Sunrise Wind Farm Project

Appendix Q2
Onshore Visual Resources Assessment

Prepared for:

Sunrise Wind | Powered by Ørsted & Eversource

August 23, 2021

Revision 1 – October 28, 2021

Technical Report

Visual Resources Assessment

Sunrise Wind Onshore Facilities

Town of Brookhaven, Suffolk County, New York

Prepared for:

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1.0 INTRODUCTION

1.1 Purpose of the Investigation

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) was retained by Sunrise Wind LLC (Sunrise Wind or the Applicant) to prepare a Visual Resource Assessment (VRA) for the Onshore Facilities associated with the proposed Sunrise Wind Farm Project. This VRA has been prepared in support of the Sunrise Wind federal Construction and Operations Plan (COP)[1] as well as the Sunrise Wind application for a Certificate of Environmental Compatibility and Public Need under Article VII of the New York State Public Service Law for the portions of the Project within New York State (the Sunrise Wind New York Cable Project).

The visible onshore components (the Project) addressed in this VRA are proposed to be located in the Town of Brookhaven in Suffolk County, New York and are described in further detail in Section 1.2 (See Figure 1.2-1). The only visible component of the operational Onshore Facilities will be the Onshore Converter Station (OnCS–DC).

The purpose of this VRA is to:

- Describe the visible onshore components of the Project within New York State.
- Define the visual character of the visual study area (VSA).
- Inventory and evaluate the existing visually sensitive resources (VSRs).
- Evaluate the potential visibility of the OnCS–DC within the VSA.
- Evaluate potential visibility of the OnCS–DC from VSRs.

This VRA was prepared in accordance with the policies, procedures, and guidelines contained in established visual assessment methodologies (see Literature Cited/References section).

1.2 Project Description and Location

1.2.1 Project Description

Onshore Facilities associated with the Project will be located in the Town of Brookhaven, and include:

- Onshore Transmission Cable and associated transition joint bays (TJBs);
- Fiber optic cable co-located with the Onshore Transmission and Onshore Interconnection Cables;
- OnCS–DC, located on south side of Union Avenue (Union Avenue Site); and
- Onshore Interconnection Cable.

As mentioned previously, the OnCS–DC is the only portion of the Onshore Facilities that is anticipated to be visible during the operational phase of the Project, and therefore will be the focus of this VRA. The location of the OnCS–DC is illustrated in Figure 1.2-2. The major visible equipment associated with the OnCS–DC is described below and illustrated in Figure 1.2-3.

[1] Offshore components of the Project in federal waters are evaluated separately in the Visual Impacts Assessment prepared for the Project (EDR, 2020b).

Table 1.2-1 Project Components in New York State Evaluated in this VRA

Project Component	Description	Visual Considerations
SRWEC – NYS	A submarine export cable buried beneath the seafloor, from the boundary of New York state waters to Transition Joint Bays (TJBs) located at Smith Point County Park on Fire Island, located in Suffolk County, New York.	Negligible visual impacts may occur during construction and will be temporary in nature. The operational components of the SRWEC-NYS will not be visible.
Onshore Transmission Cable	A terrestrial transmission cable buried beneath existing roads or within other public rights-of-way (ROWs), from the TJBs to a new OnCS–DC to be located near the existing Holbrook Substation located in the Town of Brookhaven, New York.	Portions of the Onshore Transmission Cable cross aesthetic resources, which may result in temporary impacts associated with construction of the Onshore Facilities. Visual impacts to these resources will not occur during operations.
OnCS–DC	A new onshore HVDC converter station located off Union Avenue that will interconnect to the Holbrook Substation in the Town of Brookhaven, New York.	Project components will be visible during construction and the operation phase of the Project and therefore are addressed in this VRA.
Onshore Interconnection Cable	A terrestrial interconnection cable beginning at a set of termination structures located along the northerly portion of the OnCS–DC which would be routed along the Express Drive South corridor or within an existing overhead utility ROW and would be routed along Union Avenue to the existing overhead utility ROW for connection to the Holbrook Substation.	The Onshore Interconnection Cable is proposed to be buried underground and therefore will not result in operational visual impacts. Temporary impacts during construction are expected to be minimal and similar in nature to the construction impacts associated with the Onshore Transmission Cable. However, the Onshore Interconnection Cable does not cross any major visual resources.

1.2.2 Project Location

The OnCS–DC is proposed to be located near the existing Holbrook Substation on the south side of Union Avenue, between Claremont Avenue and Middle Avenue (see Figure 1.2-2). This 7-acre site is bound to the north by Union Avenue; to the east by commercial development; to the south by the Long Island Railroad (LIRR) and commercial development; and to the west by commercial and industrial development (see Figure 1.2-2). The Union Avenue Site is currently used as a base of operations for a large paving and industrial construction company.

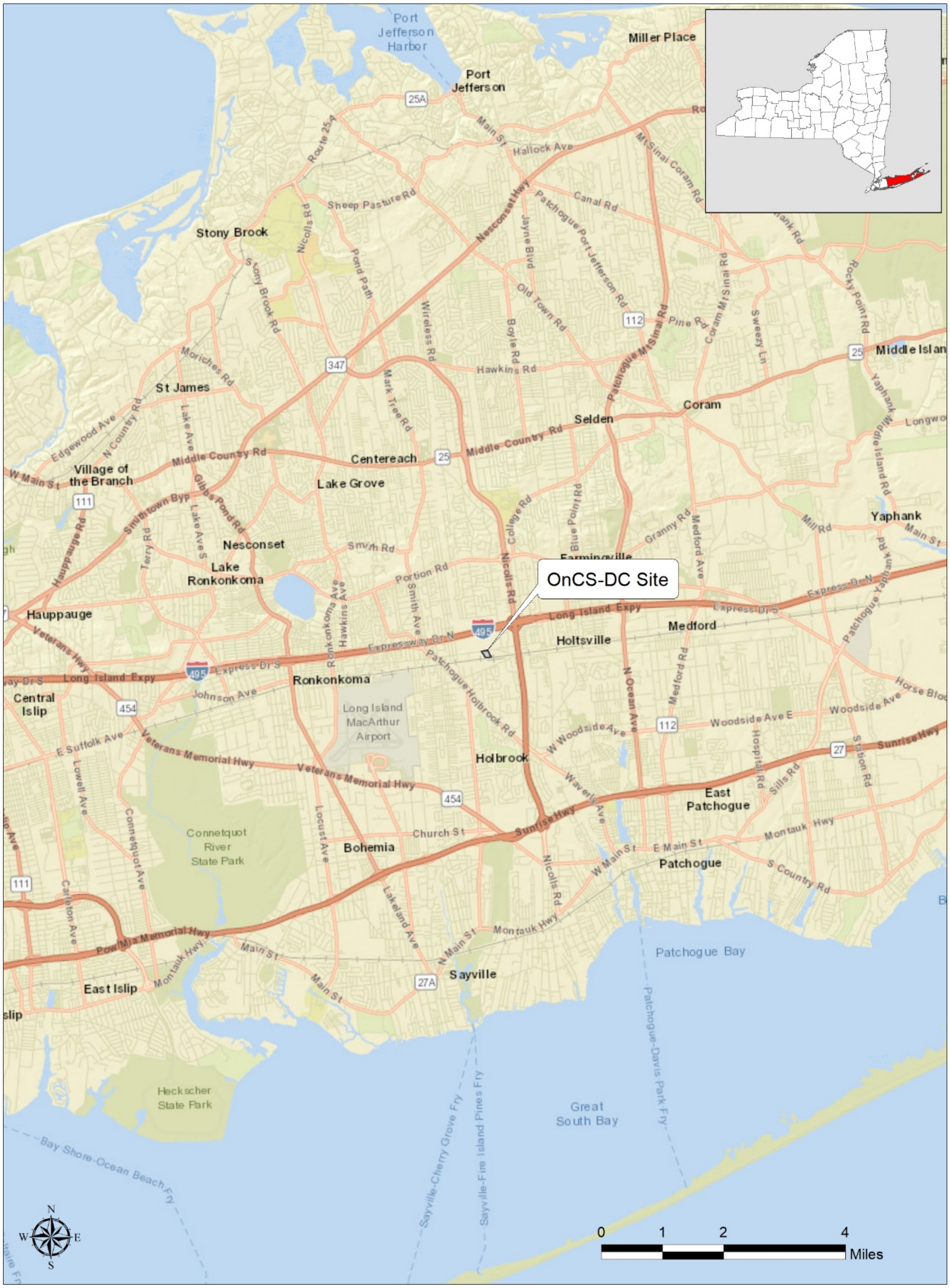

Figure 1.2-1 –Regional Location of the OnCS–DC

Figure 1.2-2 – OnCS–DC Location

1.2.3 OnCS–DC Description

Based on these conservative design assumptions, the development of the Union Avenue Site would be comprised of an approximately 7-acre area which will be graveled and surrounded by a 7-ft (2-m) high fence topped with a 1-ft (0.3-m) tall barbed wire extension for a total height of 8 ft (2.4 m) One of the major visible components of the OnCS–DC will include a converter hall, which is the largest and most prominent structure associated with the OnCS–DC measuring up to approximately 70 ft (21 m) in height (See Table 1.2.-2, below). In addition, lightning masts consisting of tapered galvanized steel monopoles are the tallest structures proposed as part of the OnCS–DC with a maximum height of up to approximately 100 ft (31 m) and will be positioned in up to 18 locations throughout the entire site. However, these structures also have the most slender profile compared to other tall features within the OnCS–DC, with a diameter of approximately 0.8 ft (0.2 m) at the top of the main mast structure. The converter hall and lightning masts provide the basis for the subsequent visibility analysis conducted within the VSA (see Section 2.1.1).

Other structures within the Union Avenue Site include a control enclosure measuring approximately 19 ft (5.8 m) high, a storage structure measuring approximately 19 ft (5.8 m) high, and an alternating current (AC) switchyard which occupies approximately one acre of Union Avenue Site and contains relatively low profile components with maximum height of approximately 26 ft (8 m) including bus structures, conductors, and steel lattice structures.

Table 1.2-2. Design Assumptions for the OnCS–DC

Parameter	Maximum Design Scenario
OnCS–DC	
Area Disturbed During Construction (acres)	7 acres
Operations Site Area	6 acres
Lightning Mast Height	100 ft
Enclosure Height	70 ft

1.3 Visual Study Area

The VSA was defined as an approximate three-mile radius around the proposed Union Avenue Site. The VSA covers approximately 31 square miles (81 sq. km) and includes portions of the Towns of Brookhaven and Islip along with very small portions of the Villages of Lake Grove and Patchogue. The location and extent of the VSA is illustrated in Figure 1.3-1.

1.3.1 Land Use Setting

Land use within the VSA consists of a mix of suburban residential and commercial development with pockets of industrial, community services, and open space uses throughout. These uses are connected by an extensive network of roadways including both local roads and Interstate 495, which cuts through the center of the VSA. The LIRR also passes through the center of the VSA. Single family residential is the dominant land use, followed by industrial, open space, multi-family residential, commercial, and institutional. The VSA is loosely organized by Hamlet, including Holbrook, Farmingville, Holtsville, and Lake Ronkonkoma, in which clusters of commercial, industrial, and residential uses are surrounded by single family residential land use. The VSA also includes significant corridors of suburban strip-commercial developments along major roadways. The Long Island MacArthur Airport occupies significant acreage in the southwestern portion of the VSA. A few patches of undeveloped forest occur throughout the VSA in the form of parkland, undeveloped land, or visual buffers between incompatible uses.

