



Visual Impact Assessment

Aquidneck Island Reliability Project

Towns of Portsmouth and Middletown, Newport County, Rhode Island

Prepared for:

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Waltham, Massachusetts 02451
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December 2015

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1.0 INTRODUCTION

Environmental Design and Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) was retained by The Narragansett Electric Company, d/b/a National Grid (TNEC), to prepare a Visual Impact Assessment (VIA) for the proposed Aquidneck Island Reliability Project (AIRP or the Project) located in the Towns of Portsmouth and Middletown, Newport County, Rhode Island. The purpose of this VIA is to:

- Describe and illustrate the appearance of the visible components of the proposed Project;
- Define and describe the visual character of the Project study area;
- Inventory and evaluate existing visual resources and viewer groups within the study area;
- Evaluate potential Project visibility within the study area;
- Identify key views for visual assessment; and
- Assess the visual impacts associated with the proposed Project.

This VIA was prepared under the direct guidance of a registered landscape architect experienced in the preparation of visual impact assessments. It is also consistent with the policies, procedures, and guidelines contained in established visual impact assessment methodologies (see Literature Cited/References section).

2.0 PROJECT DESCRIPTION

2.1 Project Site

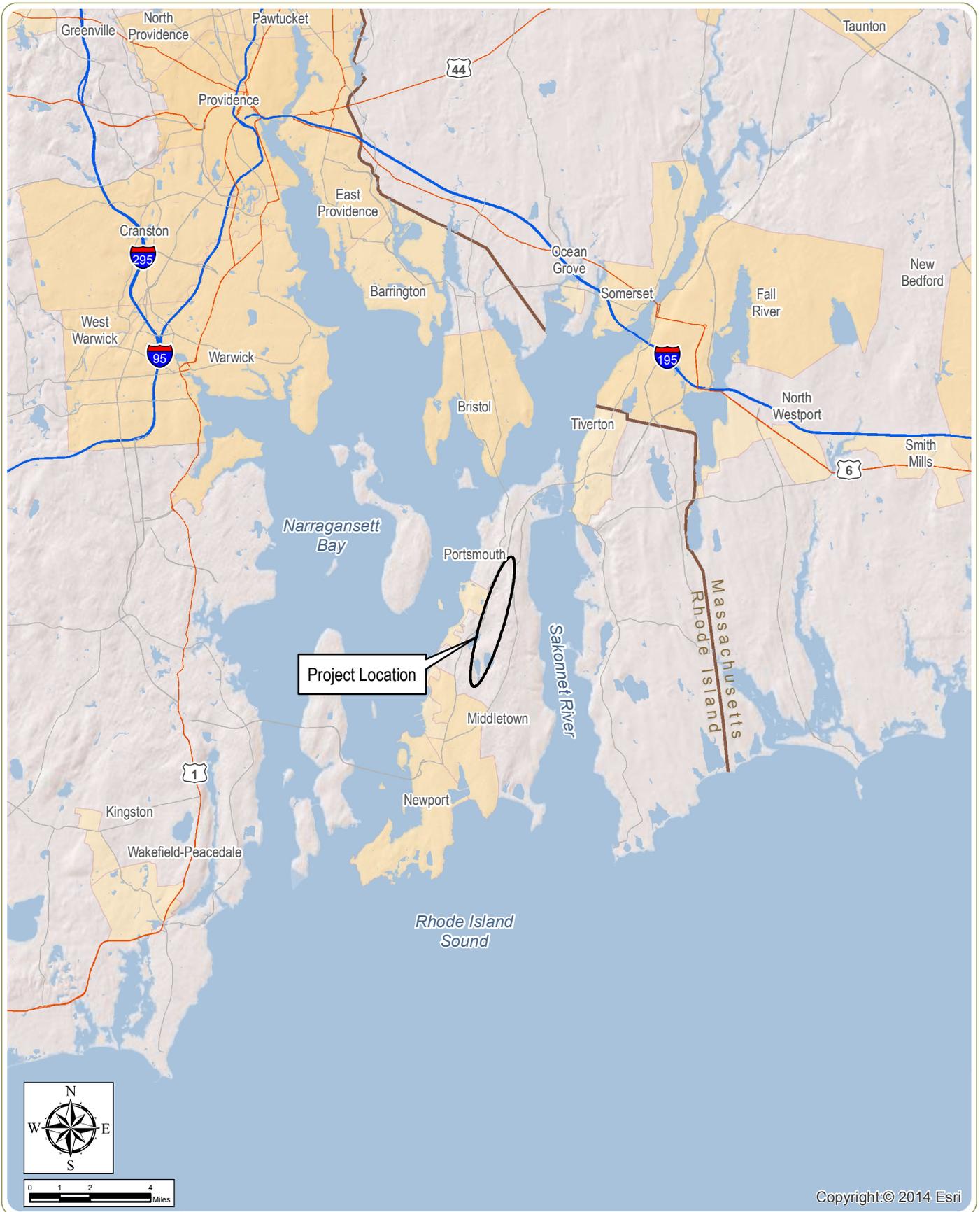
As part of the Aquidneck Island Reliability Project, TNEC is proposing to rebuild the 69 kilovolt (kV) 61 and 62 Transmission Lines between the Dexter Substation in Portsmouth, Rhode Island and the Jepson Substation in Middletown, Rhode Island, and upgrading these lines to 115 kV. In addition, the existing Jepson Substation will be retired and a new substation built across the road on Jepson Lane. The existing transmission corridor that constitutes the Project site is approximately 4.4 miles in length, and runs down the center of Aquidneck Island in a north-south direction (Figures 1 and 2).

The existing transmission corridor includes the parallel 69 kV 61 and 62 Transmission Lines, which run through the Town of Portsmouth and terminate at the Jepson Substation on the border of the Towns of Portsmouth and Middletown. The existing transmission structures are either single circuit wood pole H-frame structures installed in 2001 as part of a refurbishment project, or double-circuit wood three-pole structures installed in the 1950s and mid-1980s. The existing structures range in height from approximately 45 to 65 feet above ground level. A 13 kV distribution circuit, mounted on single wood poles that range in height from approximately 30 to 45 feet above ground level, currently runs on the western side of the ROW, approximately 12 feet (minimum clearance) from the outside phase wire of the existing 62 Line between the Dexter Substation and Locust Avenue. The width of the existing cleared right-of-way (ROW) is approximately 100 feet, and is maintained in early successional vegetation (i.e. old field herbaceous and shrub species), with topography that is generally flat, or slightly sloping in a southerly direction. The existing ROW traverses an area characterized by a mix of rural and suburban land use.

The site of the proposed new Jepson Substation is an 18-acre parcel located on the west side of Jepson Lane, across from the existing Jepson Substation. The site is characterized by gently-sloping topography that descends to the west, and successional vegetation dominated by thick shrubs. An existing gate and gravel entry drive provide access to the site, and existing overhead electrical lines run east-to-west along both edges of the site. The site is bordered by additional undeveloped land and residential properties.

The Project also includes refurbishment of the existing Dexter Substation, and will facilitate the removal of four additional 23 kV - 4 kV substations located in the Towns of Middletown and Newport. Because refurbishment of the Dexter Substation will not substantially alter the visibility or visual character of the commercial/industrial area in which it occurs, it is not addressed in this study. The four additional substations scheduled for removal are generally located

in commercial areas along major transportation routes (with the exception of the Vernon Substation, which is located in a medium to high-density residential area) outside of the study area addressed in this report.



Aquidneck Island Reliability Project

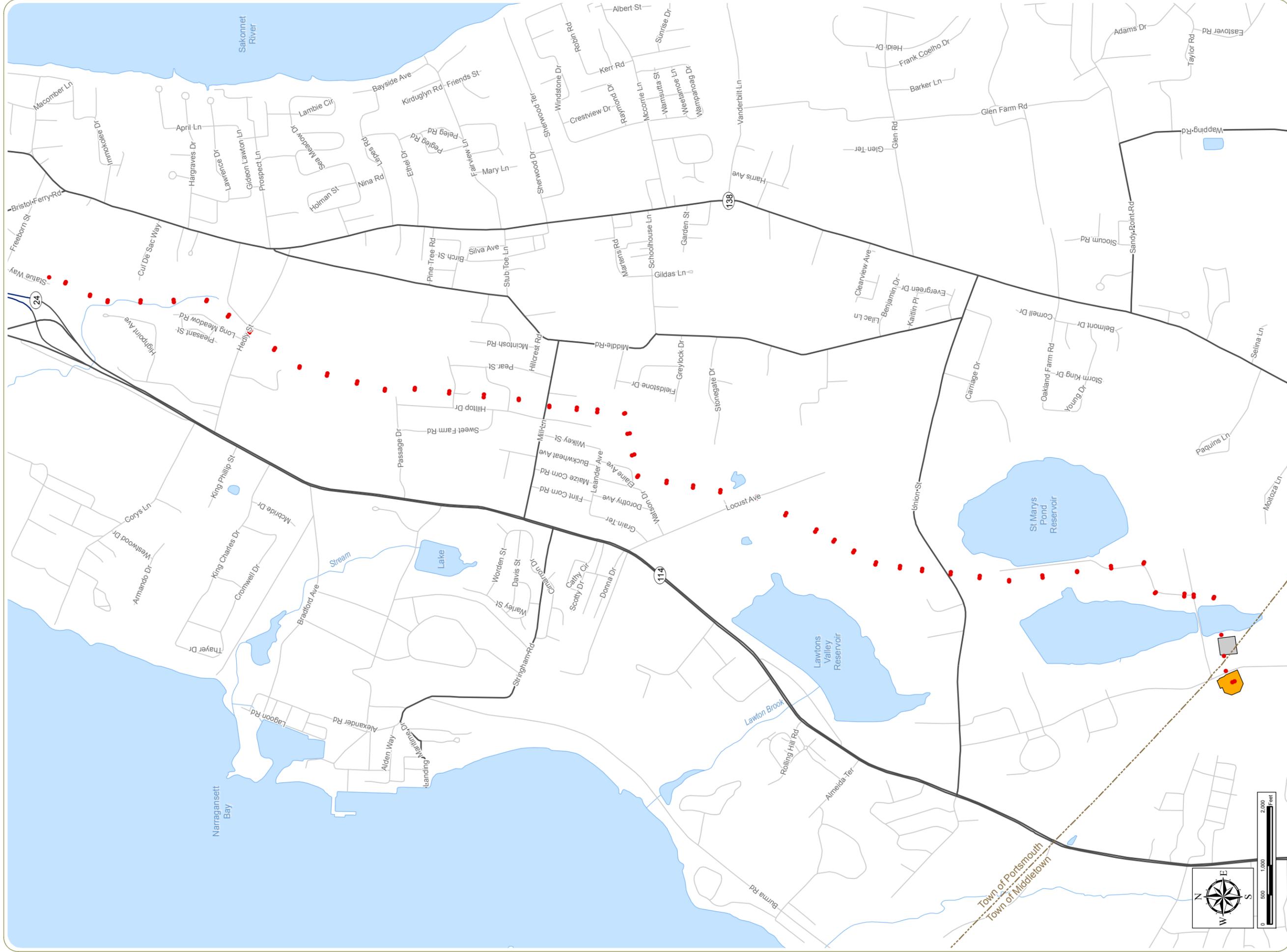
Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 1: Regional Project Location

March 2015

- Notes:** 1. Basemap: ESRI ArcGIS Online "Shaded Relief" Map Service and ESRI StreetMap North America, 2008
 2. This is a color graphic. Reproduction in grayscale may misrepresent the data.





Aquidneck Island Reliability Project
 Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 2: Proposed Project Site

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Notes: 1. Basemap: ESRI StreetMap North America, 2008.
 2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Proposed Pole Location
- Proposed Jepson Substation
- Existing Jepson Substation
- - - Town Boundary



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2.2 Proposed Project

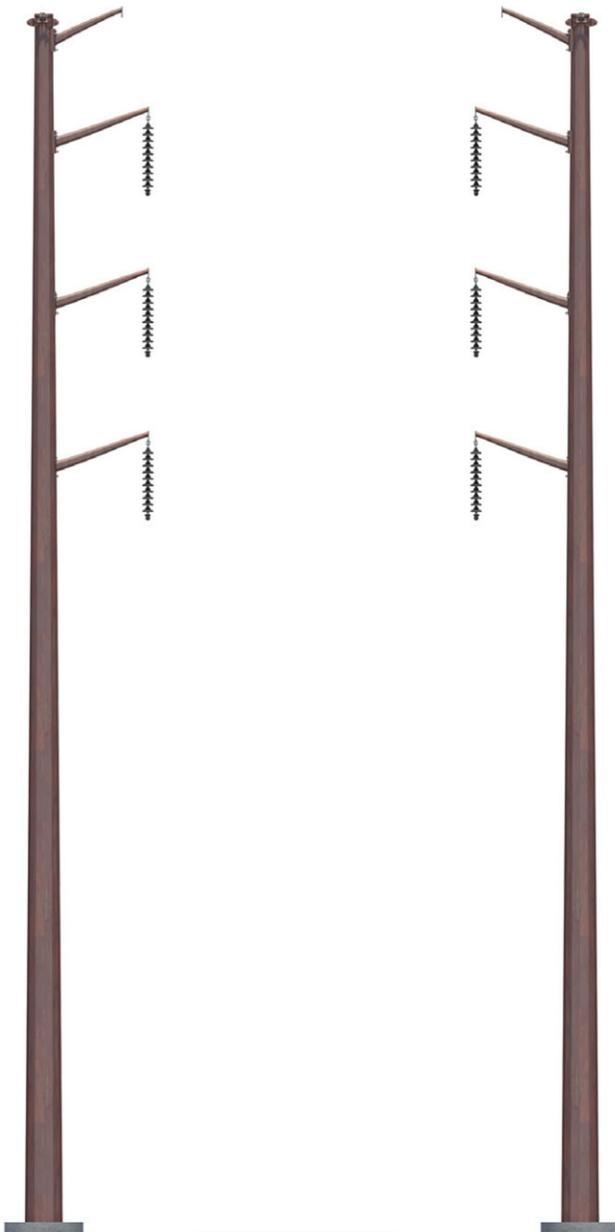
The Aquidneck Island Reliability Project includes a number of electric system improvements designed to reinforce and enhance the capacity of the existing transmission system on Aquidneck Island. As part of this Project, TNEC is proposing to rebuild and upgrade two transmission lines, construct a new Jepson Substation, and refurbish the existing Dexter Substation. The existing 61 and 62 Transmission Lines will be rebuilt and upgraded to 115 kV on the existing ROW, beginning at the Dexter Substation located off Freeborn Street in Portsmouth, Rhode Island and terminating at the proposed new Jepson Substation off Jepson Lane in Middletown, Rhode Island. To accomplish this, the existing wood pole transmission structures will be replaced with single pole, single circuit self-weathering steel poles on concrete caisson foundations with davit arms facing inwards towards the centerline of the ROW. A total of 96 structures ranging in height from 47.5 to 67 feet in height will be removed from the ROW. A total of 92 new single circuit replacement structures ranging in height from 80 to 95 feet will be installed. In addition to the structure replacements, three new double circuit steel structures ranging in height from approximately 95 to 105 feet are to be installed to extend the lines from the existing Jepson Substation to the relocated Jepson Substation across Jepson Lane. The entire length of both lines (4.4 miles each circuit) will be reconducted. The shieldwire will be replaced, and all new insulators and hardware will be used. The new circuit length will be 4.5 miles due to the extension to the relocated Jepson Substation. Computer models of the proposed transmission structures are presented in Figure 3.

Due to physical limitations of the existing Jepson Substation site, as well as environmental and constructability concerns, TNEC is proposing to relocate the Jepson Substation to a new site on property owned by TNEC on the west side of Jepson Lane, across the road from the existing substation. The new substation will be constructed within a fenced area measuring approximately 350 feet by 420 feet, and will include A-frame terminal structures, a control building, transformers, capacitor banks, circuit breakers, switches, insulators, bus work and other electrical equipment. Two new driveways will be constructed to the substation from Jepson Lane. A computer model of the proposed Jepson Substation is illustrated in Figure 3. The existing Jepson Substation, located within an approximately 280 by 290 foot fenced enclosure on the east side of Jepson Lane, will be removed, and the site restored to native vegetation.

