

Aquidneck Island Reliability Project

Portsmouth and Middletown, Rhode Island

PREPARED FOR

The Narragansett Electric Company d/b/a National Grid
280 Melrose Street
Providence, RI 02907

PREPARED BY



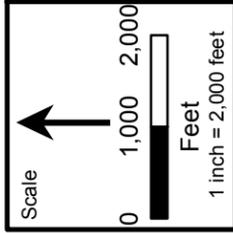
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Providence, RI 02903
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DECEMBER 2015



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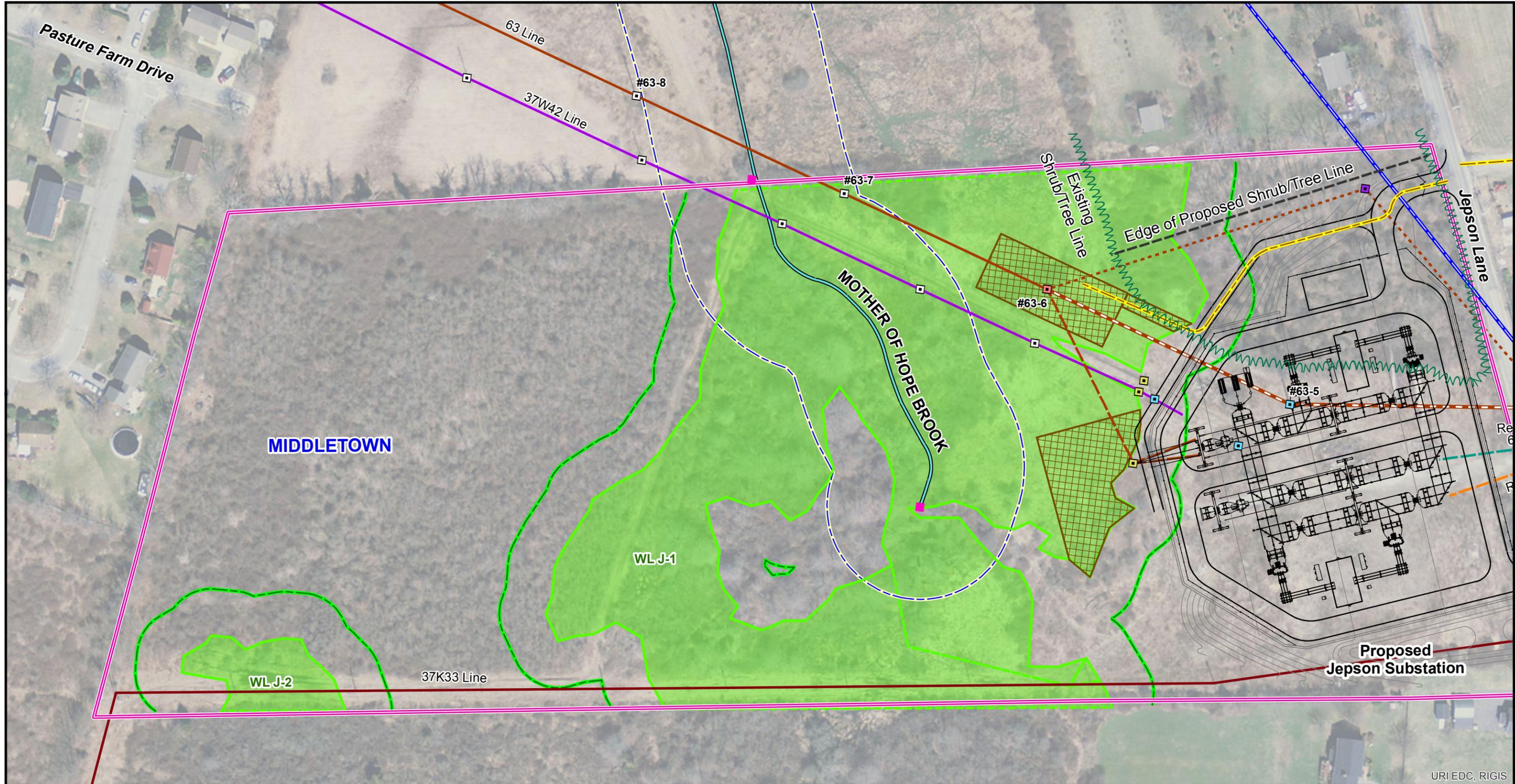


AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND
 Site Location Map
 Figure 2-1

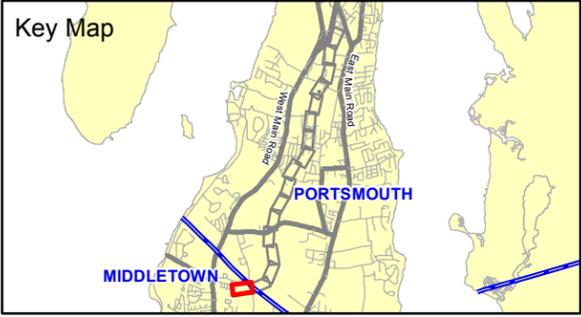
Source:
ESRI Mapping (2015)



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, Geobase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapboxIndia, © OpenStreetMap contributors, and the GIS User Community



URI EDC, RIGIS



Legend	
	Proposed Structure
	Structure to be Removed
	Structure to be Replaced
	Proposed Temporary Structure
	Existing Structure
	Access
	Proposed Swamp Mats
	Guy Wire Anchor
	Drop Inlet Catch Basin
	Culvert
	Fence
	Gate
	Stonewall
	Town Boundary
	Line 61 (To Be Rebuilt)
	Line 61 (To Be Relocated)
	Line 61 (To Be Removed)
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	Line 62 (To Be Removed)
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	Line 63 (Temporary)
	Line 63 (Relocated)
	Line (Other)
	Line (Other-Proposed)
	TNEC ROW
	TNEC Fee-Owned Property
	Delineated Wetland Edge
	50' Perimeter Wetland
	Stream
	100' Riverbank Wetland
	Edge of Open Water
	ASSF



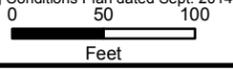
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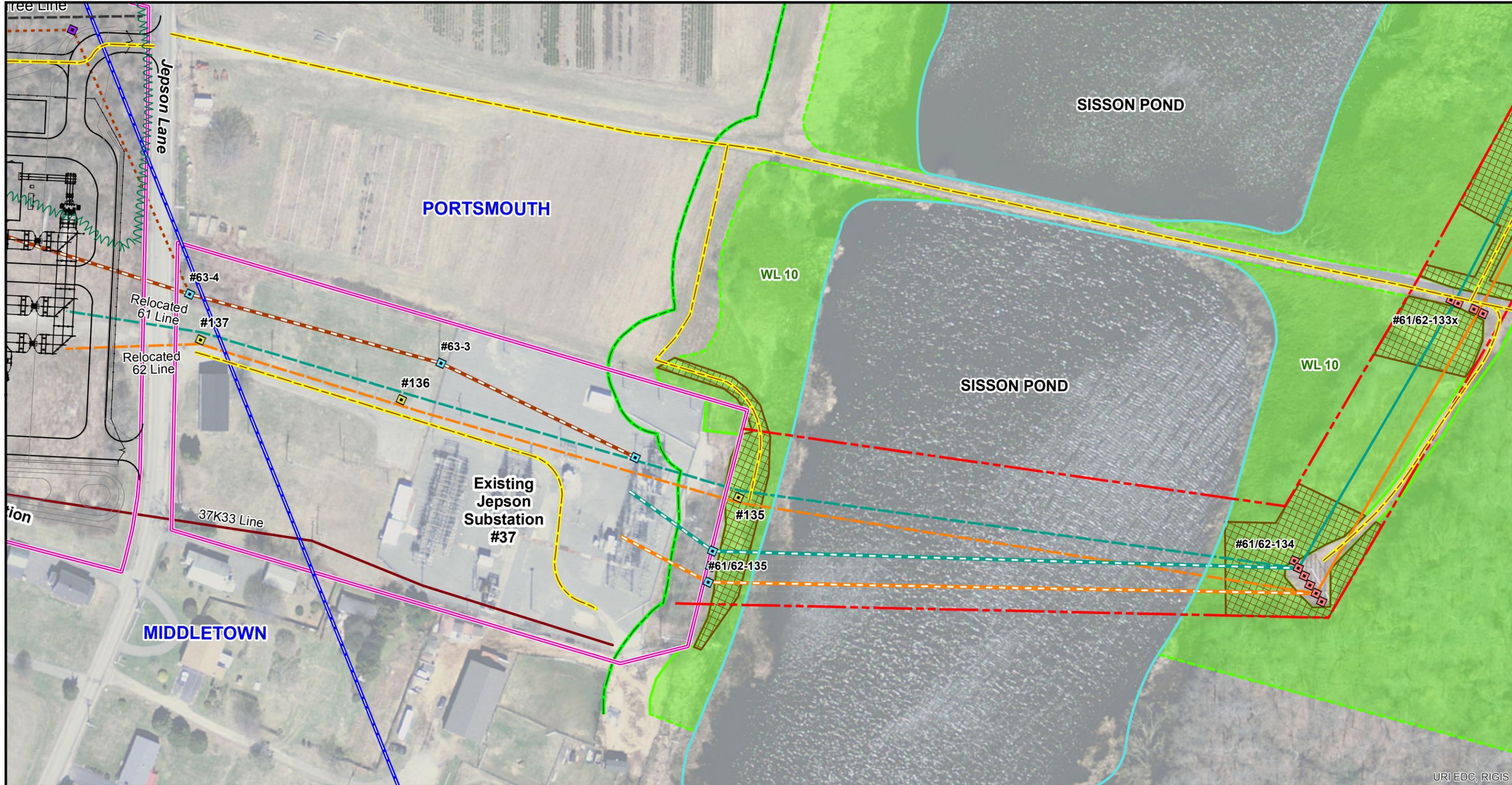
61/62 Transmission Lines Site Plans

Plan 1 of 17

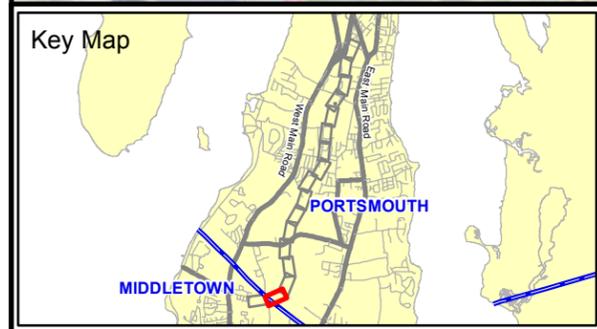
Figure 2-2

Source:
Wetland boundaries were field delineated and surveyed by VHB in 2014.
Base mapping provided by RIGIS.
Property Lines Obtained from Garofalo's Existing Conditions Plan dated Sept. 2014.





URI EDC, RIGIS



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AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

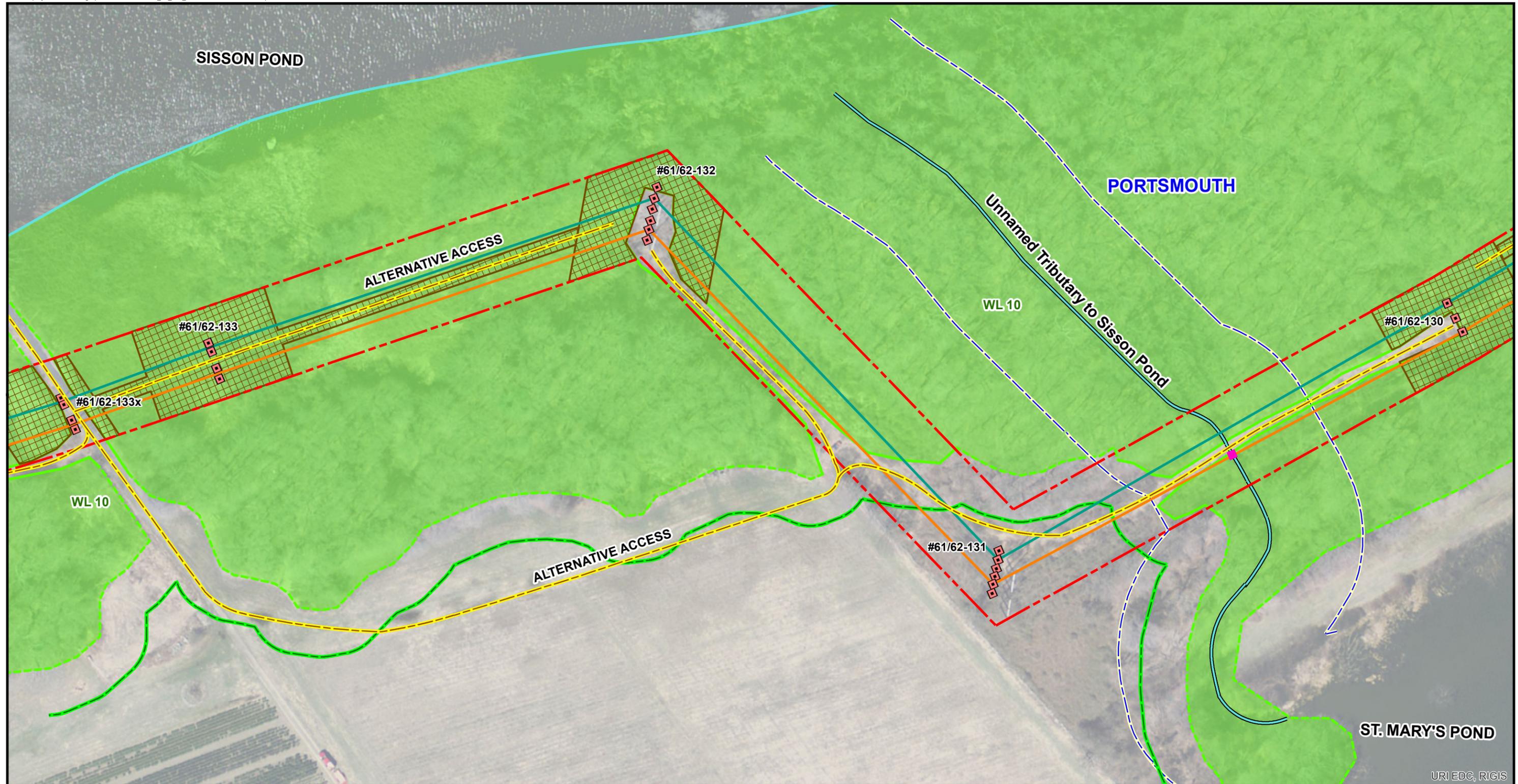
61/62 Transmission Lines Site Plans

Plan 2 of 17
Figure 2-2

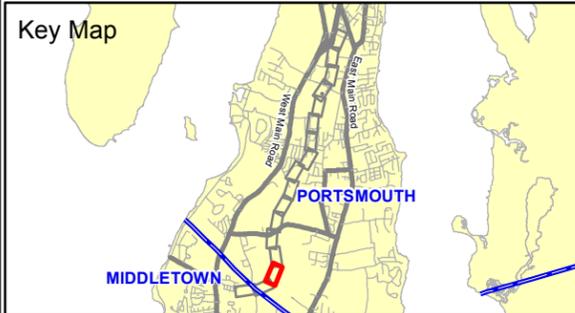
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0 50 100
Feet