Residential land use is present in the form of upscale, low-density development along road frontage and in cul-de-sacs present throughout much of the VSA, and higher density residential development in pockets of multi-family housing throughout the VSA. Commercial land use is found along Portion Road, Route 454,

North Ocean Avenue, Main Street, Gateway Boulevard, and in small areas scattered throughout the VSA. Industrial land is also present within the VSA, concentrated in and south of the MacArthur Airport property, in an industrial park between Blue Point Road and Waverley Avenue, and around the Union Avenue Site on Union Avenue.

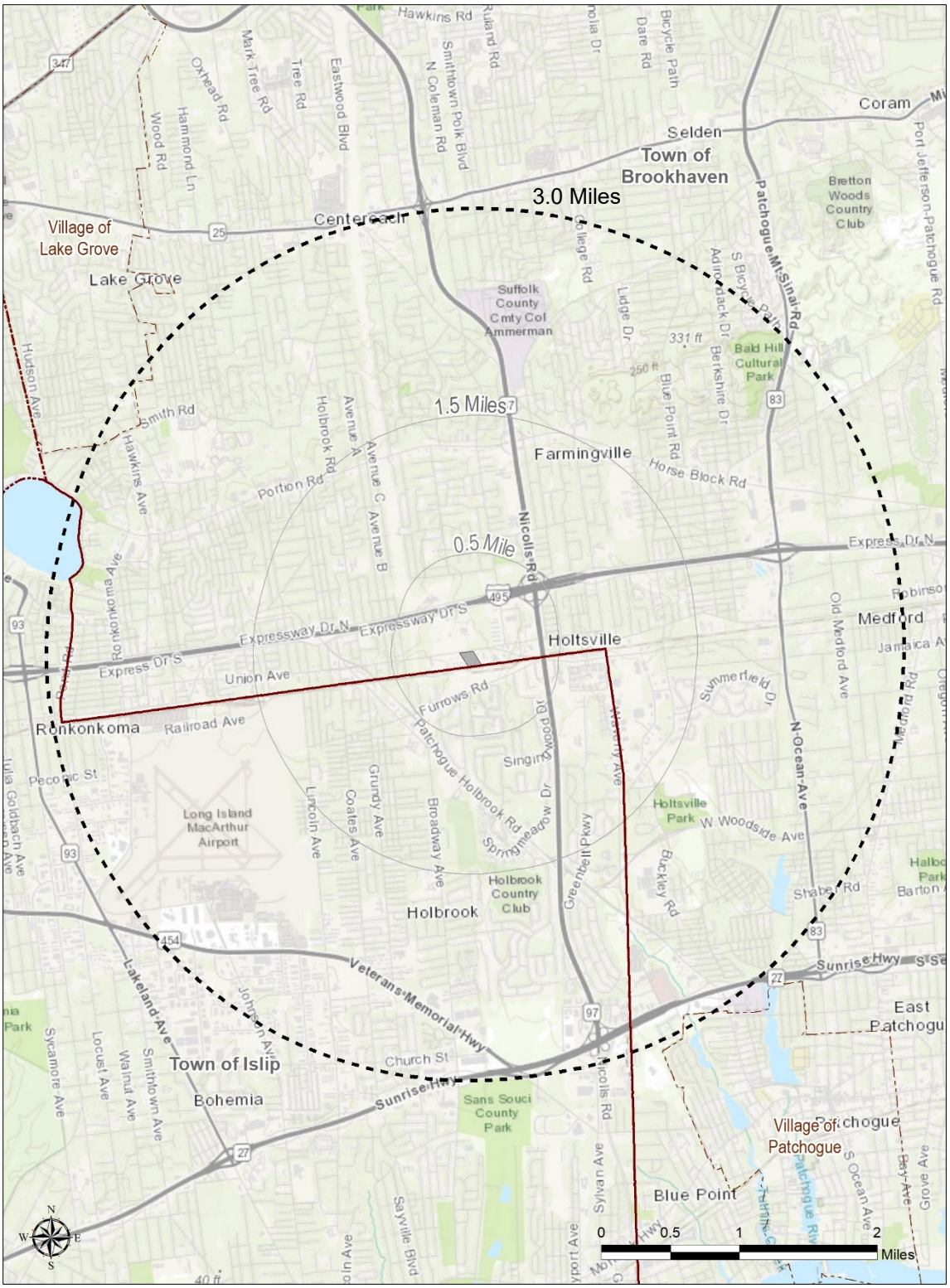

Figure 1.3-1 – Visual Study Area

1.3.2 Landscape Similarity Zones

Landscape Similarity Zones (LSZs) were defined and mapped within the entire VSA. Defining distinct landscape types within the VSA provides a useful framework for the analysis of a project's potential visual effects. LSZs within the VSA were determined using geographic information system (GIS) classification categories provided by the U.S. Geological Survey (USGS) National Land Cover Dataset (2016) and Suffolk County land use data. Individual LSZs were defined based on the similarity of various landscape characteristics, including landform, vegetation, water, and land use patterns, in accordance with established visual assessment methods (notably, USDA Forest Service, 1995; Smardon et al., 1988; USDOT Federal Highway Administration, 2014; USDI BLM, 1984). Within the VSA, the following seven distinct LSZs were identified:

- Residential
- Industrial
- Recreation, Open Space, and Forest
- Commercial
- High Density Residential
- Institutional
- Major Transportation Corridor

The extent of each LSZ within the VSA is summarized in Table 1.3-1 and depicted on Figure 1.3-2. Representative photographs of the visual characteristics of each LSZ are also included in Figure 1.3-3. The delineation methodology used to define the LSZs is provided below, followed by descriptions of each zone.

The LSZ classification analysis is subtractive, meaning that a given criterion is used to classify a portion of the VSA as a particular LSZ, and then the next criterion is applied to classify portions of the remaining land, and so forth until the entire VSA is mapped. The classification and mapping of LSZs within the VSA was conducted as follows:

- The Residential LSZ was identified as areas classified as Low and Medium Density Residential by the Suffolk County Department of Economic Development and Planning in their 2016 Land Use dataset available through Suffolk County Open Data.
- The Industrial LSZ was identified as areas classified as Industrial in the Suffolk County 2016 Land Use dataset. Aerial imagery was used to expand the boundary to include parcels with substantially similar visual characteristics such as the Long Island MacArthur Airport, the Long Island Power Authority (LIPA) Power Generation Facility, and several utility corridors.
- The Recreation, Open Space, and Forest LSZ was identified as areas classified as Recreation/Open Space by the Suffolk County 2016 Land Use dataset. This LSZ includes small areas of Forest, which were identified through aerial imagery interpretation.
- The Commercial LSZ was identified as areas classified as Commercial and Agriculture in the Suffolk County 2016 Land Use dataset. Aerial imagery was used to expand the boundary to include neighboring parcels with substantially similar visual characteristics.
- The High Density Residential LSZ was identified as areas classified as High Density Residential by the Suffolk County Department of Economic Development and Planning in their 2016 Land Use dataset available through Suffolk County Open Data.
- The Institutional LSZ was identified as areas classified as Institutional by the Suffolk County 2016 Land Use dataset.

- The Major Transportation Corridor LSZ was identified as areas extending approximately 50 feet on either side of the centerline of Interstate 495 as provided by NYSGIS.

Table 1.3-1 Landscape Similarity Zones by Total Area in Visual Study Area

Landscape Similarity Zone	Total Area of LSZ within the VSA (sq. mi/sq. km)	Percent of Total Area[1] within VSA
Residential	16.0 (41.4)	51.6%
Industrial	5.3 (13.7)	16.9%
Recreation, Open Space, & Forest	3.9 (10.1)	12.5%
Commercial	1.9 (4.9)	6.1%
High Density Residential	1.9 (4.9)	6.1%
Institutional	1.4 (3.6)	4.6%
Major Transit Corridor	0.7 (1.8)	2.3%

[1]The VSA includes approximately 31 square miles (81 sq. km).

The Residential LSZ, which makes up approximately 51.6 percent of the VSA, is generally characterized by single family homes in a variety of styles in generally good condition. This LSZ is found throughout the VSA, with concentrated pockets north of Interstate 495, east of Long Island MacArthur Airport, and in the south eastern quadrant of the VSA. This zone can be divided into two suburban neighborhood types. The first type contains homes of 1930s to 1980s construction on gridded streets, somewhat densely situated on lots averaging 0.25 square feet, although they range from 3,000 square feet to 0.5 acre. Trees are mature and lawns are well-maintained except for intermittent instances of overgrown older properties. Lot patterns and home style and size are the consistent within development tracts. Some neighborhoods which originated in the 1930s and 1940s are beginning to display housing succession whereby original housing stock is removed and rebuilt, sometimes with an enlarged footprint on combined lots. The second type contains homes built during the 1990s and 2000s on winding, curvilinear street networks which commonly integrate cul-de-sacs and sidewalks. This type is defined by large homes, young tree stock, well-manicured lawns, and deeper setbacks than the older neighborhoods. Small ponds or other water features are sometimes incorporated into these neighborhood types.

The Industrial LSZ comprises 16.9 percent of the VSA and occurs throughout the VSA with significant pockets around the Interstate 495 and Nichols Road Intersection, in and around the Long Island MacArthur Airport, and east of the Farmingville Hamlet. Views from within this LSZ generally lack tree canopy, but are often interrupted by large buildings, equipment or fencing in the foreground. Buildings within this LSZ are typically large facilities, sometimes covering multiple acres with associated large work and storage yards. The Long Island MacArthur Airport contains large buildings associated with the airport within a 1,300-acre property which also includes runways, meadow and lawn buffered on the north and east edges by forest. The industrial LSZ includes the Union Avenue Site and the Holbrook Substation.

The Recreation, Open Space, and Forest LSZ makes up approximately 12.5 percent of the VSA and is characterized by tracts of undeveloped land and includes parks, conservation lands, cemeteries, golf courses, lakes, sports and entertainment facilities, fairgrounds, and other vacant land. Forested land is also included in this LSZ, characterized by tracts of dense, undeveloped forest with mature trees and understory plants. Small areas of open space/recreational LSZ occur throughout the VSA, mostly taking the form of tree-lined neighborhood parks and undeveloped or transitional vacant land. Some large pockets of the LSZ are also present. In the northeast quadrant this includes an 80-acre forest patch on College Road, Farmingville Hills County Park, an amphitheater, and fairgrounds surrounded by forest, and a 50-acre cleared parcel. In the south east quadrant this includes the Town of Brookhaven Ecology Site, a large patch of wetlands, and Canaan Lake. A 110-acre patch of forest north of Route 24 and a large golf course and sports complex are also included in this LSZ. Within this LSZ, views occur on large areas of cleared land, such as at the golf course and amphitheater. Within the forested areas, views are generally restricted to areas where small clearings (patches of grasses and low shrubs) and road cuts provide breaks in the tree canopy. User groups within this LSZ are likely to include local residents and tourist/recreational users.

The Commercial LSZ makes up 6.1 percent of the VSA and is concentrated along Portion Road, Hawkins Avenue, Main Street, North Ocean Avenue. Common features of this LSZ are large parking lots between the roadway and the business, a variety of man-made structures, and concentrated human activity. Views from within this LSZ look outward toward busy thoroughfares yet may also include occasional long-distance views due to limited tree cover and structures. A small number of agricultural businesses have been included in this LSZ, such as are plant nurseries, greenhouses and equestrian facilities. Users of this LSZ are likely to be local residents and tourists/recreational users.