As a result of the upgrade of the 61 and 62 Lines, the Dexter Substation needs to be reconfigured to 115 kV, and the 115 kV – 69 kV transformation and associated 69 kV equipment must be removed. Because this work will not substantially affect the visibility or appearance of the Dexter Substation, this component of the Project is not addressed in this study. In addition, the Project will facilitate the removal of four substations located in the Towns of Middletown and Newport: Bailey Brook, Vernon, North Aquidneck and South Aquidneck. These substation removals are not physically proximate to the proposed Project, or located within the study area addressed in this report. In addition, these substation removals are not anticipated to have an adverse visual effect in that they will result in the removal of

electrical infrastructure from specific locations, which is typically characterized as an aesthetic improvement. Therefore, the four substation removals are not included in the following discussions of Existing Visual Character (see Section 3.0 of this report), Visual Impact Assessment Methodology (Section 4.0), or Visual Impact Assessment Results (Section 5.0). However, the substation removals (and visual simulations of the removals) are discussed in the review of potential mitigation measures to off-set the Project's visual impact (see Sections 6.0 and 7.0 of this report).

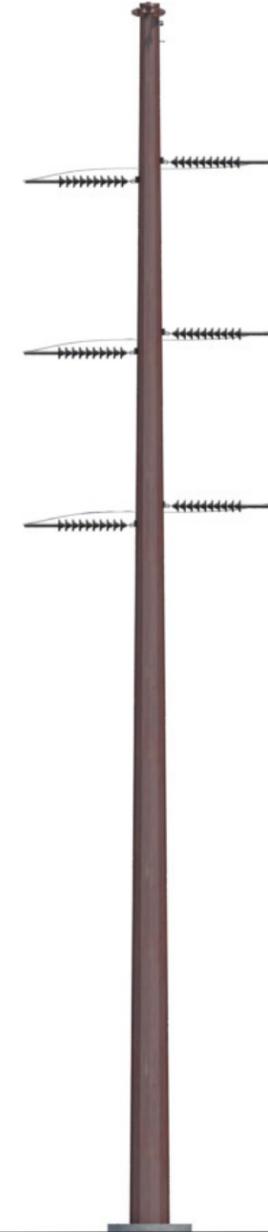
Single Circuit Tangent Davit Arm Structures



Double Circuit Deadend Structure



Single Circuit Deadend Davit Arm Structure

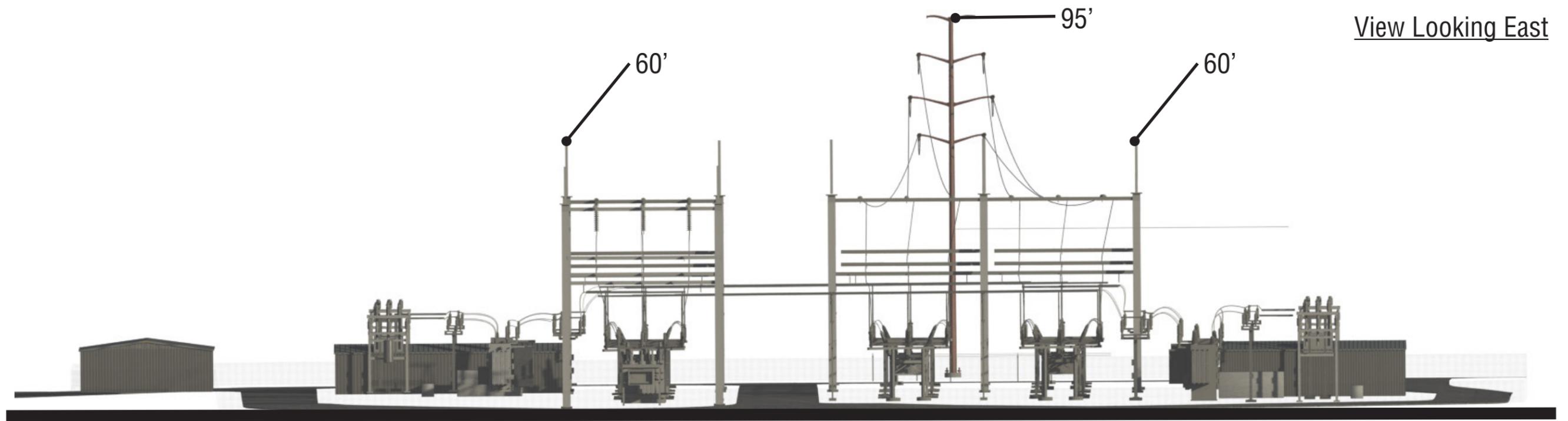
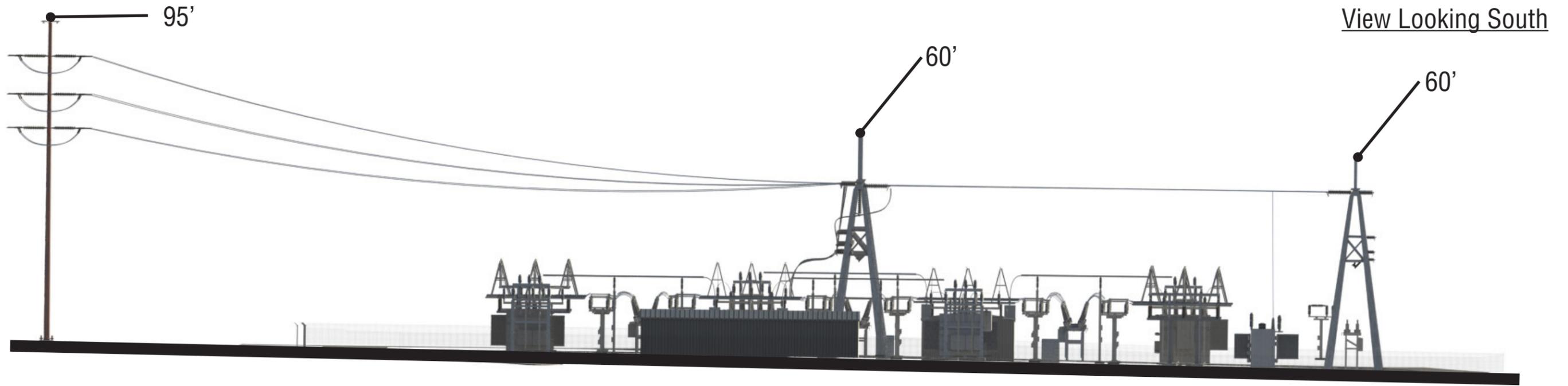


Aquidneck Island Reliability Project

Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 3 - Computer Model of Proposed Project (Representative Transmission Structures)

March 2015



3.0 EXISTING VISUAL CHARACTER

Based on established visual assessment methodology, and site-specific topographic and land use conditions, the study area for the Aquidneck Island Reliability Project was defined as the area within 1 mile of the centerline of the proposed transmission lines and within 1 mile of the new (relocated) Jepson Substation site (Figure 4). This area covers approximately 11.7 square miles, and includes portions of the Towns of Portsmouth and Middletown.

Land use within the visual study area is primarily a mix of low-to-high-density suburban residential areas (the predominant land cover type), rural residential development, occasional agricultural fields, inland water bodies, and commercial areas along major roadways and within office parks. The study area includes several heavily utilized transportation routes including Rhode Island State Routes 24, 114 and 138.

3.1 Physiographic/Visual Setting

Visual character within the study area is defined by the existing pattern of landform (topography), land use, vegetation, water features, and man-made elements in the landscape. The visual study area on Aquidneck Island is located within the Southern New England physiographic region, which covers parts of New Jersey, New York, Connecticut, Massachusetts, New Hampshire, Maine, and all of Rhode Island. Aquidneck Island is a relatively narrow landform that rises from the Sakonnet River on the east and Narragansett Bay on the west to an elevated central ridge that runs in a north-south direction. The topography in the study area is variable and includes level benches or terraces, saddles and valleys, and sloped ridges and hillsides. Elevations within the study area range from 0 to 285 feet above mean sea level.

Land use in the study area is dominated by developed suburban residential and commercial areas. The residential areas are densely clustered developments of single family homes that generally range in age and character from early-to-mid-twentieth-century Colonial, Cape Cod, and Ranch-style homes to newer subdivisions that feature larger, contemporary-style homes on cul-de-sacs. Older homes with a more historic character are generally located on the major roadways and cross streets.

The major highways within the study area include Rhode Island State Routes 24, 114, and 138. Significant portions of Routes 114 and 138 feature dense commercial development, including gas stations, chain restaurants, and a variety of local businesses. These establishments typically feature low, one- or two-story buildings of eclectic character, many

of which are set back from the roadways adjacent to open, paved parking areas. The northern portion of the study area also features clustered business parks with larger buildings occupied by both offices and light industrial facilities.

A few large areas of open agricultural land are scattered throughout the study area (primarily within the central and southern portions). Although a relatively minor component of the study area, these agricultural areas are notable in that they are typically designated as scenic and/or land conservation areas, and offer more open, long-distance views of the surrounding landscape.

The study area also includes relatively small, scattered patches of forest. Vegetation in forested areas is dominated by deciduous trees, and includes both mature and successional stands. Where forest vegetation occurs in larger, more intact blocks, it provides a strong sense of enclosure and screening along roadways and around residential and commercial areas.

Small ponds, wetlands, and streams are scattered throughout the study area, but are typically obscured from direct view by woody vegetation. The study area includes a few larger water bodies, such as the St. Mary's Pond Reservoir and Sisson Pond (both located in in the southern portion of the study area).

Note that the areas potentially affected by the proposed removal of the Bailey Brook, Vernon, North Aquidneck and South Aquidneck substations are limited to the immediate vicinity of the four substations (generally along adjacent roadways and sidewalks). These areas are not described, as they occur outside the visual study area being addressed in this report.



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 Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 4: Visual Study Area

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Notes: 1. Basemap: ESRI ArcGIS Online "USA Topo Maps" Map Service.
 2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- Proposed Pole Location
- Proposed Jepson Substation
- Existing Jepson Substation
- Visual Study Area



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3.2 Landscape Similarity Zones

Definition of discrete landscape types within a given study area provides a useful framework for the analysis of a project's potential visual effects. These landscape types, referred to in this report as Landscape Similarity Zones (LSZs), are defined based on the similarity of various landscape characteristics including landform, vegetation, water, and/or land use patterns, in accordance with established visual assessment methodologies (Smardon et al., 1987; USDA Forest Service, 1995; USDOT Federal Highway Administration, 1981; USDI Bureau of Land Management, 1980). Within the visual study area for the AIRP, EDR defined six distinct LSZs. The USGS National Land Cover Dataset (NLCD) used to help define the location of these zones is illustrated in Figure 5. The general landscape character, land use, and availability of outward views within each of the defined LSZs are described below.



Source: Esri, i-cubed, USDA, USGS, AEX, GeoEye, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community

Aquidneck Island Reliability Project Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 5: Land Cover Map

March 2015

Notes: 1. Basemap: ESRI ArcGIS Online "World Imagery" Map Service and USGS 2006 National Land Cover Dataset.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

- | | |
|---------------------|----------------------------|
| Land Cover | • Proposed Pole Location |
| Agriculture | Proposed Jepson Substation |
| Developed | Existing Jepson Substation |
| Forest | Visual Study Area |
| Grassland/Shrubland | Town Boundary |
| Open Water | |



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3.2.1 Zone 1: Suburban Residential Zone

This zone is dominated by medium-density residential neighborhood development that typically occurs along road frontage or in cul-de-sacs spurring off the main roads (Photo Insets 1 and 2). This LSZ is prevalent throughout the study area, but is located primarily along the eastern and western edges. The housing in this LSZ varies between early-to-mid-twentieth century construction and recently constructed subdivisions. Buildings along major transportation routes tend to be relatively older, 1-2 stories in height, and more spread out than in a city or village setting, with mature vegetation and trees present in yards and along roadsides (Inset 1). Housing of newer vintage is located throughout the study area, generally within recent sub-divisions and on cul-de-sacs that radiate out from major transportation routes. Newer housing developments in the study area often display low, young vegetation in front yards and roadsides with more significant screening present in back yards. The effect of vegetation on visibility is variable in this LSZ, but houses and yard trees generally block outward views in most suburban neighborhoods. Consequently, open views to the surrounding landscape from these residential areas are generally more restricted than in open agricultural areas, but more available than in areas of more concentrated urban development. Land use in this zone is almost exclusively residential, suggesting a relatively high sensitivity to visual quality and visual change.



Photo Inset 1. Suburban Residential Zone: Freeborn Street (above, left)
Photo Inset 2. Suburban Residential Zone: Acorn Lane (above, right)

3.2.2 Zone 2: Rural Residential/Agricultural Zone

The Rural Residential/Agricultural LSZ occurs primarily in the southern and central portions of the visual study area, closer to the actual transmission line corridor. This landscape type occupies the areas between the major transportation routes along the outer edges of the study area, and is characterized by a mix of active crop fields, pastures, Christmas tree farms and nurseries, hedgerows, farm structures, rural residences, and small woodlots (Photo Insets 3 and 4). Due to the presence of open fields, views within this LSZ are more open than those available in other zones within the study area. These views typically include an open field in the foreground, with a tree line defining a

woodlot or hedgerow in the mid-ground or background. Views in the Rural Residential/Agricultural LSZ also include widely scattered homes and farms and are often within state-designated Scenic Areas, which suggests generally higher scenic quality and viewer sensitivity in this LSZ. The presence of open fields in this LSZ also increases opportunities for longer distance views.



Photo Inset 3. Rural Residential/Agricultural Zone: Middle Road (above, left)
Photo Inset 4. Rural Residential/Agricultural Zone: Oliphant Lane (above, right)

3.2.3 Zone 3: Commercial Zone

This LSZ is less prevalent in the visual study area, and includes clusters of commercial businesses along State Routes 114 and 138, as well as the Portsmouth Business Park, which includes office and light industrial buildings, in the northern portion of the study area. Land use within the Commercial LSZ is a mix of commercial and light industrial buildings along with medium-density residential development (Photo Insets 5-7). Buildings are characterized by a mix of traditional and more modern architectural styles. Foreground buildings, roadside infrastructure, and associated street trees and landscape plantings dominate views in this LSZ. Occasional, partially screened, longer distance views are most likely from open parking lots and yards surrounding commercial buildings within this LSZ, where screening from structures and/or vegetation is reduced.



Photo Inset 5. Commercial Zone: RI State Route 138 (above, left)
Photo Inset 6: Commercial Zone: Intersection of RI State Route 114 and Stringham Road (above, center)
Photo Inset 7: Commercial Zone: The Portsmouth Business Park at Highpoint Avenue (above, right)

3.2.4 Zone 4: Forest Zone

This zone is characterized by the dominance of forest vegetation and occurs primarily in the southern and western portions of the visual study area, and immediately adjacent to the transmission line corridor in the central portion of the study area (Photo Insets 8 and 9). Views within this zone are generally restricted to forest edges or areas where yards, small clearings and road cuts provide breaks in the tree canopy. Where long distance views are occasionally available, they are typically of short duration, limited distance, and/or tightly framed by trees. Land use in this zone includes low-density residential development and recreational use. These forested areas are typically private lands with limited public access.



Photo Inset 8. Forest Zone: Freeborn Street (above, left)
Photo Inset 9. Forest Zone: Sisson Pond Road (above, right)

3.2.5 Zone 5: Water/Waterfront

This LSZ occurs primarily along the shoreline of Aquidneck Island, as well as in limited areas in the inland portion of the study area, including large ponds and reservoirs such as Sisson Pond, Lawtons Valley Reservoir, and St. Mary's Pond Reservoir (Inset 10). For inland waterbodies, the dominant visual feature of this zone is an open expanse of flat water that is enclosed by a vegetated shoreline. The shorelines are typically dominated by deciduous trees but are occasionally interrupted by man-made features such as homes, docks and boat launches. Human activity on the lakes and along the shoreline includes recreational activities, such as boating and fishing. Shoreline trees and low forested hills define the visible background in most views from inland lakes and ponds. Outward views from most water bodies are largely screened by shoreline vegetation. The visual study area also includes small portions of the Sakonnet River on the east, and Narragansett Bay on the west. In these coastal areas, outward views are oriented toward the open water. Views from the surface of the water (i.e., by boaters) are generally more expansive, and typically include some

shoreline residences or other structures, as well as dense shoreline vegetation. Views toward the transmission line from public roads and homes adjacent to these water bodies are typically screened by intervening trees.



