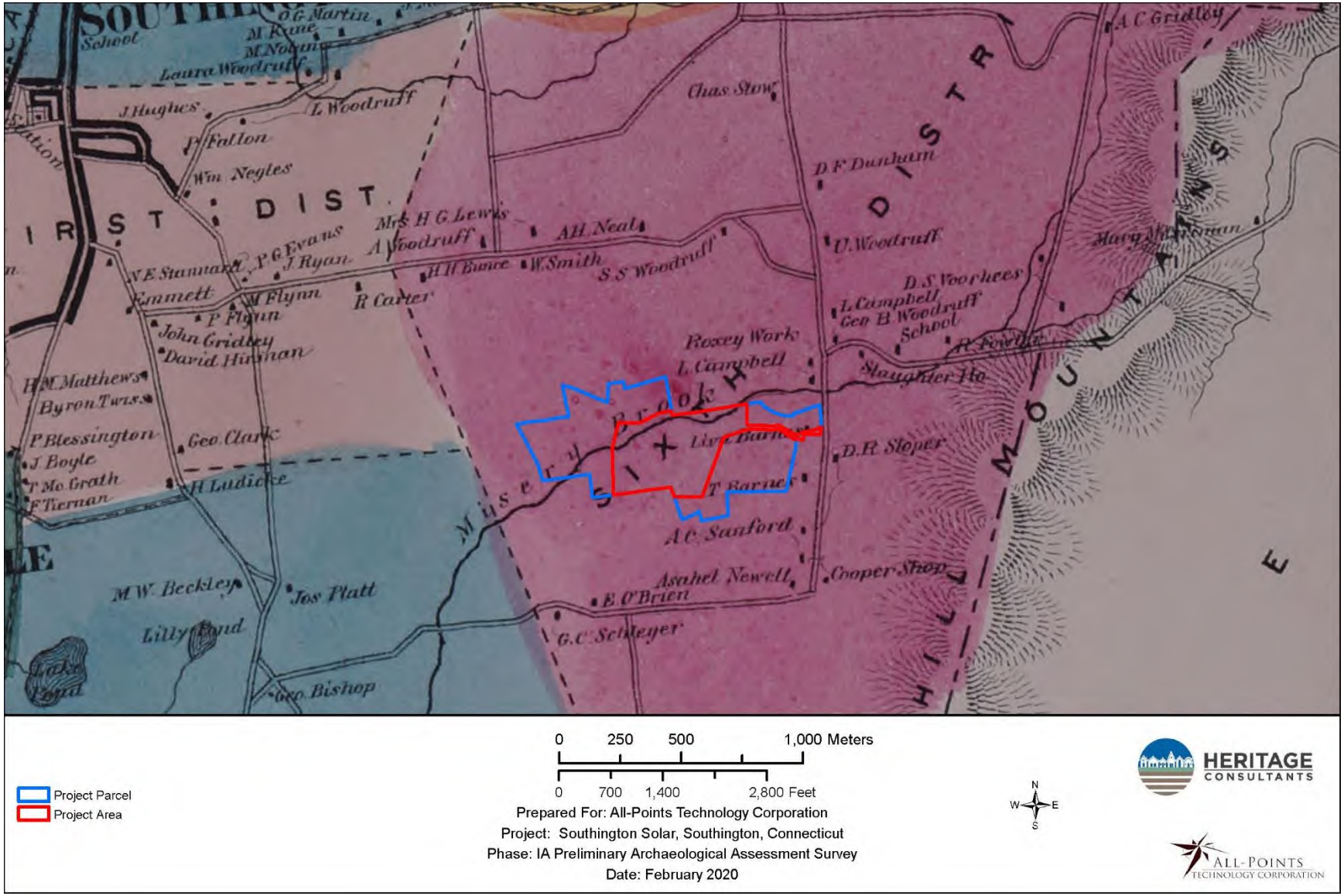

Figure 4. Excerpt from an 1869 historic map showing the location of the survey area in Southington, Connecticut.

Figure 5. Excerpt from a 1934 aerial photograph showing the location of the project area in Southington, Connecticut.

Figure 6. Excerpt from a 1951 aerial photograph showing the location of the project area in Southington, Connecticut.

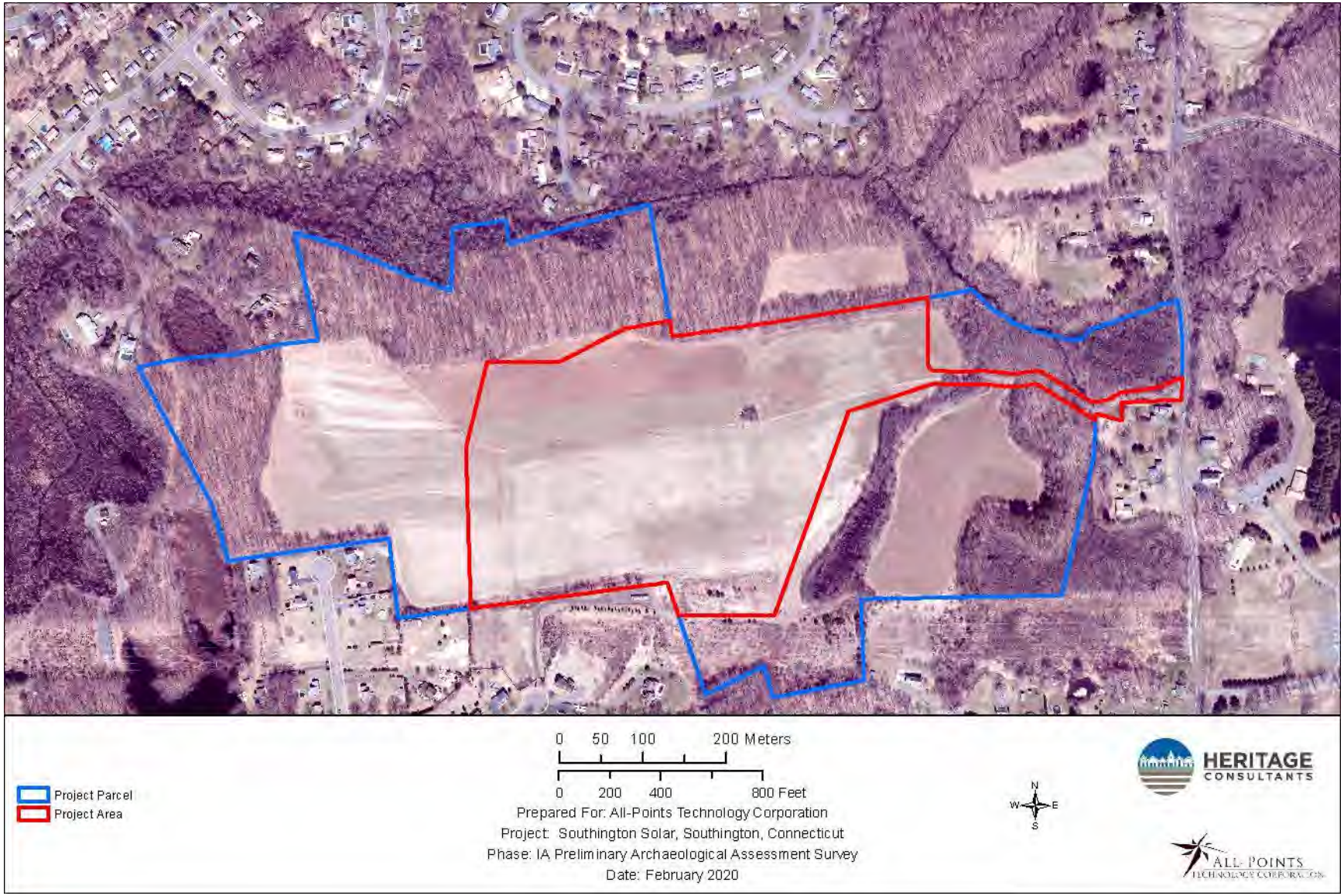

Figure 7. Excerpt from a 2019 aerial photograph showing the location of the project area in Southington, Connecticut.

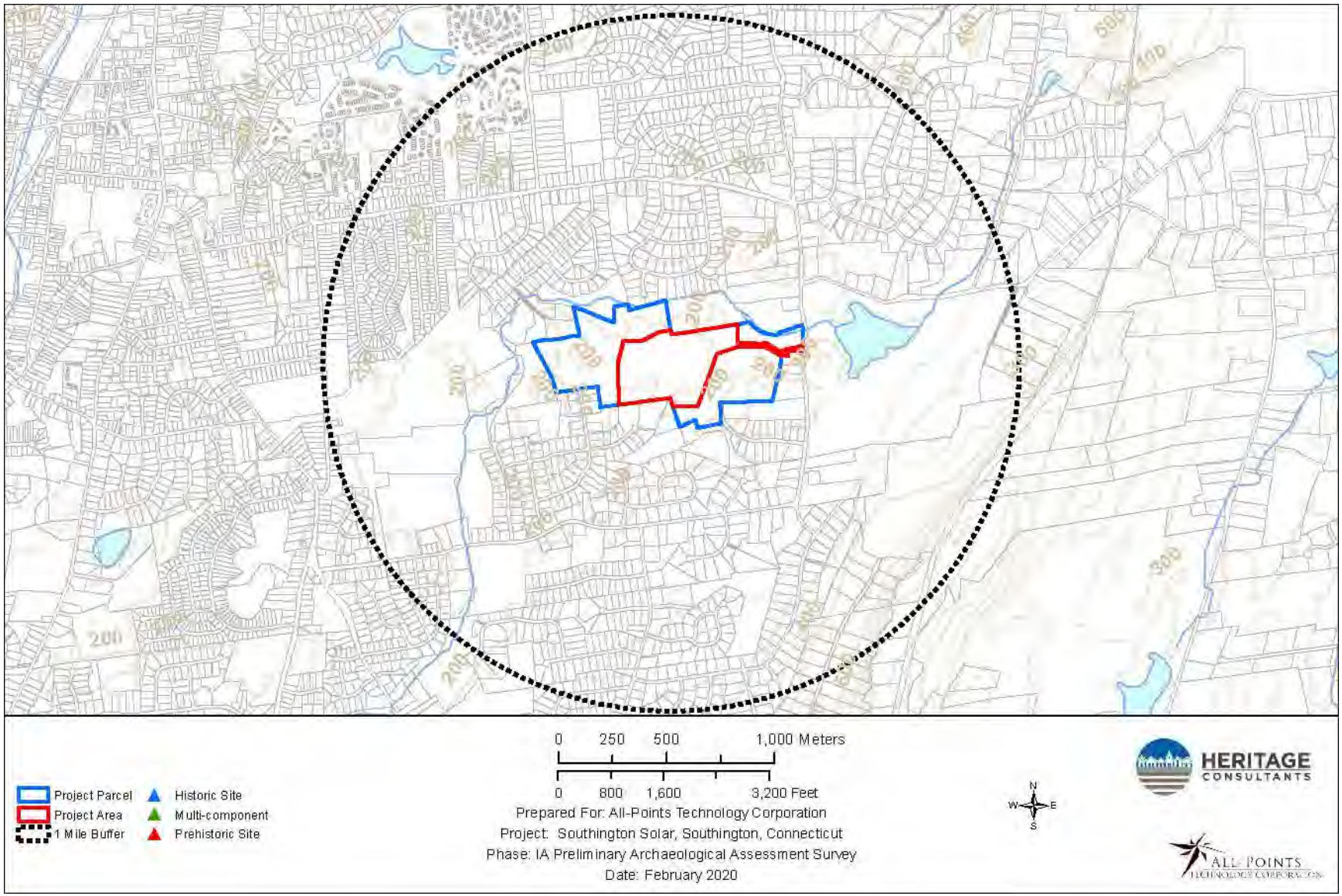

Figure 8. Digital map showing the location of previously identified archaeological sites in the vicinity of the project area in Southington, Connecticut.

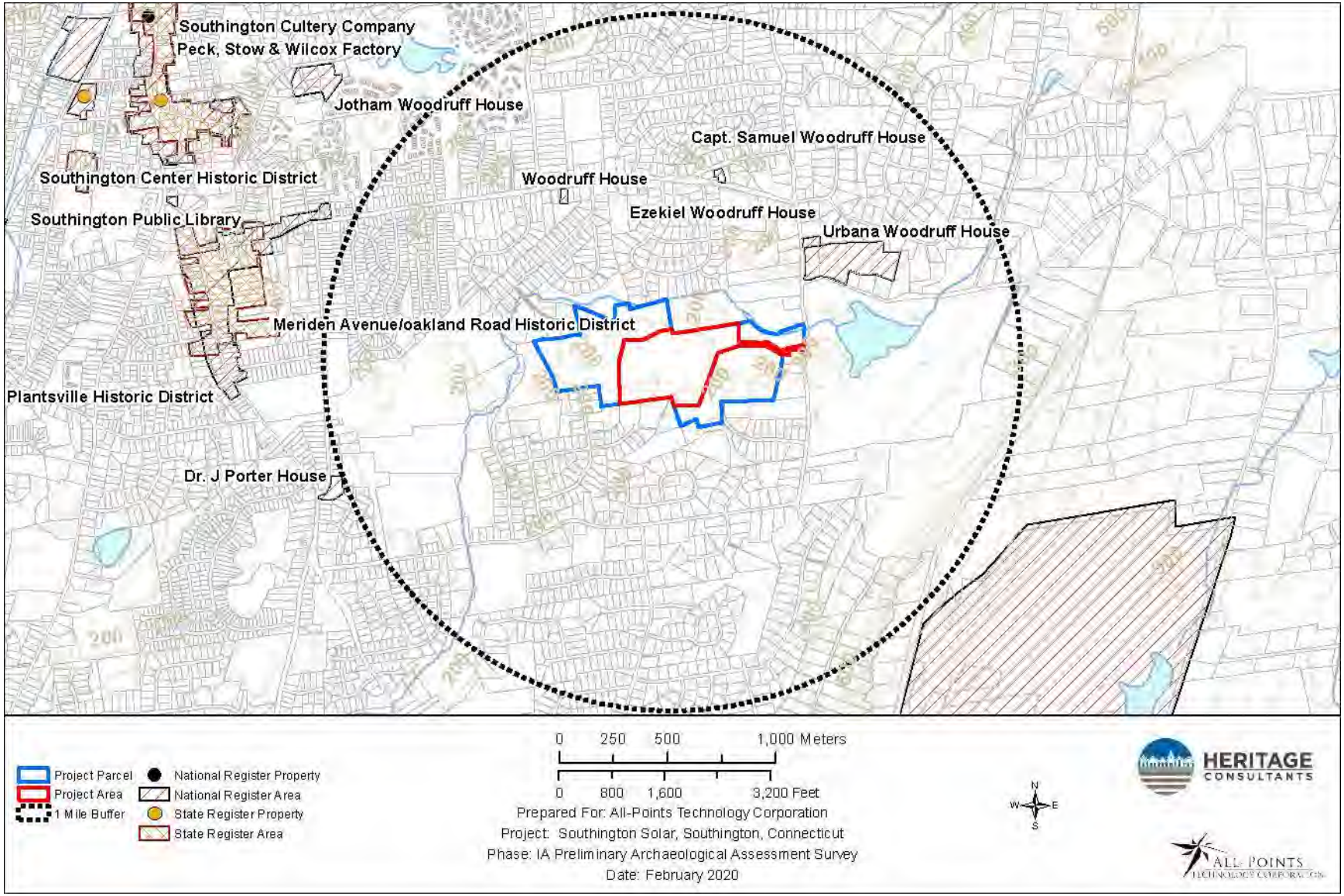

Figure 9. Digital map depicting the locations of previously identified National/State Register of Historic Places properties in the vicinity of the project area in Southington, Connecticut.

Figure 10. Overview photo of the proposed access road from its intersection with East Street, facing west.

Figure 11. Overview photo of the proposed access road facing west.

Figure 12. Overview photo of the proposed access road at the eastern edge of the project area, facing west.

Figure 13. Overview photo of the northwest portion of the project area facing southwest.

Figure 14. Overview photo of the central portion of the project area facing west.

Figure 15. Overview photo of the central portion of the project area facing north.

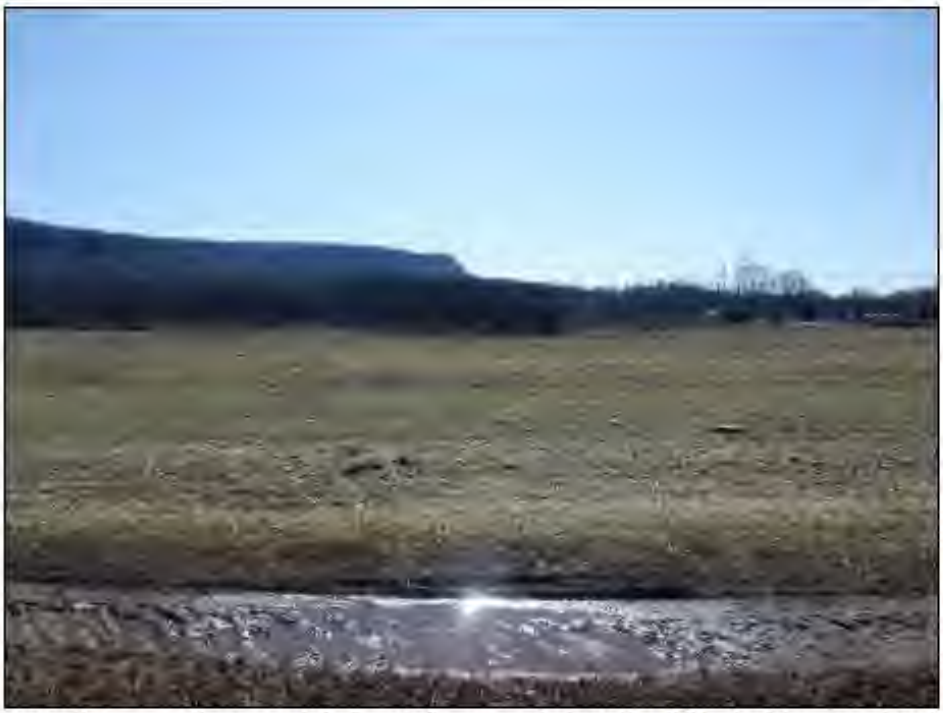

Figure 16. Overview photo of the central portion of the project area facing south, with powerline corridor in the background.

Figure 17. Overview photo of the central portion of the project area facing east.

Figure 18. Overview photo of the northwest portion of the project area facing southeast.

Figure 19. Overview photo of the southwest portion of the project area facing northeast.

JULY 2020

PHASE IB CULTURAL RESOURCES RECONNAISSANCE SURVEY OF THE PROPOSED SOUTHINGTON SOLAR ONE PROJECT IN SOUTHINGTON, CONNECTICUT

PREPARED FOR:

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ABSTRACT

This report presents the results of a Phase IB cultural reconnaissance survey of the proposed 37.7-acre Southington Solar One Project in Southington, Connecticut. Heritage Consultants, LLC completed the Phase IB cultural resources reconnaissance survey on behalf of All-Points Technology Corporation in June of 2020. A total of 187 of 187 (100 percent) planned shovel tests were excavated throughout the proposed solar center area. This effort failed to identify any Native American or historic period cultural materials or features. Therefore, no additional examination of the proposed solar center project area is recommended prior to construction.

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CHAPTER I
INTRODUCTION

This report presents the results of a Phase IB cultural resources reconnaissance survey for the proposed Southington Solar One Project in Southington, Connecticut (Figure 1). All-Points Technology Corporation (All-Points) requested that Heritage Consultants, LLC (Heritage) complete the current reconnaissance survey as part of the planning process for the proposed solar center, which will occupy approximately 37.7 acres of land. The project area is situated in the central portion of a 102.5-acre parcel of land located at 1012 East Street. It is surrounded by forested areas to the north and west, while there are residences along East Street to the east and residential subdivisions to the south. Heritage completed this investigation in June of 2020. All work associated with this investigation was performed in accordance with the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987) promulgated by the Connecticut State Historic Preservation Office.

Project Description and Methods Overview

The proposed project will consist of a 4.725 MW solar center that will include the installation of rows of solar panels spaced 4.9 m (16 ft) apart across the above-referenced project area. The panels will be split into three arrays that are divided by two existing natural pipeline easements and the access road for the facility, which retained a no/low archaeological sensitivity, provide access the facility from the northeast along East Street. The project area, which is located within a large agricultural field, is situated at elevations ranging from 61 to 64 m (200 to 210 ft) NGVD. In February 2020, Heritage conducted a pedestrian survey of the proposed development parcel to assess current field conditions and soil integrity. This included photo-documentation of property and archaeological sensitivity assessment. The pedestrian survey revealed that all 37.7 acres of the project area retain moderate/high sensitivity for intact archaeological deposits.

The current Phase IB cultural resources reconnaissance survey consisted of the completion of the following tasks: 1) a contextual overview of the area's prehistory, history, and natural setting (e.g., soils, ecology, hydrology, etc.); 2) a literature search to identify and discuss previously completed cultural resources surveys and previously recorded cultural resources in the region encompassing the project area; 3) a review of readily available historic maps and aerial imagery depicting the project area in order to identify potential historic resources and/or areas of past disturbance; 4) subsurface testing of the proposed facility location; and 5) preparation of the current Phase IB cultural resources assessment survey report.

Project Results and Management Recommendations Overview

During the current Phase IB cultural resources survey, a total of 187 of 187 (100 percent) planned shovel tests were excavated throughout the proposed solar center area. Despite this effort, no prehistoric or historic period cultural materials or features or were identified. Therefore, impacts to archaeological resources are anticipated by the proposed solar facility and no additional archaeological examination of the project area is recommended prior to construction.

Project Personnel

Key personnel for this project included David R. George, M.A., R.P.A., (Project Manager), Ms. Kelsey Tuller, M.A. (Field Director); Mr. Stephen Anderson, B.A., (GIS Specialist); and Dr. Kristen Keegan (Historian). Ms. Elizabeth Correia, M.A., (Laboratory Specialist) completed this report.

Organization of the Report

The natural setting of the region encompassing the project area is presented in Chapter II; it includes a brief overview of the geology, hydrology, and soils, of the project region. The prehistory of the project region is outlined briefly in Chapter III. The history of the region encompassing the project region and study area is chronicled in Chapter IV, while a discussion of previous archaeological investigations near the study area is presented in Chapter V. The methods used to complete this investigation are discussed in Chapter VI. The results of this investigation and management recommendations for the project area are presented in Chapter VII.

CHAPTER II
NATURAL SETTING

Introduction

This chapter provides a brief overview of the natural setting of the region containing the project area. Previous archaeological research has documented that a few specific environmental factors can be associated with both prehistoric and historic period site selection. These include general ecological conditions, as well as types of fresh water sources and soils present. The remainder of this section provides a brief overview of the ecology, hydrological resources, and soils present within the project area and the larger region in general.

Ecoregions of Connecticut

Throughout the Pleistocene and Holocene Periods, Connecticut has undergone numerous environmental changes. Variations in climate, geology, and physiography have led to the "regionalization" of Connecticut's modern environment. It is clear, for example, that the northwestern portion of the state has very different natural characteristics than the coastline. Recognizing this fact, Dowhan and Craig (1976), as part of their study of the distribution of rare and endangered species in Connecticut, subdivided the state into various ecoregions. Dowhan and Craig (1976:27) defined an ecoregion as:

> "an area characterized by a distinctive pattern of landscapes and regional climate as expressed by the vegetation composition and pattern, and the presence or absence of certain indicator species and species groups. Each ecoregion has a similar interrelationship between landforms, local climate, soil profiles, and plant and animal communities. Furthermore, the pattern of development of plant communities (chronosequences and toposequences) and of soil profile is similar in similar physiographic sites. Ecoregions are thus natural divisions of land, climate, and biota."

Dowhan and Craig defined nine major ecoregions for the State of Connecticut. They are based on regional diversity in plant and animal indicator species (Dowhan and Craig 1976). Only one of the ecoregions is germane to the current investigation: South-Central Lowlands ecoregion. A brief summary of this ecoregion is presented below. It is followed by a discussion of the hydrology and soils found in and adjacent to the project area.

<u>South-Central Lowlands Ecoregion</u>

The South-Central Lowlands ecoregion consists of "a rolling area of low average elevation, crossed by several north-trending ridge systems; streams and river systems with broad, well developed flood plains, from which the land surface generally rises to the bases of the ridges" (Dowhan and Craig 1976). Elevations average less than 60 m (200 ft) but can reach approximately 300 m (1,000 ft) in height. The region's bedrock is sedimentary, consisting of sandstones, basalt, and traprock. Soils vary from "clayey glacial till in the uplands of the region, to sand, gravel, silt, and clay in the lowlands."

Hydrology in the Vicinity of the Project area

The project area is situated within a region that contains several sources of freshwater, including Sloper's Pond, Misery Brook, Black Pond, and Spring Lake, as well as unnamed streams, ponds, and wetlands. These freshwater sources may have served as resource extraction areas for Native American and historic populations. Previously completed archaeological investigations in Connecticut have demonstrated that

streams, rivers, and wetlands were focal points for prehistoric occupations because they provided access to transportation routes, sources of freshwater, and abundant faunal and floral resources.

Soils Comprising the Project area

Soil formation is the direct result of the interaction of a number of variables, including climate, vegetation, parent material, time, and organisms present (Gerrard 1981). Once archaeological deposits are buried within the soil, they are subject to a number of diagenic processes. Different classes of artifacts may be preferentially protected, or unaffected by these processes, whereas others may deteriorate rapidly. Cyclical wetting and drying, freezing and thawing, and compression can accelerate chemically and mechanically the decay processes for animal bones, shells, lithics, ceramics, and plant remains. Lithic and ceramic artifacts are largely unaffected by soil pH, whereas animal bones and shells decay more quickly in acidic soils such as those that are present in within the current project area. In contrast, acidic soils enhance the preservation of charred plant remains.

A review of the soils within the project area is presented below. The project area is characterized by the presence of four major soil types: Hartford, Manchester, Raypol, and Ellington soils (Figure 2). A review of these soils shows that they consist of well drained sandy loams; they are the types of soils that are typically correlated with prehistoric and historic use and occupation. Descriptive profiles for each soil type are presented below; they were gathered from the National Resources Conservation Service.

Hartford Soils:

A typical profile associated with Hartford soils is as follows: **Ap**--0 to 8 inches; dark reddish brown (5YR 3/4) sandy loam; weak coarse granular structure; very friable; many fine roots; 5 percent gravel; strongly acid; clear smooth boundary; **Bw1**--8 to 20 inches; yellowish red (5YR 4/6) sandy loam; weak fine granular structure; very friable; few fine roots; 5 percent gravel; strongly acid; clear wavy boundary. **Bw2**--20 to 26 inches; reddish brown (5YR 4/4) loamy sand; single grain; loose; 10 percent gravel; strongly acid; clear wavy boundary; and **2C**--26 to 65 inches; reddish brown (5YR 4/4) stratified sand and gravel; single grain; loose; 35 percent gravel; strongly acid.

Manchester Soils:

A typical profile associated with Manchester soils is as follows: **Ap**--0 to 9 inches; dark brown (7.5YR 3/2) gravelly sandy loam; weak medium granular structure; very friable; many fine and common medium roots; 20 percent gravel; strongly acid; clear smooth boundary; **Bw**--9 to 18 inches; reddish brown (5YR 4/3) gravelly loamy sand; very weak fine and medium granular structure; very friable; few fine roots; 25 percent gravel; strongly acid; clear wavy boundary; and **C**--18 to 65 inches; reddish brown (5YR 4/4) very gravelly sand; single grain; loose; 50 percent gravel; very strongly acid.

Raypol Soils:

A typical profile associated with Raypol soils is as follows: **Ap**--0 to 8 inches; very dark brown (10YR 2/2) silt loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; common very fine, fine and medium roots; strongly acid; clear smooth boundary; **Bg1**--8 to 12 inches; grayish brown (10YR 5/2) very fine sandy loam; weak medium subangular blocky structure; friable; common very fine, fine and medium roots; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; clear wavy boundary. **Bg2**--12 to 20 inches; grayish brown (10YR 5/2) silt loam; weak medium subangular blocky structure; friable; common fine and medium roots; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; clear wavy boundary. **Bw1**--20 to 26 inches; dark yellowish brown (10YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; common medium prominent yellowish brown (10YR 5/8) and common

medium distinct light brownish gray (10YR 6/2) masses of iron accumulation; strongly acid; gradual wavy boundary. **Bw2**--26 to 29 inches; olive brown (2.5Y 4/4) very fine sandy loam; massive; friable; 5 percent gravel; common medium prominent yellowish brown (10YR 5/8) masses of iron accumulation and common medium distinct light brownish gray (10YR 6/2) iron depletions; strongly acid; clear wavy boundary; **2C1**--29 to 52 inches; light olive brown (2.5Y 5/4) gravelly sand; single grain; loose; 25 percent gravel; few medium prominent yellowish brown (10YR 5/8) masses of iron accumulation; strongly acid; and **2C2**--52 to 65 inches; dark grayish brown (2.5Y 4/2) very gravelly sand; single grain; loose; 35 percent gravel and 5 percent cobbles; few medium prominent yellowish brown (10YR 5/6) masses of iron accumulation; strongly acid.

Ellington Soils:

A typical profile associated with Ellington soils is as follows: **Ap**--0 to 8 inches; dark reddish brown (5YR 3/2) silt loam; pinkish gray (7.5YR 6/2) dry; weak medium granular structure; friable; few fine roots; 5 percent gravel; slightly acid; clear smooth boundary; **Bw1**--8 to 18 inches; reddish brown (5YR 4/4) silt loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent gravel; moderately acid; gradual wavy boundary. **Bw2**--18 to 26 inches; reddish brown (5YR 4/4) very fine sandy loam; massive; friable; 10 percent gravel; common medium distinct reddish gray (5YR 5/2) iron depletions and dark red (2.5YR 3/6) masses of iron accumulation; strongly acid; abrupt smooth boundary; and **2C**--26 to 65 inches; dark reddish brown (5YR 3/4) stratified sand and gravel with a few thin lenses of sandy loam; single grain; loose; 50 percent gravel; few fine distinct reddish gray (5YR 5/2) iron depletions and few fine faint yellowish red (5YR 4/6) masses of iron accumulation; strongly acid.

Summary

The natural setting of the area containing the proposed project area is common throughout the South-Central Lowlands ecoregion. Streams and rivers of this area empty into the Quinnipiac River, which in turn, drains into the Long Island Sound. Further, the landscape in general is dominated by sandy loamy soil types with some wetland soils intermixed. In addition, low slopes dominate the region. Thus, in general, the project region was well suited to Native American occupation throughout the prehistoric era. This portion of Southington was also used throughout the historic era, as evidenced by the presence of numerous historic residences and agricultural fields throughout the region; thus, archaeological deposits dating from the prehistoric and historic era may be expected near or within the proposed project area.

CHAPTER III
PREHISTORIC SETTING

Introduction

Prior to the late 1970s and early 1980s, few systematic archaeological surveys of large portions of the state of Connecticut had been undertaken. Rather, the prehistory of the region was studied at the site level. Sites chosen for excavation were highly visible and were located in areas such as the coastal zone, e.g., shell middens, and Connecticut River Valley. As a result, a skewed interpretation of the prehistory of Connecticut was developed. It was suggested that the upland portions of the state, i.e., the northeastern and northwestern hills ecoregions, were little used and rarely occupied by prehistoric Native Americans, while the coastal zone, i.e., the eastern and western coastal and the southeastern and southwestern hills ecoregions, were the focus of settlements and exploitation in the prehistoric era. This interpretation remained unchallenged until the 1970s and 1980s when several town-wide and regional archaeological studies were completed. These investigations led to the creation of several archaeological phases that subsequently were applied to understand the prehistory of Connecticut. The remainder of this chapter provides an overview of the prehistoric setting of the region encompassing the project area.