The High Density Residential LSZ, which makes up approximately 6.1 percent of the VSA, is characterized by neighborhoods made up of duplexes, townhomes, and multi-family apartment buildings. The duplexes and townhomes are located along neighborhood streets and have driveway access. The multi-family apartments are clustered two-story buildings connected by private streets which include large parking areas directly adjacent to each building. Planted trees or lawn separate the buildings from one another. Open lawn or dense hedgerow separate the entire development from the local transit network. The apartment complexes may feature shared-use amenities such as swimming pools, ponds, trails, tennis courts, and community rooms.

The Institutional LSZ makes up 4.6 percent of the VSA. Common features in this zone include schools, churches, firehouses which are defined by large buildings setback from the road by large parking areas, typically surrounded by an extensive area of mowed lawn and landscaping. This LSZ tends to contain standalone parcels set within the areas of larger areas of residential or commercial LSZs. Clear views into other LSZs are usually available from the buildings and parking lots of the institutional LSZ.

The Transportation Corridor LSZ occupies approximately 2.6 percent of the VSA and includes Interstate 495, a divided, multi-lane highway with limited access and a large interchange. This LSZ also includes Nicolls Road and Sunrise Highway (State Route 27). Views along these busy thoroughfares are limited to the foreground and mid ground due to the presence of vegetation and structures immediately adjacent to the roadways. Views are dominated by automobiles, pavement, guard rails, and directional signs in the foreground. Interstate 495 is treelined and somewhat elevated. The adjacent tree canopy screens views to the side of the roadway and concentrates open distant views down the road corridor. Nicolls Road is tree-lined with views dominated by automobiles, pavement, guard rails, and directional signs in the foreground. State Route 27 offers similar views where it is tree lined, but also commonly allows views of the front or backs of commercial properties including large parking lots and warehouse or strip-commercial style architecture separated by scrub or forest land. Users of this LSZ are limited to through-travelers/commuters.

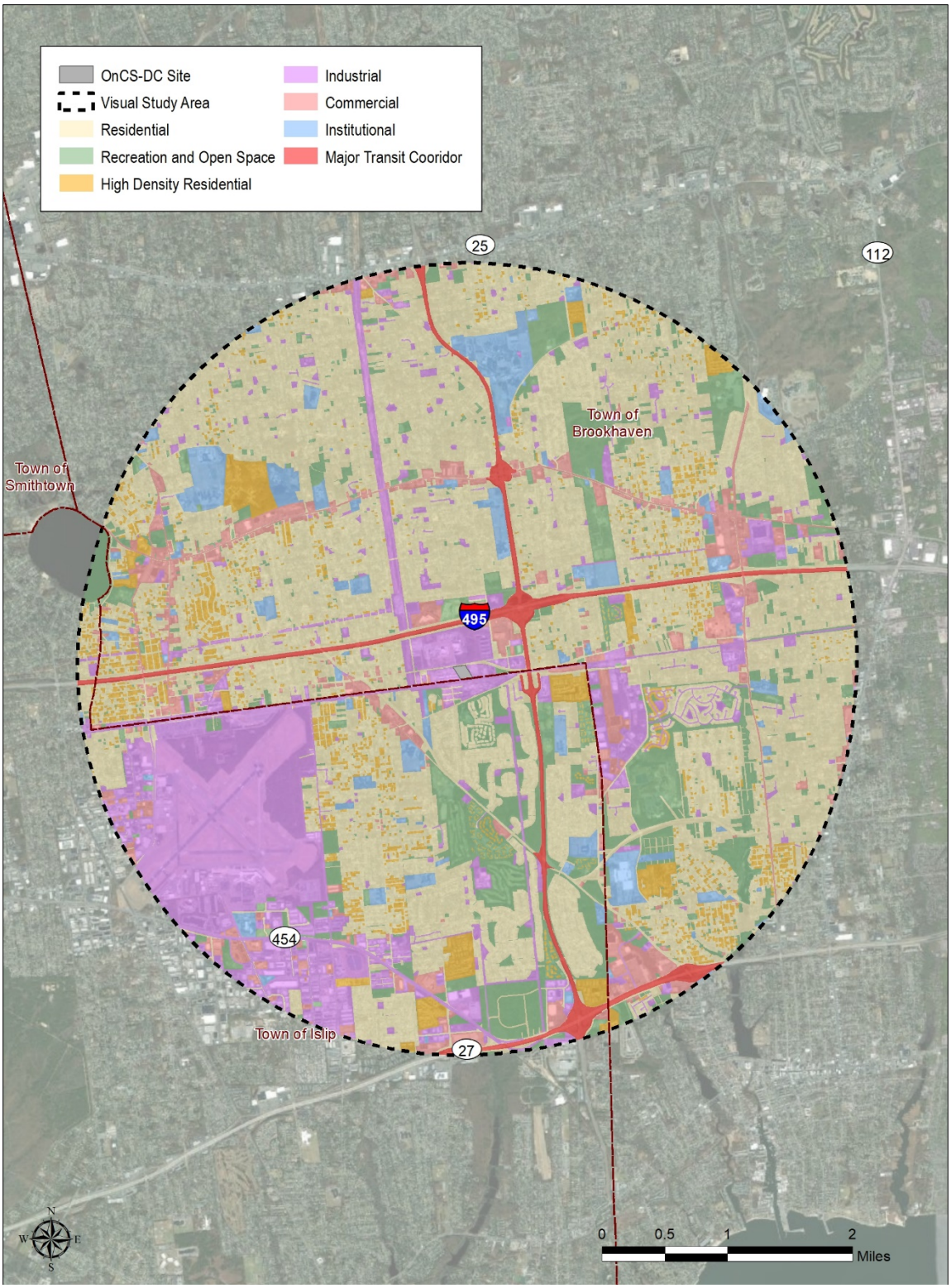

Figure 1.3-2 – Landscape Similarity Zones

Representative Example of the Residential LSZ

Representative Example of the Industrial LSZ

Representative Example of the Recreation, Open Space, & Forest

Representative Example of the Commercial LSZ

Representative Example of the High Density Residential LSZ

Representative Example of the Institutional LSZ

Representative Example of the Transportation LSZ

Figure 1.3-3 – Representative Photographs of Landscape Similarity Zones

1.3.3 Visually Sensitive Resources

Visually Sensitive Resources (VSRs) within the VSA were identified in accordance with guidance provided by NYSDEC Program Policy DEP-00-2 *Assessing and Mitigating Visual Impacts* (NYSDEC, 2019). In addition, EDR identified other resources that could be considered visually sensitive based on the type or intensity of use they receive. The categories of VSRs that would be typically required for consideration in VRAs include the following:

- **Properties of Historic Significance**: National Historic Landmarks, Sites Listed on the National or State Registers of Historic Places [NRHP, SRHP]; Properties Eligible for Listing on the NRHP or SRHP; National or State Historic Sites.

- **Designated Scenic Resources:** Rivers Designated as National or State Wild, Scenic, or Recreational; Adirondack Park Scenic Vistas; Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic; Scenic Areas of Statewide Significance; Other Designated Scenic Resources.

- **Public Lands and Recreational Resources**: National Parks, Recreation Areas, Seashores, and/or Forests; National Natural Landmarks; National Wildlife Refuges; Heritage Areas; State Parks; State Nature and Historic Preserve Areas; State Forest Preserve lands; State Wildlife Management Areas & Game Refuges; State Forests; State Boat Launches/Waterway Access Sites; Designated Trails; Palisades Park lands; Local Parks and Recreation Areas; Publicly Accessible Conservation Lands/Easements; Rivers and Streams with Public Fishing Rights Easements; Named Lakes, Ponds, and Reservoirs.

- **High Use Public Areas**: State, US, and Interstate Highways, Cities, Villages and Schools.

To identify VSRs within the VSA, EDR consulted a variety of GIS and mapping data sources. The number of visually sensitive resources are summarized in Table 1.3-2 and depicted on Figure 1.3-4. Resources relied on for the identification of VSRs are included in the Literature Cited section of this report (see Section 4.0).

Table 1.3-2 VSRs Identified Within the Visual Study Area

Visually Sensitive Resources	Total VSRs within the VSA
Properties of Historic Significance [6 NYCRR 617.4 (b)(9)]	**Total: 2**
National Historic Landmarks (NHL)	0
National/State Historic Sites	0
Properties Listed on National or State Registers of Historic Places (NRHP/SRHP)	1
Properties Eligible for Listing on NRHP or SRHP	1
Designated Scenic Resources	**Total: 0**
Rivers Designated as National or State Wild, Scenic or Recreational	0
Adirondack Park Scenic Vistas [Adirondack Park Land Use and Development Map]	0
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic ([ECL Article 49Title 1] or equivalent)	0
Scenic Areas of Statewide Significance [Article 42 of Executive Law]	0
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)	0
Public Lands and Recreational Resources	**Total: 24**
National Parks, Recreation Areas, Seashores, and/or Forests [16 U.S.C. 1c]	0

Visually Sensitive Resources	Total VSRs within the VSA
National Natural Landmarks [36 CFR Part 62]	0
National Wildlife Refuges [16 U.S.C. 668dd]	0
Heritage Areas [Parks, Recreation and Historic Preservation Law Section 35.15]	1
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]	0
State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]	0
State Forest Preserves [NYS Constitution Article XIV]	0
Other State Lands	0
Wildlife Management Areas & Game Refuges	0
State Forests	0
State Boat Launches/Waterway Access Sites	0
Designated Trails	6
Palisades Park [Palisades Interstate Park Commission]	0
Local Parks and Recreation Areas	13
Publicly Accessible Conservation Lands/Easements	1
Rivers and Streams with Public Fishing Rights Easements	0
Named Lakes, Ponds, and Reservoirs	3
High-Use Public Areas	**Total: 29**
State, US, and Interstate Highways	8
Cities, Villages, Hamlets	7
Schools	14
Total Number of Visually Sensitive Resources in the VSA	**55**

