SOUTHCOAST WIND

SCW RI CRMC Category B Assent Attachments

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SOUTHCOAST WIND

SouthCoast Wind 1 Project

Joint Application for a Category B Assent and a Freshwater Wetlands Permit

September 2024

ATTACHMENTS

Submitted to: Rhode Island Coastal Resources Management Council

Location: Rhode Island State Waters and Onshore Project Components in Portsmouth, Rhode Island

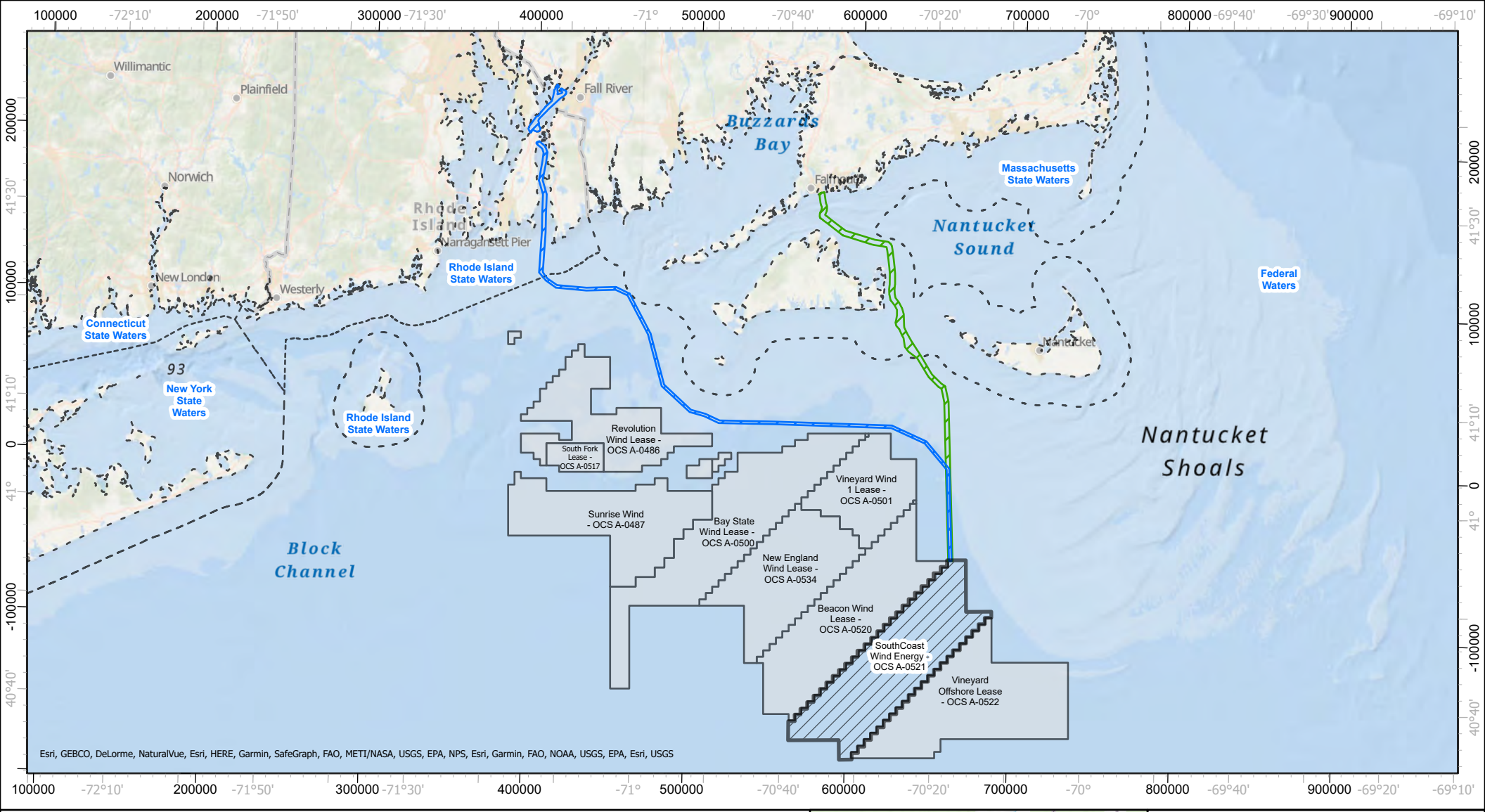
Project Proponent: SouthCoast Wind Energy LLC

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment A: Project Figures

Revised: September 2024



LEGEND

- Brayton Point Export Cable Corridor
- Falmouth Offshore Export Cable Corridor
- SouthCoast Wind Energy LLC OCS A-0521
- Wind Lease Area
- State Water Boundary

