Enclosure 8

Historic Properties Visual Impact Assessment dated December 16, 2009

HISTORIC PROPERTIES VISUAL IMPACT ASSESSMENT PSEG EARLY SITE PERMIT APPLICATION SALEM COUNTY, NEW JERSEY

DRAFT

Prepared For: PSEG Power, LLC

Submitted to: Sargent & Lundy, LLC

Prepared By:

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MACTEC Project 3250-08-5280

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LIST OF ACRONYMS

- DTM Digital Terrain Model
- ESP Early Site Permit
- GIS Geographic Information System
- GPS Global Positioning System
- HPO Historic Preservation Office
- LULC Land Use/Land Cover
- NOAA National Oceanic and Atmospheric Administration
- NRHP National Register of Historic Places
- PPE Plant Parameter Envelope
- PSEG PSEG Power LLC

- SHPO State Historic Preservation Office
- USGS U.S. Geological Survey

INTRODUCTION

PSEG Power LLC (PSEG) is preparing an Early Site Permit (ESP) Application for the construction of a new nuclear plant at the PSEG Site in Lower Alloways Creek Township, Salem County, New Jersey. Elements of the new plant would include the power block, administration building, switchyard, laydown areas, and cooling towers. The cooling water system of the new plant would include either mechanical draft or natural draft cooling towers. The bounding visual impact would be two natural draft towers, each up to 590 feet high.

As part of the ESP application process, PSEG and MACTEC contacted the New Jersey Historic Preservation Office (HPO) in compliance with Section 106 of the National Historic Preservation Act. One aspect of this discussion was the potential visual impacts of the proposed new plant on the viewshed of historic architectural sites within the 10mile radius. Representatives from MACTEC and PSEG met with the New Jersey Historic Preservation Office (HPO, Meghan MacWilliams Baratta and Vincent Maresca) and Delaware State Historic Preservation Office (SHPO, Joan N. Larrivee) on August 11, 2009 and August 12, 2009 to discuss the project and the visual assessment methodology. MACTEC proposed to develop a computer generated visibility model showing potential visual impacts on properties listed on the Natural Register of Historic Places (NRHP) followed by the field collection of empirical data from selected areas and properties in support the visibility model. The goal of this methodology is to develop a preliminary understanding of what areas and properties may have visual impacts from the proposed cooling tower location and height. This approach was reviewed with by both the New Jersey HPO and the Delaware SHPO.

METHODOLOGY

A Digital Terrain Model (DTM) was developed in a Geographic Information System (GIS) using U.S. Geological Survey (USGS) topographic information. Inputs for the cooling tower bounding elevation were then analyzed in GIS to identify listed NRHP properties from which the cooling towers may be visible. Two natural draft cooling towers were assumed to be located north of the power block. Attributes for the model included a base terrain elevation of 10 feet above existing grade, cooling tower height of 590 feet, and a tree canopy height of 50 feet.

The visibility model was created in a stepwise fashion using the following:

- Distribution of NRHP sites within the 10-mi. radius based on NRC NUREG 1555 guidance for historic properties (Figure 1)
- USGS land use/land cover (LULC) data from the National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center (<u>http://www.csc.noaa.gov/crs/lca/ccap.html</u>) (Figure 2),
- Elevation data from the USGS National Elevation Dataset (<u>http://ned.usgs.gov/</u>) (Figure 3).

A raster file with gridded cells 30x30 meters was created to hold modified elevations based on the land cover. The "Radial Line of Sight" tool was used in the Military Analyst toolbar of ArcGIS v9.2 to create a raster of cells the tower could be seen from. USGS LULC data were also merged to the digital terrain model (DTM) to allow the selection of tree masses that may effectively block views of the cooling tower. Tree masses

(deciduous, evergreen, mixed forest) represented on LULC were assigned a vertical attribute of 50 feet and merged with the digital terrain model. The water and wetland classes were also removed from the visible area as structures potentially eligible for the NRHP are not located in these areas (Figure 4).

The total number of NRHP properties located within the ten mile radius was 91, with 80 located in Delaware and 11 in New Jersey. Based on the information from the DTM, selected areas and historic properties within the 10-mile radius were chosen for a field visit to support the DTM. All New Jersey sites were visited, and 37 representative sites were investigated in Delaware. A total of 51 properties were visited as part of this survey in New Jersey and Delaware and included individual structures, historic districts, and one archaeological site. The 11 listed properties were visited in New Jersey, along with an additional three properties that were not included on the NRHP list but were of similar age and design as the included properties.