nationalgrid
vhb



URI EDC, RIGIS

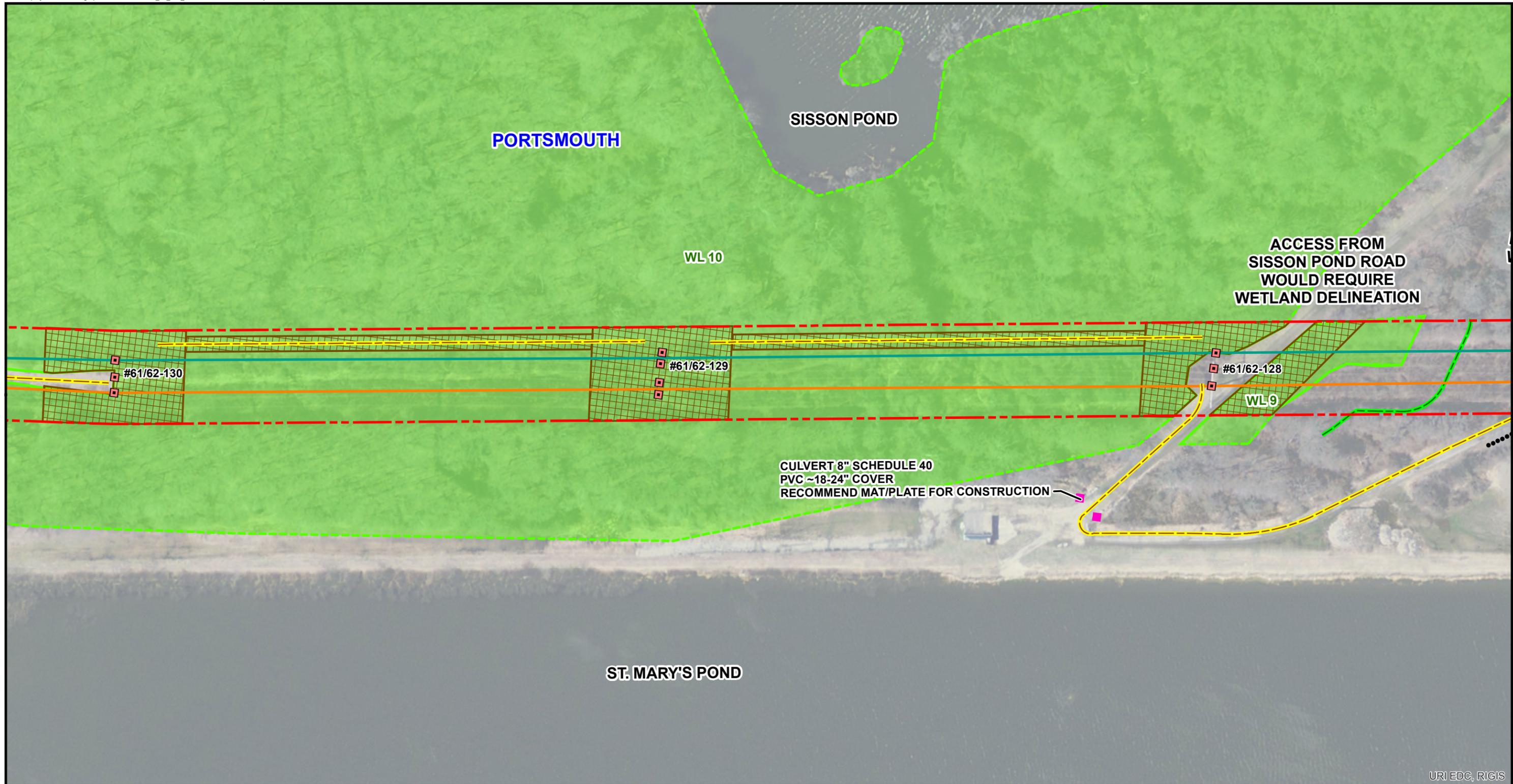


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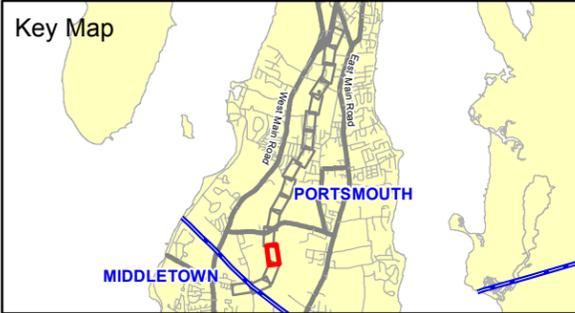
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PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND
61/62 Transmission Lines Site Plans
Plan 3 of 17
Figure 2-2

Source:
 Wetland boundaries were field delineated and surveyed by VHB in 2014.
 Base mapping provided by RIGIS.
 Property Lines Obtained from Garofalo's Existing Conditions Plan dated Sept. 2014.

Feet



URI EDC, RIGIS



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	Edge of Open Water
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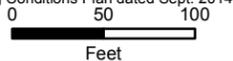
AQUIDNECK ISLAND RELIABILITY PROJECT PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

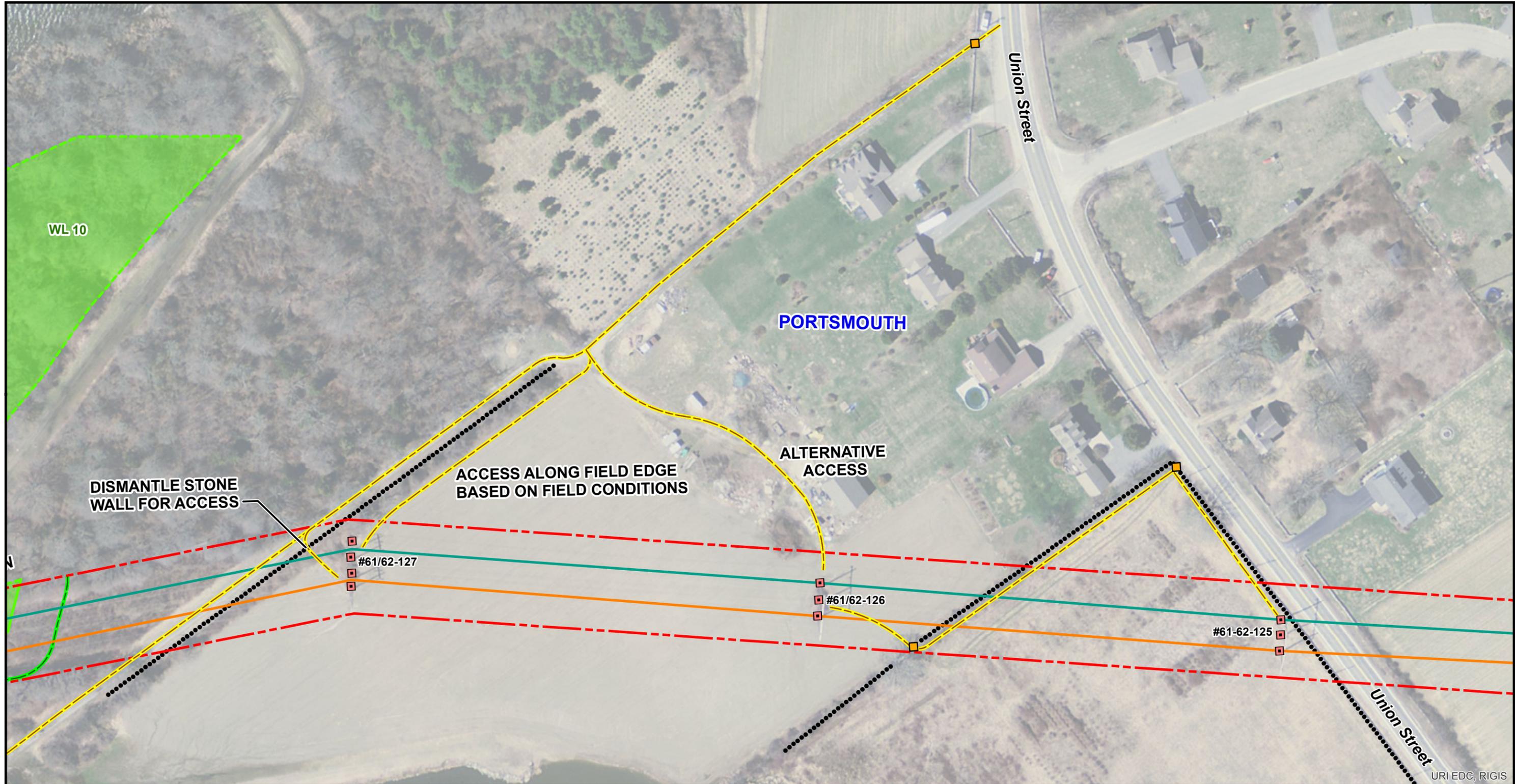
61/62 Transmission Lines Site Plans

Plan 4 of 17

Figure 2-2

Source:
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URI EDC, RIGIS



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	Delineated Wetland Edge
	50' Perimeter Wetland
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	Edge of Open Water
	ASSF

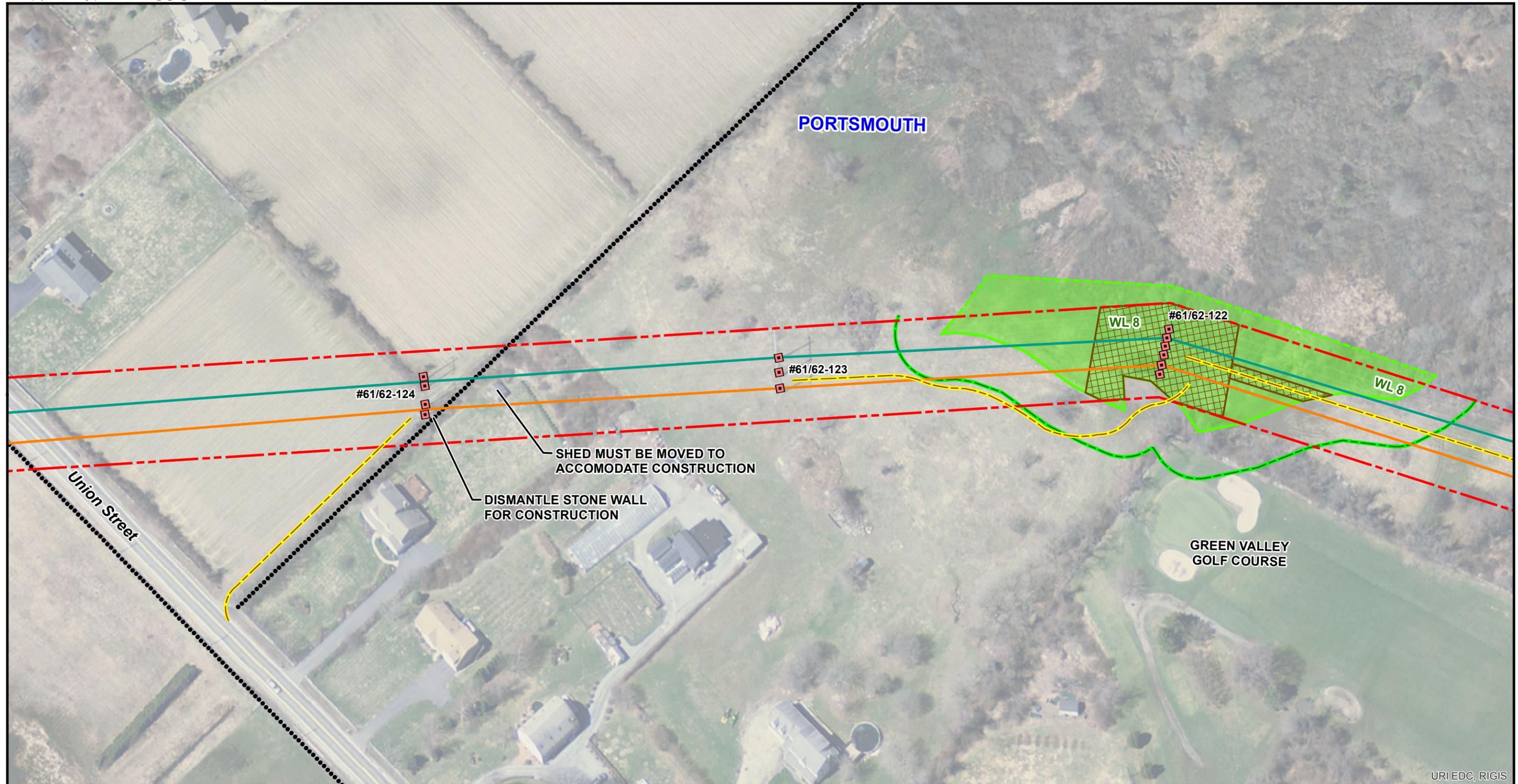
AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

61/62 Transmission Lines Site Plans
 Plan 5 of 17
 Figure 2-2

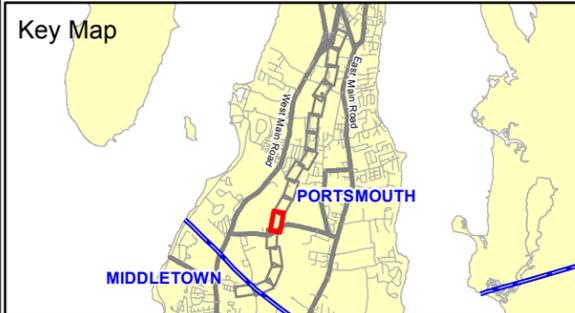
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 Property Lines Obtained from Garofalo's Existing Conditions Plan dated Sept. 2014.

0 50 100
 Feet

nationalgrid
 vhb



URI EDC, RIGIS



Legend	
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	Structure to be Replaced
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	100' Riverbank Wetland
	Edge of Open Water
	ASSF

AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

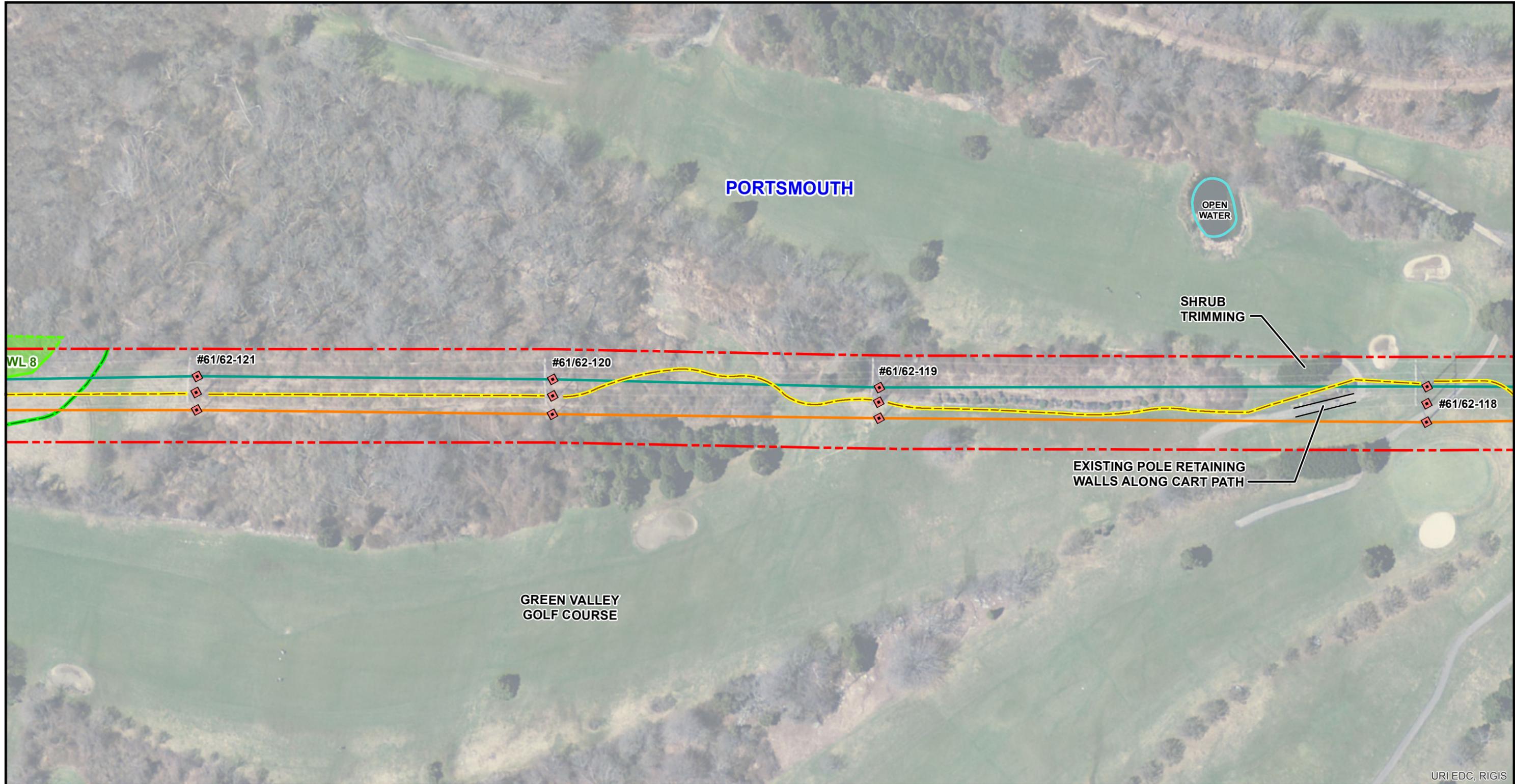
61/62 Transmission Lines Site Plans

Plan 6 of 17
Figure 2-2

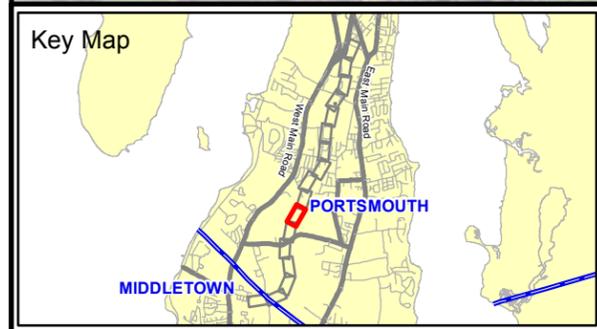
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Feet

nationalgrid
vhb



URI EDC, RIGIS



Legend	
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	TNEC Fee-Owned Property
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	50' Perimeter Wetland
	Stream
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	Edge of Open Water
	ASSF