Paleo-Indian Period (12,000 to 10,000 Before Present [B.P.])

The earliest inhabitants of the area encompassing the State of Connecticut, who have been referred to as Paleo-Indians, arrived in the area by ca., 12,000 B.P. (Gramly and Funk 1990; Snow 1980). Due to the presence of large Pleistocene mammals at that time and the ubiquity of large fluted projectile points in archaeological deposits of this age, Paleo-Indians often have been described as big-game hunters (Ritchie and Funk 1973; Snow 1980); however, as discussed below, it is more likely that they hunted a broad spectrum of animals.

While there have been numerous surface finds of Paleo-Indian projectile points throughout the State of Connecticut, only two sites, the Templeton Site (6-LF-21) in Washington, Connecticut and the Hidden Creek Site (72-163) in Ledyard, Connecticut, have been studied in detail and dated using the radiocarbon method (Jones 1997; Moeller 1980). The Templeton Site (6-LF-21) is located in Washington, Connecticut and was occupied between 10,490 and 9,890 years ago (Moeller 1980). In addition to a single large and two small fluted points, the Templeton Site produced a stone tool assemblage consisting of gravers, drills, core fragments, scrapers, and channel flakes, which indicates that the full range of stone tool production and maintenance took place at the site (Moeller 1980). Moreover, the use of both local and non-local raw materials was documented in the recovered tool assemblage, suggesting that not only did the site's occupants spend some time in the area, but they also had access to distant stone sources, the use of which likely occurred during movement from region to region.

The only other Paleo-Indian site studied in detail in Connecticut is the Hidden Creek Site (72-163) (Jones 1997). The Hidden Creek Site is situated on the southeastern margin of the Great Cedar Swamp on the Mashantucket Pequot Reservation in Ledyard, Connecticut. While excavation of the Hidden Creek Site produced evidence of Terminal Archaic and Woodland Period components (see below) in the upper soil horizons, the lower levels of the site yielded artifacts dating from the Paleo-Indian era. Recovered Paleo-Indian artifacts included broken bifaces, side-scrapers, a fluted preform, gravers, and end-scrapers. Based on the types and number of tools present, Jones (1997:77) has hypothesized that the Hidden

Creek Site represented a short-term occupation, and that separate stone tool reduction and rejuvenation areas were present.

While archaeological evidence for Paleo-Indian occupation is scarce in Connecticut, it, combined with data from the West Athens Road and King's Road Site in the Hudson drainage and the Davis and Potts Sites in northern New York, supports the hypothesis that there was human occupation of the area not long after ca. 12,000 B.P. (Snow 1980). Further, site types currently known suggest that the Paleo-Indian settlement pattern was characterized by a high degree of mobility, with groups moving from region to region in search of seasonally abundant food resources, as well as for the procurement of high-quality raw materials from which to fashion stone tools.

Archaic Period (10,000 to 2,700 B.P.)

The Archaic Period, which succeeded the Paleo-Indian Period, began by ca., 10,000 B.P. (Ritchie and Funk 1973; Snow 1980), and it has been divided into three subperiods: Early Archaic (10,000 to 8,000 B.P.), Middle Archaic (8,000 to 6,000 B.P.), and Late Archaic (6,000 to 3,400 B.P.). These periods were devised to describe all non-farming, non-ceramic producing populations in the area. Regional archeologists recently have recognized a final "transitional" Archaic Period, the Terminal Archaic Period (3,400-2,700 B.P.), which was meant to describe those groups that existed just prior to the onset of the Woodland Period and the widespread adoption of ceramics into the toolkit (Snow 1980; McBride 1984; Pfeiffer 1984, 1990; Witthoft 1949, 1953).

Early Archaic Period (10,000 to 8,000 B.P.)

To date, few Early Archaic sites have been identified in southern New England. As a result, researchers such as Fitting (1968) and Ritchie (1969), have suggested a lack of these sites likely is tied to cultural discontinuity between the Early Archaic and preceding Paleo-Indian Period, as well as a population decrease from earlier times. However, with continued identification of Early Archaic sites in the region, and the recognition of the problems of preservation, it is difficult to maintain the discontinuity hypothesis (Curran and Dincauze 1977; Snow 1980).

Like their Paleo-Indian predecessors, Early Archaic sites tend to be small and produce few artifacts, most of which are not temporally diagnostic. While Early Archaic sites in other portions of the United States are represented by projectile points of the Kirk series (Ritchie and Funk 1973) and by Kanawha types (Coe 1964), sites of this age in southern New England are identified on the basis of a series of ill-defined bifurcate-based projectile points. These projectile points are identified by the presence of their characteristic bifurcated base, and they generally are made from high quality raw materials. Moreover, finds of these projectile points have rarely been in stratified contexts. Rather, they occur commonly either as surface expressions or intermixed with artifacts representative of later periods. Early Archaic occupations, such as the Dill Farm Site and Sites 6LF64 and 6LF70 in Litchfield County, are represented by camps that were relocated periodically to take advantage of seasonally available resources (McBride 1984; Pfeiffer 1986). In this sense, a foraging type of settlement pattern was employed during the Early Archaic Period.

Middle Archaic Period (8,000 to 6,000 B.P.)

By the onset of the Middle Archaic Period, essentially modern deciduous forests had developed in the region (Davis 1969). It is at this time that increased numbers and types of sites are noted in Connecticut (McBride 1984). The most well-known Middle Archaic site in New England is the Neville Site, which is located in Manchester, New Hampshire and studied by Dincauze (1976). Careful analysis of the Neville Site indicated that the Middle Archaic occupation dated from between ca., 7,700 and 6,000 years ago. In

fact, Dincauze (1976) obtained several radiocarbon dates from the Middle Archaic component of the Neville Site. The dates, associated with the then-newly named Neville type projectile point, ranged from 7,740±280 and 7,015±160 B.P. (Dincauze 1976).

In addition to Neville points, Dincauze (1976) described two other projectile points styles that are attributed to the Middle Archaic Period: Stark and Merrimac projectile points. While no absolute dates were recovered from deposits that yielded Stark points, the Merrimac type dated from 5,910±180 B.P. Dincauze argued that both the Neville and later Merrimac and Stark occupations were established to take advantage of the excellent fishing that the falls situated adjacent to the site area would have afforded Native American groups. Thus, based on the available archaeological evidence, the Middle Archaic Period is characterized by continued increases in diversification of tool types and resources exploited, as well as by sophisticated changes in the settlement pattern to include different site types, including both base camps and task-specific sites (McBride 1984:96)

Late Archaic Period (6,000 to 3,700 B.P.)

The Late Archaic Period in southern New England is divided into two major cultural traditions that appear to have coexisted. They include the Laurentian and Narrow-Stemmed Traditions (Funk 1976; McBride 1984; Ritchie 1969a and b). Artifacts assigned to the Laurentian Tradition include ground stone axes, adzes, gouges, ulus (semi-lunar knives), pestles, atlatl weights, and scrapers. The diagnostic projectile point forms of this time period in southern New England include the Brewerton Eared-Notched, Brewerton Eared and Brewerton Side-Notched varieties (McBride 1984; Ritchie 1969a; Thompson 1969). In general, the stone tool assemblage of the Laurentian Tradition is characterized by flint, felsite, rhyolite and quartzite, while quartz was largely avoided for stone tool production.

In terms of settlement and subsistence patterns, archaeological evidence in southern New England suggests that Laurentian Tradition populations consisted of groups of mobile hunter-gatherers. While a few large Laurentian Tradition occupations have been studied, sites of this age generally encompass less than 500 m^2 (5,383 ft^2). These base camps reflect frequent movements by small groups of people in search of seasonally abundant resources. The overall settlement pattern of the Laurentian Tradition was dispersed in nature, with base camps located in a wide range of microenvironments, including riverine as well as upland zones (McBride 1978, 1984:252). Finally, subsistence strategies of Laurentian Tradition focused on hunting and gathering of wild plants and animals from multiple ecozones.

The second Late Archaic tradition, known as the Narrow-Stemmed Tradition, is unlike the Laurentian Tradition, and it likely represents a different cultural adaptation. The Narrow-Stemmed tradition is recognized by the presence of quartz and quartzite narrow stemmed projectile points, triangular quartz Squibnocket projectile points, and a bipolar lithic reduction strategy (McBride 1984). Other tools found in Narrow-Stemmed Tradition artifact assemblages include choppers, adzes, pestles, antler and bone projectile points, harpoons, awls, and notched atlatl weights. Many of these tools, notably the projectile points and pestles, indicate a subsistence pattern dominated by hunting and fishing, as well the collection of a wide range of plant foods (McBride 1984; Snow 1980:228).

The Terminal Archaic Period (3,700 to 2,700 B.P.)

The Terminal Archaic Period, which lasted from ca., 3,700 to 2,700 BP, is perhaps the most interesting, yet confusing of the Archaic Periods in southern New England prehistory. Originally termed the "Transitional Archaic" by Witthoft (1953) and recognized by the introduction of technological innovations, e.g., broadspear projectile points and soapstone bowls, the Terminal Archaic Period has long posed problems for regional archeologists. While the Narrow-Stemmed Tradition persisted through

the Terminal Archaic and into the Early Woodland Period, the Terminal Archaic is coeval with what appears to be a different technological adaptation, the Susquehanna Tradition (McBride 1984; Ritchie 1969b). The Susquehanna Tradition is recognized in southern New England by the presence of a new stone tool industry that was based on the use of high-quality raw materials for stone tool production and a settlement pattern different from the "coeval" Narrow-Stemmed Tradition.

The Susquehanna Tradition is based on the classification of several Broadspear projectile point types and associated artifacts. There are several local sequences within the tradition, and they are based on projectile point type chronology. Temporally diagnostic projectile points of these sequences include the Snook Kill, Susquehanna Broadspear, Mansion Inn, and Orient Fishtail types (Lavin 1984; McBride 1984; Pfeiffer 1984). The initial portion of the Terminal Archaic Period (ca., 3,700-3,200 BP) is characterized by the presence of Snook Kill and Susquehanna Broadspear projectile points, while the latter Terminal Archaic (3,200-2,700 BP) is distinguished by the use of Orient Fishtail projectile points (McBride 1984:119; Ritchie 1971).

In addition, it was during the late Terminal Archaic Period that interior cord marked, grit tempered, thick walled ceramics with conoidal (pointed) bases made their initial appearance in the Native American toolkit. These are the first ceramics in the region, and they are named Vinette I (Ritchie 1969a; Snow 1980:242); this type of ceramic vessel appears with much more frequency during the ensuing Early Woodland Period. In addition, the adoption and widespread use of soapstone bowls, as well as the implementation of subterranean storage, suggests that Terminal Archaic groups were characterized by reduced mobility and longer-term use of established occupation sites (Snow 1980:250).

Finally, while settlement patterns appeared to have changed, Terminal Archaic subsistence patterns were analogous to earlier patterns. The subsistence pattern still was diffuse in nature, and it was scheduled carefully. Typical food remains recovered from sites of this period consist of fragments of white-tailed deer, beaver, turtle, fish and various small mammals. Botanical remains recovered from the site area consisted of *Chenopodium* sp., hickory, butternut and walnut (Pagoulatos 1988:81). Such diversity in food remains suggests at least minimal use of a wide range of microenvironments for subsistence purposes.

Woodland Period (2,700 to 350 B.P.)

Traditionally, the advent of the Woodland Period in southern New England has been associated with the introduction of pottery; however, as mentioned above, early dates associated with pottery now suggest the presence of Vinette I ceramics appeared toward the end of the preceding Terminal Archaic Period (Ritchie 1969a; McBride 1984). Like the Archaic Period, the Woodland Period has been divided into three subperiods: Early, Middle, and Late Woodland. The various subperiods are discussed below.

<u>Early Woodland Period (ca., 2,700 to 2,000 B.P.)</u>

The Early Woodland Period of the northeastern United States dates from ca., 2,700 to 2,000 B.P., and it has been thought to have been characterized by the advent of farming, the initial use of ceramic vessels, and increasingly complex burial ceremonialism (Griffin 1967; Ritchie 1969a and 1969b; Snow 1980). In the Northeast, the earliest ceramics of the Early Woodland Period are thick walled, cord marked on both the interior and exterior, and possess grit temper.

Careful archaeological investigations of Early Woodland sites in southern New England have resulted in the recovery of narrow stemmed projectile points in association with ceramic sherds and subsistence remains, including specimens of white-tailed deer, soft and hard-shell clams, and oyster shells (Lavin and

Salwen: 1983; McBride 1984:296-297; Pope 1952). McBride (1984) has argued that the combination of the subsistence remains and the recognition of multiple superimposed cultural features at various sites indicates that Early Woodland Period settlement patterns were characterized by multiple re-use of the same sites on a seasonal basis by small co-residential groups.

Middle Woodland Period (2,000 to 1,200 B.P.)

The Middle Woodland Period is marked by an increase in the number of ceramic types and forms utilized (Lizee 1994a), as well as an increase in the amount of exotic lithic raw material used in stone tool manufacture (McBride 1984). The latter suggests that regional exchange networks were established, and that they were used to supply local populations with necessary raw materials (McBride 1984; Snow 1980). The Middle Woodland Period is represented archaeologically by narrow stemmed and Jack's Reef projectile points; increased amounts of exotic raw materials in recovered lithic assemblages, including chert, argillite, jasper, and hornfels; and conoidal ceramic vessels decorated with dentate stamping. Ceramic types indicative of the Middle Woodland Period include Linear Dentate, Rocker Dentate, Windsor Cord Marked, Windsor Brushed, Windsor Plain, and Hollister Stamped (Lizee 1994a:200).

In terms of settlement patterns, the Middle Woodland Period is characterized by the occupation of village sites by large co-residential groups that utilized native plant and animal species for food and raw materials in tool making (George 1997). These sites were the principal place of occupation, and they were positioned close to major river valleys, tidal marshes, estuaries, and the coastline, all of which would have supplied an abundance of plant and animal resources (McBride 1984:309). In addition to villages, numerous temporary and task-specific sites were utilized in the surrounding upland areas, as well as in closer ecozones such as wetlands, estuaries, and floodplains. The use of temporary and task-specific sites to support large village populations indicates that the Middle Woodland Period was characterized by a resource acquisition strategy that can best be termed as logistical collection (McBride 1984:310).

Late Woodland Period (ca., 1,200 to 350 B.P.)

The Late Woodland Period in southern New England dates from ca., 1,200 to 350 B.P., and it is characterized by the earliest evidence for the use of corn in the lower Connecticut River Valley (Bendremer 1993; Bendremer and Dewar 1993; Bendremer et al. 1991; George 1997; McBride 1984); an increase in the frequency of exchange of non-local lithics (Feder 1984; George and Tryon 1996; McBride 1984; Lavin 1984); increased variability in ceramic form, function, surface treatment, and decoration (Lavin 1980, 1986, 1987; Lizee 1994a, 1994b); and a continuation of a trend towards larger, more permanent settlements in riverine, estuarine, and coastal ecozones (Dincauze 1974; McBride 1984; Snow 1980).

Stone tool assemblages associated with Late Woodland occupations, especially village-sized sites, are functionally variable and they reflect plant and animal resource processing and consumption on a large scale. Finished stone tools recovered from Late Woodland sites include Levanna and Madison projectile points; drills; side-, end-, and thumbnail scrapers; mortars and pestles; nutting stones; netsinkers; and celts, adzes, axes, and digging tools. These tools were used in activities ranging from hide preparation to plant processing to the manufacture of canoes, bowls, and utensils, as well as other settlement and subsistence-related items (McBride 1984; Snow 1980). Finally, ceramic assemblages recovered from Late Woodland sites are as variable as the lithic assemblages. Ceramic types identified include Windsor Fabric Impressed, Windsor Brushed, Windsor Cord Marked, Windsor Plain, Clearview Stamped, Sebonac Stamped, Selden Island, Hollister Plain, Hollister Stamped, and Shantok Cove Incised (Lavin 1980, 1988a,

1988b; Lizee 1994a; Pope 1953; Rouse 1947; Salwen and Ottesen 1972; Smith 1947). These types are more diverse stylistically than their predecessors, with incision, shell stamping, punctation, single point, linear dentate, rocker dentate stamping, and stamp and drag impressions common (Lizee 1994a:216).

Summary of Connecticut Prehistory

In sum, the prehistory of Connecticut spans from ca., 12,000 to 350 B.P., and it is characterized by numerous changes in tool types, subsistence patterns, and land use strategies. For the majority of the prehistoric era, local Native American groups practiced a subsistence pattern based on a mixed economy of hunting and gathering wild plant and animal resources. It is not until the Late Woodland Period that incontrovertible evidence for the use of domesticated species is available. Further, settlement patterns throughout the prehistoric era shifted from seasonal occupations of small co-residential groups to large aggregations of people in riverine, estuarine, and coastal ecozones. In terms of the region containing the proposed project area, a variety of prehistoric site types may be expected. These range from seasonal camps utilized by Archaic populations to temporary and task-specific sites of the Woodland era.

CHAPTER IV
HISTORIC OVERVIEW

Introduction

As stated in Chapter I, the project area consists of a parcel of land containing 37.7 acres in the town of Southington in Hartford County, Connecticut. The evidence reviewed indicates that the area was part of the fields system of a farm or farms in the early twentieth century, and almost certainly for many years before that. This chapter provides an overview history of the region, as well as data specific to the project area.

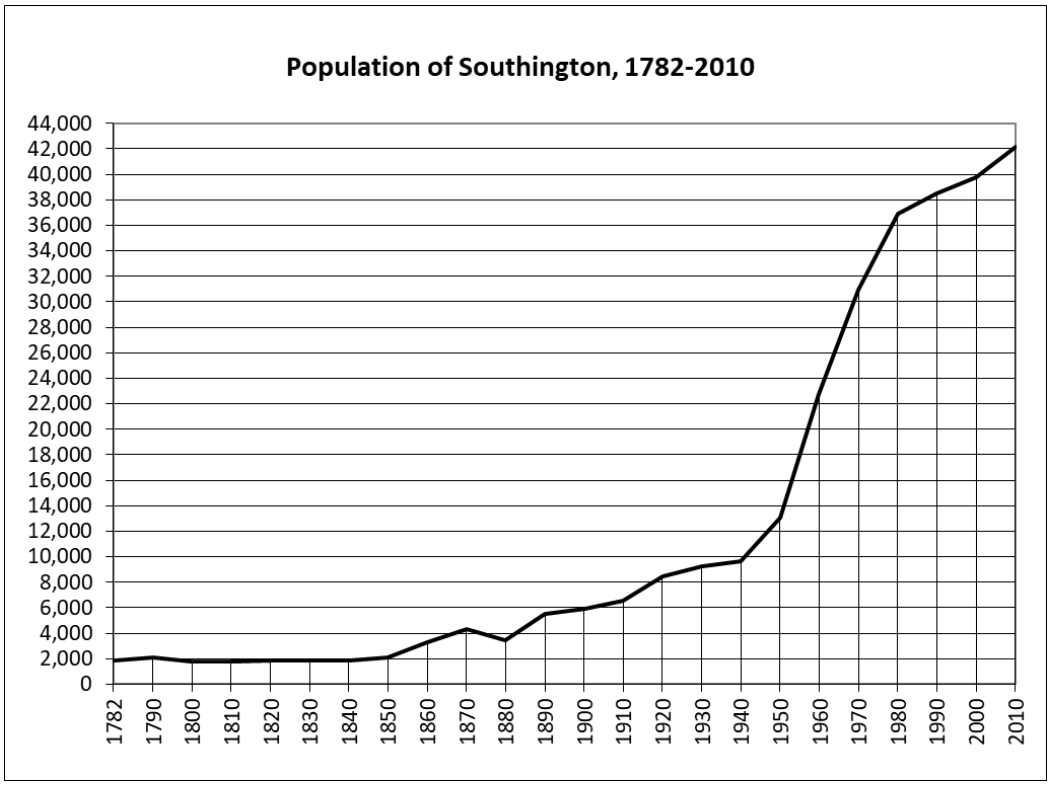
History of the Town of Southington

Hartford County is the site of one of the two earliest loci of colonial settlement in Connecticut, with three of its towns dating to the 1630s. It extends southward from the Massachusetts border and flanks the Connecticut River. The earliest colonial development of the region depended on the agricultural and transportation advantages of the river and its valley; areas further from the Connecticut River valley were colonized later and usually grew more slowly through the early nineteenth century. Thereafter, the main source of differentiation in the development of Hartford County towns' development was, first, whether they had significant levels of industrialization, and, later, whether they had significant levels of suburbanization. Southington is part of the southernmost tier of towns in Hartford County, and does not abut the Connecticut River. It did not experience the level of industrialization that would have led to the appearance of large urbanized areas. Later, however, it did experience a significant level of suburbanization. The following discussion outlines the history of the town in more detail and discusses the presence or absence of historical resources in the vicinity of the project items.

The project area is located in the southeastern quadrant of the town of Southington, inside the reverse L shape described by the course of East Street. Although the eastern edge of the larger project parcel abuts East Street, the area that is to be developed is more than 152 m (500 ft) from the roadway. Southington was incorporated in the late eighteenth century, taking territory from the older town of Farmington. At the time of colonization, the western and southern part of Farmington was the territory of the Mattabessett group of Native Americans, whose leaders Sowheage (or Sequin) and Tarramuggus sold all or most of Wethersfield and regions to its south and west to the colonists in the 1630s, 1660s, and 1670s. The Mattabessetts may have been part of a larger political grouping called the Wangunks, who moved from Wethersfield to Middletown early in the colonial period. Over time, the Wangunks' territory was reduced to reservations in Middletown and East Hampton. Some of them remained there through 1764, after which the reservation land was gradually sold off by the colonial authorities, a process that was completed in 1774 (Adams and Stiles 1904; Brandegee 1913; De Forest 1852). Some members of Native American families lingered in the Southington area until the late nineteenth century (Bickford 1982). Most of these former owners and inhabitants of the town, however, moved away in search of better opportunities, since the colonists were unwilling to treat them as good neighbors or potential citizens.

Although Farmington was incorporated in 1640 and colonized before that year, the future Southington was not colonized until Samuel Woodruff moved there in 1698. By 1720, the area was known as Panthorn, and in 1722 Farmington surveyed a large section of it and divided the land among the town's 84 proprietors (that is, residents who had rights to the land that the town entity owned). In 1724, a new

Congregational ecclesiastical society called Southington was established by the legislature; such churches, it must be remembered, were a governmental function during the colonial era. The Quinnipiac River provided a source of waterpower for early agricultural-processing industries, including a fulling mill established in 1755, which was followed by several others during the eighteenth century. In 1779, on the third request of the inhabitants, the legislature created Southington as a town (Walkley 1886). The census taken in 1782 found 1,886 inhabitants in Southington. This number changed only a little up to 1850, reaching 2,135 people in that year, and then began to grow more rapidly to 5,890 people in 1900 (see the population chart below; Keegan 2012). Through the nineteenth century, small businesses in tinware, cement, and carriage bolt manufacturing grew into a few large factories by the 1880s, while agriculture focused on rye, Indian corn, potatoes, apples, and tobacco (Crofut 1937; Walkley 1886). The Farmington Canal, built through Southington in the 1830s, was replaced by the Canal Railroad as of 1848, providing Southington's manufacturing enterprises with improved transport for materials and products (Turner and Jacobus 1989).



The town's combination of transport and manufacturing supported its modest population growth into the twentieth century, so that the town had 9,649 residents in 1940 (see the population chart above; Keegan 2012). In 1932, the town's industries included a wide range of products, including hardware, paper boxes, tools, and it also still had agricultural production (Connecticut 1932). After 1950, the town saw steep growth, such that its population reached 36,879 people in 1980 and continued growing more slowly to 42,185 residents as of 2010 (Keegan 2012). This shift is best explained by suburbanization and the construction of I-84 in the 1960s, as well as the addition of I-691 through the south end of town in 1985 and 1987 (Oglesby 2013, 2015). These limited-access highways made commuting from homes located near them more convenient, and thus encouraged the construction of new housing developments in affected towns, like Southington. As of 2016, over 12 percent of the town's jobs were still in the manufacturing sector, although instead of agriculture, the vast majority of the rest of its

employment was in retail, health care, and other tertiary-sector industries. Commuting patterns indicated that the largest group of workers stayed in town for their jobs, with the next-largest cohorts traveling to Harford, Farmington, and Bristol (CERC 2018). This indicates that as of the early twenty-first century, Southington was more of a working suburb than a stereotypical "bedroom community."

In the map of Hartford County that was published in 1855, Southington's compact industrial areas were clearly portrayed, mainly along the railroad line, and some of them named (notably Southington and "Southington Corners or Plantsville," to the west of the project area (Figure 3). Elsewhere, some places had variously dense or scattered building locations marked. Although the project area is shown on this map to be in the general vicinity of relatively dense settlement, only one building, labeled with the name Liva Barnes, was within the larger project parcel – albeit more than 152 m (500 ft) from the project area proper. It must be noted that although modern mapping shows the course of Misery Brook running to the north of this parcel, this map incorrectly portrayed it as passing through the parcel (Figure 3; Woodford 1855). The 1869 map of Southington effectively showed the same features, both across the town and near the project area, with no cultural features depicted within 152 m (500 ft) of the area to be developed and the house of Liva Barnes adjacent to East Street (Figure 4; Baker & Tilden 1869).

Although it is not certain that the Liva Barnes family owned the rear acreage on which the project area is located, researching that family has provided information on the most probable historical uses of the area. In the 1850 census, the family of Liva and Lucretia C. Barnes owned a farm valued at $3,000. The parents were 47 and 43 years old, and their three children were 18, 15, and 13 years old. Their neighbors on the census pages were almost all middling farmers, born in Connecticut, like the Barnes family (United States Census 1850a). According to the agricultural census of the same year, "Levi" Barnes owned 80 acres of improved land and 40 acres of unimproved land. This size of farm seems to have been fairly typical of his area, based on those on the same page of the return. Most of the farmers owned one or two horses (Barnes owned one), two or three milk cows (Barnes owned two), one or two teams of oxen (Barnes owned two), a few other cattle (Barnes owned two), and two or three swine (Barnes owned two). Some also owned sheep; the six that Barnes owned was toward the low end among those who did own them. These farmers all grew varying amounts of rye, corn, hay, and potatoes, and most grew some oats. None grew tobacco. Many also grew some buckwheat, peas and beans, or orchard fruit, and most produced butter and cheese (United States Census 1850b).

In 1860, the census recorded Liva and Lucretia Barnes reported a farm valued at $2,000 for the land and $1,000 in personal effects. Truman, age 25, was still in the household, though he gave his occupation as merchant; the 25-year-old Fannie Barnes was probably his wife. Like one of their neighbors, the family was earning some extra money by taking in a pauper named William Belden, who at 65 years old was working as a farm laborer. The household also included Ada Neale, age 75, relationship unknown. There was more variation in occupations among their neighbors; though most were still farmers, there was also a tailoress, a mason, a carpenter, and an iron moulder (United States Census 1860). By 1870, the Barnes family had split into two households, one headed by Liva and Lucretia and the other by Truman and Fanny. Although in his sixties, Liva was still a farmer, owning a farm valued at $6,000, with $2,000 in personal property. The only other person in their household was Ann Peck, age 38, who owned $2,500 in personal estate and quite possibly was their married or widowed daughter. Truman gave his occupation as dry goods salesman but also said he owned $3,500 in real estate and $500 in personal property. This couple had three children under 10 (named Liva, Truman, and Ann), plus a 16-year-old domestic servant (United States Census 1870b). Only Liva Barnes was listed in the 1870 agricultural schedule, reporting 60 acres of improved land and 12 acres of woodland. He and his neighbors carried on roughly the same kind of farming as they had two decades before, except that most had given up

sheep and many were growing tobacco. Barnes, however, was not among the latter group (United States Census 1870b).

As of 1880, the elder Liva Barnes had died, leaving Lucretia a widow, still living next door to her son Truman and his family. Lucretia had a store clerk and a school teacher boarding with her; Truman worked as a commercial traveler, while his son Liva E. (age 18) worked as a store clerk. It is possible, however, that they had moved away from the home farm, because none of their neighbors were farmers – they included a hotel keeper, a town selectman, several milliners, a bank president, and so forth. In contrast, one of their old neighbors, David R. Sloper, was still a farmer surrounded by farmers (United States Census 1880). It was never unusual for a farmer to give up that profession, especially when, as in the case of Truman Barnes, he had shown an early preference for non-farming work. As noted above, there were small industrial areas of Southington in which the Barnes families could have resettled, and although 1880 had seen a temporary population decline, these were growing areas that would continue to grow for many years to come.

In the absence of the automobile, however, this population growth mostly remained close to the non-farm employment areas. At the time of the 1934 aerial photograph, when Southington's population had passed 9,000 residents, the project area was definitely still rural. The project area parcel was almost entirely farmed, with only a fringe of woodland, and what appear to have been two farmsteads beside East Street. In the parcel's central acreage, and within the project area proper, there were also two small barns or outbuildings (Figure 5; Fairchild 1934). Both of the latter buildings were still present in the 1951 aerial photograph, as were the farmsteads on the road to the east. The whole area was still primarily farmland, with some woods and farmsteads, and no nearby signs of housing development (Figure 6; USDA 1951). This shows that despite the town's continuing population growth, which by that time was partly inspired by suburbanization, housing development had not yet affected this area. That situation had changed by the time of the 2019 aerial photograph. Although most of the project area was still cleared fields, housing developments surrounded it in nearly every direction, and the utility line corridor that crosses its southernmost section had been built. Some areas remained wooded or cleared, especially along stream banks, and sometimes buffering the housing developments from one another. Within the project area proper, there was no sign of the southerly barn or shed that appeared in the 1934 and 1951 aerial photographs. Close inspection of the aerial image suggests that the remains of the more northerly barn may still be present, although obscured by tree growth (Figure 7; CT ECO 2019). Southington Land Records indicate that the Catholic Cemeteries Association of the Archdiocese of Hartford owned the project parcel after 1971, buying it from the Dornfried family who used it as agricultural land. However, there is no record of the area being used for human burial before the association sold the property in 2020, and the area remained open field.

Conclusions

The documentary record indicates that it is unlikely that any significant historical resources will be impacted by the proposed project. Although there certainly maybe cultural features related to its past agricultural use, such as stone walls, these are not generally considered to be historically significant. Likewise, although there are two sites that held documented outbuildings during the early twentieth century, and one of them may still be partly extant (if in a ruined state), such minor structures are also generally not considered to be historically significant.

CHAPTER V
PREVIOUS INVESTIGATIONS

Introduction

This chapter presents an overview of previous archaeological research completed within the vicinity of the project area in Southington, Connecticut. This discussion provides the comparative data necessary for assessing the results of the current Phase IB cultural resources reconnaissance survey, and it ensures that the potential impacts to all previously recorded cultural resources located within and adjacent to the project area are taken into consideration. Specifically, this chapter reviews previously identified archaeological sites and National/State Register of Historic Places properties situated in the project region (Figures 8 and 9). The discussions presented below are based on information currently on file at the Connecticut State Historic Preservation Office in Hartford, Connecticut. In addition, the electronic site files maintained by Heritage were examined during the course of this investigation. Both the quantity and quality of the information contained in the original cultural resources survey reports and State of Connecticut archaeological site forms are reflected below.

