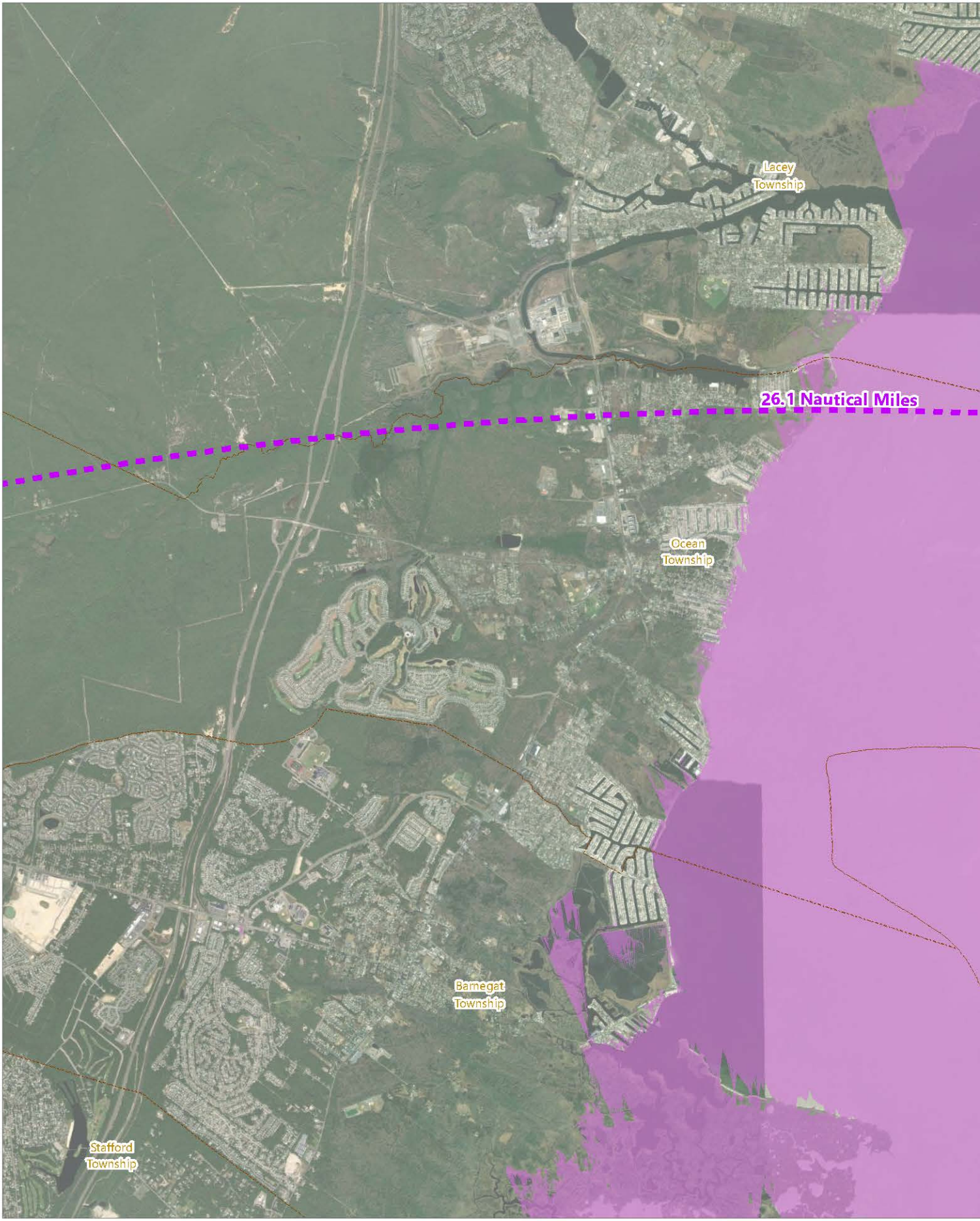
Appendix II-N3

Avoidance, Minimization, and Mitigation (AMM) Plan – Redacted

May 2024

Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properti



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GLOSSARY

AC	alternating current
ADLS	Aircraft Detection Lighting Systems
AMM	Avoidance, Minimization and Mitigation
AMSL	Above Mean Sea Level
AOWL	aviation obstruction warning light
APE	The Area of Potential Effects is the area in which the Atlantic Shores South Projects may have a visual effect on aboveground historic properties; the APE is determined by the responsible federal agency in consultation with relevant SHPOs
ASLF	ancient submerged landform feature
Atlantic Shores Offshore Project Area	The offshore area where Atlantic Shores' facilities are physically located
Atlantic Shores Offshore Wind, LLC	The owner and proponent of the Atlantic Shores Project 1 Company and Atlantic Shores Project 2 Company (collectively, Atlantic Shores)
Atlantic Shores South Offshore Wind Project	Atlantic Shores' proposal to develop the Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 0499 for the generation of renewable energy from offshore wind (The Projects)
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
C14	Carbon-14
DC	direct current
ECC	export cable corridor
EDR	Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C.
FAA	Federal Aviation Administration
FDR	Facility Design Report
FIR	Fabrication and Installation Report

G&G	Geophysical and Geotechnical
GBS	gravity base structure
GIS	Geographic Information System
HDD	horizontal directional drilling
HPTP	Historic Property Treatment Plan
HVAC	high voltage alternating current
HVDC	high voltage direct current
HRVEA	Historic Resources Visual Effects Assessment
IT	information technology
km	kilometer(s)
km^2	square kilometer(s)
Lease Area	The entire Lease Area OCS-A 0499 that Atlantic Shores acquired from BOEM
LUCY	Look Up Cultural Resources for Yourself (NJDEP's cultural resources web mapping service)
m	Meter (1 meter = 3.38 feet)
MARA	Marine Archaeological Resources Assessment
mile	Statute mile (1 mile = 1.61 kilometers = 0.87 nautical miles)
MDS	Maximum Design Scenario
MOA	memorandum of agreement
MW	Megawatt = One million watts
MPRDP	Monitoring Plan and Post Review Discoveries Plan
nm	Nautical Mile (1 nm = 1.15 statute mile)
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act of 1966
NHL	National Historic Landmark

NJDEP	New Jersey Department of Environmental Protection
NJHPO	New Jersey Historic Preservation Office
NJWEA	New Jersey Wind Energy Area
NPS	National Park Service
NRHP	National Register of Historic Places
NRHP-Listed Aboveground Historic Property	Buildings, districts, objects, structures and/or sites that have been added to the National Register of Historic Places
NRHP-Eligible Aboveground Historic Property	Buildings, districts, objects, structures and/or sites that have been determined by NJHPO as eligible for listing in the New Jersey and National Register of Historic Places, as indicated by inclusion in the publicly available data on the LUCY website and the NJHPO's quarterly updated listing of NRHP-listed and -eligible aboveground historic properties
OCS	Outer Continental Shelf
O&M Facility	All onshore buildings and infrastructure used to support operations and maintenance activities
OSS	Offshore Substation
PAPE	The Preliminary Area of Potential Effects (PAPE) includes areas from which the proposed offshore Project components may be visible as determined by GIS-based viewshed analysis
PDE	Project Design Envelope, includes the range of development options identified within the Construction and Operations Plan
PIP	Phased Identification Plan
POI	point of interconnection
QMA	Qualified Marine Archaeologist
ROW	right-of-way
SHPO	State Historic Preservation Office
sq mi	Square Mile
STATCOM	static synchronous compensator
TARA	Terrestrial Archaeological Resources Assessment

THPO	Tribal Historic Preservation Office
USCG	United States Coast Guard
USGS	United States Geological Survey
VIA	Visual Impact Assessment
viewshed	Area of potential Projects' visibility defined by maximum structure height and mapped topography, vegetation, buildings, and structures within the study area
WTA	The Wind Turbine Area, the southern portion of Lease Area OCS-A 0499 that will be developed for Atlantic Shores as described in this Historic Resources Visual Effects Assessment
WTG	Wind Turbine Generator
3D	three-dimensional

EXECUTIVE SUMMARY

Per Section 106 of the National Historic Preservation Act (NHPA) and on behalf of Atlantic Shores Offshore Wind, LLC (Atlantic Shores), a 50/50 joint venture between EDF-RE Offshore Development, LLC, a wholly owned subsidiary of EDF Renewables, Inc. (EDF Renewables) and Shell New Energies US, LLC (Shell), Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) prepared this Cultural Resources Avoidance, Minimization and Mitigation (AMM) Plan in support of the Atlantic Shores Construction and Operations Plan (COP) for two offshore wind energy generation projects within the southern portion of Bureau of Ocean Energy Management (BOEM) Lease Area OCS-A 0499 for renewable energy generation from offshore wind. The Projects are comprised of up to 200 wind turbine generators (WTGs) and up to 10 offshore substation (OSS) positions (hereinafter, the Projects).[1]

Section 106 of the NHPA requires federal agencies (i.e., BOEM) to consider the potential effect of their undertakings (i.e., the review and approval of the Projects) on historic properties, defined generally to include National Historic Landmarks (NHLs) and properties listed on or eligible for listing on the National Register of Historic Places (NRHP) and can include terrestrial archaeological resources, marine archaeological resources, and aboveground historic properties.

Based on desktop analysis and archaeological reconnaissance presented in the *Terrestrial Archaeological Resources Assessment – Onshore Interconnection Facilities* (TARA; COP Appendix II-P1; EDR, 2024a) and *Phase IA Terrestrial Archaeological Resources Assessment – Operations and Maintenance Facility* (O&M TARA; COP Appendix II-P2; EDR, 2024b), there is a very low likelihood of intact or potentially significant terrestrial archaeological resources to be locate within the Projects' Preliminary Area of Potential Effects (PAPE). Identification level Phase IB archaeological survey is ongoing under a phased identification approach, which will inform future determinations of the Projects potential effects on terrestrial archaeological resources.

As described in the *Marine Archaeological Resources Assessment Atlantic Shores Offshore Wind Project Construction and Operations Plan and Addendum*, [redacted] submerged targets were identified (MARA; COP Appendix II-Q1; SEARCH, 2022 and 2023). [redacted] targets are located within the Wind Turbine Area; [redacted] targets are located in the Atlantic Export Cable Corridors (ECC); [redacted] targets are located along the Monmouth ECC; and [redacted] ancient submerged landform features (ASLFs) were identified within the Marine PAPE. Physical avoidance buffers of the targets are recommended, and mitigation measures for potential effects to marine resources are proposed.

BOEM's review of the Projects is anticipated (based on precedent) to result in a determination that the Projects will result in adverse effects on historic properties and that mitigation will be required. Based on existing records of state and federal agencies, GIS databases, previous cultural resources surveys, local inventories, historical collections, and field survey, the *Historic Resources Visual Effects Assessment, Atlantic Shores South Offshore Wind – Wind Turbine Area* (HRVEA; COP Appendix II-O; EDR, 2024e) 102 aboveground historic properties were identified within the PAPE. Applying the Criteria of Adverse Effect per

[1] The two wind energy projects within the Lease Area are more fully described in Volume I (Project Information) of the COP for the Project (EDR, 2022a).

Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properti

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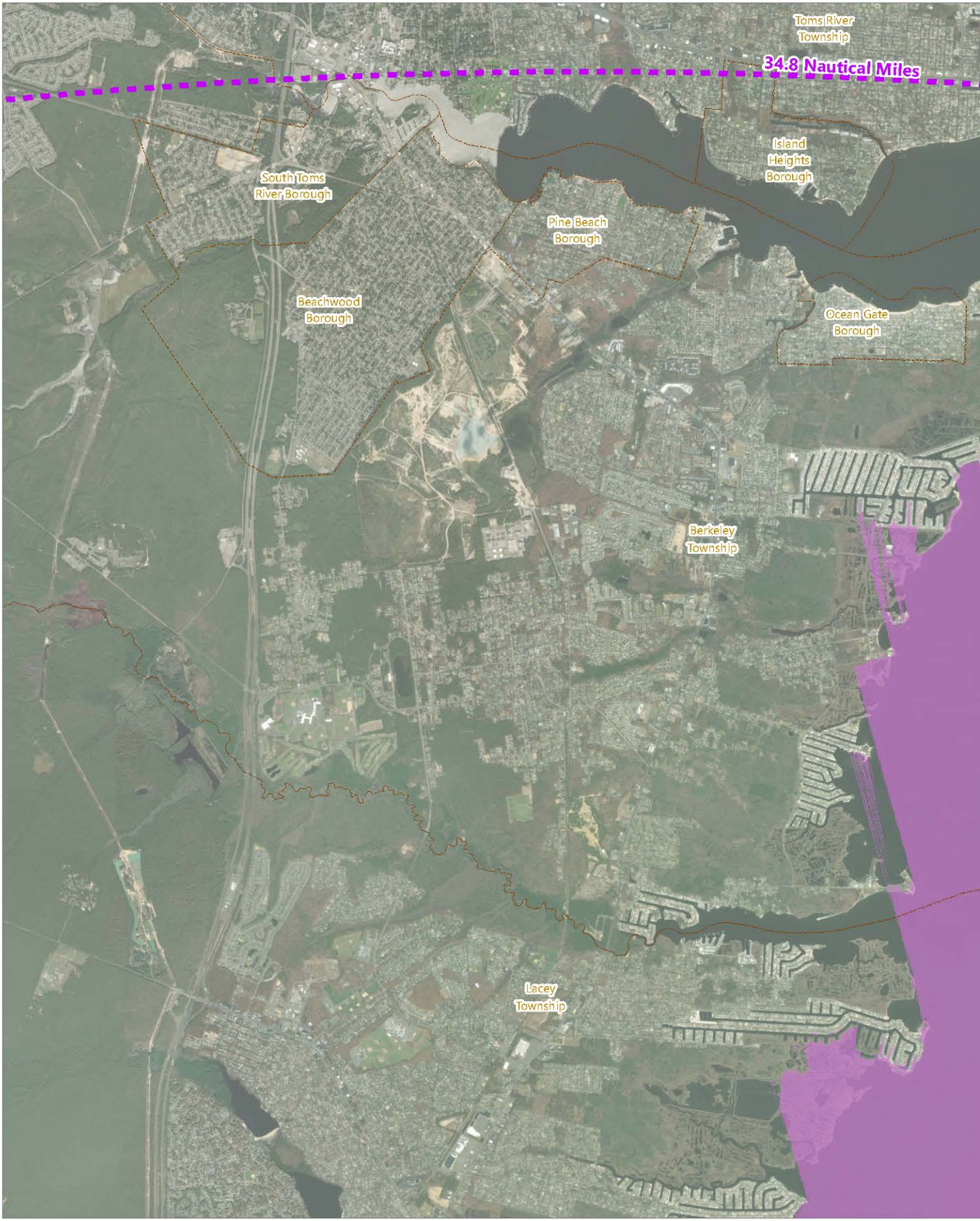

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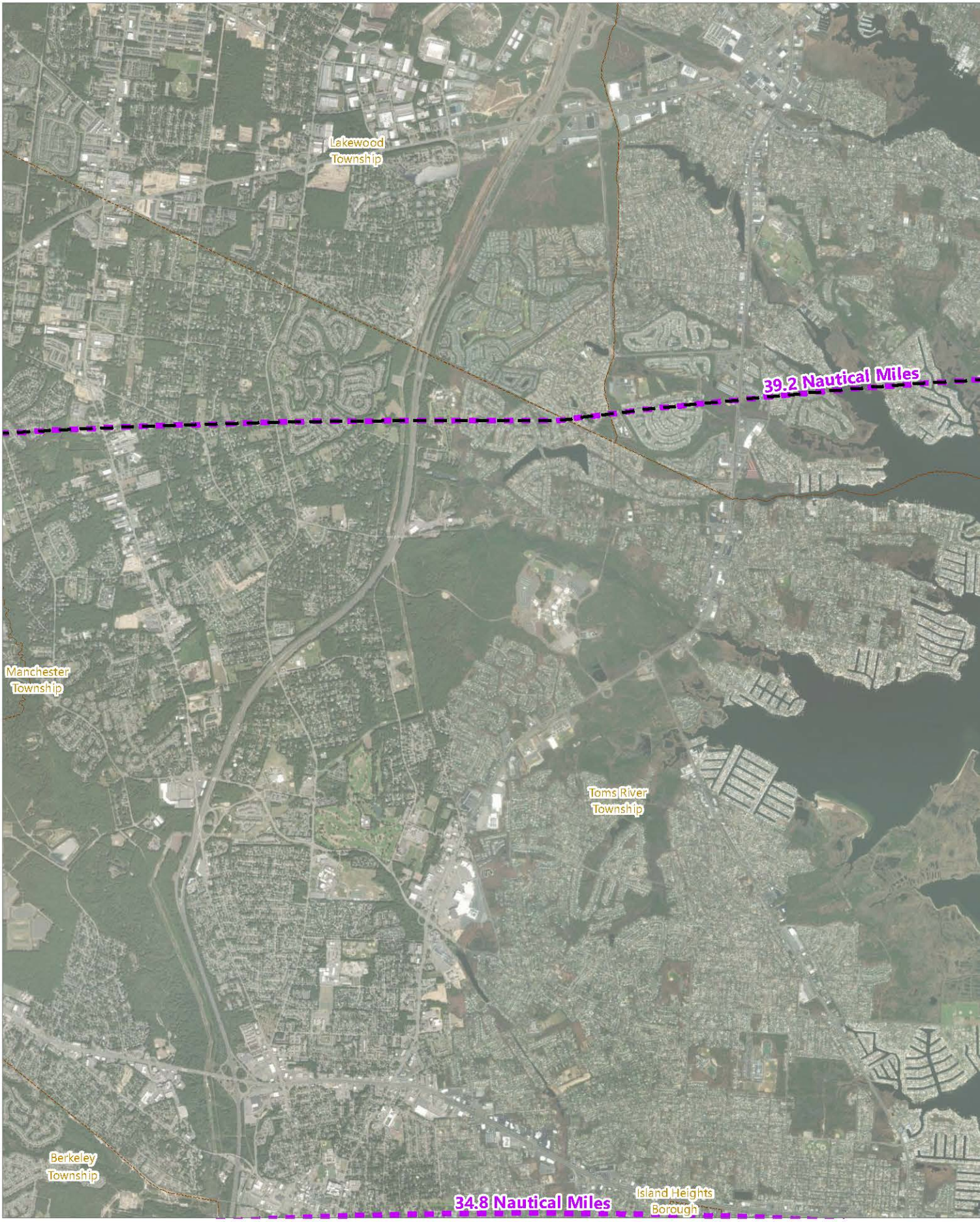
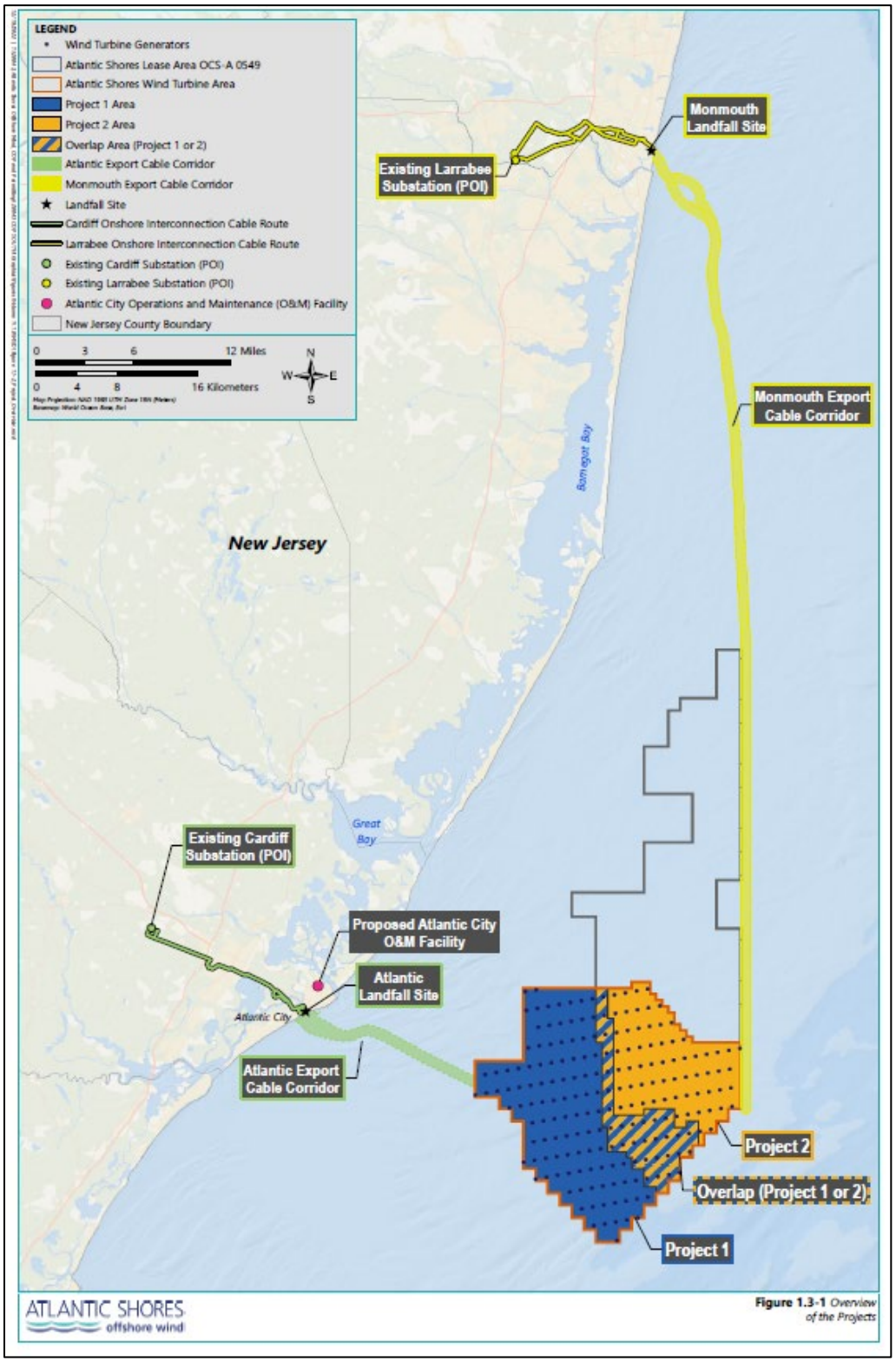


Figure 1.3-1. Overview of the Projects.