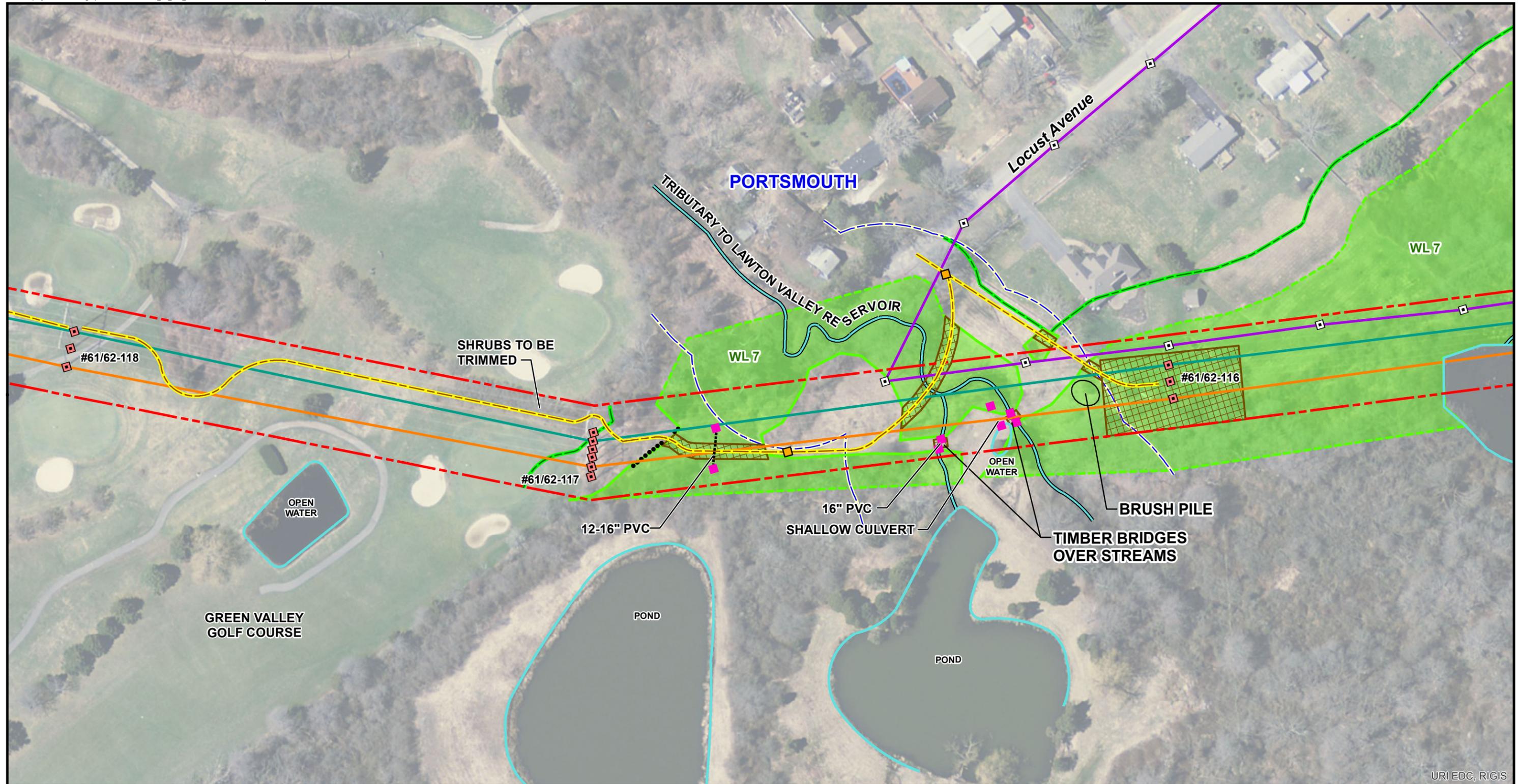
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PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

61/62 Transmission Lines Site Plans
 Plan 7 of 17
 Figure 2-2

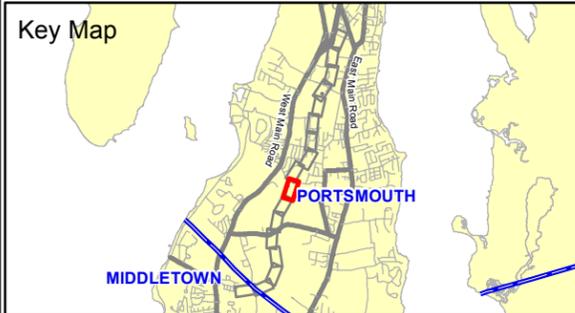
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 Feet

nationalgrid
 vhb



URI EDC, RIGIS



Legend	
	Proposed Structure
	Structure to be Removed
	Structure to be Replaced
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	Access
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	Guy Wire Anchor
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	TNEC Easement
	TNEC Fee-Owned Property
	Delineated Wetland Edge
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	Stream
	100' Riverbank Wetland
	Edge of Open Water
	ASSF

AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

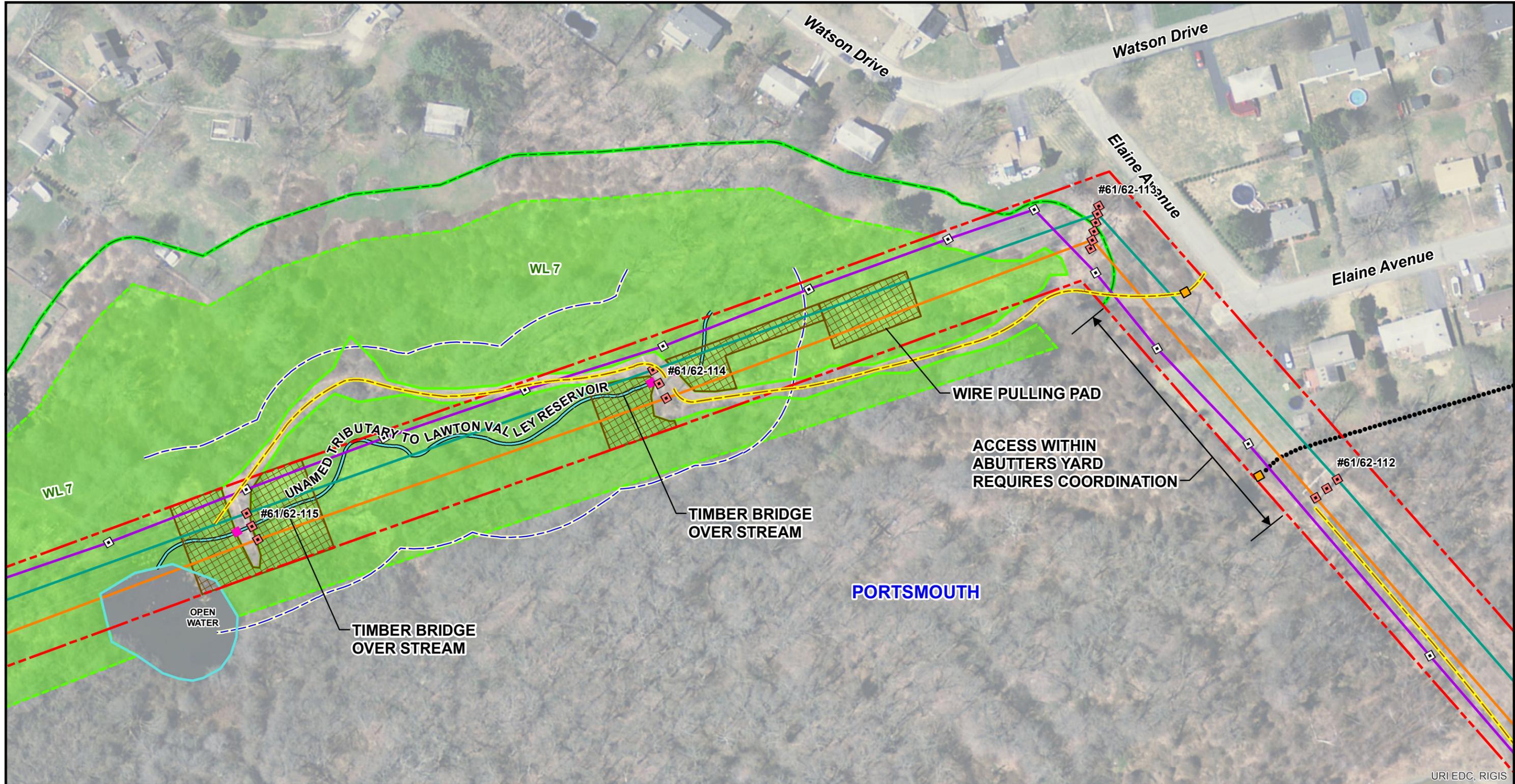
61/62 Transmission Lines Site Plans

Plan 8 of 17
Figure 2-2

Source:
Wetland boundaries were field delineated and surveyed by VHB in 2014.
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0 50 100
Feet

nationalgrid



URI EDC, RIGIS



Legend					
	Proposed Structure		Line 61 (To Be Rebuilt)		TNEC ROW
	Structure to be Removed		Line 61 (To Be Relocated)		TNEC Easement
	Structure to be Replaced		Line 62 (To Be Rebuilt)		TNEC Fee-Owned Property
	Proposed Temporary Structure		Line 62 (To Be Relocated)		Delineated Wetland Edge
	Existing Structure		Line 62 (To Be Removed)		50' Perimeter Wetland
	Access		Line 63 (Existing)		Stream
	Proposed Swamp Mats		Line 63 (To Be Relocated)		100' Riverbank Wetland
	Guy Wire Anchor		Line 63 (Temporary)		Edge of Open Water
	Drop Inlet Catch Basin		Line 63 (Relocated)		ASSF
	Culvert		Line (Other)		
	Fence		Line (Other-Proposed)		
	Gate				
	Stonewall				
	Town Boundary				

AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

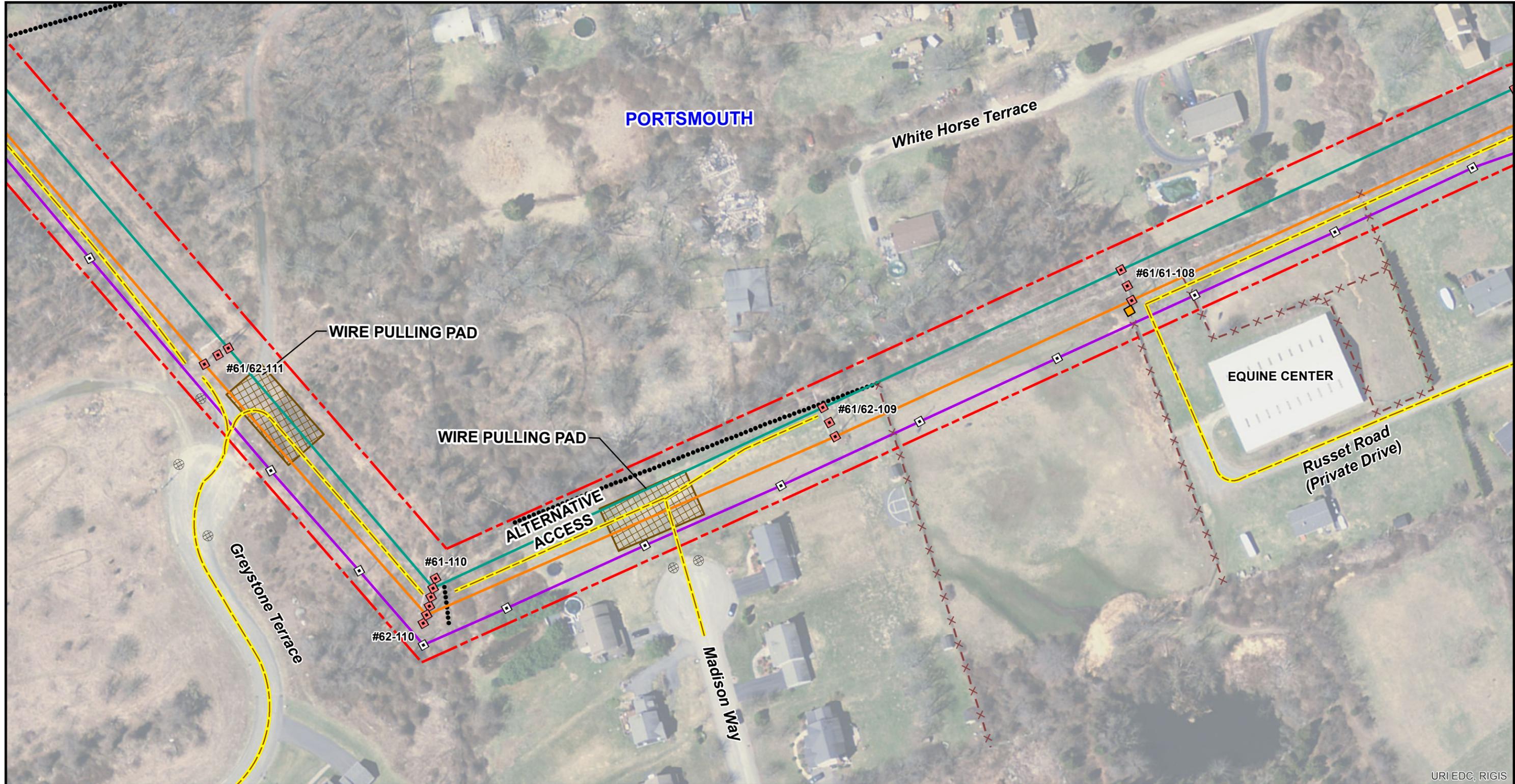
61/62 Transmission Lines Site Plans

Plan 9 of 17
 Figure 2-2

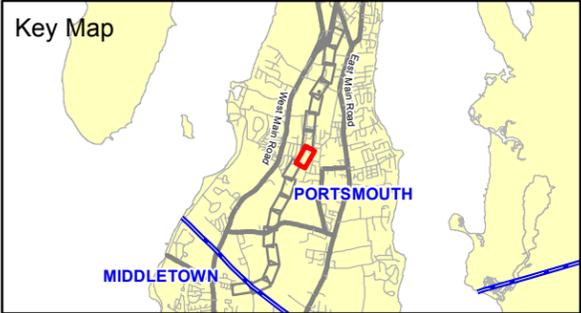
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0 50 100
 Feet

nationalgrid
 vhb



URI EDC, RIGIS



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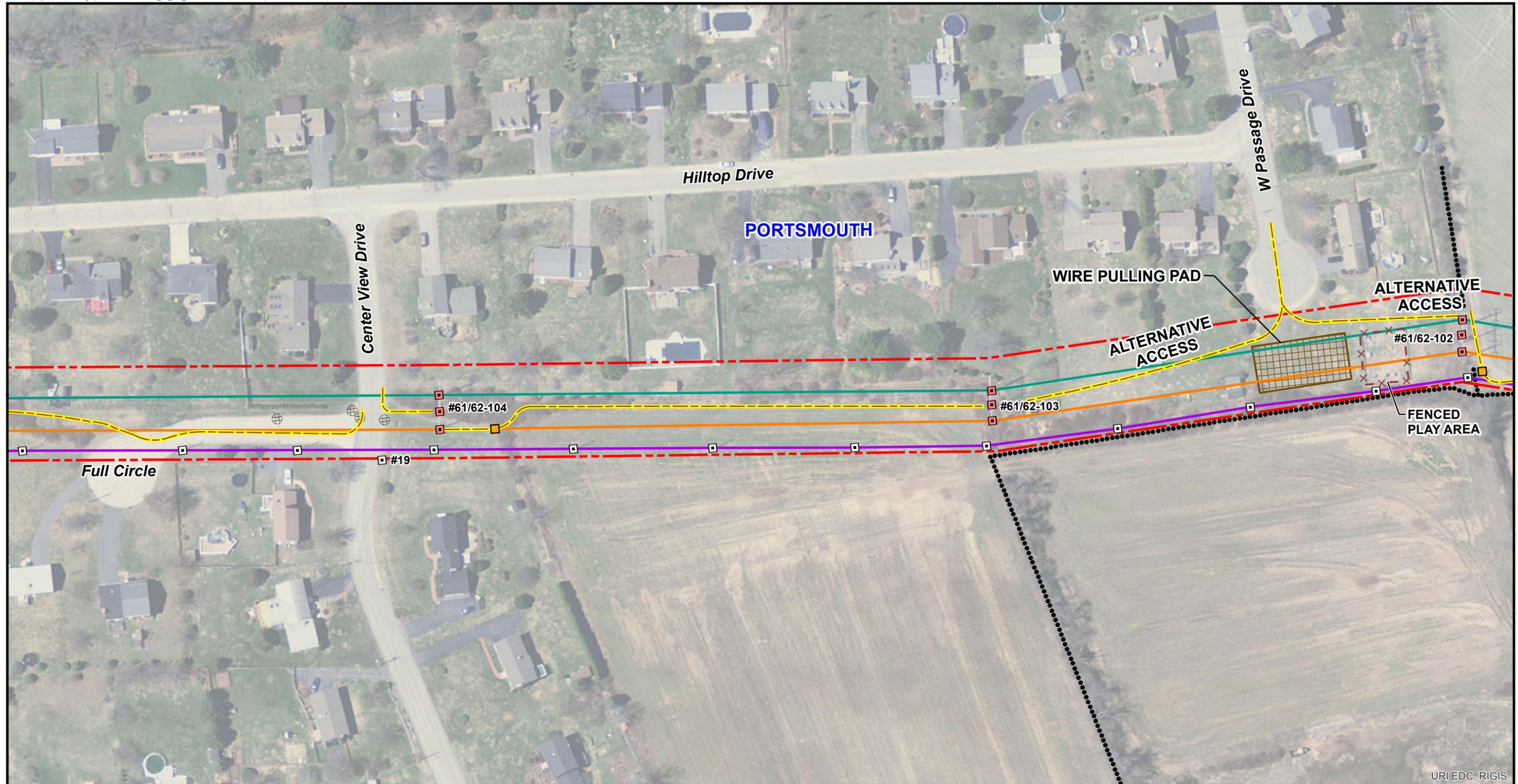
AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