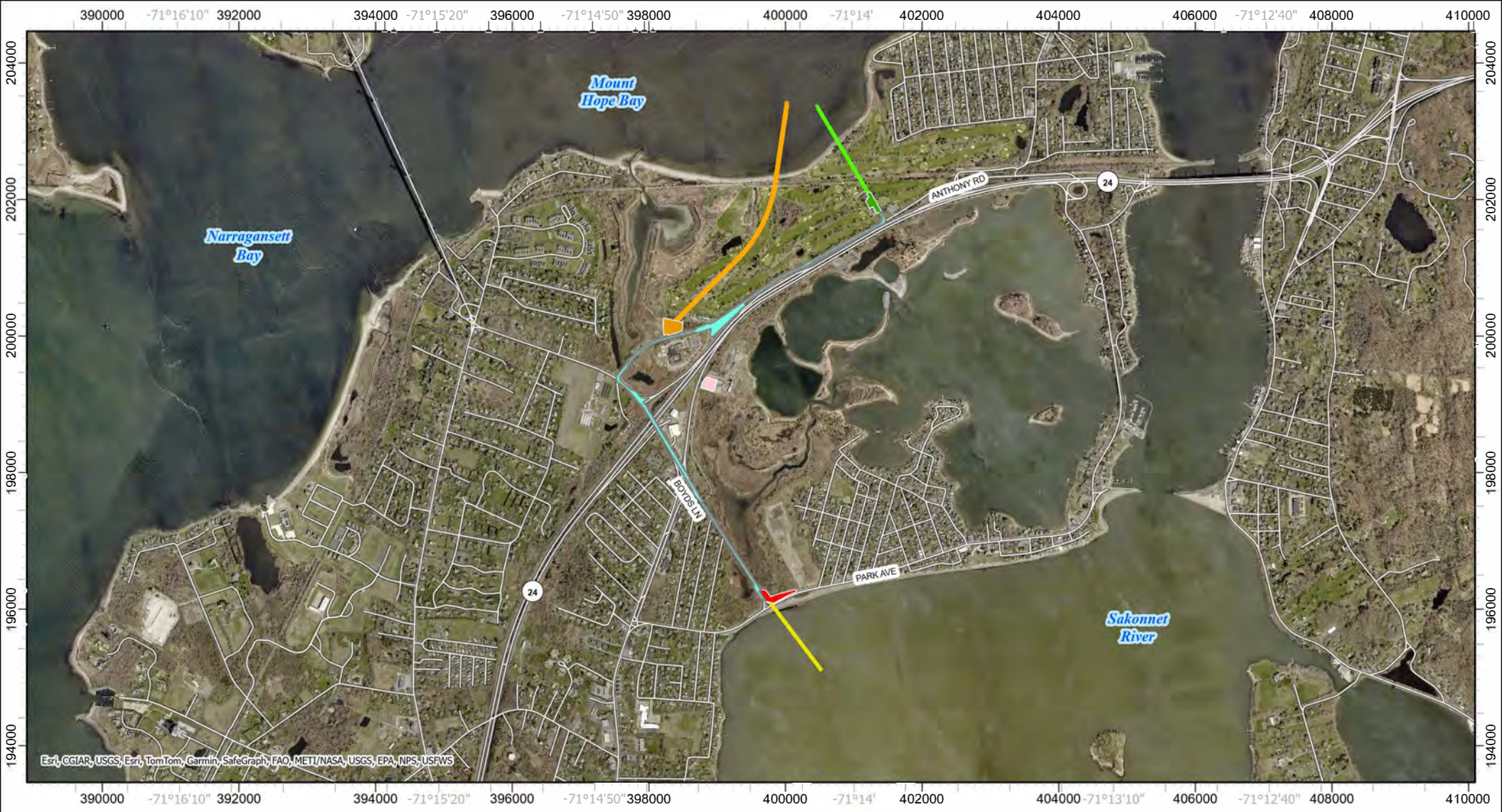
SOUTHCOAST WIND

FIGURE 1-1
PROJECT OVERVIEW

Date: 2/20/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:1,000,000

0 10 20
Miles

POWER ENGINEERS



LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Boyds Lane Horizontal Directional Drill Staging Area
- Montaup Horizontal Directional Drill Staging Area
- RWU North Parcel Horizontal Directional Drill Staging Area
- Potential Additional Staging Area
- Common Horizontal Directional Drill Trajectory
- Montaup Horizontal Directional Drill Trajectory
- RWU Horizontal Directional Drill Trajectory
- Road