Photo Inset 10. Water/Waterfront Zone: Upper Melville Pond (above, left)
Photo Inset 11. Water/Waterfront Zone: Narragansett Bay (above, right)

3.2.6 Zone 6: Transportation Zone

The Transportation LSZ occurs along portions of State Routes 24, 114, and 138. These are the primary high-volume vehicular travel corridors traversing the study area, and are dominated by automobiles, pavement, and signs. Views are focused on the roadway and associated traffic. Travel is at high speed, and outward peripheral views are fleeting. The surrounding scenery is variable, but within the study area, is dominated by adjacent structures and trees with limited elevated long-distance views available.



Photo Inset 12. Highway Transportation Zone: Rhode Island State Route 138 (above, left)
Photo Inset 13. Highway Transportation Zone: Intersection of RI State Route 114 and Stringham Road (above, right)

3.3 Viewer/User Groups

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

3.3.1 Local Residents

Local residents include those who live, work, and travel for their daily business within the visual study area. They generally view the landscape from their yards, homes, local roads and places of employment. Residents are concentrated in the residential subdivisions located off of Routes 114 and 138, but occur throughout the study area. Except when involved in local travel, residents are likely to be stationary, and have frequent or prolonged views of the landscape. Residents' sensitivity to visual quality is variable, and may be tempered by the aesthetic character/setting of their neighborhood and local roads. Those living in densely settled areas with views focused on their neighborhood street or adjacent commercial development may be less sensitive to landscape changes than those with a view of open farmland or undeveloped forest. However, it is assumed that residents are familiar with the surrounding landscape and may be very sensitive to visual change.

3.3.2 Through Travelers

Travelers passing through the area view the landscape from motor vehicles on their way to other destinations. Through travelers are typically moving, have a relatively narrow field of view oriented along the axis of the roadway, and are destination-oriented. Drivers on major roads in the area (e.g., State Routes 114 and 138, Union Street and Oliphant Lane) will generally be focused on the road and traffic conditions, but do have the opportunity to observe roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and therefore may be more aware of the quality of surrounding scenery. However, through travelers who are not residents of the area are unlikely to be particularly sensitive to visual change along the route of their travel.

3.3.3 Visitors

This viewer group consists of out-of-town visitors who come to the area to visit family or friends, or participate in cultural and recreational activities. Members of this group may view the landscape from area highways while on the way to their destinations, or from the sites themselves. This group includes sight-seers and those involved in outdoor recreation, such as walkers, bicyclists and boaters. Outdoor recreational users will often have continuous views of landscape features over relatively long periods of time. Visual quality may or may not be an important part of their visit to the area, however, in almost all cases, scenery can serve to enhance the quality of their visit.

3.4 Visually Sensitive Resources

To identify visually sensitive resources within the visual study area, EDR consulted a variety of data sources, including: digital geospatial data (shapefiles) obtained primarily through the Rhode Island Geographic Information System (URIEDC, 2014) or the Environmental Systems Research Institute (ESRI); numerous national, state, county and local agency/program websites, as well as websites specific to identified resources; USGS 7.5-minute topographic maps; and web mapping services such as Google Maps. All inventoried sensitive aesthetic resources, including their distance relative to the Project Site, are listed in Table A, included in Appendix A. The locations of mapped visually sensitive resources within the visual study area are illustrated in Figure 6 and the large-scale viewshed map included in Appendix A.

Visually sensitive resources generally fall into two categories: 1) aesthetic resources that have been formally recognized, such as buildings and landscapes listed on the National or State Register of Historic Places, designated scenic areas, or publicly-owned properties such as conservation areas and parks, or 2) places of concentrated activity such as schools, villages centers and heavily used roadways, or landscapes of high aesthetic merit that may be considered important by local residents. Visually sensitive resources include resources of national, state and local significance.

The visual study area for the AIRP includes two visually sensitive resources of national significance. These include one National Historic Landmark (NHL); the Battle of Rhode Island Historic District (NPS, 2015a), and one National Historic Trail; the Washington-Rochambeau Revolutionary Route National Historic Trail (NPS, 2015b). No other scenic or recreational resources of national significance are present within the study area. The area includes no national scenic byways (FHA, 2015) or national recreation trails (NRT, 2015). None of the water bodies in the study area are included on the national list of wild, scenic or recreational rivers (NWSRS, 2015), and there are no national wildlife refuges (USFWS, 2015), national seashores, national forests (USDA, 2015), national parks or national natural landmarks (NPS, 2015c) located within or adjacent to the visual study area.

As indicated in Table A, and shown on Figure 6, the study area does include numerous resources/sites that could be considered visually sensitive from a statewide, regional, or local perspective. Aesthetic resources within the visual study area considered to be of statewide significance include historic structures listed in the State/National Register of Historic Places (NRHP), state-designated scenic areas, and state conservation lands. Regionally and locally significant resources include designated open space (e.g., land trust properties and local conservation lands/open space set-asides), schools/colleges, cemeteries, water bodies, and areas of intensive land use (e.g., village centers, residential

neighborhoods, and major transportation corridors). Specific visually sensitive resources of these types that occur within the visual study area are described below.

3.4.1 Historic Sites

According to databases maintained by the U.S. Department of the Interior National Park Service (NPS, 2015a, b and d) and the Rhode Island Geographic Information System (URIEDC, 2014), the area within 1 mile of the proposed Project includes one National Historic Landmark district, one National Historic Trail, four historic sites that are listed on the NRHP, and 14 local historic sites that are candidates for listing on the NRHP. These sites are distributed throughout the study area, with a greater concentration along major roads such as Union Street and State Route 138.

The Battle of Rhode Island Historic District is a National Historic Landmark (NHL) located in the northern portion of the visual study area. NRHP-listed sites include Oak Glen (Julia Ward Howe House), the Union Church and Southernmost School, Portsmouth Friends Meeting House Parsonage and Cemetery, and the Lawton-Almy-Hall Farm. All significant historic sites within the visual study area are located in the Town of Portsmouth.

- The Battle of Rhode Island Historic District is a NHL (listed in 1974) comprised of two separate sites related to the 1778 American Revolutionary War battle. Butts Hill Fort is located near the northern extent of the visual study area and is comprised of a 34 acre-site east of State Route 24 that includes Revolutionary War-era earthworks. The primary battle site is located to the south of the Butts Hill Fort site and is comprised of approximately 365 acres bisected by State Routes 24 and 114. This area that has been largely disturbed by modern residential, commercial and recreational development (Sullivan, 1973; RIMAP, 2009; RIHPHC, 2015). The northern portion of the Project is located within the Battle of Rhode Island Historic District boundary.
- Oak Glen (also known as the Julia Ward Howe House) is a 2.5-story wood frame structure located on Union Street constructed circa 1870 as a summer retreat for writer and social activist Julia Ward Howe. Oak Glen was listed on the NRHP in 1978 (Kennedy, 1977; RIHPHC, 2015).
- The Union Church is a two-story vernacular rectangular structure with no steeple originally constructed circa 1866, and added to the NRHP in 1974. The Southernmost School was originally constructed between 1716 and 1725 and moved to the Union Church site on East Main Road in 1952. It is believed to be the oldest schoolhouse standing in Rhode Island, and is included as part of the Union Church NRHP listing (Lynch, 1979; RIHPHC, 2015).
- The Portsmouth Friends Meeting House Parsonage and Cemetery is a historic meetinghouse and cemetery of the Religious Society of Friends (Quakers) listed on the NRHP in 1978. The meetinghouse, located on East Main Road, is a two-story, plain rectangular structure originally constructed between 1699 and 1702 with

several alterations over the years to its original form. The cemetery is located west of the meetinghouse fronting Hedly Street, and was first used circa 1706, but the earliest grave markers only date to 1830 (Lynch, 1978; RIHPHC, 2015).

- The Lawton-Almy-Hall Farm is a forty-acre farm complex on Union Street listed on the NRHP in 1978. The oldest portion of the rectangular-plan farmhouse dates to 1700. Several outbuildings were included as part of the original nomination though many appear to have been removed or demolished since the building was listed on the NRHP (Harrington and Kennedy, 1978; RIHPHC, 2015).

In addition to the NHL or NRHP-listed historic sites, there are several locally significant historic sites identified as candidates for listing on the NRHP. Historic candidate sites are resources identified by the Rhode Island Historic Preservation Commission (RIHPHC) as historically significant and potentially NRHP-eligible, but are not yet formally listed on the NRHP (RIHPHC, 1979). A list of these historic candidate sites is provided in Table A.

One National Historic Trails (NHT) is located within the visual study area. The Washington-Rochambeau Revolutionary Route is a 680-mile land and water trail that passes through portions of nine states, including Rhode Island. The portion of the historic trail within the study area follows State Route 114, eventually terminating south of the study area in Newport (NPS, 2015b).

3.4.2 Scenic Areas

The visual study area includes a number of state and locally-designated scenic and conservation areas. State-designated scenic areas located within the visual study area are primarily associated with inland ponds and coastal areas that have been designated as noteworthy or distinctive scenic landscapes or views by the Rhode Island Department of Environmental Management (RIDEM). These include Hessians Hole Swamp State Scenic Area, Sandy Point Road State Scenic Area, Mary's Pond/Sisson Pond State Scenic Area, and Mitchell Lane State Scenic Area. Portions of the Paradise Avenue State Scenic Byway are located in the southeast corner of the visual study area. The byway was designated in 1993 and includes 8.3 miles of roads in Middletown leading to Sachuset Point on the Sakonnet River's entrance to the Atlantic Ocean (RIDOT, 2006).

Conservation lands are lands controlled by the State of Rhode Island, including conservation and recreation easements, and deeds to development rights for farms conserved by the Rhode Island Agricultural Land Preservation Commission (RIDEM, 2015). State-designated conservation lands are primarily located in the southern half of the visual study area and include the following resources:

- The Escobar Farm includes 74.85 acres and is the last remaining active dairy farm on Aquidneck Island (ALT, 2015).
- Wicks Nursery includes 39.42 acres in Portsmouth which is contiguous to a number of other local and state-designated conservation lands (ALT, 2015).
- Oakland Forest, a 33.59-acre forest that includes a 20-acre meadow and a forest stand considered to be one of the last old-growth forests in Rhode Island (ALT, 2015).

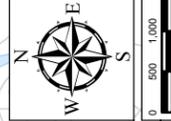
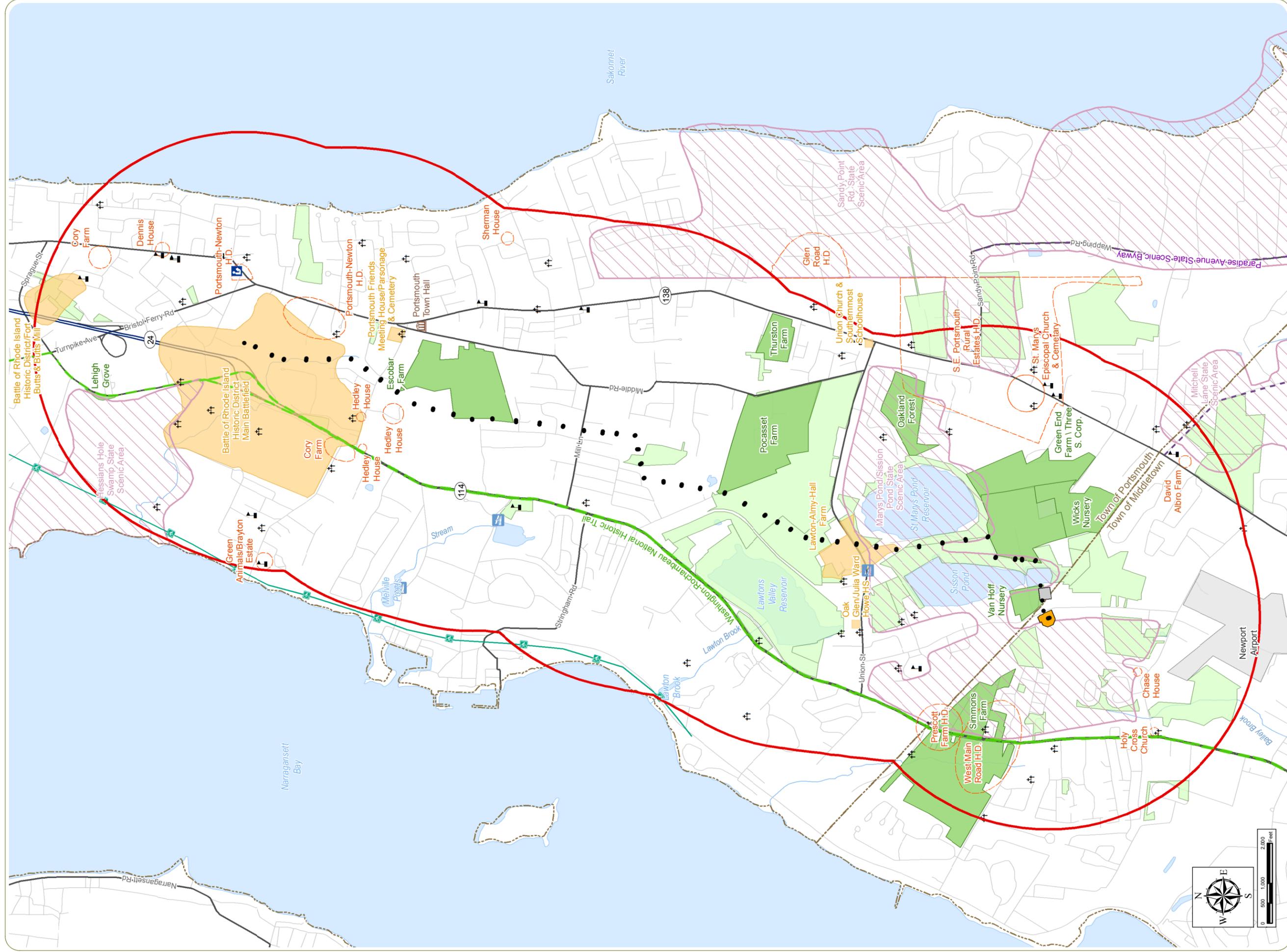
Additional state conservation lands located within the visual study area include the Pocasset Farm (91.09 acres), Van Hoff Nursery (62.17 acres), Simmons Farm (27.84 acres), Thurston Farm (17.52 acres), Green End Farm (46.17), and Lehigh Grove (1.34 acres) (RIDEM, 2015).

Local-designated conservation lands comprise a considerable quantity of visually sensitive resources within the study area. Many of the locally-designated lands are protected by the Aquidneck Island Land Trust, a not-for-profit organization founded in 1990 that has protected approximately 2,448 acres of land throughout Aquidneck Island to date (ALT, 2015). Locally-designated conservation lands are concentrated in the southern half of the visual study area on the north and south sides of Union Street. Larger locally-designated conservation lands within the study area include the Butts Hill Farm, Escobar Farm, Green Valley Country Club, Pocasset Farm, Sisson Pond, and Simmons Farm. Several of the locally-designated conservation lands are also designated as conservation lands and scenic areas by the State. A number of large water bodies are located within the conservation lands and scenic areas included in the visual study area, most notably Lawton Valley Reservoir, St. Mary's Pond Reservoir, and Sisson Pond. These water bodies are aesthetic components of the landscape, and while they are primarily located on private land, some are public recreational resources that are used for wildlife/nature observation and other activities.

3.4.3 Parks and Recreational Areas

According to the Rhode Island Geographic Information System database (URIEDC, 2014), the visual study area includes additional local recreational resources such as smaller water bodies, public water access points, and recreational paths that could be considered visually sensitive due to type or level of recreational use they receive. Notable examples include the Upper and Lower Melville Ponds, and the bike path along Narragansett Bay. In addition, several schools, libraries, cemeteries, and other areas of concentrated human activity that could be considered visually sensitive, are dispersed throughout the visual study area.