61/62 Transmission Lines Site Plans
 Plan 10 of 17
 Figure 2-2

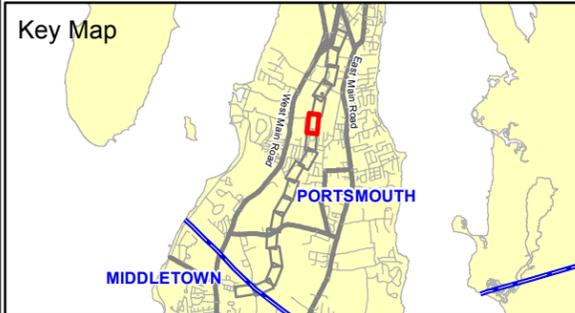
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 Feet

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URI EDC, RIGIS



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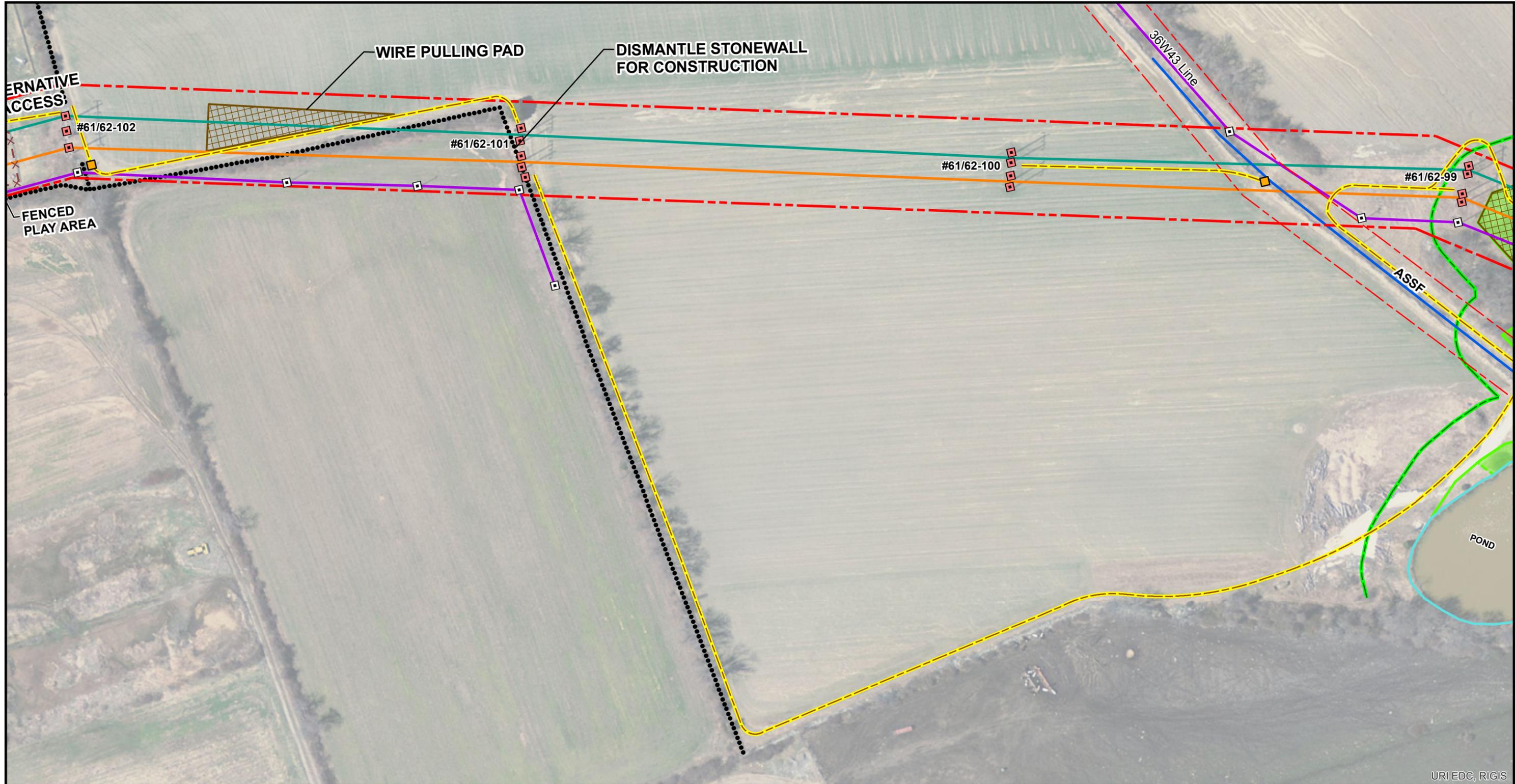
AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

61/62 Transmission Lines Site Plans
 Plan 12 of 17
 Figure 2-2

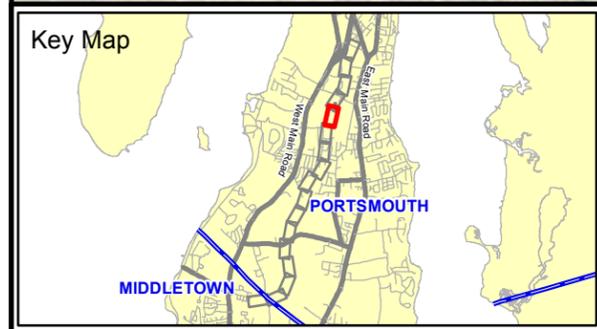
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URI EDC, RIGIS



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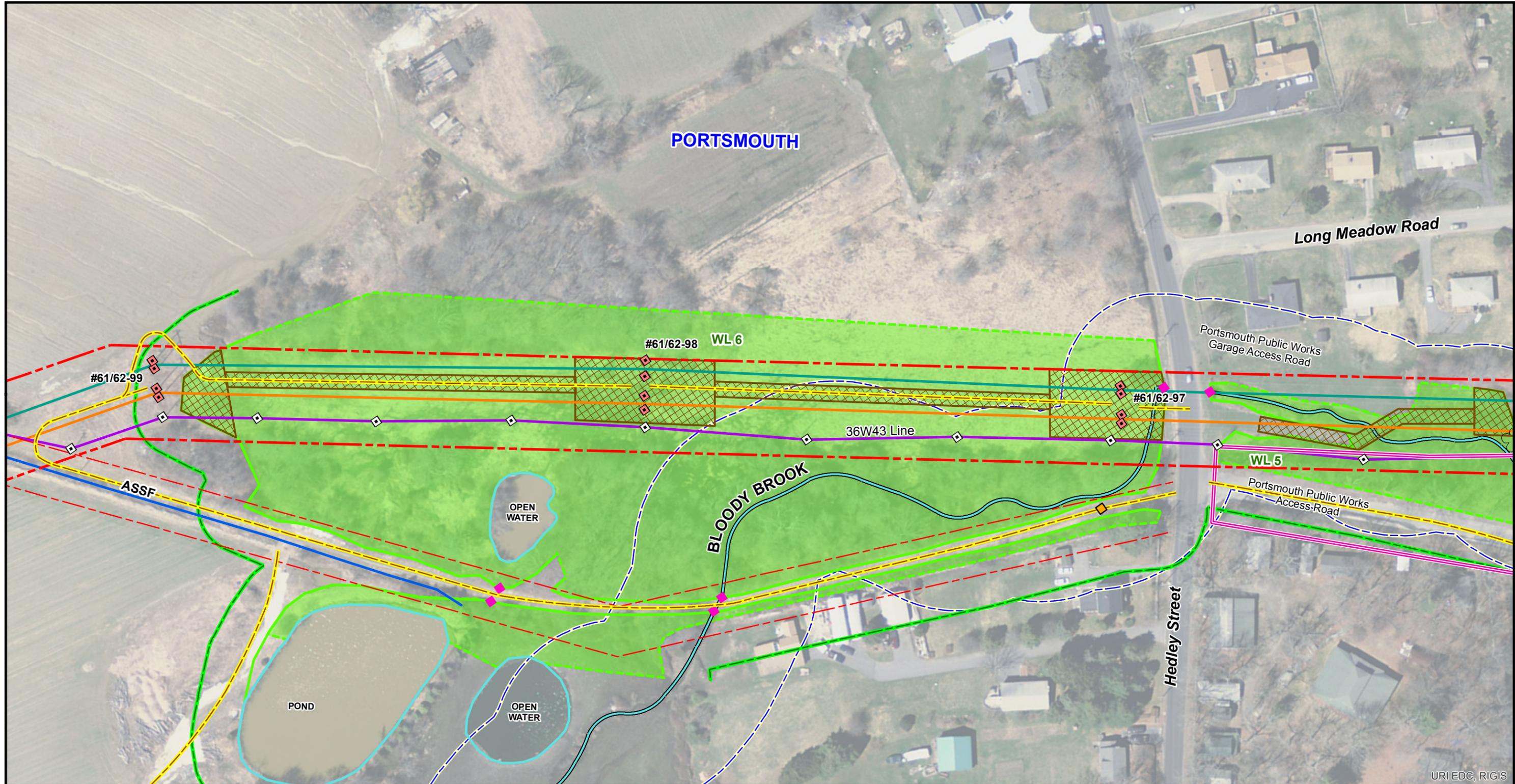
AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

61/62 Transmission Lines Site Plans
 Plan 13 of 17
 Figure 2-2

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0 50 100
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URI EDC, RIGIS



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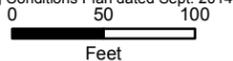
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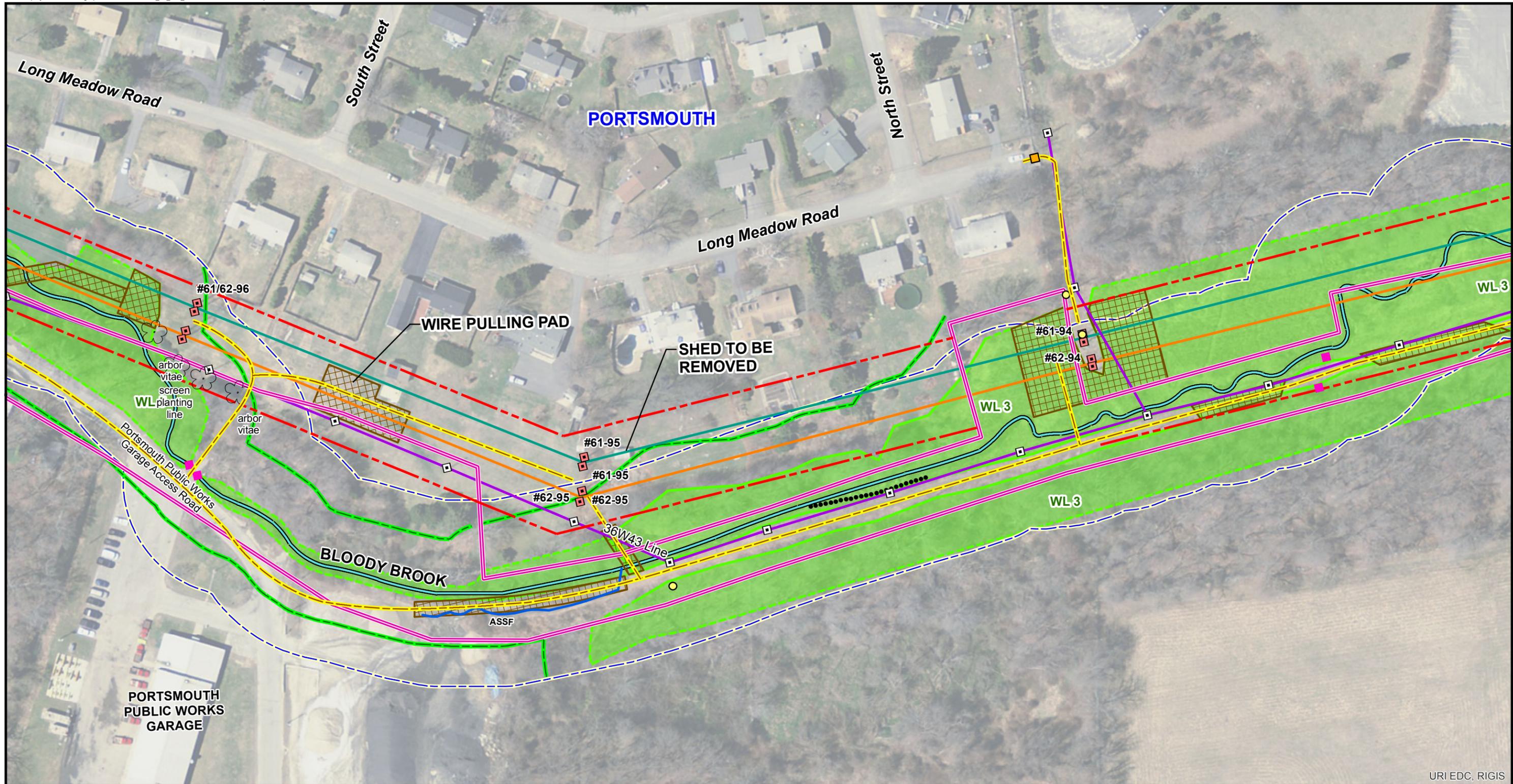
61/62 Transmission Lines Site Plans

Plan 14 of 17

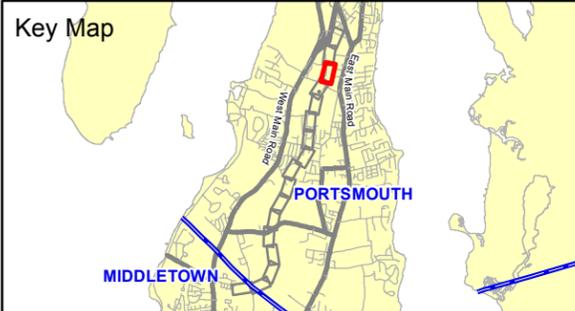
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URI EDC, RIGIS



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	Proposed Swamp Mats
	Guy Wire Anchor
	Drop Inlet Catch Basin
	Culvert
	Fence
	Gate
	Stonewall
	Town Boundary
	Line 61 (To Be Rebuilt)
	Line 61 (To Be Relocated)
	Line 61 (To Be Removed)
	Line 62 (To Be Rebuilt)
	Line 62 (To Be Relocated)
	Line 62 (To Be Removed)
	Line 63 (Existing)
	Line 63 (To Be Removed)
	Line 63 (Temporary)
	Line 63 (Relocated)
	Line (Other)
	Line (Other-Proposed)
	TNEC ROW
	TNEC Easement
	TNEC Fee-Owned Property
	Delineated Wetland Edge
	50' Perimeter Wetland
	Stream
	100' Riverbank Wetland
	Edge of Open Water
	ASSF