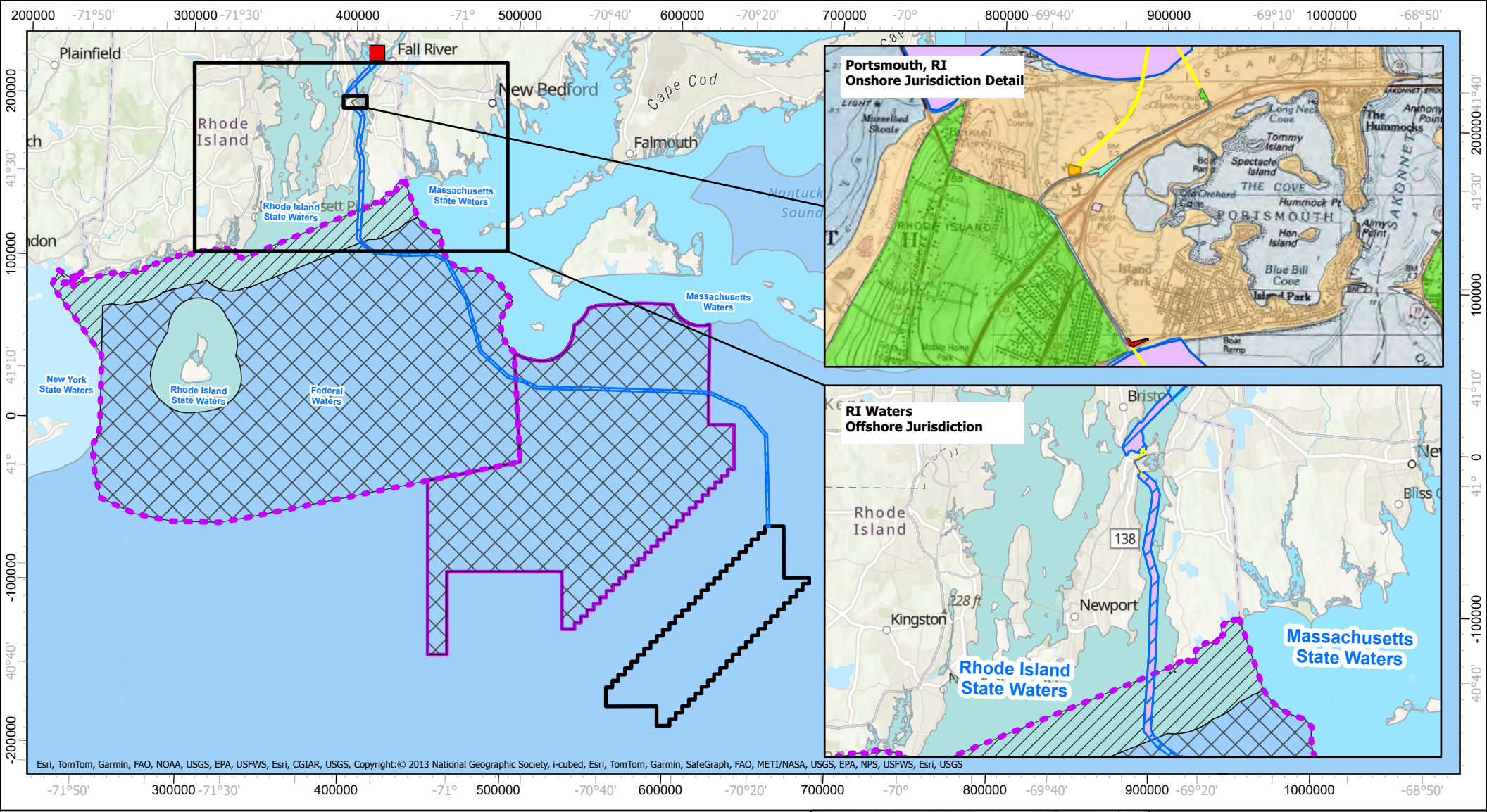
SOUTHCOAST WIND

FIGURE 1-2
ONSHORE CONSTRUCTION CORRIDOR

Date: 9/4/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:24,000

0 1
Miles

POWER ENGINEERS



LEGEND

- Brayton Point POI
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Boyds Lane Horizontal Directional Drill Staging Area
- Montaup Horizontal Directional Drill Staging Area
- RWU North Parcel Horizontal Directional Drill Construction Area
- Potential Additional Staging Area
- Brayton Point Export Cable Corridor
- SouthCoast Wind Energy LLC OCS A-0521
- RI Ocean SAMP (2010) Study Area
- Geographic Location Description Boundary (2018)
- Ocean SAMP-Federal Consistency Review Only
- Ocean SAMP-Category B Assent
- CRMP Jurisdiction in RI Waters of the Export Cable Corridor
- CRMC (CRMP Onshore Jurisdiction)
- DEM (Onshore Jurisdiction)
- Federal Waters
- Massachusetts State Waters (3-Nautical Mile State Water Boundary)
- Rhode Island State Waters (3-Nautical Mile State Water Boundary)