Information provided from the NRHP website was used to locate each selected property in the field to document its surroundings, current conditions, and exact address. When possible multiple photographs of the structure were taken to show any additions or major changes to the property. Photographs were also taken at properties where the existing Hope Creek cooing tower was visible. The location was recorded in the GPS unit using reference numbers. Location points for historical districts were taken from roughly the center of the district and example photographs of contributing and non-contributing structures were taken. For structures not included on the list, a form of the property's address or name was entered into the GPS and a photograph was taken of the property.

RESULTS

GIS Predictive Analysis

Figure 5 presents the results of the visual assessment of the new plant using GIS analysis. Appendix A contains an expansion of Figure 5 and provides a detailed view of this assessment for the each grid within the 10-mile area. Each listed site is identified on the figure along with potentially visible areas. In all, a total of 65 of the 91 NRHP-listed sites (71 percent) considered in this analysis were determined to be in a setting in which the new plant cooling tower would be visible.

Field Survey Results

Table 1 presents a listing of each site visited during field reconnaissance. Details of the field reconnaissance are presented in Appendix B. For five of the properties included in the field survey, no structures matching the information from the NRHP were found. The Duncan Beard site could not be located due to vague location information, but likely exists based on the level of preservation present in the Odessa area. The Liston and Hart Houses are located in a restricted access area inside which only a silo, barn, and outbuilding were located. It appears that these ancillary buildings mark the location of the former historic structures, which may no longer exist. The Greenlawn and Field Heirs properties were located in areas that are now large residential housing developments, one of which is named after the Greenlaw property. Extensive driving throughout both developments failed to locate either structure making it seem likely that both have been demolished.

The visibility of the existing Hope Creek cooling tower is variable depending on local topography and vegetation near each property, but the tower was typically seen from a greater distance on the Delaware side of the survey. The Delaware side affords a greater visibility of the cooling tower because of the topography of rolling hills, where the New Jersey side is relatively flat, causing the cooling tower to be out of view as a result of a relatively small obstructions. A total of 12 of the above listed NJ and DE properties had either partial or whole views of the cooling tower.

A total of 34 of the 46 sites located were predicted to be in settings in which the cooling tower would be visible. However, a number of these sites (e.g., NJ: Alloways Creek Meetinghouse, Hancock House, Broadway Historic District; DE: Achmeister, Monterey, Misty Vale, etc.) had a view in which the cooling tower was not visible, due to obstructions (buildings or trees) that were not accounted for by the GIS terrain model. In total, the cooling tower of the new plant was predicted to be visible at 71 percent of the sites visited, but in fact, was observed to be visible at 26 percent of the sites (Table 2).

Simulated Perspectives of the New Plant

In order to provide information that can be used to evaluate the potential effects of the new plant on the visual environment, simulated cooling towers were created within the digital terrain model. Characteristics of the Hope Creek cooling tower were based on asbuilt specifications (512 feet high), whereas the characteristics of the new plant cooling towers were based on the bounding visual condition of the plant parameter envelope (PPE) for natural draft cooling towers (590 feet high).

Figure 6 provides a typical view of the PSEG Site with both the existing Hope Creek cooling tower and the natural draft cooling towers of the new plant. Simulated views of the PSEG Site from several of the closer historic sites are presented in Appendix C, and include three sites in New Jersey and two sites in Delaware. In each case the view of the new cooling towers is shown to be an additional feature of the landscape, but one that is both similar in form and closely associated with the existing cooling tower at Hope Creek.

CONCLUSIONS

A GIS analysis of potential visual impacts within a 10-mi. vicinity surrounding the PSEG Site was conducted in response to project review inputs provided by the NJ HPO and the DE SHPO regarding the proposed new plant. Based on GIS analysis, 71 percent of the 91 NRHP-listed sites were predicted to have a viewshed in which the natural draft cooling towers of the new plant would be visible. However, based on reconnaissance performed at 46 sites visited in the field, the new plant cooling tower was only visible at 26 percent of the sites. Local obstructions not discernable in the GIS analysis interrupted viewsheds at a number of locations and accounted for the reduced number of sites having cooling tower visibility. Additionally, three dimensional perspective simulations were also developed for the new plant from five representative site locations. As distances from the PSEG Site are relative large for each of the listed sites, and the proposed cooling towers would be co-located at an existing nuclear generation station site that has a similarly sized natural draft cooling tower, the alteration of the viewshed is considered to be limited and of low significance.