The location of all identified historic, recreational, natural, open space and scenic resources within the visual study area, as well as areas of intensive land use, are illustrated in Figure 6. They are also listed in Table A and overlaid on a Project viewshed map in Appendix A.



Aquidneck Island Reliability Project
 Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 6: Visually Sensitive Resources

March 2015

- † Cemetery
- † Library
- † School
- † Town Hall
- † Water Access
- † Bike Path
- Proposed Pole Location
- ◻ Airport
- ◻ Proposed Jepson Substation
- ◻ Existing Jepson Substation
- ◻ Visual Study Area
- ◻ Town Boundary
- National Historic Trail
- State Scenic Byway
- Historic Site/District
- Historic Candidate Site
- State Scenic Areas
- State Conservation Land
- Local Park/Conservation Land



Notes: 1. Basemap: ESRI StreetMap North America, 2008.
 2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

4.0 VISUAL IMPACT ASSESSMENT METHODOLOGY

The VIA procedures used for this study are consistent with methodologies developed by various state and federal agencies, including the U.S. Department of the Interior, Bureau of Land Management (1980), U.S. Department of Agriculture, National Forest Service (1974), the U.S. Department of Transportation, Federal Highway Administration (1981), and the New York State Department of Environmental Conservation (not dated, 2000). The specific techniques used to assess potential Project visibility and visual impacts are described in the following section.

4.1 Project Visibility

An analysis of Project visibility was undertaken to identify those locations within the visual study area where there is potential for the proposed transmission lines and substation structures to be seen from ground-level vantage points. This analysis included identifying potentially visible areas on viewshed maps and evaluating potential Project visibility in the field. The methodology employed for each of these assessment techniques is described below.

4.1.1 Viewshed Analysis

Viewshed maps define areas of potential Project visibility by identifying areas within the study area that could have an unobstructed line of sight from the viewer to any portion of one or more of the proposed transmission structures (NYSDEC, not dated). To evaluate potential Project visibility, EDR performed viewshed analyses of the existing and proposed transmission line structures, including the tallest structures proposed to be located within the new Jepson Substation. The viewshed analyses were based on data provided by TNEC, indicating the location and height of all existing and proposed structures along the transmission line corridor. Heights of existing structures evaluated in this analysis ranged from 47.5 feet to 67 feet, while heights of the proposed transmission structures ranged from 80 feet to 105 feet. Three of the proposed substation structures are 60 feet tall; one located within the Dexter Substation and two located within the proposed new Jepson Substation. Only one 105-foot tall structure is proposed, located between Sisson Pond and the existing Jepson Substation. All remaining proposed structures are in the range of 80 to 95 feet tall. Topographic viewshed maps for the Project were prepared using USGS digital elevation model (DEM) data (7.5-minute series), the location and height of all proposed structures, an assumed viewer height of 5.5 feet, and ESRI ArcGIS® software with the Spatial Analyst extension. Two 1-mile radius topographic viewsheds were mapped, one to illustrate potential visibility of the proposed structures, and the other to illustrate potential visibility of the existing transmission structures already on the ROW (see Figure 7, Sheet 1).

The ArcGIS program defines the viewshed (using topography only) by reading every cell of the DEM data and assigning a value based upon the existence of a direct, unobstructed line of sight to transmission structure location/elevation coordinates from observation points throughout the 1-mile study area. The resulting topographic viewshed maps define the maximum area from which any portion of any structure in the completed Project could potentially be seen within the study area based on the existence of a direct line of sight, and ignoring the screening effects of existing vegetation and structures. Its accuracy is directly related to the accuracy of the USGS DEM data used in the analysis. The resulting viewshed map for the existing transmission line structures and the viewshed map for the new transmission line structures were then overlaid and compared to show the areas of potential increased or decreased visibility resulting from construction of the proposed Project.

Because the screening provided by vegetation and structures is not considered in this specific analysis, the topographic viewshed represents a "worst case" assessment of potential Project visibility. Topographic viewshed maps assume that no trees exist, and therefore are very accurate in predicting where visibility will not occur due to topographic interference. However, they are less accurate in identifying areas from which the Project would actually be visible. Trees and buildings can limit or eliminate visibility in areas indicated as having potential Project visibility in the topographic viewshed analysis.

To supplement the topographic viewshed analysis, a vegetation viewshed was also prepared to illustrate the potential screening provided by forest vegetation (see Figure 7, Sheet 2). A base vegetation layer was created using the USGS 2006 National Land Cover Dataset (NLCD) to identify the mapped location of forest land (including the Deciduous Forest, Evergreen Forest and Mixed Forest NLCD classifications). Based on standard visual assessment practice, the mapped locations of the forest land was assigned a conservative assumed height of 40 feet and added to the DEM. The viewshed analysis was then re-run, as described above. As with the topographic viewshed analysis, the potential visibility of both the existing and proposed structures was evaluated. Once the viewshed analysis was completed, the areas covered by the forest vegetation layer were designated as "not visible" on the resulting data layer. Although there are certainly areas of mapped forest that have natural or man-made clearings that provide open outward views, these openings are typically narrow/enclosed and would include little of the proposed Project. In most forested areas, outward views will be well screened by tree trunks, branches and/or the overhead tree canopy. During the growing season the forest canopy will generally fully block views of the proposed structures, and such views will typically be almost completely obscured, or at least significantly screened, even under "leaf-off" conditions.

Because it accounts for the screening provided by mapped forest stands, the vegetation viewshed is a much more accurate representation of potential Project visibility. However, it is important to note that screening provided by buildings and street/yard trees, as well as characteristics of the proposed transmission structures that influence visibility

(color, narrow profile, distance from viewer, etc.), are not taken consideration in the viewshed analyses. These factors can limit or eliminate Project visibility. Consequently, being within the vegetation viewshed does not necessarily equate to actual Project visibility.

4.1.2 Field Verification

Visibility of the transmission line portion of the proposed Project was also evaluated in the field on April 28 and May 7, 2014. Sunny to partly cloudy skies resulted in good visibility throughout both days. Subsequent field visits occurred on May 21 and November 19 to obtain additional viewpoints of the proposed location of the new Jepson Substation. A field visit to photograph substations proposed for removal occurred on January 16, 2015.

During the field verification, an EDR field crew drove public roads and visited public vantage points within the 1-mile radius study area to document locations from which the transmission line would likely be visible, partially screened, or fully screened. Photos were taken from 146 representative viewpoints within the study area (see Figure 8). All photos were obtained using a digital SLR camera with focal length set between 28 and 35 mm (equivalent to between 45 and 55 mm on a standard 35 mm film camera). This focal length is the standard used in visual impact assessment because it most closely approximates normal human perception of spatial relationships and scale in the landscape. Photo resolution was a minimum of 10 megapixels. Viewpoint locations were determined using a hand-held global positioning system (GPS) unit and high resolution aerial photographs (digital ortho quarter quadrangles). The time and location of each photo was documented on all field data sheets (see Appendix B). Viewpoints photographed during field review generally represented the most open, unobstructed available views toward the Project site.

4.2 **Project Visual Impact**

Beyond evaluating potential visibility of the rebuilt transmission lines, the VIA also examined the visual impact of the proposed Project on the aesthetic resources and viewers within the visual study area. This assessment involved creating computer models of the proposed Project structures, selecting representative viewpoints within the study area, and preparing computer-assisted visual simulations of the proposed Project. These simulations were then used to characterize the type and degree of visual impact resulting from Project construction. Details of the visual impact assessment procedures are described below.

4.2.1 Viewpoint Selection

From the photo documentation conducted during field verification, EDR selected a total of 10 viewpoints for development of visual simulations. Seven of these viewpoints were selected to illustrate views of the proposed

transmission lines, two viewpoints were selected provide views of the new Jepson Substation, and one viewpoint was selected to illustrate removal of the old Jepson substation. These viewpoints were selected based upon the following criteria:

1. They provide open views of the Project (as determined through field evaluation).
2. They illustrate typical views from landscape similarity zones and sensitive resources where views of the Project will be available.
3. They illustrate typical views of the proposed Project that will be available to representative viewer/user groups within the visual study area.
4. They illustrate views from a variety of viewer distances and directions, to illustrate the range of Project visibility and visual change that will occur with the Project in place.

It is worth noting that all of the selected viewpoints fall within the Suburban Residential and Rural Residential/Agricultural LSZs. They are also all less than 0.5 mile from the proposed Project, and thus all fall within the foreground viewing distance. In this regard, these viewpoints present potential “worst case” visibility and visual impact of the AIRP. Locational details and the criteria for selection of the viewpoints selected for simulation are summarized in Table 1.

Table 1. Viewpoints Selected for Simulations and Evaluation

VP #	Viewpoint Location	Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance	View Orientation ²
Transmission Line Viewpoints						
16	Hedly Street	-	Suburban Residential	Residents, Travelers	~50 feet	NE
20	Hedly Street	Historic Site	Rural Residential/Agricultural	Residents, Travelers	~790 feet	S
26	Middle Road	Conservation Land	Rural Residential/Agricultural	Residents, Travelers, Visitors	~1,865 feet	W
31	Full Circle	-	Suburban Residential	Residents	~255 feet	N
60	Union Street	-	Rural Residential/Agricultural	Residents, Travelers, Visitors	~1,360 feet	SW
88	Jepson Lane	Scenic Area	Rural Residential/Agricultural	Residents, Travelers	~890 feet	E
97	Union Street	Historic District	Rural Residential/Agricultural	Residents, Travelers	~75 feet	N
Substation Viewpoints						
129	Jepson Lane	-	Rural Residential/Agricultural	Residents, Travelers	~55 feet	W
141	Jepson Lane	-	Rural Residential/Agricultural	Residents, Travelers	~410 feet	NW

VP #	Viewpoint Location	Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance	View Orientation ²
84	Jepson Lane	-	Rural Residential/Agricultural	Residents, Travelers	~310 feet	E

¹Distance measured in miles from viewpoint to proposed Project structure

²N = North, S = South, E = East, W = West

4.2.2 Visual Simulations

To show anticipated visual changes associated with the proposed Project, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the transmission lines and substation from each of the 10 selected viewpoints. The photographic simulations were developed by using Autodesk 3ds Max® software to create a simulated perspective (camera view) to match the location, bearing, and focal length of the existing conditions photograph. Existing elements in the view (e.g., buildings, existing transmission structures, roads) were modeled based on aerial photographs and DEM data in AutoCAD Civil 3D®. A three dimensional ("3-D") topographic mesh of the landform (based on DEM data) was then brought into the 3-D model space. At this point minor adjustments were made to camera and target location, focal length, and camera roll to align all modeled elements with the corresponding elements in the photograph. This assures that any elements introduced to the model space (i.e., the proposed transmission structures and substation) will be shown in proportion, perspective, and proper relation to the existing landscape elements in the view. Consequently, the alignment, elevations, dimensions and locations of the proposed Project structures will be accurate and true in their relationship to other landscape elements in the photograph.

Three dimensional (3D) computer models of the proposed transmission structures and new Jepson Substation were prepared based on specifications and data provided by TNEC (see representations of 3-D models in Figure 3). Using the camera view as guidance, the visible portions of these modeled Project components were imported to the landscape model space described above, and set at the proper coordinates. A grading/site plan for the substation, along with coordinates for proposed transmission structures, were provided to EDR by TNEC. For the purposes of this visual impact assessment, all substation components were assumed to be galvanized steel or otherwise gray in color, and all new transmission structures were assumed to be self-weathering steel poles with brown insulators.

Once the proposed Project was accurately aligned within the camera view, a lighting system was created based on the actual time, date, and location of the photograph. Using the Mental Ray Rendering System® with Final Gather and Mental Ray Daylight System® within the Autodesk 3ds MAX® software, light reflection, highlights, color casting, and shadows were accurately rendered on the modeled Project based on actual environmental conditions represented in the photograph.

The rendered Project was then superimposed over the photograph in Adobe Photoshop CS3® and portions of the Project that fall behind vegetation, structures or topography were masked out. Photoshop software was also used to take out any existing structures or vegetation proposed to be removed as part of the Project. Once the new Project components were added to the photo, any shadows cast on the ground by the proposed structures were also included by rendering a separate “shadow pass” over the DEM model in Autodesk 3ds Max® and then overlaying the shadows on the simulated view with the proper fall-off and transparency using Adobe Photoshop CS3®. A conceptual planting plan for the new Jepson Substation was also provided by TNEC. The plan recommended the addition of tree and shrub plantings around the perimeter of the station. Using this plan as guidance, plantings of junipers were added to the new Jepson Substation simulations at the height they would likely achieve in approximately 5-7 years following installation. The junipers added to the simulations were provided from EDR’s in-house digital library.

4.2.3 Visual Impact Evaluation

To evaluate anticipated visual changes associated with the proposed Project, the photographic simulations of the completed Project (as described above) were compared to photos of existing conditions. These “before” and “after” photographs, identical in every respect, except for the Project components shown in the simulated views, were printed in 11 x 17 inch format for each selected viewpoint. A licensed EDR landscape architect was then asked to determine the effect of the proposed Project on visual conditions, in terms of its contrast with existing components of the landscape (land form, vegetation, land use, water and sky). The methodology utilized in this evaluation is a simplified version of the U.S. Department of the Interior, Bureau of Land Management (BLM) contrast rating methodology (USDI BLM, 1980). The rating form was developed by EDR, and has been used for visual impact evaluation on numerous energy generation and transmission projects in New York and New England. Along with having proven to be accurate in predicting public reaction to these projects, this methodology 1) documents the basis for conclusions regarding visual impact, 2) allows for independent review and replication of the evaluation, and 3) allows a large number of viewpoints to be evaluated in a reasonable amount of time without “burn-out” of the evaluator.

Visual impact rating form instructions were provided to the landscape architect to clarify terms and understanding of what information was requested in the rating forms. The instructions provided: background concerning the LSZs, viewer types, and visually sensitive resources in the study area; guidance regarding how best to describe landscape components depicted in each viewpoint (e.g., in terms of landscape composition, form, line, color, texture, focal point, order, atmospheric conditions, lighting direction, and visual clutter); guidance regarding evaluation of viewpoint sensitivity (in terms of both scenic quality and viewer exposure); and guidance regarding terms and concepts used in contrast rating. The visual impact rating form instructions (see Appendix C) included the following guidance to ensure

consistency and reliability in the landscape architect's understanding of what should be considered for each of the factors under consideration:

Landform: Please consider the effect of the project relative to the appearance of the landform or topography, including the strength and range of color, the density of relief, the space as defined by the landform, and the extent of its scale.

Because this is a transmission line rebuild, key considerations relative to landform may include the vertical scale relationship and spatial presence/prominence of the proposed structures relative to existing topography and other landscape elements, including existing utility structures. Relevant considerations include the form, size, and spacing of the proposed structures relative to landscape elements in the view.

Vegetation: Please consider the effect of the project relative to the appearance of the form(s) and variety of vegetation, including the extent of clearing, the range of color, the density of texture, space as defined by the vegetation, and its hierarchy/diversity of scale.

Key considerations for a transmission line rebuild relative to vegetation include change in vertical scale of the proposed structures relative to vegetation in the view, proposed vegetation clearing associated with right-of-way expansion of the existing ROW, and the color of the proposed transmission structures. The introduction of transmission structures into an otherwise "natural" setting that does not include visible utility infrastructure is likely to be perceived as generally less compatible (or greater contrast). In areas with existing electrical infrastructure, the replacement, alteration, or addition of transmission structures is generally less likely to attract attention or be perceived as incompatible with the existing setting. Structures that are consistent in color or tone with their back-drop, such as brown structures against a forested backdrop, are less likely to attract viewer attention.

Land Use: Please consider the effect of the project relative to the appearance of identifiable land use(s) in the view, and evaluate the degree to which the project is compatible/consistent with the appearance of existing land use(s) in the view.

The key considerations for a transmission line rebuild relative to land use are the natural and man-made features of the landscape that define its dominant character. The type and extent of existing development and the compatibility of the proposed changes to the utility infrastructure with their setting – including whether similar structures are present in the existing view – should be considered. In instances where similar infrastructure or other man-made features are not apparent in the existing view, the proposed project is more likely to attract viewer attention and may be perceived as less compatible with existing land use. In areas with existing electrical infrastructure, the replacement, alteration, or addition of transmission structures is generally less likely to attract attention or be perceived as incompatible with the existing setting.