1.3.1 Project Design Envelope

Atlantic Shores has applied a Project Design Envelope (PDE) approach to describe the facilities and activities associated with the Projects. A PDE is defined as "a reasonable range of project designs" associated with various components of a project (e.g., foundation and WTG options) (BOEM, 2018). In accordance with the PDE evaluation approach, the assessment of project effects must include the maximum design case for all project development scenarios. Consistent with BOEM's *Draft Guidance Regarding the Use of a Project Design Envelope in a Construction and Operations Plan* (2018), this report and all related analyses consider a maximum design case layout. The layout represents the largest geographic footprint that could be occupied by visible structures and, therefore, the largest percentage of the visible horizon from shoreline locations that may be affected by the Projects. The maximum design case components are described below.

Table 1.3-1. Key Elements of the PDE.

Element	Project Design Element	Total	Project 1	Project 2
WTGs	**Max. Number of WTGs**	200 (inclusive of the 31 WTGs in the Overlap Area)[a]	105-136	64-95
	WTG Layout	Grid layout with ENE/WSW rows and approximately N/S columns, consistent with the predominant flow of traffic		
	Max. rotor diameter	918.6 ft (280.0 m)		
	Max. tip height[b]	1,048.8 ft (319.7 m)		
OSSs	**Max. Number of OSSs**	10 small OSSs, or	5	5
		5 medium OSSs, or	2	3
		4 large OSSs	2	2
	OSS Layout	Positioned along the same ENE/WSW rows as WTGs		
	Min. Distance from Shore	Small OSS: 12 mi (19.3 km)		
		Medium and large OSS: 13.5 mi (21.7 km)		
WTG and OSS Foundations	**Foundation types**			
	Piled	Monopiles or piled jackets		
	Suction bucket	Mono-buckets, suction bucket jackets, or suction bucket tetrahedron bases [c]		
	Gravity	Gravity-base structures (GBS) or gravity-pad tetrahedron bases[c]		
	Max. pile diameter at seabed	Monopile: 49.2 ft (15.0 m)		
	(for piled foundation types)	Piled jacket: 16.4 ft (5.0 m)		
Inter-Array and Inter-Link Cables	**Cable types and voltage**	Inter-array: 66–150 kV high voltage alternating current (HVAC)		
		Inter-link: 66–275 kV HVAC		
	Max. Total Cable Length	Inter-array: 547 mi (880 km)	273.5 mi (440 km)	273.5 mi (440 km)
		Inter-link: 37 mi (60 km)	18.6 mi (30 km)	18.6 mi (30 km)
	Target burial depth range	5 to 6.6 ft (1.5 to 2 m)		

1.3.2 Description of Offshore Components

At its closest point, the WTA is approximately 8.7 miles (mi) (14 kilometers [km]) from the New Jersey shoreline. The WTA will include an array of wind turbine generators (WTGs) and multiple offshore substations (OSSs). A meteorological (met) tower and/or meteorological and oceanographic (metocean) buoys may also be installed in the WTA. The WTA layout is designed to maximize offshore renewable wind energy production while minimizing effects on existing marine uses. The structures will be aligned in a uniform grid with multiple lines of orientation allowing straight transit through the WTA.

For the development of the viewshed analysis (see Section 2.2.1 of the HRVEA [COP Appendix II-O; EDR, 2024e]), all 200 foundation locations located within the WTA were analyzed using the largest WTGs included within the PDE in order to capture the maximum area of potential visibility. By evaluating the largest WTG currently under consideration, the theoretical WTG visibility increases for distant viewpoints, thereby providing a conservative assessment of visibility of the Projects.

Each WTG will consist of four major components: the foundation, the tower, the nacelle, and the rotor (Figure 1.3-2). The height of the tower, or "hub height" (height from the water's surface to the center of the rotor) will be approximately 574.2 feet (175 m) above mean sea level (AMSL). The nacelle sits atop the tower, and the rotor hub is mounted to the nacelle. Assuming a maximum rotor diameter of 918.6 feet (280 m), the total WTG height (i.e., height AMSL at the highest blade tip position) will be approximately 1046.6 feet (319 m).

Descriptions of each of the proposed WTG components included in the HRVEA are provided below:

Foundation: For the purpose of the HRVEA, it was assumed that each of the WTGs will be anchored to the sea floor using a monopile foundation secured with a single steel pile driven into the sea floor. However, the WTGs may utilize suction bucket or concrete gravity base structure (GBS) foundations. The monopile foundation is a tubular steel structure with a diameter of 39.4 feet (12 m) AMSL, upon which the tower transition will be mounted. A suction bucket foundation option consists of a hollow tube embedded in the ocean floor which holds the structure in place through vacuum pressure. The GBS consists of steel-reinforced concrete sunk to the ocean floor and held in place by gravity. The foundation will extend above the water surface, and the exposed portion of the foundation will be yellow in color. A boat landing will be affixed to the foundation with a stairway connecting the landing to a railed deck at the base of the tower.

Tower: The towers used for the Projects are tapered hollow steel structures manufactured in three sections. The assembled towers have a diameter of approximately 32.8 feet (10 m) at the base and 27.9 feet (8.5 m) at the top. Two amber U.S. Coast Guard (USCG) warning lights will be mounted on the deck at the base of each tower. In accordance with the BOEM and Federal Aviation Administration (FAA) obstruction marking standards, the WTG will be painted a light grey (RAL 7035) to pure white (RAL 9010). Additionally, the tower will be equipped with a minimum of three low intensity red flashing lights (L-810) at the approximate mid-section of the tower, which will operate during nighttime hours only.

Nacelle: The main mechanical components of the WTG are housed in the nacelle. These components include the drive train, generator, and transformer. For the purpose of this study, the nacelle is assumed to

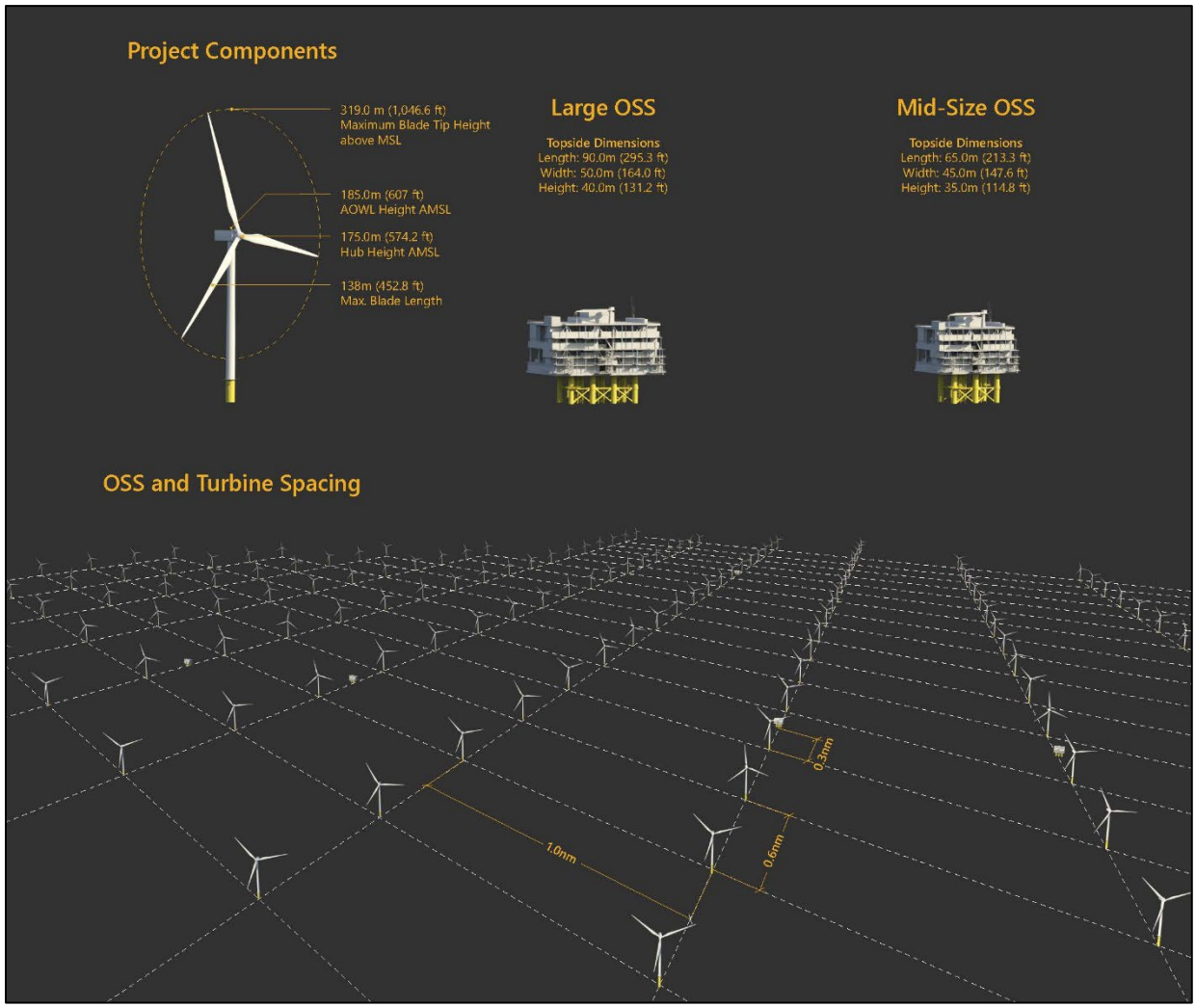
have maximum dimensions of approximately 82 feet (25 m) long, 52.5 feet (16 m) wide, and 39.4 feet (12 m) in height. Two aviation warning lights are proposed to be located on top of the nacelle, in accordance with BOEM and FAA guidelines. These will be medium intensity, flashing red lights (L-864) that are operated only at night, and will be synchronized with the L-810 lights described above. The WTG nacelle will be the same color as the tower and will not include any obvious lettering, logos, or other exterior markings (FAA, 2018). Where applicable, the lighting parameters presented in the VIA follow the current BOEM guidance for the lighting and marking of WTGs in order to illustrate the potential nighttime visual impacts associated with the Projects. However, lighting requirements may change based on final BOEM/FAA recommendations.

Rotor: A rotor assembly is mounted on the nacelle to operate upwind of the tower. The rotor consists of three composite blades, each approximately 452.8 feet (138 m) in length. The three-bladed rotor assembly will be light grey to white in color (consistent with the tower) and will have a maximum diameter of 918.6 feet (280 m). The rotor blades are rotated along their axis, or "pitched," to enable them to operate efficiently at varying wind speeds. The rotor can spin at varying speeds, but typically rotates at a rate around 10 revolutions per minute.

The OSSs will be an enclosed structure measuring up to 295.3 feet long by 164 feet (90 m × 50 m) wide, with a maximum elevation of up to 131.2 feet (40 m) AMSL. For the purpose of the HRVEA, it was assumed that OSSs will be mounted on piled jacket foundations. However, the OSSs may utilize suction bucket or concrete GBS foundations. Diagram illustrating the appearance and dimensions of the WTG and OSS evaluated in this study are presented in Figure 1.3-2.

A single permanent meteorological (met) tower may be installed within the WTA during construction of Project 1. Up to 4 locations for the met tower, all located within Project 1, are under consideration. The foundation options for the met tower include all options under consideration for WTG foundations and the construction methodologies are assumed to be the same as those for WTG foundations. There is sufficient conservatism in the total estimates of seafloor disturbance from WTG foundation installation to account for the impacts from the met tower's installation (see Section 4.6 of the COP). The maximum height of the met tower will not exceed 16.5 ft (5 m) above the hub height of the largest WTG installed. Therefore, it is conservative to assume the maximum height of the met tower will be 590.6 ft (180 m) above MSL. The met tower itself is expected to be composed of square lattice consisting of tubular steel. It will be equipped with a deck estimated to be approximately 50 ft by 50 ft (15 m by 15 m) mounted at approximately the same elevation as the interface between the WTGs and their foundations.

Figure 1.3-2. Computer Model of Offshore Platform and WTG Maximum Dimensions



Within the WTA, the WTGs and OSSs for Project 1 and Project 2 will be connected by two separate, electrically distinct systems of inter-array cables and/or inter-link cables. Energy from the OSSs will be delivered to shore by export cables that will travel within designed Export Cable Corridors (ECCs) from the WTA through federal and New Jersey state waters to one or two landfall sites on the New Jersey coastline. The Atlantic ECC extends from the western tip of the WTA to the Atlantic Landfall Site in Atlantic City, New Jersey. The Monmouth ECC extends from the eastern corner of the WTA, along the eastern edge of the Lease Area, to the Monmouth Landfall Site in Sea Girt, New Jersey. Both Projects 1 and 2 have the potential to use either ECC, and offshore export cables for each may also be co-located within an ECC.

At both the Monmouth and Atlantic Landfall Sites, horizontal directional drilling (HDD) will be employed to minimize impacts to the intertidal and nearshore habitats and ensure stable burial of the cables. From each landfall site, the onshore interconnection cables will travel underground primarily along existing roadways, utility rights-of-way (ROWs), and/or along bike paths to two new onshore substation and/or converter

station sites. From the onshore substations and/or converter stations, the onshore interconnection cables will continue to existing substations where the Projects will be connected into the electrical grid at the Cardiff Substation point of interconnection (POI) in Egg Harbor Township, New Jersey and/or the Larrabee Substation POI in Howell, New Jersey. While both Project 1 and Project 2 will be electrically distinct from one another, both Projects require the ability to interconnect at the two POIs to accommodate the maximum amount of electricity that could be generated by the Projects.

1.3.3 Description of Onshore Substation and Converter Facilities

Each Project will be electrically distinct and will require the use of an onshore substation (if HVAC export cables are used) or a converter station (if HVDC export cables are used). The onshore substation may use either an air-insulated switchgear design or a gas-insulated switchgear design pending the substations' final detailed design. The substation design and specific equipment will depend on whether the onshore interconnection cables are HVAC or HVDC. The onshore interconnection cables will be buried beneath or adjacent to existing rights-of-way.

If the HVAC option is constructed, each onshore substation will include up to four power transformers, static synchronous compensators (STATCOMs), shunt reactors, service station transformers, harmonic filter banks, and a substation control building. The tallest component of the substation will be the lightning mast which will be up to 80 feet (24.4 m) tall. The substation will receive electricity produced by the offshore components of the Atlantic Shores South Offshore Wind Projects via a buried onshore transmission cable to convert the incoming voltage to the voltage at the existing grid point of interconnect (POI).

If HVDC is selected, the equipment and facilities installed at the site could include a valve hall, service building, transformers, an AC yard and a DC area, a reactor yard, valve cooling towers, AC filters, and a storage building. At each onshore HVDC converter station, the current will be converted from DC to AC and the voltage will be stepped up or stepped down to match the electrical grid voltage.

Atlantic Shores has identified potential locations for these Facilities (Figure 1.3-1), including the following:

- Three potential locations for the proposed Larrabee Onshore Substation and/or Converter Station**:**[2]
    - Lanes Pond Road Site (formerly Parcel Area 7 and the Binyan Site) is an approximately 16.3-acre (6.6-ha) parcel consisting of agricultural fields and wooded areas south of the intersection of Miller Road and Lanes Pond Road in Howell Township.
    - The Brook Road Site (formerly Parcel Area 8 and the 100 Acre Site) is an approximately 99.4-acre (40.2-ha) combination of two parcels consisting primarily of forested uplands and some wetlands between Randolph Road and the Metedeconk River in Howell Township.

[2] Atlantic Shores previous submitted a memorandum to BOEM in August 2022 with information on eight potential locations (Parcel Areas) for the proposed Larrabee Onshore Substation and/or Converter Station. Design decisions since the transmittal of that memorandum have resulted in the removal of six of the previously identified locations (Parcel Areas 1-6), and the addition of one location (Randolph Road Site). The designations of the two retained locations (Parcel Areas 7/Binyan Site and 8/100 Acre Site) have been updated to the Lanes Pond Road Site and the Brook Road Site options.

The Randolph Road (formerly Arnold Steel Site) option is an approximately 24.6-acre (9.97-ha) combination of three parcels consisting of a steel fabrication facility with associated laydown yard, offices, and parking, as well as forested wetlands surrounding Dicks Brook. The location north of Randolph Road to the northeast of the existing Larrabee POI in Howell Township.

- The Fire Road Site located at approximately 3038 Fire Road, is situated on approximately 19.71 acres (7.98 ha) of currently wooded and overgrown lots in Egg Harbor Township.

Figure 1.3-3. Regional Substation Locations.

1.3.3.1 Onshore Facility Siting

While both Project 1 and Project 2 will be electrically distinct from one another, the Projects require the ability to interconnect at two POIs to accommodate the maximum amount of electricity that could be generated by the Projects. Therefore, the Projects require two POIs and, consequently, two onshore interconnection cable routes and two landfall sites. To identify the locations of the Projects' onshore facilities, Atlantic Shores conducted an onshore routing assessment through an inter-related process that identified options for landfall sites and onshore interconnection cable routes to existing POIs. Identification of landfall sites and onshore interconnection cable routes in New Jersey is constrained by the density of development along the shorelines and built infrastructure inland. This siting must also account for the area required for horizontal directional drilling (HDD) staging areas as well as the physical dimensions required to install an underground transition vault that connects the export cables and the onshore interconnection cables.

1.3.3.2 Points of Interconnection

Five potential POIs within New Jersey (see Table 1.3-1) were identified based on their proximity to the coastline and their environmental and technical attributes (e.g., substation voltage, potential for expansion, upgrades required to accommodate the Projects' interconnection). These five POIs were used to evaluate potential onshore interconnection cable routes from the landfall sites to the POIs.

Table 1.3-2. Potential Points of Interconnection

Potential POIs	County
Larrabee	Monmouth
Cardiff	Atlantic
Lewis	Atlantic
Oyster Creek	Ocean
BL England	Cape May

1.3.3.3 Landfall Sites

Atlantic Shores conducted a siting evaluation of potential landfall sites that was largely based on parcel size, surrounding land use, and proximity to established linear development corridors (e.g., roadway and utility right-of-way [ROW]) that could serve as an onshore interconnection cable route. The specific siting criteria used to identify potential landfall sites included the following:

- **Technical considerations:**
  - The landfall sites require adequate open space onshore and in proximity to the coastline to accommodate the underground transition vaults and required HDD staging areas.
  - Landfall sites with offshore water depths that are deep enough to accommodate a cable laying vessel at the offshore HDD entrance/exit point are preferred.
- **Site characteristics:** The Projects require areas that are either undeveloped or consist of surface development (i.e., parking lots), without conflicting subsurface infrastructure.