Previously Recorded Archaeological Sites and National/State Register of Historic Places Properties/Districts in the Vicinity of the Project Area

A review of data currently on file at the Connecticut State Historic Preservation Office, as well as the electronic site files maintained by Heritage failed to detect any previously identified archaeological sites situated within 1.6 km (1 mi) of the project area (Figure 8). However, this review did reveal that four National Register of Historic Places properties are located within 1.6 km (1 mi) of the project area, all to the north (Figure 9). They are the Woodruff House, the Captain Samuel Woodruff House, the Ezekiel Woodruff House, and the Urbana Woodruff House. They are each described below.

Woodruff House

The Woodruff House is a ca., 1780 gable-roofed Greek Revival residence located at 377 Berlin Street in Southington. It occupies approximately 0.516 acres of land and is characterized by a five-bay façade with a central door. Side lights around the door, wide plain pilasters, broad window caps, and the eave returns denote the Greek Revival style and make the Woodruff House an example of an eighteenth-century vernacular adaptation of the style. In addition, the Woodruff family was one of Southington's first settlers, and one of their members lived here. The house was recorded by David Ransom, a consultant, in November 1985. It was then listed on the National Register of Historic Places on January 19, 1989. This property will not be impacted by the proposed solar center development.

Captain Samuel Woodruff House

The Captain Samuel Woodruff House is located at 23 Old State Road in Southington on a 3.22-acre lot that was once part of a larger farm. Today, a mid-nineteenth century barn remains on the property, a testament to its agricultural history. The Captain Samuel Woodruff House was nominated to the National Register of Historic Places by Consultants Barbara A. Lewis and Gregory Andrews on December 8, 1988. The house represents the Greek Revival architectural style and was built in ca., 1840. It has two stories and three-bays on its main façade. The house's flushboard siding was replaced by clapboards in the late 1920s. The house has a rare pyramidal hip roof, now covered in asphalt shingles, with a central chimney. In addition, there is a gable-roofed rear ell. Despite some modern alterations, the Captain Samuel Woodruff House remains an excellent example of a Greek Revival style farmhouse that is

altogether well-preserved. The house was built for Captain Samuel Woodruff, a Civil War captain and a direct descendent of Samuel Woodruff, Southington's first colonial settler. This property will not be impacted by the proposed solar center development.

Ezekiel Woodruff House

The Ezekiel Woodruff House was listed on the National Register of Historic Places on January 19, 1989 for its architectural significance. It was first recorded by Consultant David Ransom in November of 1985. It is a vernacular residence that was built in ca., 1758 at 1152 East Street in Southington. The house sits on a brownstone ashlar foundation, has clapboard siding, and an asphalt-shingled gable roof. It has five bays on its main façade with a central door and is one story in height. The windows have six-over-six sashes and there is a central chimney. The Woodruff family, who occupied this residence, are the first settlers of Southington. This property will not be impacted by the proposed solar center development.

Urbana Woodruff House

The Urbana Woodruff House is located at 1096 East Street in Southington. It is a 1784 vernacular residence built for the historically significant Woodruff Family. Urbana was the son of Isaac Woodruff, one of Southington's early settlers. John Jamieson, an ice man who harvested ice from Sloper's Pond, also lived in the house in the first quarter of the twentieth century. The Urbana Woodruff House was listed on the National Register of Historic Places on January 19, 1989. It is considered significant for its architectural style and displays a five-bay façade with central door and central chimney. The door surround is simple, and all windows are two-over-two sash. It provides an example of a vernacular house from the colonial era. This property will not be impacted by the proposed solar center development.

Summary and Interpretations

The review of previously identified cultural resources in the vicinity of the proposed project area indicates that the larger project region contains historic structures from Southington's earliest settlement to the present era, in an area that was agricultural for much of its history. Though no archaeological sites have been previously identified in the area, the natural setting discussed in Chapter II suggests Native Americans may have once inhabited the area, and sites may yet be discovered.

CHAPTER VI
METHODS

Introduction

This chapter describes the research design and field methods used to complete the current Phase IB cultural resources reconnaissance survey in Southington, Connecticut. It also includes the location and point-of-contact for the final facility at which all drawings, maps, photographs, and field notes generated during survey will be curated is provided below.

Research Design

The current Phase IB cultural resources reconnaissance survey was designed to identify all prehistoric and historic archaeological resources located within the project area associated with the proposed project area. Fieldwork for the project was comprehensive in nature; planning considered the results of each previously completed archaeological survey within the project general area, the distribution of previously recorded archaeological sites located near the proposed project area, and a geological assessment of the study area. The methods used to complete this investigation were designed to provide complete and thorough coverage of all portions of the study area. This undertaking entailed pedestrian survey, systematic subsurface testing, detailed mapping, and photo-documentation throughout the limits of the project area.

Field Methodology

Following the completion of all background research, the project area was subjected to a Phase IB cultural resources reconnaissance survey utilizing pedestrian survey, photo-documentation, mapping, and systematic shovel testing. The field strategy was designed such that the project area visually and photographed. The pedestrian survey portion of this investigation included visual reconnaissance of all areas scheduled for impacts by the proposed development project. The field methodology also included subsurface testing of the proposed array areas, during which shovel tests were excavated at 25 m (82 ft) intervals along survey transects spaces 25 m (82 ft) apart. Shovel testing was not completed within the two natural gas pipeline right of ways separating the solar arrays since these areas were previously disturbed by construction. The proposed access road leading to the solar facility also was not tested because it was heavily disturbed in the past and contained areas of slope.

Each shovel test excavated during the survey measured 50 x 50 cm (19.7 x 19.7 in) in size and each was excavated until the glacially derived C-Horizon was encountered or until large buried objects (e.g., boulders) prevented further excavation. Each shovel test was excavated in 10 cm (3.9 in) arbitrary levels within natural strata, and the fill from each level was screened separately. All shovel test fill was screened through 0.635 cm (0.25 in) hardware cloth and examined visually for cultural material. Soil characteristics were recorded in the field using Munsell Soil Color Charts and standard soils nomenclature. Finally, each shovel test was backfilled immediately upon completion of the archaeological recordation process.

Curation

Following the completion and acceptance of the Final Report of Investigations, all drawings, maps, photographs, and field notes will be curated with:

Dr. Sarah Sportman
Office of Connecticut State Archaeology
Box U-1023
University of Connecticut
Storrs, Connecticut 06269

CHAPTER VII
RESULTS OF THE INVESTIGATION

Introduction

This chapter presents the results of a Phase IB cultural resources reconnaissance survey of the project area associated with the proposed Southington Solar One Project in Southington, Connecticut (Figure 1). The Phase IB investigation was completed on behalf of All-Points Technology Corporation in June of 2020 by personnel representing Heritage. All fieldwork was performed in accordance with the *Environmental Review Primer for Connecticut's Archaeological Resources* (Poirier 1987) promulgated by the Connecticut State Historic Preservation Office. The Phase IB cultural resources reconnaissance survey results are presented below.

Results of the Phase IB Cultural Resources Reconnaissance Survey of the Study Area

As discussed in Chapter I of this document, the parcel of land associated with the proposed project will be the site of a 4.725 MW solar center that will include the installation of rows of solar panels spaced 4.9 m (16 ft) apart across three solar arrays. This area will be accessed via an access road leading from East Street to the northeastern portion of the project area. The project area, which is located within a large agricultural field, is situated at elevations ranging from 61 to 64 m (200 to 210 ft) NGVD and it contains two natural gas line easements.

The current Phase IB survey effort consisted of pedestrian survey, subsurface testing, and mapping of the project parcel. The subsurface testing regime associated with the Phase IB cultural archaeological resources survey resulted in the excavation of 187 of 187 (100 percent) planned shovel tests measuring 50 x 50 cm (19.7 x 19.7 in) in size throughout the proposed solar center area (Figure 10). A single shirt cuff button was recovered from Shovel Test Pit 2 along Transect 7; however this item was later determined to be plastic and of modern origin. Thus, no prehistoric or historic period cultural materials or evidence of cultural features was identified during the archaeological survey. Heritage anticipates that no archaeological deposits will be impacted by the proposed project and no additional survey is recommended prior to construction.

CHAPTER VIII
SUMMARY AND MANAGEMENT RECOMMENDATIONS

Heritage completed the current Phase IB cultural resources reconnaissance survey on behalf of All-Points Technology Corporation in June of 2020. A total of 187 of 187 (100 percent) planned shovel tests were excavated throughout the 37.7-acre proposed solar center area in Southington, Connecticut. This effort failed to identify any prehistoric or historic period cultural materials or features. Therefore, no additional examination of the proposed solar center project area is recommended prior to construction.

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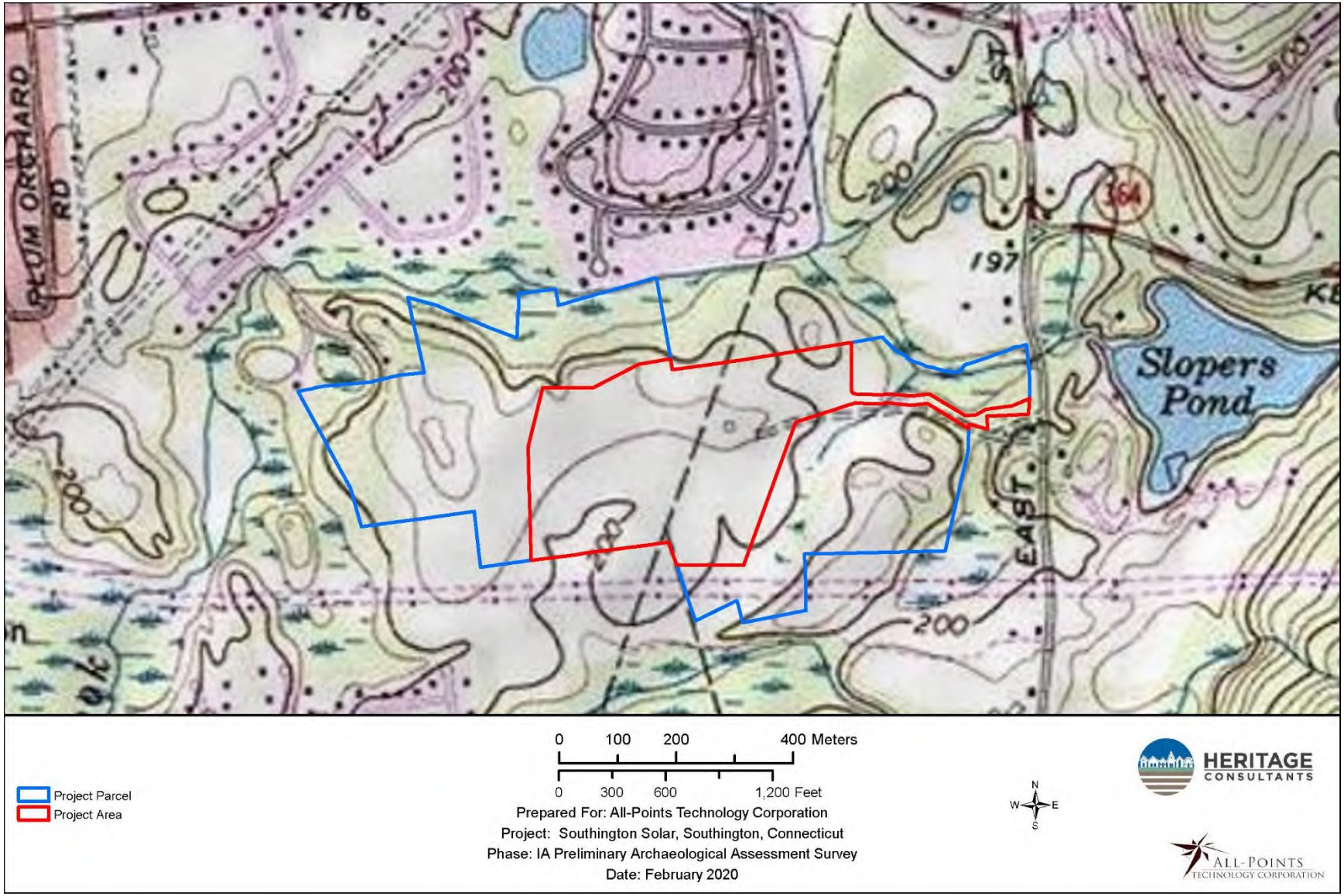


Figure 1. Excerpt from a USGS 7.5' series topographic quadrangle image showing the location of the survey area in Southington, Connecticut.

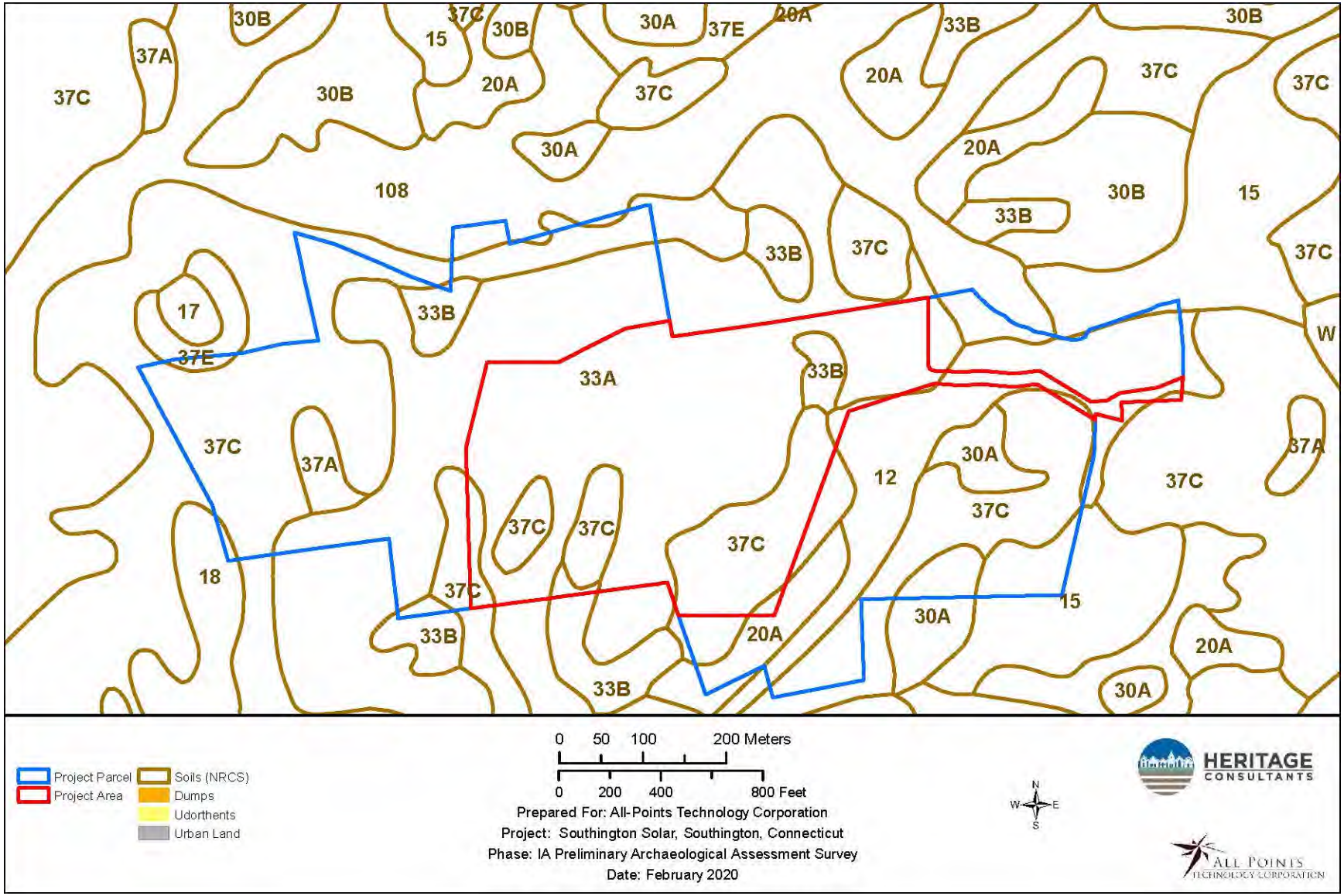


Figure 2. Map of soils located in the vicinity of the survey area in Southington, Connecticut.

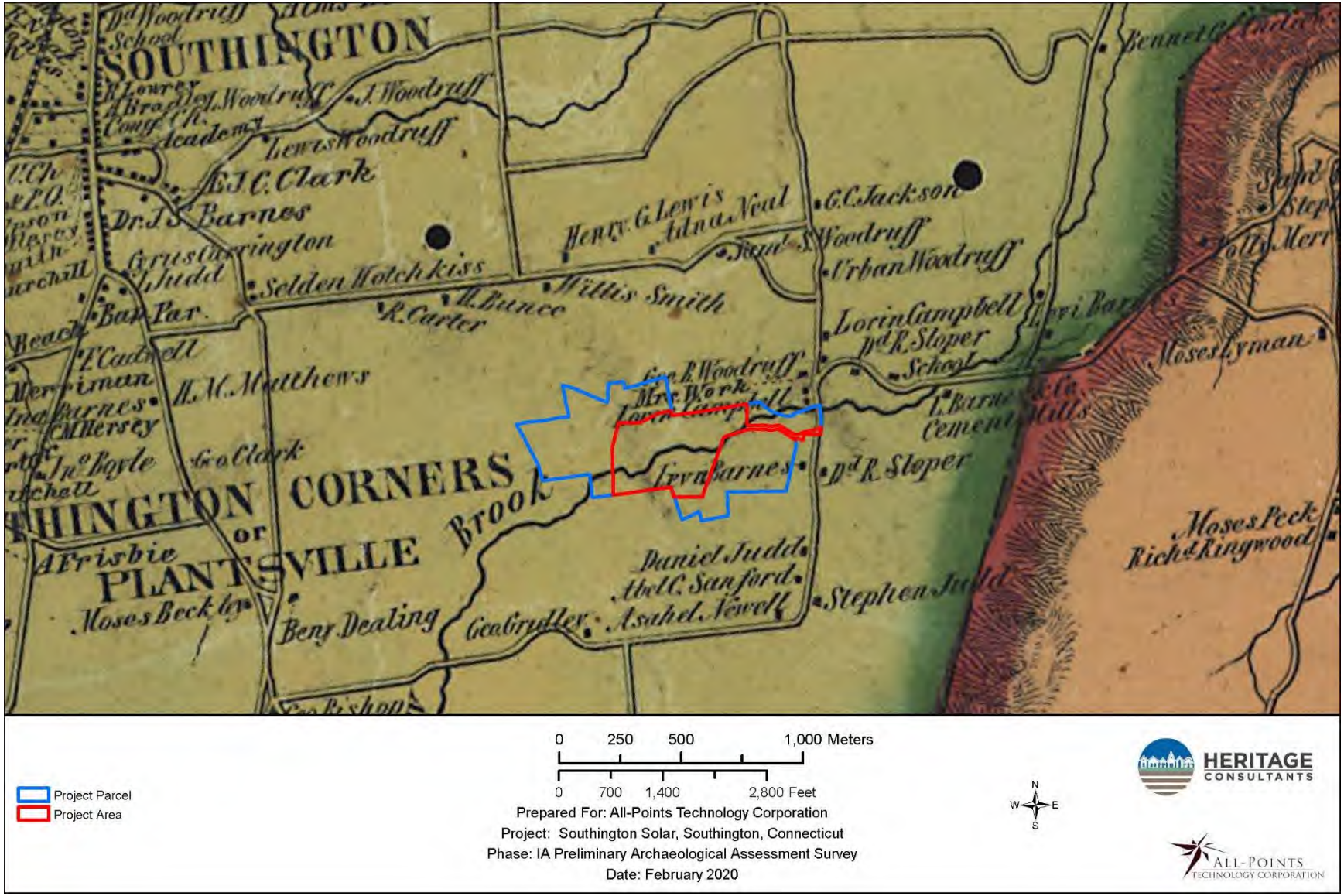


Figure 3. Excerpt from an 1855 historic map showing the location of the survey area in Southington, Connecticut.

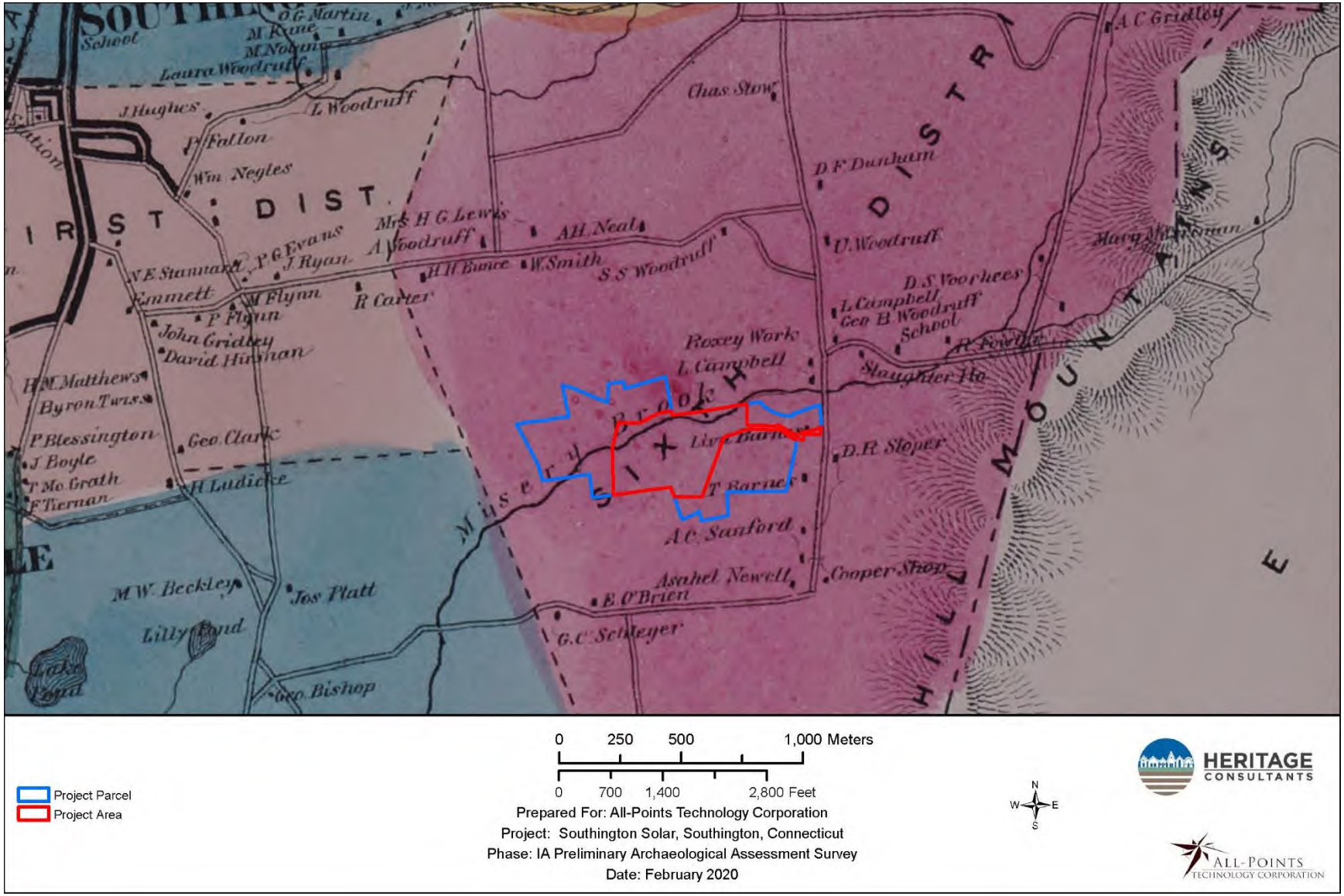


Figure 4. Excerpt from an 1869 historic map showing the location of the survey area in Southington, Connecticut.

Figure 5. Excerpt from a 1934 aerial photograph showing the location of the project area in Southington, Connecticut.

Figure 6. Excerpt from a 1951 aerial photograph showing the location of the project area in Southington, Connecticut.

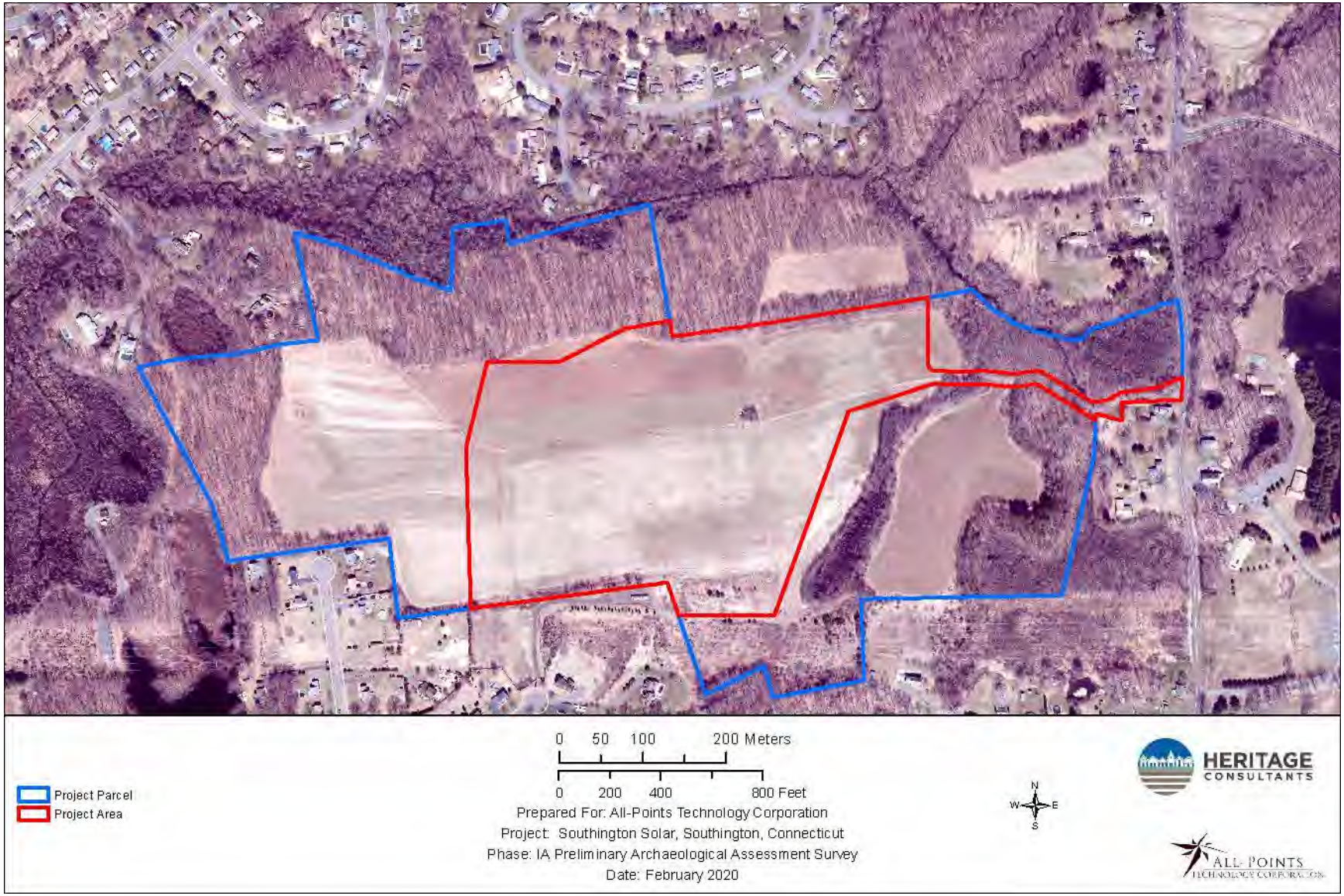


Figure 7. Excerpt from a 2019 aerial photograph showing the location of the project area in Southington, Connecticut.

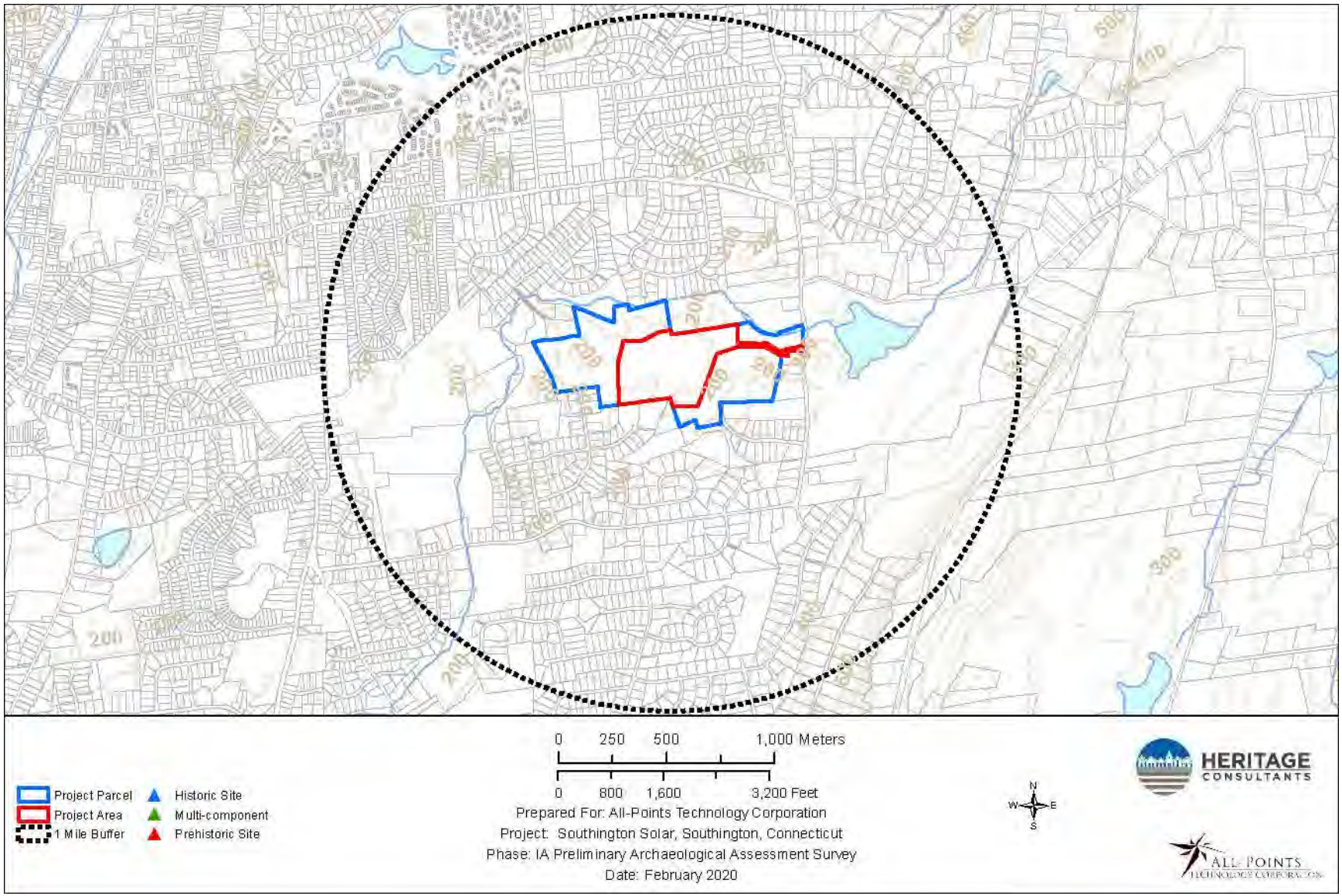


Figure 8. Digital map showing the location of previously identified archaeological sites in the vicinity of the project area in Southington, Connecticut.