Water: Please consider the effect of the project relative to the appearance of water features in terms of the form of the water body(ies), its (their) shorelines, color, and texture (which refers here to movement) reflection, degree of enclosure, and the scale or extent of the presence of water in the view.

Waterbodies typically attract viewer attention, provide a focal point in the view, and are generally associated with higher scenic quality. Key considerations for a transmission line rebuild relative to waterbodies is the degree to which the changes to the view resulting from the project obstruct, compete with, or distract from the viewer's attention to, and/or enjoyment of, the waterbody as a focal point or scenic element in the view. This effect is often a function of the project's proximity to the water and/or the viewer's distance from the project.

Sky: Please consider the effect of the project relative to the appearance of the sky in terms of form (including the appearance of clouds), the edges of its lines (perhaps in terms of the horizon), clarity of color, texture (which here could refer to cloudiness or other atmospheric conditions), the degree of openness or enclosure, and the scale or extent of the sky in the view.

Key considerations for a transmission line rebuild relative to sky include potential changes in height of the proposed structures relative to existing structures and the effect of color. Visual contrast is generally increased if the proposed structures appear significantly taller and/or appear significantly more prominent relative to existing structures and the horizon in the view. Structures that are "skylined" or silhouetted on the horizon typically result in greater visual contrast. The color of the proposed structures can also affect the degree of contrast, with lighter poles often appearing less prominent against the back-drop of the sky.

Viewer Activity: Please consider the effect of the project on the viewer's perception of the scenic quality and potential viewer enjoyment of the view, taking into account the viewpoint location and context, viewer type, and duration of the view.

The key consideration for a transmission line rebuild relative to viewer activity is the degree to which the proposed project would compete for viewer attention and/or decrease the viewer's enjoyment of whatever activity in which they are engaged. Viewers engaged in activities such as outdoor recreation and sightseeing would generally be more sensitive to visual impact than those commuting or participating in athletic events. In instances where similar or comparable infrastructure is not apparent in the existing view, the proposed project is more likely to attract viewer attention and may be perceived as less compatible with existing viewer activities. In areas with existing electrical infrastructure, the replacement, alteration, or addition of transmission structures is generally less likely to attract attention or be perceived as incompatible with the viewer activities.

The landscape architect then evaluated the before and after views from each viewpoint, and assigned each view showing the proposed Project quantitative contrast ratings on a scale of 0 (insignificant) to 4 (strong). The ratings were based on consideration of five landscape components (landform, vegetation, land use, water, and sky), as well as viewer activity. Comments were solicited on the observed degree of contrast, variables that might alter perceived contrast, and overall effect on scenic quality. The contrast ratings and comments provided by the landscape architect were reviewed to generate narrative descriptions of the existing setting and the overall visual impact of the Project on the landscape, aesthetic resources, and viewers represented by each of the selected viewpoints.

5.0 VISUAL IMPACT ASSESSMENT RESULTS

5.1 Project Visibility

5.1.1 Viewshed Analysis

Potential Project visibility, as indicated by the viewshed analyses, is illustrated in Figure 7 and summarized in Table 2. Topographic viewshed analysis revealed that approximately 82.3% of the visual study area could have potential views of the proposed Project, an increase of approximately 6.5% as compared to visibility of the existing transmission line. This number reflects the fact that, based on topography alone, a large portion of the study area already has potential views of the existing structures. The topographic viewshed of the existing lines covers 75.8% of the study area, disregarding screening provided by existing vegetation and man-made structures (see Table 2).

As indicated by the topographic viewshed analysis, areas of increased potential visibility occur throughout the study area, generally as small expansions along the edges of areas already exhibiting potential visibility of the existing transmission structures (Figure 7, Sheet 1). Larger areas of increased potential visibility are found in the vicinity of Route 114, between the intersections with Hadley Street and Passage Drive and also near the intersection with Union Street; along, and to the east of, State Route 138; and an area around Bailey Brook and the Newport Airport. Some increase in potential visibility may be experienced from certain visually sensitive resources, as indicated in Appendix A. However, most of these sites are already in the viewshed of the existing lines. According to the topographic viewshed analysis, sites that may have a view of the proposed transmission lines, where the existing lines are currently screened from view by intervening topography include: Glen Road candidate historic district and Dennis House candidate historic site, Greenscape LLC local conservation area, Pennfield School, and the Children's School.

Although it does not account for all potential sources of visual screening (e.g., man-made structures and small groups of trees) factoring mapped forest vegetation into the viewshed analysis significantly reduces the area where direct lines of sight toward the Project could potentially be available, and is a more accurate reflection of what the actual extent of Project visibility is likely to be (Figure 7, Sheet 2). Within a 1-mile radius, the vegetation viewshed analysis indicates that approximately 59.3% of the area could have potential views of some portion of the Project based on the availability of an unobstructed line of sight. The majority of the visual study area has undergone some level of development, but areas of mapped forest are scattered through most of the study area. The northeastern and east central portions of the study area are the exception, as they lack areas of mapped forest land almost entirely. As indicated in Table 2, when considering the screening effect of both topography and vegetation, areas of potential transmission line visibility within the visual study area increase by 7.9% when compared to the vegetation/topographic viewshed of the existing

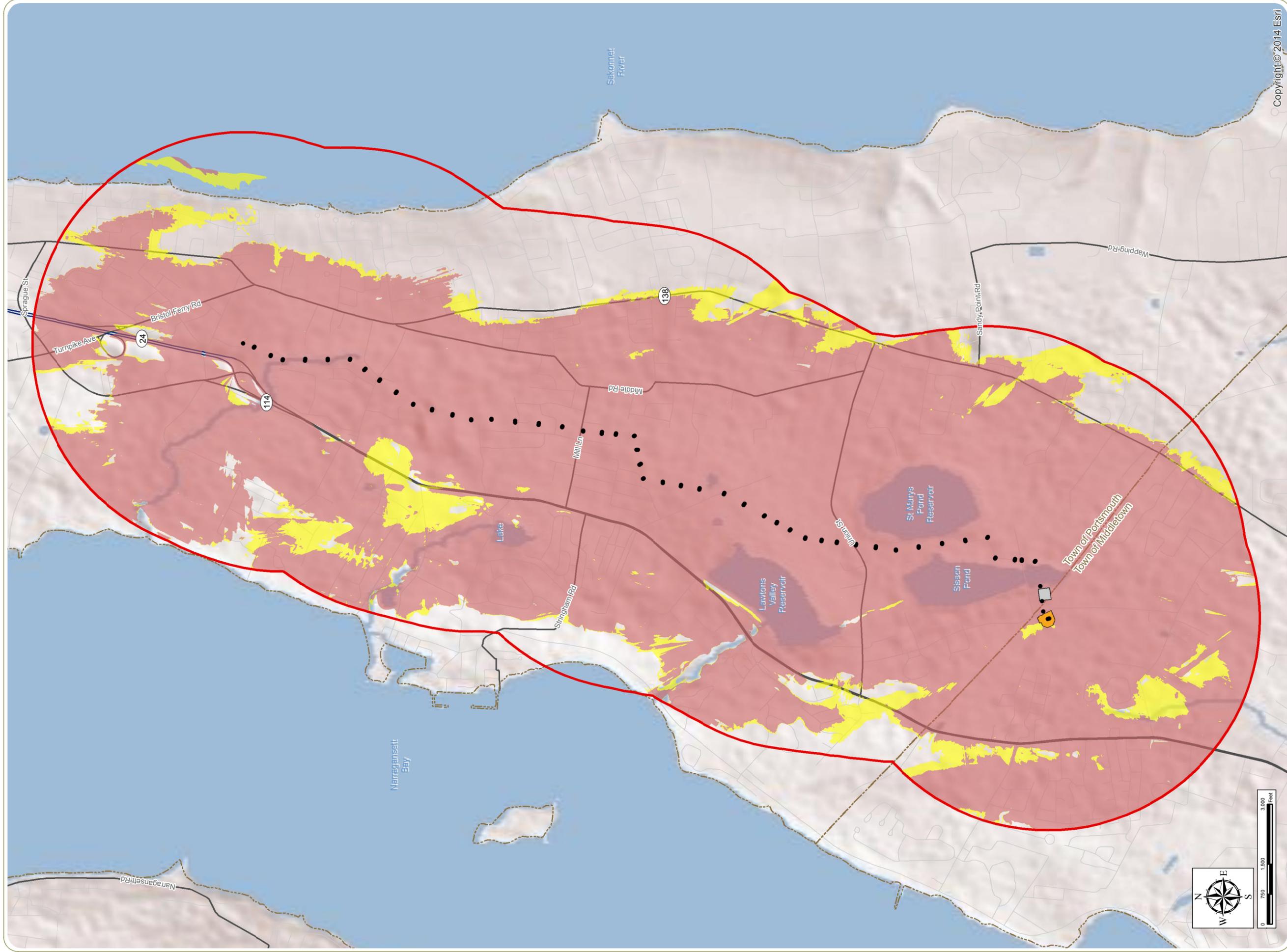
transmission line. According to the viewshed analysis, sites that may have a view of the proposed transmission lines that are currently screened from view of the existing lines by intervening topography and forest vegetation include: Glen Road and Prescott Farm candidate historic districts and Dennis House and David Albro Farm candidate historic sites; Glenn Farm, Three S. Field, Crystal Spring Water Company, and Huntington Farm local conservation/recreation areas; Sakonnet River and Bailey Brook; Children's School, Pennfield School and Little Friends preschool; and Union, Trinity and Holy Cross Church Cemeteries.

As mentioned previously, being within the Project viewshed does not equate to Project visibility, which needs to be verified in the field (see Section 5.1.2). Areas of actual visibility are anticipated to be more limited than indicated by the vegetation viewshed analysis, due to the slender profile of the transmission structures, the effects of distance, and screening provided by yard trees, street trees and buildings in the study area, all of which are not considered in the viewshed analysis. In addition, the analysis assumed 40 foot trees, when in fact a number of these forested areas are dominated by trees taller than this height.

Table 2. Viewshed Analysis Summary

Type of Viewshed	Visual Study Area		
	Total Area (Square Miles)	Visible Area (Square Miles)	%
Existing Structures - Topography Only	11.5	8.7	75.8%
Proposed Structures - Topography Only	11.5	9.5	82.3%
Existing Structures - Topography & Vegetation	11.5	5.9	51.4%
Proposed Structures - Topography & Vegetation	11.5	6.8	59.3%

¹USGS Digital Elevation Model data does not include the portion of the visual study area within the Sakonnet River beyond approximately 600 feet of the shoreline. As a result, the "total area" considered in the viewshed analysis is 0.2 square miles smaller than the size of the visual study area (11.7 square miles).



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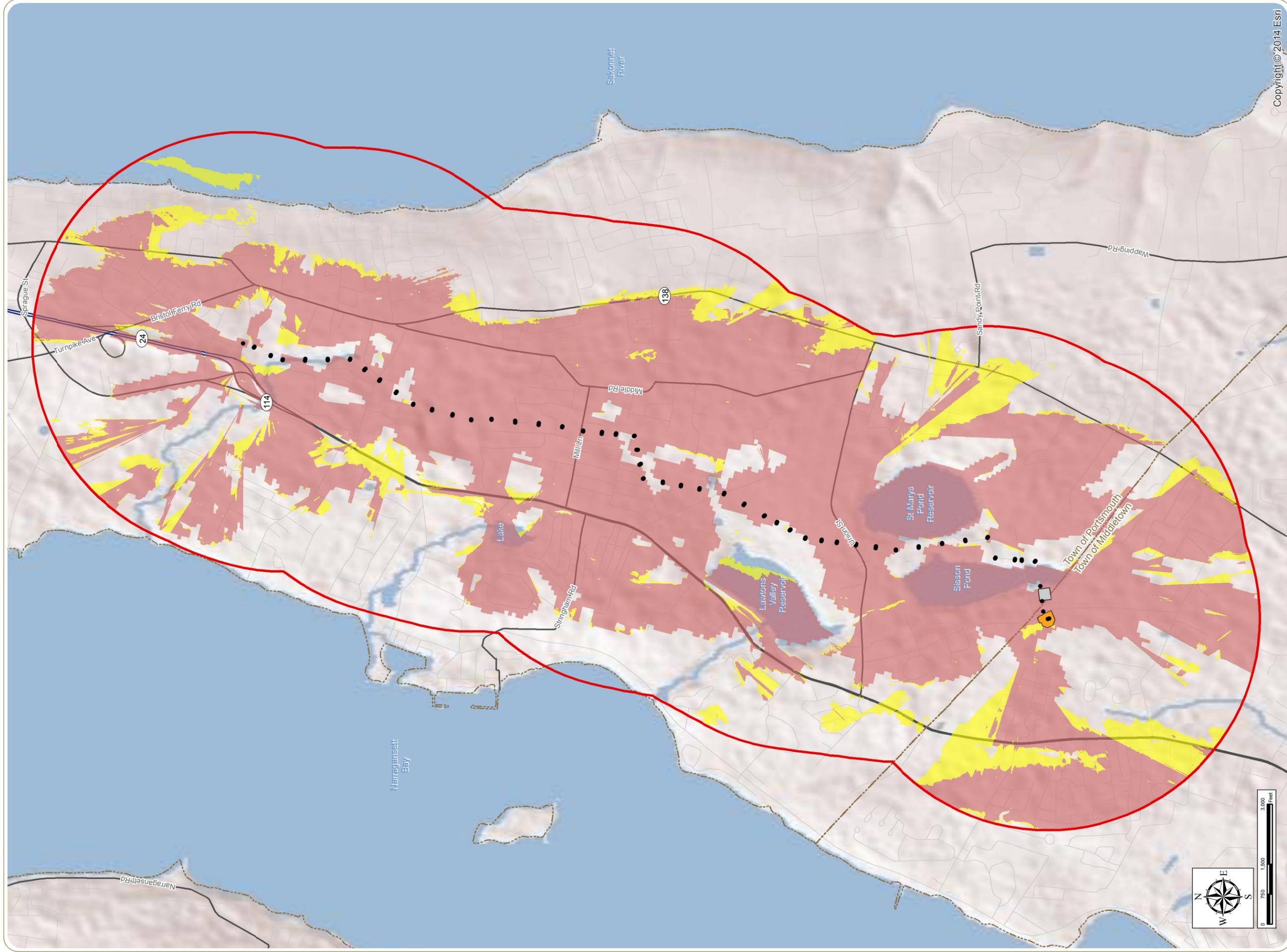
- Proposed Pole Location
- Existing Visibility (Area that already has a View of Existing Transmission Structures)
- Newly Visible Area (Area without View of Existing Transmission Structures)
- Proposed Jepsen Substation
- Existing Jepsen Substation
- Visual Study Area
- Town Boundary

Aquidneck Island Reliability Project
 Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 7: Viewshed Analyses
 Sheet 1 of 2: Visibility Based on Topography Only

March 2015

- Notes:
1. Basemap: ESRI/ArcGIS Online "World Shaded Relief" Map Service and ESRI StreetMap North America, 2008.
 2. Potential Project visibility based on topography only. Screening effects of buildings, trees or other factors are not accounted for.
 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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Aquidneck Island Reliability Project Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 7: Viewshed Analyses
Sheet 2 of 2: Visibility Based on Topography and Vegetation

March 2015

- Notes:
1. Basemap: ESRI ArcGIS Online "World Shaded Relief" Map Service and ESRI StreetMap North America, 2008.
 2. Potential Project visibility based on topography and potential screening by mapped forest vegetation (with an assumed height of 40 feet).
 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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| <ul style="list-style-type: none"> ● Proposed Pole Location ■ Existing Visibility (Area that already has a View of Existing Transmission Structures) ■ Newly Visible Area (Area without View of Existing Transmission Structures) | <ul style="list-style-type: none"> ■ Proposed Jepsen Substation ■ Existing Jepsen Substation □ Visual Study Area □ Town Boundary |
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5.1.2 Field Evaluation

Field review suggests that actual Project visibility is likely to be more limited than suggested by viewshed mapping. The combined effect of vegetation (forest areas, street trees, and yard vegetation) and buildings throughout the study area is to screen (or partially screen) views of the Project from many locations (see Figure 8 and Appendix B). The results of EDR's field review are summarized below and organized generally according to 1) visibility from major roadways and commercial areas, 2) visibility from developed residential areas, 3) visibility in areas with forest vegetation, and 4) visibility from sensitive sites (including agricultural lands) within the study area.