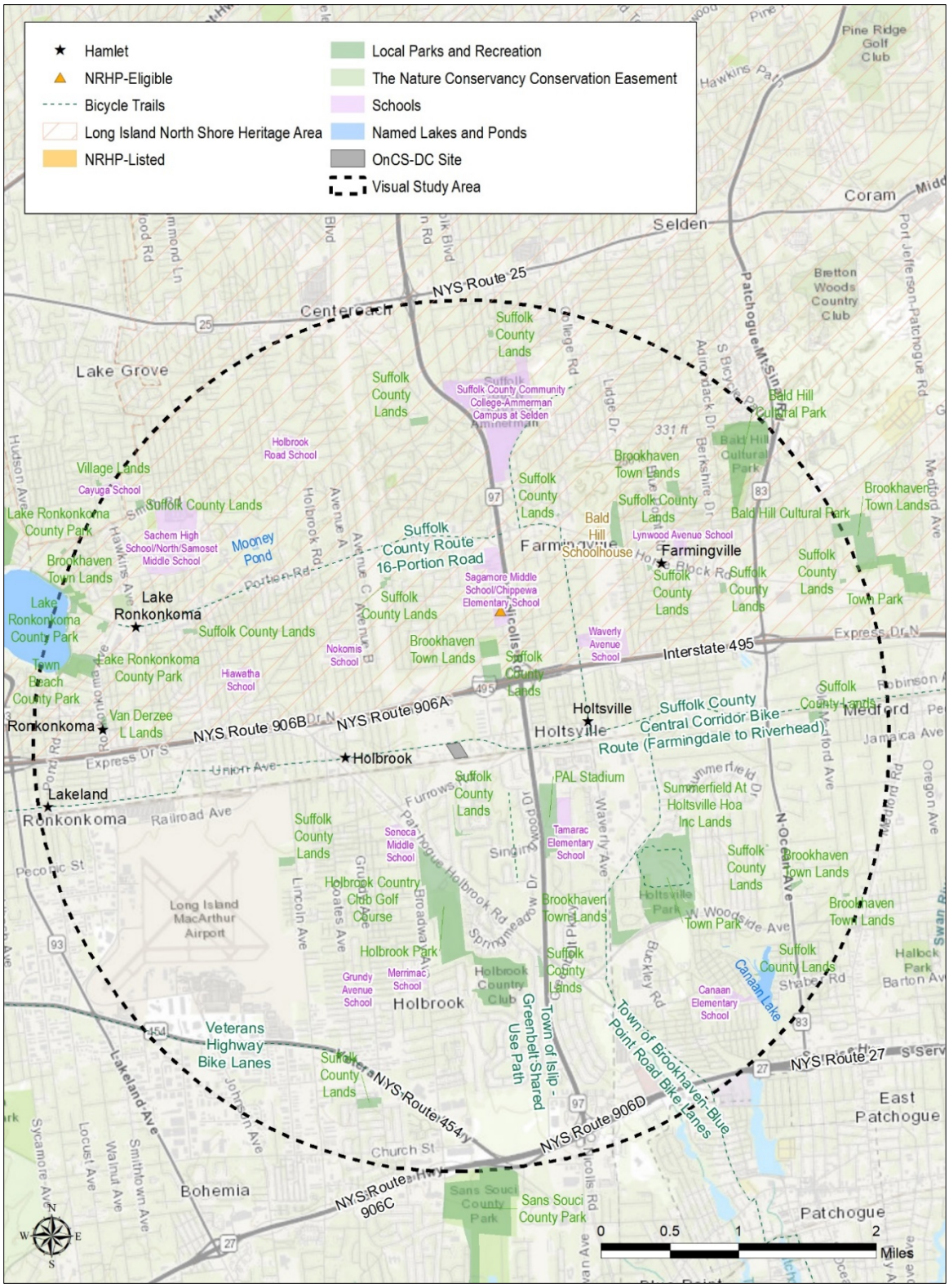

Figure 1.3-4 – Visually Sensitive Resources

1.3.4 Distance Zones

Distance zones are typically defined in visual studies to divide the VSA into distinct classifications based on the various levels of landscape detail available to the viewer. Three distinct distance zones were developed for this purpose. To define these zones, EDR consulted several well-established agency protocols, including those published by the U.S. Forest Service (USFS), Bureau of Land Management (BLM), and U.S. Department of Transportation (USDOT), to determine the appropriate values for each distance zone. It is important to note that each of the agency protocols consulted for this exercise are not specific to this VSA. For example, the BLM recommends a combined foreground-middle ground zone extending from 0-5 miles. While this is appropriate in a western United States landscape with frequent, unscreened views over very long distances, it does not translate to northeastern United States landscapes where views can frequently be contained to within 1.0 mile of the viewer. Conversely, the USFS (1995) suggests the foreground be defined as an area extending 0.5 mile from the viewer. Due to the scale of the specific landscape being evaluated in this VRA, EDR defined the distance zones (as measured from the Union Avenue Site) as follows:

- *Near-Foreground*: 0 to 0.5 mile. At this distance, a viewer is able to perceive details of an object with clarity. Surface textures, small features, and the full intensity and value of color can be seen on foreground objects. The near-foreground distance zone represents 11 percent of the VSA.
- *Foreground*: 0.5 to 1.5 miles. At this distance, elements in the landscape tend to retain visual prominence, but detailed textures become somewhat muted. Larger scale landscape elements remain as a series of recognizable and distinguishable landscape patterns, colors, and textures.
- *Middle ground*: 1.5 to 3.0 miles. The middle ground is usually the predominant distance at which landscapes are seen. At these distances a viewer can perceive individual structures and trees but not in great detail. This is the zone where the parts of the landscape start to join together; individual hills become a range, individual trees merge into a forest, and buildings appear as simple geometric forms. Colors will be distinguishable but subdued by a bluish cast and a softer tone than those in the foreground. Contrast in texture among landscape elements will also be reduced.

1.3.5 Viewer/User Groups

Three categories of viewer/user groups were identified within the VSA. These include the following:

- *Local Residents:* Local residents include those who live and work within the VSA. They generally view the landscape from their yards, homes, local roads and places of employment. Residents are located throughout, and especially in the northern half of the VSA. Except when involved in local travel, residents are likely to be stationary and have frequent or prolonged views of their surroundings although, in many areas, views are limited by forest, landscaping, and/or privacy fences. Local residents may view the landscape from ground level or elevated viewpoints (typically upper floors/stories of homes). This viewer group may be more focused on the visual qualities of their surroundings than travelers or visitors to the VSA. Residents may engage in recreational outdoor activities such as walking in and between neighborhoods, spending time in neighborhood and county parks, using active recreation facilities such as tennis courts, swimming pools, and sports fields.
- *Through Travelers/Commuters:* Commuters and travelers passing through the area view the landscape from motor vehicles on their way to work or other destinations. Commuters and through travelers typically are moving, have a relatively narrow field of view, and are destination oriented. Drivers on major roads in the area (e.g., Interstate 495, Nicolls Road and the Sunrise Highway) generally will be focused on the road and traffic conditions but do have the opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and accordingly, may have greater perception of changes in the visual environment.

- *Tourists/Recreational Users:* Recreational users and tourists include local (full-time and part-time) residents and out-of-town visitors involved in cultural and recreational activities in locations such as local beaches, parks, schools, athletic facilities, and historic districts within the study area. Members of this group may view the landscape from area highways while on their way to these destinations, or from the sites themselves. Scenery will be an important part of all recreational activities, and in almost all cases scenery enhances the quality of these recreational experiences. Recreational users and tourists engaged in outdoor activities will often have continuous views of landscape features over relatively long periods of time and will typically view the surrounding landscape from ground-level vantage points.

2.0 VISUAL ASSESSMENT

The visual assessment procedures and analyses presented in this study are consistent with methodologies developed by the NYSDEC (2019), U.S. Department of the Interior, the Bureau of Land Management (1980), the U.S. Department of Agriculture, the U.S. Forest Service (1974), the U.S. Department of Transportation, the Federal Highway Administration (1981), and the U.S. Army Corps of Engineers (Smardon, et al., 1988). The specific techniques used to assess potential facility visibility and visual effects are described in the following section. Sunrise Wind developed protocol for this assessment and was reviewed and discussed with stakeholders from November 2019 to April 2020. The protocol and the methodology contained in this VRA is provided in a document titled "Visual Resources Assessment Study Plan – Onshore Substation" (April 2020), which was reviewed by BOEM and the NYSHPO.

2.1 Viewshed Analysis

An analysis of the visibility of the proposed OnCS–DC was undertaken to identify those locations within the VSA where there is potential for the proposed OnCS–DC to be seen from ground-level vantage points. This analysis included identifying potentially visible areas on viewshed maps and verifying visibility in the field. The methodology employed for each of these assessment techniques is described below.

2.1.1 Viewshed Methodology

Viewshed analysis was based on USGS 2014 light detection and ranging (lidar) data for Long Island. Lidar is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth to generate precise, three-dimensional information about the shape of the Earth and its surface characteristics (NOAA, 2017). A digital surface model (DSM) of the VSA was created from the lidar data, which includes the elevations of buildings, trees, and other objects large enough to be resolved by lidar technology. The viewshed analysis also included an assumed viewer height of 6 ft (2 m); the location and height of proposed structures within the OnCS–DC, and ESRI ArcGIS® software with the Spatial Analyst extension. The viewshed analysis was based on 18 proposed lightning mast locations (100 ft [30 m] tall) to provide a worst-case assessment of Project visibility. However, due to the slender profile of the lightning masts, the viewshed analysis also considers sample points from large recognizable features such as eight converter hall sample points (70 ft [21 m] tall), four outdoor cooler sample points (31 ft [10 meters] tall), and six DC structure sample points (26 ft [8 meters] tall)

Since portions of the OnCS–DC Site include existing structures and trees, the DSM was modified to reflect bare-earth elevations within the Union Avenue Site to account for Project-related demolition and clearing. This modified DSM was then used as a base layer for the viewshed analysis.

Once the viewshed analysis was complete, a conditional statement was used to set visibility to zero in locations where the DSM elevation exceeded the bare earth elevation by six feet or more. This was done for two reasons; 1) because in locations where trees or structures are present in the DSM, the viewshed would reflect visibility from the vantage point of standing on the tree top or building roof, which is not the intent of this analysis and 2) to reflect the fact that ground-level vantage points within buildings or areas of vegetation exceeding 6 ft (2 m) in height will generally be screened from views of the OnCS–DC.

Viewshed analysis does not consider the acuity of the viewer, atmospheric diminishment of visibility, or elements too small to be resolved by lidar data. Therefore, the geographic areas of visibility resulting from the viewshed analysis are considered a worst-case analysis of potential visibility of the OnCS–DC.

2.1.2 Viewshed Results

Potential visibility of the OnCS–DC, as indicated by the viewshed analysis, is illustrated in Figure 2.1-1 and is broken down by LSZ in Table 2.1-1. As indicated by the viewshed analysis, the OnCS–DC could potentially be visible from approximately 0.3 square miles within the VSA (0.8 percent of the VSA).