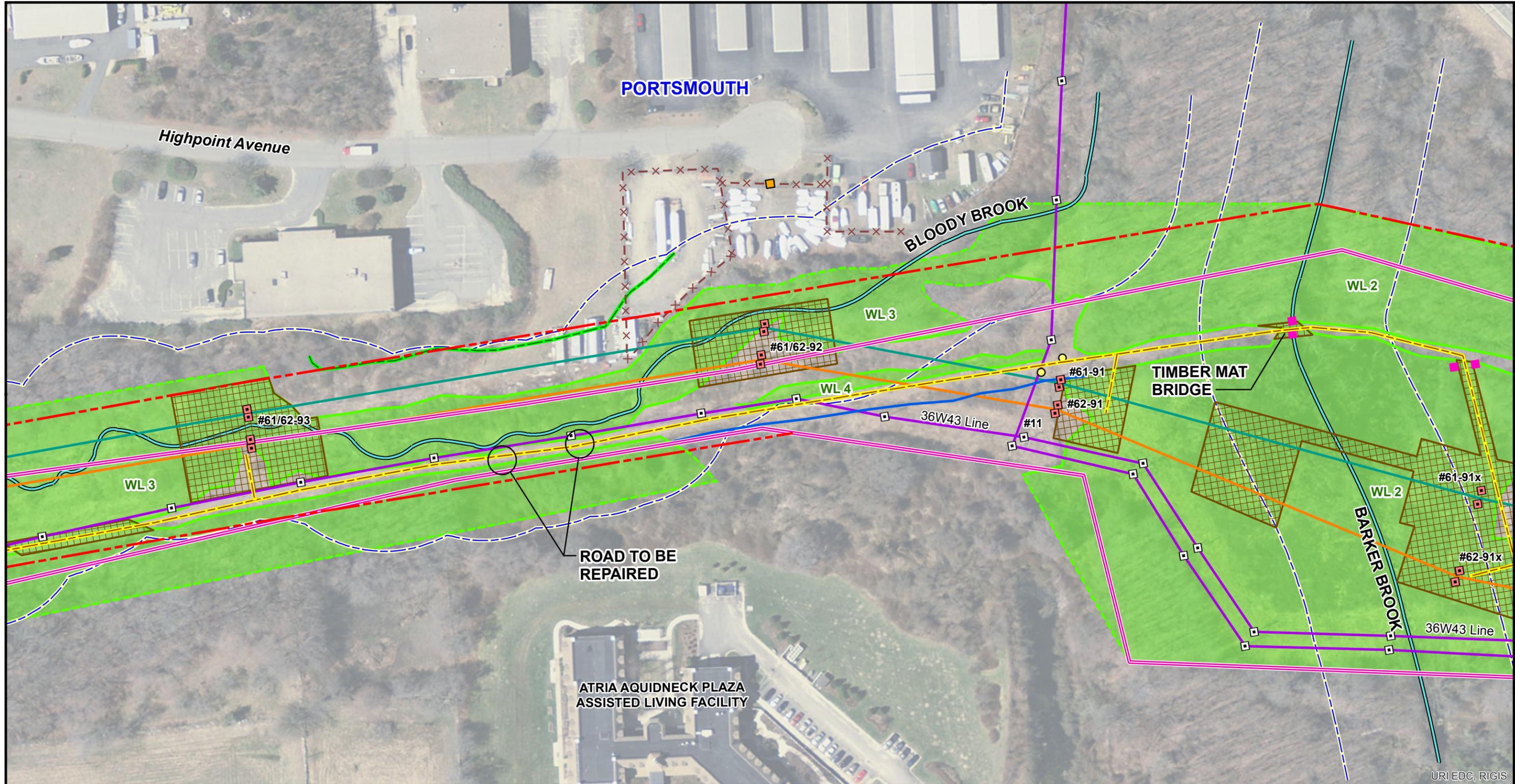
AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

61/62 Transmission Lines Site Plans
Plan 15 of 17
Figure 2-2

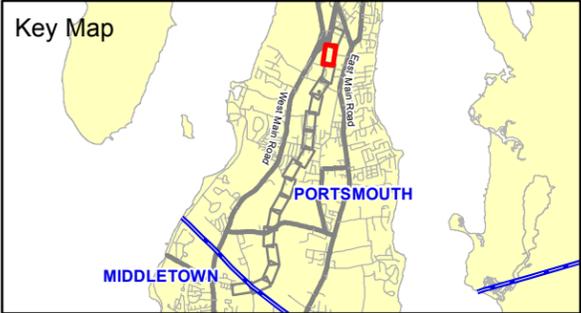
Source: Wetland boundaries were field delineated and surveyed by VHB in 2014. Base mapping provided by RIGIS. Property Lines Obtained from Garofalo's Existing Conditions Plan dated Sept. 2014.

0 50 100
 Feet

nationalgrid
 vhb



URI EDC, RIGIS



Legend	
	Proposed Structure
	Structure to be Removed
	Structure to be Replaced
	Proposed Temporary Structure
	Existing Structure
	Access
	Proposed Swamp Mats
	Guy Wire Anchor
	Drop Inlet Catch Basin
	Culvert
	Fence
	Gate
	Stonewall
	Town Boundary
	Line 61 (To Be Rebuilt)
	Line 61 (To Be Relocated)
	Line 61 (To Be Removed)
	Line 62 (To Be Rebuilt)
	Line 62 (To Be Relocated)
	Line 62 (To Be Removed)
	Line 63 (Existing)
	Line 63 (To Be Removed)
	Line 63 (Temporary)
	Line 63 (Relocated)
	Line (Other)
	Line (Other-Proposed)
	TNEC ROW
	TNEC Easement
	TNEC Fee-Owned Property
	Delineated Wetland Edge
	50' Perimeter Wetland
	Stream
	100' Riverbank Wetland
	Edge of Open Water
	ASSF

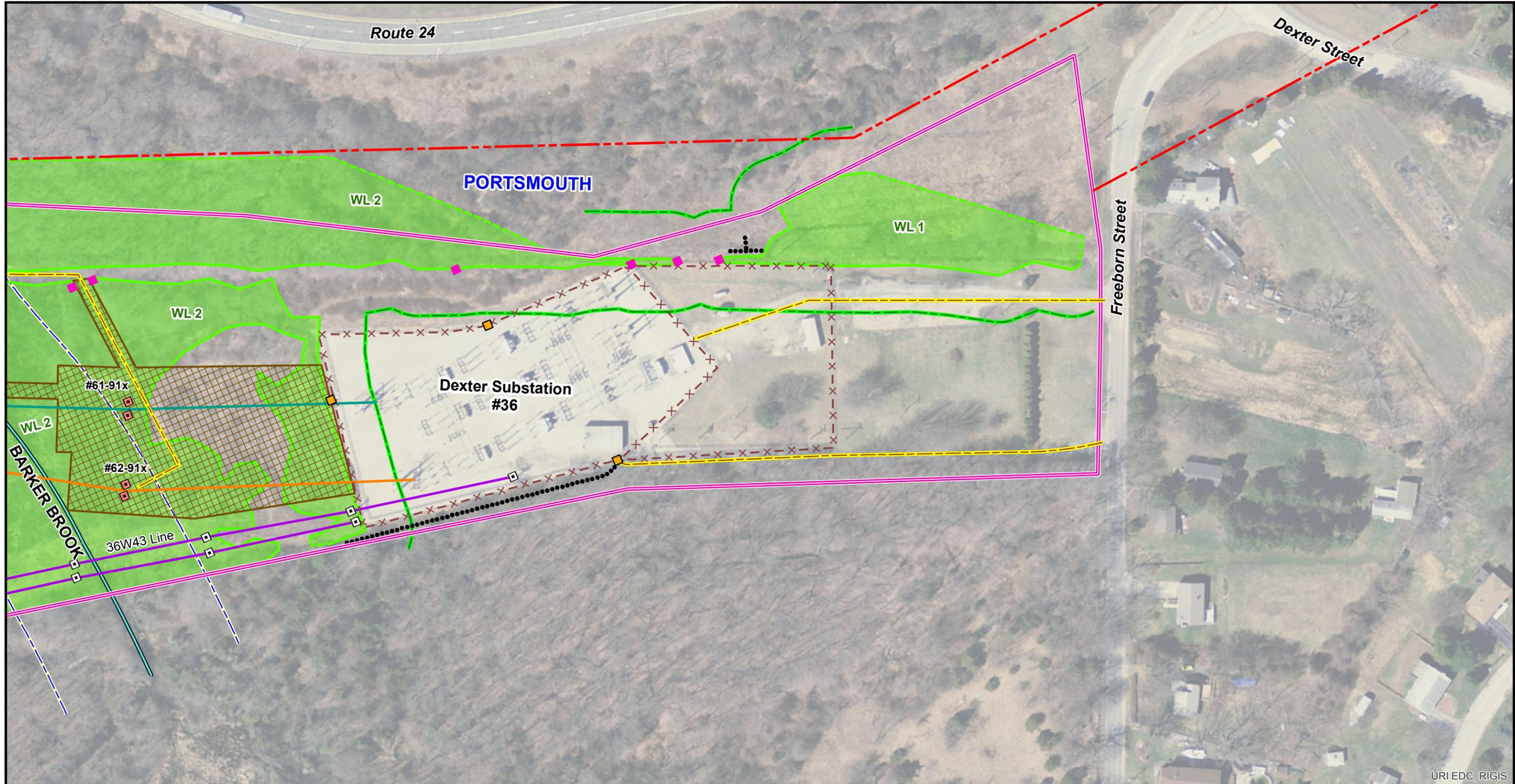
AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

61/62 Transmission Lines Site Plans
Plan 16 of 17
Figure 2-2

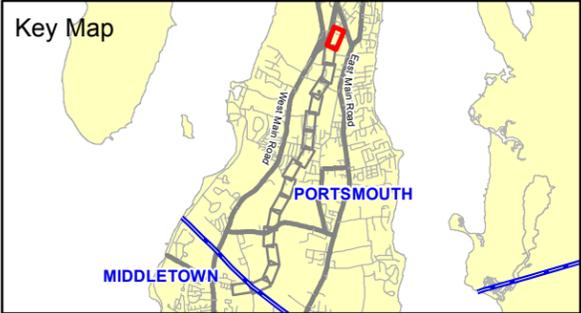
Source:
Wetland boundaries were field delineated and surveyed by VHB in 2014.
Base mapping provided by RIGIS.
Property Lines Obtained from Garofalo's Existing Conditions Plan dated Sept. 2014.

0 50 100
Feet

nationalgrid
vhb



URI EDC, RIGIS



Legend	
	Proposed Structure
	Structure to be Removed
	Structure to be Replaced
	Proposed Temporary Structure
	Existing Structure
	Access
	Proposed Swamp Mats
	Guy Wire Anchor
	Drop Inlet Catch Basin
	Culvert
	Fence
	Gate
	Stonewall
	Town Boundary
	Line 61 (To Be Rebuilt)
	Line 61 (To Be Relocated)
	Line 61 (To Be Removed)
	Line 62 (To Be Rebuilt)
	Line 62 (To Be Relocated)
	Line 62 (To Be Removed)
	Line 63 (Existing)
	Line 63 (To Be Removed)
	Line 63 (Temporary)
	Line 63 (Relocated)
	Line (Other)
	Line (Other-Proposed)
	TNEC ROW
	TNEC Easement
	TNEC Fee-Owned Property
	Delineated Wetland Edge
	50' Perimeter Wetland
	Stream
	100' Riverbank Wetland
	Edge of Open Water
	ASSF

AQUIDNECK ISLAND RELIABILITY PROJECT PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

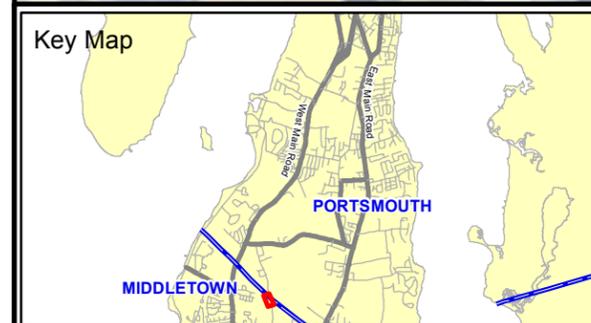
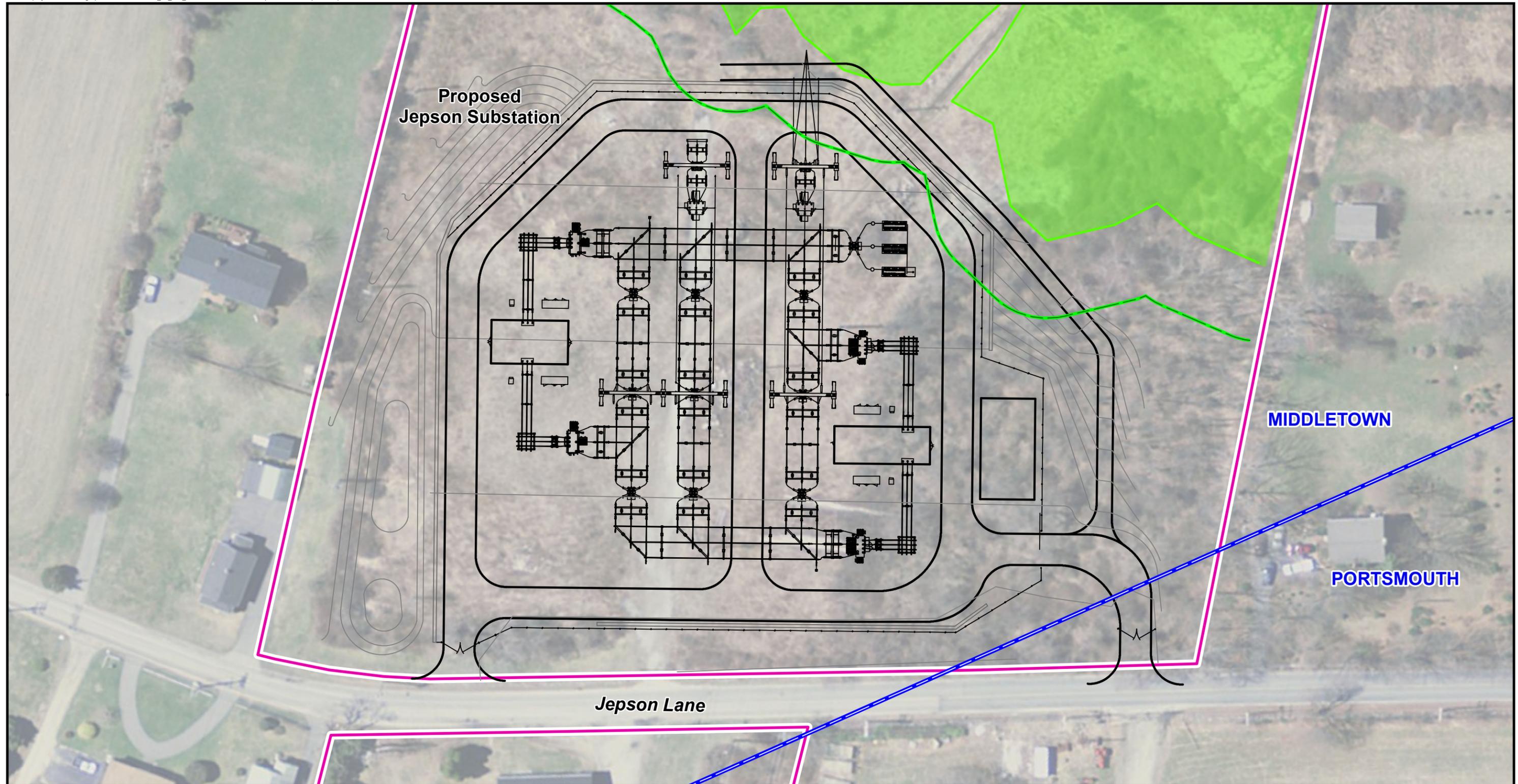
61/62 Transmission Lines Site Plans

Plan 17 of 17

Figure 2-2

Source:
Wetland boundaries were field delineated and surveyed by VHB in 2014.
Base mapping provided by RIGIS.
Property Lines Obtained from Garofalo's Existing Conditions Plan dated Sept. 2014.