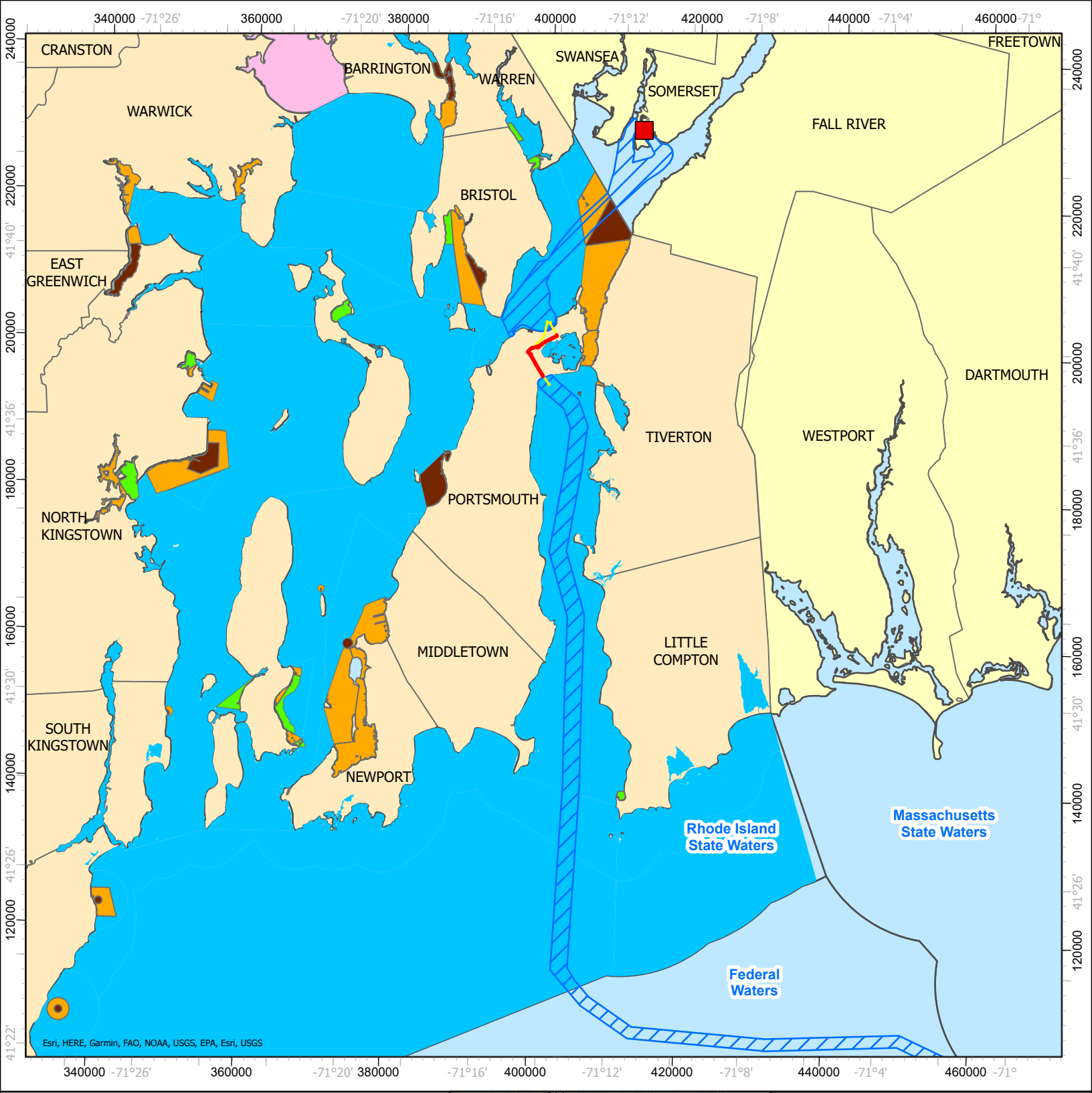
SOUTHCOAST WIND

FIGURE 1-3
PROJECT LOCATION AND CRMC REGULATORY JURISDICTION

Date: 8/1/2024
NAD 1983 2011 UTM Zone 19N
Scale: 1:1,000,000

0 10 20
Miles

POWER ENGINEERS



LEGEND

- Brayton Point POI
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Brayton Point Export Cable Corridor
- Federal and State Waters
- Rhode Island Town Boundary
- Massachusetts Town Boundary

Water Quality Standard Class (RIDEM 2020)

- SA
- SA{b}
- SB
- SB1
- SB{a}

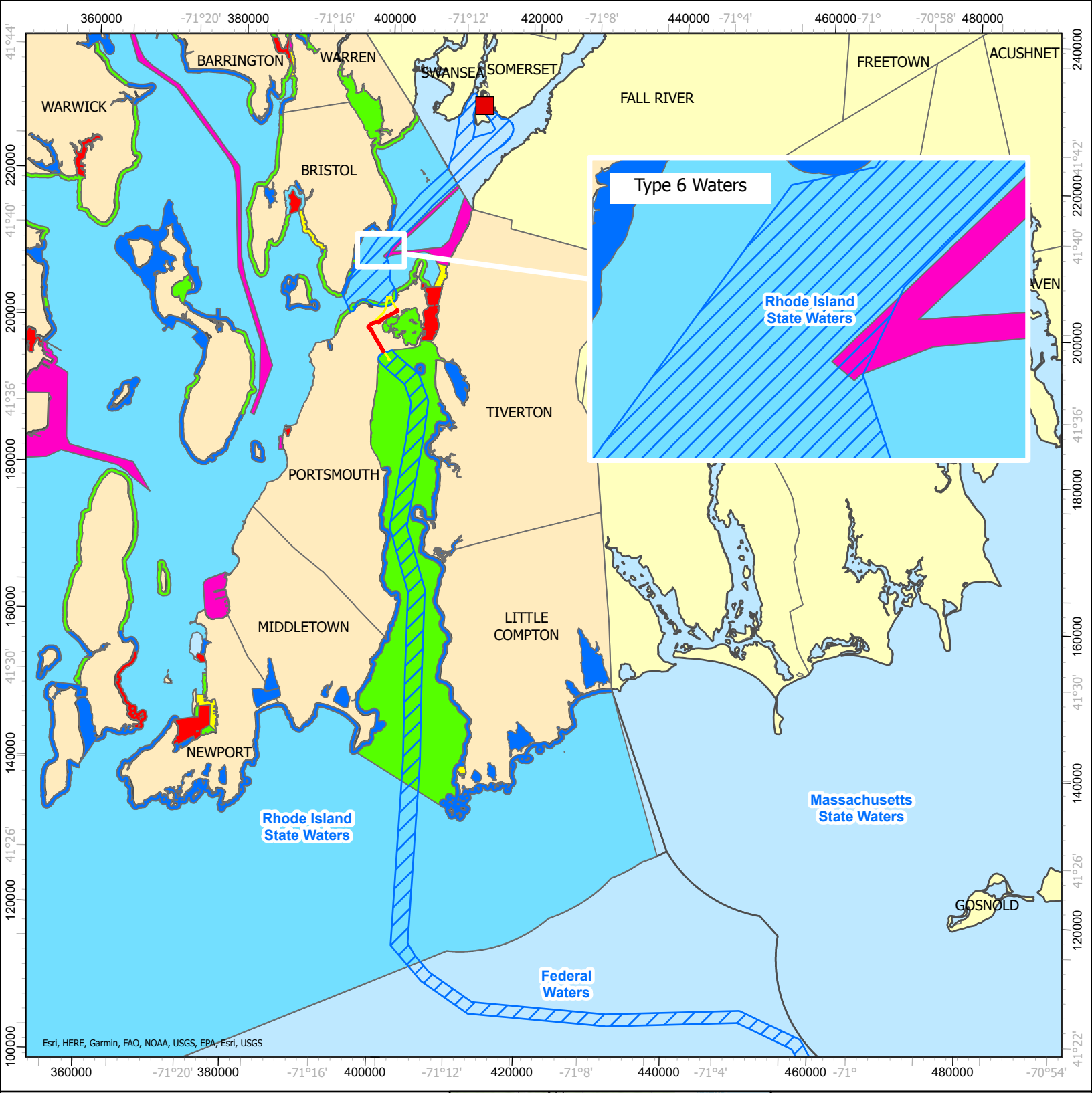
SOUTHCOAST WIND

FIGURE 1-4
RIDEM SURFACE WATER CLASSES (2020)