Name	Property Address	Uisted on NRHP	Predicted to be Vietbic (MN)	levredo ed oj edisiv (MM)
NEW JERSEY				
Alloways Creek Meetinghouse	70-80 Buttonwood Avenue	Yes	Y	N
Hancock House	3 Front Street	Yes	Y	N
Abbott House	120 Abbott Farm Road	No	Y	N
Joseph Ware House	134 Poplar Street	Yes	N	Y
Deen House	112 Poplar Street	No	Y	N
Broadway Historic District	Salem, NJ	Yes	Y	N
Market Street Historic District	Salem, NJ	Yes	Y	N
Hedge-Carpenter-Thompson Historic District	Salem, NJ	Yes	N	N
Finn's Point Rear Range Light	179 Lighthouse Road (CR 632)	Yes	N	N
Fort Mott and Finn's Point National Cemetery District	454 Fort Mott Road	Yes	Ý	N
Benjamin Holmes House	410 Ft. Elfsborg Road (CR 624)	Yes	N	Y
Abel and Mary Nicholson	12 Ft. Elfsborg Road (CR 624)	Yes	Y	Y
Sarah and Samuel Nicholson	Money Island Road	Yes	N	N
John Mason House	63 Money Island Road	No	Y	Y
ELAWARE		•		
Appoquinmink Friends Meetinghouse	Main Street (Route 299)	Yes	Y	N
Duncan Beard Site	Unknown	Yes	Y	ND ¹
Corbit-Sharp House	118 Main Street	Yes	N	N
Odessa Historic District	Odessa, DE	Yes	Y	N
Old St. Paul's Methodist Church	506 High Street	Yes	Y	N
Greenlawn	Unknown (possible demolished)	Yes	Y	ND
Field Heirs	Unknown (possible demolished)	Yes	Y	ND
Middletown Academy	218 North Broad Street	Yes	Y	N
Middletown Historic District	Middletown, DE	Yes	Y	N
St. Joseph Church	17 Cochran Street	Yes	Y	N
Armstrong-Walker House	5036 Summit Bridge Road (SR 71)	Yes	Y	N
Sutton House	10 Delaware Street	Yes	N	N
North Saint George Historic District	Saint George, DE	Yes	Y	N
St. George Presbyterian Church	Main Street	Yes	N	N
Bloomfield-Kirkwood	St. George Road	Yes	N	N
Chelsea	910 5th Street	Yes	N	N
Eastern Lock of the Chesapeake & Delaware Canal	Delaware City, DE	Yes	N	Ν
Fort DuPont Historic District	Delaware City, DE	Yes	Y	N
Delaware City Historic District	Delaware City, DE	Yes	Y	N
Augustine Beach Hotel	1919 St. Augustine Road (Route 9)	Yes	Y	Y
Port Penn Historic District	Port Penn, DE	Yes	Y	Y
Liston Front Range Lighthouse	1600 Belts Road	Yes	Y	Y
Riverdale	1322 Bayview Road	Yes	Y	Y.
Hell Island	Unknown	Yes	Y	Y
Fleming House	992 Fleming Island Road (Route 9)	Yes	Y	N

Table 1. List of Historic Properties Visited During Survey

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Name.	Property Address	Listed on NRHP	Predicted to be Visible* (WW)	Obeerveel to be Mistble (MNI)
Short's Landing Hotel Complex	6180 Fleming Island Road	Yes	Y	Y
Liston House	Cedar Swamp Road (destroyed)	Yes	Y	ND
Hart House	Cedar Swamp Road (destroyed) Yes Y		Y	ND
Reedy Island Rear Range Light	Inters of State Rt 9 & Cedar Swamp Yes Y Rd (CR 453)		Y	
Huguenot House	798 Cedar Swamp Road (CR 453)	Yes	N	N
Achmester	617 Marl Pit Road	Yes	Y	N
Commander Thomas MacDonough House	2501 DuPont Highway (Route 13)	Yes	Y	N
Monterey	692 Bayview Road	Yes	Y .	N
Misty Vale	Off Reading Lane	Yes	Y Y	Y
Liston Rear Range Light	409 Port Penn Road	Yes	Y	N
Mondamon Farm	380 Port Pen Road	Yes	Y	N
Biddle House	Corner of Port Penn Road and Route 13	Yes	Y	N