The major roadways within the study area include State Routes 24, 114, and 138. For the most part, the visual character along these roadways is defined by developed commercial areas. In most locations along these roadways, buildings and vegetation screen outward views from the roadway, including views toward the Project (Photo Insets 8-10).

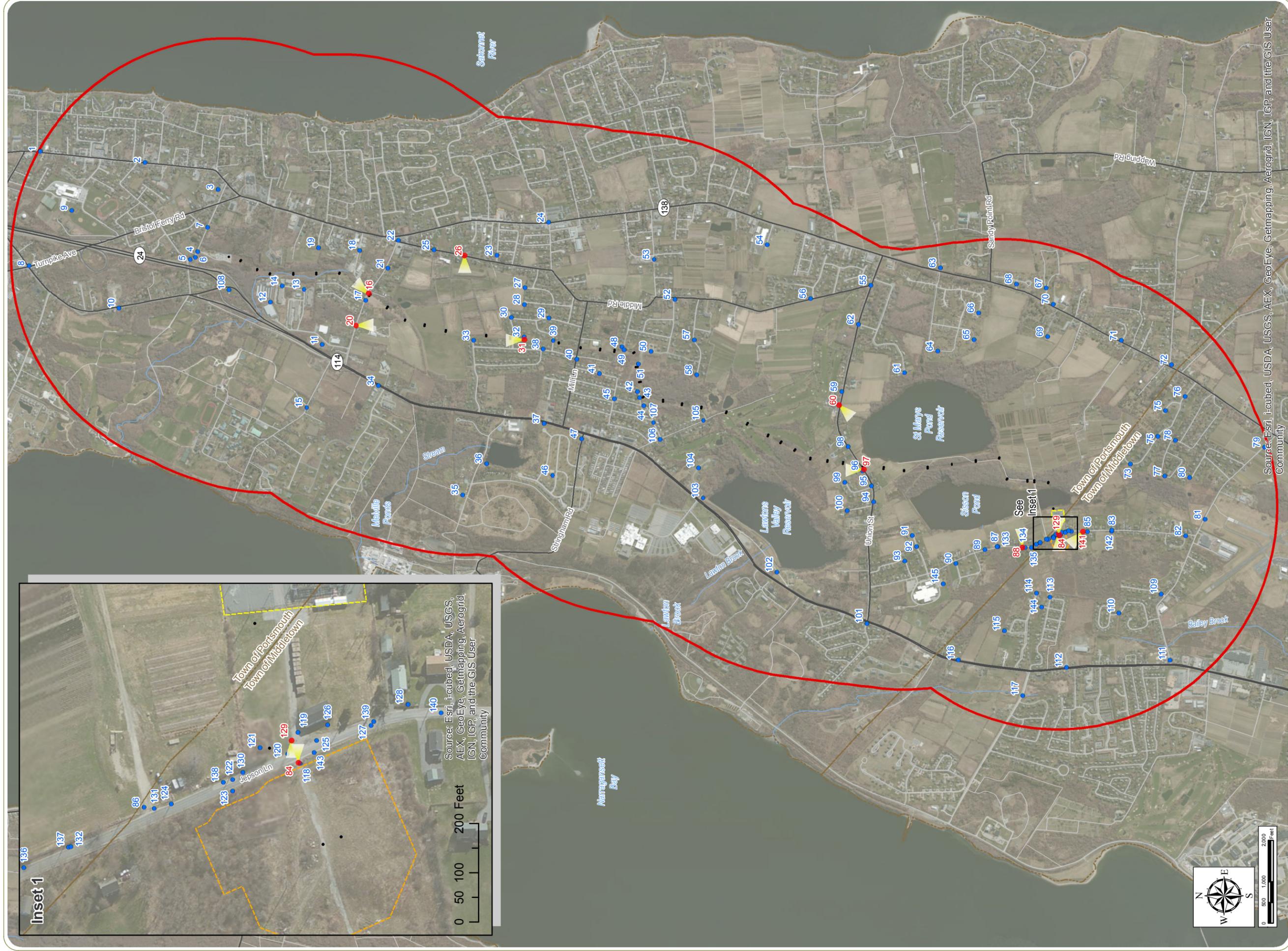


Photo Inset 8. Viewpoint 1: View toward the Project (screened) from RI Route 138 (above, left).

Photo Inset 9. Viewpoint 24: View toward the Project (screened) from RI Route 138 at Fairview Lane/Stub Toe Lane (above, center).

Photo Inset 10. Viewpoint 47: View toward the Project (screened) from RI Route 114 at Stringham Road (above, right).

However, the existing 61 and 62 Transmission Lines were visible (and therefore, the Project would be visible) from major roadways in a few locations. Views of the Project in these instances would be fleeting, partial views over roadside vegetation and structures or through gaps in the vegetation. For instance, the existing transmission lines are visible from Route 114 in the area of Lehigh Grove (Viewpoint 10; see Photo Insets 11 and 12). From this elevated vantage point, the transmission lines are visible on the slope rising opposite the viewer in the direct line of sight for a driver or passenger traveling on this road. It is worth noting, however, that vehicles on this roadway travel at relatively high speeds and drivers' (and passengers') attention will generally be focused on the roadway, so the Project may not attract viewer attention in this location. In addition, the top of a single structure from the existing transmission lines was visible from at least one location further to the south on Route 114 (at Russo Road; Viewpoint 37 – see Photo Inset 13). Because the proposed replacement structures will be taller, it is likely that the upper portions of the proposed transmission structures will be visible from some areas along this portion of Route 114.



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Figure 8: Viewpoint Location Map

- Viewpoint
- Simulation Viewpoint
- Proposed Pole Location
- Existing Jepson Substation
- Proposed Jepson Substation
- Visual Study Area
- Town Boundary





Photo Inset 11. Viewpoint 10: View toward the Project (partially visible) from RI Route 114 at Lehigh Grove (above, left).
 Photo Inset 12. Viewpoint 20: Detail (zoomed) of view toward the Project (partially visible) RI Route 114 at Lehigh Grove (above, center).
 Photo Inset 13. Viewpoint 37: View toward the Project (partially visible) from RI Route 114 at Russo Road (above, right).

Significant portions of the study area are densely developed residential areas (see Figure 5). The viewshed analysis (considering vegetation as well as topography) indicates potential Project visibility from a large portion of these areas (see Figure 7: Sheet 2). However, field review revealed that from most areas located more than approximately 0.25-mile from the Project, the combination of screening provided by buildings, trees, and other vegetation in yards and along roadsides effectively obscures views toward the Project site (Photo Insets 14-16).



Photo Inset 14. Viewpoint 7: View toward the Project (screened) from Freeborn and Gorton Streets (above, left).
 Photo Inset 15. Viewpoint 21: View toward the Project (screened) from Hedly Street (above, center).
 Photo Inset 16. Viewpoint 55: View toward the Project (screened) from Union Street at Middle Lane (above, right).

In most residential areas, clear views of the existing transmission line structures are available only from streets and yard areas immediately adjacent to the transmission line ROW (see Photo Insets 17-19 for representative examples). Many of these areas are relatively recent subdivisions where houses have been built in close proximity to the existing lines. The existing transmission lines are (and therefore, the Project will be) very visible and visually prominent from many of these areas.



Photo Inset 17. Viewpoint 30: Proximity and visibility of the Project relative to residences on Center View Drive (above, left).

Photo Inset 18. Viewpoint 32: Proximity and visibility of the Project relative to residences on Full Circle (above, center).

Photo Inset 19. Viewpoint 38: Proximity and visibility of the Project relative to residences on Hilltop Drive (above, right).

Forested areas within the study area are relatively small, dis-contiguous areas interspersed with developed residential and commercial areas. Forest vegetation typically screens outward views – including views of the existing transmission structures (see Photo Insets 20-22). From elevated vantage points where the transmission lines are located in areas of dense vegetation, the vegetation does not completely screen the transmission structures but does it make it difficult to discern them, and generally reduces viewer awareness of the facilities (see Photo Inset 22).



Photo Inset 20. Viewpoint 35: View toward the Project illustrating the screening effect of vegetation from Melville Recreation Area (above, left).

Photo Inset 21. Viewpoint 64: View toward the Project illustrating the screening effect of vegetation from Oakland Farm Drive (above, center).

Photo Inset 22. Viewpoint 69: Detail (zoomed) of view toward Project illustrating the screening effect of vegetation (one transmission structure is partially visible) from St. Mary's Episcopal Church on East Main Road/RI Route 138 (above, right).

Visually sensitive sites are located throughout the study area (see Section 3.4; Figure 6). Views from sensitive sites toward the Project are highly variable based on distance to the Project and the relative openness of the view. In general, sensitive sites located beyond approximately 0.25-mile from the Project have partially or completely screened views of the Project. Open views of the existing transmission lines are available from many of the sensitive sites located within approximately 0.25-mile of the Project, although even at close distances visibility is variable due to the screening effect of buildings and vegetation.

The Battle of Rhode Island Historic District Main Battlefield is a National Historic Landmark located in the northern portion of the study area (the northern portion of the existing 61 and 62 Transmission Lines is located within the Battlefield). The area designated as the Battlefield also includes the Portsmouth Business Park which is a heavily developed area with office buildings and light-industrial facilities, densely developed residential areas, and significant

transportation routes – including elevated, four-lane portions of State Route 24. A monument commemorating the battle is located in Heritage Park (Photo Inset 23), which is a small park set atop the peak of a ridge located on Highpoint Avenue within the Portsmouth Business Park. The existing transmission lines are partially visible from Heritage Park, although significantly screened by forest vegetation (Photo Inset 24). Moreover, the existing views within the Battlefield (particularly within the Portsmouth Business Park) include an abundance of modern development and infrastructure, and the integrity of this historic site's setting is significantly compromised (Photo Insets 24-25). The Project will not affect the integrity of the setting for the site, which has already been compromised by existing modern development.



Photo Inset 23. Viewpoint 11: Commemorative sign for the Battle of Rhode Island at Heritage Park (above, left).

Photo Inset 24. Viewpoint 11: View toward the Project illustrating the screening effect of vegetation and visual character of the Portsmouth Business Park from Heritage Park, which is a commemorative site for the Battle of Rhode Island (above, center).

Photo Inset 25. Viewpoint 12: View of the Project (visible) illustrating the visual character of the Portsmouth Business Park, within the Battle of Rhode Island Historic District Main Battlefield (above, right).

Other NRHP-listed and/or eligible candidate sites within the study area where the existing transmission lines are visible (and therefore the Project will be visible) include the Lawton-Almy-Hall Farm on Union Street (Photo Inset 26), the Escobar Farm on Middle Road (Photo Inset 27), and the Hedley Farm on Hedly Street (Photo Inset 28). Limited or partially screened views of the existing transmission lines are available from Portsmouth Friends Meeting House/Parsonage and Cemetery at the junction of Middle Road, Hedly Street, and East Main Road/State Route 138 (Photo Inset 29) and St. Mary's Episcopal Church and Cemetery (see Photo Inset 22). From most of the historic sites within the study area, views of the existing transmission lines are screened by intervening topography, vegetation, and/or buildings, such as the Cory Farm on East Main Road/RI Route 138 (see Photo Inset 8), the Battle of Rhode Island Historic District Fort Butts and Butts Mill (Photo Inset 30), and the Union Church and Southernmost Schoolhouse at the junction of Union Street and East Main Road (Photo Inset 31).



Photo Inset 26. Viewpoint 96: Open view of the existing transmission line and Project from Union Street at Lawton-Almy-Hall Farm (above, left).
 Photo Inset 27. Viewpoint 97: Open view of the existing transmission line and Project from Middle Road at Escobar Farm (above, center).
 Photo Inset 28. Viewpoint 40: Open view of the existing transmission line and Project from Hedly Street at Hedley Farm (above, right).



Photo Inset 29. Viewpoint 22: View toward the Project (mostly screened) from Portsmouth Friends Meeting House (above, left).
 Photo Inset 30. Viewpoint 9: View toward the Project (screened) from Portsmouth High School, within the Battle of Rhode Island Historic District/Fort Butts and Butts Mills (above, center).
 Photo Inset 31. Viewpoint 55: View toward the Project (screened) from vicinity of Union Church & Southernmost Schoolhouse (above, right).

It is also worth noting that State Route 114 (West Main Road) is the National Park Service (NPS)-designated Washington-Rochambeau Revolutionary Route National Historic Trail. Potential visibility of the Project from this designated historic trail is described above (in the discussion of visibility from major transportation routes) and illustrated in Photo Insets 11-13.

The study area also includes portions of five designated State Scenic Areas (Figure 6). Based on the results of field review, the existing transmission lines are not visible (and therefore, the Project is anticipated to be at least partially screened) from Hessians Hole Swamp, Sandy Point Road, Paradise Road Scenic Byway, and Mitchell Lane State Scenic Areas. However, the existing transmission lines run through Mary's Pond/Sisson Pond State Scenic Areas, and open, unobstructed views of the Project will be available from multiple locations within this scenic area (Photo Insets 32-34).



Photo Inset 32. Viewpoint 96: Open view of the existing transmission line and Project from Union Street within Mary's Pond/Sission Pond State Scenic Area (above, left).
 Photo Inset 33. Viewpoint 89: Distant view of the existing transmission line and Project from Jepsom Lane within Mary's Pond/Sission Pond State Scenic Area (above, center).
 Photo Inset 34. Viewpoint 88: Open view of the existing transmission line and Project from Jepsom Lane within Mary's Pond/Sission Pond State Scenic Area (above, right).

The central and southern portions of the study area also include areas of agricultural use (see Figure 5), which in many instances are also designated conservation and/or scenic areas (see Section 3.4; Figure 6). The existing transmission lines traverse many of these agricultural areas and are very visible in some locations where open fields permit unobstructed views of the transmission line structures (Photo Insets 35 and 36). In other locations the lines are screened by topography, or obscured by hedgerows and/or areas of forest vegetation on the far side of field areas, despite the availability of open views across fields from public roads (Photo Inset 37).



Photo Inset 35. Viewpoint 26: Open view of the existing transmission line and Project from Middle Road at Escobar Farm (above, left).
 Photo Inset 36. Viewpoint 99: Open view of the existing transmission line and Project across agricultural field from Peaceful Way (above, center).
 Photo Inset 37. Viewpoint 56: Open view across farm field (transmission line screened) from Middle Road at Pocasset Farm (above, right).

A comprehensive summary of potential Project visibility from visually sensitive resources, based on viewshed analysis as well as field review, is presented in the table and map included in Appendix A.

5.2 Project Visual Impact

To illustrate anticipated visual changes associated with the proposed Project, photographic simulations of the completed Project from each of the 10 simulation viewpoints indicated in Figure 8 were used to evaluate Project visibility and appearance. Review of these images, along with photos of the existing view, allowed for comparison of the

aesthetic character of each view, with and without the proposed Project in place. Results of this evaluation are presented below.

5.2.1 Analysis of Existing and Proposed Views

Viewpoint 16 (Figure 9)

Existing View

Viewpoint 16 is located on Hedly Street, a residential street that runs between West Main Road (Route 114) and East Main Road (Route 138). This viewpoint is located directly under the existing transmission lines in a residential neighborhood. The view to the northeast is dominated by the existing 61 and 62 Transmission Lines, and a third single-pole line, on a ROW that includes a mix of mowed lawn and low brush. Trees border the ROW on both sides, and form a back-drop to the line where it turns to the left. Level topography and tall trees in this area limit views to foreground features in the landscape. The residential character of this viewpoint is indicated by a single house and maintained backyards on the left side of the view. Scenic quality of this view is relatively low.