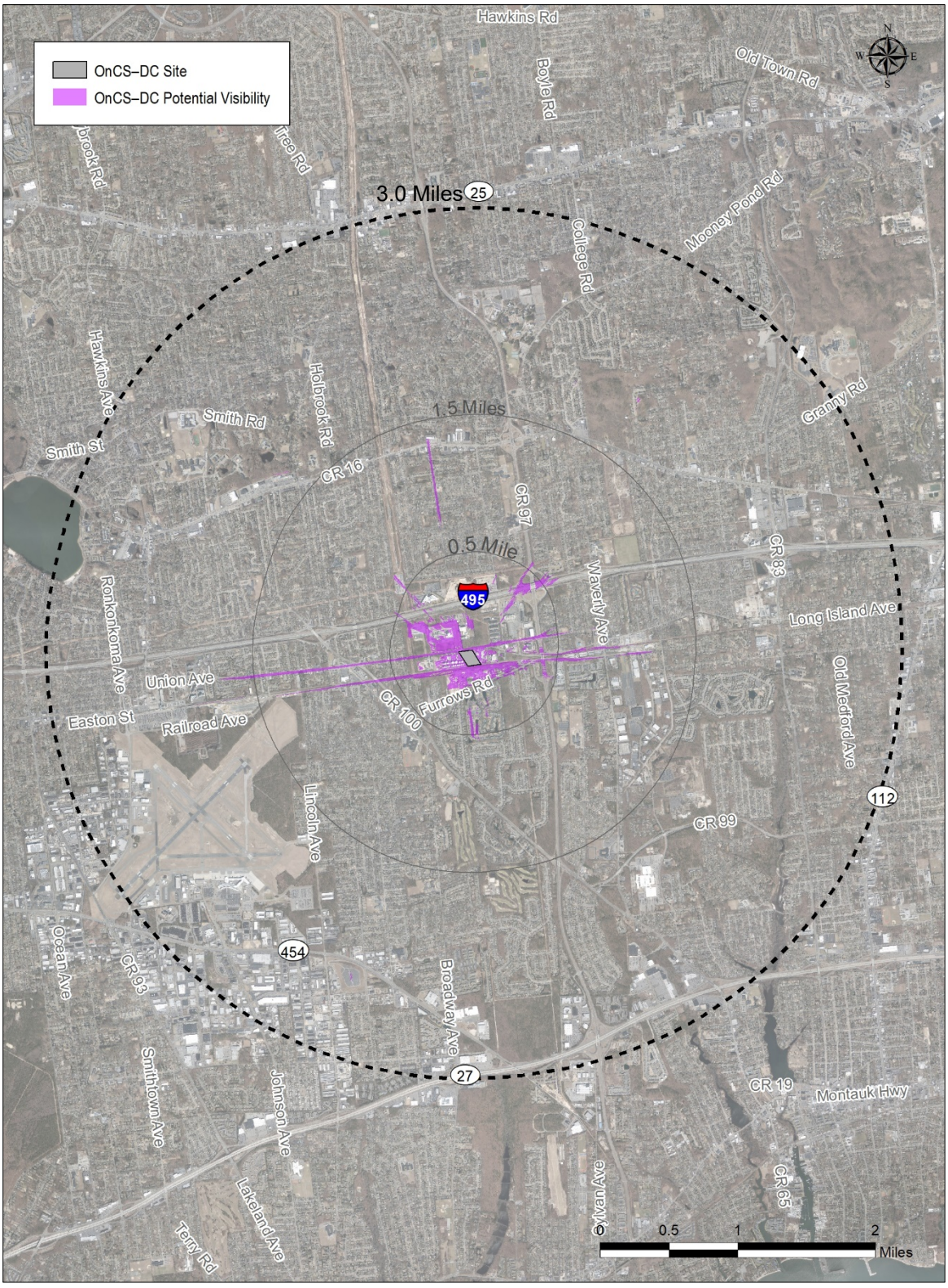

Figure 2.1-1 – Viewshed Analysis - OnCS–DC

Table 2.1-1 indicates the viewshed analysis results in each of the identified LSZs (see Section 1.3.2). It is anticipated that greater than 60% of the total anticipated visibility within the VSA will occur in the Industrial LSZ, which occupies 5.3 sq mi (13.7 sq km) of the total area within the VSA. Of this area, 0.2 sq miles (0.4 sq km) or 3.0% of the Industrial LSZ would have potential visibility of the OnCS–DC. The prevalence of visibility within the Industrial LSZ is directly attributed to the fact that the Union Avenue Site is surrounded on all four sides by industrial land and potential Project visibility is most concentrated in the near-foreground distance zone. Of the remaining LSZs, the Residential LSZ has the next greatest visible area with less than 40 acres (0.4%) of the total area with potential Project visibility, followed by the Major Transit Corridor LSZ which includes approximately 16.0 acres of visible area which makes up 3.6% of that LSZ total land area. The remaining LSZs (Recreation, Open Space, & Forest, Commercial, High Density Residential, and Institutional) include less than 13 acres of total visibility within the entire VSA, suggesting that if views are available, they will be limited to a very small, discrete area.

Table 2.1-1 Viewshed Results by Landscape Similarity Zone

Landscape Similarity Zone	Total Area of LSZ within the VSA (sq. mi/sq. km)	Total Area of LSZ with Potential Visibility (sq. mi/sq. km)	Total Area of LSZ with Potential Visibility (Acres)	Percent of LSZ with Potential Visibility
Residential	16.0 (41.4)	0.1 (0.2)	38.8	0.4%
Industrial	5.3 (13.7)	0.2 (0.4)	101.4	3.0%
Recreation, Open Space, & Forest	3.9 (10.1)	<0.1 (<0.1)	4.6	0.2%
Commercial	1.9 (4.9)	<0.1 (<0.1)	6.9	0.6%
High Density Residential	1.9 (4.9)	<0.1 (<0.1)	0.5	<0.1%
Institutional	1.4 (3.6)	<0.1 (<0.1)	0.3	<0.1%
Major Transit Corridor	0.7 (1.8)	<0.1 (0.1)	16.0	3.6%

A total of 55 VSRs were identified within the VSA, with 12 of those showing potential visibility according to the DSM viewshed analysis. The VSRs with potential visibility are presented in Table 2.1-2, followed by a brief description of the VSRs that could potentially have views of the proposed OnCS–DC in Table 2.1-3.

Table 2.1-2 VSRs with Potential Visibility of the OnCS–DC

Visually Sensitive Resources	Total Number of Resources within the Visual Study Area	Total Number of Resources with Visibility
Properties of Historic Significance [6 NYCRR 617.4 (b)(9)]	**Total: 2**	**Total: 0**
National Historic Landmarks (NHL)	0	0
National/State Historic Sites	0	0
Properties Listed on National or State Registers of Historic Places (NRHP/SRHP)	1	0
Properties Eligible for Listing on NRHP or SRHP	1	0
Designated Scenic Resources	**Total: 0**	**Total: 0**
Rivers Designated as National or State Wild, Scenic or Recreational	0	0
Adirondack Park Scenic Vistas [Adirondack Park Land Use and Development Map]	0	0
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic ([ECL Article 49Title 1] or equivalent)	0	0
Scenic Areas of Statewide Significance [Article 42 of Executive Law]	0	0
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)	0	0
Public Lands and Recreational Resources	**24**	**Total: 6**
National Parks, Recreation Areas, Seashores, and/or Forests [16 U.S.C. 1c]	0	0

Visually Sensitive Resources	Total Number of Resources within the Visual Study Area	Total Number of Resources with Visibility
National Natural Landmarks [36 CFR Part 62]	0	0
National Wildlife Refuges [16 U.S.C. 668dd]	0	0
Heritage Areas [Parks, Recreation and Historic Preservation Law Section 35.15]	1	1
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]	0	0
State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]	0	0
State Forest Preserves [NYS Constitution Article XIV]	0	0
Other State Lands	0	0
Wildlife Management Areas & Game Refuges	0	0
State Forests	0	0
State Boat Launches/Waterway Access Sites	0	0
Designated Trails	6	3
Palisades Park [Palisades Interstate Park Commission]	0	0
Local Parks and Recreation Areas	13	2
Publicly Accessible Conservation Lands/Easements	1	0
Rivers and Streams with Public Fishing Rights Easements	0	0
Named Lakes, Ponds, and Reservoirs	3	0
High-Use Public Areas	**Total: 29**	**Total: 6**
State, US, and Interstate Highways	8	3
Cities, Villages, Hamlets	7	2
Schools	14	1
Total Number of Visually Sensitive Resources in the VSA	**55**	**12**

Table 2.1-3 Description of VSRs with Potential Visibility of the OnCS–DC

Resource Type	Resources	Distance from Facility (Miles)	Facility Visibility
Heritage Areas [Parks, Recreation and Historic Preservation Law Section 35.15]	Long Island North Shore Heritage Area	0.3	The VSA encompasses a portion of the Long Island North Shore State Heritage Area which occurs on the north side of Interstate 495 and extends to the North Shore of Long Island. Given the expanse of this resource, geographic areas of visibility are variable in size. However, the largest areas of contiguous visibility are located in corridors crossing over, and extending along, portions of Interstate 495. As noted in the viewshed analysis results, several local roads that occur within the Heritage Area north of the Project may also have intermittent and discrete visibility of portions of the OnCS–DC. The most prominent of these locations occurs on Warren Avenue from Monaco Court to Portion Road.
Designated Trails: Bicycle Trails/Routes	Suffolk County Central Corridor Bike Route (Farmingdale to Riverhead)	0.0	Potential visibility is generally contained within one half mile of the Site which results in extended views along open roadway corridors adjacent to the Project. As such, bicycle trails oriented toward the site or that pass directly adjacent to the site are likely to have visibility of the OnCS–DC. The Suffolk County Central Corridor Bike Route traverses the VSA east to west following Johnson, Union, and Long Island Avenue, along unmarked lanes shared with vehicle traffic. This resource crosses north of the Project site and, as demonstrated by the viewshed analysis, provides a direct line of site along the corridor from the site to Babcock Road. Intermittent visibility of short duration may also be available in discrete locations east of the site. The Town of Brookhaven-Blue Point Road Bike Lane runs north-south, crossing the Suffolk County Central Corridor Bike Route east of the site. Portions of the bike lane following Blue Point Road provide on-road striped bicycle lanes. Potential visibility of the Project is limited to thin corridors crossing the trail at the Union Avenue intersection. The Suffolk County Route 16 Bike Route is located on Portion Road. It is an on-road striped bicycle route that has potential visibility near the intersection with Warren Road. However, field review confirmed that extensive vegetative screening occurring on both sides of the road is likely to partially or completely screen views toward the OnCS–DC, particularly at a distance of 1.2 miles.
	Town of Brookhaven-Blue Point Road Bike Lane	0.9	
	Suffolk County Route 16-Portion Road		
Local Parks and Recreation Areas	Suffolk County Lands	0.3	All Local Park and Recreation resources with potential visibility are located within the foreground distance zone. The closest of which, Suffolk County Lands, is connected to the Greenleaf Trail System. However, the foreground of this view contains significant vegetative screening in the near foreground which is anticipated to significantly screen the OnCS–DC. In addition, any potential visibility beyond the foreground vegetation will likely be limited to the lightning mast or upper most portions of the OnCS–DC, which would likely be difficult to distinguish from existing visual distractions present around the site, such as the LIPA Power Generation Facility. Visibility at the Town of Brookhaven Ecology Site/Holtsville Wildlife & Ecology Center is largely contained to inaccessible areas, such as maintenance areas and an open field containing a fenced solar facility.
	Town of Brookhaven Ecology Site/Holtsville Wildlife & Ecology Center	1.5	
State, US, and Interstate Highways	New York State Route 906A	0.3	Interstate 495 traverses the VSA east and west with NYS Route 906A and 906B running parallel on the south and north side of Interstate 495, respectively. Potential visibility from the roadways is primarily indicated as thin corridors of visibility that cross the roadways at distinct locations contained within 0.5 mile of the Project. The most concentrated area of visibility is indicated at the Nicolls Road junction. However, these limited areas of visibility are anticipated to be difficult to distinguish for viewers traveling at the speed limit of 55 miles per hour and primarily focused on the roadway. Furthermore, these roadways, even in proximity to the Project, are typically lined with vegetation and will likely increase the potential screening of the OnCS–DC due to the fact that road side vegetation is not considered in the viewshed analysis.
	Interstate 495	0.3	
	New York State Route 906B	0.4	
Schools	Suffolk County Community College-Ammerman	1.9	Suffolk County Community College is located on a geographic high point and potential visibility, as indicated by the viewshed analysis, occurs along a portion of the central campus green where mature tree canopy is minimal. However, due to the distance from the Project and the presence of foreground and middle ground distractions, it is likely that only the upper portions of the lightning masts will be visible.

Resource Type	Resources	Distance from Facility (Miles)	Facility Visibility
	Campus at Selden		
Hamlets	Hamlet of Holbrook	0.5	Two hamlets were noted as having potential visibility based on the viewshed analysis. However, visibility is minimal and exists at distinct locations along local roads and in residential areas lacking in vegetative screening. Visibility from these locations would likely require prolonged viewing along specific lines of sight. Potential visibility at these hamlets is described below: • Hamlet of Holbrook: Union and Railroad Avenues, and the Long Island Railroad Corridor • Hamlet of Holstville: Union, Waverly, and Long Island Avenues and the Long Island Railroad Corridor
	Hamlet of Holtsville	0.5	

2.2 Field Verification

2.2.1 Field Verification Methodology

Visibility of the proposed OnCS–DC was evaluated in the field in June 2020 and February 2021. The purpose of these site visits was to verify potential OnCS–DC visibility within the VSA and obtain representative site photographs. The weather conditions were clear and sunny, providing ideal long-distance visibility toward the Union Avenue Site. During field review, consideration was also given to viewer orientation and time of day by strategically capturing a variety of lighting conditions (front lit, side lit and backlit) in the photographs.