Date: 2/21/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:210,000

0 5
Miles

POWER ENGINEERS



LEGEND

- Brayton Point POI
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Brayton Point Export Cable Corridor
- Federal and State Waters
- Rhode Island Town Boundary
- Massachusetts Town Boundary

Water Use Designation (CRMC 2011)

- Type 1 Conservation Areas
- Type 2 Low Intensity Use
- Type 3 High Intensity Boating
- Type 4 Multi-Purpose Waters
- Type 5 Commercial & Recreational Harbors
- Type 6 Industrial Waterfronts and Commercial Navigation Channels

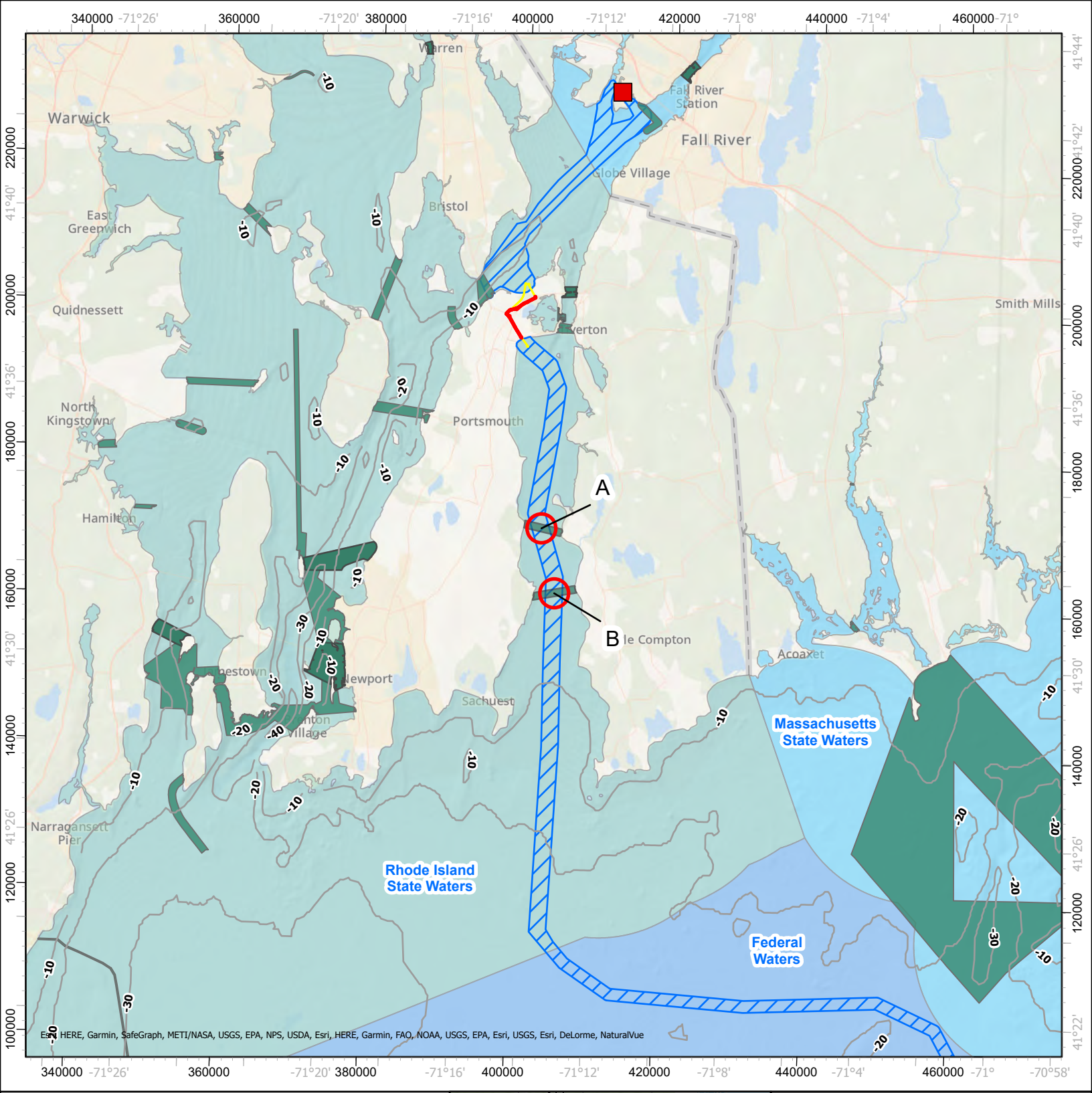
SOUTHCOAST WIND

FIGURE 1-5
RI CRMC WATER USE DESIGNATIONS (2011)

Date: 2/21/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:210,000

0 5
Miles

POWER ENGINEERS



LEGEND

- Brayton Point POI
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Brayton Point Export Cable Corridor
- Depth (meters)
- Potential Crossings
- Cable/Pipeline Areas (NOAA 2020)
- Federal Waters
- Massachusetts State Waters
- Rhode Island State Waters