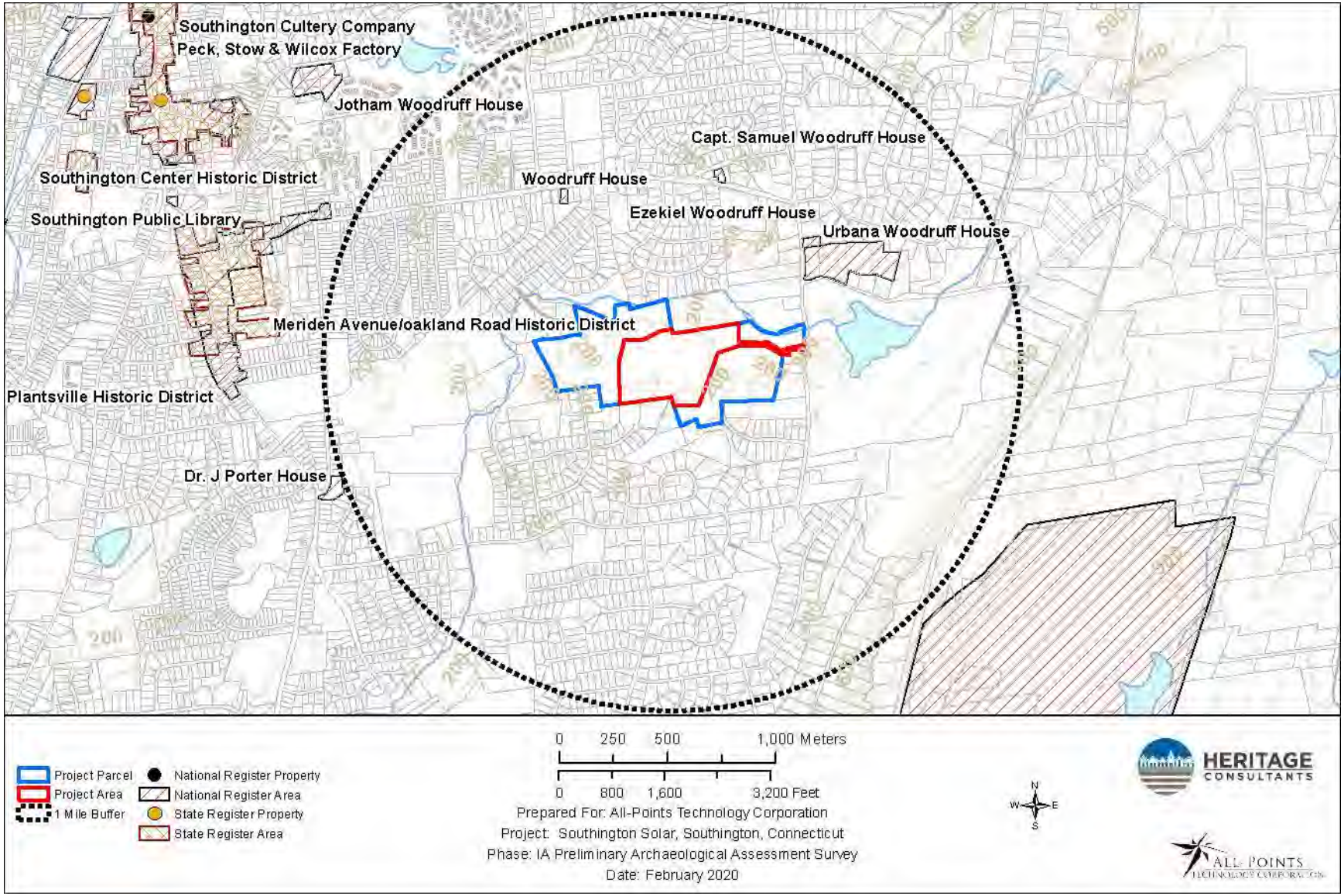


Figure 9. Digital map depicting the locations of previously identified National/State Register of Historic Places properties in the vicinity of the project area in Southington, Connecticut.

Figure 10. Plan view of shovel test pits excavated within the project area in Southington, Connecticut.

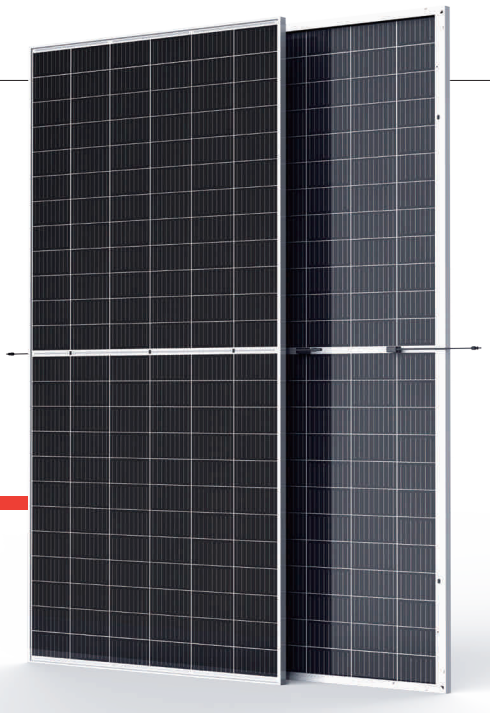
APPENDIX F

PRODUCT INFORMATION SHEETS

THE

DUOMAX twin

BIFACIAL DUAL GLASS 144 CELL MULTI BUSBAR MODULE



PRODUCTS	POWER RANGE
TSM-DEG15MC.20(II)	390-410W

144-Cell
MONOCRYSTALLINE MODULE

390-410W
POWER OUTPUT RANGE

20.2%
MAXIMUM EFFICIENCY

0~+5W
POSITIVE POWER TOLERANCE

Founded in 1997, Trina Solar is the world's leading total solution provider for solar energy. With local presence around the globe, Trina Solar is able to provide exceptional service to each customer in each market and deliver our innovative, reliable products with the backing of Trina as a strong, bankable brand. Trina Solar now distributes its PV products to over 100 countries all over the world. We are committed to building strategic, mutually beneÿcial collaborations with installers, developers, distributors and other partners in driving smart energy together.

Comprehensive Products and System Certificates

IEC61215/IEC61730/IEC61701/IEC62716
ISO 9001: Quality Management System
ISO 14001: Environmental Management System
ISO14064: Greenhouse Gases Emissions Veriÿcation
OHSAS 18001: Occupation Health and Safety Management System

High power output

- Up to 410W front power and 20.2% module efficiency with half-cut and MBB (Multi Busbar) technology enabling higher BOS savings
- Lower resistance of half-cut cells ensures higher power

Certified to perform in highly challenging environments

- High PID resistance through cell process and module material control
- Resistant to salt, acid, sand, and ammonia
- Proven to be reliable in high temperature and humidity areas
- Certified to the best fire class A
- Minimizes micro-crack and snail trails
- Certified to 5400 Pa positive load and 2400 Pa negative load

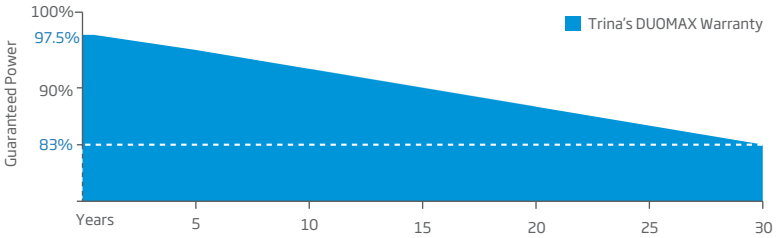
High energy generation, low LCOE

- Up to 25% additional power gain from back side, depending on the albedo
- Excellent 3rd party validated IAM and low light performance with cell process and module material optimization
- Low temp coefficient (-0.35%) and NMOT increases energy production
- Better anti-shading performance and lower operating temperature
- Higher power from same installation footprint as standard modules

Easy to install, wide application

- Frame design enables compatibility with standard installation methods
- Deployable for ground mounted utility, carports, and agricultural projects
- Safe and easy to transport, handle, and install like normal framed modules

Trina Solar's DUOMAX Performance Warranty



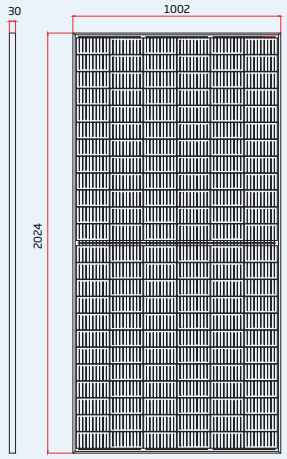
From the 2nd year to the 30th year, the average annual power decline will be no more than 0.5%.

Trinasolar

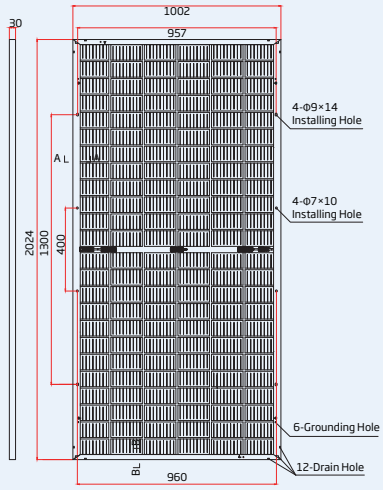
DUOMAX twin

BIFACIAL DUAL GLASS 144 HALF-CELL MBB MODULE

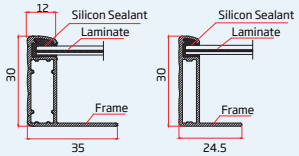
DIMENSIONS OF PV MODULE (mm)



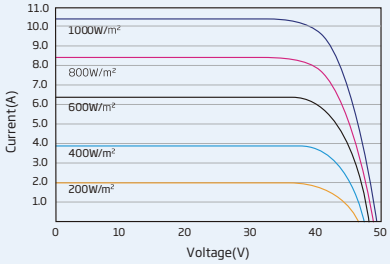
Front View



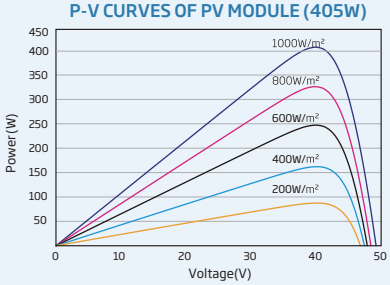
Back View



I-V CURVES OF PV MODULE (405 W)



P-V CURVES OF PV MODULE (405W)



ELECTRICAL DATA (STC)

Peak Power Watts-P_{MAX} (Wp)*	390	395	400	405	410
Power Output Tolerance-P_{MAX} (W)	0 ~ +5				
Maximum Power Voltage-V_{MPP} (V)	40.2	40.5	40.8	41.1	41.4
Maximum Power Current-I_{MPP} (A)	9.71	9.76	9.81	9.86	9.91
Open Circuit Voltage-V_{OC} (V)	48.5	48.7	48.9	49.1	49.3
Short Circuit Current-I_{SC} (A)	10.25	10.29	10.33	10.37	10.41
Module Efficiency η_m (%)	19.2	19.5	19.7	20.0	20.2

STC: Irradiance 1000W/m², Cell Temperature 25°C, Air Mass AM1.5.
*Measuring tolerance: ±3%.

ELECTRICAL DATA (NMOT)

Maximum Power-P_{MAX} (Wp)	295	299	302	306	310
Maximum Power Voltage-V_{MPP} (V)	37.7	38.0	38.3	38.6	38.9
Maximum Power Current-I_{MPP} (A)	7.82	7.86	7.90	7.93	7.97
Open Circuit Voltage-V_{OC} (V)	45.7	45.9	46.1	46.3	46.5
Short Circuit Current-I_{SC} (A)	8.26	8.29	8.33	8.36	8.39

NMOT: Irradiance at 800W/m², Ambient Temperature 20°C, Wind Speed 1m/s.

Electrical characteristics with different rear side power gains (referenced specifically to 405 Wp front)**

Maximum Power-P_{MAX} (Wp)	425	446	466	486	506
Maximum Power Voltage-V_{MPP} (V)	41.1	41.1	41.1	41.1	41.1
Maximum Power Current-I_{MPP} (A)	10.35	10.85	11.34	11.83	12.33
Open Circuit Voltage-V_{OC} (V)	49.2	49.3	49.4	49.5	49.6
Short Circuit Current-I_{SC} (A)	10.89	11.41	11.93	12.44	12.96
P_{max} gain	5%	10%	15%	20%	25%

Power Bifaciality:70±5%.

MECHANICAL DATA

Solar Cells	Monocrystalline
Cell Orientation	144 cells (6 × 24)
Module Dimensions	2024 × 1002 × 30 mm (79.69 × 39.45 × 1.18 inches)
Weight	26.0 kg (57.3 lb)
Front Glass	2.0 mm (0.08 inches), High Transmission, AR Coated Heat Strengthened Glass
Encapsulant material	POE/EVA
Back Glass	2.0 mm (0.08 inches), Heat Strengthened Glass (White Grid Glass)
Frame	30mm (1.18 inches) Anodized Aluminium Alloy
J-Box	IP 68 rated
Cables	Photovoltaic Technology Cable 4.0 mm² (0.006 inches²) Portrait: 280/280 mm (11.02/11.02 inches) Landscape: 1900/1900 mm (74.80/74.80 inches)
Connector	Trina TS4

TEMPERATURE RATINGS

NMOT(Nominal Moudule Operating Temperature)	41°C (±3°C)
Temperature Coefficient of P_{MAX}	- 0.35%/°C
Temperature Coefficient of V_{OC}	- 0.25%/°C
Temperature Coefficient of I_{SC}	0.04%/°C

MAXIMUM RATINGS

Operational Temperature	-40~+85°C
Maximum SystemVoltage	1500V DC (IEC)
	1500V DC (UL)
Max Series Fuse Rating	20A

(Do not connect Fuse in Combiner Box with two or more strings in parallel connection)

WARRANTY

12 year Product Workmanship Warranty

30 year Power Warranty

(Please refer to product warranty for details)

PACKAGING CONFIGURATION

Modules per box: 35 pieces

Modules per 40' container: 665 pieces

** Back-side power gain varies depending upon the specific project albedo

Trinasolar

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

Version number: TSM_DEG15MC20_EN_2020_RED

www.trinasolar.com

HIGH PERFORMANCE
BIFACIAL PERC MONOCRYSTALLINE MODULE

RSM144-6-370BMDG-390BMDG

144 CELL MONOCRYSTALLINE MODULE

370-390Wp POWER OUTPUT RANGE

1500VDC MAXIMUM SYSTEM VOLTAGE

19.5% MAXIMUM EFFICIENCY

risen solar technology

About Risen Energy

Risen Energy is a leading, global tier 1 manufacturer of high-performance solar photovoltaic products and provider of total business solutions for residential, commercial and utility-scale power generation. The company, founded in 1986, and publicly listed in 2010, compels value generation for its chosen global customers. Techno-commercial innovation, underpinned by consummate quality and support, encircle Risen Energy's total Solar PV business solutions which are among the most powerful and cost-effective in the industry. With local market presence and strong financial bankability status, we are committed, and able, to building strategic, mutually beneficial collaborations with our partners, as together we capitalise on the rising value of green energy.

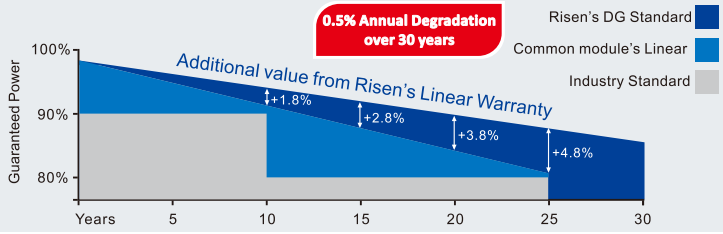
ISO9001
ISO14001
OHSAS18001

KEY SALIENT FEATURES

- Global, Tier 1 bankable brand, with independently certified state-of-the-art automated manufacturing
- Bifacial technology enables additional energy harvesting from rear side (up to 25%)
- Industry leading lowest thermal co-efficient of power
- Industry leading 12 years product warranty
- Excellent low irradiance performance
- Excellent PID resistance
- Positive tight power tolerance
- Dual stage 100% EL Inspection warranting defect-free product
- Module Imp binning radically reduces string mismatch losses
- Warranted reliability and stringent quality assurances well beyond certified requirements
- Certified to withstand severe environmental conditions
  - Anti-reflective & anti-soiling surface minimise power loss from dirt and dust
  - Severe salt mist, ammonia & blown sand resistance, for seaside, farm and desert environments
  - Excellent mechanical load 2400Pa & snow load 5400Pa resistance

LINEAR PERFORMANCE WARRANTY

12 year Product Warranty / 30 year Linear Power Warranty

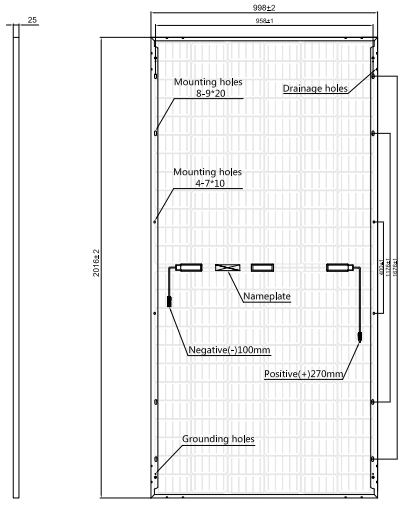


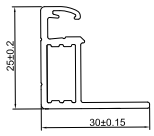
RISEN ENERGY CO., LTD.
Tashan Industry Zone, Meilin,
Ninghai 315609,Ningbo | PRC
Tel: +86-574-59953239
Fax: +86-574-59953599
E-mail: info@risenenergy.com
Website: www.risenenergy.com

THE POWER OF RISING VALUE

Dimensions of PV Module

Unit: mm





ELECTRICAL DATA (STC)

Model Number	RSM144-6-370BMDG	RSM144-6-375BMDG	RSM144-6-380BMDG	RSM144-6-385BMDG	RSM144-6-390BMDG
Rated Power in Watts-Pmax(Wp)	**370**	**375**	**380**	**385**	**390**
Open Circuit Voltage-Voc(V)	47.60	47.75	48.00	48.15	48.30
Short Circuit Current-Isc(A)	9.90	10.00	10.10	10.20	10.30
Maximum Power Voltage-Vmpp(V)	39.80	39.90	40.05	40.15	40.25
Maximum Power Current-Impp(A)	9.30	9.40	9.50	9.60	9.70
Module Efficiency (%)	18.5	18.8	19.0	19.3	19.5
Encapsulated Cell Efficiency (%)	20.8	21.1	21.4	21.6	21.9

STC: Irradiance 1000 W/m², Cell Temperature 25°C, Air Mass AM1.5 according to EN 60904-3.
Power production tolerance: 0~+3%

REARSIDE POWER GAIN BIFACIAL FACTOR:75%±5

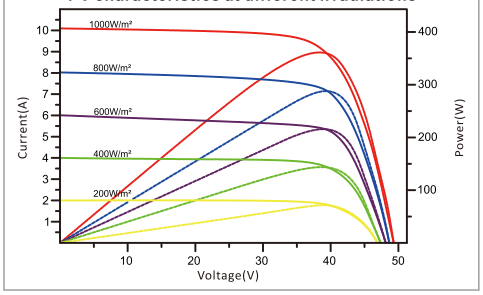
Model Number		RSM144-6-370BMDG	RSM144-6-375BMDG	RSM144-6-380BMDG	RSM144-6-385BMDG	RSM144-6-390BMDG
10%	Power Output(Wp)	407	413	418	424	429
15%	Power Output(Wp)	426	431	437	443	449
20%	Power Output(Wp)	444	450	456	462	468
25%	Power Output(Wp)	463	469	475	481	488

ELECTRICAL DATA (NMOT)

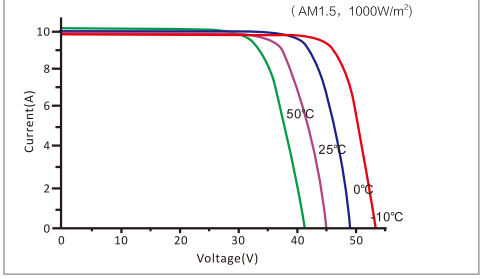
Model Number	RSM144-6-370BMDG	RSM144-6-375BMDG	RSM144-6-380BMDG	RSM144-6-385BMDG	RSM144-6-390BMDG
Maximum Power-Pmax (Wp)	276.7	280.3	284.4	288.1	291.8
Open Circuit Voltage-Voc (V)	43.8	43.9	44.2	44.3	44.4
Short Circuit Current-Isc (A)	8.12	8.20	8.28	8.36	8.45
Maximum Power Voltage-Vmpp (V)	36.5	36.6	36.7	36.8	36.9
Maximum Power Current-Impp (A)	7.59	7.67	7.75	7.83	7.92

NMOT: Irradiance at 800 W/m², Ambient Temperature 20°C, Wind Speed 1 m/s.

RSM144-6-390BMDG
I-V characteristics at different irradiations



I-V characteristics at different temperatures
(AM1.5, 1000W/m²)



MECHANICAL DATA

Solar cells	Monocrystalline, 6" half cell
Cell configuration	144 cells (6×12+6×12)
Module dimensions	2016×998×25mm
Weight	26kg
Superstrate	2.0 mm, ARC Glass
Substrate	2.0 mm, Glazed Glass
Frame	Anodized Aluminium Alloy type 6063T5, Silver Color
J-Box	Potted, IP68, 1500VDC, 3 Schottky bypass diodes
Cables	4.0mm² (12AWG), positive 270mm length, negative 100mm length
Connector	Risen Twinsel PV-SY02, IP68

TEMPERATURE & MAXIMUM RATINGS

Nominal Module Operating Temperature (NMOT)	45°C±2°C
Temperature Coefficient of Voc	-0.29%/°C
Temperature Coefficient of Isc	0.06%/°C
Temperature Coefficient of Pmax	-0.37%/°C
Operational Temperature	-40°C~+85°C
Maximum System Voltage	1500VDC
Max Series Fuse Rating	20A
Limiting Reverse Current	20A

PACKAGING CONFIGURATION

	40ft	20ft
Number of modules per container	880	400
Number of modules per pallet	40	40
Number of pallets per container	22	10
Packaging box dimensions (LxWxH) in mm	2110×1130×1140	2110×1130×1140
Box gross weight[kg]	1100	1100

Our Partners:

CAUTION: READ SAFETY AND INSTALLATION INSTRUCTIONS BEFORE USING THE PRODUCT.

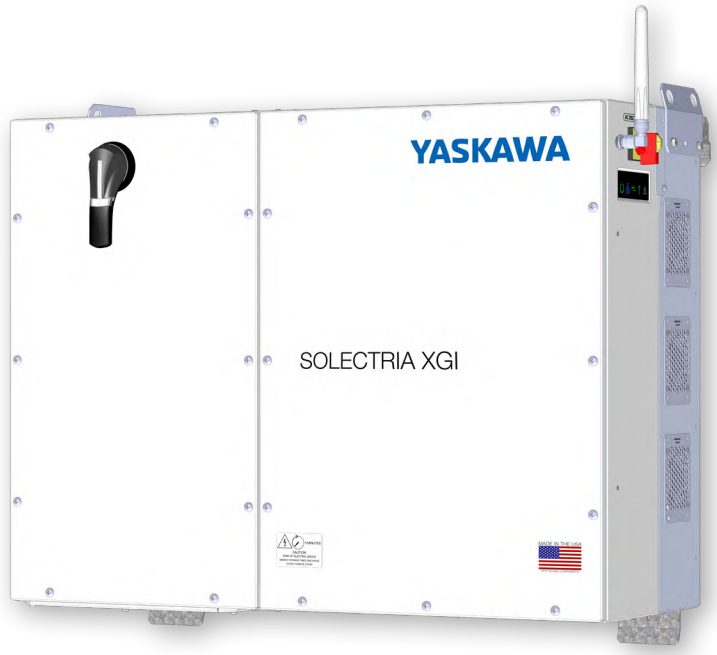
THE POWER OF RISING VALUE

REM144-BMDG-EN-BVC-Q3.2019-5BB

YASKAWA

SOLECTRIA XGI™ 1500

Premium 3-Phase Transformerless Utility-Scale Inverters



Features

- Made in the USA with global components
- Buy American Act (BAA) compliant
- Four models: 125kW/125kVA, 125kW/150kVA, 150kW/166kVA, 166kW/166kVA
- 99.0% peak efficiency
- Flexible solution for distributed and centralized system architecture
- Advanced grid-support functionality Rule 21/UL1741SA
- Robust, dependable and built to last
- Lowest O&M and installation costs
- Access all inverters on site via WiFi from one location
- Remote diagnostics and firmware upgrades
- SunSpec Modbus Certified

Options

- String combiners for distributed and centralized systems
- Web-based monitoring
- Extended warranty

MADE IN THE USA

With U.S. and Global Components

Yaskawa Solectria Solar's XGI 1500 utility-scale string inverters are designed for high reliability and built of the highest quality components that were selected, tested and proven to last beyond their warranty. The XGI 1500 inverters provide advanced grid-support functionality and meet the latest IEEE 1547 and UL 1741 standards for safety. The XGI 1500 inverters are the most powerful 1500VDC string inverters in the PV market and have been engineered for both distributed and centralized system architecture. Designed and engineered in Lawrence, MA, the new SOLECTRIA XGI inverters are assembled and tested at Yaskawa America's facilities in Buffalo Grove, IL. The XGI 1500 inverters are Made in the USA with global components and are compliant with the Buy American Act.

SOLECTRIA SOLAR

SOLECTRIA XGI 1500

Specifications

	XGI 1500-125/125	XGI 1500-125/150	XGI 1500-150/166	XGI 1500-166/166
DC Input				
Absolute Maximum Input Voltage	1500 VDC	1500 VDC	1500 VDC	1500 VDC
Maximum Power Input Voltage Range (MPPT)	860-1250 VDC	860-1250 VDC	860-1250 VDC	860-1250 VDC
Operating Voltage Range (MPPT)	860-1450 VDC	860-1450 VDC	860-1450 VDC	860-1450 VDC
Number of MPP Trackers	1 MPPT	1 MPPT	1 MPPT	1 MPPT
Maximum Operating Input Current	148.3 A	148.3 A	178.0 A	197.7 A
Maximum Operating PV Power	128 kW	128 kW	153 kW	170 kW
Maximum DC/AC Ratio | Max Rated PV Power	2.0 | 250 kW	2.0 | 250 kW	1.66 | 250 kW	1.5 | 250 kW
Max Rated PV Short-Circuit Current (∑Isc x 1.25)	320 A	320 A	320 A	320 A
AC Output				
Nominal Output Voltage	600 VAC, 3-Ph	600 VAC, 3-Ph	600 VAC, 3-Ph	600 VAC, 3-Ph
AC Voltage Range	-12% to +10%	-12% to +10%	-12% to +10%	-12% to +10%
Continuous Real Output Power	125 kW	125 kW	150 kW	166 kW
Continuous Apparent Output Power	125 kVA	150 kVA	166 kVA	166 kVA
Maximum Output Current	120 A	144 A	160 A	160 A
Nominal Output Frequency	60 Hz	60 Hz	60 Hz	60 Hz
Power Factor (Unity default)	+/- 0.80 Adjustable	+/- 0.80 Adjustable	+/- 0.80 Adjustable	+/- 0.80 Adjustable
Total Harmonic Distortion (THD) @ Rated Load	<3%	<3%	<3%	<3%
Grid Connection Type	3-Ph + N/GND	3-Ph + N/GND	3-Ph + N/GND	3-Ph + N/GND
Fault Current Contribution (1 cycle RMS)	144 A	173 A	192 A	192 A
Efficiency				
Peak Efficiency	98.9%	98.9%	99.0%	99.0%
CEC Average Efficiency	98.5%	98.5%	98.5%	98.5%
Tare Loss	<1 W	<1 W	<1 W	<1 W
Temperature				
Ambient Temperature Range	-40°F to 140°F (-40C to 60C)		-40°F to 140°F (-40C to 60C)	
De-Rating Temperature	122°F (50C)		113°F (45C)	
Storage Temperature Range	-40°F to 167°F (-40C to 75C)		-40°F to 167°F (-40C to 75C)	
Relative Humidity (non-condensing)	0 - 95%		0 - 95%	
Operating Altitude	9,840 ft (3 km)		9,840 ft (3 km)	
Communications				
Advanced Graphical User Interface	WiFi			
Communication Interface	Ethernet			
Third-Party Monitoring Protocol	SunSpec Modbus TCP/IP			
Web-Based Monitoring	Optional			
Firmware Updates	Remote and Local			
Testing & Certifications				
Safety Listings & Certifications	UL 1741, IEEE 1547, UL 1998			
Advanced Grid Support Functionality	Rule 21, UL 1741SA			
Testing Agency	ETL			
FCC Compliance	FCC Part 15, Class A			
Warranty				
Standard and Options	5 Years Standard; Option for 10 Years			
Enclosure				
Acoustic Noise Rating	56 dBA @ 3 m			
DC Disconnect	Integrated 2-Pole 250 A DC Disconnect			
Mounting Angle	Vertical only			
Dimensions	Height: 29.5 in. (750 mm) | Width: 39.4 in. (1000 mm) | Depth: 15.1 in. (380 mm)			Specifications subject to change.
Weight	270 lbs (122 kg)			
Enclosure Rating and Finish	Type 4X, Polyester Powder-Coated Aluminum			

SOLECTRIA SOLAR

Yaskawa Solectria Solar
360 Merrimack Street
Lawrence, MA 01843
solectria.com

1-978-683-9700
Email: inverters@solectria.com

Document FL.XGI1500.01
2/6/2020

YASKAWA

YASKAWA

XGI 1500 COMBINERS

Increased Design Flexibility for SOLECTRIA XGI 1500

Features

- Made in the USA with global components
- Buy American Act (BAA) compliant
- Designed exclusively for use with XGI 1500 inverters
- Both poles fused and switched
- 16, 20, 24, 26, and 28 fuse positions
- 15 and 20 A fuse options for all models; 25 and 30 A fuse options for select models only
- Connection plates for compression terminals
- 90C terminal rating

Option

- Surge arrestor, both polarities

Yaskawa Solectria Solar offers two 1500V string combiners, Attachable & Remote, each designed to pair exclusively with SOLECTRIA XGI 1500 inverters. The 1500V Attachable Combiner is designed to mate directly to the XGI 1500 inverter for use in distributed PV systems where the combiner and inverter are located together throughout the array field. The 1500V Remote Combiner has similar features, but is designed for a centralized or clustered deployment of multiple XGI 1500 inverters where the combiners are distributed throughout the PV array field. Both combiner lines feature the highest quality and durability in the industry today.

Choose from models with 16 to 28 fused positions and either 15 or 20 A fuses. Specific models also available with 25 A fuses (20 positions) and 30 A fuses (16 positions). The combiners match the XGI 1500 in quality and appearance. Both models satisfy the National Electrical Code for systems with ungrounded PV source circuits. All Yaskawa Solectria Solar XGI inverters and combiners are Made in the USA with global components and are compliant with the Buy American Act.