During the field verification, an EDR field crew drove public roads and visited public vantage points within the VSA to document points from which the OnCS–DC was indicated as visible by the viewshed analysis. This determination was made based on the visibility of the existing LIPA Power Generation Facility, which served as a location and scale reference. Photos were taken from 42 representative viewpoints within the VSA. The locations of all viewpoints visited during the field review are depicted on Figure 2.2-2, and a focused review of viewpoints directly surrounding the Union Avenue Site are depicted on Figure 2.2-3. A representative photograph from each viewpoint is included in Appendix B.

Photos were obtained using a Nikon D7100 or Canon EOS digital camera with a focal length between 28 and 35 mm (equivalent to between 45 and 55 mm on a full frame 35mm camera). This focal length most closely approximates the relative scale and perspective relationship of objects in the view (minimal distortion between foreground, mid-ground, and background elements). Viewpoint locations were determined using hand-held global positioning system (GPS) units and high resolution lidar data (to determine elevation). The time and location of each photograph were recorded in a digital data collection system, which also provided real-time viewer position data and high-resolution aerial photography verification. To assist in orienting the viewer, the position of the Union Avenue Site was plotted on the field GPS and real time view position and direction of view was provided to the field photographer. Where potential views existed, viewpoints photographed during field review generally represented the most open, unobstructed available views toward the proposed Union Avenue Site.

2.2.2 Field Verification Results

Field verification suggests that the areas of potential visibility of the proposed OnCS–DC would be significantly less frequent than suggested by the viewshed analysis. Longer distance views throughout the VSA are limited and in most places obstructed by mature vegetation, which is generally occurs along most streets and neighborhoods. As discussed in Section 2.1.1, the viewshed analysis does not consider the screening provided by roadside vegetation due to the frequent presence of overhead utility lines, which appear in the analysis as screening features if not removed. Other factors that will limit the actual visibility of the proposed OnCS–DC include the narrow, slender profile of the masts, which do not generally attract viewer attention, particularly when viewed amongst foreground to background mature vegetation. Review of potential OnCS–DC visibility from visually sensitive areas throughout the study area is summarized in Section 2.1.2. Observations based on EDR's field review include:

- Anticipated visibility will be generally limited to a few areas within approximately one-quarter mile of the Union Avenue Site. These areas generally correspond to the areas of predicted visibility located adjacent to the Union Avenue Site as determined by viewshed analysis.
- Probable visibility on Union Avenue between Nicolls Road and the Union Avenue Site (east to west). Visibility increases when viewers are travelling from east to west.
- Visibility on Union Avenue between Patchogue-Holbrook Road to the Union Avenue Site (west to east), are impeded by topography (there is a hill on Union Avenue east of Avenue C) and vegetation which arches over the roadway and limits views.

- Visibility from Springwood Drive and associated residential neighborhood was impeded by the presence of homes and trees which block views to the northwest.
- Visibility from Warren Avenue were completely screened by mature vegetation along the perpendicular roads aligned with the Union Avenue Site.
- Visibility is possible from Long Island Avenue looking west toward the Union Avenue Site particularly when the road is aligned with the Union Avenue in a northwest direction.

In summary, throughout most of the VSA, the proposed OnCS–DC is not anticipated to be visible due to densely situated buildings and houses in the villages, and dense, mature evergreen and deciduous forest in the surrounding areas. Potential visibility of the OnCS–DC will be generally limited to a few areas within approximately one-quarter mile of the site. Where visible, it is expected that views of the proposed OnCS–DC from most of these areas would be limited to the uppermost portions of the proposed lightning masts.

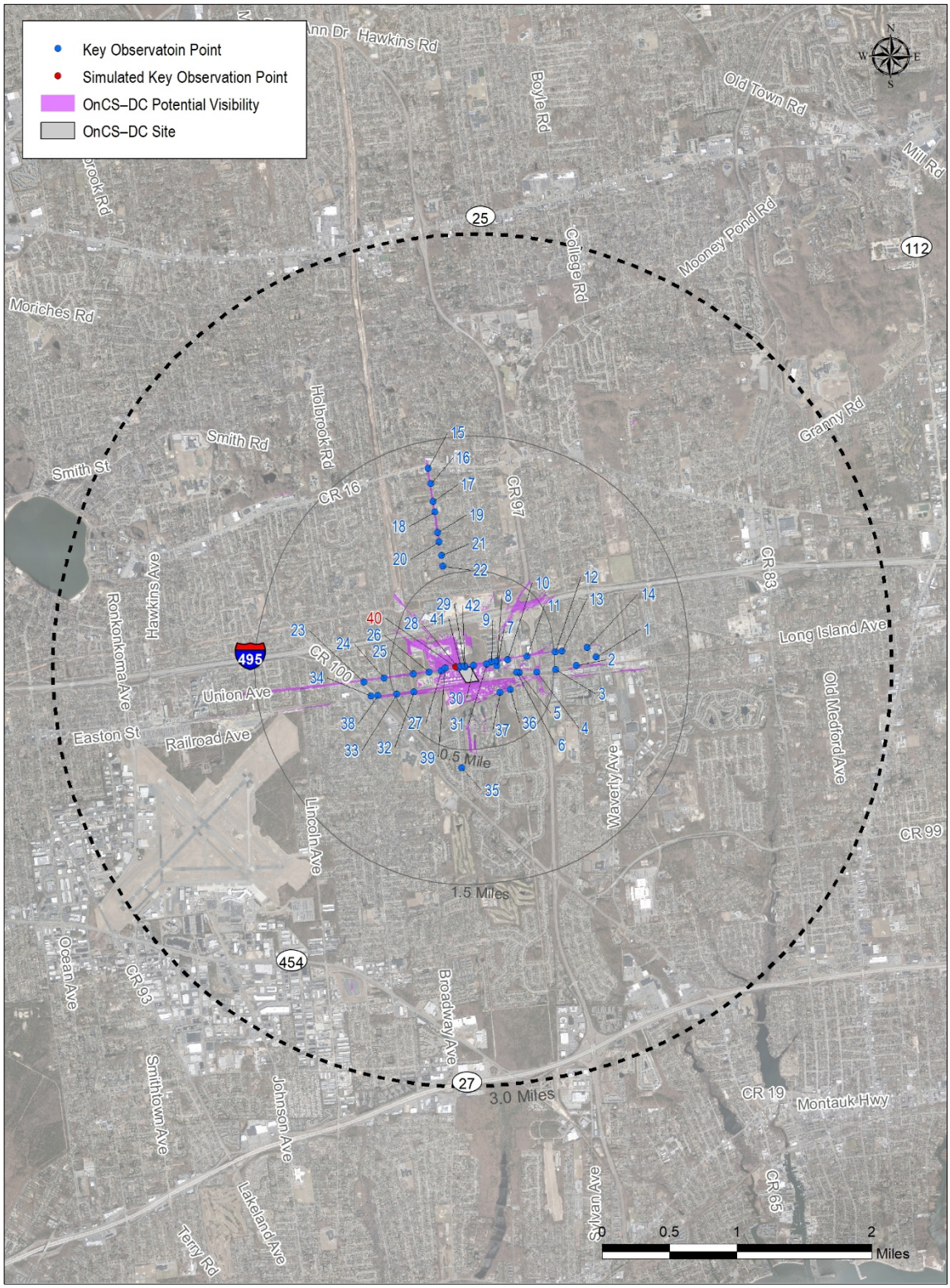

Figure 2.2-2 – Viewpoint Locations

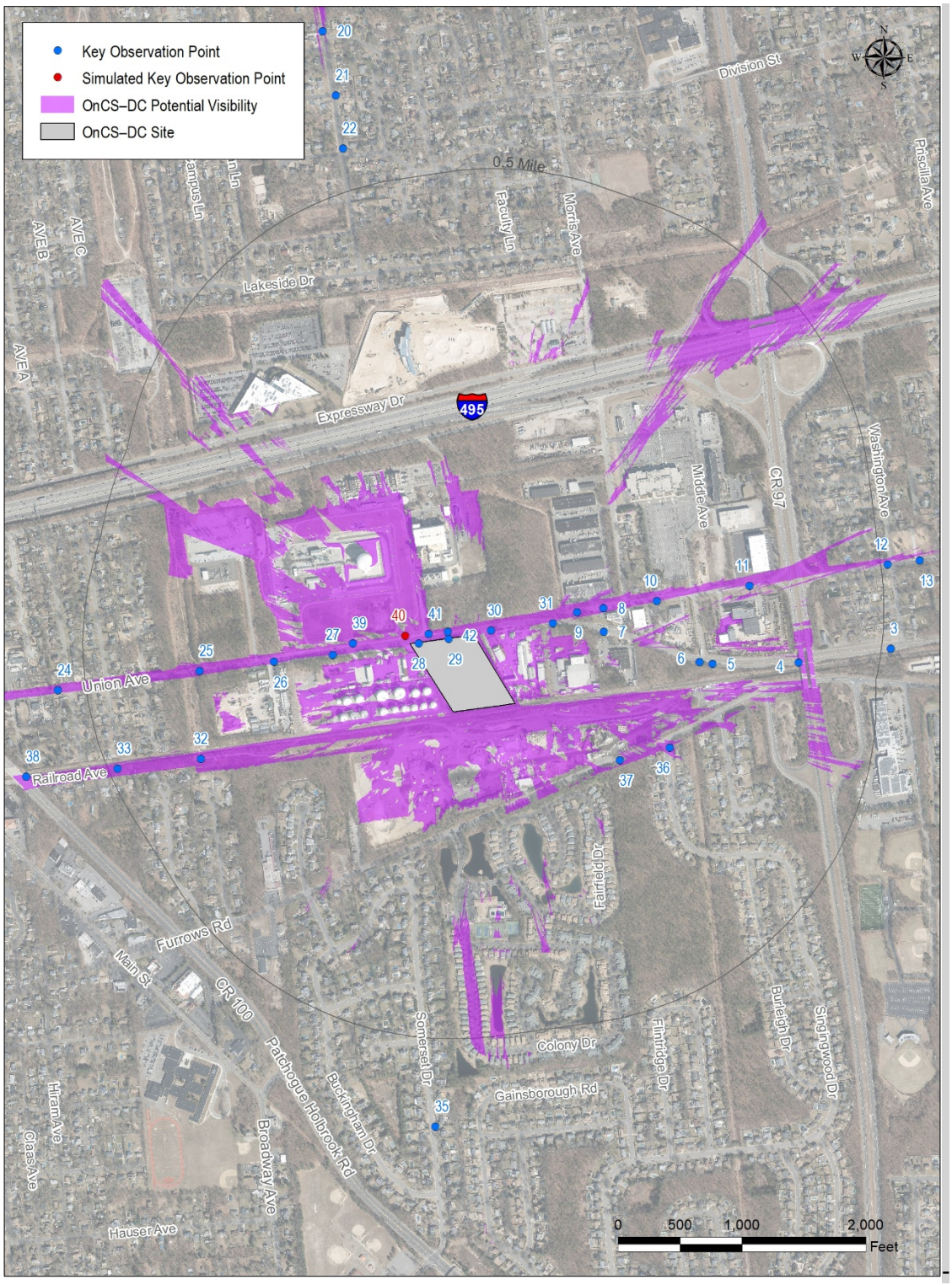

Figure 2.2-3 – Viewpoint Locations – Union Avenue

2.2.3 Simulation Results

Existing View

The simulation photograph at KOP 40, depicted in Figure 2.2-4, was taken from the north-side of Union Avenue in the Town of Brookhaven, New York, approximately 221 ft (67.4 m) northwest of the OnCS–DC. The existing view to the southeast from this location looks across Union Avenue, directly into the existing entrance to Guy Pratt, Inc., a heavy site construction company. The majority of the existing site features are screened due to the presence of a dense evergreen buffer between the property and the sidewalk on the south side of Union Avenue. However, an existing warehouse and three overhead doors can be seen through and gap in the vegetation that accommodates the site entry road. In the foreground, a maze of overhead wires and vertical utility poles dominate the view and result in numerous discordant features with no distinct focal point. The late winter conditions are made apparent by the lack of leaves on the deciduous vegetation, the presence of old snow piles, and the general muted tones presented by the vegetation, road, and buildings. Views of the sky are interrupted by foreground screening features, but where visible appears white to dull grey providing a high contrast backdrop for the trees and wires that extend into it. The horizon is almost completely obscured with only suggestions of background features which consist primarily of a mix of deciduous and evergreen vegetation. To provide additional context to this view, a panorama is provided in Figure 2.2-5. As illustrated in this image, the commercial/industrial land use, dominance of pavement, and variety of discordant features result in a high degree of visual clutter and relatively low scenic quality. Cyclists and commuters are the most likely viewers at this KOP, and their views into the site will be peripheral and of short duration due to the fact that the view is discrete (available from a single location/orientation), and most users will be travelling along the road either in a car or on a bicycle.