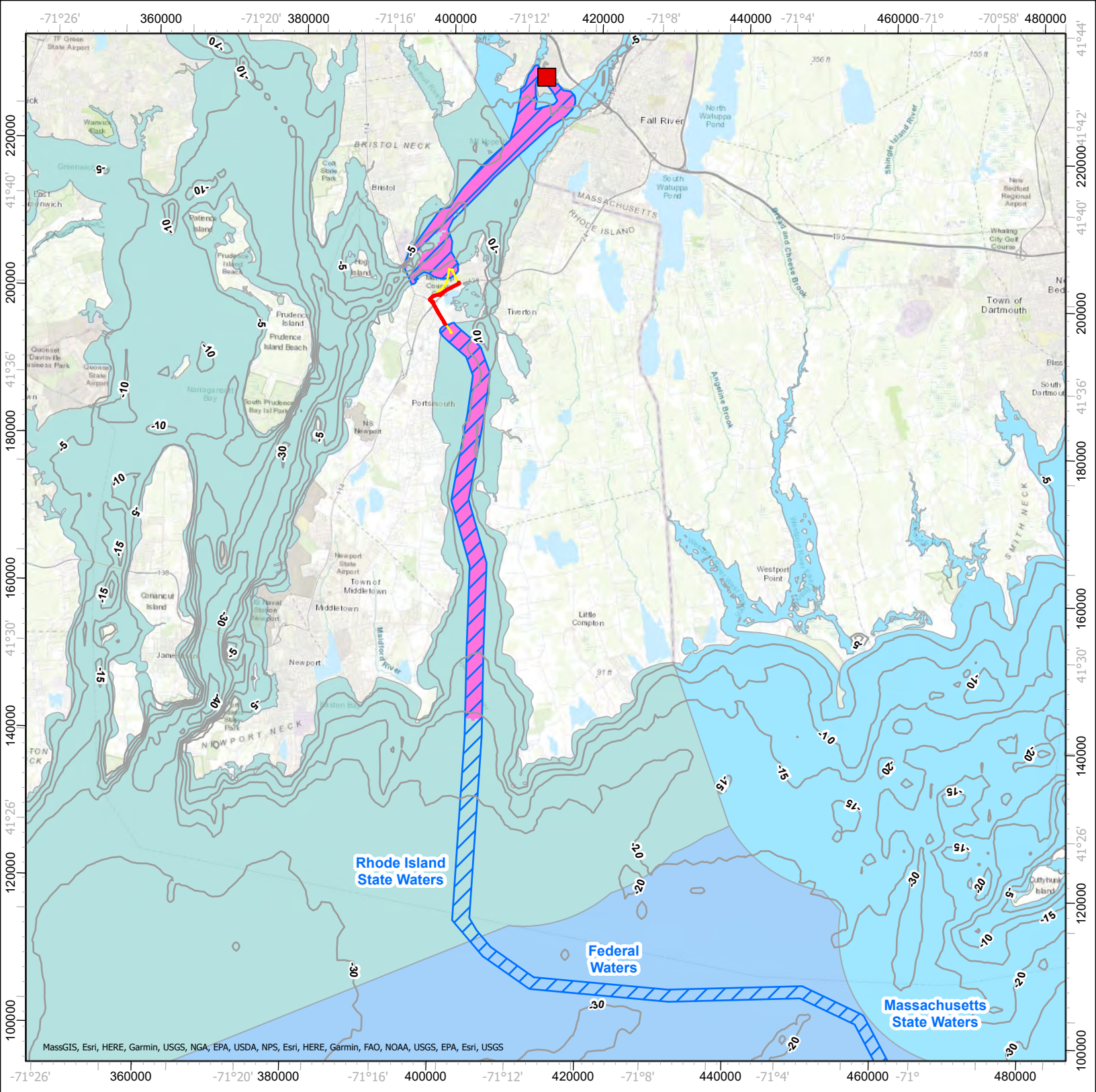
SOUTHCOAST WIND

FIGURE 2-1
POTENTIAL CABLE AND PIPELINE CROSSINGS

Date: 2/21/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:210,000

0 5
Miles

POWER ENGINEERS



LEGEND

- Brayton Point POI
- Onshore Export Cable Route Corridor
- Horizontal Directional Drill Trajectory
- Brayton Point Export Cable Corridor
- Depth (meters)
- Potential Area for Anchoring
- Federal Waters
- Massachusetts State Waters
- Rhode Island State Waters

SOUTHCOAST WIND

FIGURE 2-2
POTENTIAL AREAS FOR ANCHORING INSIDE THE BRAYTON POINT EXPORT CABLE CORRIDOR

Date: 2/23/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:210,000

0 5
Miles

POWER ENGINEERS

LEGEND

- Culvert
- Drain Manhole
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Boyds Lane Horizontal Directional Drill Staging Area
- Portsmouth Tax Parcel Boundary
- Stream (National Hydrography Dataset) (USGS 2011)

Contiguous Area Boundary

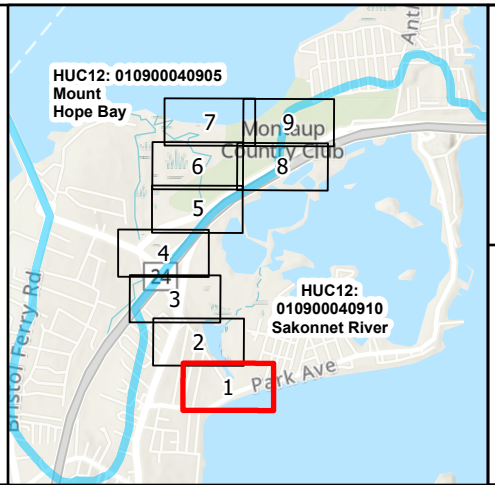
- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland
- 200 foot Contiguous Area of a River/Stream