- **Existing uses and sensitive areas:** Preferred landfall sites are not located proximate to residential communities and other sensitive receptors such as wildlife management areas, state parks, and other protected open spaces, which make up most of the open land along the New Jersey coast.

Based on these criteria, aerial photographs of the coastline were manually analyzed to determine candidate landfall sites. A total of 10 potential landfall sites were initially identified, as presented in Table 1.3-2 and shown on Figure 1.3-4.

Table 1.3-3. Landfall Sites

Landfall Site	Potential POI	Approximate Size	Latitude	Longitude
Wesley Lake	Larrabee	<1 acre (<0.004 [square kilometer] km^2)	40.218344	-74.004783
Monmouth	Larrabee, Oyster Creek	164 acres (0.66 km^2)	40.121597	-74.033785
Island Beach State Park	Larrabee, Oyster Creek	2,200 acres (8.9 km^2)	39.904109	-74.081359
Abbott Avenue	Larrabee, Oyster Creek	2 acres (0.008 km^2)	39.543841	-74.255182
Jeffrey Avenue	Larrabee, Oyster Creek	<1 acre (<0.004 km^2)	39.539932	-74.259552
Roosevelt Avenue	Larrabee, Oyster Creek	3 acres (0.01 km^2)	39.534552	-74.262262
North Atlantic City	Cardiff, Lewis	<1 acre (<0.004 km^2)	39.364038	-74.413007
Bader Airfield	Cardiff, Lewis	143 acres (0.58 km^2)	39.359757	-74.455573
Atlantic	Cardiff, Lewis	2 acres (0.008 km^2)	39.351952	-74.450009
Corson's Inlet	BL England	42 acres (0.17 km^2)	39.216859	-74.642799

1.3.3.4 Onshore Interconnection Routes

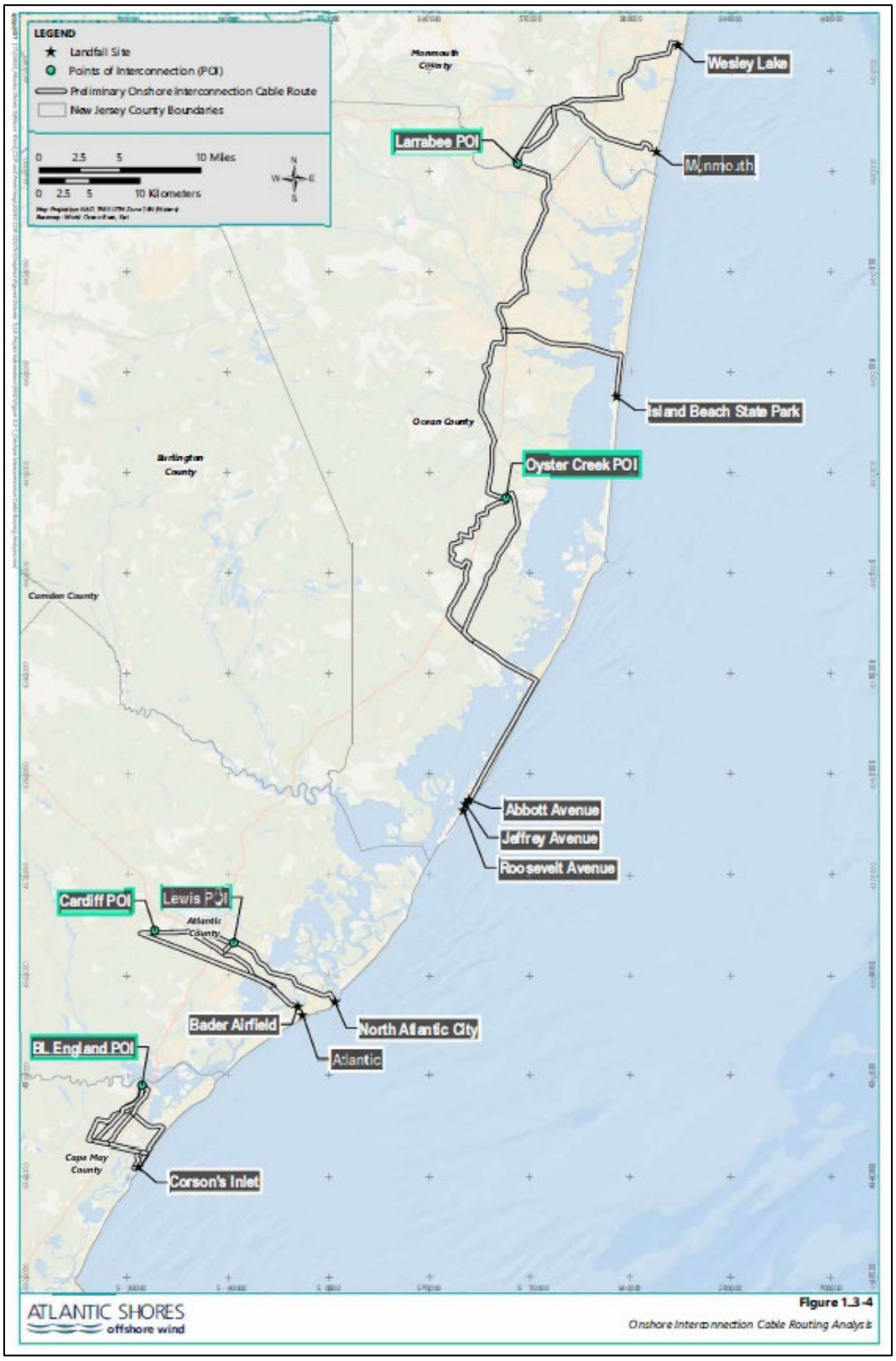
From each landfall site, Atlantic Shores conducted an iterative onshore interconnection cable routing assessment to each of the five POIs. The routing assessment was supported by aerial photography, publicly available Geographic Information Systems (GIS) environmental data, and baseline windshield surveys. Based on this routing analysis, 16 preliminary onshore interconnection cable routes were identified as shown in Figure 1.3-4.

A set of environmental and feasibility criteria were identified and weighted to establish and evaluate each onshore interconnection cable route. Route ranking was based on the following criteria:

- **Technical considerations:**
    - Shorter route lengths are preferred to reduce overall potential impacts and installation costs.
    - A lower number of hard route angles requiring a dead-end or corner transmission structure is preferred since hard route angles are more challenging and costly to construct.
- **Site characteristics:** Routes utilizing established ROWs for larger highways, state routes, existing transmission lines, or railroads are preferred because of the widespread development along the coast that prevents the establishment of a new ROW.
- **Existing uses and sensitive areas:**

- Routes that avoid or minimize the distance of the onshore interconnection cable route in or within proximity to residential neighborhoods are preferred to reduce temporary, construction-related noise impacts.
- Routes that minimize impacts to mapped threatened and endangered species habitat, tidelands, and wetlands are preferred.

Figure 1.3-4. Onshore Interconnection Cable Routing Analysis



1.3.4 Description of the O&M Facility

Once operational, the Projects will be supported by a new Operations and Maintenance Facility (O&M Facility) that Atlantic Shores is proposing to establish in Atlantic City, New Jersey. The O&M Facility will be used by Atlantic Shores as the primary location for O&M operations including material storage, day-to-day management of inspection and maintenance activities, vehicle parking, marine coordination, vessel docking, and dispatching of technicians. The O&M Facility will be designed to provide a safe and efficient operational flow of activities and equipment, and will consist of the following:

- office space, including a server/IT room to house the Project's IT infrastructure, and a control room for surveillance and coordination of offshore activities and Project operations;
- warehouse space, including full-height access for deliveries and equipment storage, a temperature and humidity-controlled electrical storage room, and a lifting facility; and
- harbor area and quayside, including but not limited to vessel mooring, unloading capabilities, a crane, berthing area, and emergency spill response equipment.

To establish the O&M Facility, Atlantic Shores intends to purchase and develop the 1.22-acre (0.49 ha) shoreside parcel at 801 North Maryland Avenue in Atlantic City, New Jersey (see Figure 1.3-5). The current owner of the site is listed as Amoco Oil Company in New Jersey Department of Environmental Protection (NJDEP) documents; it is presumed that the parcel was formerly used for oil storage, vessel docking, or other port activities. Construction of the O&M Facility is expected to involve the construction of a new building and a potential adjacent parking lot structure, repairs to any existing bulkheads/docks, installation of new dock facilities, and limited marine dredging. Alternatively, the O&M Facility may utilize the parking lot located on California Avenue at the Atlantic Landfall site or other existing surface lots in Atlantic City supported by shuttles to and from the O&M Facility.

Figure 1.3-5 Regional O&M Facility Location

2.0 TERRESTRIAL ARCHAEOLOGICAL RESOURCE AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Atlantic Shores has proposed the Onshore Facilities be located primarily in previously disturbed areas including previously developed parcels, paved roadways, railroad ROWs and bike paths. These areas are likely to have disturbed soils due to the existing infrastructure and structures and there is a very low likelihood of intact or potentially significant archaeological resources to be in these areas. As described in the *Terrestrial Archaeological Resources Assessment – Onshore Interconnection Facilities* (TARA; COP Appendix II-P1; EDR, 2023a) and Phase IA Terrestrial Archaeological Resources Assessment – Operations and Maintenance Facility (O&M TARA; COP Appendix II-P2; EDR, 2023b) the Projects were sited to minimize potential adverse effects to terrestrial archaeological resources. The *"proposed Onshore Facilities associated with the Cardiff and Larrabee Physical Effects PAPEs have been significantly disturbed due to transportation infrastructure development (principally roadways, railroads, and bike paths) and adjoining business and residential neighborhoods"* (EDR, 2023a).

The desktop assessments and archaeological reconnaissance described in the TARA identified areas within the PAPE with the potential to contain intact archaeological resources. Pedestrian survey (with judgmental shovel testing if deemed appropriate based on observed field conditions) was recommended in any low sensitivity, "Potentially Undisturbed" areas adjacent to paved roadways (within which the onshore cables are actually sited) where depth to culturally sterile subsoil is less than approximately 2.0 feet as well as in any wetlands or areas of steep slope. Targeted archaeological shovel testing is recommended within those portions of the proposed Onshore Facilities that are sited within areas of the PAPE categorized as Medium and Medium-High sensitivity and "Potentially Undisturbed". These areas have been designated the "Potential Phase IB Survey Areas". Potentially undisturbed areas which are completely paved within 1,000 ft of previously identified archaeological sites are recommended for archaeological monitoring (see COP Appendix II-P1: Attachments C and D). Subsurface investigations of Onshore Interconnection Cable routes will focus on shovel test pit excavation along potentially intact road margins and within public ROWs to identify archaeological deposits or sites that could extend beneath paved surfaces. Field investigations to date include archaeological reconnaissance of the Onshore Facilities and in-progress Phase IB shovel test survey of the "Potential Phase IB Survey Areas" identified in the TARA analysis.

BOEM has determined, in accordance with Section 106 regulations (36 CFR § 800.4 (b)(2)), that a phased identification approach is appropriate for the survey, reporting, and consultation related to the outstanding Phase IB archaeological investigation. Atlantic Shores developed a Phased Identification Plan (PIP) for Terrestrial Archaeological Resources for the "Potential Phase IB Survey Areas" identified in the TARA to further evaluate the potential for archaeological sites within the Terrestrial PAPE, and to minimize the risk of unanticipated discoveries or disturbance to archaeological resources during construction (see MOA attachment *Phased Identification Plan: Terrestrial Archaeological Resources and Monitoring Plan and Post Review Discovery Plan: Terrestrial Archaeological Resources*). Given the Onshore Interconnection Cable routes would be buried in existing road ROWs or installed via HDD below the ground surface, no phased identification to identify and evaluate aboveground historic properties is anticipated. The PIP serves as a process document detailing the areas where phased identification survey will be conducted, the steps Atlantic Shores will take to complete the required cultural resources survey, and a schedule of associated

milestones. All milestones are anticipated to be completed before issuance of the Final Environmental Impact Statement and BOEM's Record of Decision.

To further mitigate the potential (however unlikely) for encountering archaeological resources during installation of the Onshore Facilities, as part of the PIP, Atlantic Shores has prepared a Monitoring Plan and Post Review Discoveries Plan (MPRDP) for terrestrial archaeological resources, which includes stop-work and notification procedures to be followed if a cultural resource is encountered during installation (see MOA attachment *Phased Identification Plan: Terrestrial Archaeological Resources and Monitoring Plan and Post Review Discovery Plan: Terrestrial Archaeological Resources*). Atlantic Shores anticipates that the MPRDP will be incorporated in a Memorandum of Agreement (MOA) executed among BOEM, SHPOs, consulting Tribal Nations, and potentially other consulting parties to resolve anticipated adverse effects to identified historic properties and to memorialize specific measures that Atlantic Shores will take to avoid and minimize potential effects to other historic properties in the event of a post-review discovery. The MPRDP outlines the steps for dealing with potential unanticipated discoveries of cultural resources, including human remains, during the construction of the proposed Onshore Facilities. In summary the MPRDP:

- Presents to regulatory and review agencies the plan Atlantic Shores and its contractors and consultants will follow to prepare for and potentially respond to unanticipated cultural resources (i.e., terrestrial archaeological) discoveries;
- Includes provisions and procedures allowing for a Cultural Monitor (Archaeologist) and Tribal Monitors to be present during construction and installation activities conducted in targeted areas of concern as identified in the TARA and through consultation with Tribal Nations; and
- Provides guidance and instruction to Atlantic Shores personnel and its contractors and consultants as to the proper procedures to be followed in the event of an unanticipated cultural resource (i.e., terrestrial archaeological) discovery.

3.0 MARINE ARCHAEOLOGICAL RESOURCE AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

As described in the *Marine Archaeological Resources Assessment Atlantic Shores Offshore Wind Project Construction and Operations Plan and Addendum* prepared by Atlantic Shore's Qualified Marine Archaeologist (QMA), SEARCH, [redacted] targets were identified (MARA and MARA Addendum; COP Appendix II-Q1; SEARCH, 2022 and 2023). [redacted] targets are located within the WTA; [redacted] targets are located in the Atlantic Export Cable Corridors (ECC); [redacted] targets are located along the Monmouth ECC; and [redacted] ancient, submerged landform features (ASLF) were identified within the Marine PAPE. In order to avoid the ASLF, the report recommends:

1. Avoidance of each of the submerged cultural resources with a recommended a minimum 1-meter (3.2 feet) vertical buffer (ASLFs and shipwrecks/debris fields);
2. Avoidance of the 25-meter (82-foot) recommended horizontal buffer from ASLFs;
3. Avoidance of a QMA recommended and anomaly-specific 50-meter (164-foot) horizontal buffer from the outer edge of magnetic anomalies or acoustic contacts (shipwrecks and debris fields).

In addition, the MARA noted:

> *SEARCH has identified the paleolandscape features within the Project Areas and recommends refining engineering plans to minimization impacts and/or avoidance measures to identified ancient, submerged landform features and targets. ASOW will compile a list of targets that cannot be avoided. The data collected and a mitigation framework will be presented to stakeholders. Then, a mitigation plan will involve stakeholders and subject matter experts to develop a treatment plan to address targets where impacts cannot be avoided* (SEARCH, 2021).

In addition to the proposed avoidance and minimization measures described above, the MPRDP for Submerged Cultural Resources (see the MOA attachment *Monitoring Plan and Post Review Discovery Plan: Submerged Cultural Resources*) will discuss how Atlantic Shores has and will continue to implement the following Applicant-proposed environmental protection measures to avoid, minimize, and/or mitigate potential impacts to marine archaeological resources:

- Native American Tribal representatives and other consulting party members were invited to participate in the following:
    - Pre-Survey Meetings;
    - Preliminary Geologic Modeling;
    - Preliminary Geotechnical Sampling;
    - Preliminary Carbon-14 (C14) dating;
    - Selected Cultural Vibracore Sampling;
    - C14 and Geophysical Ground Modeling;
    - QMA Lab processing of Selected Cores;
    - Video Documentation of Core Processing.

- Shipwrecks and associated historic sites potentially eligible for listing on the NRHP will be avoided within a minimum 50-meter buffer and Atlantic Shores will follow the Notification of the Discovery of Shipwrecks on the Seafloor (30 CFR 250.194(c), 30 CFR 250.1009(c)(4), and 30 CFR 251.7(b)(5)(B)(iii)). As per QMA recommendations (MARA; COP Appendix II-Q1; SEARCH, 2022), the avoidance buffer will be resource specific. The avoidance buffer for magnetic anomalies will be calculated as a radius from a circular polygon delineated from the perimeter of the anomaly. In instances where the anomaly was identified by acoustic contact, the target avoidance buffer originates from the contact rather than the anomaly perimeter but still encompasses the entirety of the anomaly. This avoidance method is designed to account for sensor positional errors which may have occurred during survey, contouring accuracy between survey transects, and to account for potential buried non-ferrous debris and expected types of seafloor impacts.
- Completed Geophysical and Geotechnical (G&G) campaigns have been proactive in targeting and collecting culturally pertinent samples and information to be used in a robust ground model, which will inform Atlantic Shores' design decisions moving forward.
- Atlantic Shores plans to share the robust ground model as a mitigation to impacts to geologic landforms in Lease Area OCS-A 0499. Efforts can be made to make data products and media products available for all interested parties to aid in development of technical or historical retention.
- Where feasible, Atlantic Shores will present visual demonstrations of both the ASLFs and planned infrastructure. As an example, the ground model could be deconstructed into time-elements, in 3D space, and in a manner that tells a sequential geologic history using G&G data, all presented in an easily understood format. This map/landscape reconstruction could:
    - Be developed in collaboration with consulting Tribal Nations;
    - Where appropriate, incorporate traditional ecological knowledge shared by Tribal Nations;
    - Include illustrations/animations of traditions regarding evolution of seas and lands of the Atlantic OCS;
    - Include reconstruction of ancient landscapes based on Projects' survey data.
- Atlantic Shores has developed potential measures to mitigate unavoidable adverse effects to the affected ASLFs. These measures are further detailed in the MOA attachment *Historic Property Treatment Plan (HPTP) for Ancient Submerged Landform Features*. These potential measures include the following:
    - Preconstruction Geoarchaeology
        - Collaborative review of existing geophysical and geotechnical data and any relevant supplemental analyses with Tribal Nations;
        - Consultations among BOEM, Atlantic Shores, Tribal Nations and other interested consulting parties to select appropriate locations within affected ASLFs for coring;
        - Selection of coring locations in consultation with Tribal Nations;

- Collection of vibracores;
- Written verification to BOEM that the samples collected are sufficient for the planned analyses and consistent with the agreed scope of work;
- Collaborative laboratory analyses at a laboratory;
- Screening of recovered sediments for debitage or micro-debitage associated with indigenous land uses;
- Third-party laboratory analyses, including micro- and macro-faunal analyses, micro- and macro-botanical analyses, radiocarbon dating of organic subsamples, and/or chemical analyses for potential indirect evidence of indigenous occupations;
- Temporary curation of archival core sections;
- Draft reports for review by interested consulting parties; and
- Final reporting.

o Open-Source GIS, Story Maps, and Animations

- Collaboration to strengthen the model as a useable educational tool.
- Publicizing information by sharing the model and other educational tools with impacted communities.
- Understanding that the expanse of science and mitigation can extend beyond a 3D ground model into a modern world that is made better through the development of offshore wind. This step can be part of a contribution from the stakeholder comment period identifying needs that can be fulfilled through our project.

o Postconstruction ASLF Investigation

- QMA review and analysis of postconstruction geophysical data to identify areas of high preservation potential.
- Preparation of a draft technical report outlining the methods and findings of the analysis for BOEM review.
- Distribution of the technical report to Participating Parties.
- A consultation meeting among the Participating Parties to review the findings and recommendation in the technical report, and to select targeted areas (if any) appropriate for subsequent surveys, inspections, or documentation.
- Execution of appropriate surveys, inspections, and/or documentation utilizing one or more of the proposed methods outlined in Section 4.1.4 of the HPTP.
- The type of trenching system will inform the survey methodology. The search area will be based on the distance sediments are dispersed during cable installation.