 1 ND = Not detected in field

Table 2. Summary of Visibility Assessment

	. CIS An	elysis 👘	Field	SURVEY RES	dle⁰ <i>™</i> ana
	No. NRHP Stres	Percent	Predicted	Observed	Dercent
Visible	65	71	<u>34</u>	12	26
Not Visible	26	29	12	34	74
Total	91	100	46	46	100

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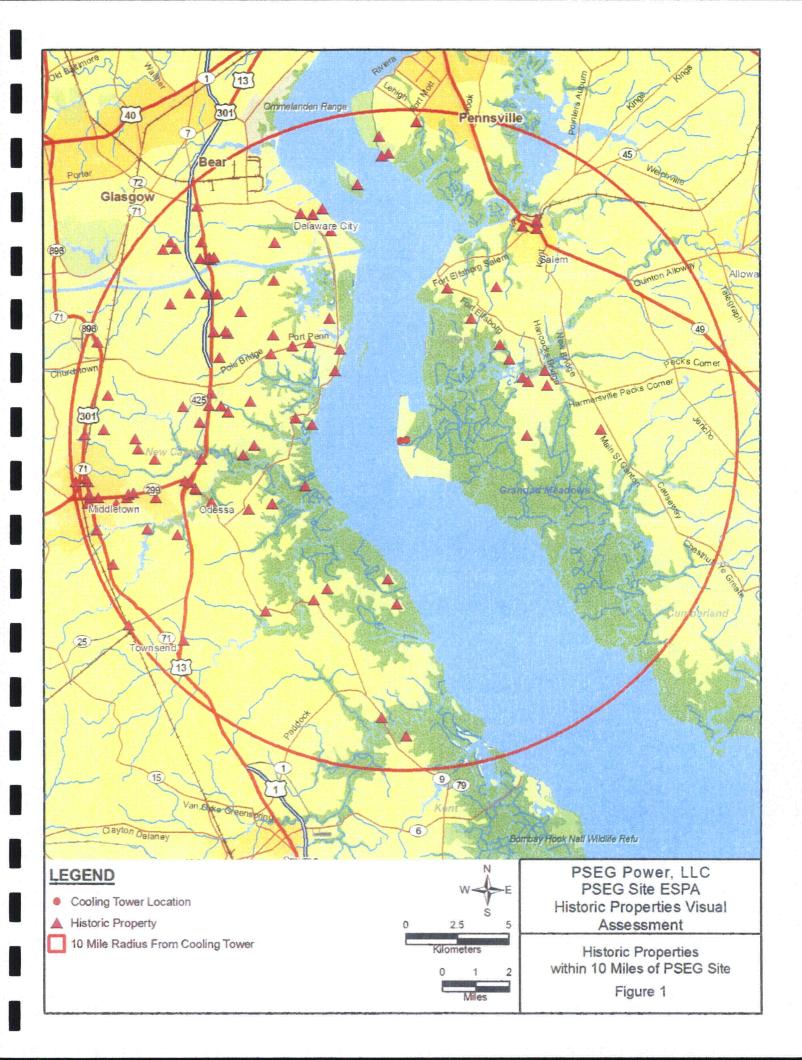
¹Note: field survey located 46 of the 51 sites initially selected (see text)