Wetlands and Shoreline Features (POWER Field Delineated)

- Coastal Dune
- Coastal Wetland
- Coastal Wetland (Approximate)
- Man-made Shoreline
- MLW/Seaward Edge Coastal Beach (Approximate)
- Coastal Wetland (Approximate) for Wetland Buffers

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



SOUTHCOAST WIND

FIGURE 3-1 PANEL 1
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

0 200
Feet

POWER ENGINEERS

LEGEND

- Culvert
- Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary
- Stream (National Hydrography Dataset) (USGS 2011)

Contiguous Area Boundary

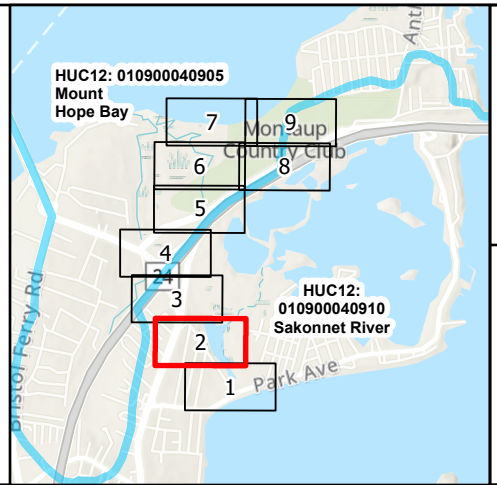
- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland
- 200 foot Contiguous Area of a River/Stream

Wetlands and Shoreline Features (POWER Field Delineated)

- Coastal Wetland (Approximate)
- Coastal Wetland (Approximate) for Wetland Buffers

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Freshwater Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



SOUTHCOAST WIND

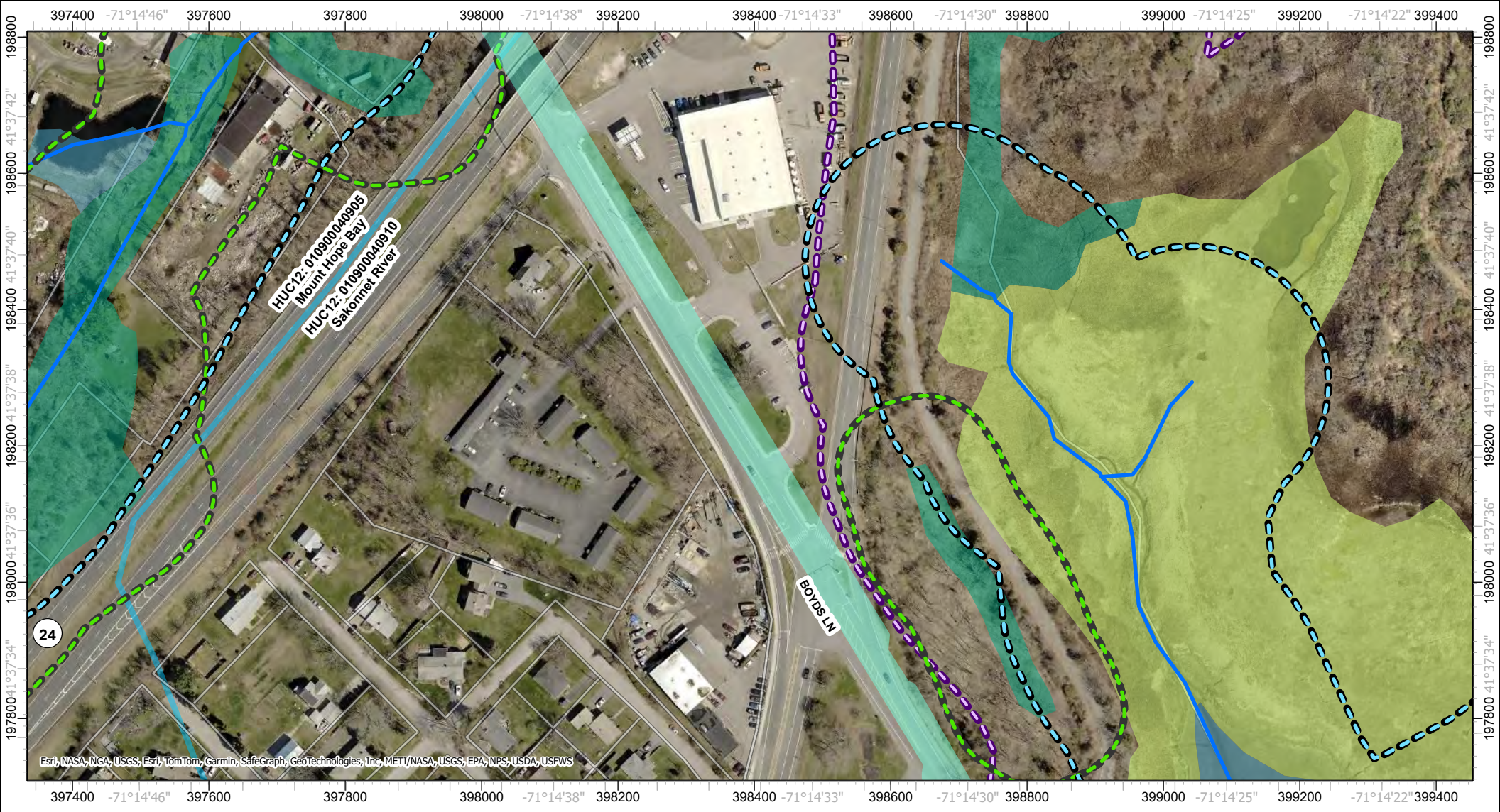
FIGURE 3-1 PANEL 2
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