MADE IN THE USA

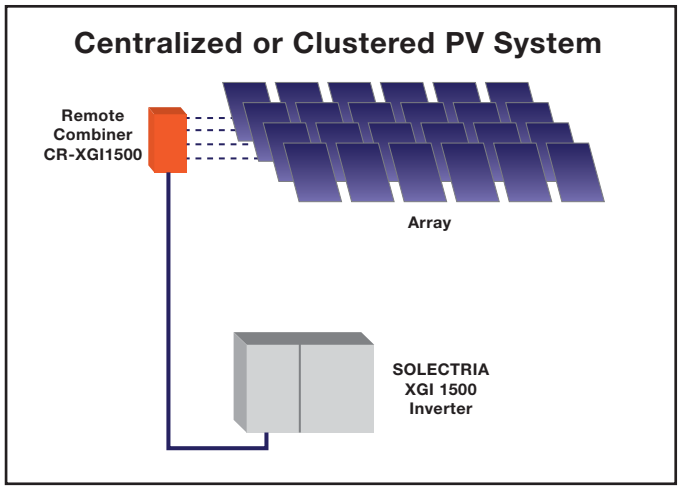
With U.S. and Global Components

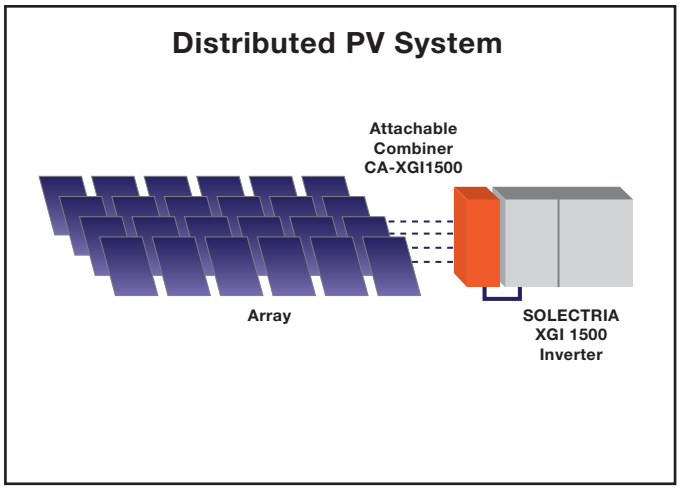
SOLECTRIA SOLAR

XGI 1500 COMBINERS

Specifications

	1500V Remote Combiner			1500V Attachable Combiner		
1500V String Combiners exclusively for use with SOLECTRIA XGI 1500						
Input Wire Compatibility	14-4 AWG			14-4 AWG		
Output Wire Compatibility	Compression Terminal: 1 conductor, 1/0 - 500 kcmil | 2 conductors, 1/0 - 500 kcmil			Compression Terminal: 1 conductor, 1/0 - 500 kcmil | 2 conductors, 1/0 - 500 kcmil		
Maximum Voltage	1500 VDC			1500 VDC		
Fuse Rating Options	15 A or 20 A (fuses included)	25 A	30 A	15 A or 20 A (fuses included)	25 A	30 A
Number of Fused Positions	16 / 20 / 24 / 26 / 28	20	16	16 / 20 / 24 / 26 / 28	20	16
Input PV Source Circuit Configurations	Ungrounded PV Source Circuits			Ungrounded PV Source Circuits		
Fuse Configurations	Both positive and negative polarities fused			Both positive and negative polarities fused		
DC Disconnect	2-pole integrated DC disconnect, positive and negative poles switched			DC Disconnect located on XGI 1500 inverter		
DC Disconnect Current Rating	250 A			250 A (located on XGI 1500)		
Temperature Range	-40°F to 122°F (-40°C to 50°C)			-40°F to 122°F (-40°C to 50°C)		
Mounting Positions	Indoor, Outdoor, Wall, Array - Vertical, Horizontal or Angled			Mechanically attaches to structure		
Safety Certification & Listing	UL 1741			UL 1741		
Standard Warranty	5 Years			5 Years		
Enclosure Material Options & Rating	Polyester Powder Coated Aluminum, NEMA Type 4X			Polyester Powder Coated Aluminum, NEMA Type 4X		
Option						
Surge Protection	Both positive and negative polarities			Both positive and negative polarities		





SOLECTRIA SOLAR

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DOCR-071001-C | February 2019

YASKAWA

power to conserve

HPS Millennium™ E
Medium Voltage Distribution Transformer
- up to 34.5kV

power to perform

Hammond Power Solutions

HPS Millennium™ E
Medium Voltage Transformer

HPS MILLENNIUM™ E

Hammond Power Solutions (HPS) is the industry leading manufacturer of standard and custom dry-type transformers in North America. Every HPS product is built with the quality and dependability you count on.

HPS Millennium™ medium voltage distribution transformers are designed for many demanding and diverse applications, while minimizing both installation and maintenance costs. Coils are precision wound with copper or aluminum conductors using either barrel or comb wound designs with a full vacuum-pressure impregnation (VPI) insulation system.

With three phase ratings up to 15MVA, 34.5kV, 175kV BIL and single phase to 5MVA, they feature the newest technology and manufacturing processes.

To service all of your medium voltage needs, HPS Millennium™ G is also available for applications requiring voltages up to 5kV. For more information on HPS Millennium™ G (catalog no. MILGMED), please contact us or visit the HPS Website.

SUPPORT & RESOURCES

No other transformer company can offer our service and quality in a full range of products:

- **Current Calculator:** Calculate the Amps, Volts, or kVA of a transformer. Visit the "Online Tools" area of the HPS website.
- **Fast On-Site Response:** On-site technicians are available to assist with any technical problems or issues that cannot be resolved over the phone.
- **Live Telephone Technical Support:** Our inside sales team is available to quickly answer your questions. They are technically trained and able to answer most questions right over the phone.
- **Easy-To-Access Installation Manuals:** All transformer installation manuals are conveniently located on our website so you can access them anywhere, anytime.
- **Online Technical Support:** Get answers to frequently asked questions, troubleshooting tips and instruction sheets by visiting the "Technical Support" area of the HPS website.

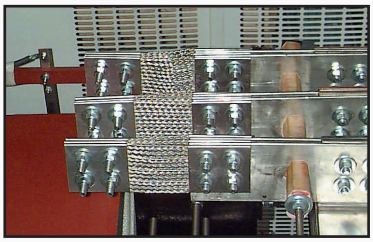
APPLICATIONS

HPS Millennium™ E is suitable for any commercial, industrial, manufacturing or production process application. They can be offered for a variety of environmental conditions and built to meet the most onerous duty.

- Industrial
- Commercial
- Data Centers
- Renewable Energy

Built-in enclosure fork lift capability


Low voltage bus bar


Flexible connectors

Hammond Power Solutions

FEATURES

Core & Coil Construction:

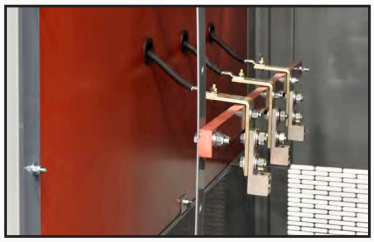
- Manufactured from quality non-aging, cold rolled, silicon steel laminations
- Cores are precision cut to close tolerances to eliminate gaps and improve performance
- Core is coated to prevent the ingress of moisture
- Precision wound with copper or aluminum conductors that are electrically balanced to minimize axial forces during short-circuit conditions
- Wire or foil conductors for optimum performance for the application
- Robust interface between core & coils for better short circuit performance
- Utilize both barrel or comb wound construction techniques
- Available with multiple termination configurations: stubs-up, coordinated bus-to-end
- Vibration isolation pads to minimize noise

BENEFITS

- Meets the minimum efficiency standards mandated in DOE 10 CFR Part 431 (levels as of Jan. 1st 2016), NRCan 2019 SOR/2018-201 Amd. 14, ON Reg. 404/12 (effective Jan. 1st, 2018) and exceeds CSA C802.2-12 resulting in increased dollar savings and positive societal/ environmental payback
- Designed for indoor or outdoor applications
- VPI windings are mechanically durable for the most demanding environments typically found in mining, crane and other difficult mechanical applications.
- Minimal maintenance required beyond removing surface contaminants, such as dirt
- Can be energized immediately after installation
- Excellent resistance to short circuits
- Self-extinguishing in the unlikely event of fire
- Environmentally friendly


Lift off hinged doors


Lifting eyes for core & coil assembly


Air terminal chamber (ATC)

HPS Millennium™ E
Medium Voltage Transformer

Specifications - Copper or Aluminum

kVA: 225-2500kVA (DOE16)
225-7500kVA (NRCan 2019) others available upon request

High Voltage (Primary): Up to 34.5 kV Class, up to 175 kV BIL
Up to 150 kV BIL (BIL per CSA and IEEE/ANSI standards)
Standard taps +/- 2.5%, +/- 5%
Other options available upon request

Low Voltage (Secondary): 208Y/120V to 600Y/347V & 2.4-5kV up to 60kV BIL
Higher BIL available upon request

Frequency: 60 Hz, others available upon request

Insulation System: 220°C (200°C for some lower kVA ratings)

Enclosure Type: Type 1, 2, 3/3R, 4/4X or 12 available (others available upon request).
Enhanced Type 3R option available for improved outdoor performance.
Lift off hinged doors for easy accessibility and quick removal if required.
Built-in enclosure fork lift capability.

Enclosure Finish: ANSI 61 Grey
Compliant with UL 50

Neutral: Neutral terminal for field connection (on applicable units)

Temperature Rise: 150°C typical temperature rise, (optional 115°C & 80°C rise available)

Termination: Front accessible separate high and low voltage terminals; connectors suitable for aluminum and copper are provided for easy cable installation.

Impedance: 3-7%, typically 5.75%

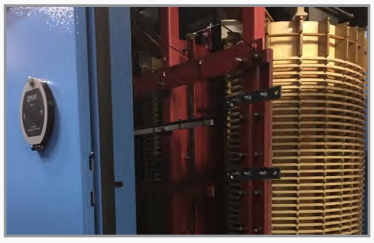
Seismic: Seismically qualified according to the International Building Code (IBC) 2018, and the American Society of Civil Engineers ASCE 7-16 specifications, with the following design parameters:
Spectral acceleration: $S_{DS} \leq 2.0$ g
Importance factor: $I_p = 1.5$
Attachment/height ratio: z/h = 0
OSHPD compliance available upon request

Sound Level: Meets IEEE C57.12.01
(other sound level performance available)

Altitude: Standard up to 1000 meters (de-rated above 1000 meters)

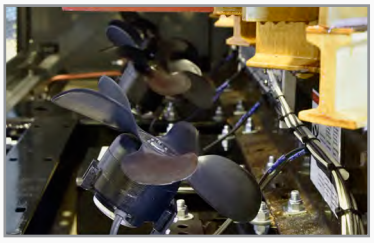
Ambient: -20°C to 40°C (with de-rating possible from 40°C to 60°C, consult HPS)

Duty: Special duty available upon request.



Infrared viewing window & custom enclosure finish

Lightning arrestors



Cooling fans

OPTIONAL ACCESSORIES

- Forced air-cooling (or provisions for later)
- Heat exchanger/cooling for TENV units
- Lightning arrestors rated for system voltage (Station, Intermediate or Distribution)
- Grounding resistor
- Neutral Ground Monitor
- Thermal sensing & indication
- - Thermocouples
- - Thermometers (analog/digital)
- - Thermostat alarm / trip (N.O. /N.C. contacts)
- Current transformers
- Potential transformers
- Key interlock to prevent unauthorized access
- Electrostatic shielding
- Rated to handle non-linear loads
- Strip heater (powered from separate source)
- Surge protection devices
- Air terminal chamber
- Low voltage panel
- Coordinated bus-to-end
- Primary fused disconnects
- Infrared viewing windows

Comparison of Enclosures for Indoor and Outdoor Non-Hazardous Locations

		Indoor						Indoor/Outdoor								Submersible	
CSA C22.2 No. 94.2 Enclosure Type		**1[a]**	**2[a]**	**5**	**12**	**12K**	**13**	**3**	**-**	**3R[a]**	**-**	**3S**	**-**	**4**	**4X**	**6**	**6P**
NEMA 250 Enclosure Type		**1[a]**	**2[a]**	**5**	**12**	**12K**	**13**	**3**	**3X**	**3R[a]**	**3RX[a]**	**3S**	**3SX**	**4**	**4X**	**6**	**6P**
Equivalent IEC 60529 IP designation [e]		**IP20**	**IP22**	**IP53**	**IP54**	**IP54**	**IP54**	**IP55**	**IP55**	**IP24**	**IP24**	**IP55**	**IP55**	**IP66**	**IP66**	**IP67**	**IP68**
Provides a degree of protection against these environmental conditions	Accidental contact with live parts	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Falling dirt	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Dripping and light splashing of non-corrosive liquids		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	Circulating dust, lint, fibres and flyings [d]				X	X	X	X	X			X	X	X	X	X	X
	Settling dust, lint, fibres and flyings [d]			X	X	X	X	X	X			X	X	X	X	X	X
	Wind-blown dust							X	X			X	X	X	X	X	X
	Rain, snow and external formation of ice or sleet [b]							X	X	X	X	X	X	X	X	X	X
	External formation of ice or sleet											X	X				
	Hose down and splashing water													X	X	X	X
	Corrosion												X		X		X
	Occasional temporary submersion															X	X
	Occasional prolonged submersion																X
	Oil and coolant seepage				X	X	X										
	Oil and coolant seepage, spraying and splashing						X										

Notes:
a. - These enclosures may be ventilated
b. - External operating mechanism(s) is not required to operate when the enclosure is ice covered
c. - External operating mechanism(s) shall be operable when the enclosure is ice covered
d. - These fibres and flyings are non-hazardous and are not considered Class III type ignitable fibres or combustible flyings
e. - Since IEC 60529 does not specify degrees of protection for many conditions considered CSA C22.2 No. 94.2, the IEC classifications cannot be exactly equated to North American Type numbers. The North American Type numbers meet or exceed the test requirements for the associated IP classifications.
This table cannot be used to convert from IEC classifications to North American Type designations.

References: CSA C22.2 No. 94, CSA C22.1 (CEC), NEMA 250, NEMA document - NEMA Enclosure Types
Disclaimer: This table is for quick comparison only. Please refer to appropriate standard for enclosure selection to your needs.

TESTING

All VPI Power transformers are tested at HPS prior to shipment. They must meet specific criteria to be certified acceptable for release. The following tests are performed on each power transformer:

- Resistance Measurement*
- Voltage Ratio
- Polarity & Phase-Relation Test
- No-Load Loss and Excitation Current Test
- Induced Voltage
- Impedance, Voltage & Load Loss Test*
- Power frequency voltage-withstand each winding
- Other testing available upon customer request

* typically not performed for units ≤ 500kVA

COMPLIANCE & APPROVALS

HPS Millennium™ E is CSA Certified and UL Listed to the following standards:

- CSA C22.2 No. 47
- CSA C9-02
- U.L. 1562

Compliant to the following industry standards:

- IEEE-C57.12.01
- IEEE-C57.12.51
- IEEE-C57.12.70
- IEEE-C57.12.91
- CSA 802.2-12
- DOE 10 CFR Part 431: 2010 or 2016
- NRCan SOR/2018-201 Amd. 14
- ON Reg. 404/12 (2018)
- IEC 60076 (upon request)
- IBC 2018/OSHPD for seismic conditions

Selection Tables

ALUMINUM WOUND

kVA	Voltage Class kV	BIL	Enclosure with Stubs Up Fig. 1				Enclosure with Bus-To-End Fig. 2			
			Width (W)	Depth (D)	Height (H)	Weight (Lbs.)	Width (W)	Depth (D)	Height (H)	Weight (Lbs.)
225	5	30	49	42	64	2000	60	50	82	2300
	15	60	54	47	72	2400	60	50	82	2700
	15	95	60	50	82	3000	72	54	91.5	3700
	25	110	72	54	91.5	4100	72	60	91.5	4400
	25	125	72	60	91.5	4500	72	60	91.5	4900
	34.5	150	90	72	91.5	5500	90	72	91.5	5900
300	5	30	49	42	64	2100	68	50	72	2400
	15	60	68	50	72	2900	68	50	72	3200
	15	95	72	54	91.5	4000	84	54	91.5	4400
	25	110	72	54	91.5	4200	84	60	91.5	4800
	25	125	84	60	91.5	4800	84	60	91.5	5200
	34.5	150	90	72	91.5	5700	90	72	91.5	6100
500	5	30	54	47	72	3100	78	48	78	3600
	15	60	68	50	72	3900	78	48	78	4400
	15	95	84	54	91.5	5300	84	54	91.5	5800
	25	110	84	54	91.5	5700	84	60	91.5	6400
	25	125	90	60	91.5	6400	96	72	91.5	7200
	34.5	150	96	72	91.5	7800	96	72	91.5	8400
750	5	30	68	50	72	5000	84	54	91.5	6100
	15	60	78	48	78	5300	90	54	91.5	6400
	15	95	84	54	91.5	6700	96	60	91.5	7600
	25	110	84	60	91.5	7000	90	60	91.5	7600
	25	125	90	60	91.5	7100	96	72	91.5	8000
	34.5	150	96	72	91.5	9000	102	72	91.5	9900
1000	5	30	78	48	78	6100	90	54	91.5	7300
	15	60	84	54	91.5	7200	96	54	91.5	8000
	15	95	90	60	91.5	8400	102	60	91.5	9400
	25	110	90	60	91.5	8500	96	60	91.5	9300
	25	125	96	60	91.5	8700	102	72	91.5	9800
	34.5	150	96	72	110	10000	102	72	110	11000
1500	5	30	78	48	78	8100	96	54	91.5	9500
	15	60	90	54	91.5	9600	102	60	91.5	10800
	15	95	96	60	91.5	10800	108	60	91.5	12100
	25	110	96	60	91.5	10900	108	72	91.5	12500
	25	125	102	72	110	11800	108	72	110	13000
	34.5	150	108	72	110	13900	120	72	110	15400
2000	5	30	90	54	91.5	10800	108	60	91.5	12400
	15	60	96	54	91.5	11500	108	60	91.5	13000
	15	95	102	60	91.5	13400	120	72	91.5	15300
	25	110	102	72	91.5	13800	120	72	91.5	15500
	25	125	108	72	110	15000	120	72	110	16600
	34.5	150	120	72	110	16200	120	72	110	17600
2500	5	30	90	54	91.5	13000	120	60	91.5	15100
	15	60	96	60	91.5	13700	120	72	91.5	15800
	15	95	108	60	91.5	15800	132	72	110	18400
	25	110	108	72	110	14900	120	72	110	16500
	25	125	108	72	110	15900	120	72	110	17600
	34.5	150	108	72	110	16900	132	72	110	19000

Weight and dimensions are typical for 150ºC Average Winding Rise.
Weights and dimensions are for DOE 2016/NRCan 2019 compliant product.
All dimensions are in inches.
For Type 2 enclosure styles, add 4 inches to the enclosure depth and 20 lbs to the total weight.
Not for construction purposes. Approval drawings can be provided as needed.

Add 20 inch for ATC up to 110kV BIL designs and 24 inch for ATC with 125/150kV BIL designs.
Add approx. 400 lbs. per ATC.

Selection Tables

ALUMINUM WOUND

Hammond Power Solutions

kVA	Voltage Class kV	BIL	Enclosure with Stubs Up Fig. 1				Enclosure with Bus-To-End Fig. 2			
			Width (W)	Depth (D)	Height (H)	Weight (Lbs.)	Width (W)	Depth (D)	Height (H)	Weight (Lbs.)
3000	5	30	90	60	110	15700	120	60	110	17900
	15	60	96	60	110	17300	120	72	110	19800
	15	95	102	60	110	19000	132	72	110	21700
	25	110	102	72	110	20700	120	72	110	23100
	25	125	108	72	110	22900	132	72	110	25600
	34.5	150	Consult HPS				Consult HPS			
3750	5	30	Consult HPS				Consult HPS			
	15	60	96	60	110	17800	120	72	110	20300
	15	95	102	60	110	19500	132	72	135	22800
	25	110	108	72	110	21400	132	72	135	24400
	25	125	108	72	110	23900	Consult HPS			
	34.5	150	Consult HPS				Consult HPS			
5000	5	30	Consult HPS				Consult HPS			
	15	60	102	60	110	19000	120	72	110	21400
	15	95	108	72	135	21400	132	72	135	23900
	25	110	120	72	135	23200	132	72	135	25500
	25	125	120	72	135	25700	Consult HPS			
	34.5	150	Consult HPS				Consult HPS			
7500	5	30	Consult HPS				Consult HPS			
	15	60	120	72	135	21700	132	72	135	23900
	15	95	120	72	135	23200	Consult HPS			
	25	110	120	72	135	24700	Consult HPS			
	25	125	Consult HPS				Consult HPS			
	34.5	150	Consult HPS				Consult HPS			

Weight and dimensions are typical for 150ºC Average Winding Rise.
Weights and dimensions are for NRCan 2019 compliant product.
All dimensions are in inches.
For Type 2 enclosure styles, add 4 inches to the enclosure depth and 20 lbs to the total weight.
Not for construction purposes. Approval drawings can be provided as needed.

Add 20 inch for ATC up to 110kV BIL designs and 24 inch for ATC with 125/150kV BIL designs.
Add approx. 400 lbs. per ATC.

Selection Tables

COPPER WOUND

kVA	Voltage Class kV	BIL	Enclosure with Stubs Up Fig. 1				Enclosure with Bus-To-End Fig. 2			
			Width (W)	Depth (D)	Height (H)	Weight (Lbs.)	Width (W)	Depth (D)	Height (H)	Weight (Lbs.)
225	5	30	49	42	64	2000	60	50	82	2300
	15	60	60	50	82	2700	68	50	72	2900
	15	95	68	50	72	3100	72	54	91.5	3900
	25	110	68	50	72	3300	72	54	91.5	4100
	25	125	72	54	91.5	3900	72	60	91.5	4200
	34.5	150	90	72	91.5	4800	90	72	91.5	5100
300	5	30	49	42	64	2100	60	50	82	2400
	15	60	60	50	82	3100	68	50	72	3400
	15	95	68	50	72	3700	72	54	91.5	4500
	25	110	72	54	91.5	4400	84	54	91.5	4900
	25	125	84	54	91.5	4600	84	60	91.5	5200
	34.5	150	90	72	91.5	5200	90	72	91.5	5600
500	5	30	49	42	64	2800	68	50	72	3200
	15	60	78	48	78	4400	78	48	78	4800
	15	95	84	54	91.5	5700	84	54	91.5	6200
	25	110	84	54	91.5	5800	84	60	91.5	6500
	25	125	84	60	91.5	6100	84	60	91.5	6600
	34.5	150	90	72	91.5	6400	96	72	91.5	7000
750	5	30	60	50	82	4800	78	48	78	5300
	15	60	78	48	78	5500	84	54	91.5	6500
	15	95	84	54	91.5	6500	90	60	91.5	7200
	25	110	90	54	91.5	6800	96	60	91.5	7600
	25	125	90	60	91.5	7000	96	72	91.5	7900
	34.5	150	96	72	91.5	7500	102	72	91.5	8300
1000	5	30	68	50	72	5800	84	54	91.5	7000
	15	60	78	48	78	6500	90	54	91.5	7700
	15	95	90	54	91.5	8400	96	60	91.5	9300
	25	110	90	60	91.5	8600	96	60	91.5	9400
	25	125	90	60	91.5	8700	96	72	91.5	9700
	34.5	150	96	72	91.5	9200	102	72	91.5	10200
1500	5	30	78	48	78	7900	90	54	91.5	9200
	15	60	84	54	91.5	8500	96	54	91.5	9400
	15	95	90	54	91.5	10400	102	60	91.5	11700
	25	110	96	60	91.5	10800	102	72	91.5	12100
	25	125	102	72	91.5	12200	108	72	91.5	13400
	34.5	150	102	72	91.5	13800	108	72	91.5	15200
2000	5	30	78	48	78	9700	96	54	91.5	11300
	15	60	84	54	91.5	11100	102	60	91.5	12600
	15	95	96	54	91.5	12200	108	60	91.5	13800
	25	110	96	60	91.5	12900	108	72	91.5	14700
	25	125	102	72	91.5	13900	120	72	91.5	15600
	34.5	150	108	72	110	17400	120	72	110	19200
2500	5	30	84	54	91.5	11300	102	60	91.5	12800
	15	60	90	54	91.5	12100	108	60	91.5	13800
	15	95	96	54	91.5	14100	120	72	91.5	16400
	25	110	96	72	91.5	15100	120	72	91.5	17200
	25	125	102	72	110	16600	120	72	110	18500
	34.5	150	108	72	110	18400	Consult HPS			

Weight and dimensions are typical for 150ºC Average Winding Rise.
Weights and dimensions are for DOE 2016/NRCan 2019 compliant product.
All dimensions are in inches.
For Type 2 enclosure styles, add 4 inches to the enclosure depth and 20 lbs to the total weight.
Not for construction purposes. Approval drawings can be provided as needed.

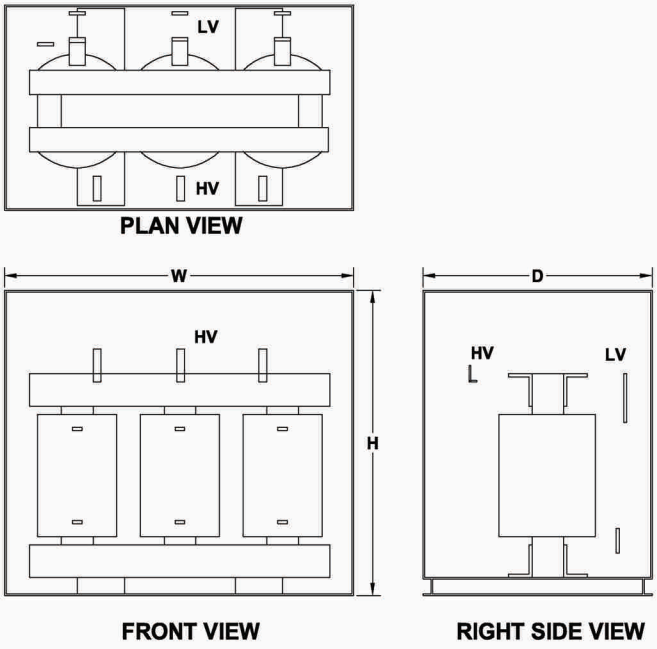
Add 20 inch for ATC up to 110kV BIL designs and 24 inch for ATC with 125/150kV BIL designs.
Add approx. 400 lbs. per ATC.

kVA	Voltage Class kV	BIL	Enclosure with Stubs Up Fig. 1				Enclosure with Bus-To-End Fig. 2			
			Width (W)	Depth (D)	Height (H)	Weight (Lbs.)	Width (W)	Depth (D)	Height (H)	Weight (Lbs.)
3000	5	30	90	54	91.5	15200	120	60	91.5	17500
	15	60	96	54	91.5	17300	120	60	91.5	19700
	15	95	102	54	91.5	19500	120	72	91.5	22100
	25	110	102	72	91.5	21800	120	72	91.5	24300
	25	125	102	72	110	23700	120	72	110	26400
	34.5	150	Consult HPS				Consult HPS			
3750	5	30	Consult HPS				Consult HPS			
	15	60	96	60	110.0	19800	120	60	110	22300
	15	95	102	60	110.0	22300	120	72	110.0	25000
	25	110	102	60	110	23000	120	72	110.0	25800
	25	125	108	72	110	24900	132	72	110.0	27800
	34.5	150	120	72	110	26700	Consult HPS			
5000	5	30	Consult HPS				Consult HPS			
	15	60	96	60	110	20800	108	60	110	23100
	15	95	102	60	110	23000	120	60	110.0	25600
	25	110	108	72	135	25400	120	72	135.0	28000
	25	125	108	72	135	25900	120	72	135.0	28500
	34.5	150	Consult HPS				Consult HPS			
7500	5	30	Consult HPS				Consult HPS			
	15	60	102	72	135	23700	120	72	135	26300
	15	95	108	72	135	25600	132	72	135.0	28500
	25	110	120	72	135	26400	132	72	135.0	29000
	25	125	120	72	135	27700	132	72	135.0	30500
	34.5	150	Consult HPS				Consult HPS			

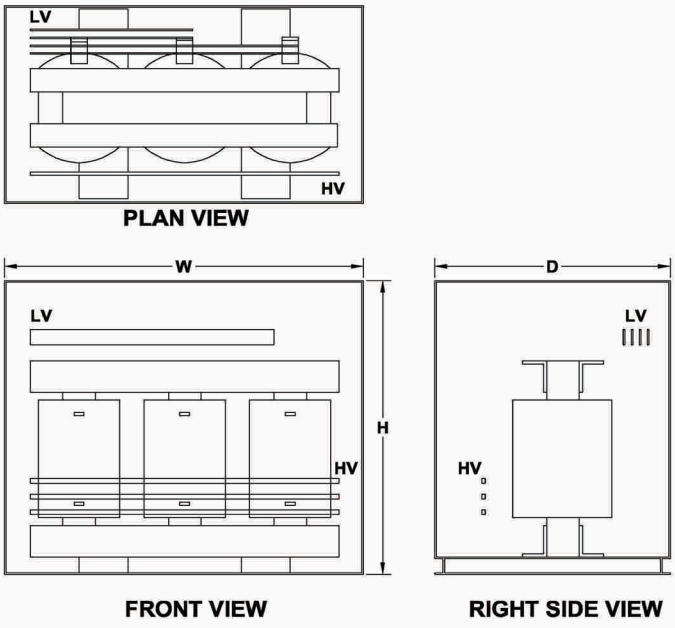
Weight and dimensions are typical for 150ºC Average Winding Rise.
Weights and dimensions are for NRCan 2019 compliant product.
All dimensions are in inches.
For Type 2 enclosure styles, add 4 inches to the enclosure depth and 20 lbs to the total weight.
Not for construction purposes. Approval drawings can be provided as needed.

Add 20 inch for ATC up to 110kV BIL designs and 24 inch for ATC with 125/150kV BIL designs.
Add approx. 400 lbs. per ATC.

Drawings



ENCLOSURE WITH STUBS UP FIG. 1



ENCLOSURE WITH BUS-TO-END FIG. 2

Anti-Vibration Pad & Vibration Isolator Kits

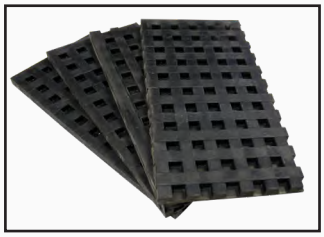
Hammond Power Solutions

ANTI-VIBRATION PAD AND VIBRATION ISOLATOR KITS

All standard transformers come with installed internal vibration absorbing pads to minimize noise during operation. Optional external "anti-vibration" pad and "vibration isolator" (for higher noise dampening) kits can be used to reduce operating noise even further. All are resistant to industrial contaminants like oil, acids and alkalines.

Anti-Vibration Pad Kits

Part No.	Description
PD1	Set of four (4) rubber anti-vibration pads which replace the standard steel enclosure washers.
PD2	



All anti-vibration pad kits contain a set of four (4) pads or isolators. Therefore only one kit is required per transformer.

Vibration Isolator Kits

Part No.	Transformer Weight (Lbs)	Description
NMP1	Up to 340 lbs	Set of four (4) molded neoprene and steel plate assemblies that virtually eliminate vibration noise between the transformer and the mounting surface.
NMP2	341 to 680 lbs	
NMP3	681 to 1040 lbs	
NMP4	1041 to 1740 lbs	
NMP5	1741 to 2330 lbs	
NMP6	2331 to 3450 lbs	
NMP7	3451 to 4690 lbs	

All vibration isolator kits and anti-vibration pad kits contain a set of four (4) pads or isolators. Therefore only one kit is required per transformer.