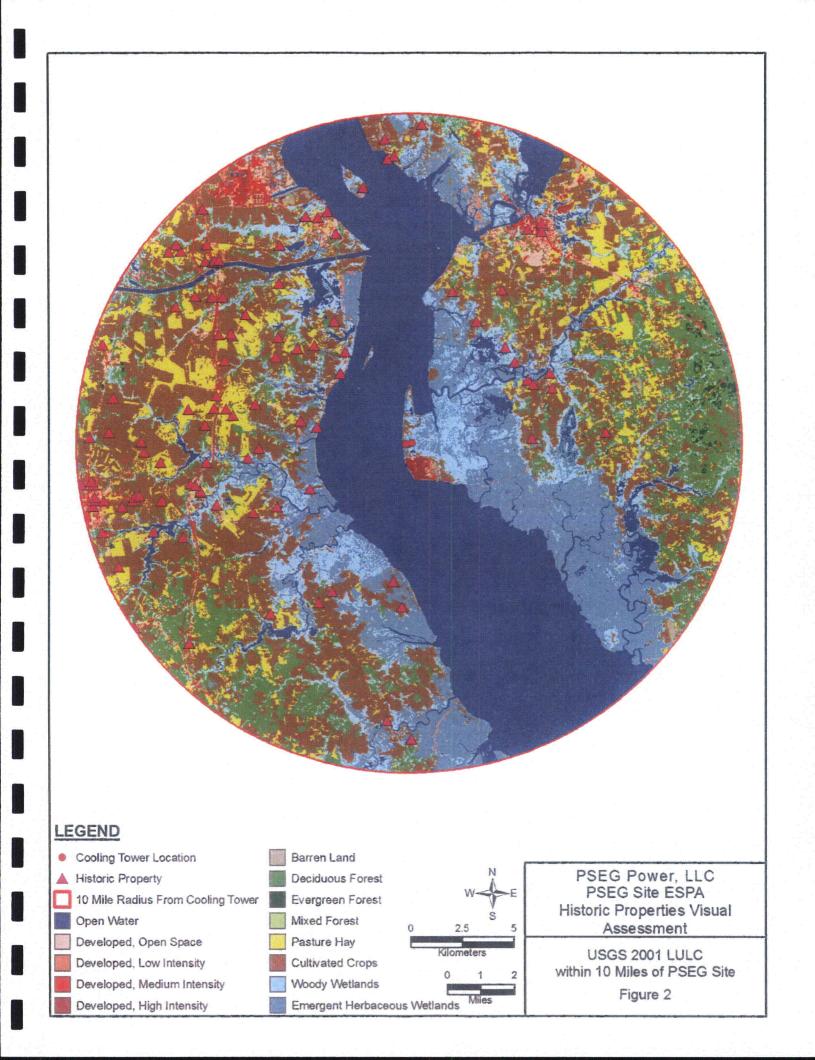
FIGURES

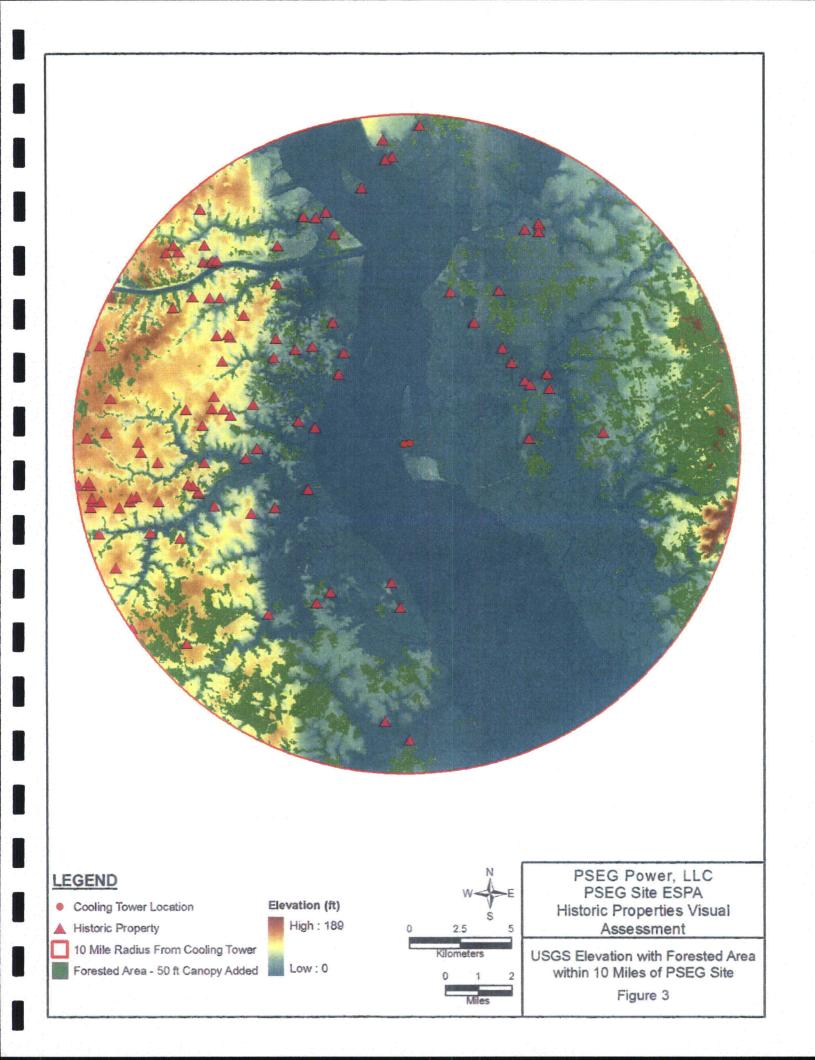
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