Proposed Project

With the proposed Project in place, the two wood pole H-frame transmission structures on the existing ROW have been replaced with two self-weathering steel davit-arm structures. The new structures are consistent in line, color and form with the third line on the ROW, but are substantially taller than the structures on this line, as well as the structures they have replaced. This increase in height accounts for the majority of visual impact, as the new structures extend above the trees and into the sky substantially more than the existing structures. The structures' greater height also brings the conductors and davit-arms higher, which creates more visual clutter against with the sky. The new structures' larger diameter also contributes to their greater contrast with both vegetation and sky. The Project's impact on land use and viewer activity is more moderate, given that it is occurring on an existing transmission corridor. However, the new larger structures have a stronger/more imposing presence than the existing structures.



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Towns of Portsmouth and Middletown, Newport County, Rhode Island
Figure 9 - Viewpoint 16 (Hedly Street - View to the northeast)
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Figure 9 - Viewpoint 16 (Hedly Street - View to the northeast)

March 2015

Sheet 2 of 2 - Proposed View



Viewpoint 20 (Figure 10)

Existing View

Viewpoint 20 is also located on Hedly Street, adjacent to the Hedly House, a candidate for listing on the NRHP as a historic site. This viewpoint is approximately 790 feet from the existing transmission line. The view to the south from this viewpoint is toward a farmstead that includes farm fields and an unpaved driveway in the immediate foreground, backed by a hedgerow of deciduous trees, several low greenhouses, a farmhouse (the Hedley House), and assorted equipment and trailers. Overhead utility poles along the driveway draw the viewer's eye to the farmhouse and greenhouses, which are the focal points in this view. The mid-ground of this view includes additional farm fields and hedgerows along with the existing 61 and 62 Transmission Lines, which are partially screened by trees. The land rises gradually in the distance, which along with existing trees and brush, blocks views to more distant landscape features. The active fields and farm-related development give this view a strong rural/agricultural character. However, visual clutter in the existing view results in low to moderate scenic quality.

Proposed Project

With the proposed Project in place, the wood H-frame transmission line structures have been replaced with steel davit-arm structures. At this distance, and under these lighting conditions, the existing color and form of the new structures appear similar to that of the existing structures. However, the new structures are noticeably taller and thicker, and project above the treetops that largely screened the existing structures. The increased height of the new structures presents appreciable to strong contrast with the vegetation and sky. Their increase visibility and visual dominance could also have an appreciable effect on viewers who may visit this site due to its status as a historic site. However, trees in the mid-ground hedgerow still provide substantial screening, which somewhat mitigates these impacts. The structures' greater height also presents moderate contrast with the gently rising landform, but their occurrence within an existing transmission corridor results in minimal contrast with existing land use.



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Figure 10 - Viewpoint 20 (Hedly Street - View to the south)

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Sheet 1 of 2 - Existing View





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Figure 10 - Viewpoint 20 (Hedly Street - View to the south)

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Sheet 2 of 2 - Proposed View

Viewpoint 26 (Figure 11)

Existing View

This viewpoint is located on Middle Road, adjacent to the Escobar Farm, a state-designated conservation land and locally-designated scenic area. It is approximately 1,865 feet from of the nearest proposed transmission structure that would be visible in this view. The existing view to the west includes a stone wall, trees, and farm structures in the immediate foreground that frame the view. Other foreground features include large signs identifying the site, and farm equipment, backed by a stand of planted Christmas trees. The land descends to a series of level agricultural fields and hedgerows in the mid-ground. The wood pole structures of existing transmission line can be seen running through the fields parallel to one of the hedgerows. The topography continues to drop beyond the mid-ground, which allows for expansive views of the background landscape, which includes low, gently rolling wooded hills and a glimpse of Narragansett Bay beyond the barn on the right hand side of the view. The variety of landscape features, available long distance views, and strong rural/agricultural character give this view high scenic quality.

Proposed Project

With the proposed Project in place, the existing wood pole transmission structures have been replaced by self-weathering steel davit-arm structures. While occurring in the same location and presenting the same line and form as the existing structures, the new structures are noticeably darker in color, wider in diameter, and taller than the existing poles. Their darker color blends with the background vegetation, but their greater height is noticeable as the structures now extend above the wooded hills in the background, and break the horizon line. Viewed against the back-drop of the sky, the transmission structures and insulators are now much more noticeable and become more dominant mid-ground features. The taller poles present moderate contrast with the land form, as they reduce the perceived elevation change between the viewer and the transmission line. The scale of the structures also presents strong contrast with the existing mid-ground vegetation, and disrupts the previously even and consistent horizon line. The Project's contrast with the distant water features is minimal, and since they occur on an existing transmission corridor, the new structures' contrast with existing land use is insignificant. Viewer activity, although not likely altered due to the presence of the new structures, could experience a moderate impact due to the increased visual presence of the transmission line.



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Figure 11 - Viewpoint 26 (Middle Road - View to the west)
March 2015



Aquidneck Island Reliability Project
Towns of Portsmouth and Middletown, Newport County, Rhode Island
Figure 11 - Viewpoint 26 (Middle Road - View to the west)
March 2015

Sheet 2 of 2 - Proposed View

Viewpoint 31 (Figure 12)

Existing View

Viewpoint 31 is located on Full Circle, a local street within a residential subdivision located north of Mill Lane and west of Middle Road. This viewpoint is located directly under the existing transmission line, and the view is oriented down the ROW to the north. This view is dominated by the existing 61 and 62 Transmission Lines, which include multiple large three-pole structures, the closest of which has wooden cross bracing and conductors that extend over the head of the viewer in this location. A paved residential street, bordered by lawn and evergreen tree plantings on both sides, is backed by multiple three-pole transmission structures that extend away from the viewer down the brushy ROW. A second smaller line with single wood poles runs parallel to the 61 and 62 Lines. A glimpse of a house through the planted hedge on the left side of the view, as well as the roadside lawns and landscaping, indicate the suburban residential character of this area. Level topography in combination with existing trees and brush limit views to foreground features of the landscape. Scenic quality of the existing view is relatively low.

Proposed Project

With the proposed Project in place, the three-pole wooden transmission structures have been replaced by two parallel lines of single pole self-weathering steel davit-arm structures. While the new structures present simpler, cleaner lines, and thus reduce visual clutter in the view, they are markedly taller and darker than the existing structures. Due to their larger diameter, greater height and darker color, the new structures present greater contrast with both the existing vegetation and sky, when compared to the structures currently in place. Although they are occurring on an existing transmission corridor, the new structures have a much stronger visual presence, and thus present moderate to strong contrast with existing viewer activity and land use in this residential setting. The adverse visual impact is mitigated somewhat by the existing view's low scenic quality.



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Figure 12 - Viewpoint 31 (Full Circle - View to the north)

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Sheet 1 of 2 - Existing View





Aquidneck Island Reliability Project

Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 12 - Viewpoint 31 (Full Circle - View to the north)

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Sheet 2 of 2 - Proposed View



Viewpoint 60 (Figure 13)

Existing View

This viewpoint is located on Union Street, approximately 1,360 feet from the nearest proposed transmission structure that will be visible from this viewpoint. The existing view to the southwest is a peaceful rural setting that includes active agricultural fields and a small shed in the immediate foreground, with associated stonewalls, brush and trees running along the field edges. A sizeable body of water (St. Mary's Pond) is the dominant feature of the mid-ground and extends across almost the full field of view. The foreground shed provides a visual focal point, while the pond draws the viewer into the scene, and creates visual interest in this view. Beyond the water is a level landscape dominated by deciduous forest and brush. This area includes a single garage structure on the right, and the existing transmission lines, which run parallel to the water's edge across the view. Small portions of the Claiborne-Pell Newport Bridge can barely be seen above the background trees, which form a consistent horizon line, and block views of all other distant features of the landscape. Scenic quality in this view is relatively high.

Proposed Project

With the proposed Project in place, the existing wood pole transmission line structures have been replaced by self-weathering steel structures. The location of the structures and their line and form are largely consistent with existing structures and the poles' dark color blends well with the background vegetation. However, their greater height now breaks the background tree line and the upper portions of the transmission structures are viewed against the sky. The result is that the structures become a much more noticeable background feature of this view. The height of the new structures, and their increased visibility, presents moderate to appreciable contrast with the existing vegetation and sky. The more noticeable vertical line of the new structures also contrasts with the strong horizontal lines in the landscape created by the stone walls, plowed field, water edges, bands of vegetation, and uniform horizon line. Although the Project occurs on an existing transmission corridor, the new structures' substantially greater visibility presents a moderate contrast with existing land use, and an appreciable impact on viewer activity due to their effect on the scenic quality of the existing view.



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Figure 13 - Viewpoint 60 (Union Street - View to the southwest)

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Sheet 1 of 2 - Existing View





Aquidneck Island Reliability Project

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Figure 13 - Viewpoint 60 (Union Street - View to the southwest)

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Sheet 2 of 2 - Proposed View



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Viewpoint 88 (Figure 14)

Existing View

Viewpoint 88 is located within a state-designated scenic area on Jepson Lane, approximately 890 feet from the nearest proposed transmission structure that would be visible from this viewpoint. The existing view to the east features a stone wall and plowed field in the foreground that extend across the full field of view. A clump of daffodils in front of the wall provides a central focal point and enhances the scenic quality of the view. A stand of large trees frames the view on the edge of the field to the left, but otherwise, the remaining features of the landscape all occur on the opposite side of the field. This mid-ground landscape rises gently, as evidenced by some open fields, but the majority of this area is forested. The upper portions of the existing transmission structures can be seen against the sky as they protrude slightly above the mid-ground tree line that forms the visible horizon. Strong horizontal lines in the landscape are created by the stone wall, furrows in the plowed field and the level horizon line. The view has moderate scenic quality.

Proposed Project

With the proposed Project in place, four sets of paired transmission structures are now clearly visible against the sky. Their visibility is accentuated by their greater height, as well as their larger diameter and darker color, especially under the backlit conditions illustrated in this photo. The structures' greater height above the trees that form the horizon line present strong contrast with the scale of the background vegetation. The trees on the left side of the view mitigate the scale contrast somewhat, but the proposed structures also present strong color contrast with the sky. The stone wall and other foreground elements are still the dominant features of the view, but the new structures begin to compete for viewer attention. However, the presence of the new structures does not alter perceived land use and would not impact viewer activities at this site.



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Figure 14 - Viewpoint 88 (Jepson Lane - View to the east)

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Sheet 1 of 2 - Existing View





Aquidneck Island Reliability Project

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Figure 14 - Viewpoint 88 (Jepson Lane - View to the east)

March 2015

Sheet 2 of 2 - Proposed View



Viewpoint 97 (Figure 15)

Existing View

Viewpoint 97 is located on Union Street, directly adjacent to the existing transmission line. This viewpoint is approximately 75 feet from the nearest proposed transmission structure, and is oriented to the north. The existing view features a mix of agricultural and residential features. A plowed field spans the foreground, but is bordered by maintained lawn and residential homes on both sides. A decorative stone wall in the immediate foreground frames the field, and adds to the maintained residential character of the view. The existing transmission line spans the field, and runs adjacent to nearby residential structures. The overhead conductors cut diagonally across the view, and significant portions of the poles are prominently visible against the sky. Beyond the field, the transmission line ROW and surrounding area is dominated by brush and low trees, which block views of more distant landscape features. The upper portion of a large wind turbine on the left side of the view is the only background feature visible beyond the mid-ground tree line. Existing scenic quality is relatively low.

Proposed Project

With the proposed Project in place, new self-weathering steel davit-arm structures have replaced the existing wood pole H-frame structures. The new structures are taller, darker, and thicker than the existing poles. Their color blends well with the mid-ground vegetation, but stands out strongly against the sky. The structures' greater height is most apparent in the more distant structures which, unlike the structures they have replaced, now extend well above the tree line and increase the number of transmission structures visible in this view. Because the existing poles also extend above the trees, the Project's contrast with the existing vegetation is moderated somewhat. However, the additional height and greater number of visible poles presents appreciable to strong contrast with the sky. Perceived land use does not change with the Project in place, due to the presence of the existing transmission corridor. However, the new structures greater visibility accentuates the length of the transmission corridor across the landscape. This, along with their more dominant presence in the foreground, results in moderate contrast with existing land use and viewer activity in this residential setting.



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Figure 15 - Viewpoint 97 (Union Street - View to the north)

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Sheet 1 of 2 - Existing View





Aquidneck Island Reliability Project

Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 15 - Viewpoint 97 (Union Street - View to the north)

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Sheet 2 of 2 - Proposed View



Viewpoint 129 (Figure 16)

Existing View

This viewpoint is located on Jepson Lane directly across the road (approximately 90 feet) from the proposed new Jepson Substation. The existing view to the west from this viewpoint features a single beam entry gate along the roadside, flanked by two large wooden posts. Transmission structures and overhead lines frame the right side of the view, and are also visible in the mid-ground from the left to central portion of the view. The mid-ground landscape is characterized by level topography and uniform cover by shrubs and young trees. The dense vegetative cover blocks views of more distant landscape features. The existing gate, transmission infrastructure, lack of topographic and vegetative variability, and screening of background features results in a view of relatively low scenic quality.

Proposed Project

With the proposed Project in place, existing natural features in the view are replaced by the built components of the new Jepson Substation. Although existing scenic quality is low and some vegetation remains visible behind the substation, the character of the view is changed entirely, and is now dominated by man-made utility infrastructure. The built components of the station present strong contrast with the existing vegetation and the sky. Although the existing view includes some transmission infrastructure, the Project's effect on perceived land use and visual character is appreciable. With the substation in place, the character of the view changes from rural to industrial. Because, the area is already gated and essentially unavailable for public use, the proposed substation, enclosed within a perimeter fence, maintains this condition. However, its dominant foreground presence could have an adverse effect on viewer activity along Jepson Lane and at nearby residences.

Roadside screening, in the form of planted junipers, soften the appearance of the new substation, and screen some of the lower components of the facility. The screening effect of these plantings will be greater for drivers on Jepson Lane, as these viewers will be located closer to the planted trees. However, the evergreen plantings are not consistent with the existing native vegetation, and given the presence of the overhead lines, will probably not be allowed to grow tall enough to screen significant portions of the substation. The majority of the station is still visible, and remains the character defining component of the view.



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Figure 16 - Viewpoint 129 (Jepson Lane - View to the west)

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Sheet 1 of 3 - Existing View





Aquidneck Island Reliability Project

Towns of Portsmouth and Middletown, Newport County, Rhode Island

Figure 16 - Viewpoint 129 (Jepson Lane - View to the west)

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Sheet 2 of 3 - Proposed View -
No Screening





Aquidneck Island Reliability Project

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Figure 16 - Viewpoint 129 (Jepson Lane - View to the west)

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Sheet 3 of 3 - Proposed View -
With Screening



Viewpoint 141 (Figure 17)

Existing View

This viewpoint is also located on Jepson Lane, approximately 410 feet south of the location of the proposed new Jepson Substation. The view to the northwest from this location features a harvested agricultural field and mowed road shoulder in the immediate foreground, backed by a residential yard featuring a well-kept house, out buildings, lawn and yard trees. An area of brush and young trees is visible beyond the house, along with several existing overhead utility lines. Numerous conductors can be seen against the sky, but they are partially screened by foreground vegetation. Rising topography and thick vegetation behind the house screens views of mid-ground and background landscape features. The view has a strong rural residential character and low to moderate scenic quality.

Proposed Project

With the proposed Project in place, new overhead lines and the new Jepson Substation are visible directly behind the existing residence in this view. While portions of the substation are screened by foreground trees, the large A-frame terminal structures, and much of the ground-level equipment, is clearly visible through gaps in the vegetation. New overhead lines can also be seen in the sky above the house. Although the foreground trees and A-frame structures are similar in height, vegetation on the Project site has been replaced with built features. The scale and form of these structures also presents strong contrast with the sky. Despite the fact that some utility infrastructure was present in the existing view, the presence of the new substation substantially alters visual character from this viewpoint. What was previously a rural residential setting now has a much more industrial/utilitarian character. The Project presents appreciable to strong contrast with the existing residential land use and viewer activity.

The addition of landscaping between the yard and the substation helps to screen views of ground-level equipment, and softens the space where the substation meets the ground. The screening provided by these plantings will also become more effective over time. However, the landscaping does not completely screen the large A-frame structures that contribute most substantially to the industrial character of the new view.