- Legend**
- TNEC Fee-Owned Property
 - Delineated Wetland Edge
 - Wetlands
 - 50' Perimeter Wetland
 - Town Boundary



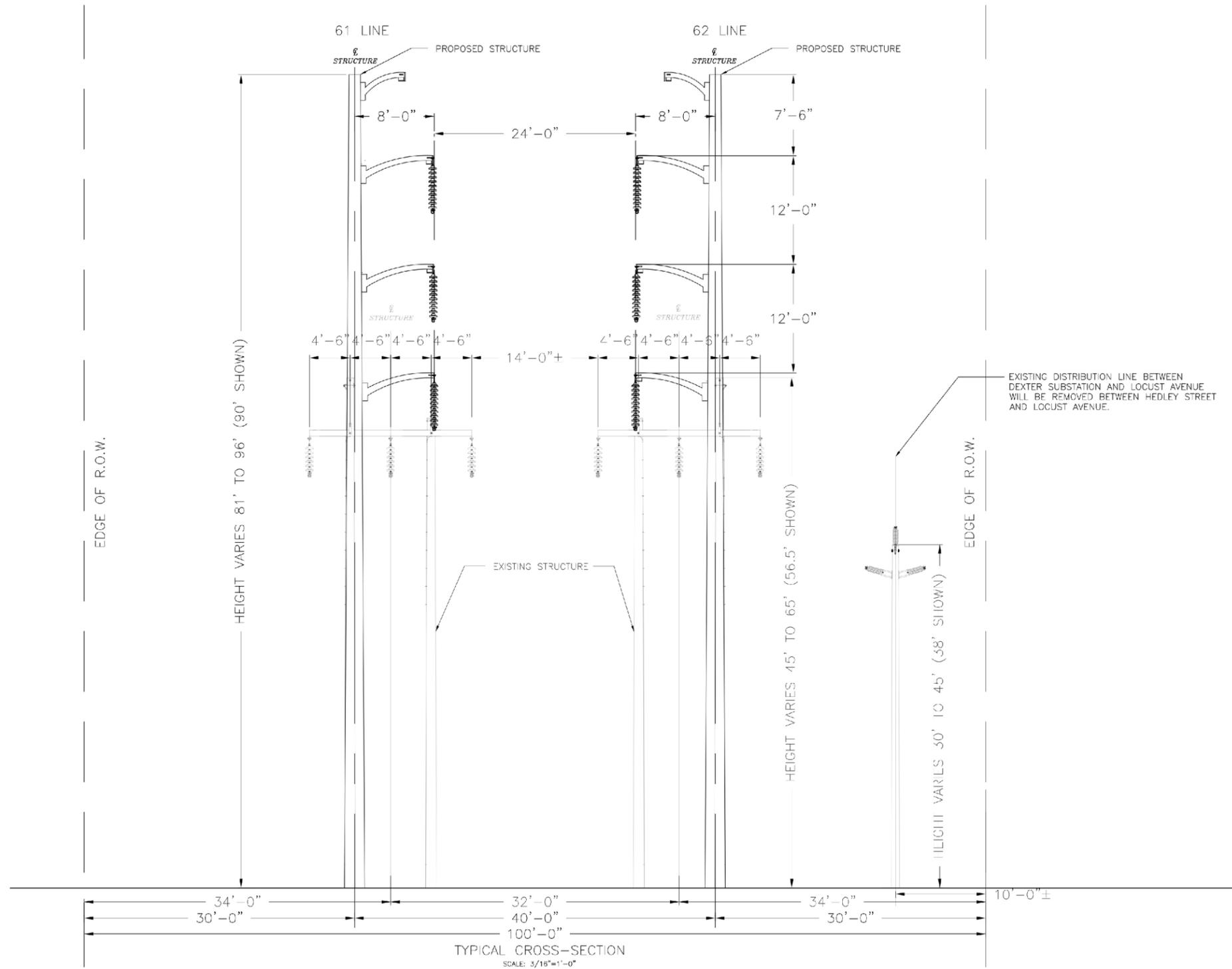
**AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND**

**Proposed Jepson Substation
Figure 2-3**

Source:
Wetland boundaries were field delineated and surveyed by VHB in 2014.
Base mapping provided by RIGIS.
Property Lines Obtained from Garofalo's Existing Conditions Plan dated Sept. 2014.

0 30 60
Feet





Scale
Not to Scale

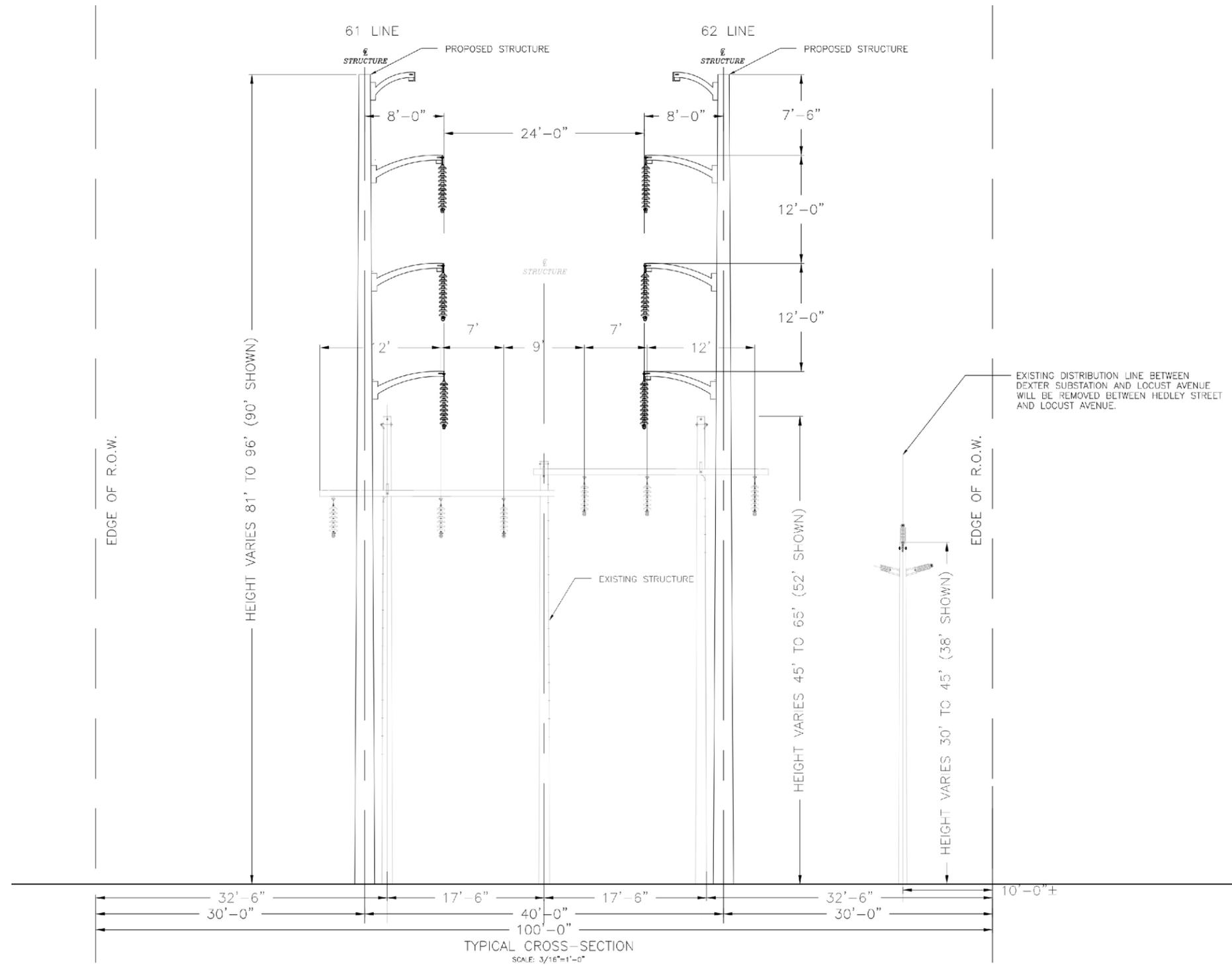
**AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND**

Cross Section of Davit Arm Structures Replacing Existing Single Circuit H-Frame Structures Facing North

Figure 4-1

Source:
National Grid (December 2015)



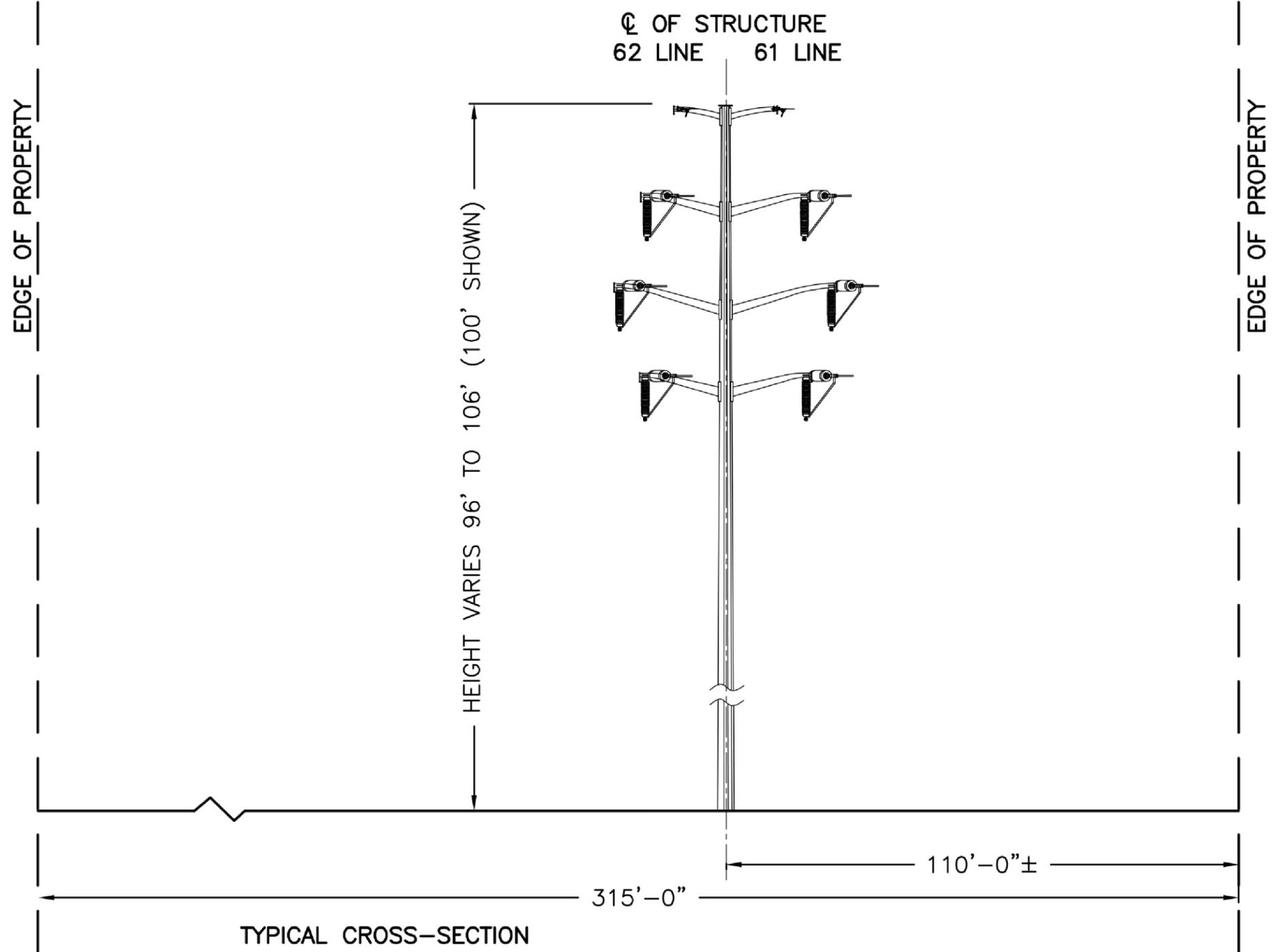


Scale
Not to Scale

AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND
Cross Section of Davit Arm Structures Replacing Existing Double Circuit 3 Pole Structures Facing North
Figure 4-2

Source:
National Grid (December 2015)





Scale
Not to Scale

**AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND**
Cross Section of New Double Circuit Davit Arm Structures from Sisson Pond to Jepson Lane facing West
Figure 4-3

Source:
National Grid (December 2015)



	2014				2015				2016				2017				2018				2019				2020											
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4								
Engineering	█																																			
Licensing and Permitting									█																											
Final Engineering										█																										
Procurement													█																							
Construction																					█															