        - Analysis and reporting of the results of any supplemental surveys/inspections conducted as a result of the postconstruction analyses and consultations.
        - Public and/or professional presentations summarizing the results of the investigations, developed with the consent of the consulting Tribal Nations.
    - Tribal Capacity Support for the Delaware Nation, the Delaware Tribe of Indians, the Mashpee Wampanoag Tribe, the Shinnecock Indian Nation, the Mashantucket (Western) Pequot Tribal Nation, and the Wampanoag Tribe of Gay Head (Aquinnah)
        - Atlantic Shores will provide funding to the Tribal Nations that may be used for, but is not limited to the following:
            - Engagement in consultations related to the Projects.
            - Monitoring of the ASLFs.
            - Technology upgrades and training associated with interpretation and analysis of non-proprietary or otherwise regulatory-protected GIS data.
            - The Delaware Nation and Delaware Tribe of Indians' participation in ethnographic studies with other Tribes, if applicable.
            - The Delaware Nation and Delaware Tribe of Indians THPOs' collaboration in those same studies, if applicable.
            - The Tribal Nations will determine priority Tribal capacity needs and initiatives associated with monitoring of ASLFs.
- Subsistence and Settlement Study of New Jersey for the Stockbridge-Munsee Community Band of Mohican Indians
    - Selection of a qualified contractor by the interested Tribal Nations
    - Contractor's development of methodology for predictive modeling
    - Contractor's compilation of GIS data, site forms, site maps, reports, and relevant literature
    - Collaboration among Tribal Nation(s) and Contractor on execution of the analyses and reporting
    - Preparation by the Contractor of a draft confidential technical report for each participating Tribal Nation, including GIS data layers for use by such Tribal Nations and a tutorial on use of the data layers for the participating Tribal Nations
    - Review and comment on the draft GIS data and associated confidential technical report(s) by the Tribal Nations.
    - Preparation of a publicly-accessible report that excludes culturally sensitive information or information that may risk damage to sensitive cultural sites, per NHPA Section 304.

- Final confidential reporting and GIS data compilation by the Contractor.

4.0 ABOVEGROUND HISTORIC PROPERTIES

As stated in the HRVEA, Onshore Interconnection Facilities Historic Resources Effect Assessment (HREA), and the O&M Facilities HREA (COP Appendices II-O, II-N1; EDR, 2024f; and II-N2, EDR, 2024g respectively), online data sources, GIS data, public records, NJHPO data, and field surveys were used to review parcels that included previously identified (e.g., NRHP-listed or NJHPO-identified) historic properties within the PAPEs and/or where public records indicated the potential for buildings greater than 40 years in age. EDR's Secretary of Interior-qualified architectural historians performed desktop and field reviews to develop the list of the potential aboveground historic properties within the PAPEs. Following completion of the field surveys these properties were further evaluated for potential NRHP eligibility based on desktop research. Based on the above methodology:

- A total of 102 aboveground historic properties were identified in the HRVEA.
- Three aboveground historic properties were identified in the Onshore Interconnection Facilities HREA.
- Seven aboveground historic properties were identified in the O&M Facilities HREA.

4.1 Applying the Criteria of Adverse Effect

Potential effects on aboveground historic properties resulting from an offshore wind project include physical effects – such as alteration, disturbance, or destruction of a historic property caused by construction activities – as well as other changes such as visual, auditory, or atmospheric effects that diminish the historically significant characteristics of an historic property. No physical impacts to aboveground historic properties will occur as a result of the Projects' activities onshore, on the OCS, or within state waters, nor will any buildings or other potential onshore aboveground historic properties be physically altered by construction of the Projects. Instead, the Projects' potential effects on onshore aboveground historic properties would be a change to a given property's historic setting resulting from the introduction of WTGs and other offshore components, as well as any onshore components. Consistent with recent case law, BOEM, as the lead federal agency, considers visual effects caused by the construction/operation of the onshore and offshore facilities to be direct effects.

Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties that are listed or meet the eligibility criteria for listing in the NRHP. Per NHPA Section 106, 36 CFR § 800.5 (a)(1), the assessment of adverse effects on an historic property requires the following steps:

> *(a) Apply criteria of adverse effect. In consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that attaches religious and cultural significance to identified historic properties, the agency official shall apply the criteria of adverse effect to historic properties within the area of potential effects. The agency official shall consider any views concerning such effects which have been provided by consulting parties and the public* (CFR, 2022).

The Federal Regulations entitled "Protection of Historic Resources" (36 CFR 800) include in Section 800.5(2) a discussion of potential adverse effects on historic properties. The criteria for determining whether a project ("undertaking") may have an adverse effect on historic properties are as follows:

> *(vii) Criteria of adverse effect. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative* (CFR, 2022).

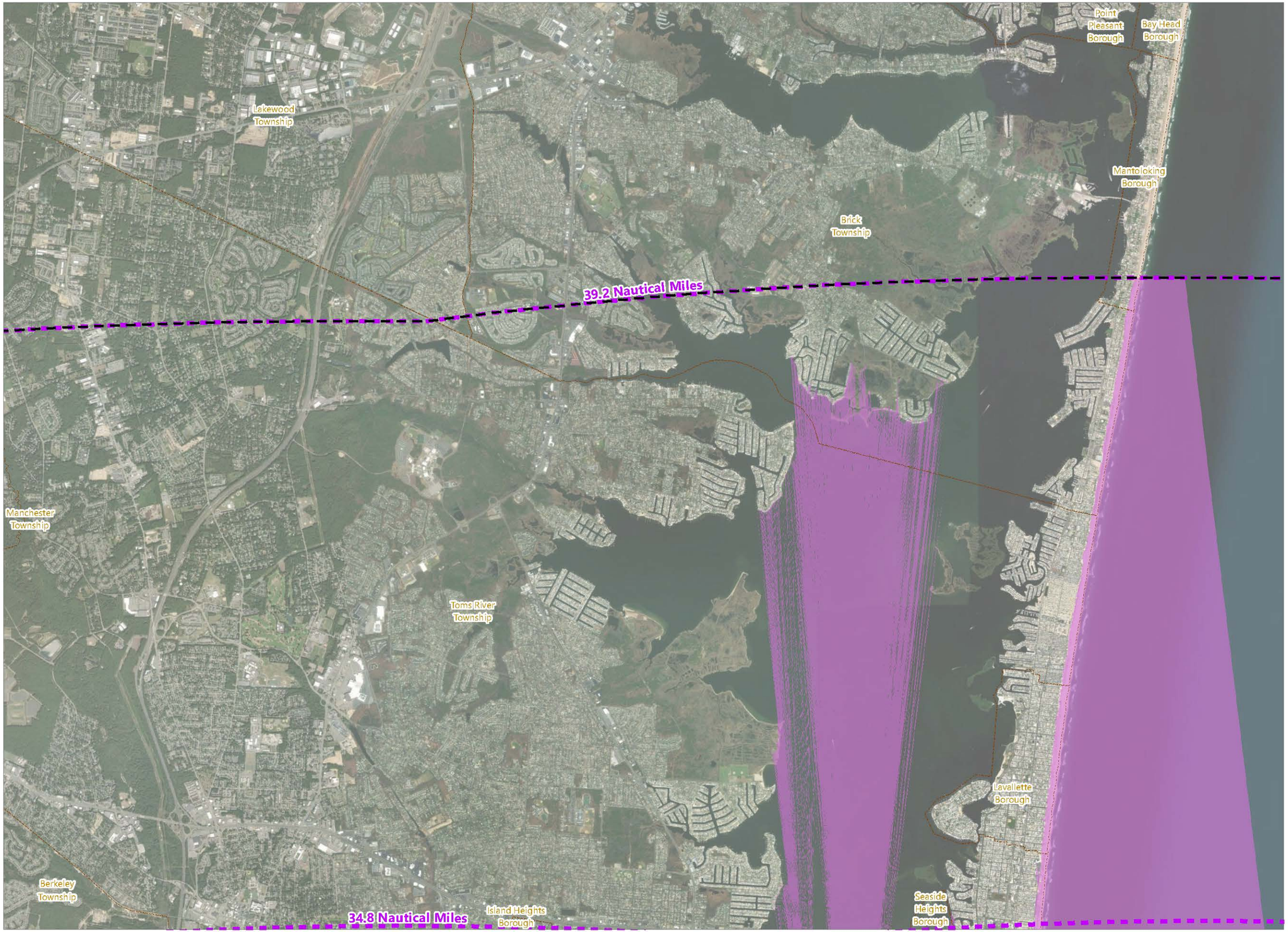
As stated in the HRVEA (COP Appendix II-O; EDR, 2024e), the majority of aboveground historic properties that fall within the Projects' viewshed will have partially obstructed views of the Projects due to screening provided by intervening topography, vegetation, and/or buildings and structures. The proposed WTGs are located between 9.78 miles (15.73 km) to 45.24 miles (72.8 km) away from the aboveground historic properties located within the PAPE.

The visual simulations prepared for the Projects in the Visual Impact Assessment (COP Appendix II-M1; EDR, 2023) show that in some cases views of the ocean will be disrupted by the size and scale of the WTGs. The introduction of vertical elements along the horizon line has the potential to create a pattern of visual disturbance within the natural seascape. Distance may be a mitigating factor in some cases. However, under clear conditions even at distances of 20 miles (32.2 km) away, WTGs spread across the horizon will likely become focal points of viewers from the shore, and the effect of "stacking" can cause multiple individual WTGs to appear as a larger, more substantial form. However, atmospheric conditions will affect the frequency and duration of WTG visibility from historic properties within the PAPE which will minimize the visual effect of the Projects under some conditions.

The Projects have been designed to minimize impacts to aboveground historic properties to the extent feasible; however, applying the Criteria of Adverse Effect per NHPA Section 106, 36 CFR § 800.5 (as previously summarized):

- A total of 29 of the 102 aboveground historic properties identified in the HRVEA and located within the WTA PAPE will be adversely affected (see Table 4.1-1 and Appendix II-O; EDR, 2024e).
- None of the three aboveground historic properties identified in the Onshore Interconnection Facilities HREA will be adversely affected by the Projects (see COP Appendix II-N1; EDR, 2024f).
- None of the seven aboveground historic properties identified in the Operation and Maintenance Facilities HREA will be adversely affected by the Projects (see COP Appendix II-N2 EDR, 2024g).

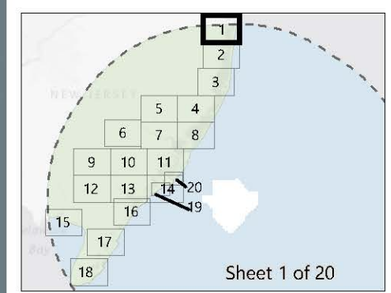
Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properties



Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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Prepared January 31, 2024

Basemap: Esri ArcGIS Online "World Imagery" map service

ATLANTIC SHORES offshore wind

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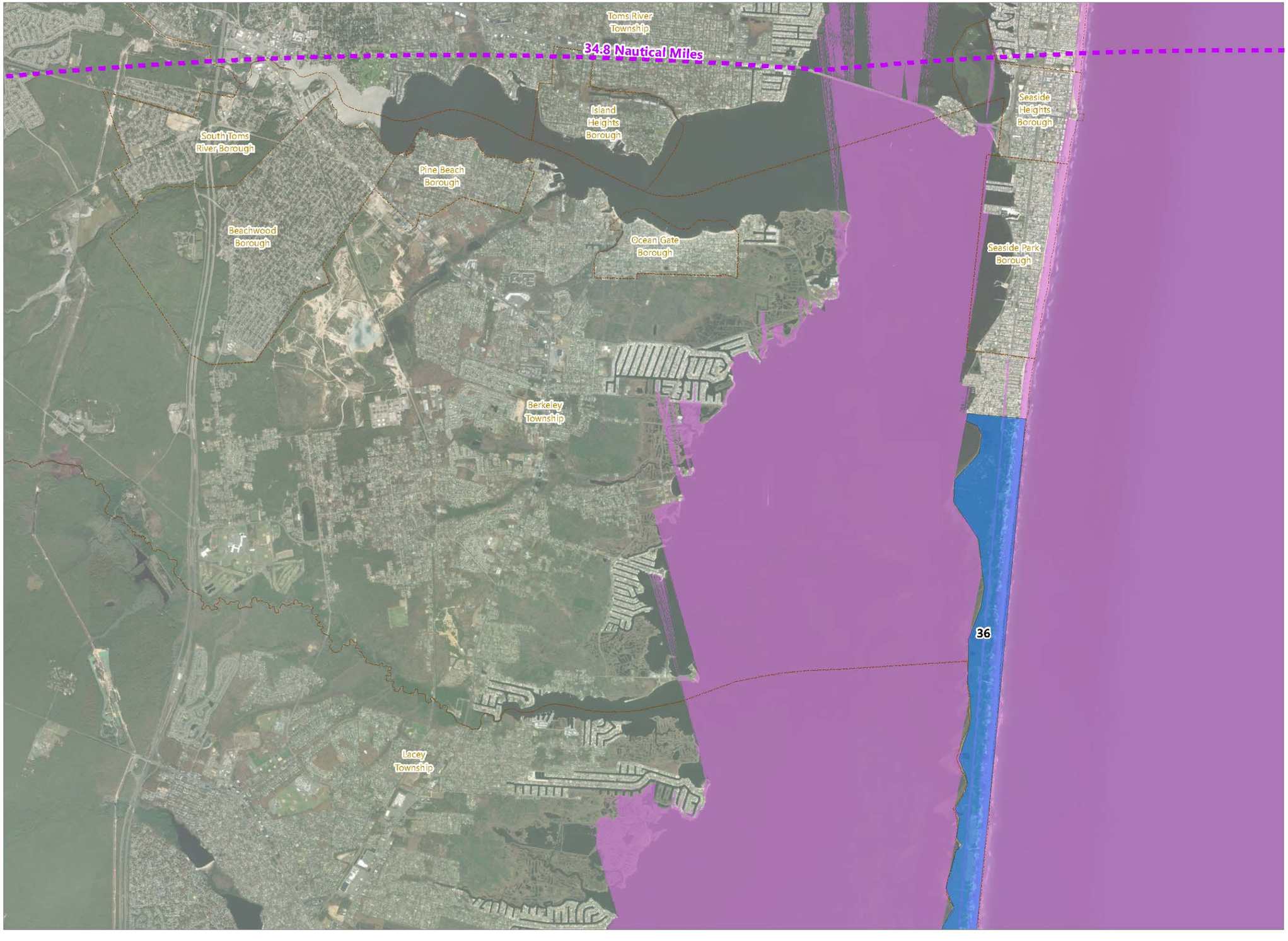
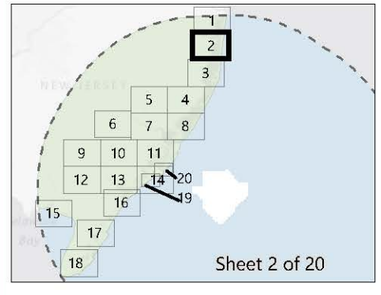
Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properties



Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Aboveground Historic Property
- NRHP-Eligible Property
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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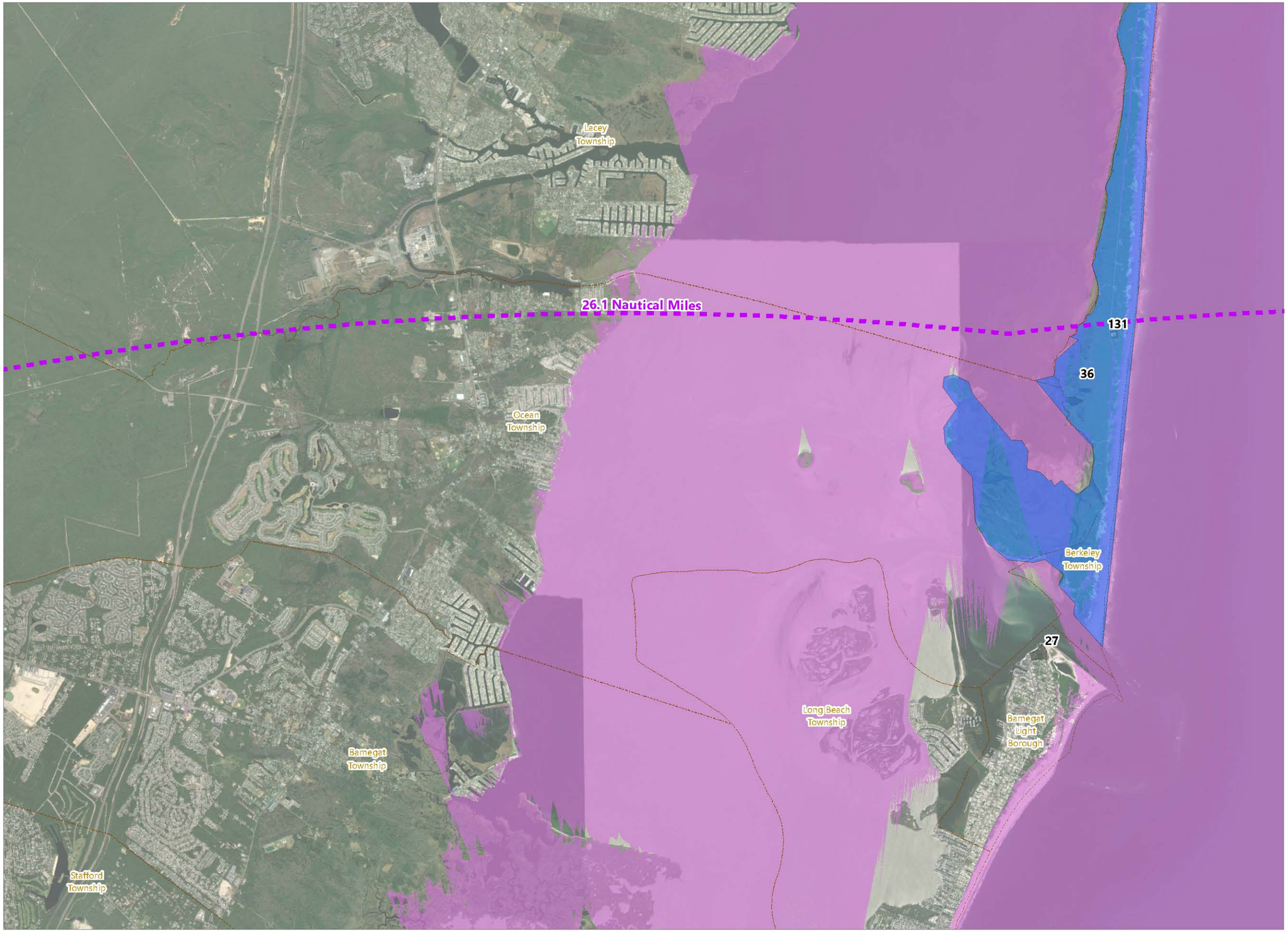
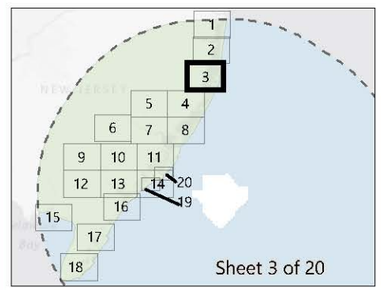


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

Preliminary Area of Potential Effects (PAPE)
Aboveground Historic Property
NRHP-Listed Property
NRHP-Eligible Property
Turbine Distance Interval
45.1-Mile Viewshed Radius
Municipal Boundary