Typical Performance Data

5 kV, 30kV BIL - Aluminum

75ºC, 4160V Delta (30 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	630	2770	5.7%	1.2%	5.6%	4.64	0.65%	2.18%	1.38%	4.40%	98.56%	98.82%	98.71%	98.50%
300	735	3420	5.7%	1.1%	5.6%	5.10	0.63%	2.16%	1.33%	4.37%	98.72%	98.93%	98.80%	98.60%
500	1020	4925	5.7%	1.0%	5.7%	5.66	0.54%	2.12%	1.17%	4.27%	98.93%	99.09%	98.98%	98.80%
750	1500	6010	5.8%	0.8%	5.7%	7.13	0.44%	2.05%	0.96%	4.15%	99.01%	99.21%	99.14%	99.01%
1000	1790	7145	5.8%	0.7%	5.7%	8.18	0.41%	2.03%	0.90%	4.11%	99.10%	99.28%	99.21%	99.09%
1500	2150	10235	5.8%	0.7%	5.7%	8.19	0.39%	2.02%	0.86%	4.08%	99.26%	99.37%	99.29%	99.17%
2000	2595	12440	5.8%	0.6%	5.7%	9.57	0.35%	1.99%	0.79%	4.03%	99.33%	99.43%	99.36%	99.25%
2500	2785	15460	5.8%	0.6%	5.7%	9.58	0.35%	1.99%	0.78%	4.03%	99.40%	99.47%	99.39%	99.28%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

5 kV, 30kV BIL - Copper

75ºC, 4160V Delta (30 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss* (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	575	3070	5.6%	1.3%	5.4%	4.17	0.72%	2.19%	1.51%	4.40%	98.65%	98.82%	98.65%	98.41%
300	690	3720	5.6%	1.2%	5.5%	4.56	0.66%	2.15%	1.39%	4.34%	98.79%	98.93%	98.78%	98.55%
500	900	5550	5.6%	1.1%	5.5%	5.01	0.59%	2.12%	1.26%	4.27%	99.01%	99.09%	98.94%	98.73%
750	1475	6050	5.7%	0.8%	5.6%	7.00	0.44%	2.02%	0.96%	4.09%	99.02%	99.21%	99.14%	99.01%
1000	1650	7840	5.7%	0.8%	5.6%	7.01	0.43%	2.02%	0.94%	4.07%	99.15%	99.28%	99.20%	99.06%
1500	1910	11240	5.7%	0.7%	5.6%	8.02	0.41%	2.01%	0.91%	4.05%	99.31%	99.37%	99.27%	99.13%
2000	2265	13750	5.7%	0.7%	5.6%	8.05	0.38%	1.99%	0.85%	4.01%	99.38%	99.43%	99.34%	99.21%
2500	2570	16310	5.7%	0.6%	5.6%	9.40	0.37%	1.97%	0.81%	3.99%	99.43%	99.47%	99.38%	99.25%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

15 kV, 60kV BIL - Aluminum

75°C, 12470V Delta (60 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	915	2300	5.7%	1.0%	5.6%	5.64	0.55%	2.12%	1.18%	4.28%	98.15%	98.69%	98.71%	98.59%
300	1025	3135	5.7%	1.0%	5.6%	5.64	0.56%	2.13%	1.20%	4.29%	98.40%	98.81%	98.78%	98.63%
500	1275	5085	5.7%	1.0%	5.6%	5.65	0.55%	2.12%	1.18%	4.28%	98.74%	98.99%	98.91%	98.74%
750	1700	6510	5.8%	0.9%	5.7%	6.32	0.47%	2.07%	1.03%	4.19%	98.89%	99.12%	99.06%	98.92%
1000	2075	7585	5.8%	0.8%	5.7%	7.14	0.42%	2.04%	0.92%	4.12%	98.99%	99.21%	99.16%	99.04%
1500	2775	9950	5.8%	0.7%	5.7%	8.19	0.37%	2.01%	0.83%	4.06%	99.10%	99.30%	99.26%	99.16%
2000	3285	12850	5.8%	0.6%	5.7%	9.57	0.36%	2.00%	0.81%	4.05%	99.19%	99.35%	99.30%	99.20%
2500	3825	14710	5.8%	0.6%	5.8%	9.59	0.34%	1.98%	0.75%	4.01%	99.25%	99.40%	99.36%	99.26%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

15 kV, 60kV BIL - Copper

75°C, 12470V Delta (60 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	750	2725	5.6%	1.2%	5.5%	4.55	0.64%	2.14%	1.36%	4.32%	98.29%	98.69%	98.63%	98.45%
300	950	3425	5.6%	1.0%	5.5%	5.54	0.61%	2.13%	1.29%	4.29%	98.47%	98.81%	98.74%	98.56%
500	1240	5215	5.6%	1.0%	5.5%	5.54	0.56%	2.10%	1.20%	4.23%	98.76%	98.99%	98.90%	98.73%
750	1540	7115	5.6%	0.9%	5.6%	6.18	0.51%	2.07%	1.10%	4.17%	98.95%	99.12%	99.02%	98.86%
1000	1800	8980	5.7%	0.9%	5.6%	6.20	0.49%	2.05%	1.05%	4.14%	99.08%	99.21%	99.10%	98.94%
1500	2485	11215	5.7%	0.8%	5.6%	7.02	0.41%	2.00%	0.91%	4.05%	99.16%	99.30%	99.22%	99.09%
2000	2860	14695	5.7%	0.7%	5.6%	8.03	0.41%	2.00%	0.89%	4.04%	99.25%	99.35%	99.26%	99.13%
2500	3015	18025	5.7%	0.7%	5.6%	8.04	0.40%	2.00%	0.88%	4.04%	99.34%	99.40%	99.30%	99.17%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

Typical Performance Data

15 kV, 95kV BIL - Aluminum

75ºC, 12470V Delta (95 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	930	2240	5.7%	1.0%	5.7%	5.65	0.51%	1.28%	1.04%	2.57%	98.13%	98.69%	98.72%	98.61%
300	1050	3005	5.7%	1.0%	5.7%	5.65	0.51%	1.28%	1.04%	2.57%	98.38%	98.81%	98.80%	98.67%
500	1350	4820	5.7%	1.0%	5.7%	5.66	0.53%	1.32%	1.09%	2.65%	98.75%	98.99%	98.90%	98.72%
750	1750	6280	5.8%	0.8%	5.7%	7.12	0.45%	1.57%	0.94%	3.15%	98.89%	99.12%	99.06%	98.92%
1000	2275	7050	5.8%	0.7%	5.7%	8.18	0.37%	1.52%	0.78%	3.06%	98.93%	99.20%	99.18%	99.09%
1500	2850	9620	5.8%	0.6%	5.7%	9.57	0.35%	1.60%	0.74%	3.22%	99.09%	99.30%	99.27%	99.18%
2000	3350	12465	5.8%	0.6%	5.7%	9.57	0.37%	1.70%	0.79%	3.43%	99.23%	99.36%	99.29%	99.17%
2500	3900	14235	5.8%	0.5%	5.8%	11.51	0.33%	1.68%	0.72%	3.39%	99.26%	99.41%	99.35%	99.25%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

15 kV, 95kV BIL - Copper

75ºC, 12470V Delta (95 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss* (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	850	2570	5.6%	1.1%	5.5%	4.83	0.60%	2.02%	1.28%	4.06%	98.23%	98.69%	98.66%	98.50%
300	1000	3235	5.6%	1.1%	5.5%	4.98	0.58%	2.11%	1.23%	4.25%	98.42%	98.81%	98.76%	98.61%
500	1425	4450	5.7%	0.9%	5.6%	6.27	0.49%	2.08%	1.05%	4.21%	98.66%	98.99%	98.96%	98.84%
750	1725	6400	5.7%	0.9%	5.6%	6.58	0.47%	2.23%	1.05%	4.50%	98.88%	99.12%	99.06%	98.93%
1000	2040	7890	5.7%	0.8%	5.6%	7.19	0.44%	2.21%	0.98%	4.46%	99.00%	99.20%	99.14%	99.02%
1500	2610	10700	5.7%	0.7%	5.6%	7.92	0.41%	2.18%	0.91%	4.41%	99.13%	99.30%	99.24%	99.12%
2000	3070	13550	5.7%	0.7%	5.6%	8.41	0.39%	2.17%	0.87%	4.39%	99.22%	99.36%	99.29%	99.18%
2500	3600	15480	5.7%	0.6%	5.6%	9.11	0.36%	2.15%	0.81%	4.35%	99.27%	99.41%	99.35%	99.24%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

25 kV, 125kV BIL - Aluminum

75°C, 24940V Delta (125 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	950	2714	5.7%	1.2%	5.6%	4.65	0.64%	2.17%	1.36%	4.38%	98.05%	98.57%	98.55%	98.40%
300	1165	3280	5.7%	1.1%	5.6%	5.11	0.59%	2.14%	1.25%	4.32%	98.21%	98.69%	98.68%	98.54%
500	1535	5038	5.7%	1.0%	5.6%	5.65	0.54%	2.12%	1.17%	4.27%	98.54%	98.89%	98.85%	98.70%
750	2000	6868	5.7%	0.9%	5.7%	6.31	0.50%	2.09%	1.08%	4.22%	98.72%	99.02%	98.97%	98.83%
1000	2460	8045	5.8%	0.8%	5.7%	7.13	0.44%	2.05%	0.97%	4.15%	98.83%	99.11%	99.08%	98.96%
1500	3115	11312	5.8%	0.7%	5.7%	8.17	0.42%	2.04%	0.92%	4.12%	98.99%	99.21%	99.16%	99.05%
2000	4015	12822	5.8%	0.7%	5.7%	8.20	0.36%	2.00%	0.81%	4.05%	99.05%	99.28%	99.26%	99.17%
2500	4200	17000	5.8%	0.7%	5.7%	8.19	0.38%	2.01%	0.84%	4.07%	99.17%	99.33%	99.27%	99.16%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

25 kV, 125kV BIL - Copper

75°C, 24940V Delta (125 kV BIL) -
480Y/277V, 600Y/347V (10kV BIL), 60 Hz

kVA	No Load Loss (W)	Load Loss (W)	Impedance	Resistance	Reactance	X/R Ratio	Regulation				% Efficiency at different loads			
							at 50% load		at 100% load					
							pf = 1	pf = 0.8	pf = 1	pf = 0.8	25%	50%*	75%	100%
225	900	2920	5.6%	1.3%	5.4%	4.14	0.69%	2.17%	1.45%	4.37%	98.11%	98.57%	98.52%	98.33%
300	1115	3500	5.6%	1.2%	5.5%	4.58	0.62%	2.13%	1.32%	4.30%	98.25%	98.69%	98.65%	98.48%
500	1525	5085	5.6%	1.0%	5.5%	5.55	0.55%	2.09%	1.17%	4.21%	98.55%	98.89%	98.84%	98.70%
750	1955	7100	5.6%	0.9%	5.6%	6.18	0.51%	2.07%	1.10%	4.17%	98.74%	99.02%	98.95%	98.81%
1000	2340	8520	5.6%	0.8%	5.6%	6.99	0.47%	2.04%	1.01%	4.12%	98.86%	99.11%	99.06%	98.93%
1500	3280	10730	5.7%	0.7%	5.6%	8.04	0.40%	1.99%	0.87%	4.03%	98.96%	99.21%	99.18%	99.07%
2000	3650	14600	5.7%	0.7%	5.6%	8.03	0.40%	2.00%	0.89%	4.04%	99.10%	99.28%	99.22%	99.10%
2500	4050	17740	5.7%	0.7%	5.6%	8.04	0.39%	1.99%	0.87%	4.03%	99.18%	99.33%	99.26%	99.14%

*Meets DOE 10 CFR Part 431 - 2016 & NRCan 2019/ON Reg. 404/12 Energy Efficiency Regulations for MVDT Transformers

Technical Information

The following information is provided for reference only:

Average Audible Sound Levels

Self-Cooled		Ventilated Forced Air Cooled	
Equivalent Two-Winding (kVA)	Ventilated (Class AA Rating)	Equivalent Two-Winding (kVA)	Class FA and AFA Rating
0-9	40	0-1167	67
10-50	45	1168-1667	68
51-150	50	1668-2000	69
151-300	55	2001-3333	71
301-500	60	3334-5000	73
501-700	62	5001-6667	74
701-1000	64	6668-8333	75
1001-1500	65	8334-10000	78
1501-2000	66		
2001-3000	68		
3001-4000	70		
4001-5000	71		
5001-6000	72		
6001-7500	75		

System Voltage and Transformer BIL Ratings

Nominal L-L System Voltage	Low Frequency Voltage Insulation Level	Basic lightning impulse insulation levels (BIL ratings) in common use kV crest[a,b] (1.2 x 50 µs)												
(kV)	(kV rms)	10	20	30	45	60	95	110	125	150	200	250	300	350
0.25	2.5	None												
0.6	3	S	1	1										
1.2	4	S	1	1										
2.5	10		S	1	1									
5.0	12			S	1	1								
8.7	20				S	1	1							
15.0	34					S	1	1						
18.0	40						S	1	1					
25.0	50						2	S	1	1				
34.5	70								2	S	1			
46.0	95										S	1	1	
69.0	140											S	1	1
Chopped wave[c,d] minimum time to flashover µs		1.0	1.0	1.0	1.25	1.5	1.6	1.8	2.0	2.25	2.7	3.0	3.0	3.0

When performing an impulse test on the low voltage windings, the high voltage windings may experience higher test voltage than the rated BIL level.
Note - The latest edition of IEEE Std. C62.22™ [B3] should be consulted for information coordination with available surge arrester protection levels.
S = Standard values
1 = Optional higher levels where exposure to overvoltages occurs and improved protective margins are required.
2 = Optional lower levels where protective characteristics of applied surge arresters have been evaluated and found to provide appropriate surge protection.
a = Low-impedance low-side windings may be tested with a much faster 0.5 x 1.5 µs impulse wave on BIL ratings less than or equal to 30 kV.
b = A positive impulse wave shall be used.
c = The voltage crest of the chopped wave should be approximately the same as the full wave magnitude.
d = No chopped waves are required on 0.6 kV systems and below.

Standard Transformer Ratings, Primary Voltage Class 2.3-46 kV

kVA 3 Phase			Secondary Voltage			
Self-Cooled	Fan-Cooled Ventilated Dry	Fan-Cooled Weather Resistant Ventilated	208Y/120 V 240 V Delta	480Y/277 V 480V Delta	4160Y/2400 V 4160 V Delta 2400 V Delta	600Y/277 V 600V Delta
225			X	X		X
300	400	400	X	X		X
500	667	667	X	X	X	X
750	1000	1000	X	X	X	X
1000	1333	1333	X	X	X	X
1500	2000	2000	X	X	X	X
2000	2666	2666		X	X	X
2500	3333	3333		X	X	X
3750	5000	5000			X	
5000	6650	6650			X	
7500	10000	10000			X	

The above combinations are based on standard designs. Other than standard designs may place further restrictions on the availablilty of voltage and kVA combinations. Consult factory for final determination.

Altitude Derating Factor

Altitude (FT)	kVA Correction	BIL Correction
3300	1.00	1.00
4000	0.994	0.98
5000	0.985	0.95
6000	0.975	0.92
7000	0.966	0.89
8000	0.957	0.86
9000	0.948	0.83
10,000	0.939	0.80
11,000	0.930	0.77
12,000	0.921	0.75
13,000	0.912	0.72
14,000	0.903	0.70
15,000	0.894	0.67

Per IEEE 100m = 330 ft

Other HPS Energy Efficient Products

ENERGY EFFICIENT GENERAL PURPOSE DISTRIBUTION TRANSFORMERS

Generally used for supplying appliance, lighting, heating, motorized machine and power loads from electrical distribution systems.

Standard features include:

HPS Sentinel®

- Meets C802.2 (2012) efficiencies per Canadian Energy Efficiency Regulations SOR/94-651

HPS Sentinel® G

- Meets new DOE 2016/NRCan 2019 & ON Reg. 404/12 efficiency standards
- 10kV BIL on all transformers

ENERGY EFFICIENT K-FACTOR TRANSFORMERS

The use of K-factor distribution transformers has become a popular means of supplying power for non-linear loads such as electronic ballasts, drives, personal computers, telecommunications equipment, broadcasting equipment and other similar power electronics. These non-linear loads generate harmonic currents which can substantially increase transformer losses. Our K-rated transformers have been specifically designed to prevent failure due to overheating.

Standard features include:

HPS Synergy®

- K-Factor ratings of K4, K9, K13 and K20
- Meets C802.2 (2012) efficiencies per Canadian Energy Efficiency Regulations SOR/94-651

HPS Sentinel® K

- K-Factor ratings of K4, K9, K13 and K20
- Meets new DOE 2016/NRCan 2019 & ON Reg. 404/12 efficiency standards
- 10kV BIL on all transformers

ENERGY EFFICIENT HARMONIC MITIGATING TRANSFORMERS

HPS Harmonic Mitigating transformers reduce voltage distortion (flat-topping) and power losses due to current harmonics created by single-phase, non-linear loads such as computer equipment. They treat sequence harmonics (3rd, 9th and 15th) within the secondary windings and 5th and 7th harmonics upstream with appropriate phase shifting. Typical applications of severe non-linear loading conditions include data centers, internet-service providers, telecom sites, call centers, broadcast centers, etc.

Standard features include:

HPS Centurion®

- Meets C802.2 (2012) efficiencies per Canadian Energy Efficiency Regulations SOR/94-651

HPS Sentinel® H

- K-Factor rating of K13 (others available on request)
- Meets new DOE 2016/NRCan 2019 & ON Reg. 404/12 efficiency standards
- 10kV BIL on all transformers

Hammond Power Solutions

ENERGY EFFICIENT DRIVE ISOLATION TRANSFORMERS

HPS drive isolation transformers are suitable for both AC and DC variable speed drives. They are sized to match standard motor horsepower and voltage ratings.

Standard features include:

- Three phase ratings from 7 kVA to 660 kVA
- Copper and aluminum available
- Optional shield available
- UL Listed and CSA Certified
- Type 3R enclosure (optional type 4, 12 or stainless)

HPS Tribune™

- Meets TP1 and C802.2-12 efficiencies

HPS Tribune™ E

- Meets NRCan 2019 & ON Reg. 404/12 efficiency standards

HPS ENDURACOIL™ CAST RESIN TRANSFORMERS

HPS EnduraCoil™ is a high-performance cast resin product designed for many demanding and diverse applications. Coils are precision wound with copper or aluminum conductors that are electrically balanced to minimize axial forces during short-circuit conditions.

Standard features include:

- kVA ratings from 300 to 3000 ANN, 4000 AFN, up to 34.5 kV Class
- Enclosure options (Type 1, 2, 3R, 3RE, 4, 12; other paint colors or stainless steel)
- Multiple standard options
- UL listed and CSA certified

HPS EnduraCoil™

- Meets Canadian Energy Efficiency Regulations SOR/94-651 efficiency levels at 50% of rated load

HPS EnduraCoil™ E

- Meets new DOE 2016/NRCan 2019 & ON Reg. 404/12 efficiency standards

HPS MILLENNIUM™ ENERGY EFFICIENT MEDIUM VOLTAGE DISTRIBUTION TRANSFORMERS

5 kV class transformers are designed to step down incoming high voltage power to utilize voltages for commercial, institutional or industrial applications.

Standard features include:

- Large variety of standard and custom single phase and three phase voltages and kVA ratings
- Standard primary voltages of 2400 and 4160 volts
- UL Listed and CSA Certified
- Type 3R and ANSI 61 enclosure (optional Type 4, 12; other paint colors or stainless steel)

HPS Millennium™

- Meets CSA C802.2-12 efficiency standards at 50% of rated load

HPS Millennium™ G

- Meets new DOE 2016/NRCan 2019 & ON Reg. 404/12 efficiency standards

Hammond Power Solutions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December 2019

APPENDIX G

FAA DETERMINATIONS

Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2486-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 1
Location:	Southington, CT
Latitude:	41-35-27.49N NAD 83
Longitude:	72-50-49.25W
Heights:	192 feet site elevation (SE) 22 feet above ground level (AGL) 214 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2486-OE

Signature Control No: 437359744-442736510 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2486-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2486-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

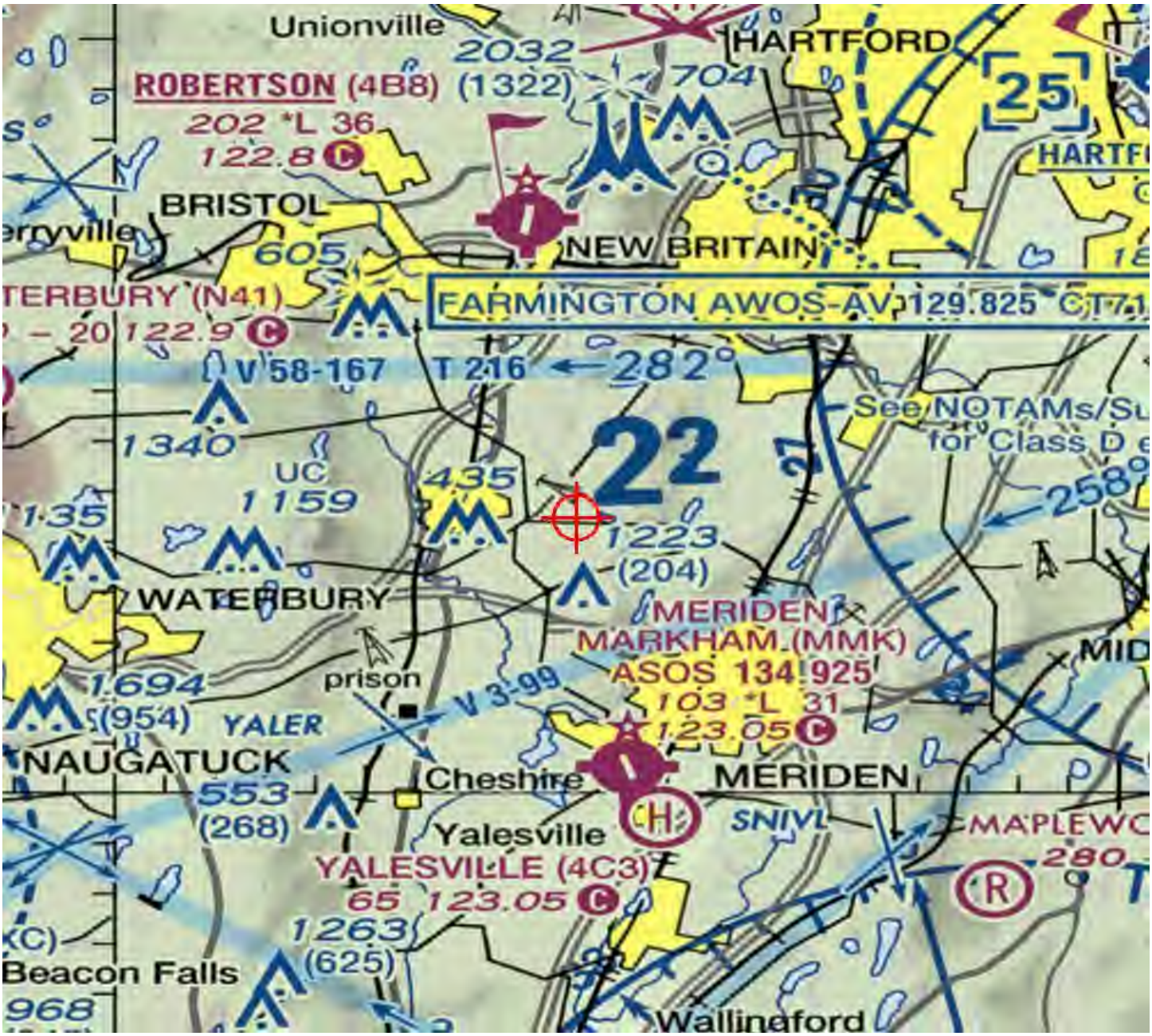
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2486-OE



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Aeronautical Study No.
2020-ANE-2487-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
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Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 2
Location:	Southington, CT
Latitude:	41-35-19.93N NAD 83
Longitude:	72-50-54.14W
Heights:	200 feet site elevation (SE) 22 feet above ground level (AGL) 222 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2487-OE

Signature Control No: 437359745-442736511 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2487-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2487-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

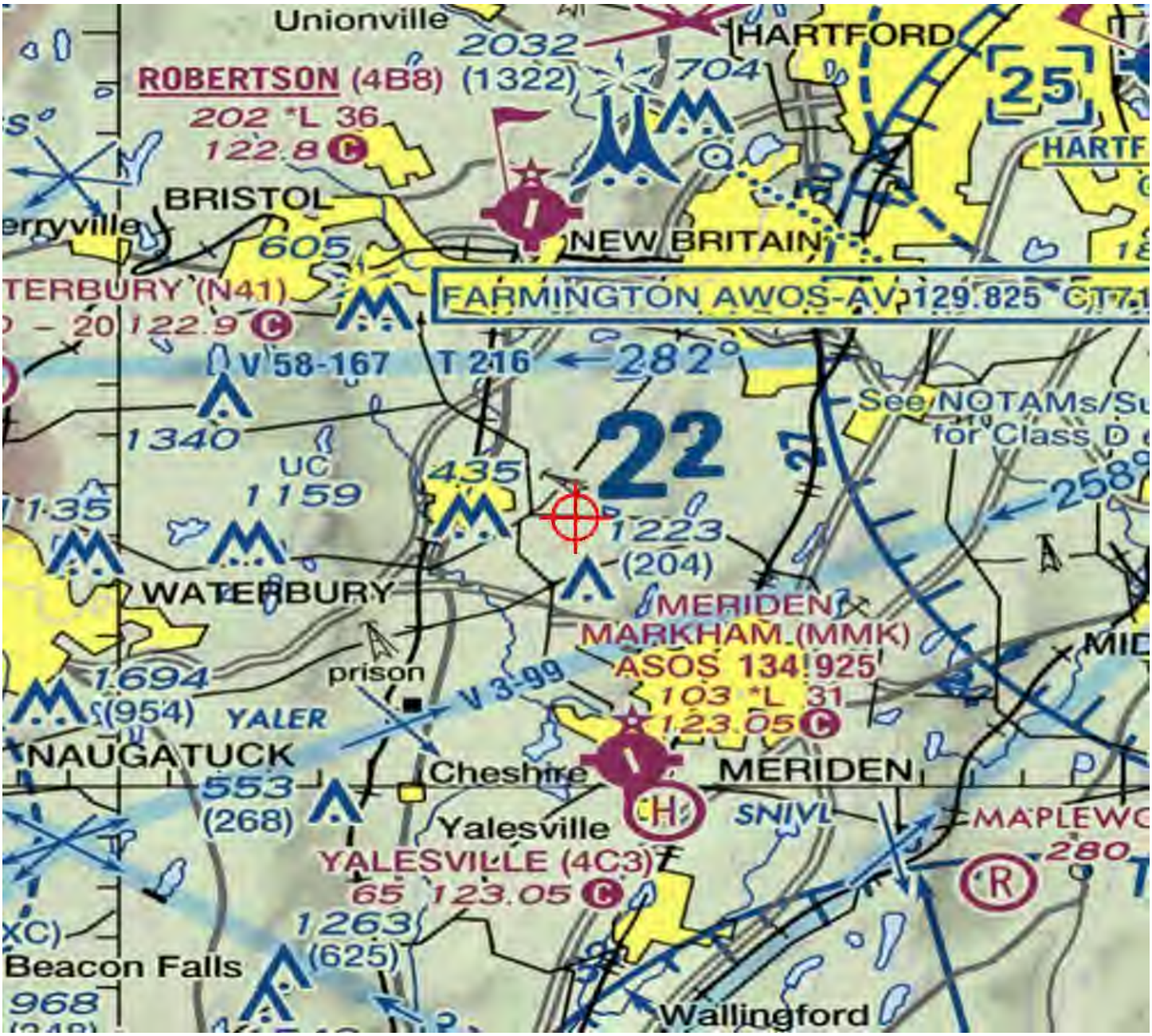
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2487-OE



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Aeronautical Study No.
2020-ANE-2488-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 3
Location:	Southington, CT
Latitude:	41-35-19.11N NAD 83
Longitude:	72-50-57.34W
Heights:	200 feet site elevation (SE)
	22 feet above ground level (AGL)
	222 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2488-OE

Signature Control No: 437359746-442736508 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2488-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2488-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2488-OE

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Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2489-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
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****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 4
Location:	Southington, CT
Latitude:	41-35-18.47N NAD 83
Longitude:	72-51-11.85W
Heights:	205 feet site elevation (SE)
	22 feet above ground level (AGL)
	227 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2489-OE

Signature Control No: 437359747-442736513 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2489-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2489-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

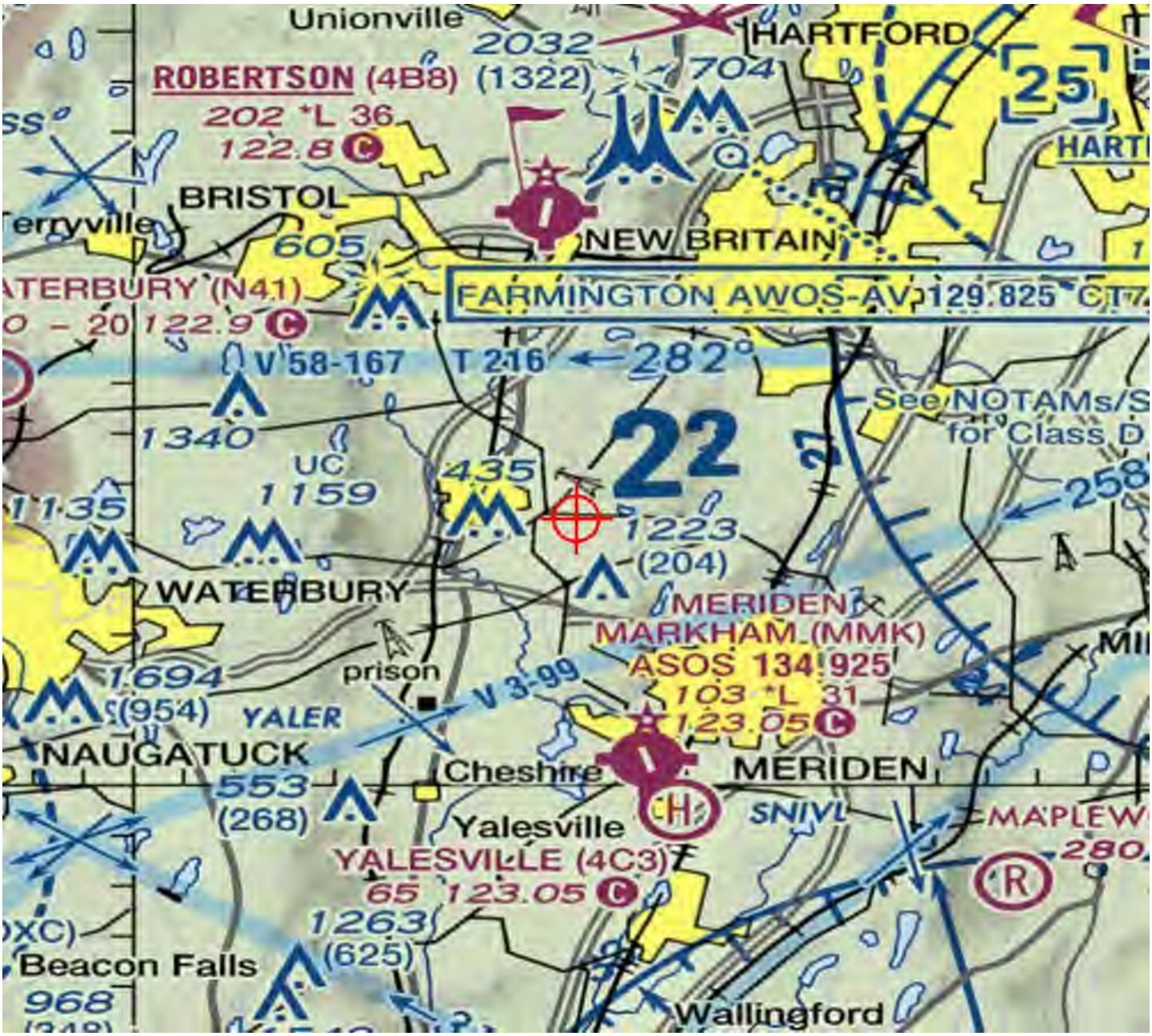
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2489-OE