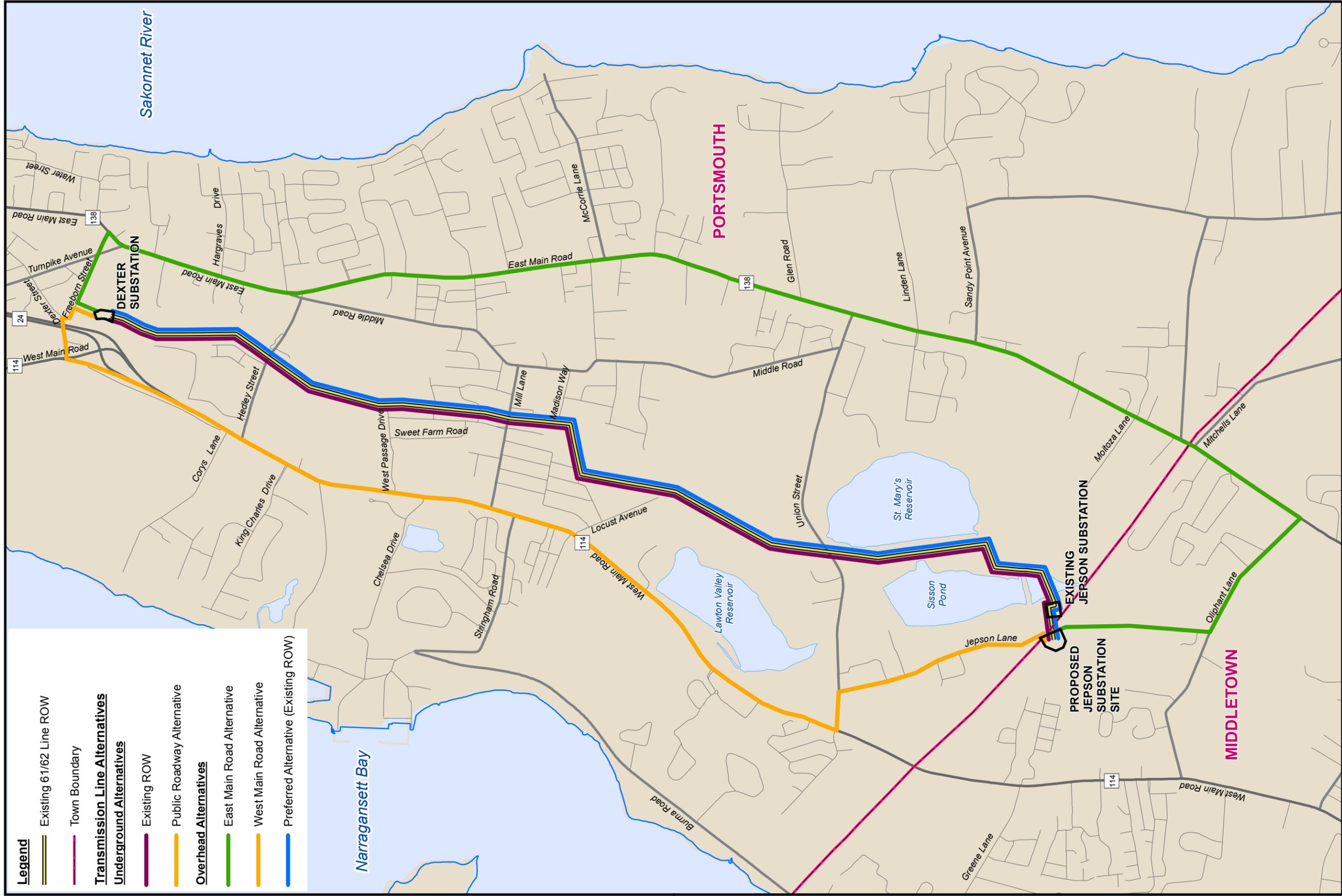
Scale
Not to Scale

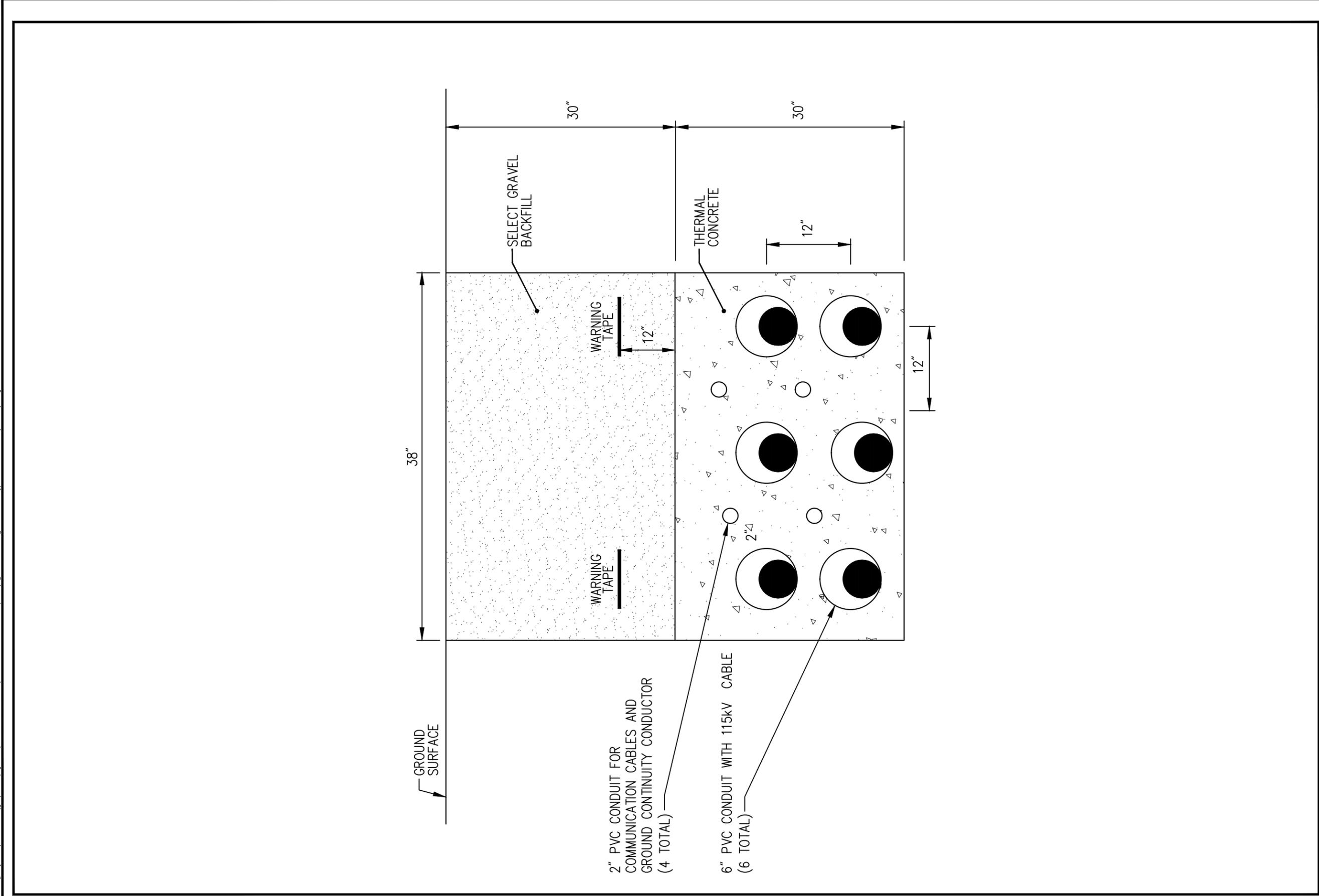
**AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND**

**Project Schedule
Figure 4-4**

Source:
National Grid (December 2015)





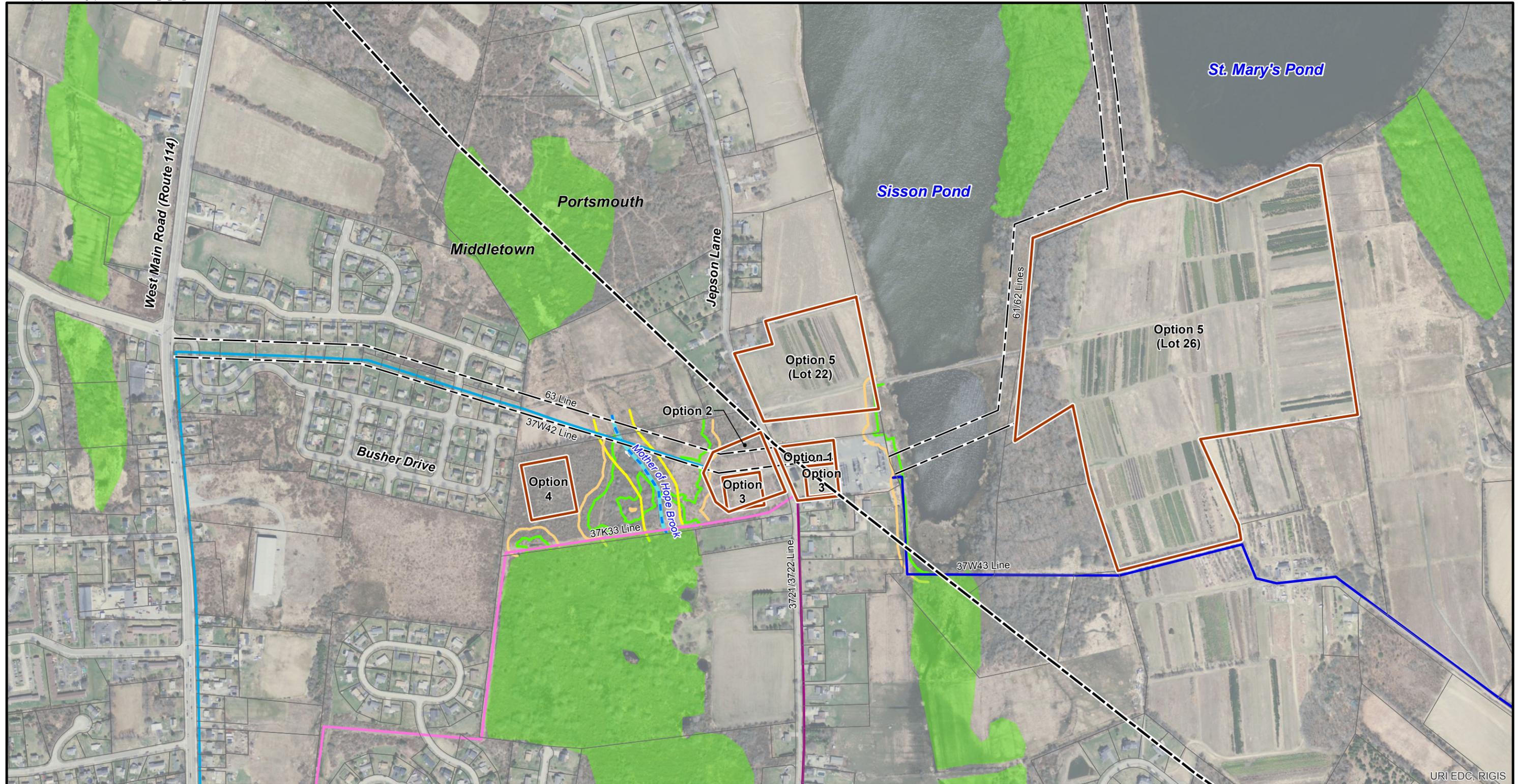


Scale
Not to Scale

AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND
Underground Alternative Trench Cross-Section
Figure 5-2

Source:
National Grid, 2015.





URI EDC, RIGIS



Legend

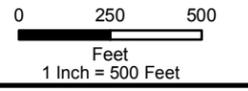
- Transmission Line ROW
- Line 3721/3722
- Line 37J2
- Line 37W42
- Line K33
- Town Boundary
- Mother of Hope Brook
- Flagged Wetland Edge
- Freshwater Wetland
- 50' Perimeter Wetland
- 100' Riverbank Wetland

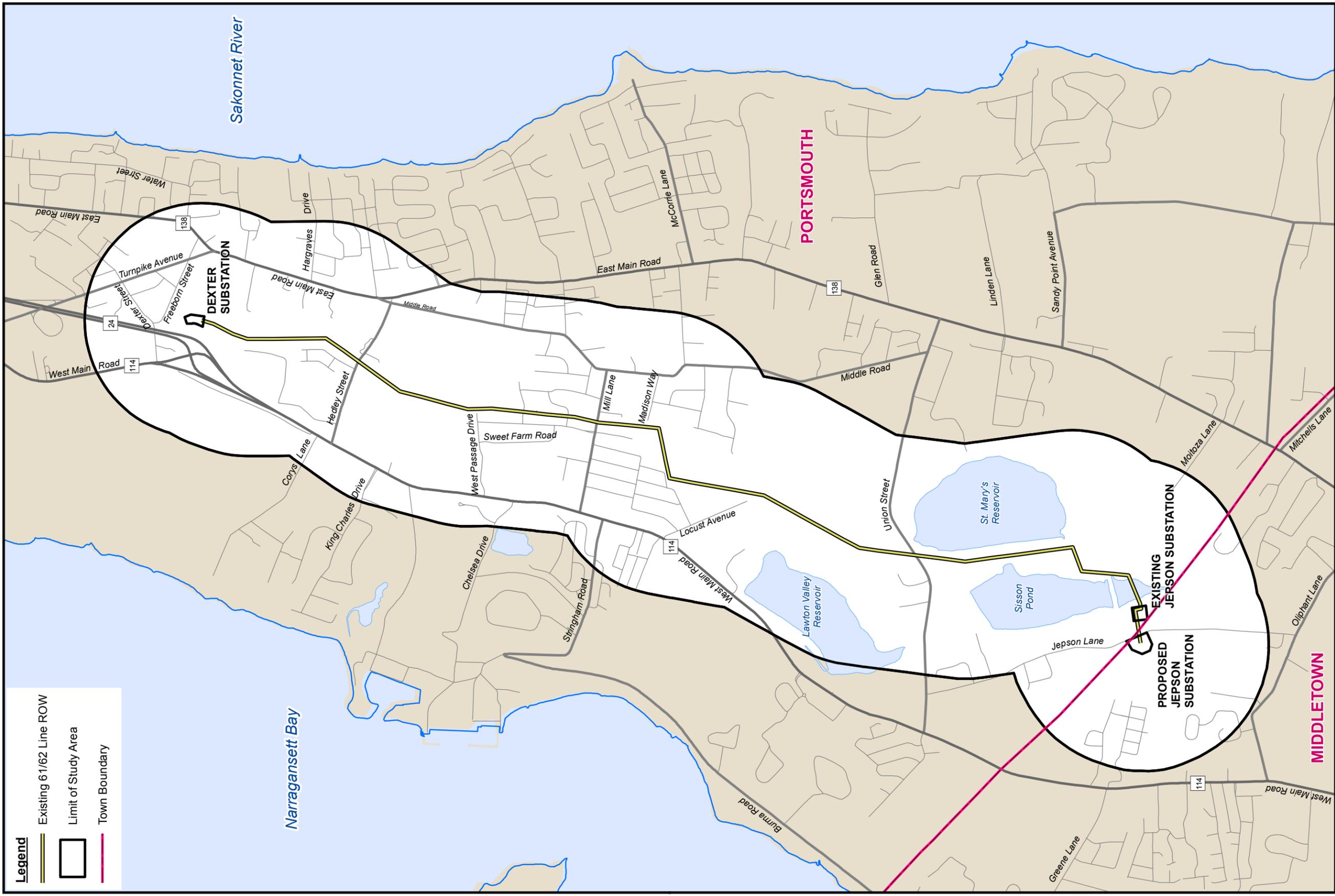


**AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND**

**Jepson Substation Alternatives
Figure 5-3**

Source: Wetland boundaries were field delineated and surveyed by VHB in 2014. Base mapping provided by RIGIS.





Legend

- Existing 61/62 Line ROW
- Limit of Study Area
- Town Boundary

Scale

0 1,000 2,000

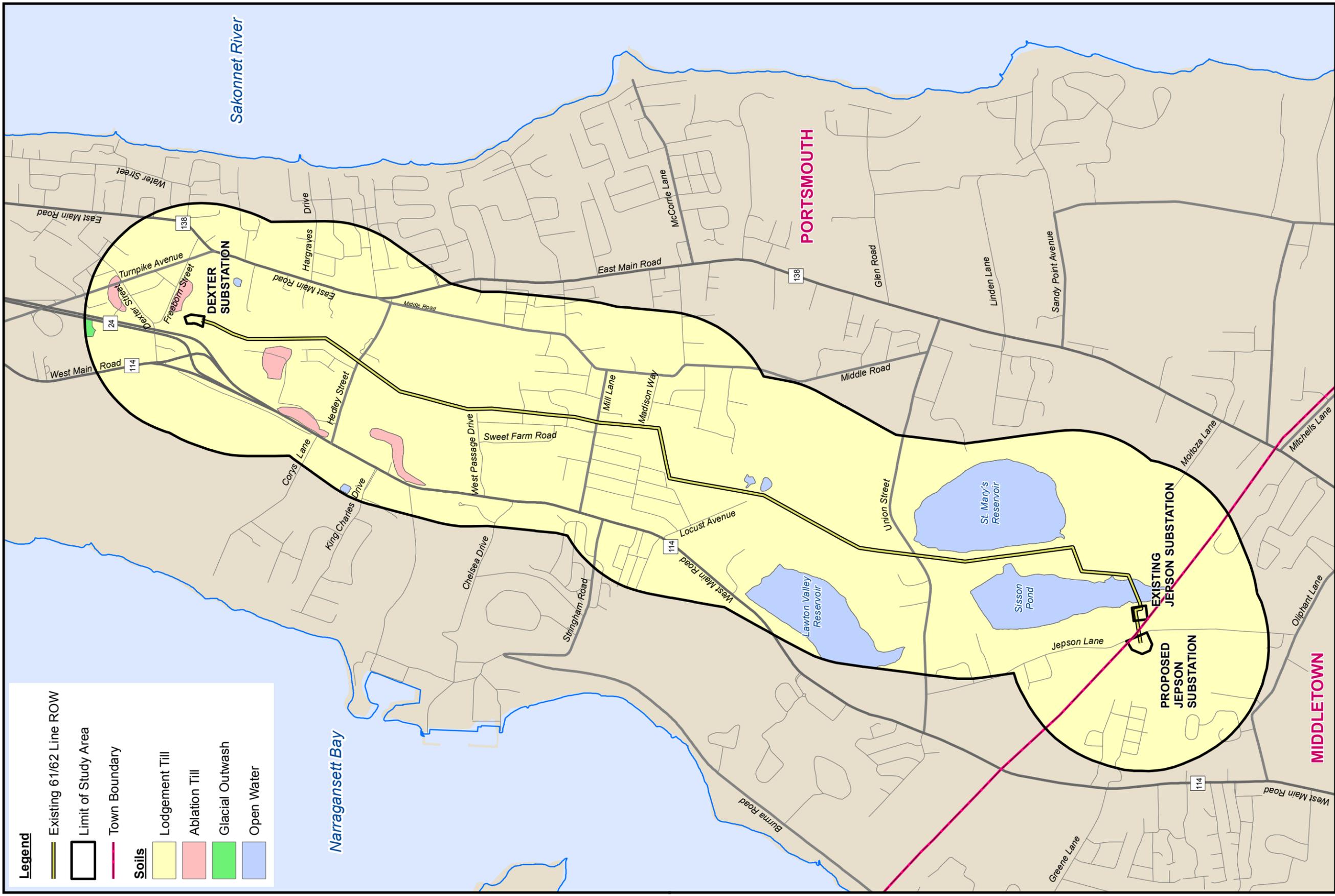
Feet

1 inch = 2,000 feet

AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

Study Area Base Plan
Figure 6-1

Source:
RIGIS (2014)