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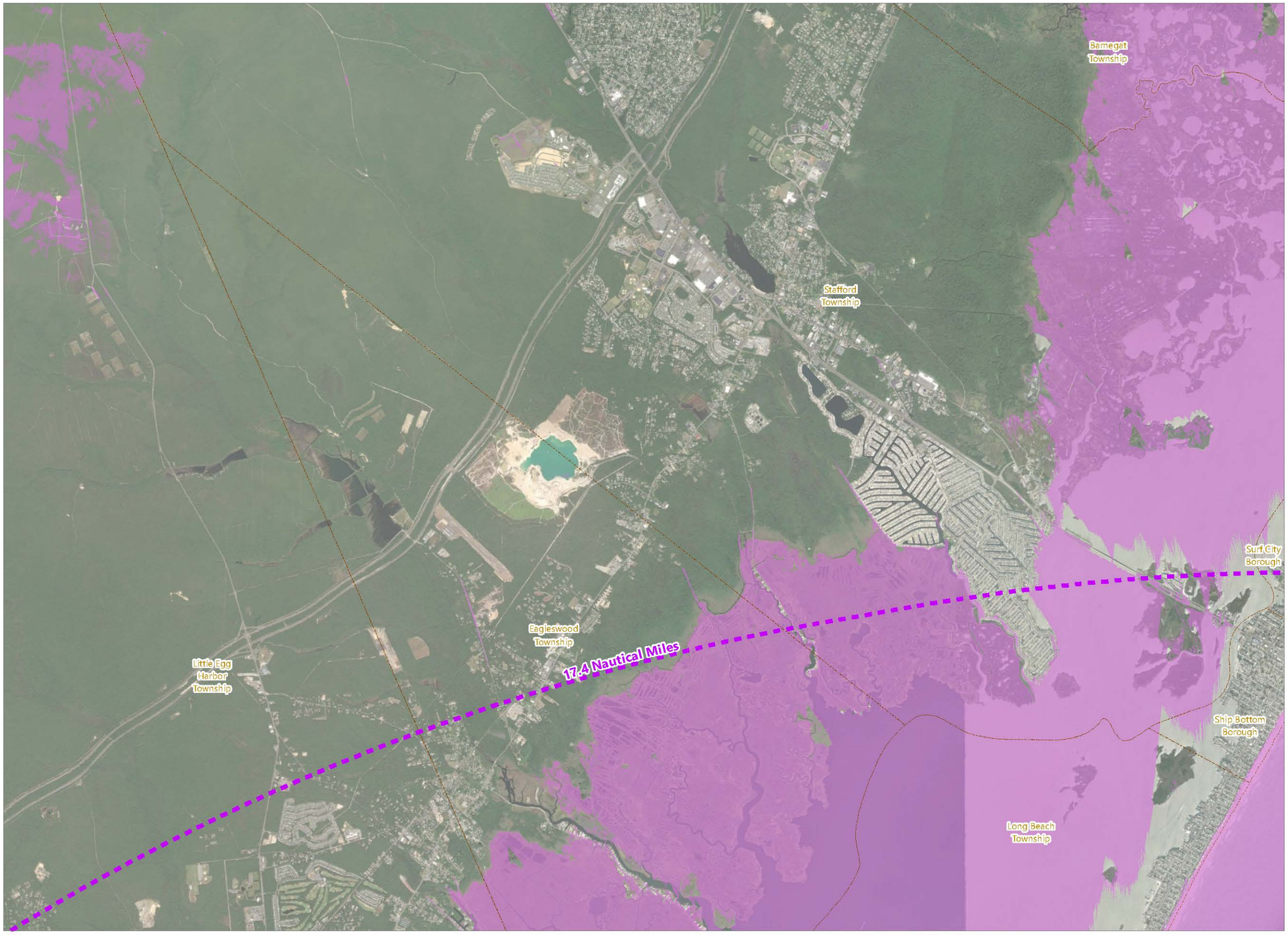

Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

Preliminary Area of Potential Effects (PAPE)
Turbine Distance Interval
45.1-Mile Viewshed Radius
Municipal Boundary

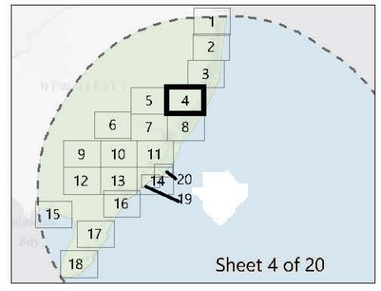

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Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properties

Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary

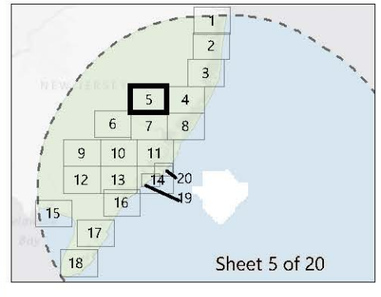

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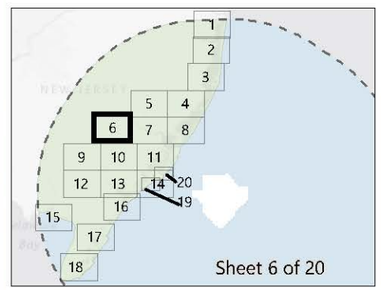
Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properties

Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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Prepared January 31, 2024

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ATLANTIC SHORES offshore wind

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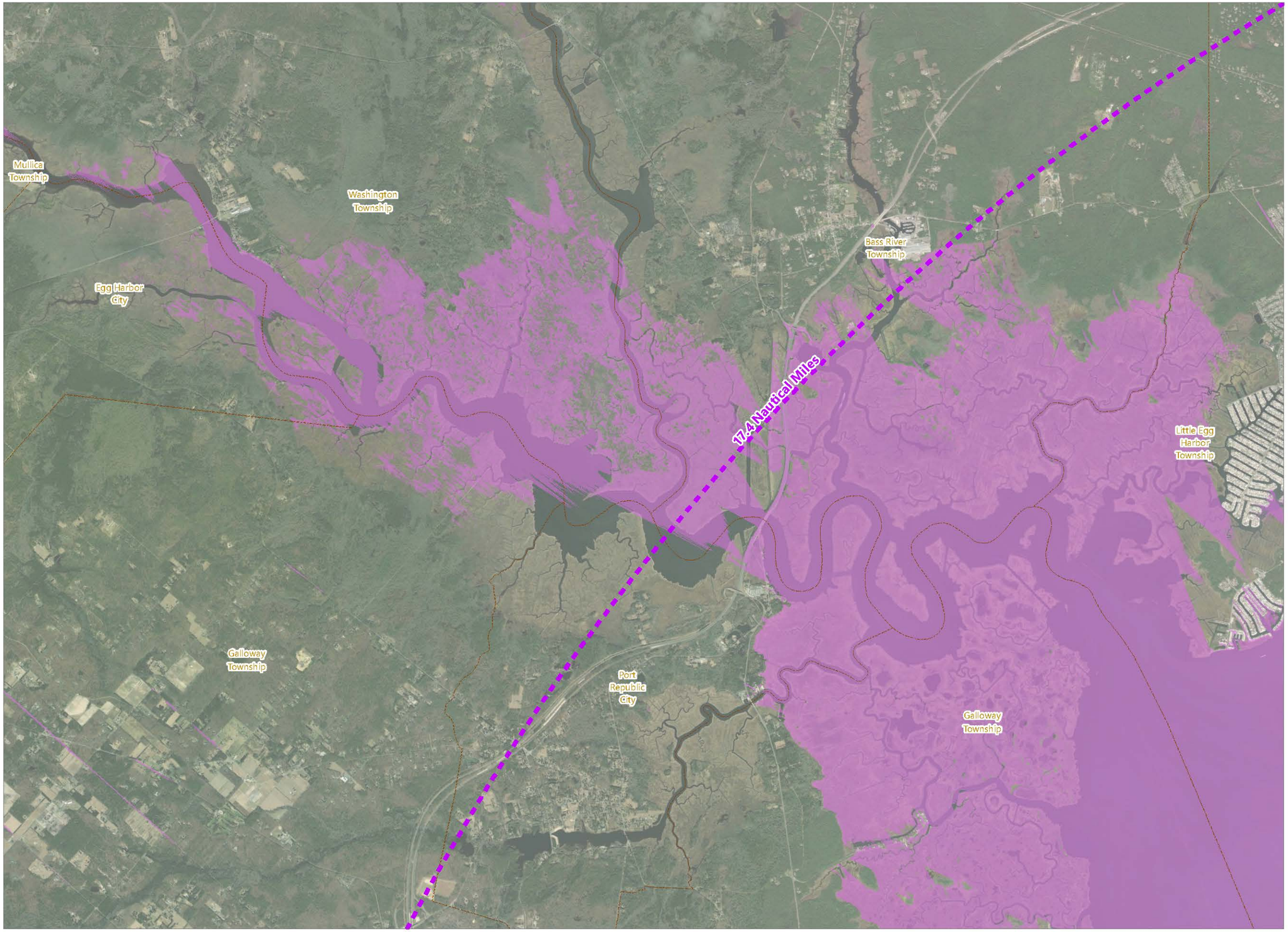
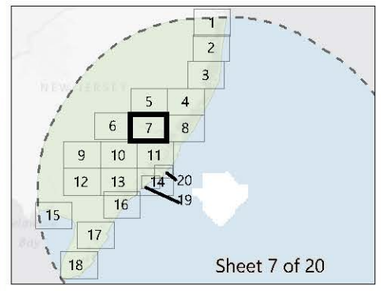


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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Prepared January 31, 2024

Basemap: Esri ArcGIS Online "World Imagery" map service

ATLANTIC SHORES offshore wind

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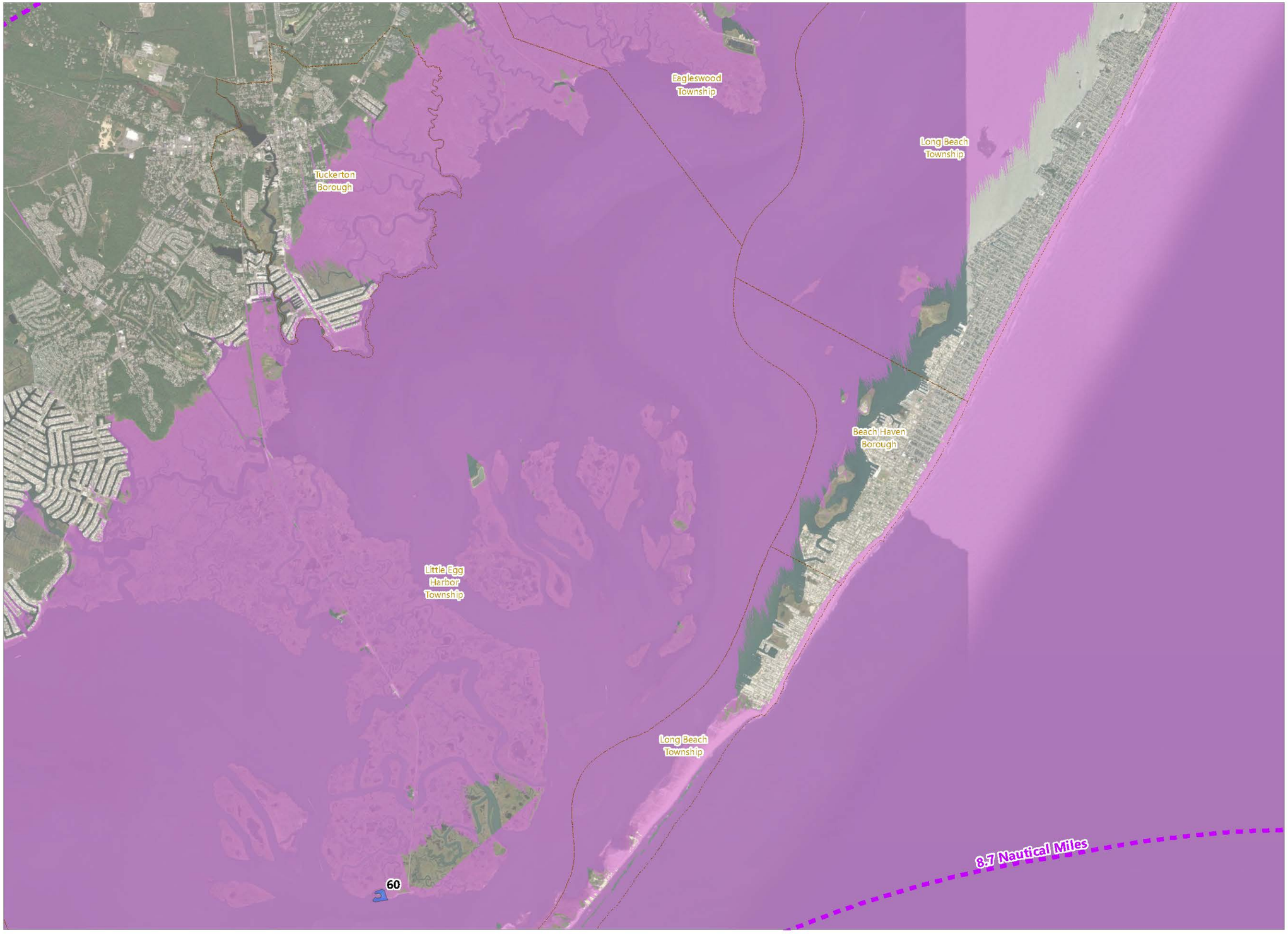
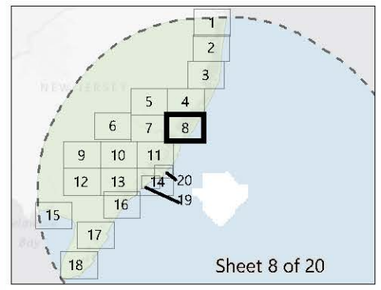
Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properties



Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

Preliminary Area of Potential Effects (PAPE)
Aboveground Historic Property
NRHP-Eligible Property
Turbine Distance Interval
45.1-Mile Viewshed Radius
Municipal Boundary



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Basemap: Esri ArcGIS Online "World Imagery" map service

ATLANTIC SHORES offshore wind

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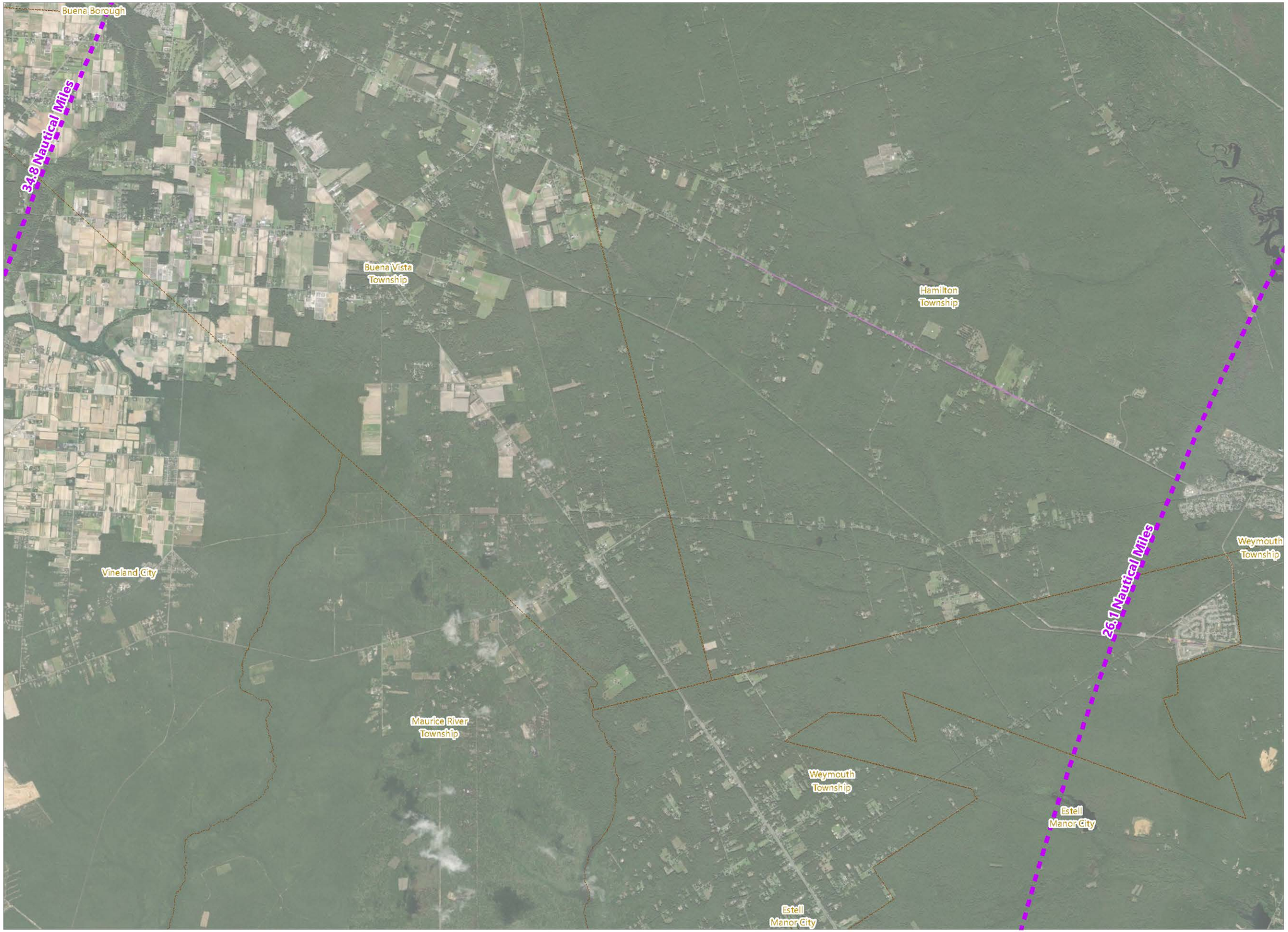
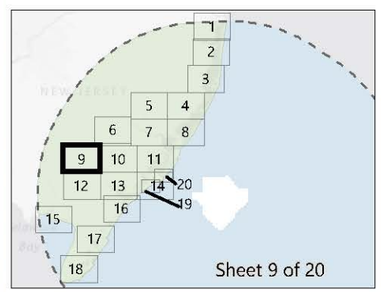


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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Prepared January 31, 2024

Basemap: Esri ArcGIS Online "World Imagery" map service

ATLANTIC SHORES offshore wind

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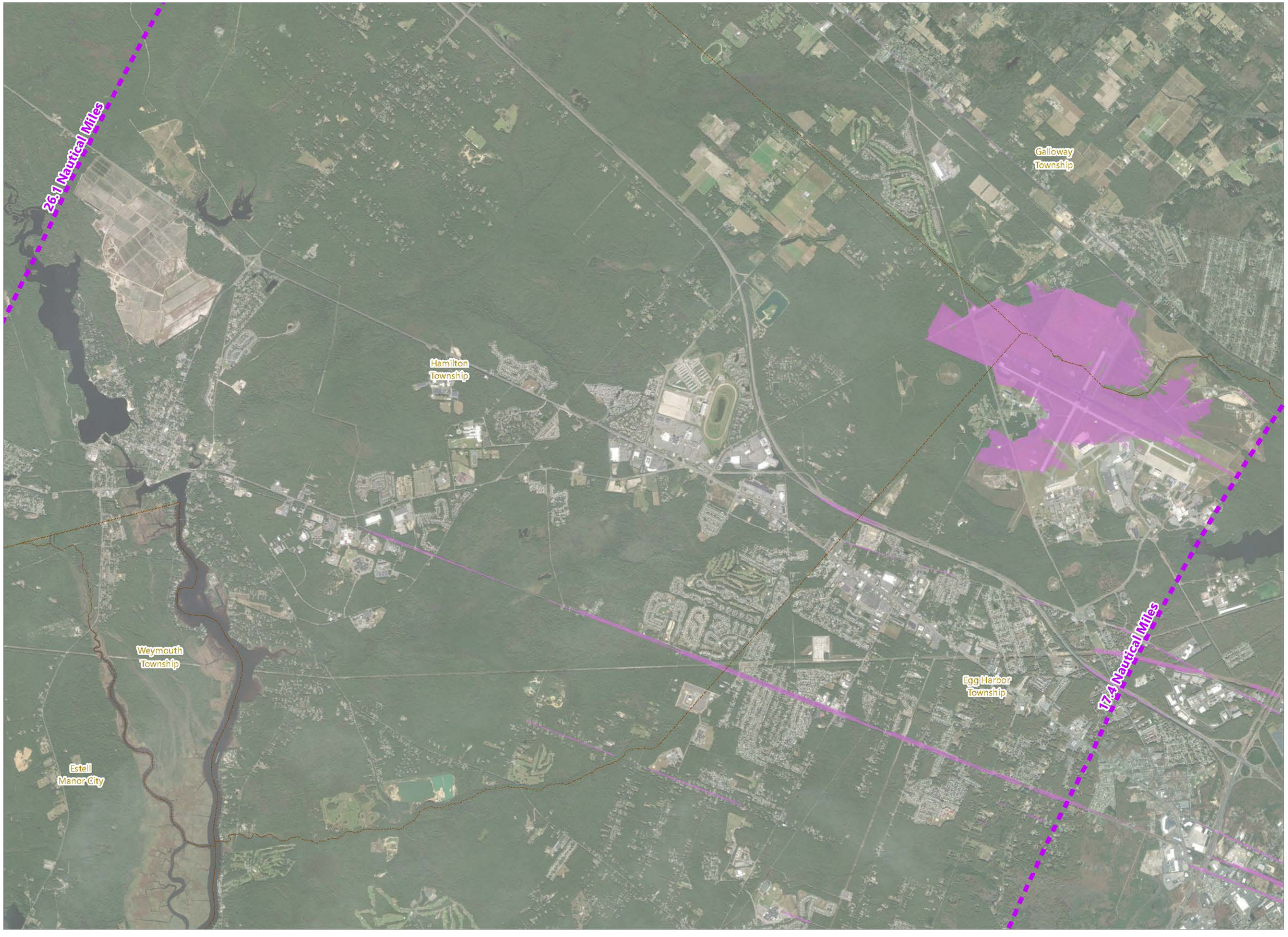
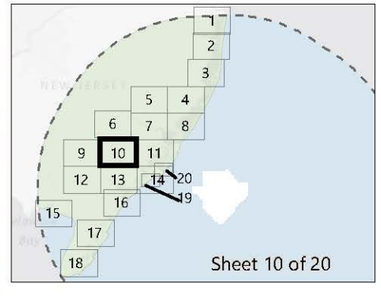
Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properties



Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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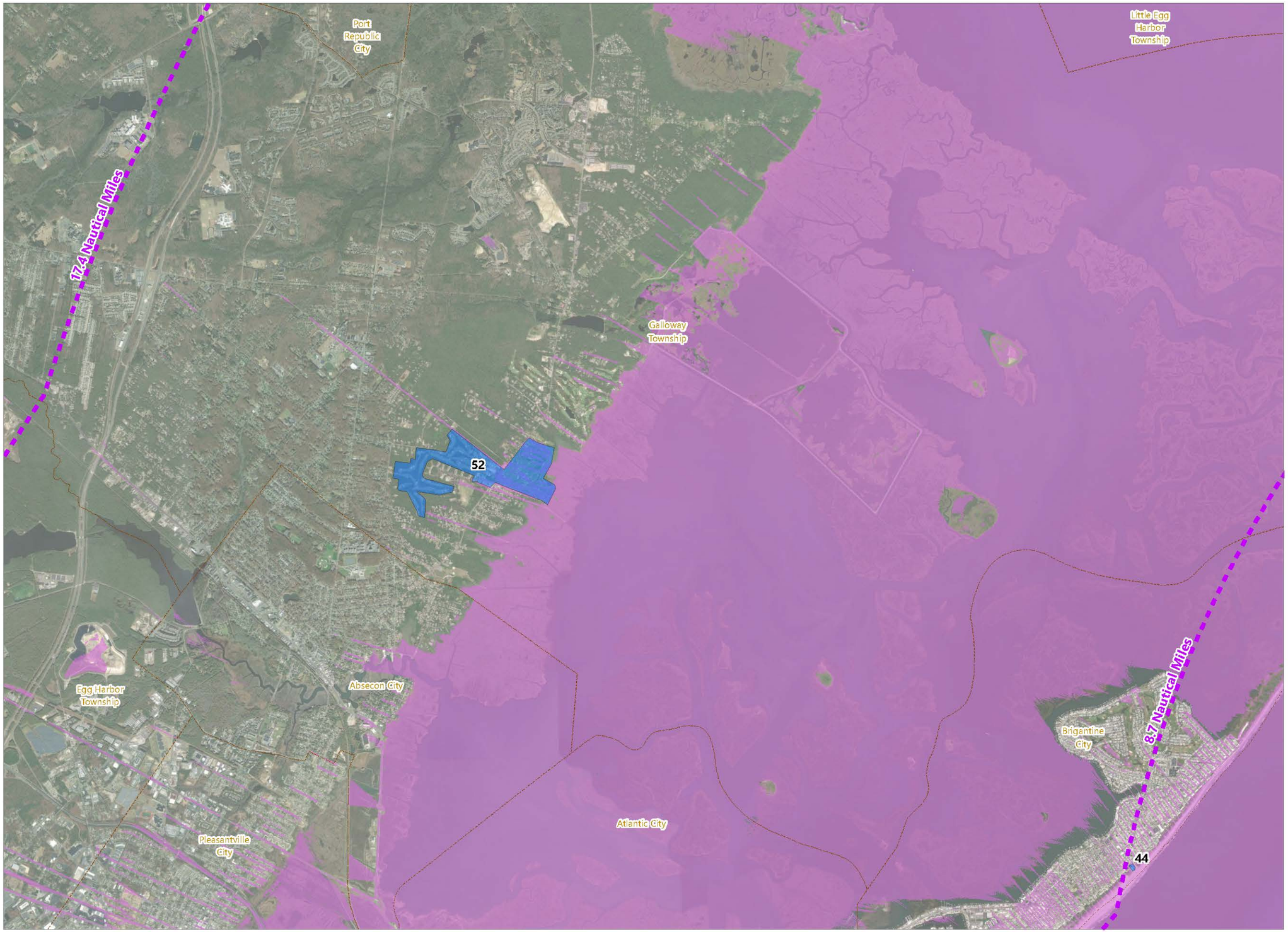
Prepared January 31, 2024

Basemap: Esri ArcGIS Online "World Imagery" map service

ATLANTIC SHORES offshore wind

EDR

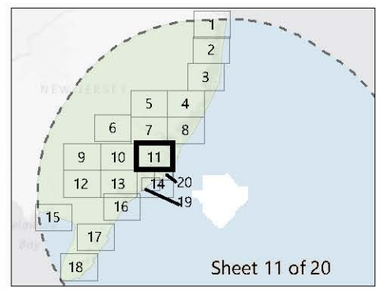
Figure 4.1-1: Potential Adversely-Effected Aboveground Historic Properties



Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

Preliminary Area of Potential Effects (PAPE)
Aboveground Historic Property
NRHP-Eligible Property
Turbine Distance Interval
45.1-Mile Viewshed Radius
Municipal Boundary



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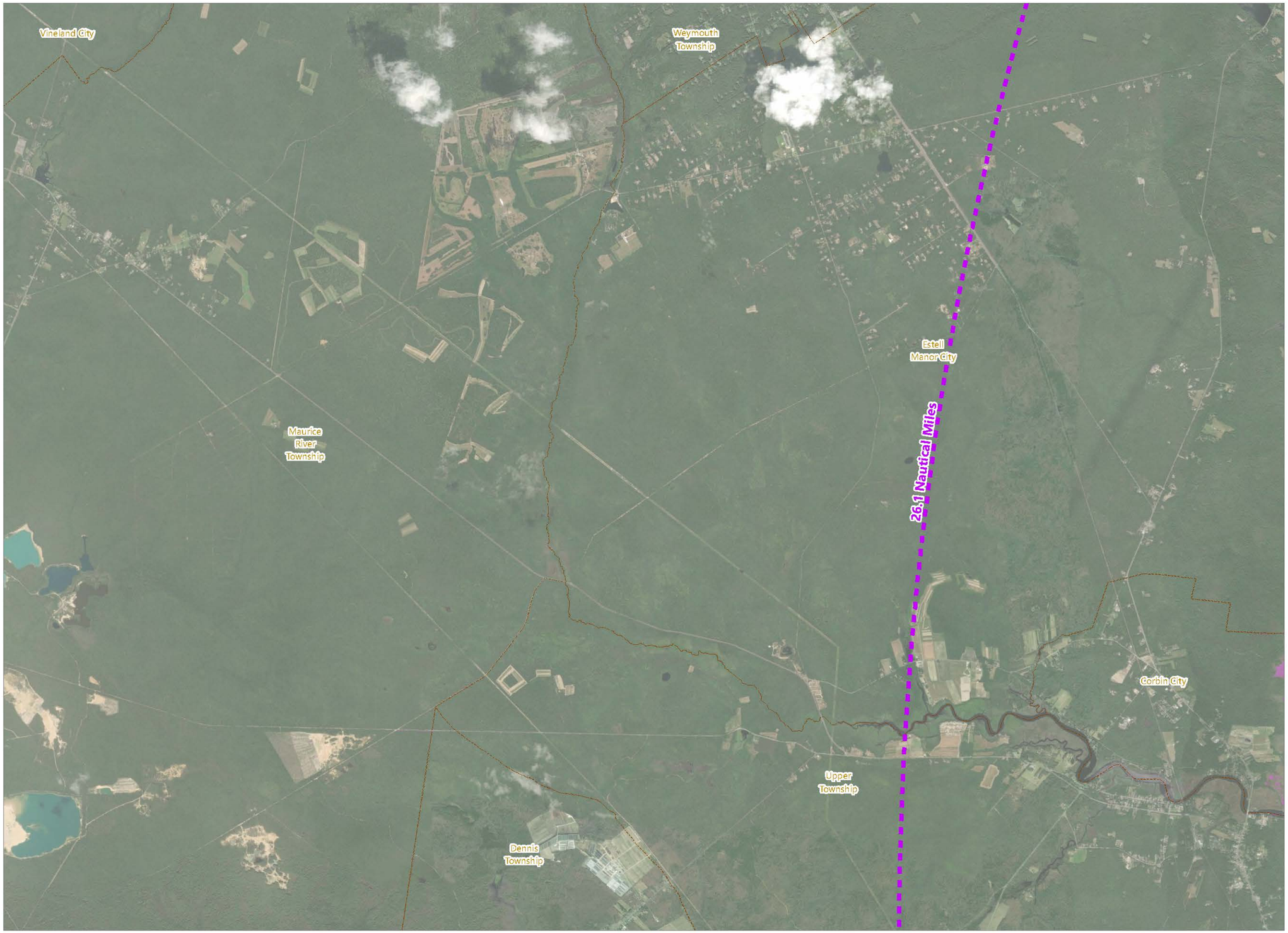
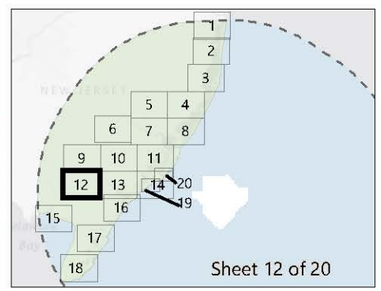


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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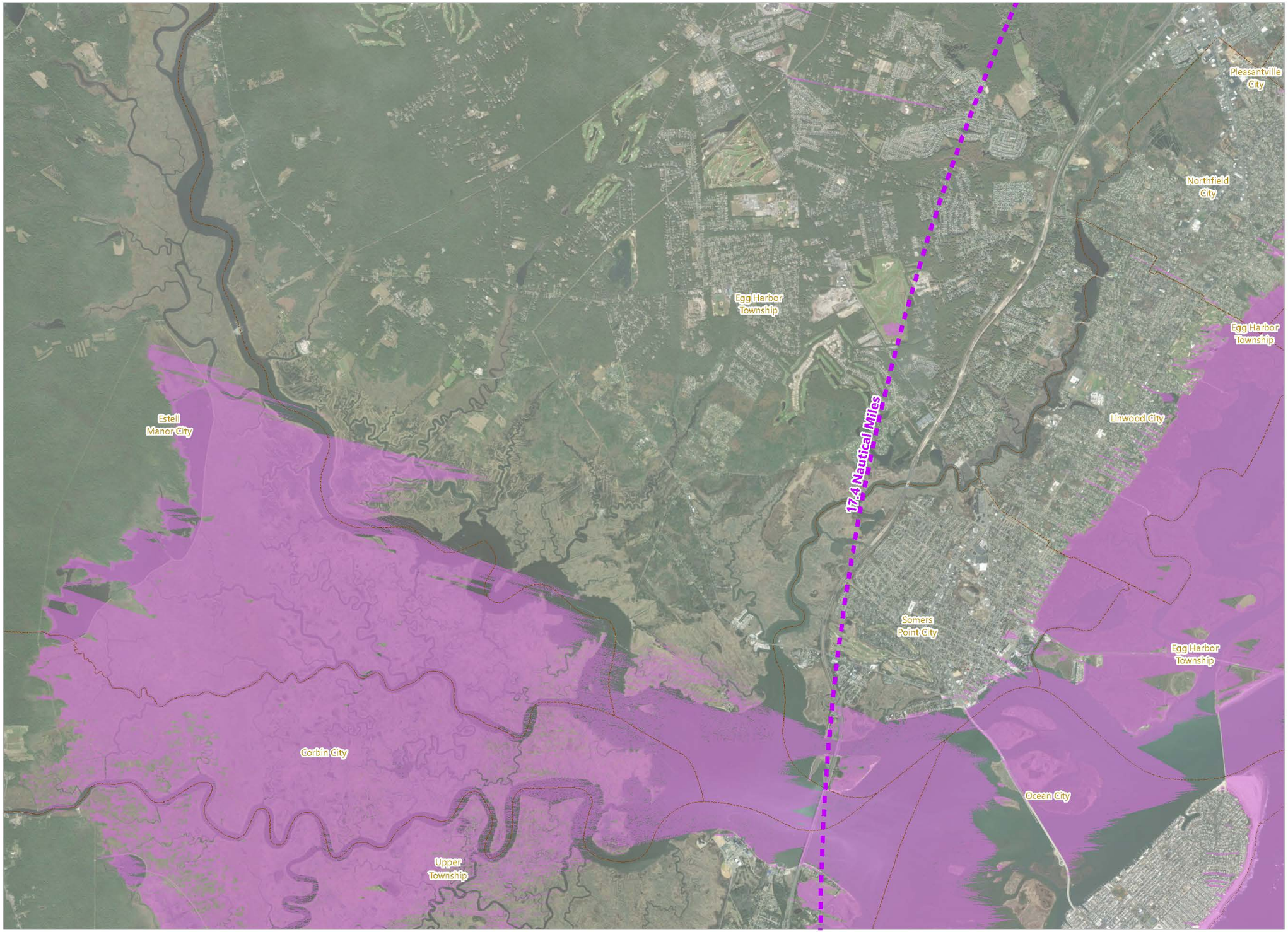
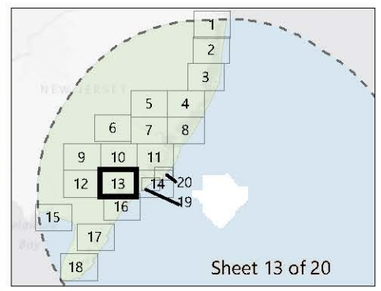


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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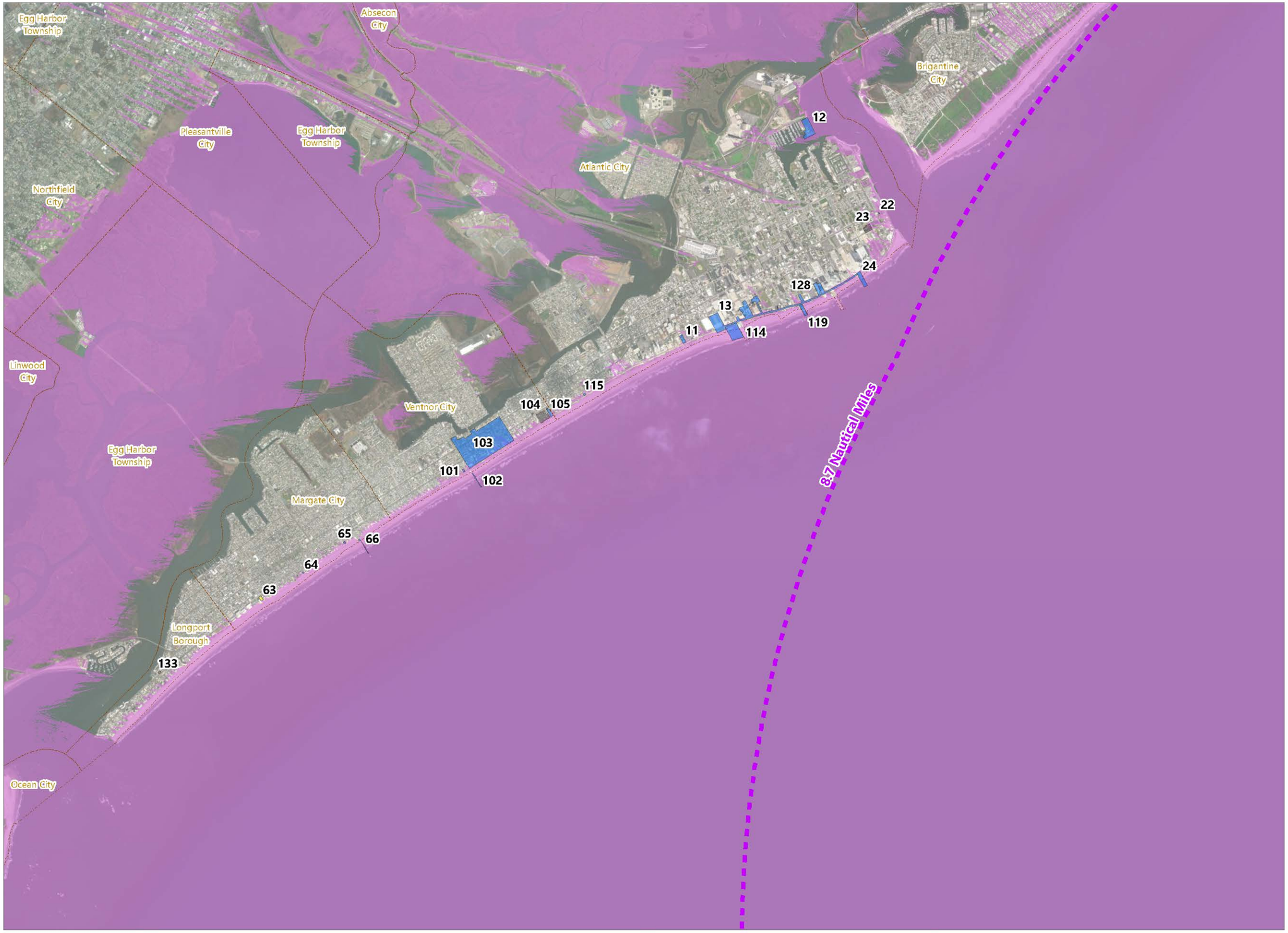


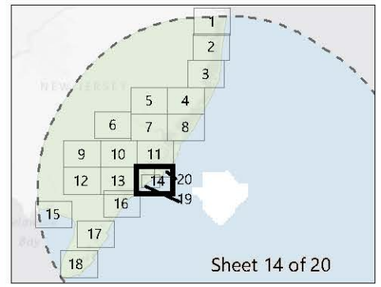
Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)