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Figure 17 - Viewpoint 141 (Jepson Lane - View to the northwest)

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Figure 17 - Viewpoint 141 (Jepson Lane - View to the northwest)

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No Screening





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Figure 17 - Viewpoint 141 (Jepson Lane - View to the northwest)

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With Screening



Viewpoint 84 (Figure 18)

Existing View

Viewpoint 84 is located on Jepson Lane at the entrance drive to the existing Jepson Substation. The viewpoint is approximately 310 feet from the existing substation and 65 feet from the nearest new transmission structure that would be visible from this viewpoint. The existing view to the east is dominated by transmission infrastructure, including the existing substation, overhead lines and poles in the foreground. The paved entrance drive, an area of lawn, and the corner of a building fronting on Jepson Lane that frames the right side of the view, are other prominent foreground features in this view. The topography descends to a level mid-ground landscape dominated by deciduous trees, but that also includes some open areas (wetlands and fields) and some more distant transmission structures. The level topography and mature mid-ground trees limit long distance views from this viewpoint. The existing scenic quality of the view is low.

Proposed Project

With the proposed Project in place, the existing Jepson Substation and the associated foreground building have been removed, which affords more open views of the wetland, shrub and forest vegetation that exist behind these structures. The multiple overhead lines on wood pole structures have been replaced by a single line of self-weathering single circuit and double circuit steel pole structures. Although the new structures are noticeably taller (especially those in the distance) there are fewer of them, and their line and form are cleaner and more orderly than the existing structures and overhead lines they have replaced. Their color blends well with the forested back-drop in this view, and their protrusion into the sky is less substantial than is present under the existing condition. Even though transmission lines remain, removal of the substation (and associated overhead lines) results in a substantial improvement in perceived land use, which now appears more rural than industrial. Removal of the station would also have a moderately positive effect on viewer activity in this area. The overall effect is a substantial reduction in visual clutter and an improvement in visual quality in this view.



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Figure 18 - Viewpoint 84 (Jepson Lane - View to the east)

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Figure 18 - Viewpoint 84 (Jepson Lane - View to the east)

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Sheet 2 of 2 - Proposed View



5.2.2 Impact Evaluation

Evaluation of the simulations of the proposed Project by an EDR landscape architect indicated that overall visual contrast and impact on scenic quality is likely to be variable, depending on the distance of the viewer from the Project, the landscape context in which the Project is viewed, and the degree to which the new structures differ from the existing transmission infrastructure in their visibility, orderliness and prominence (see completed evaluation forms in Appendix C). For the seven transmission line simulations evaluated, composite contrast ratings ranged from 1.4 to 2.7, and averaged 2.1 on a scale of 0 (insignificant) to 4 (strong). This rating indicates an overall moderate contrast with existing conditions. This is largely due to the fact that the Project is a rebuild and the existing 61 and 62 Transmission Lines which are clearly visible and well-established components of the landscape. When looking at Project contrast with individual components of the landscape, the ratings reflect appreciable to strong contrast with the existing vegetation and sky due to the greater height and visual presence of the new structures. However, the overall rating reflects insignificant to moderate contrast in the categories of land form, land use and viewer activity, due to the fact that the Project is a rebuild of existing lines within an existing transmission corridor.

Viewpoint 31 received the highest composite contrast rating (2.7), indicating a moderate to appreciable overall visual contrast. As in most of the viewpoints, this is largely attributable to the Project's strong contrast with the existing vegetation and sky, and in this case, with the residential land use that lines the ROW. Impact on viewer activity, is mitigated by the presence of the existing lines, however, even in this category moderate contrast was noted due to the new structures' stronger visual presence. Higher contrast ratings for this viewpoint also reflect the short distance between the viewer and the nearest structures (255 feet), and the fact that the view of the Project is from the ROW itself, and completely unscreened from this vantage point. This view essentially represents a "worst case" scenario, since it is as close as a viewer can get to the line. Viewpoint 20 received a similar score (2.4) for largely the same reasons. The somewhat lower score received by Viewpoint 20 reflects the greater distance between the Project and the viewer (790 feet), and between the Project and nearby residential land use. However, as in most viewpoints, the Project's contrast with vegetation and sky, were in the range of appreciable to strong. The lowest overall contrast rating was received by Viewpoint 88 (1.4). The relatively minimal contrast noted in this viewpoint is largely a reflection of the Project's insignificant contrast with land use and viewer activity, as a result of the Project occupying an existing transmission line corridor. The Project's distance from the viewer, the back-drop of trees, and the relatively small number of visible structures also serve to reduce visual contrast from this viewpoint.

Simulations of the new Jepson Substation received substantially higher contrast ratings than the transmission line simulations. Average contrast ratings for the two simulations illustrating this component of the Project ranged from 3.0 to 3.6 (average = 3.3) indicating an overall appreciable to strong contrast with the existing landscape. Unlike the

transmission line simulations, where most of the contrast related to impact on only a few landscape components (primarily vegetation and sky), for the substation, substantial contrast with almost all components of the landscape was noted. This is a reflection of the fact that the existing site does not already include a substation, and the new Jepson Substation essentially replaces a rural (albeit not particularly scenic) landscape with one that has a much more industrial character. Unlike the transmission lines, this results in a substantial change in the perception of land use and potentially affects viewer activities at residential sites adjacent to the proposed substation. This impact is exacerbated by the proximity of the viewer and the general lack of screening in the selected viewpoints. It is worth noting that removal of the existing Jepson Substation off-sets this effect to some extent, as indicated in the evaluation for Viewpoint 84. Perimeter screen plantings also help mitigate the station's visual impact, but only to a limited degree.

Table 3. Visual Impact Assessment Summary

Viewpoint	Contrast Score ¹						
	Landform	Vegetation	Land Use	Water	Sky	Viewer Activity	Average
<u>Transmission Line Views</u>							
16	0	3	2	N/A	4	2	2.2
20	2	4	0	N/A	3	3	2.4
26	2	4	0	1	3	2	2.0
31	0	4	4	N/A	3.5	2	2.7
60	0	2	2	3	3	3	2.2
88	1	2	0	N/A	4	0	1.4
97	0	2	2	N/A	3.5	2	1.9
Average	0.7	3.0	1.4	2	2.9	2.0	2.1
<u>Substation Views²</u>							
129	0	4	3	N/A	4	4	3.0
141	3	3.5	3.5	N/A	4	4	3.6
Average	1.5	3.75	3.25	N/A	4	4	3.3

¹On a scale of 0 to 4, where: 0 = Insignificant, 1 = Minor, 2 = Moderate, 3 = Appreciable, and 4 = Strong.

²Note: Viewpoint 84 is not included as it illustrates substation removal, and contrast in that instance is indicated as a beneficial rather than an adverse impact.

6.0 CONCLUSIONS

The VIA for the Aquidneck Reliability Project allows the following conclusions to be drawn:

1. Based on topographic viewshed analysis (i.e., analysis that considers only the screening provided by landform) approximately 82.3% of the visual study area could have potential views of the proposed Project; however, this only represents a 6.5% increase in visible area when compared to the topographic viewshed of the existing transmission lines. When the screening effect of mapped forest vegetation is factored into the viewshed analysis, approximately 59.3% of the study area has potential views of the proposed Project. This represents a 7.9% increase in visible area when compared to the vegetation/topographic viewshed of the existing 61 and 62 Transmission Lines.
2. Topographic viewshed analysis indicates that views of the proposed transmission line could potentially be available from the majority of the visually sensitive resources that occur within the 1-mile visual study area. However, vegetation viewshed analysis suggest that views of the Project from many of these sensitive sites will be fully or significantly screened by foreground vegetation and/or structures, or obscured by the effects of distance.
3. Field review suggests that actual Project visibility is likely to be more limited than suggested by viewshed mapping. The combined effect of vegetation (forest areas, street trees, and yard vegetation) and buildings throughout the study area screen (or partially screen) views of the Project from many locations. The existing 61 and 62 Transmission Lines were visible (and therefore, the Project would be visible) from major roadways in a few locations. However, views of the Project in these instances would be fleeting, partial views over roadside vegetation and structures, or through gaps in the vegetation. In developed residential areas located more than approximately 0.25-mile from the Project, the combination of screening provided by buildings, trees, and other vegetation in yards and along roadsides effectively obscured views toward the Project site. Clear views of the existing 61 and 62 Transmission Line structures are only available from streets and yard areas immediately adjacent to the transmission line ROW, including several relatively new subdivisions where houses have been built in close proximity to the existing transmission line.
4. Fieldwork also confirmed that views from visually sensitive sites toward the Project are highly variable, based primarily on distance to the Project and the relative openness of the view. In almost all cases, views of the Project from sensitive sites located beyond approximately 0.25-mile from the Project will be partially or completely screened. From most of the historic sites within the study area, views of the existing transmission lines are screened by intervening topography, vegetation, and/or buildings. Historic properties with relatively open views of

the existing transmission lines (and therefore, open views of the Project) include the Lawton-Almy-Hall Farm on Union Street, the Escobar Farm on Middle Road, and the Hedley Farm on Hedly Street. The existing transmission lines run through Mary's Pond/Sisson Pond State Scenic Area, and open, unobstructed views of the Project will be available from multiple locations within this area. However, the study area also includes portions of four other designated scenic areas, where no views of the proposed Project are anticipated. The central and southern portions of the study area also include areas of agricultural use, which in many instances are also designated conservation lands and/or scenic areas. The existing 61 and 62 Transmission Lines traverse many of these agricultural areas and in some locations open fields permit unobstructed views of the transmission line structures. In other locations the lines are screened by topography, or hedgerows and/or areas of forest vegetation on the far side of field areas.

5. Simulations of the proposed transmission line indicate that the visibility and visual impact of the Project will be variable, based largely on the distance from the viewer to the Project, the landscape setting and the degree to which the new structures differ from the existing transmission structures in their visibility and perceived scale and extent. Evaluation by a licensed EDR landscape architect indicates that the proposed transmission lines' overall contrast with the visual/aesthetic character of the area will generally be moderate, however strong to appreciable contrast with the existing vegetation and sky was noted for most viewpoints, due to the new structures greater height, darker color, and more dominant visual presence. This effect was off-set somewhat by the Project's more limited contrast with existing land use and viewer activity, due to the proposed location of the Project on an existing transmission line ROW.
6. Simulations of the new Jepson Substation indicate that visual contrast presented by the station will be appreciable to strong from foreground viewer locations, that provide "worst case" Project visibility. More moderate to insignificant visual contrast can be anticipated from more distant and/or well-screened viewpoints. The new substation's conversion of a largely undeveloped site into a major built facility changes the perceived character of the site from rural to industrial. However, the degree of visual contrast presented by the new Jepson Substation is partially off-set by removal of the existing Jepson Substation, and mitigated to a degree by proposed perimeter screen plantings.
7. As indicated by the results of the analyses summarized above, visual impact of the proposed Project will generally be restricted to sites within 0.25 mile of the Project that have an unobstructed line of sight toward the proposed transmission lines and substation. In most instances, views of the landscape already include the existing 61 and 62 Transmission Lines. As a result, the proposed Project's contrast with the existing visual character of the area will generally be limited. However, due to the increase in size of the proposed transmission structures, and the

relocation of the substation to a currently undeveloped site, the Project will be more visible and/or perceived as being more visually prominent from some locations. Consequently, the feasibility and possible benefits of potential visual mitigation measures should be evaluated.

Siting of the proposed lines within an existing transmission corridor significantly reduces adverse visual impacts by avoiding the need for additional ROW clearing and minimizing perceived change in land use. The natural brown color of the self-weathering steel poles generally blends well with background vegetation, and screen plantings at the new Jepson Substation will help soften the visual impact of that facility. However, such plantings are limited in their effectiveness due to electrical clearances that must be maintained, and the size of the structures they are screening. Additional screening of the transmission lines, through plantings or fencing, would generally not be effective in reducing the visibility or visual impact of the new lines, given their height, length, and the multiple vantage points from which they can be viewed. Removal of the old Jepson Substation and four other substations on Aquidneck Island represents substantial visual mitigation. As illustrate in Figures 16 and 19, removal of these substations results in improved visual quality and/or reduced visual clutter, through the elimination of utility infrastructure and the opening of views to surrounding natural features of the landscape. This type of “off-set” mitigation is appropriate, given the limited options for improved Project siting and screening. Additional discussion of possible mitigation is included in Section 7.0.



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Figure 19 - Substation Removal - Bailey Brook Substation (East Main Road, view to the south)

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Figure 19 - Substation Removal - Bailey Brook Substation (East Main Road, view to the south)

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Figure 19 - Substation Removal - South Aquidneck Substation (Intersection of Valley Road and Aquidneck Avenue, view to the west)

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Figure 19 - Substation Removal - South Aquidneck Substation (Intersection of Valley Road and Aquidneck Avenue, view to the west)

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Figure 19 - Substation Removal - Vernon Substation (Freeborn Street, view to the west)

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Figure 19 - Substation Removal - Vernon Substation (Freeborn Street, view to the west)

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Figure 19 - Substation Removal - North Aquidneck Substation (Aquidneck Avenue, view to the east)

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Figure 19 - Substation Removal - North Aquidneck Substation (Aquidneck Avenue, view to the east)

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7.0 RECOMMENDATIONS

Several comments and recommendations regarding potential means of reducing the Project's visual impact were provided by EDR staff that conducted the field review, and the landscape architect rating the Project's visual impact.

These include the following:

- It was suggested that the new transmission structures would present less contrast if they were lower in height. Organizing the conductors in a horizontal configuration (e.g., on H-frame structures) could keep the structures from protruding above the trees and thus being viewed against the sky. This would address the most common impact noted in the evaluation process. However, putting the conductors on shorter H-frame structures would increase the number of structures required, and could not be accomplished within the confines of the existing cleared ROW. Along with additional cost and logistical difficulties, acquiring and clearing additional ROW to pursue this alternative would have additional visual impacts that could off-set or exceed any aesthetic benefits achieved by reducing structure height.
- Another alternative that could reduce the Project's visual impact would be to consolidate the paired single circuit structures into single double circuit structures. This would effectively reduce the number of proposed new structures by about half. While not reducing structure height, use of double circuit structures could reduce visual clutter and present a simpler, cleaner appearance. However, putting both the 61 and 62 Transmission Lines on a single structure creates reliability concerns and, according to TNEC, would not be allowed from an electrical planning perspective.
- An alternative to changing structure height or design would be to utilize a different finish/color on the poles and insulators in selected locations. The self-weathering steel poles and brown insulators generally blend well with a vegetated back-drop, especially when viewed at a distance. However, they present strong contrast where viewed against the sky at foreground distances. Along stretches of the line where the structures are close to viewers, and where the majority of the structures are viewed against the sky (e.g., where the lines pass directly through or adjacent to residential neighborhoods), use of galvanized steel poles and gray insulators could reduce color contrast and lighten the visual mass of the structures. An example of where these circumstances apply is the residential neighborhood north of Mill Lane that includes Hilltop Drive, Center View Drive, Sweet Farm Road, and West Passage Drive. The visual benefits of using stretches of galvanized structures in areas such as this should be evaluated.

- Evaluation of the new Jepson Substation simulations indicate that screen plantings have the potential to reduce visual impact, but are limited in their ability to do so. Relocation of the station further from the edge of Jepson Lane would help reduce the prominence of the station, and would make roadside plantings more effective in screening the facility. It might also result in better visual separation of the new substation from adjacent residential land uses. The possibility of moving the new Jepson Substation to the west, even a modest distance, should be evaluated. If relocation of the new Jepson Substation is not feasible, alternative screening approaches should be evaluated, including development of a more substantial planting plan, utilizing tree and shrub species that blend better with the existing vegetation, and/or possible utilization of berms, walls, or fencing to more completely screen ground-level components of the facility.
- Lower profile structures, especially the A-frame terminal structures, would help reduce the visual impact of the new Jepson Substation. However, the height of these structures is largely driven by electrical and safety requirements that cannot be compromised. Consequently, this alternative is not considered feasible.
- As mentioned in Section 6.0, correcting an existing aesthetic problem in the landscape can be an acceptable means of off-setting a project's adverse visual impact when other screening and design alternatives are not available. The fact that the AIRP will result in the retirement and removal of five existing substations on Aquidneck Island is meaningful off-set mitigation.

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