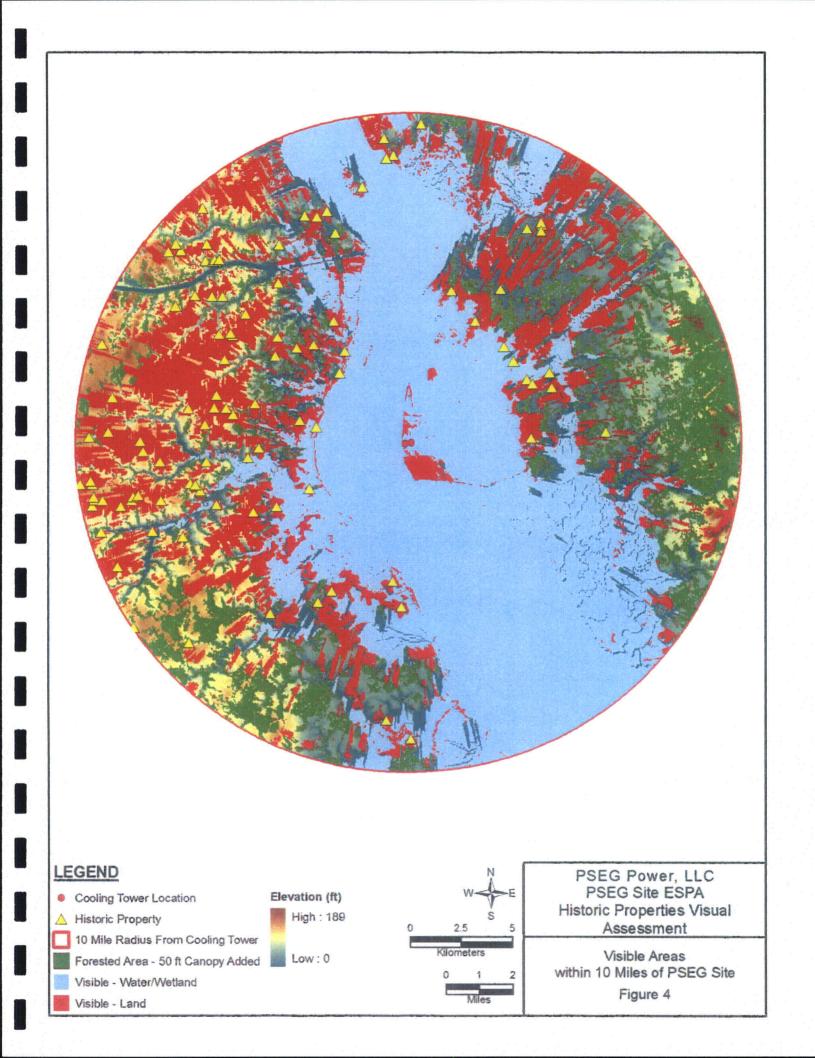
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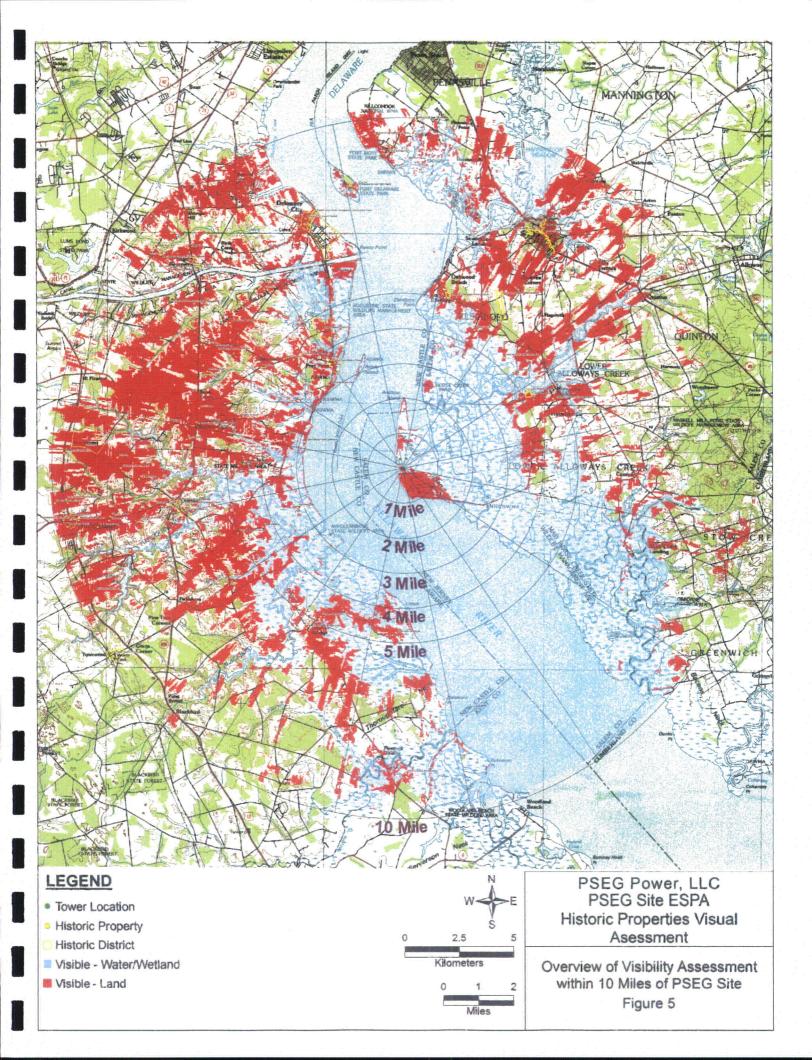
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