Figure 2.2-4 – Visual Simulation – Existing View

Figure 2.2-5 – Existing View Panorama

Proposed View

With the OnCS–DC in place, the foreground vegetation has been eliminated revealing an open view into the OnCS–DC site (see Figure 2.2-6). The converter hall and switchyard along with the lightning masts are visible in the immediate foreground. The converter hall, due to its large size competes for viewer attention and becomes the focal point of the view. In addition, the converter hall further reduces visibility of the background, removing nearly all indications of background vegetation and a visible horizon. The lightning masts extend into the sky above resulting in minimally increased visual clutter. The presence of the OnCS–DC, as proposed will result in substantial visual contrasts in this specific location of Union Avenue. However, this impact is mitigated by the low baseline scenic quality, the fleeting nature of the views along Union Avenue and the general compatibility of the surrounding land uses (see Figure 2.2-5).

Figure 2.2-6 – Visual Simulation – Proposed View

OnCS–DC is consistent with the overall visual context at this location given the adjacent land uses along Union Avenue (see Figure 2.2-6). Despite the relatively considerable visual changes presented in the visual simulation, a traveler along Union Avenue would see this view for a few seconds if travelling by car and a minute or less travelling by bicycle or walking.

3.0 CONCLUSION

3.1 Visual Assessment Summary

The results of the visual assessment for the OnCS–DC can be summarized as follows:

- The VSA was defined as a three-mile radius around the proposed Union Avenue Site. Land use within the study area consists largely of dense suburban residential development, but the Site is surrounded by a mix of industrial, commercial, and residential uses. To the north of the Site, Interstate 495 divides the VSA from east to west.
- A GIS-based viewshed analysis was prepared to evaluate potential visibility of the proposed OnCS–DC within the VSA. Based on the viewshed analysis screening provided by topography, vegetation, and structures, the OnCS–DC would theoretically not have visibility from approximately 99.2 percent of the VSA. It is anticipated that the majority of visibility (60%) indicated by the viewshed analysis will occur within the industrial LSZ and within the near-foreground distance zone. This suggests that the OnCS–DC is appropriately sited within an area that can be characterized as industrial.

- Field review indicated that the actual visibility of the OnCS–DC is likely to be even more limited than suggested by the viewshed analysis due to the conservative nature of the analysis. This is due to the fact that the viewshed analysis does not consider screening features within 50 ft (15 m) of roadway corridors (see Section 2.1.1). However, field verification suggested the presence of mature vegetation within established residential neighborhoods which limited views to within the near-foreground distance zone in most instances. The viewshed also indicates visibility of any portion of the Project, including the narrow-profile lightning masts. From distances greater than one mile, it would be difficult to perceive these components of the OnCS–DC. Throughout most of the VSA, the OnCS–DC is not anticipated to be visible due to densely situated buildings and houses, and dense, mature evergreen and deciduous forest in the surrounding areas.
    - Potential visibility will be generally limited to a few areas within approximately one-quarter mile of the Union Avenue Site. These areas generally correspond to the areas of predicted visibility as indicated by the viewshed analysis.
    - Narrow views of small portions of the OnCS–DC may be available from Interstate 495, as well as several residential streets that are aligned with the Union Avenue Site. However, Project components in this view would be consistent with other developed features surrounding the Project site, making it difficult to distinguish particular Project components from other elements in the view.
    - Where the OnCS–DC is visible from greater distances, the lightning masts, even if visible, would be difficult to distinguish on the horizon due to their narrow profile and gray color.
- Field review confirmed that the OnCS–DC viewshed suggests that the greatest potential area of visibility would occur along Union Avenue, which was also identified as a visually sensitive resource (Suffolk County Central Corridor Bike Route).
- The visual simulation illustrates that views into the site will be available from discrete locations in the immediate vicinity of the OnCS–DC. Where visible, the OnCS–DC results in some visual contrast when compared to previous use of the site. The removal of the vegetative buffer and introduction of the switchyard and converter hall structure constitutes an alteration of the view. However, this use is not out of place along this heavily industrialized/commercial character present along this portion of Union Avenue. Given the localized nature and short duration of the potential visual effects illustrated in the visual simulation and the lack of potential visibility of the OnCS–DC along other portions of Union Avenue, it is anticipated that the visual effects resulting from the operation of the Project will be minimal when considered in the context of the VSA.
- As illustrated in the visual simulation, mitigation options are generally limited to low-growing shrubs and small trees which effectively soften views of the OnCS–DC fence and low-level component within the switchyard. This has the effect of minimally reducing the perceived scale of the OnCS–DC, but with mitigation in place the visual contrasts are still relatively strong.

3.2 Mitigation

NYSDEC Program Policy DEP-00-2 Assessing and Mitigating Visual Impacts (NYSDEC, 2019) provides guidance for identifying and considering potential mitigation measures to reduce or eliminate the visibility of a project or alter a project's effect on scenic or aesthetic resources. As described in that guidance, a properly sited and designed project is the best way to mitigate potential visual impacts. As indicated by the results of the analyses summarized above, visual impact of the proposed OnCS–DC has been avoided and minimized through careful site selection. The proposed Union Avenue Site is sited adjacent to existing utility infrastructure, thereby avoiding the potential introduction of utility-related visual elements in areas where such facilities are not currently part of the landscape. By selecting the Union Avenue Site for the proposed OnCS–DC, the siting of the proposed OnCS–DC complies with the New York State Coastal Management Program's Coastal Policy 24 to prevent impairment of scenic resources of statewide significance.

The feasibility and possible benefits of such measures are described below.

- Screening. The proposed OnCS–DC is located in an industrial area near an existing power generation facility, as well as an existing substation. Therefore, the OnCS–DC is generally screened from view from most areas within the VSA due to the heavily developed nature of the VSA. To further minimize potential visibility of the OnCS–DC from adjacent areas vegetative buffers have been developed to soften near-foreground views. However, the density and height of species selection options are limited to those that are conducive to the safe operation of the facility, above ground, and underground utilities present on site. Therefore, while effective in reducing the potential visual impacts, the OnCS–DC still presents strong visual contrasts within the selected view.

- Relocation. The proposed OnCS–DC has been sited in an industrial area near an existing power plant and substation to avoid and minimize potential visual impacts from VSRs in the VSA. The OnCS–DC is also sited near existing utility infrastructure, thereby avoiding the potential introduction of utility-related visual elements in areas where such facilities are not currently part of the landscape. If screening measures are implemented, it is anticipated that the Project siting avoids and minimizes potential visibility and visual impacts to the greatest extent practicable.

- Camouflage. Camouflage of project components is not the preferred option for electrical infrastructure, due to site security concerns. In addition, station components are metallic (silver or gray) and their color and form they cannot be practicably changed. However, much of the equipment may be included in an enclosure which would somewhat blend the facility into the surrounding urban environment and minimize potential visual impacts. Screening walls in place of chain link fencing may be a viable option to help screen the AC switchyard and other low-profile features which would be visible from along portions of Union Avenue.

- Low Profile. The tallest structures within the OnCS–DC would be the proposed lightning masts. To provide a conservative analysis, this VRA is based on an assumed maximum height of 100 feet for the lightning masts. Field review, which included consideration of the visibility of the LIPA Power Generation Facility, indicated that views of the Union Avenue Site will be screened (by vegetation and structures) from most locations in the VSA.

- Downsizing. The size of the OnCS–DC is necessary to maintain required safety and reliability standards and therefore downsizing is not a viable option.

- Alternate Technologies. Given the minimal visibility within the VSA (0.8 percent) and the small, noncontiguous areas of potential visibility, alternate technologies are unlikely to substantially reduce potential visual impacts. Alternate technologies, such as Alternate Current (AC) would require similar vegetation clearing and facility heights. However, significant portions of the Facility will be enclosed within a structure as a method to reduce visual clutter associated with the OnCS–DC. Additionally, the burial of the Onshore Transmission Cable eliminates the visual impacts during the operational phase of the Project.

- Non-specular Materials. To the extent practicable, buildings, fencing, and other periphery structures on the OnCS–DC site will utilize non-specular materials. This could include the use of neutral, earth-tone colors on buildings. It is anticipated that the material utilized for equipment not enclosed within the Facility structure will be galvanized steel or be painted grey. Due to the nature of this technology, alternative materials are not under consideration.

- Lighting. Lighting for the OnCS–DC will be kept to the minimum necessary for facility safety and security and will comply with Town requirements (to the extent practicable) for limiting off-site light pollution. It is anticipated that lighting will be directed downward where possible and manual switches and/or movement sensors will be installed for the security lighting to minimize the effects of light pollution and reduce potential wildlife attraction.

- Maintenance. Sunrise Wind will maintain the proposed OnCS–DC so that it appears clean and orderly. The proposed components will not require regular painting to maintain their appearance.

- Decommissioning. Once the OnCS–DC has reached its useful service period it will either be decommissioned or repurposed. Decommissioning will be completed in accordance with approved regulatory filings.
- Offsets. Correction of an existing aesthetic problem within the viewshed is a viable mitigation strategy for projects that result in significant adverse visual impact. However, the analysis presented herein indicates that adverse visual impact, if any, will be very minor and localized to the areas immediately adjacent to the Union Avenue Site. Therefore, based on the results of the Visual Resources Assessment, no offset mitigation is necessary.