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Aeronautical Study No.
2020-ANE-2490-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 5
Location:	Southington, CT
Latitude:	41-35-21.34N NAD 83
Longitude:	72-51-12.46W
Heights:	208 feet site elevation (SE) 22 feet above ground level (AGL) 230 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2490-OE

Signature Control No: 437359750-442736506 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2490-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2490-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

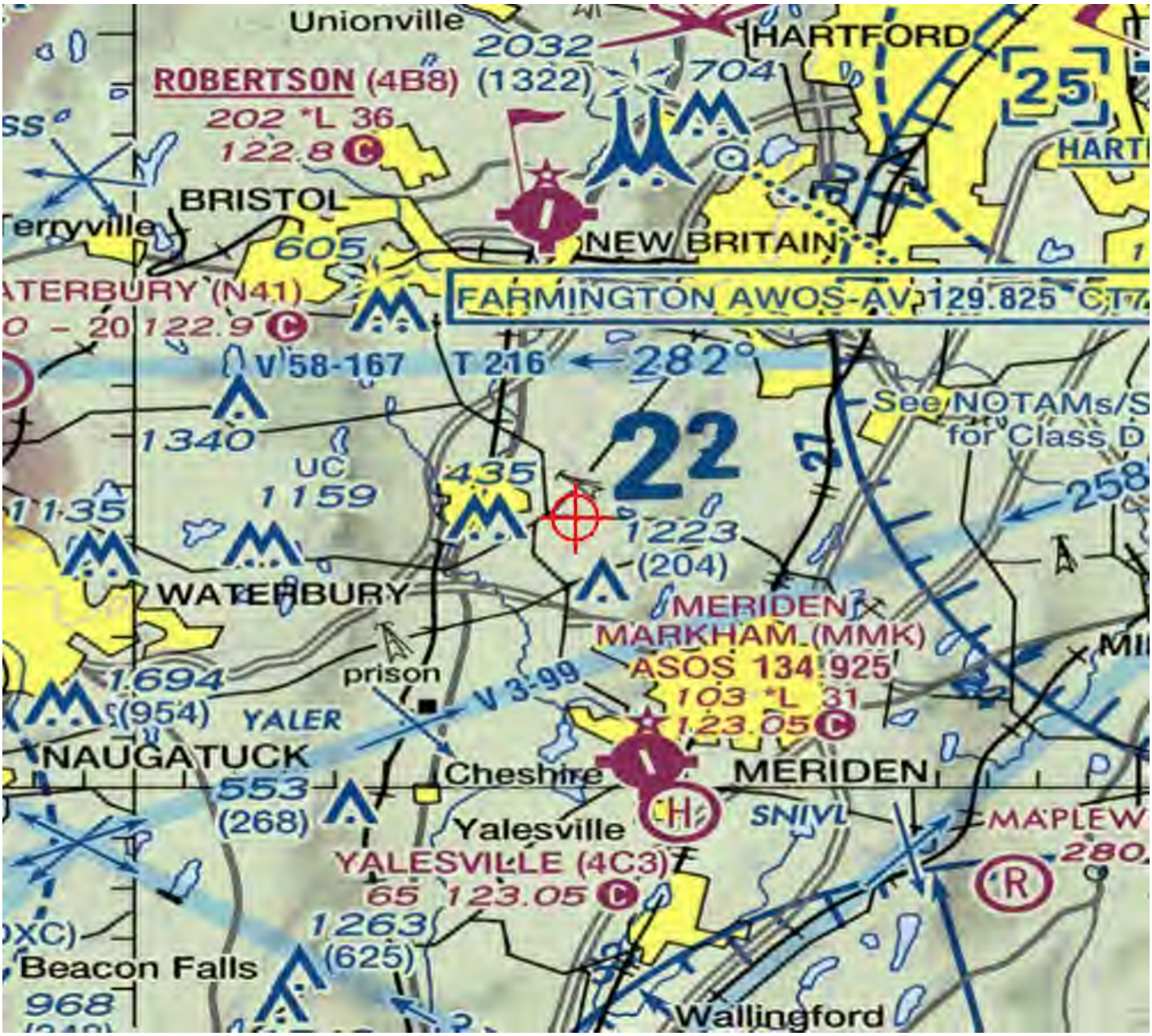
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2490-OE



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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2491-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 6
Location:	Southington, CT
Latitude:	41-35-21.62N NAD 83
Longitude:	72-51-18.05W
Heights:	207 feet site elevation (SE)
	22 feet above ground level (AGL)
	229 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2491-OE

Signature Control No: 437359751-442736512 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2491-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2491-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/ VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

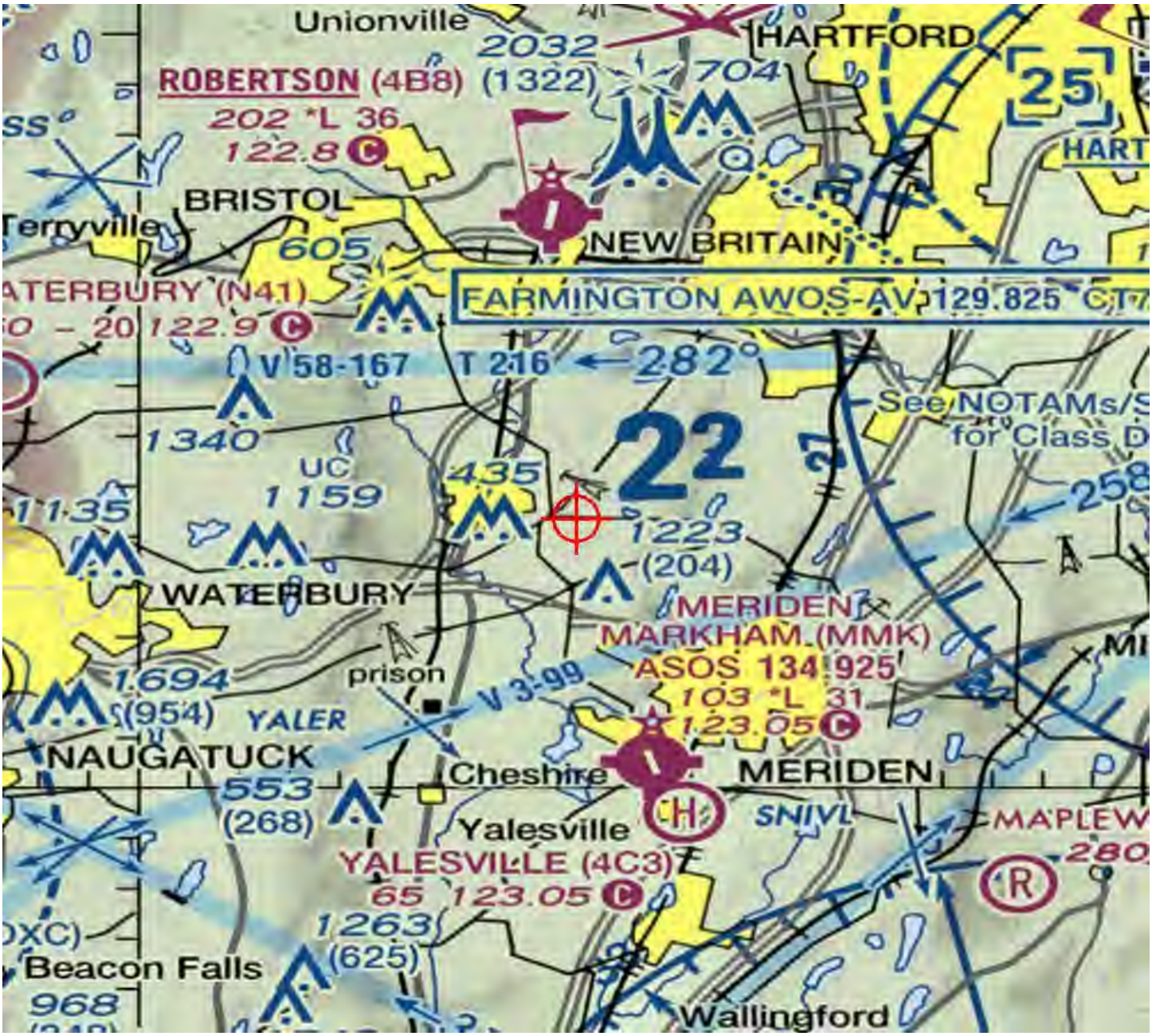
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2491-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2492-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 7
Location:	Southington, CT
Latitude:	41-35-26.47N NAD 83
Longitude:	72-51-17.72W
Heights:	202 feet site elevation (SE) 22 feet above ground level (AGL) 224 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2492-OE

Signature Control No: 437359755-442736507 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2492-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2492-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

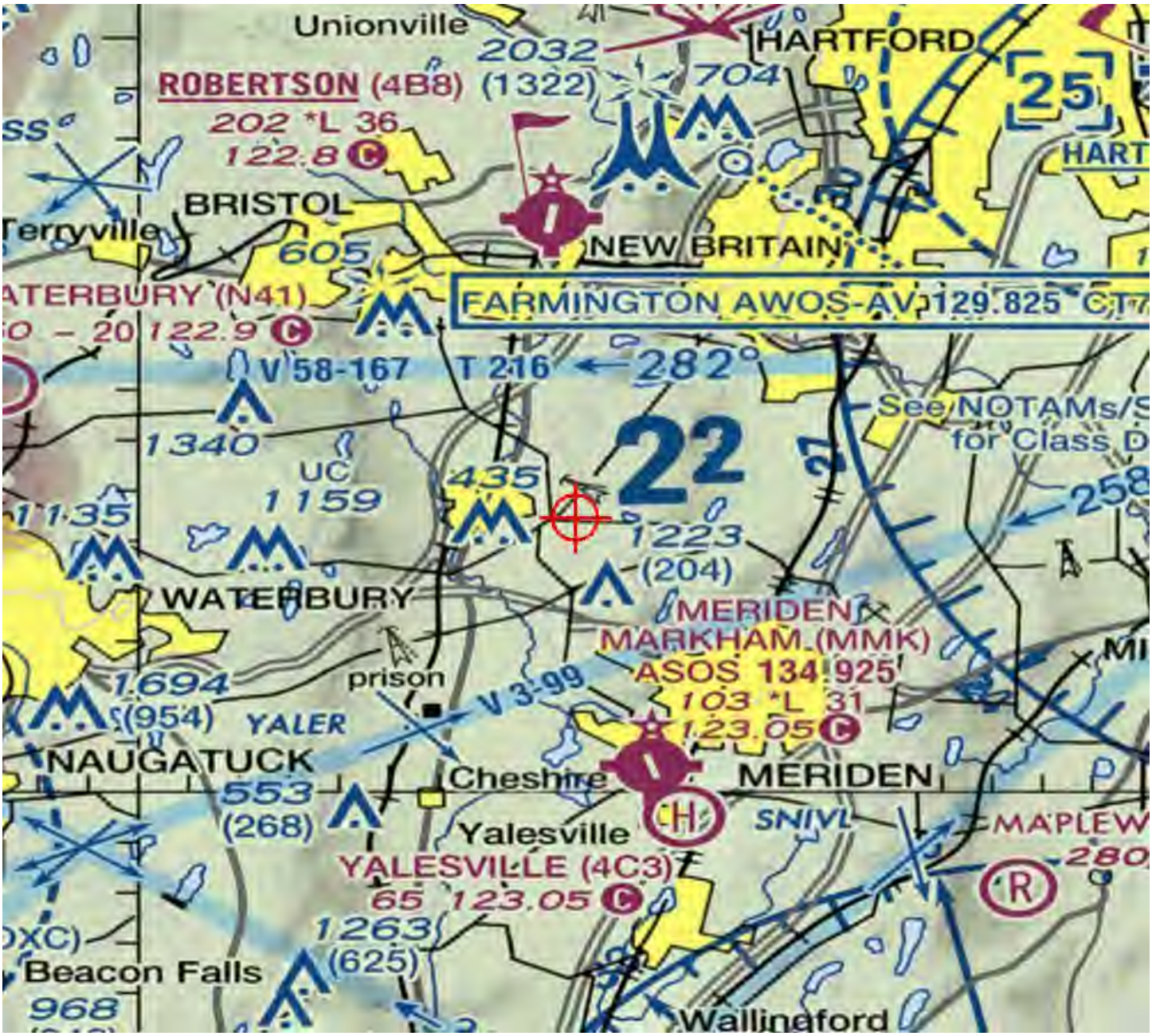
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2492-OE



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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2493-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane Point 8
Location:	Southington, CT
Latitude:	41-35-27.66N NAD 83
Longitude:	72-51-01.71W
Heights:	205 feet site elevation (SE) 22 feet above ground level (AGL) 227 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2493-OE

Signature Control No: 437359759-442736514 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2493-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2493-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

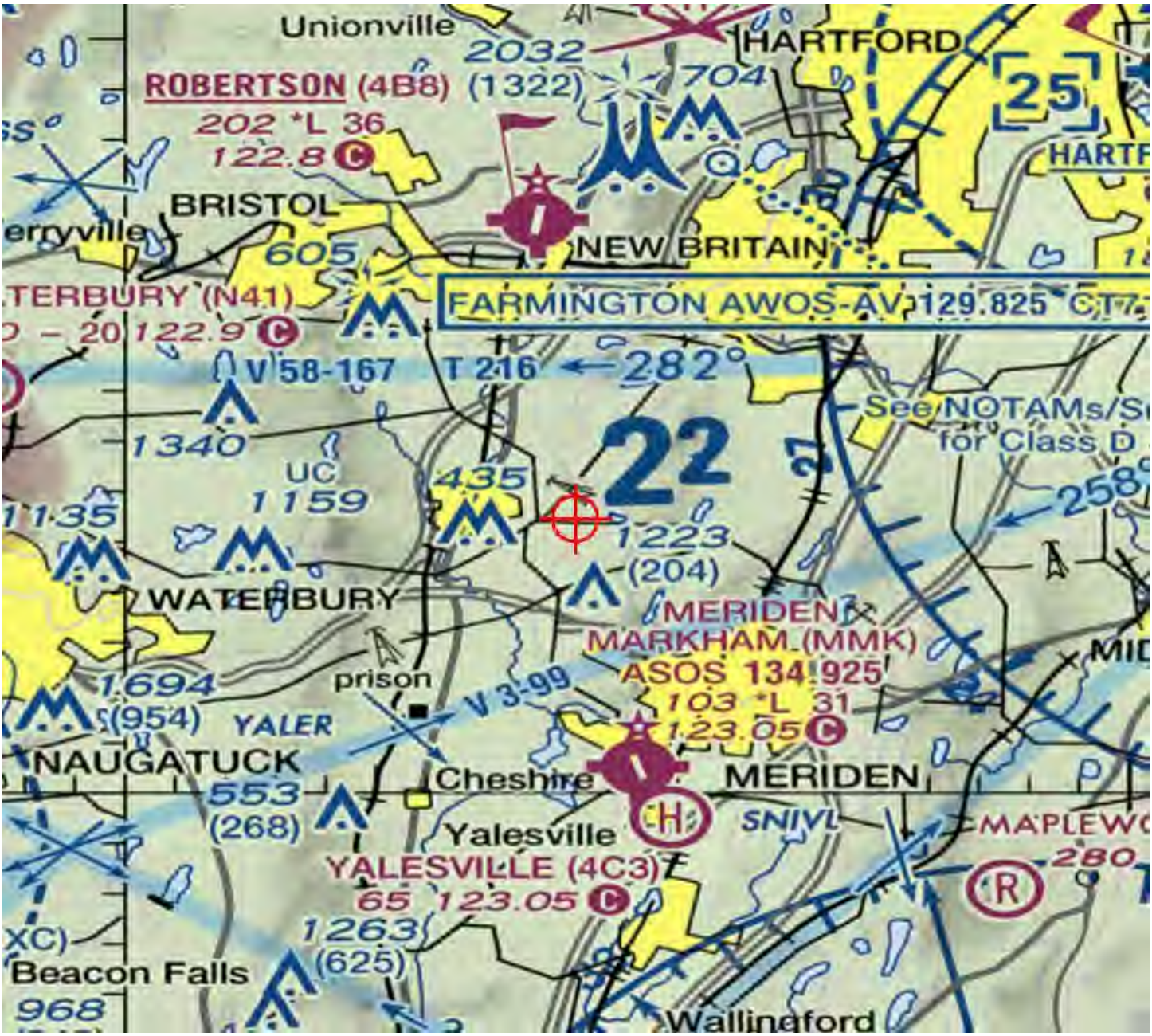
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2493-OE



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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2494-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

****DETERMINATION OF NO HAZARD TO AIR NAVIGATION FOR TEMPORARY STRUCTURE****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Crane HP
Location:	Southington, CT
Latitude:	41-35-25.33N NAD 83
Longitude:	72-51-12.35W
Heights:	210 feet site elevation (SE) 22 feet above ground level (AGL) 232 feet above mean sea level (AMSL)

This aeronautical study revealed that the temporary structure does not exceed obstruction standards and would not be a hazard to air navigation provided the condition(s), if any, in this letter is (are) met:

SEE ATTACHMENT FOR ADDITIONAL CONDITION(S) OR INFORMATION

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of a structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this temporary structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Aviation Administration Flight Procedures Office if the structure is subject to the issuance of a Notice To Airman (NOTAM).

If you have any questions, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2494-OE

Signature Control No: 437359760-442736509 (TMP)
David Maddox
Specialist

Additional Condition(s) or Information for ASN 2020-ANE-2494-OE

Proposal: To construct and/or operate a(n) Crane to a height of 22 feet above ground level, 214 feet above mean sea level.

Location: The structure will be located 5.0 nautical miles north of MMK Airport reference point.

Case Description for ASN 2020-ANE-2494-OE

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Part 77 Obstruction Standard(s) Exceeded and Aeronautical Impacts, if any:

Preliminary FAA study indicates that the above mentioned structure would:
have no effect on any existing or proposed arrival, departure, or en route instrument flight rules (IFR) operations or procedures.
have no effect on any existing or proposed arrival, departure, or en route visual flight rules (VFR) operations.
have no effect on any existing or proposed arrival, departure, or en route instrument/visual flight rules (IFR/VFR) minimum flight altitudes.
not exceed traffic pattern airspace
have no physical or electromagnetic effect on the operation of air navigation and communications facilities.
have no effect on any airspace and routes used by the military.

Based on this aeronautical study, the structure would not constitute a substantial adverse effect on aeronautical operations or procedures because it will be temporary. The temporary structure would not be considered a hazard to air navigation provided all of the conditions specified in this determination are strictly met.

As a condition to this Determination, the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 L Change 2, Obstruction Marking and Lighting, flag marker - Chapters 3(Marked)&12.

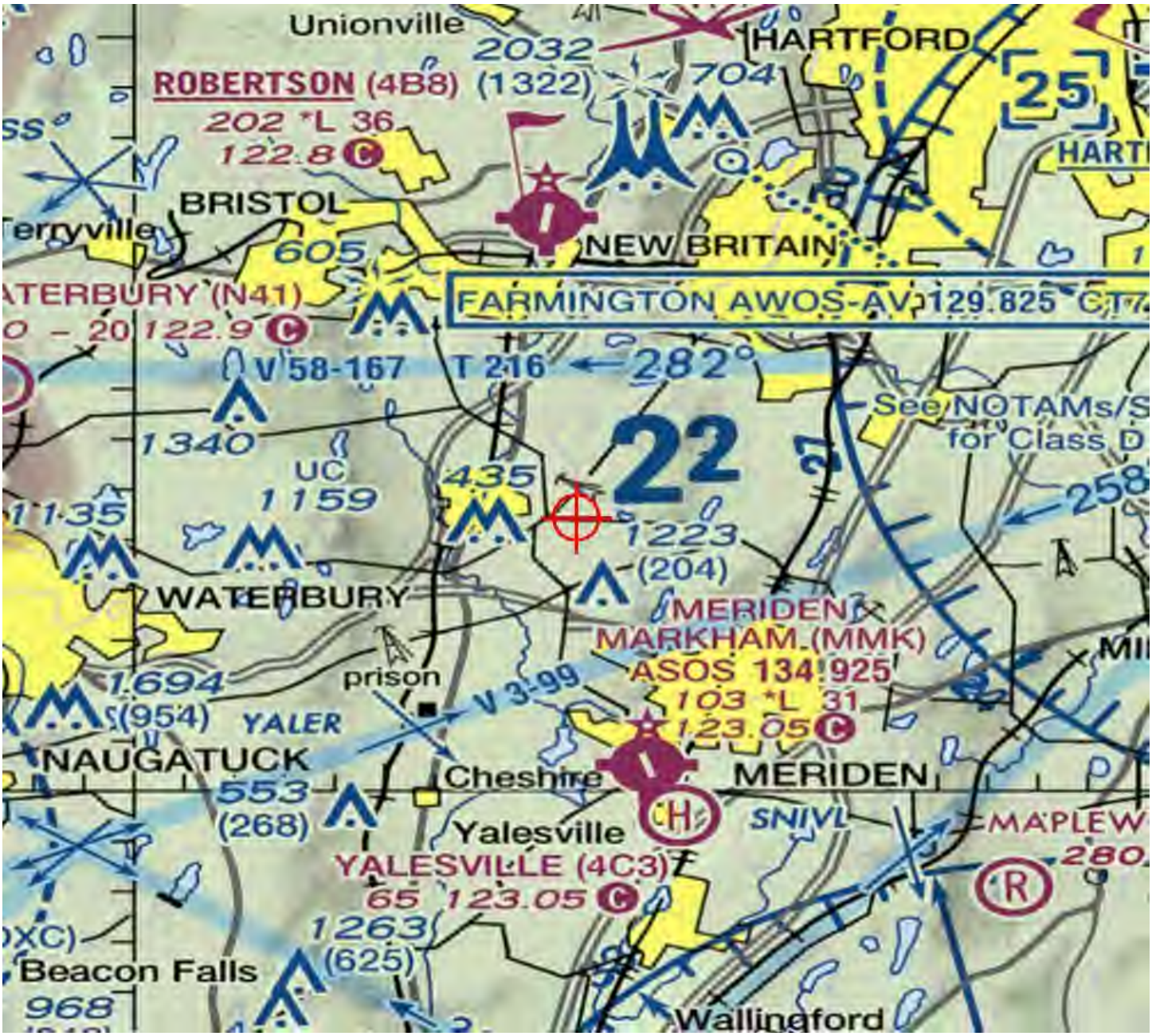
Any failure or malfunction that lasts more than thirty (30) minutes and affects a top light or flashing obstruction light, regardless of its position, should be reported immediately to (877) 487-6867 so a Notice to Airmen (NOTAM) can be issued. As soon as the normal operation is restored, notify the same number.

This determination expires on 12/12/2021 unless extended, revised, or terminated by the issuing office.

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed within 5 days after the temporary structure is dismantled.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

Sectional Map for ASN 2020-ANE-2494-OE



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Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2495-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 1
Location:	Southington, CT
Latitude:	41-35-27.49N NAD 83
Longitude:	72-50-49.25W
Heights:	192 feet site elevation (SE) 10 feet above ground level (AGL) 202 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

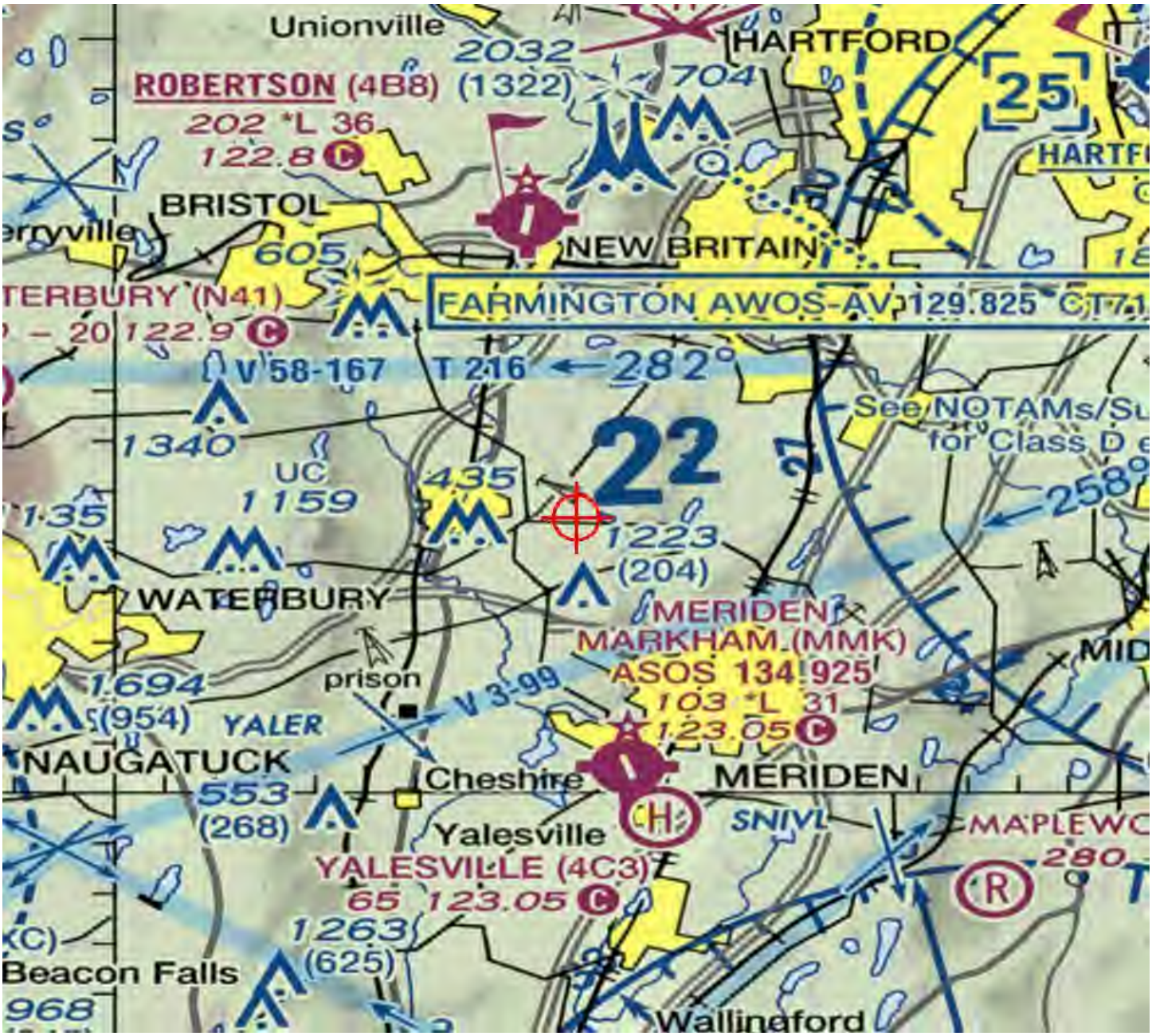
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2495-OE.

Signature Control No: 437375433-442736199 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2495-OE



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Federal Aviation Administration
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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2496-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 2
Location:	Southington, CT
Latitude:	41-35-19.93N NAD 83
Longitude:	72-50-54.14W
Heights:	200 feet site elevation (SE) 10 feet above ground level (AGL) 210 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

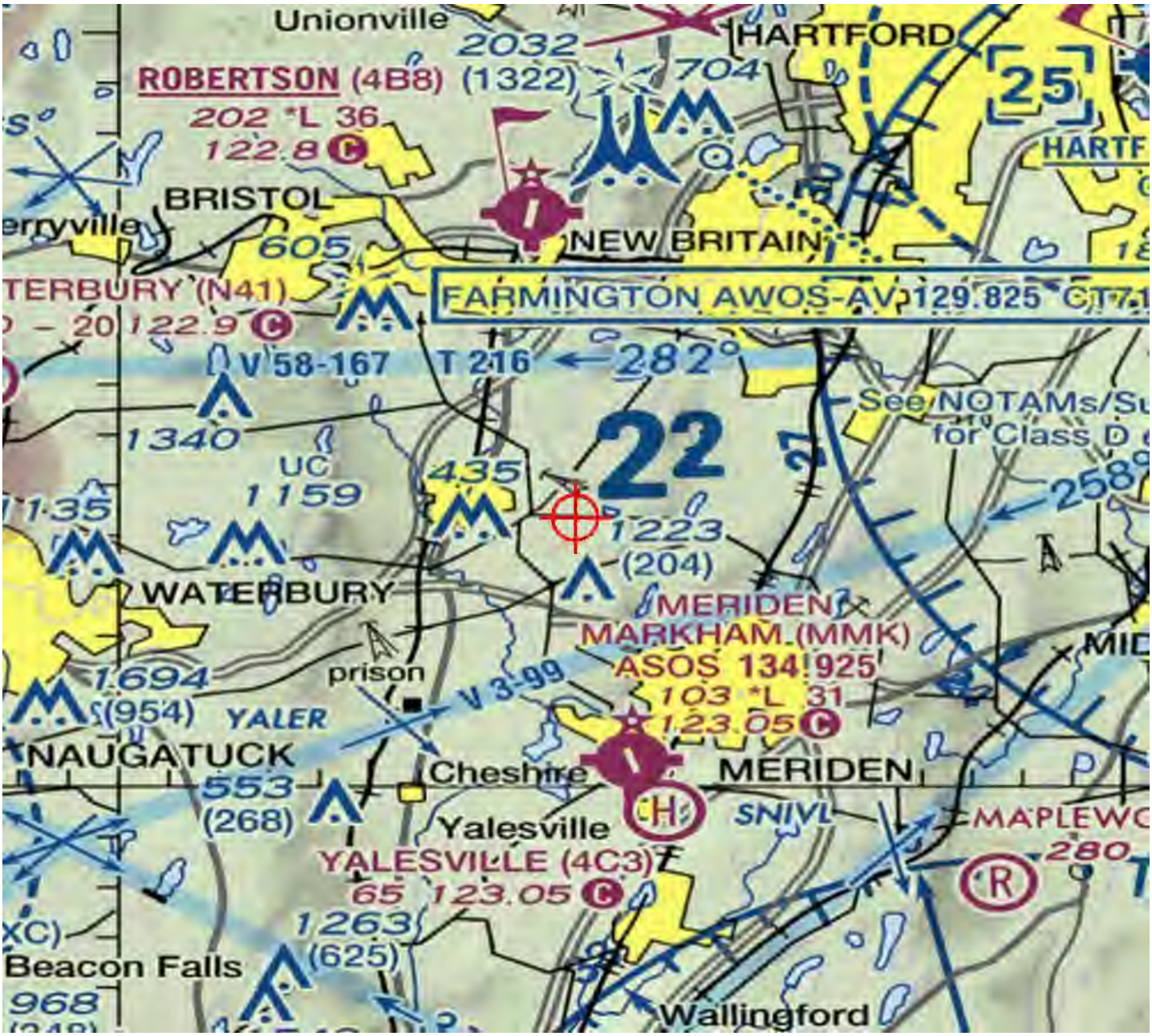
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2496-OE.