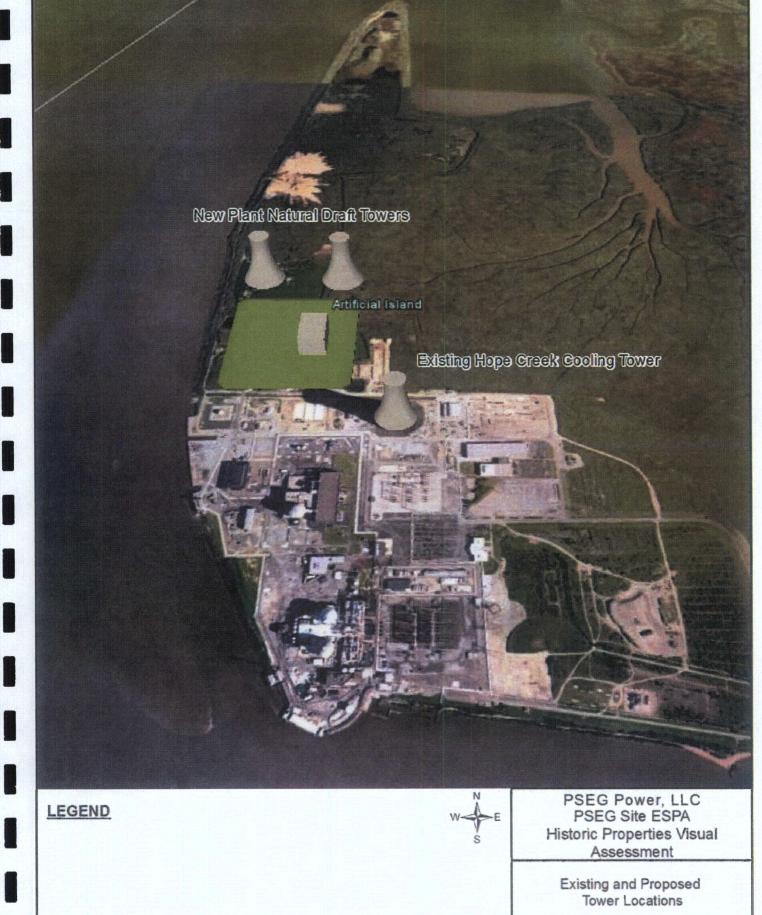


Figure 6

Appendix A

Detailed GIS Maps

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