Legend

- Existing 61/62 Line ROW
- Limit of Study Area
- Town Boundary

Soils

- Lodgement Till
- Ablation Till
- Glacial Outwash
- Open Water

Scale

0 1,000 2,000

Feet

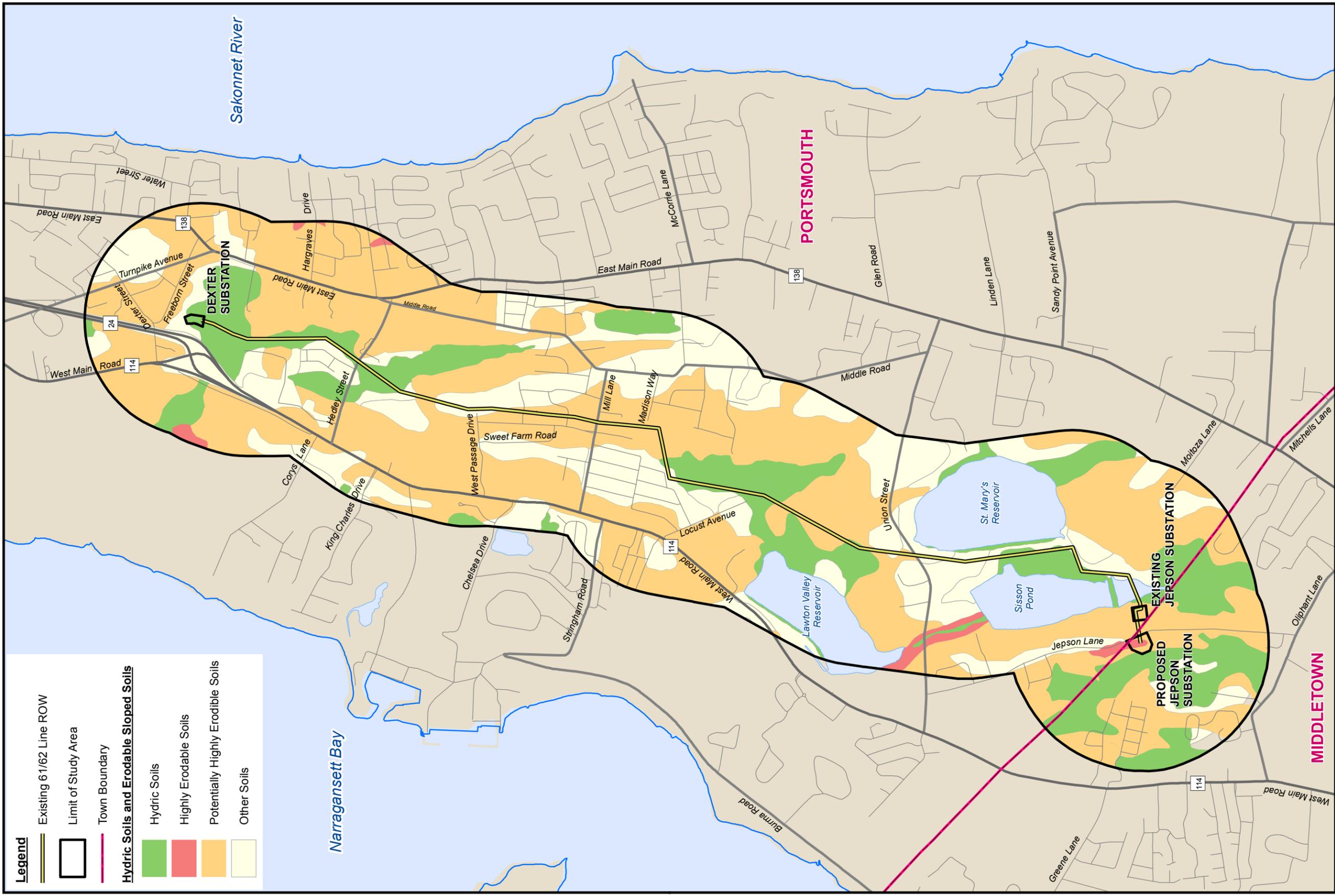
1 inch = 2,000 feet

**AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND**

**Surficial Geology Plan
Figure 6-2**

Source:
RIGIS (2014)





Legend

- Existing 61/62 Line ROW
- Limit of Study Area
- Town Boundary

Hydric Soils and Erovable Sloped Soils

- Hydric Soils
- Highly Erovable Soils
- Potentially Highly Erovable Soils
- Other Soils

Scale

0 1,000 2,000

Feet

1 inch = 2,000 feet

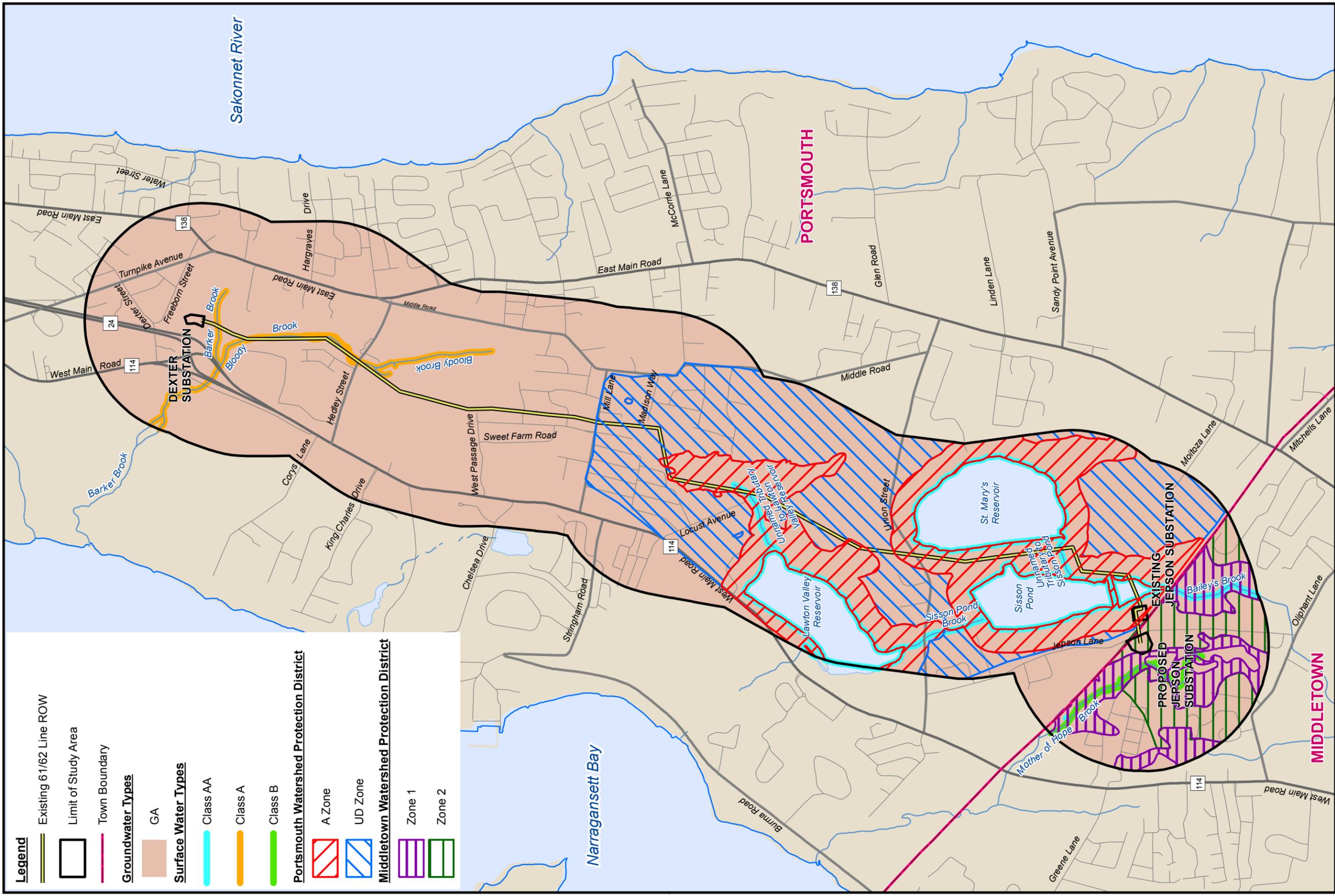
AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

Soils Plan
Figure 6-3

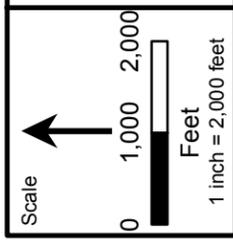
Source:
RIGIS (2014)



Path: \\UR-data\projects\72518_00\graphics\FIGURES\Lines_61_and_62\FEESB_EnvironmentalReport\FIG 6-4_Surface and Groundwater Plan (72518).mxd



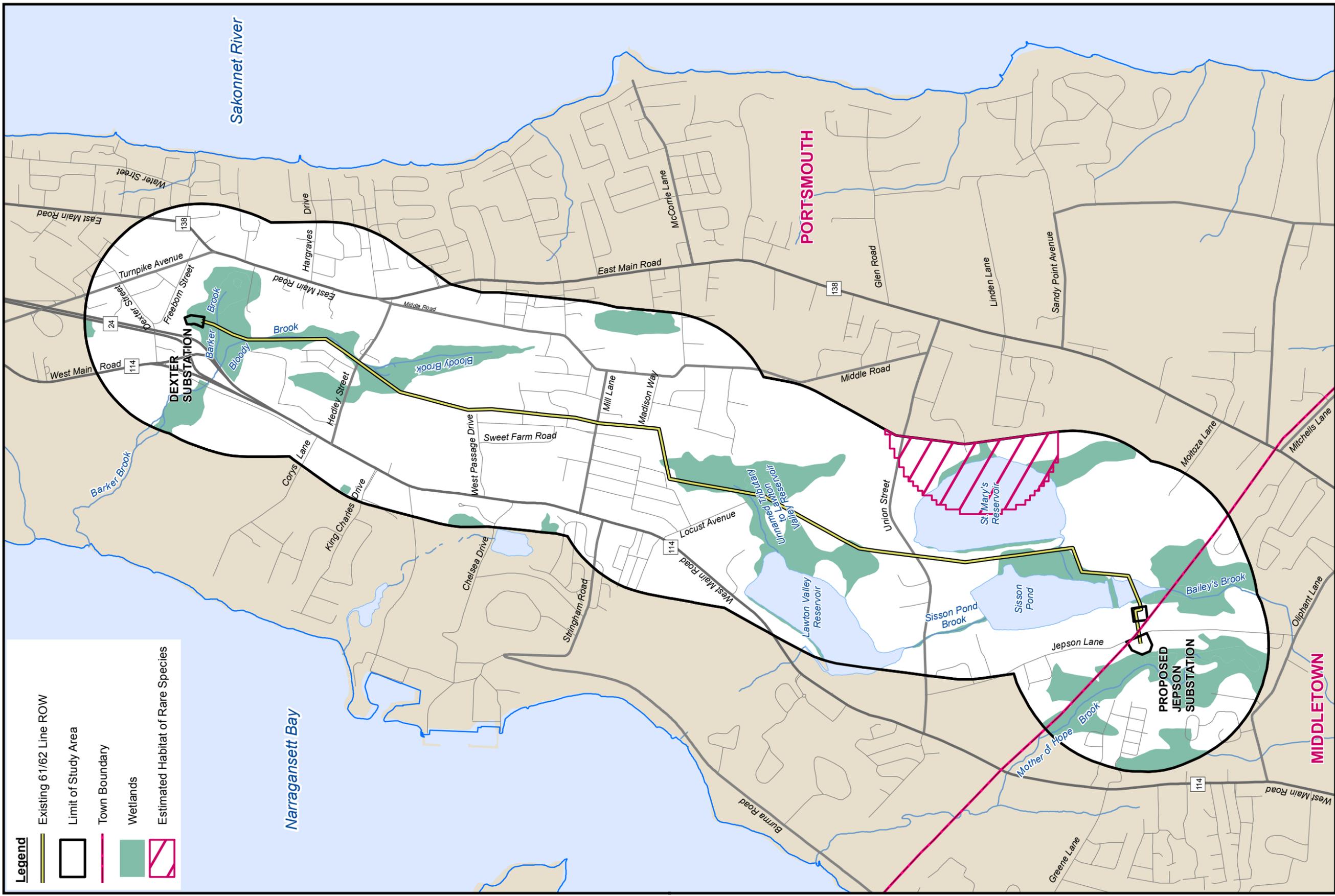
- Legend**
- Existing 61/62 Line ROW
 - Limit of Study Area
 - Town Boundary
 - Groundwater Types**
 - GA
 - Surface Water Types**
 - Class AA
 - Class A
 - Class B
 - Portsmouth Watershed Protection District**
 - A Zone
 - UD Zone
 - Middletown Watershed Protection District**
 - Zone 1
 - Zone 2



AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND
Surface and Groundwater Resources Plan
Figure 6-4

Source:
 RIGIS (2014)
 Town of Portsmouth
 Planning Department (2015)
 Town of Middletown
 Planning Department (2015)

THIS DOCUMENT IS INTENDED FOR GENERAL PLANNING & INFORMATION PURPOSES ONLY. ALL MEASUREMENTS & LOCATIONS ARE APPROXIMATE



Legend

- Existing 61/62 Line ROW
- Limit of Study Area
- Town Boundary
- Wetlands
- Estimated Habitat of Rare Species

Scale

0 1,000 2,000

Feet

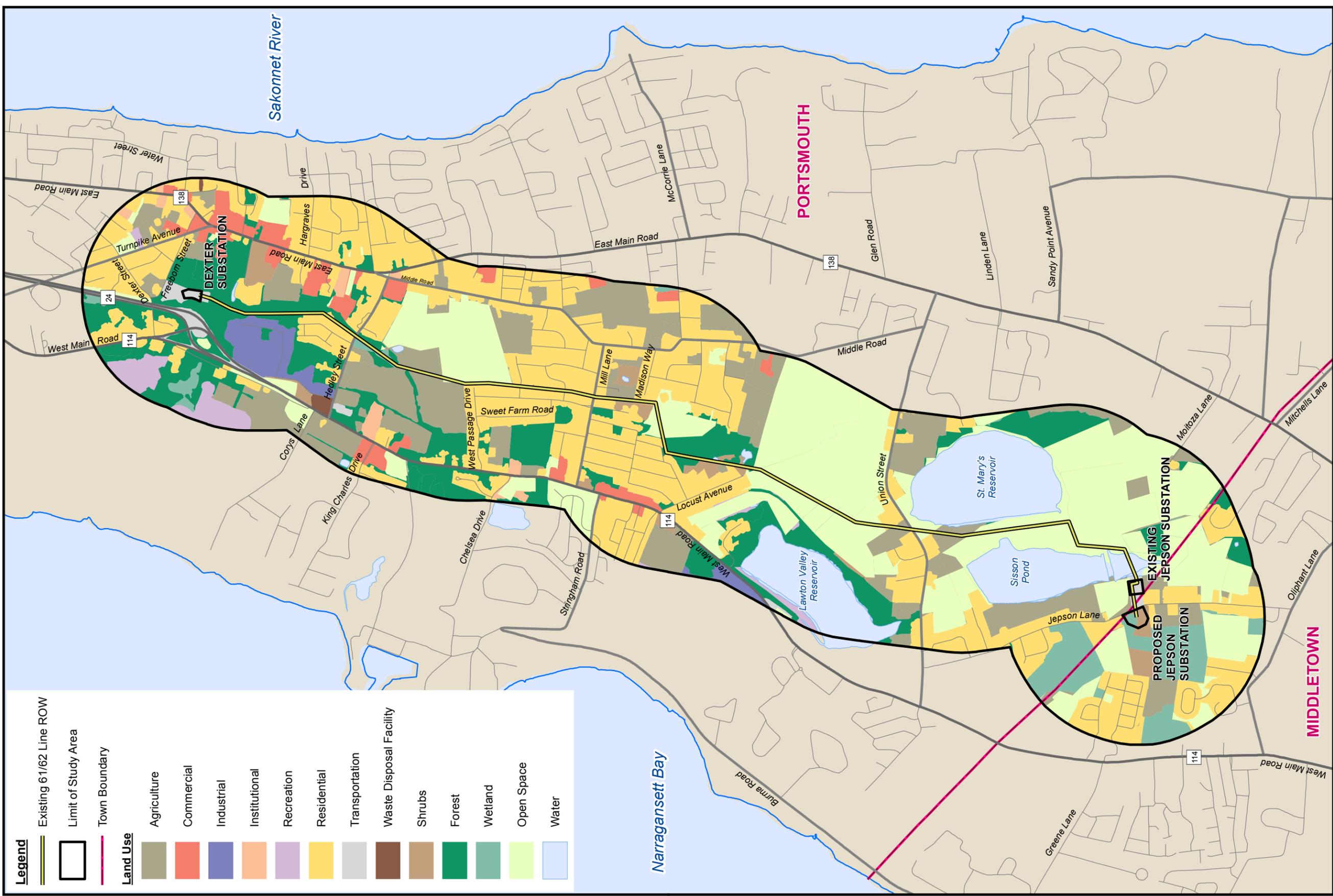
1 inch = 2,000 feet

Source: RIGIS (2014)



AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

Wetlands and Rare Species Plan
Figure 6-5



Legend

- Existing 61/62 Line ROW
- Limit of Study Area
- Town Boundary

Land Use

- Agriculture
- Commercial
- Industrial
- Institutional
- Recreation
- Residential
- Transportation
- Waste Disposal Facility
- Shrubs
- Forest
- Wetland
- Open Space
- Water

Scale

0 1,000 2,000

Feet

1 inch = 2,000 feet

AQUIDNECK ISLAND RELIABILITY PROJECT
PORTSMOUTH AND MIDDLETOWN, RHODE ISLAND

Land Use Plan
 Figure 7-1

Source:
 RIGIS (2011)