Aboveground Historic Property

- National Historic Landmark
- NRHP-Listed Property
- NRHP-Eligible Property
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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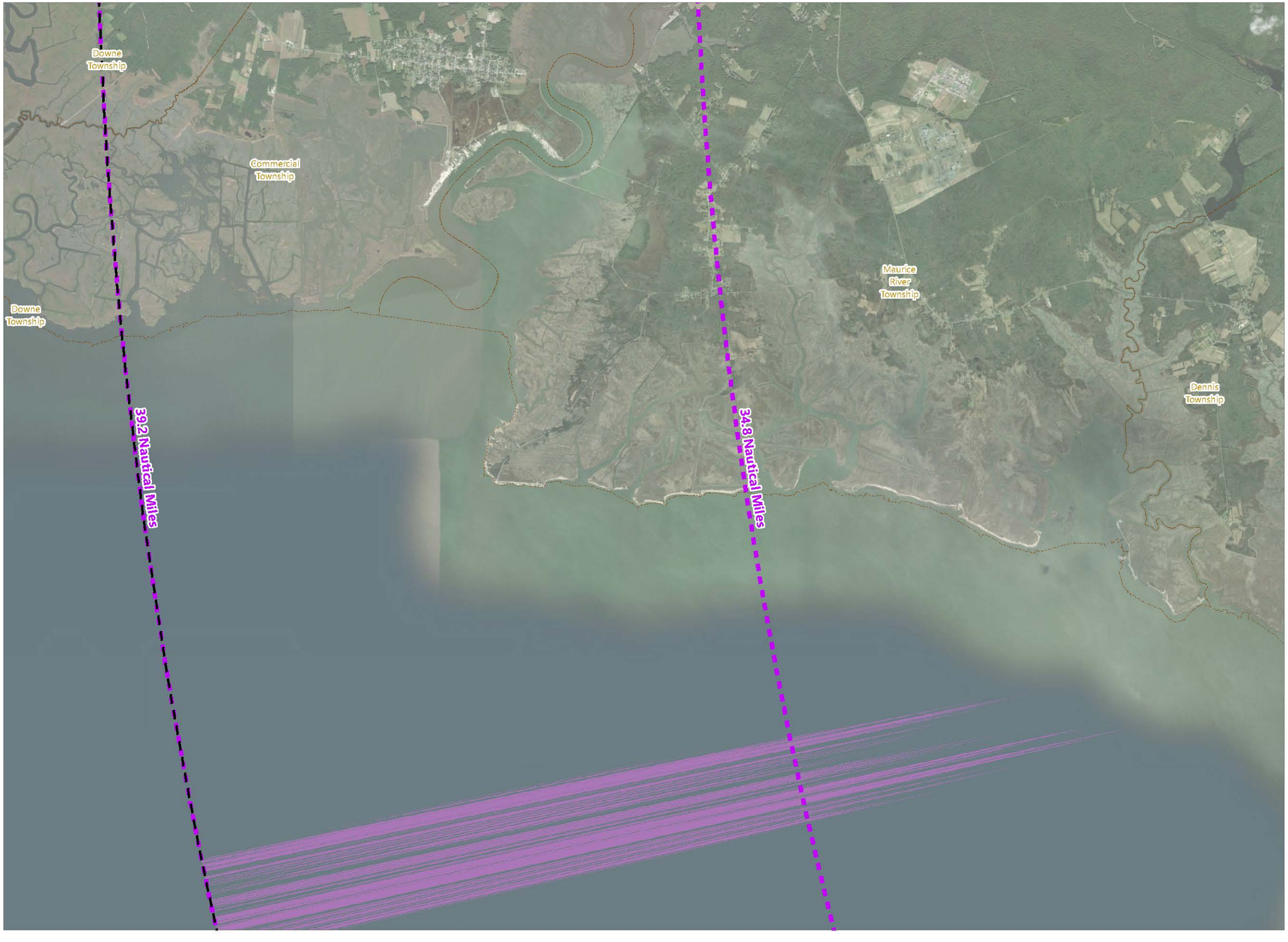

Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

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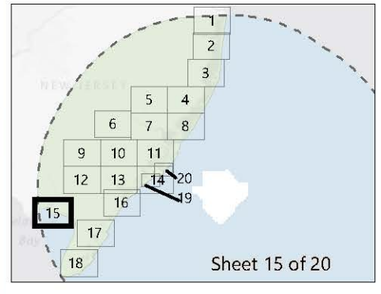

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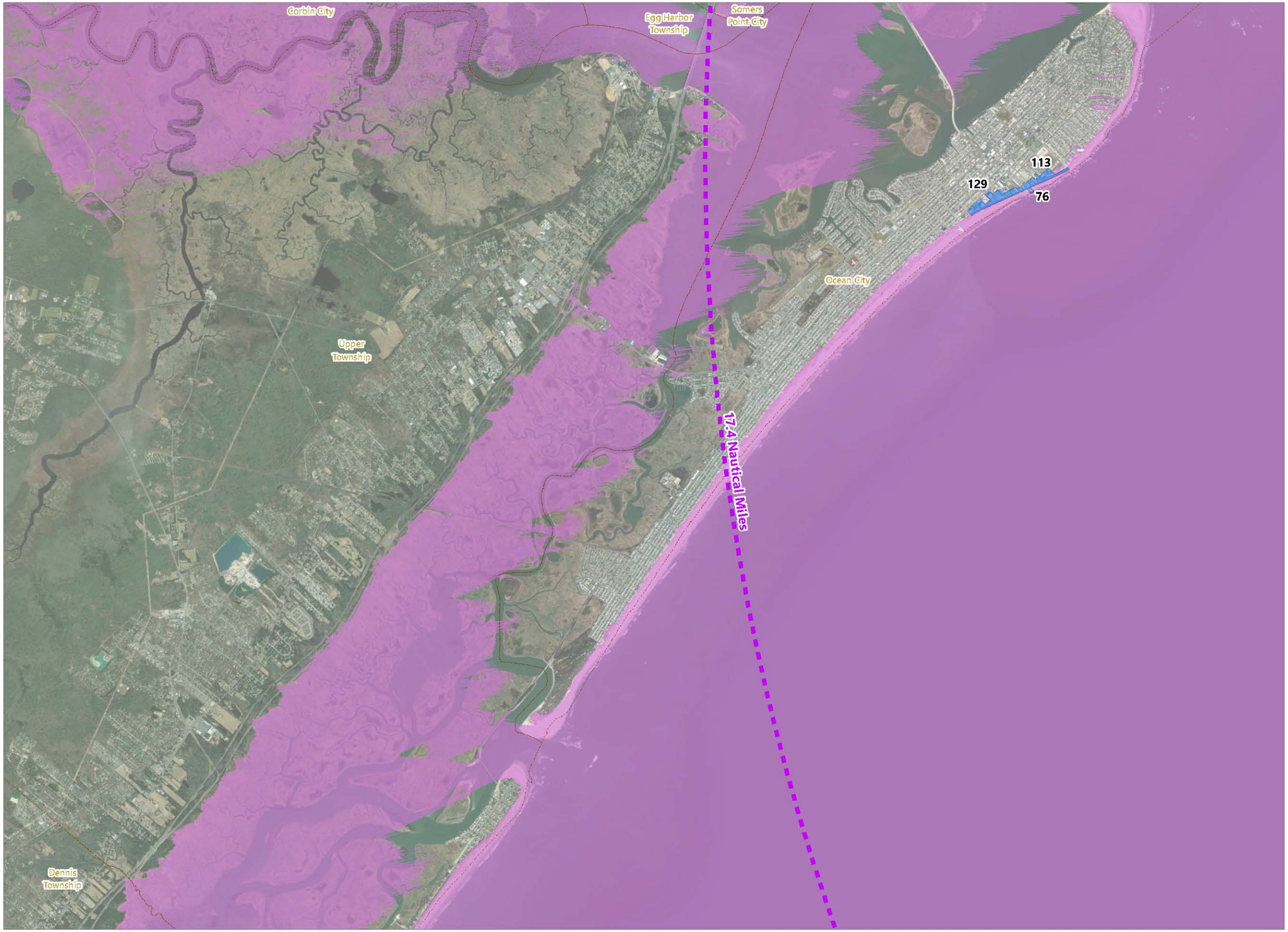
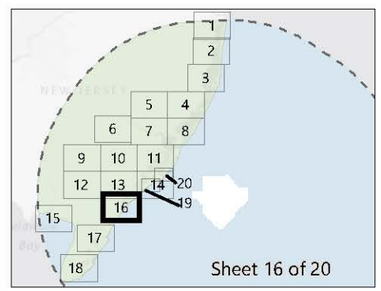


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Aboveground Historic Property
- NRHP-Listed Property
- NRHP-Eligible Property
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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EDR

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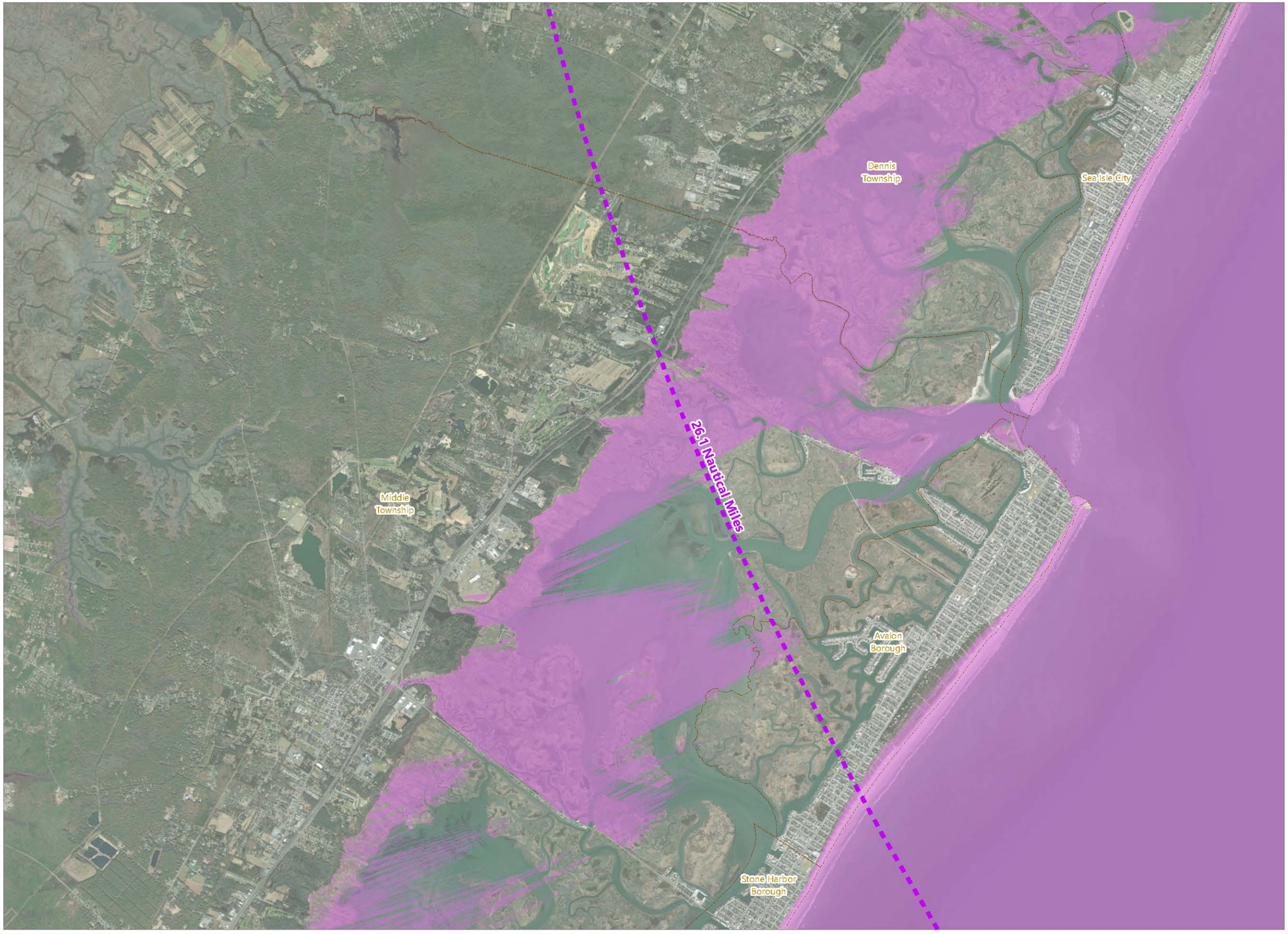
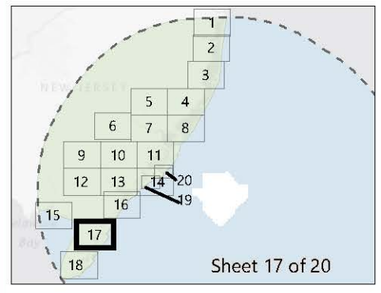


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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ATLANTIC SHORES offshore wind

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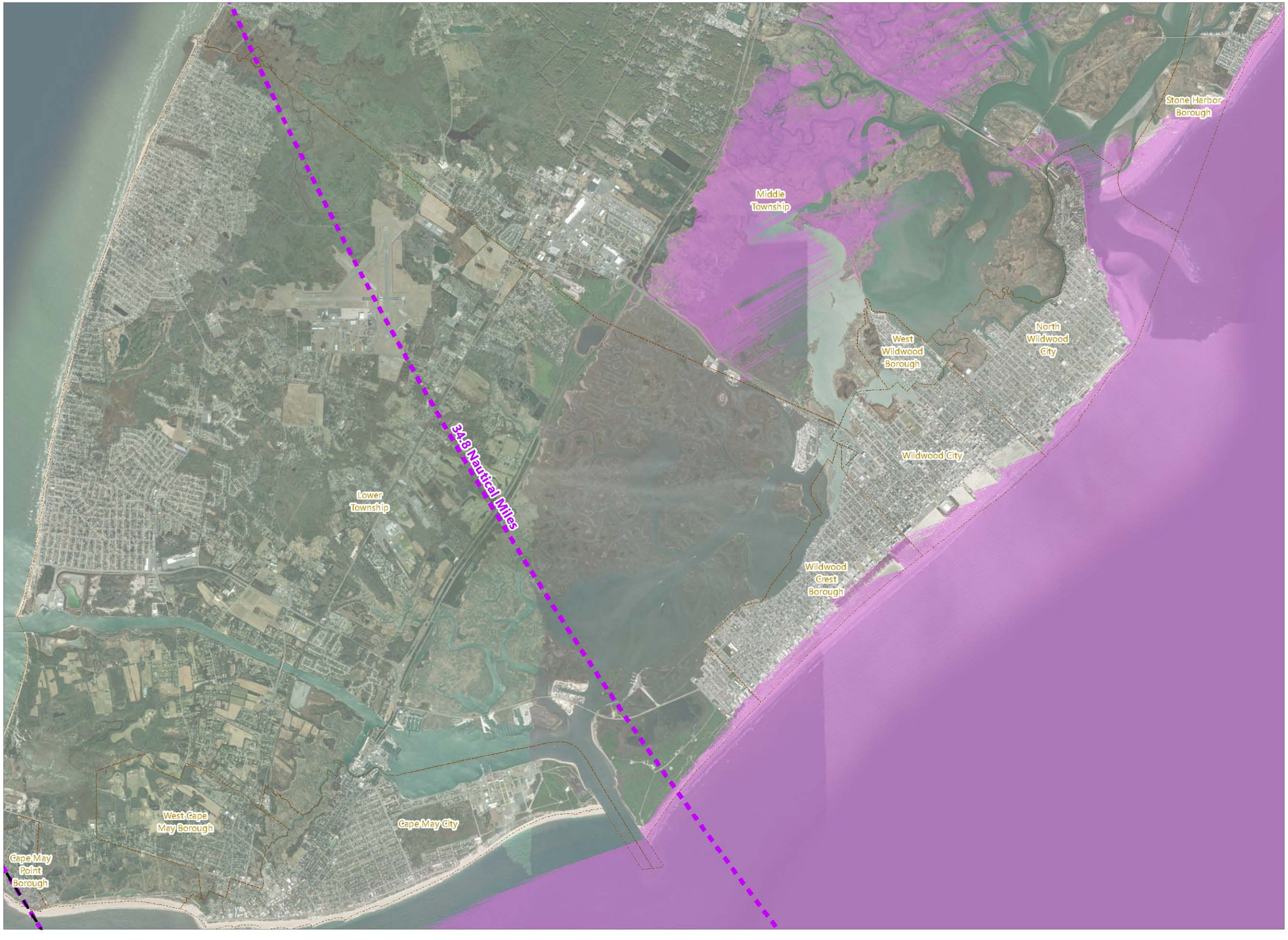
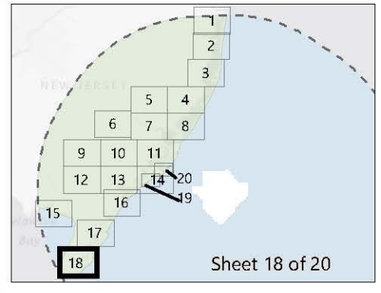


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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ATLANTIC SHORES offshore wind

EDR

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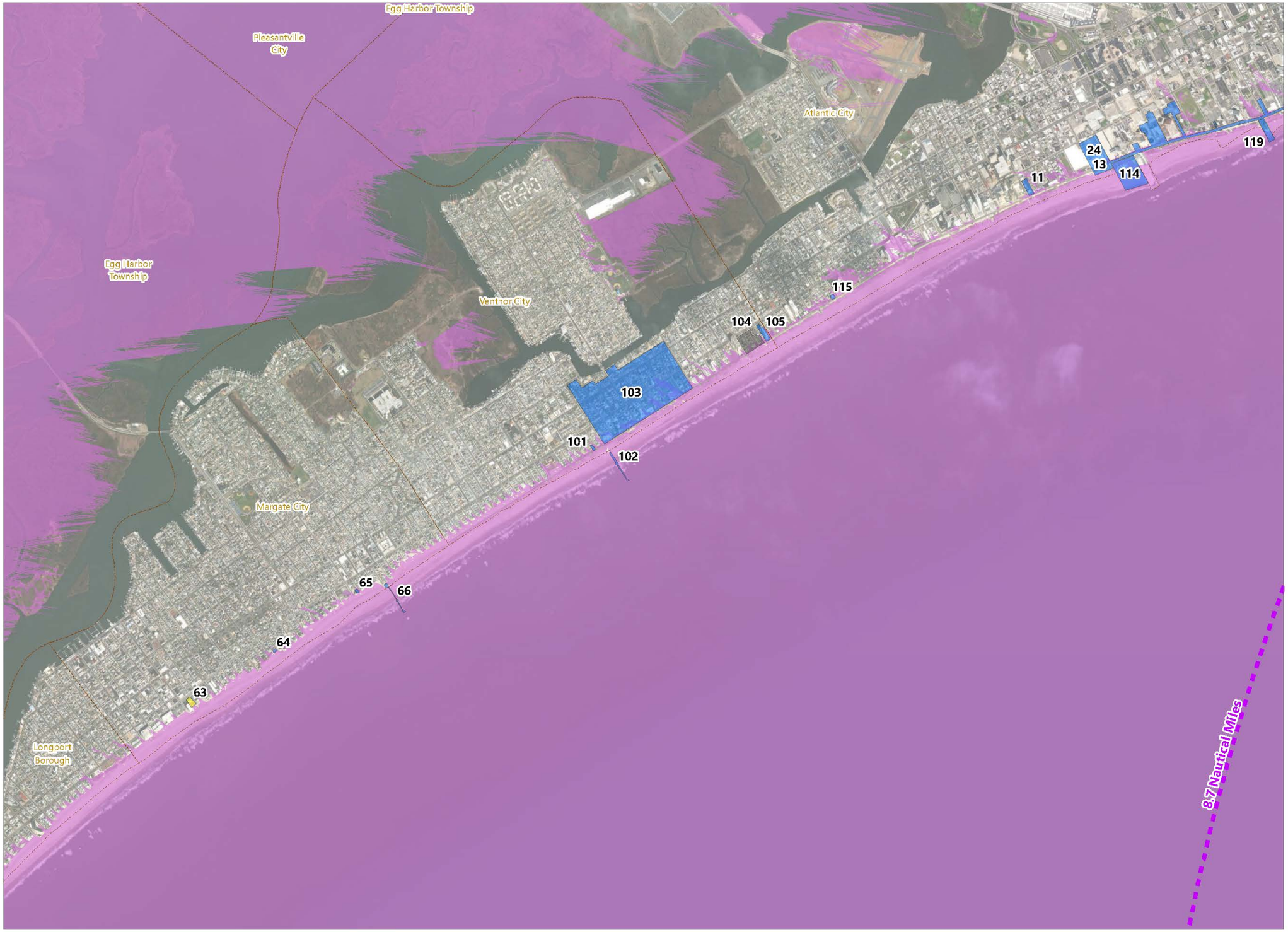


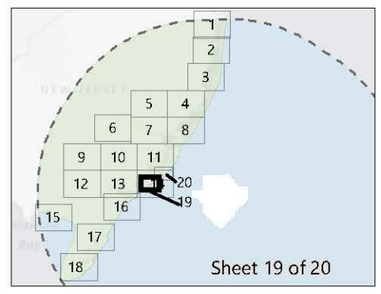
Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)