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Appendix A: Visually Sensitive Resources Table

Visually Sensitive Resource	Location		VP Number[1]	Distance[2]	Distance Zone	Viewshed Results
						+ Visible - Not Visible +/- Partially Visible
	Town	County		Miles from OnSS/OnCS	● Near-Foreground ● Foreground ● Midground • Background	DSM Viewshed (Topography, Structures, and Vegetation)
Properties of Historic Significance [6 NYCRR 617.4 (b)(9)]						
National/State Historic Landmarks						
None in Study Area						
National/State Historic Sites						
None in Study Area						
Sites Listed on National or State Registers of Historic Places (NRHP/SRHP)						
Bald Hill Schoolhouse	Brookhaven	Suffolk		1.8	●	-
Sites Eligible for Listing on NRHP or SRHP						
Sagamore Middle School. 1961, Mid-century modern.	Brookhaven	Suffolk		0.9	●	-
Designated Scenic Resources						
Rivers Designated as National or State Wild, Scenic or Recreational						
None in Study Area						
Adirondack Park Scenic Vistas [Adirondack Park Land Use and Development Map]						
None in Study Area						
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic ([ECL Article 49 Title 1] or equivalent)						
None in Study Area						
Scenic Areas of Statewide Significance [Article 42 of Executive Law]						
None in Study Area						
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)						
None in Study Area						
Public Lands and Recreational Resources						

Visually Sensitive Resource	Location		VP Number[1]	Distance[2]	Distance Zone	Viewshed Results
	Town	County		Miles from OnSS/OnCS	⬤ Near-Foreground ● Foreground ● Midground • Background	+ Visible - Not Visible +/- Partially Visible DSM Viewshed (Topography, Structures, and Vegetation)
National Parks, Recreation Areas, Seashores, and Forests [16 U.S.C. 1c]						
None in Study Area						
National Natural Landmarks [36 CFR Part 62]						
None in Study Area						
National Wildlife Refuges [16 U.S.C. 668dd]						
None in Study Area						
Heritage Areas (formerly Urban Cultural Parks) [Parks, Recreation and Historic Preservation Law Section 35.15]						
North Shore State Heritage Area	Brookhaven, Islip	Suffolk	15-22	0.3	●	+/-
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]						
None in Study Area						
State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]						
None in Study Area						
State Forest Preserve [NYS Constitution Article XIV]						
None in Study Area						
Other State Lands						
Wildlife Management Areas & Game Refuges						
None in Study Area						
State Forests						
None in Study Area						
State Fishing/Waterway Access Sites						
None in Study Area						
Trails						

Visually Sensitive Resource	Location		VP Number[1]	Distance[2]	Distance Zone	Viewshed Results
						+ Visible - Not Visible +/- Partially Visible
	Town	County		Miles from OnSS/OnCS	● Near-Foreground ● Foreground ● Midground • Background	DSM Viewshed (Topography, Structures, and Vegetation)
State and Federal Trails						
None in Study Area						
Snowmobile/ATV Trails						
None in Study Area						
Bike Trails/Routes						
Suffolk County Central Corridor Bike Route (Farmingdale to Riverhead)	Brookhaven, Islip	Suffolk	1-9, 23-31	0.0	●	+/-
Town of Islip - Greenbelt Shared Use Path	Islip	Suffolk		0.4	●	-
Town of Brookhaven-Blue Point Road Bike Lanes	Brookhaven, Islip	Suffolk		0.9	●	+/-
Holtsville Ecology Center Fitness Trail	Brookhaven	Suffolk		1.4	●	-
Suffolk County Route 16-Portion Road	Brookhaven	Suffolk		1.5	●	+/-
Veterans Highway Bike Lanes	Islip	Suffolk		2.3	●	-
Other Trails						
None in Study Area						
Palisades Park [Palisades Interstate Park Commission]						
Not Applicable						
Local Parks and Recreation Areas						
Suffolk County Lands	Islip	Suffolk		0.3	●	+/-
PAL Stadium	Islip	Suffolk		0.6	●	-

Visually Sensitive Resource	Location		VP Number[1]	Distance[2]	Distance Zone	Viewshed Results
						+ Visible - Not Visible +/- Partially Visible
	Town	County		Miles from OnSS/OnCS	● Near-Foreground ● Foreground ● Midground • Background	DSM Viewshed (Topography, Structures, and Vegetation)
Islip Town Lands	Islip	Suffolk		0.6	●	-
Brookhaven Town Lands	Brookhaven	Suffolk		0.6	●	-
Holbrook Park	Islip	Suffolk		0.7	●	-
Holbrook Country Club Golf Course	Islip	Suffolk		0.7	●	-
Brookhaven Ecology Site/Holtsville WIldlife & Ecology Center	Brookhaven	Suffolk		1.4	●	+/-
Summerfield At Holtsville Hoa Inc Lands	Brookhaven	Suffolk		1.6	●	-
Van Derzee L Lands	Brookhaven	Suffolk		2.5	●	-
Bald Hill Cultural Park	Brookhaven	Suffolk		2.6	●	-
Town Beach County Park	Brookhaven	Suffolk		2.6	●	-
Lake Ronkonkoma County Park	Brookhaven, Islip	Suffolk		2.6	●	-
Town Park	Brookhaven	Suffolk		3.1	●	-
Publicly Accessible Conservation Lands/Easements						
Finlay-Wolf Pond (TNC)	Brookhaven	Suffolk		2.5	●	-
Rivers and Streams with Public Fishing Rights Easements						
None in Study Area						

Visually Sensitive Resource	Location		VP Number[1]	Distance[2]	Distance Zone	Viewshed Results
						+ Visible - Not Visible +/- Partially Visible
	Town	County		Miles from OnSS/OnCS	● Near-Foreground ● Foreground ● Midground • Background	DSM Viewshed (Topography, Structures, and Vegetation)
Named Lakes, Ponds, and Reservoirs						
Mooney Pond	Brookhaven	Suffolk		2.0	●	-
Canaan Lake	Brookhaven	Suffolk		2.3	●	-
Lake Ronkonkoma	Brookhaven, Islip	Suffolk		2.8	●	-
High-Use Public Areas						
State, US, and Interstate Highways						
NYS Route 906A	Brookhaven, Islip	Suffolk		0.3	●	+/-
Interstate 495	Brookhaven, Islip	Suffolk		0.3	●	+/-
NYS Route 906B	Brookhaven, Islip	Suffolk		0.4	●	+/-
NYS Route 454	Islip	Suffolk		2.3	●	-
NYS Route 906D	Brookhaven, Islip	Suffolk		2.8	●	-
NYS Route 27	Brookhaven, Islip	Suffolk		2.8	●	-
NYS Route 906C	Brookhaven, Islip	Suffolk		2.8	●	-
Schools						

Visually Sensitive Resource	Location		VP Number[1]	Distance[2]	Distance Zone	Viewshed Results
	Town	County		Miles from OnSS/OnCS	⬤ Near-Foreground ● Foreground ● Midground • Background	+ Visible - Not Visible +/- Partially Visible DSM Viewshed (Topography, Structures, and Vegetation)
Seneca Middle School	Islip	Suffolk		0.6	●	-
Tamarac Elementary School	Islip	Suffolk		0.7	●	-
Sagamore Middle School/Chippewa Elementary School	Brookhaven	Suffolk		0.9	●	-
Nokomis School	Brookhaven	Suffolk		0.9	●	-
Waverly Avenue School	Brookhaven	Suffolk		1.1	●	-
Hiawatha School	Brookhaven	Suffolk		1.5	●	-
Merrimac School	Islip	Suffolk		1.6	●	-
Grundy Avenue School	Islip	Suffolk		1.8	●	-
Suffolk County Community College-Ammerman Campus at Selden	Brookhaven	Suffolk		1.9	●	+/-
Lynwood Avenue School	Brookhaven	Suffolk		2.1	●	-
Sachem High School/North/Samoset Middle School	Brookhaven	Suffolk		2.2	●	-
Holbrook Road School	Brookhaven	Suffolk		2.3	●	-
Canaan Elementary School	Brookhaven	Suffolk		2.5	●	-

Visually Sensitive Resource	Location		VP Number[1]	Distance[2]	Distance Zone	Viewshed Results
	Town	County		Miles from OnSS/OnCS	● Near-Foreground ● Foreground ● Midground • Background	+ Visible - Not Visible +/- Partially Visible
						DSM Viewshed (Topography, Structures, and Vegetation)
Cayuga School	Brookhaven	Suffolk		3.0	●	-
Cities, Villages, Hamlets						
Cities and Villages						
Village of Lake Grove	Brookhaven	Suffolk		2.8	●	-
Village of Patchogue	Brookhaven	Suffolk		2.9	●	-
Hamlets						
Hamlet of Holbrook	Brookhaven, Islip	Suffolk	23, 24, 34, 38	0.5	●	+/-
Hamlet of Holtsville	Brookhaven, Islip	Suffolk	1, 2, 14	0.7	●	+/-
Hamlet of Farmingville	Brookhaven	Suffolk		1.8	●	-
Hamlet of Lake Ronkonkoma	Brookhaven	Suffolk		2.2	●	-
Hamlet of Ronkonkoma	Brookhaven	Suffolk		2.3	●	-
Hamlet of Lakeland	Brookhaven, Islip	Suffolk		2.7	●	-

[1] If no viewpoint (VP) number is indicated, no photo was obtained during fieldwork.

[2] For large areas and linear sites, approximate distance to the OnCS-DC was measured from the respective area's closest point.

Appendix B: Viewpoint Photo Log

Viewpoint 1 - View from Long Island Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 2 - View from Long Island Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 3 - View from Long Island Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 4 - View from Long Island Ave, Town of Brookhaven, Suffolk County, looking Northwest

Viewpoint 5 - View from Long Island Ave, Town of Brookhaven, Suffolk County, looking Northwest

Viewpoint 6 - View from Long Island Ave, Town of Brookhaven, Suffolk County, looking Northwest

Viewpoint 7 - View from Long Island Ave, Town of Brookhaven, Suffolk County, looking Northwest

Viewpoint 8 - View from Union Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 9 - View from Union Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 10 - View from Union Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 11 - View from Union Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 12 - View from Union Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 13 - View from Union Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 14 - View from Union Ave, Town of Brookhaven, Suffolk County, looking West

Viewpoint 15 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 16 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 17 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 18 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 19 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 20 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 21 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 22 - View from Warren Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 23 - View from Union Ave, Town of Brookhaven, Suffolk County, looking East

Viewpoint 24 - View from Union Ave, Town of Brookhaven, Suffolk County, looking East

Viewpoint 25 - View from Union Ave, Town of Brookhaven, Suffolk County, looking East

Viewpoint 26 - View from Union Ave, Town of Brookhaven, Suffolk County, looking East

Viewpoint 27 - View from Union Ave, Town of Brookhaven, Suffolk County, looking East

Viewpoint 28 - View from Union Ave, Town of Brookhaven, Suffolk County, looking Northeast

Viewpoint 29 - View from Union Ave, Town of Brookhaven, Suffolk County, looking North

Viewpoint 30 - View from Union Ave, Town of Brookhaven, Suffolk County, looking North

Viewpoint 31 - View from Union Ave, Town of Brookhaven, Suffolk County, looking Northwest

Viewpoint 32 - View from Railroad Ave, Town of Islip, Suffolk County, looking Northeast

Viewpoint 33 - View from Railroad Ave, Town of Islip, Suffolk County, looking Northeast

Viewpoint 34 - View from Railroad Ave, Town of Islip, Suffolk County, looking Northeast

Viewpoint 35 - View from Somerset Dr, Town of Islip, Suffolk County, looking North

Viewpoint 36 - View from Singingwood Dr, Town of Islip, Suffolk County, looking Northwest

Viewpoint 37 - View from Furrows Rd, Town of Islip, Suffolk County, looking Northwest

Viewpoint 38 - View from Patchogue Holbrook Rd, Town of Islip, Suffolk County, looking Northeast

Viewpoint 39 - View from Union Ave, Town of Brookhaven, Suffolk County, looking Southeast

Viewpoint 40 - View from Union Ave, Town of Brookhaven, Suffolk County, looking Southeast

Viewpoint 41 - View from Union Ave, Town of Brookhaven, Suffolk County, looking South

Viewpoint 42 - View from Union Ave, Town of Brookhaven, Suffolk County, looking South