Signature Control No: 437375438-442736194 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2496-OE



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Federal Aviation Administration
Southwest Regional Office
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10101 Hillwood Parkway
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Aeronautical Study No.
2020-ANE-2497-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
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3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 3
Location:	Southington, CT
Latitude:	41-35-19.11N NAD 83
Longitude:	72-50-57.34W
Heights:	200 feet site elevation (SE) 10 feet above ground level (AGL) 210 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2497-OE.

Signature Control No: 437375447-442736198 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2497-OE

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Aeronautical Study No.
2020-ANE-2498-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
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3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 4
Location:	Southington, CT
Latitude:	41-35-18.47N NAD 83
Longitude:	72-51-11.85W
Heights:	205 feet site elevation (SE) 10 feet above ground level (AGL) 215 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

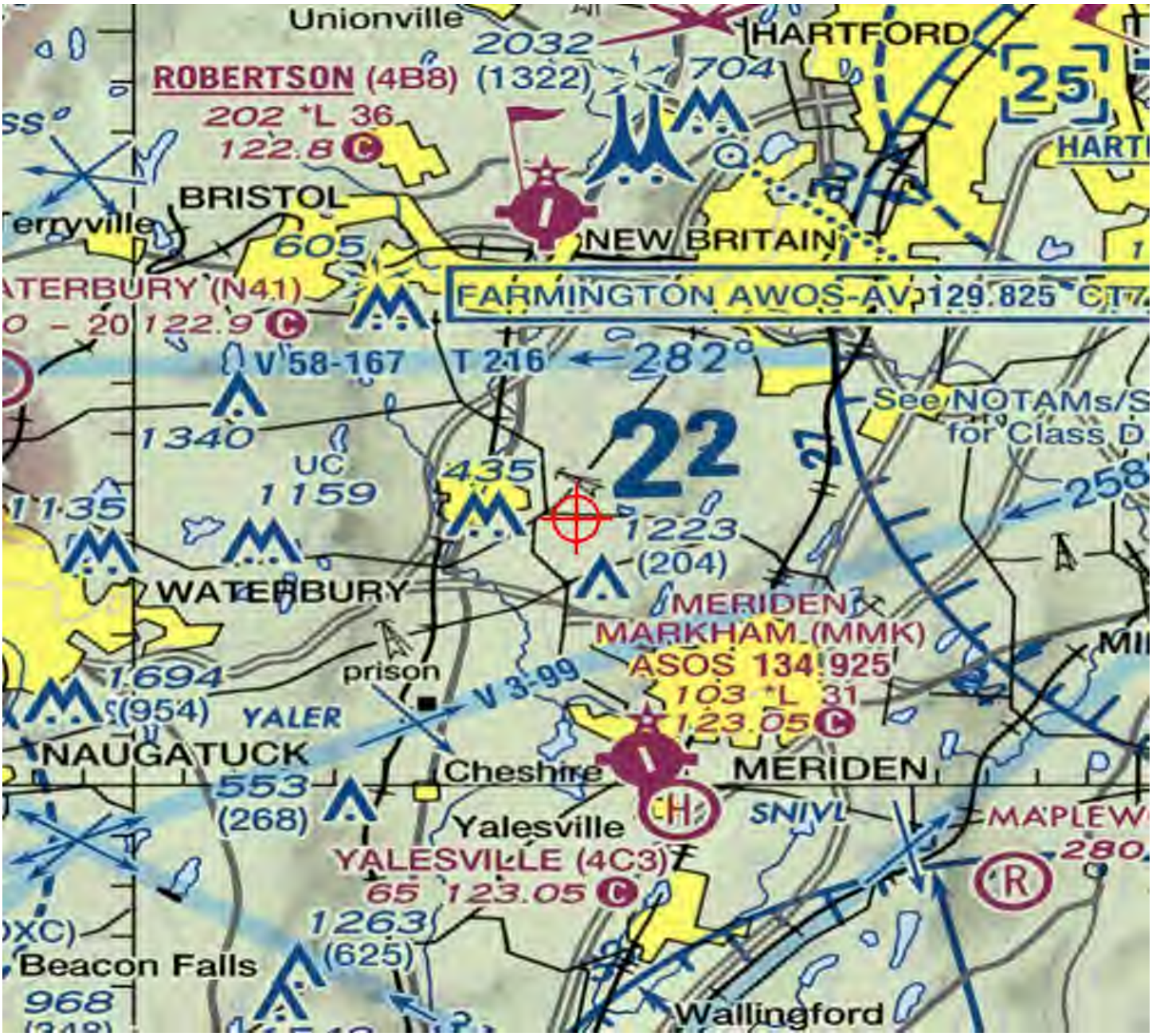
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2498-OE.

Signature Control No: 437375453-442736195 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2498-OE



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Federal Aviation Administration
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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2499-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 5
Location:	Southington, CT
Latitude:	41-35-21.34N NAD 83
Longitude:	72-51-12.46W
Heights:	208 feet site elevation (SE) 10 feet above ground level (AGL) 218 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

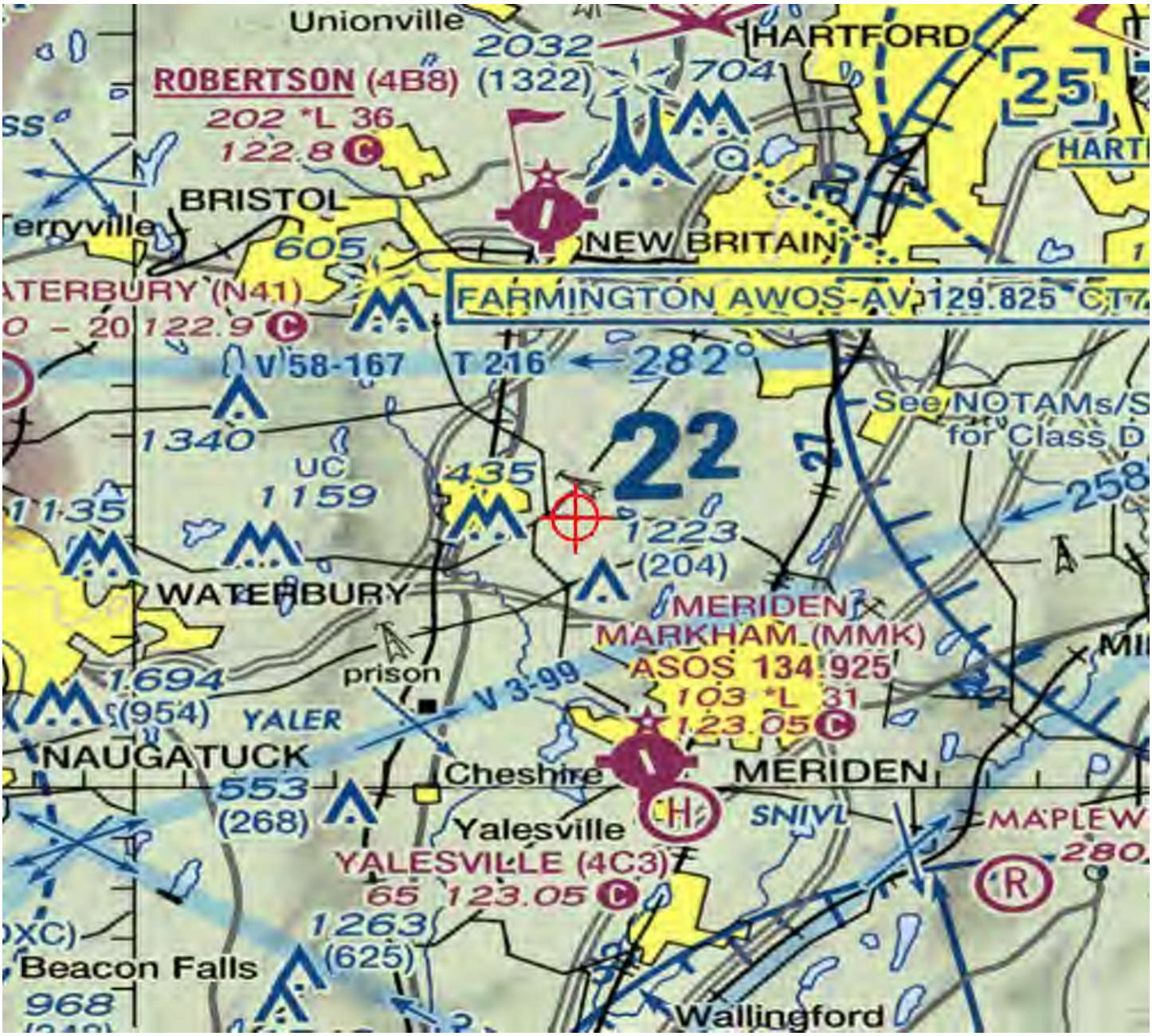
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2499-OE.

Signature Control No: 437375458-442736202 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2499-OE



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Federal Aviation Administration
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10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2500-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 6
Location:	Southington, CT
Latitude:	41-35-21.62N NAD 83
Longitude:	72-51-18.05W
Heights:	207 feet site elevation (SE) 10 feet above ground level (AGL) 217 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

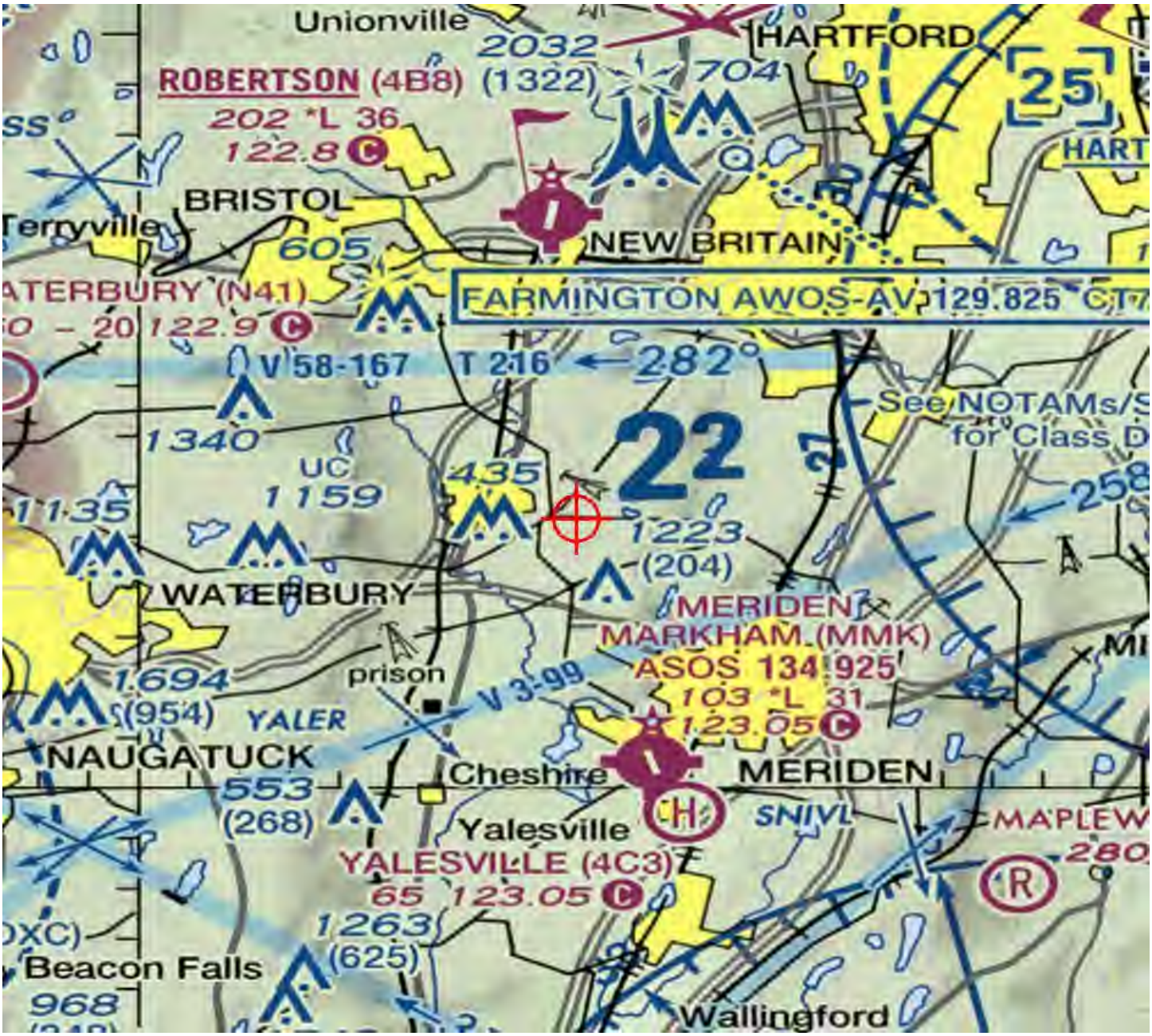
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2500-OE.

Signature Control No: 437375460-442736196 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2500-OE



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Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2501-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 7
Location:	Southington, CT
Latitude:	41-35-26.47N NAD 83
Longitude:	72-51-17.72W
Heights:	202 feet site elevation (SE) 10 feet above ground level (AGL) 212 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

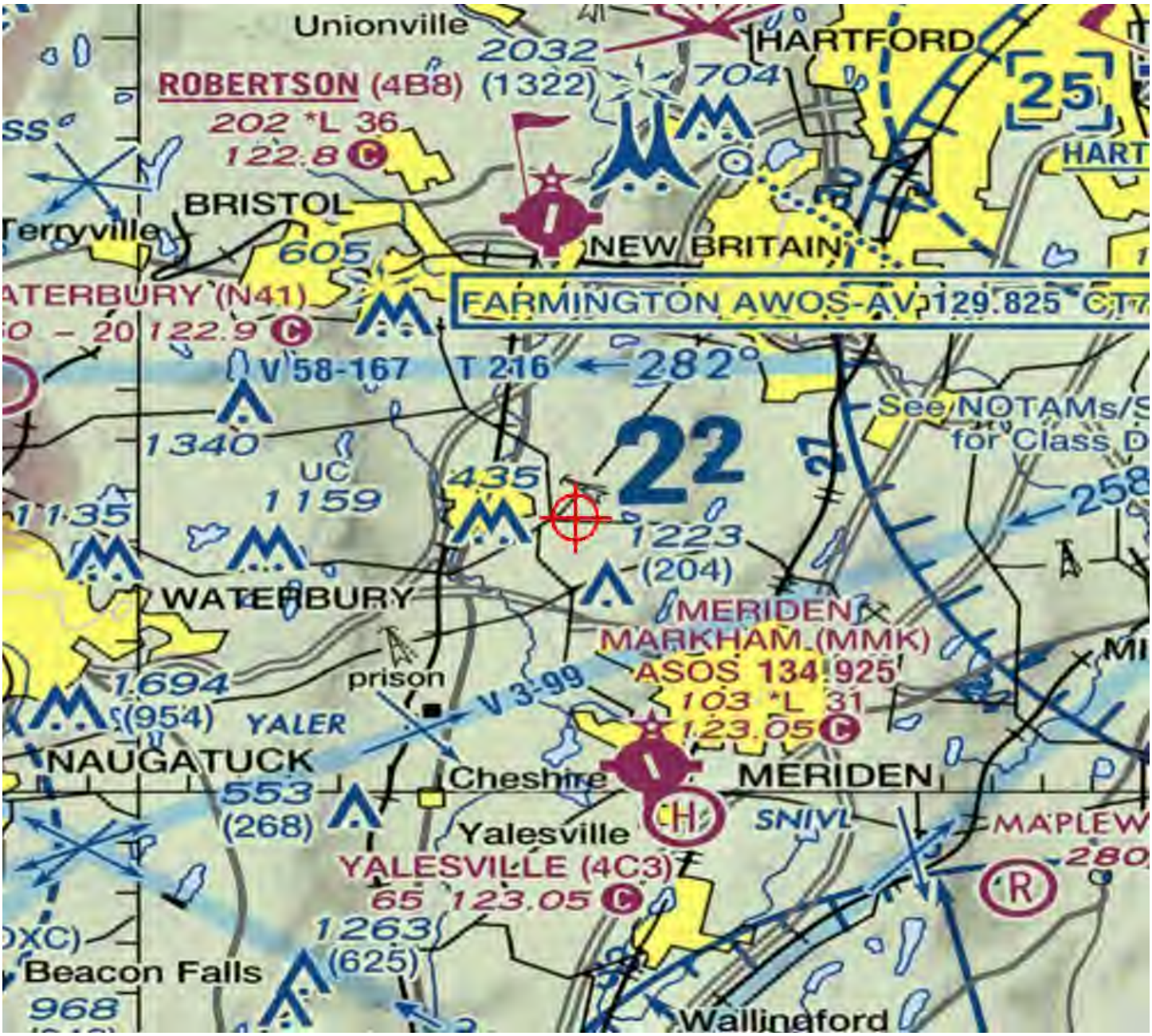
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2501-OE.

Signature Control No: 437375462-442736201 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2501-OE



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Federal Aviation Administration
Southwest Regional Office
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10101 Hillwood Parkway
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Aeronautical Study No.
2020-ANE-2502-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
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**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel Point 8
Location:	Southington, CT
Latitude:	41-35-27.66N NAD 83
Longitude:	72-51-01.71W
Heights:	205 feet site elevation (SE) 10 feet above ground level (AGL) 215 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

This determination expires on 12/12/2021 unless:

(a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
(b) extended, revised, or terminated by the issuing office.
(c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

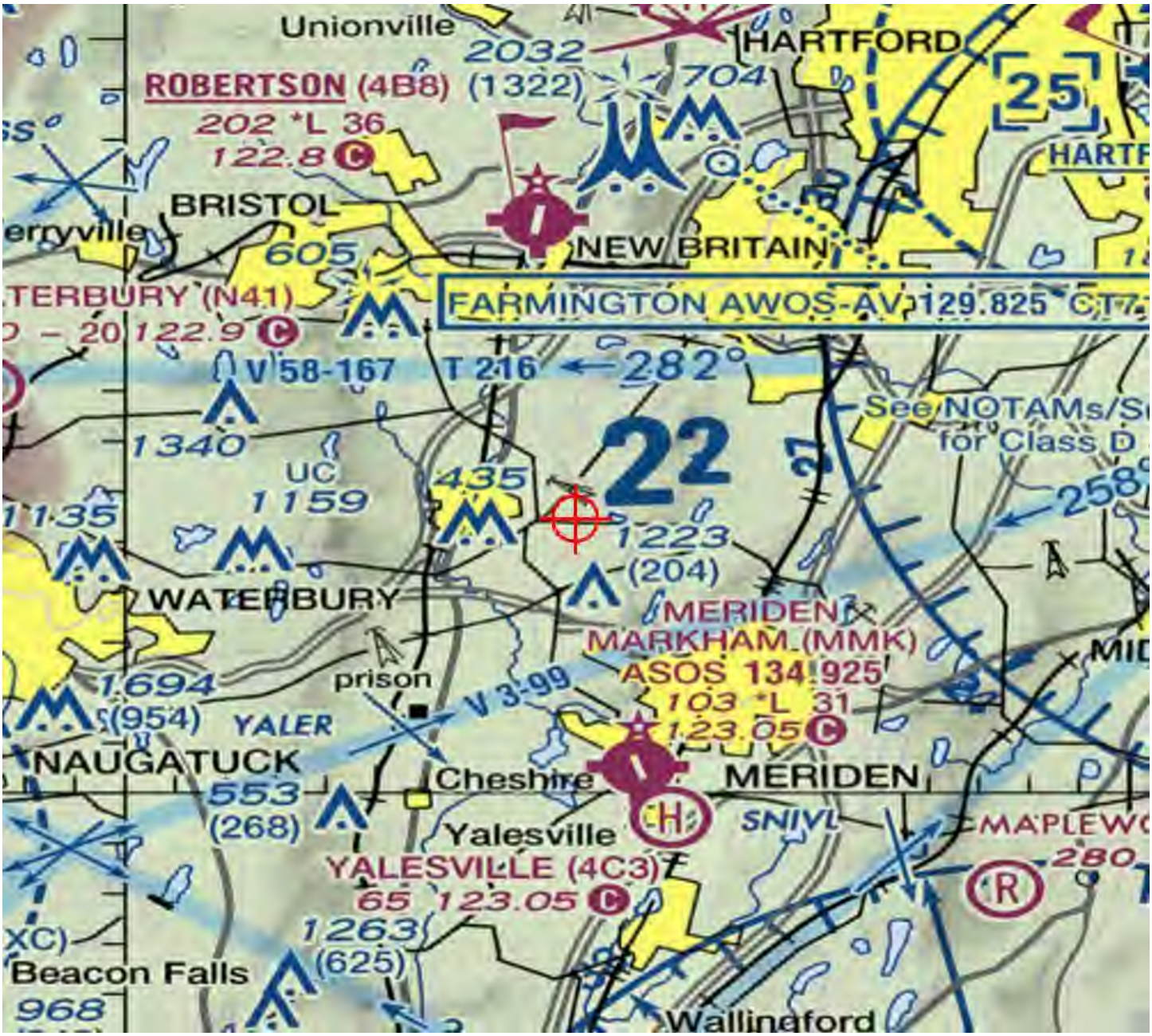
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2502-OE.

Signature Control No: 437375464-442736197 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2502-OE



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2020-ANE-2503-OE

Issued Date: 06/12/2020

Bradley J. Parsons, PE, PMP
All-Points Technology Corporation - Engineering
3 Saddlebrook Dr
Killingworth, CT 06419

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Solar Panel HP
Location:	Southington, CT
Latitude:	41-35-25.33N NAD 83
Longitude:	72-51-12.35W
Heights:	210 feet site elevation (SE) 10 feet above ground level (AGL) 220 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/ lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 L Change 2.

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This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, effective 21 Nov 2007, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA.This determination includes all previously filed frequencies and power for this structure.

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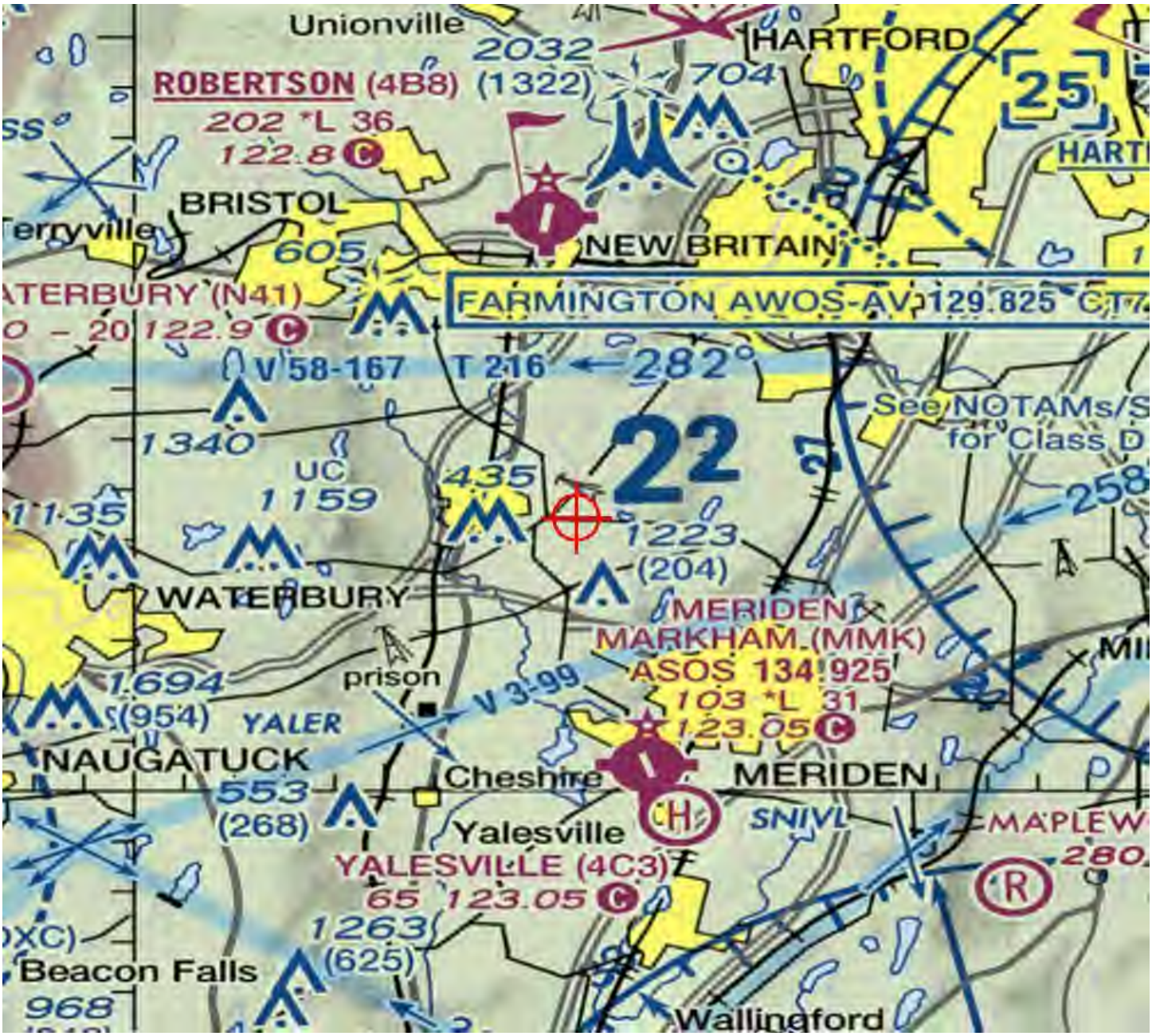
If we can be of further assistance, please contact our office at (202) 267-4525, or david.maddox@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2020-ANE-2503-OE.

Signature Control No: 437375465-442736200 (DNE)
David Maddox
Specialist

Attachment(s)
Case Description
Map(s)

Study is being requested in connection w/ a proposed solar facility consisting of solar panels and associated ground equipment. Please see uploaded PDF file for site layout and point locations.

Sectional Map for ASN 2020-ANE-2503-OE

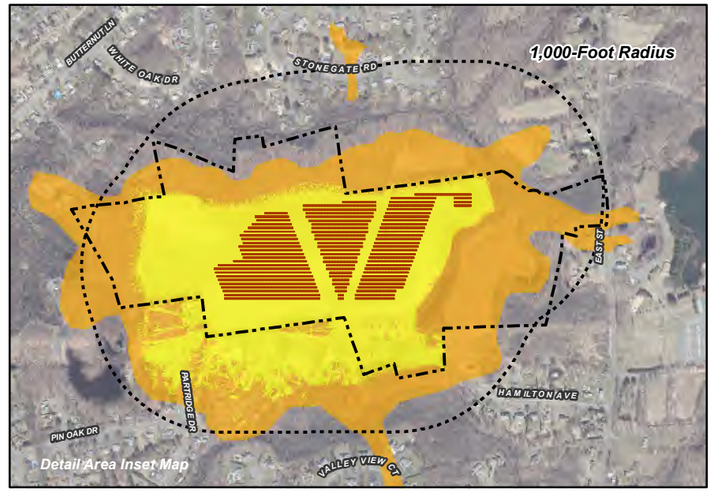


APPENDIX H

VIEWSHED MAP AND
PHOTO-SIMULATIONS

C:\Users\mkopel\Dropbox (APT GIS)\APT GIS Team Folder\Projects\Verogy\Southington_Solar_One_CT590170\mxd\Verogy_Southington_Viewshed_Aerial.mxd

Statewide and Regional Overview Map



Detail Area Inset Map

Viewshed Analysis Map

Proposed Solar Facility
Southington Solar One
1012 Easet Street
Southington, Connecticut

Proposed solar panels to be mounted on approximate 10' AGL support structures.
Forest canopy height and topographic contours are derived from LiDAR data.
Study area encompasses a 1-mile radius and includes 2,635 acres.
Base Map Source: 2019 Aerial Photograph (CTECO)
Map Date: June 2020

Legend

- Site
- Study Area (1-Mile Radius)
- Proposed Perimeter Fence
- Proposed Solar Panel
- Predicted Year-Round Visibility (82 Acres)
- Areas of Potential Seasonal Visibility (116 Acres)
- Municipal Boundary
- Photographic Locations (Taken on April 10, 2020)
- Trail
- Scenic Highway
- DEEP Boat Launches
- Municipal and Private Open Space Property
- State Forest/Park

Protected Open Space Property

- Federal
- Land Trust
- Municipal
- Private
- State

Data Sources:

Physical Geography / Background Data

A digital surface model (DSM) was created from the State of Connecticut 2016 LiDAR LAS data points. The first return LiDAR LAS values, associated with the highest feature in the landscape (such as a treetop or top of building), were used to capture the natural and built features on the Earth's surface beyond the approximate limits of clearing associated with the proposed solar facility. The "bare-earth" return values were utilized to reflect proposed conditions where vegetative clearing associated with the proposed solar facility would occur.

Municipal Open Space, State Recreation Areas, Trails, County Recreation Areas, and Town Boundary data obtained from CT DEEP.
Scenic Roads: CTDOT State Scenic Highways (2015); Municipal Scenic Roads (compiled by APT)

Dedicated Open Space & Recreation Areas

Connecticut Department of Energy and Environmental Protection (DEEP): DEEP Property (May 2007; Federal Open Space (1997); Municipal and Private Open Space (1997); DEEP Boat Launches (1994)

Connecticut Forest & Parks Association, Connecticut Walk Books East & West

Other

CTDOT Scenic Strips (based on Department of Transportation data)

Notes

***Not all the sources listed above appear on the Viewshed Maps. Only those features within the scale of the graphic are shown.*

Limitations

This map depicts areas where the proposed Facility may potentially be visible to the human eye without the aid of magnification based on a viewer eye-height of 5 feet above the ground and intervening topography, tree canopy and structures. This analysis may not account for all visible locations, as it is based on the combination of computer modeling, incorporating the DSM and 2019 digital aerial photographs only. No in-field verification has been completed. This analysis does not claim to depict the only areas, or all locations, where visibility may occur; it is intended to provide a representation of those areas where the Facility is likely to be seen.

0.25 0.125 0 0.25 Miles

Southington Solar One, LLC

ALL-POINTS TECHNOLOGY CORPORATION

PHOTOGRAPHED ON 4/10/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
1	**PIN OAK DRIVE**	**NORTHEAST**	**+/- 0.13 MILE**	**NOT VISIBLE**

PHOTOGRAPHED ON 4/10/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	**PARTRIDGE DRIVE**	**NORTHEAST**	**+/- 450 FEET**	**VISIBLE**

ALL-POINTS TECHNOLOGY CORPORATION

Bristol Solar One, LLC

NOTE: PHOTO-VOLTAIC PANELS DEPICTED ARE APPROXIMATELY 1,3185 FEET AWAY. ADDITIONAL PANEL ARRAYS WOULD EXTEND FARTHER TO LEFT AND NEARER TO CUL-DE-SAC.

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
2	**PARTRIDGE DRIVE**	**NORTHEAST**	**+/- 450 FEET**	**VISIBLE**

PHOTOGRAPHED ON 4/10/2020

EXISTING

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	**COPPER RIDGE**	**NORTHWEST**	**+/- 0.95 MILE**	**VISIBLE**

PROPOSED

PHOTO	LOCATION	ORIENTATION	DISTANCE TO SITE	VISIBILITY
3	**COPPER RIDGE**	**NORTHWEST**	**+/- 0.95 MILE**	**VISIBLE**