Aboveground Historic Property

- National Historic Landmark
- NRHP-Listed Property
- NRHP-Eligible Property
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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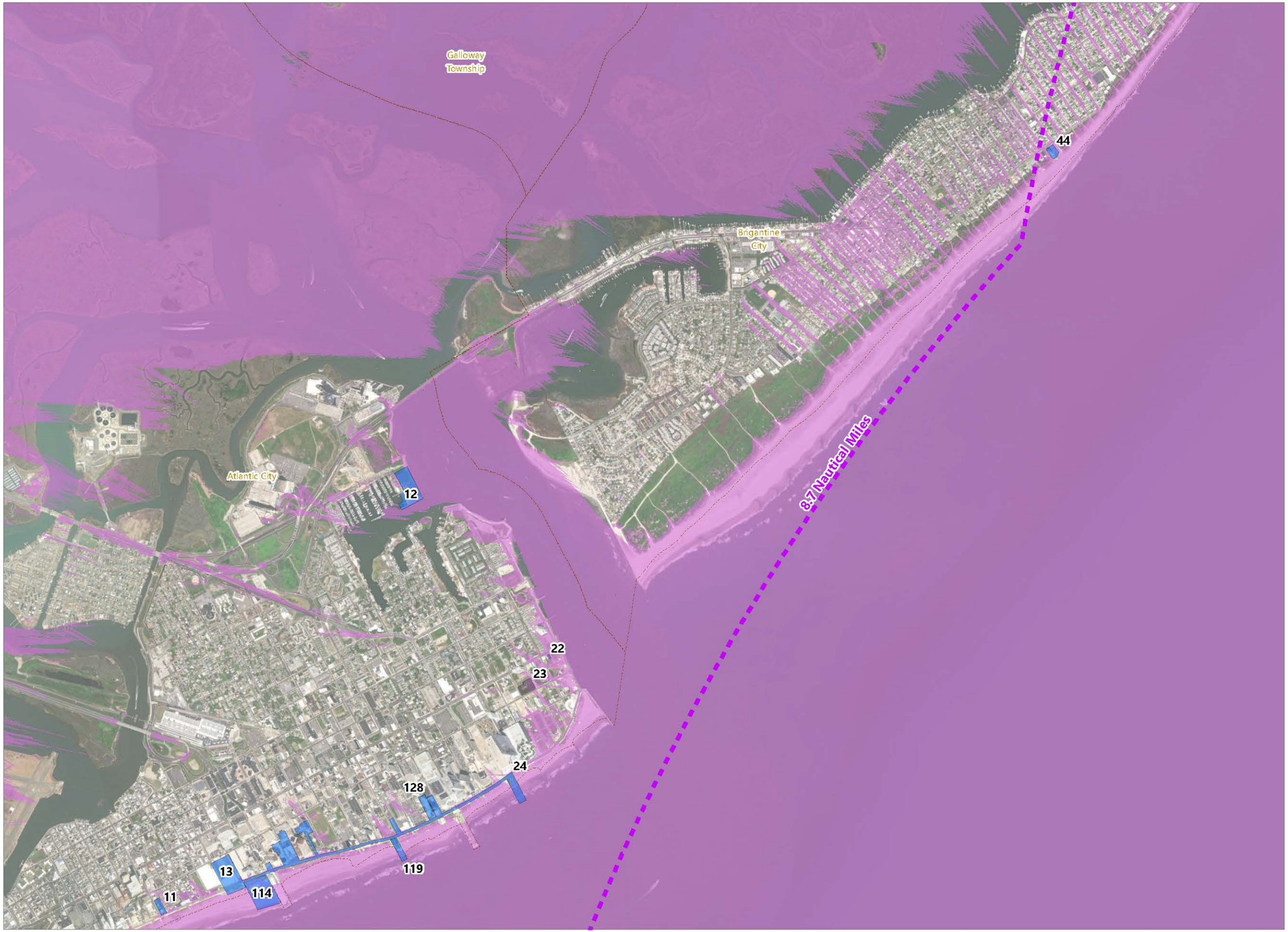
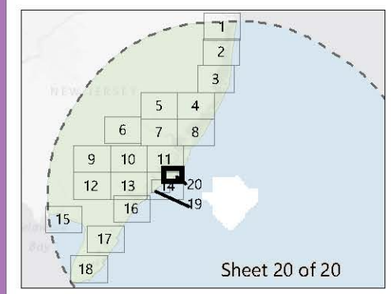


Atlantic Shore South Offshore Wind Project

Outer Continental Shelf

- Preliminary Area of Potential Effects (PAPE)
- Aboveground Historic Property
- National Historic Landmark
- NRHP-Listed Property
- NRHP-Eligible Property
- Turbine Distance Interval
- 45.1-Mile Viewshed Radius
- Municipal Boundary



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Prepared January 31, 2024

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ATLANTIC SHORES offshore wind

EDR

Table 4.1-1. Adversely Affected Aboveground Historic Properties

Property ID	Property Name	Address	Municipality	Recommended Designation
11	Ritz Carlton Hotel	2715 Boardwalk	Atlantic City	NRHP-Eligible (NJHPO-Determined)
12	USCG Station Atlantic City	900 Beach Thorofare	Atlantic City	NRHP-Eligible (NJHPO-Determined)
13	Atlantic City Convention Hall	Boardwalk between Pacific, Mississippi, and Florida Avenues	Atlantic City	National Historic Landmark
22	120 Atlantic Avenue	120 Atlantic Avenue	Atlantic City	NRHP-Eligible (EDR-Recommended)
23	Absecon Lighthouse	31 S. Rhode Island Avenue	Atlantic City	NRHP-Listed
24	Atlantic City Boardwalk Historic District	Boardwalk roughly bounded by S. Georgia Avenue to the southwest and Garden Pier to the northeast	Atlantic City	NRHP-Eligible (NJHPO-Determined)
128	Resorts Casino Hotel	1121 Boardwalk	Atlantic City	NRHP-Eligible (NJHPO-Determined)
114	Missouri Avenue Beach (Chicken Bone Beach)	N/A	Atlantic City	NRHP-Eligible (EDR-Recommended)
115	Riviera Apartments	116 S. Raleigh Avenue	Atlantic City	NRHP-Eligible (NJHPO-Determined)
119	Central Pier	1400 Boardwalk	Atlantic City	NRHP-Eligible (NJHPO-Determined)
131	Forked River Coast Guard Station No. 112	Central Avenue	North Wildwood City	NRHP-Eligible (NJHPO-Determined)
36	Island Beach State Park Historic District	Central Avenue	North Wildwood City	NRHP-Eligible (NJHPO-Determined)

Property ID	Property Name	Address	Municipality	Recommended Designation
44	Brigantine Hotel	1400 Ocean Avenue	Brigantine City	NRHP-Eligible (EDR-Recommended)
52	Seaview Golf Club (historic), Clarence Geist Pavilion	401 South New York Road	Galloway Township	NRHP-Eligible (EDR-Recommended)
60	Little Egg Harbor US Life Saving Station #23	800 Great Bay Boulevard	Little Egg Harbor Township	NRHP-Eligible (NJHPO-Determined)
133	Great Egg Coast Guard Station	2301 Atlantic Avenue	Longport	NRHP-Eligible (NJHPO-Determined)
63	Lucy, the Margate Elephant	Decatur and Atlantic Avenues	Margate City	National Historic Landmark
64	114 South Osborne Avenue	114 South Osborne Avenue	Margate City	NRHP-Eligible (BOEM-Determined)
65	108 South Gladstone Avenue	108 South Gladstone Avenue	Margate City	NRHP-Eligible (NJHPO-Determined)
66	Margate Fishing Pier	121 S. Exeter Avenue	Margate City	NRHP-Eligible (EDR-Recommended)
129	The Flanders Hotel	719 East 11th Street	Ocean City	NRHP-Listed
76	Music Pier	825 Boardwalk	Ocean City	NRHP-Eligible (NJHPO-Determined)
113	Ocean City Boardwalk	N/A	Ocean City	NRHP-Eligible (NJHPO-Determined)
101	114 South Harvard Avenue	114 South Harvard Avenue	Ventnor City	NRHP-Eligible (NJHPO-Determined)

Property ID	Property Name	Address	Municipality	Recommended Designation
102	Ventnor City Fishing Pier	Cambridge Avenue at the Ventnor City Boardwalk	Ventnor City	NRHP-Eligible (EDR-Recommended)
103	Saint Leonard's Tract Historic District	Ventnor and Atlantic Avenues roughly bounded by the shoreline, S. Surrey Avenue, N. Cambridge Avenue and the Intercoastal Waterway	Ventnor City	NRHP-Eligible (NJHPO-Determined)
104	John Stafford Historic District	100 blocks of Vassar Square, Baton Rouge, Marion and Austin Avenues	Ventnor City	NRHP-Listed
105	Vassar Square Condominiums	4800 Boardwalk	Ventnor City	NRHP-Eligible (BOEM-Determined)
102	Ventnor Fishing Pier	Cambridge Avenue at the Ventnor City Boardwalk	Ventnor City	NRHP-Eligible (EDR-Recommended)

Therefore, aboveground historic properties will only be adversely affected by the introduction of the offshore components within extant ocean viewsheds. The onshore components will not adversely affect any aboveground historic properties. The Projects would introduce new man-made features to the seascape horizon, which includes few existing, fixed modern visual elements. The introduction of the WTGs would constitute a change to the historic setting of some aboveground historic properties within the PAPE. This is particularly true for those aboveground historic properties for which open views of the ocean are integral, such as lighthouses and recreation areas. Even for historic properties that were once strongly associated with open ocean views, existing conditions may no longer be representative of the settings related to those properties' periods of significance. Many sections of the WTA PAPE have been subject to multiple phases of development, demolition, and redevelopment. These cycles have substantially altered the historic settings of many historic properties located along the shorelines where unobstructed views of the Projects will be concentrated. In such circumstances, the changes to viewsheds related to the Projects may represent a minor, incremental alteration to some settings that have already been compromised.

4.2 Avoidance and Minimization Measures

Atlantic Shores is prioritizing avoiding and minimizing the adverse effects that will result from the Projects. In order to avoid and/or minimize potential adverse effects on aboveground historic properties, Atlantic Shores will implement the following measures which are based on protocols and procedures successfully implemented for similar offshore projects:

- Atlantic Shores will engage with relevant stakeholders to determine additional avoidance, minimization, or mitigation measures regarding potential effects on aboveground historic properties as required by 30 CFR 585.626(b)(15).
- WTGs will have uniform design, height, and rotor diameter.
- The Projects are located in a designated offshore wind development area that has been identified by BOEM as suitable for development.
- The OSSs will be set back sufficient to minimize their visibility from the shore.
- The WTGs will be painted no lighter than Pure White (RAL 9010) and no darker than Light Grey (RAL 7035) as required by BOEM and the FAA. WTGs of this color white generally blend well with the sky at the horizon and eliminate the need for daytime warning lights or red paint marking of the blade tips.
- The WTGs and OSSs will be lit and marked in accordance with BOEM and USCG requirements for aviation and navigation obstruction lighting, respectively.
- Atlantic Shores will use an Aircraft Detection Lighting System (ADLS) or related means (e.g., dimming or shielding) to limit visual impact, pursuant to approval by the FAA and BOEM, commercial and technical feasibility at the time of Facility Design Report (FDR)/Fabrication and Installation Report (FIR) approval, and dialogue with stakeholders. If successfully implemented, ADLS would limit the activation of the Aeronautical Obstruction Lights (AOWLs) to approximately 11 hours per year (Capitol Airspace Group, 2021), thus substantially limiting the nighttime visibility and visual impact of the Projects.

4.3 Proposed Mitigation Measures for Adverse Visual Effects

Despite implementation of the above-referenced design measures, unavoidable adverse effects to aboveground historic properties will remain. The *Historic Resources Visual Effects Assessment* identified 29 aboveground historic properties where there is a potential for adverse effects resulting from the Projects construction and operation, primarily located along the shorelines of the New Jersey barrier islands. Options to avoid potential adverse visual effects on aboveground historic properties are limited, given the nature of the Projects (i.e., very tall, vertical structures) and their siting criteria (i.e., established OCS lease area). Many of the common measures used for other infrastructure projects are inappropriate for offshore wind developments. For example, in some settings visual impacts to aboveground historic properties may be resolved through vegetative screening or landscaping that blocks or screens views of new infrastructure. Such efforts are not appropriate or feasible for many coastal historic properties where views of the ocean and shores are integral to the historic setting, location, uses, and public appreciation of the resources. The project-scale mitigation measures for adverse visual effects summarized below will minimize, but not eliminate, changes to the integrity of historic settings for the affected properties. Therefore, for most wind energy projects, mitigation of impacts to historic properties typically consists of supporting initiatives that benefit historic sites or buildings and/or the public's appreciation of historic resources to offset potential adverse effects to historic properties resulting from the introduction of WTGs into their visual setting.

Atlantic Shores has carefully considered potential Projects-related measures to avoid, minimize, and mitigate adverse effects to aboveground historic properties, archaeological sites, and marine archaeological properties. Atlantic Shores, in consultation with interested consulting parties, has developed measures to mitigate unavoidable adverse visual effects to the affected aboveground historic properties. The measures have been developed to appropriately align the specific type and magnitude of adverse effect caused by the Projects with the character-defining aspects of the affected properties. The mitigation measures are appropriate to the scale of the Projects and tailored to the specific historic properties where adverse visual effects are anticipated. The measures are intended to preserve and enhance the historic maritime settings of properties, where appropriate, and enhance public appreciation and enjoyment of the affected aboveground historic properties. These mitigation measures are further detailed in the HPTPs which contain the detailed mitigation actions that will be implemented to resolve adverse effects from the Projects, as well as the responsibilities of the parties involved and schedule. The HPTPs, can be found as attachments to the MOA and were developed in consultation with the interested consulting parties to mitigate adverse effects to the following historic properties:

- Atlantic City Boardwalk Historic District, Atlantic City, Atlantic County, New Jersey
- Atlantic City Convention Hall, Atlantic City, Atlantic County, New Jersey
- Great Egg Coast Guard Station, Longport, Atlantic County, New Jersey
- Missouri Avenue Beach (Chicken Bone Beach), Atlantic City, Atlantic County, New Jersey
- Absecon Lighthouse, Atlantic City, Atlantic County, New Jersey
- Barnegat Lighthouse, Barnegat Light Borough, Ocean County, Ocean County, New Jersey
- Forked River Coast Guard Station No. 112, Berkeley Township, Ocean County, New Jersey
- Island Beach State Park Historic District, Berkeley Township, Ocean County, New Jersey
- Lucy, the Margate Elephant, Margate City, Atlantic County, New Jersey
- Ancient Submerged Landform Features, Outer Continental Shelf

A Mitigation Fund will be established that provides financial support for preservation activities that would appropriately resolve adverse effects for the remaining historic properties adversely affected by the Projects listed below. The mitigation fund will be a grant program where interested consulting parties or property owners can apply for specific activities that will support the preservation, interpretation, and/or commemoration of the adversely affected historic properties. The details of the mitigation fund are outlined in the MOA.

- 120 Atlantic Avenue, Atlantic City, Atlantic County, New Jersey
- Central Pier, Atlantic City, Atlantic County, New Jersey
- Resorts Casino Hotel, Atlantic City, Atlantic County, New Jersey
- Ritz Carlton Hotel, Atlantic City, Atlantic County, New Jersey
- Riviera Apartments, Atlantic City, Atlantic County, New Jersey
- USCG Station Atlantic City, Atlantic City, Atlantic County, New Jersey
- Brigantine Hotel, Brigantine City, Atlantic County, New Jersey
- Seaview Golf Club (historic), Clarence Geist Pavilion, Galloway Township, Atlantic County, New Jersey
- Little Egg Harbor US Life Saving Station #23, Little Egg Harbor Township, Ocean County, New Jersey

- 108 South Gladstone Avenue, Margate City, Atlantic County, New Jersey
- 114 South Osborne Avenue, Margate City, Atlantic County, New Jersey
- Margate Fishing Pier, Margate City, Atlantic County, New Jersey
- Music Pier, Ocean City, Cape May County, New Jersey
- Ocean City Boardwalk, Cape May County, New Jersey
- The Flanders Hotel, Cape May County, New Jersey
- 114 South Harvard Avenue, Ventnor City, Atlantic County, New Jersey
- John Stafford Historic District, Ventnor City, Atlantic County, New Jersey
- Saint Leonard's Tract Historic District, Ventnor City, Atlantic County, New Jersey
- Vassar Square Condominiums, Ventnor City, Atlantic County, New Jersey
- Ventnor City Fishing Pier, Ventnor City, Atlantic County, New Jersey

Atlantic Shores intends to have all mitigation measures developed and finalized and funding placed in escrow accounts prior to construction. The implementation of the mitigation measure/s will begin following finalization of the MOA executed among BOEM, SHPOs, consulting Tribal Nations, and potentially other consulting parties.

5.0 APPLICANT-PROPOSED MITIGATION ENGAGEMENT AND REFINEMENT PLAN

Atlantic Shores has hosted a series of informational meetings with interested consulting parties to refine the mitigation framework summarized above. The intent of the meetings was to solicit feedback on the feasibility and appropriateness of the proposed mitigation measures and to document comments, specific interests, or concerns expressed by the interested parties regarding resolution of the anticipated effects to historic properties. The meetings were voluntary, limited to appropriate stakeholders for given historic properties, and not intended to replace or supplant BOEM's public meetings or associated Section 106 consultations.

Informational meetings will not, and cannot, replace agency consultations required by the NHPA; for example, the necessity of agency consultations is clear with respect to resolution of expected adverse effects to significant properties associated with Tribal Nations. Atlantic Shores respects tribal sovereignty and the unique relationship among federally recognized Tribal Nations and the federal government. Where feasible and appropriate, tribal representatives will be invited to further discuss their interests and concerns regarding the Projects and potential effects to resources of concern to the Tribal Nations and how such effects may be feasibly resolved. Likewise, other interested parties may wish to confine their engagement with Atlantic Shores to the formal permitting process.

6.0 SUMMARY

The intent of this AMM Plan is to outline the measures developed to avoid, minimize and/or mitigate the Projects' adverse effects to historic properties. The AMM Plan also describes the process by which Atlantic Shores plans to enhance and refine these measures in cooperation with other interested parties.

Based on desktop analysis and archaeological reconnaissance presented in the *Terrestrial Archaeological Resources Assessment – Onshore Interconnection Facilities* (TARA; COP Appendix II-P1; EDR, 2024c) and *Phase IA Terrestrial Archaeological Resources Assessment – Operations and Maintenance Facility* (O&M TARA; COP Appendix II-P2; EDR, 2024d), there is a very low likelihood of intact or potentially significant terrestrial archaeological resources to be located within the Projects' PAPE. Identification level Phase IB archaeological survey is ongoing under a phased identification approach, which will inform future determinations of the Projects' potential effects on terrestrial archaeological resources.

As described in the *Marine Archaeological Resources Assessment Atlantic Shores Offshore Wind Project Construction and Operations Plan and Addendum*, 22 submerged targets were identified (MARA and MARA Addendum; COP Appendix II-Q1; SEARCH, 2022 and 2023). Nine targets are located within the WTA; four targets are located in the Atlantic Export Cable Corridors (ECC); nine targets are located along the Monmouth ECC; and 59 ASLFs were identified within the Marine PAPE. Physical avoidance buffers of the targets are recommended, and mitigation measures for potential effects to marine resources are proposed.

Applying the Criteria of Adverse Effect per NHPA Section 106, 36 CFR § 800.5, a total of 29 aboveground historic properties will be adversely affected by the Projects.

The steps outlined in this report are based on the current design of the Projects. Alterations to Projects' infrastructure, installation methodology, or workspace requirements have the potential to preclude specific mitigation options proposed herein or require new procedures to adequately approach the mitigation of historic properties.

7.0 REFERENCES

Capitol Airspace Group. 2021. Atlantic Shores Offshore Wind Project Aircraft Detection Lighting System (ADLS) Efficacy Analysis. Prepared for EDR. February 2021. Alexandria, VA.

Code of Federal Regulations. 2022. 36 CFR 800 – Protection of Historic Properties [incorporating amendments effective December 15, 2021]. Available at https://www.ecfr.gov/current/title-36/chapter-VIII/part-800.

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