0 200
Feet

POWER ENGINEERS



LEGEND

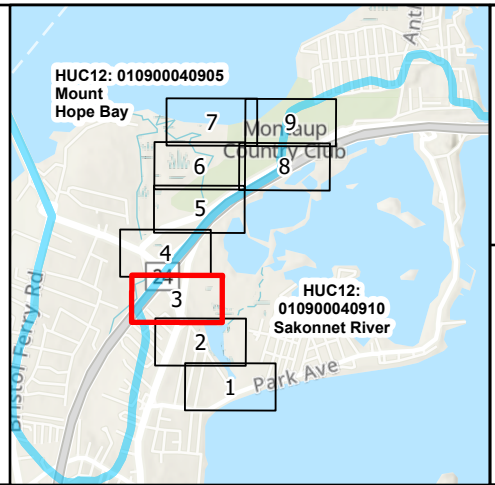
- Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary
- Stream (National Hydrography Dataset) (USGS 2011)

Contiguous Area Boundary

- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland
- 200 foot Contiguous Area of a River/Stream

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Freshwater Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



SOUTHCOAST WIND

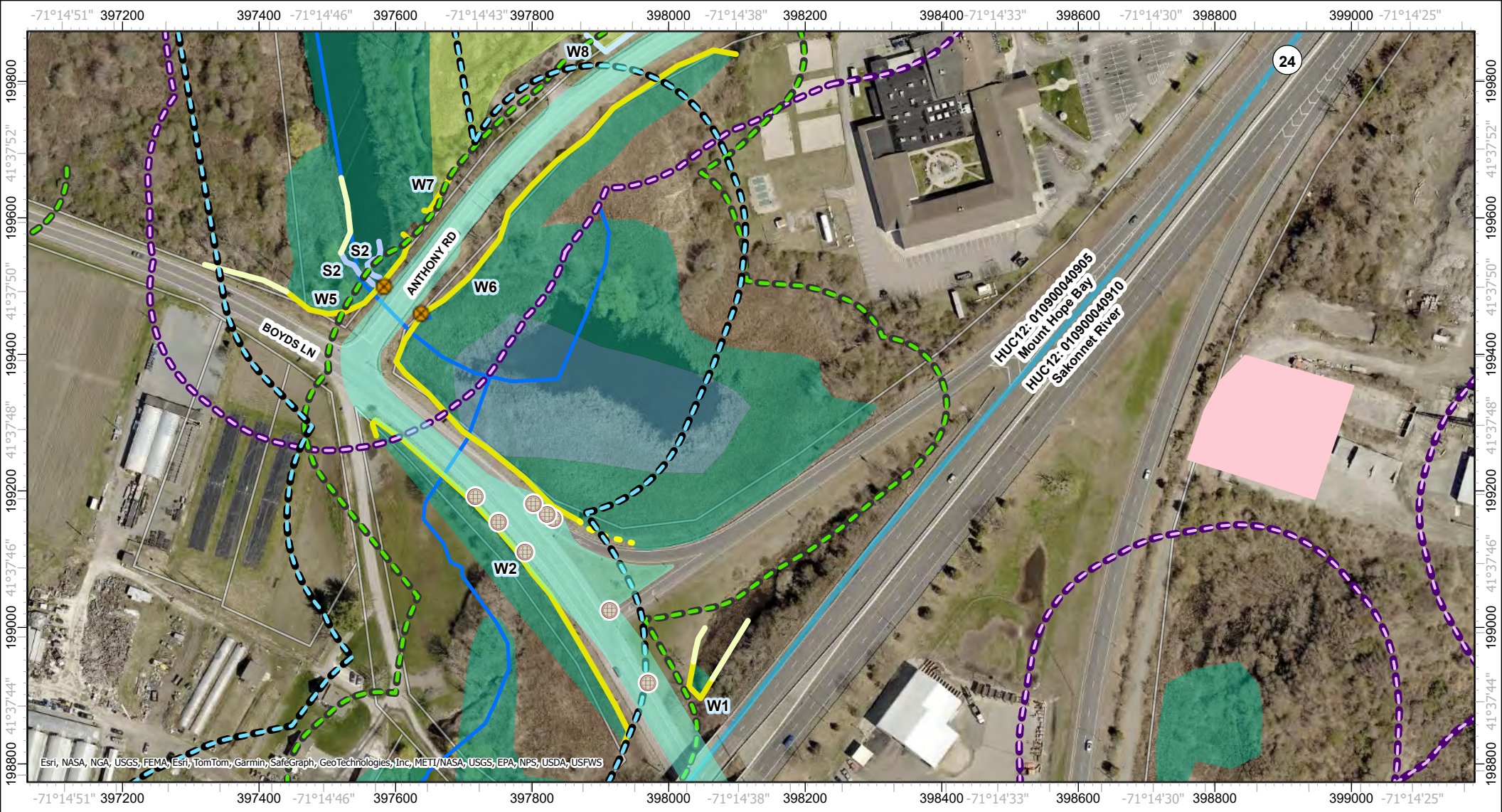
FIGURE 3-1 PANEL 3
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

0 200
Feet

POWER ENGINEERS



LEGEND

- Culvert
- Drain Manhole
- Onshore Export Cable Route Corridor Limit of Disturbance
- Potential Additional Staging Area
- Portsmouth Tax Parcel Boundary
- Stream (National Hydrography Dataset) (USGS 2011)

Contiguous Area Boundary

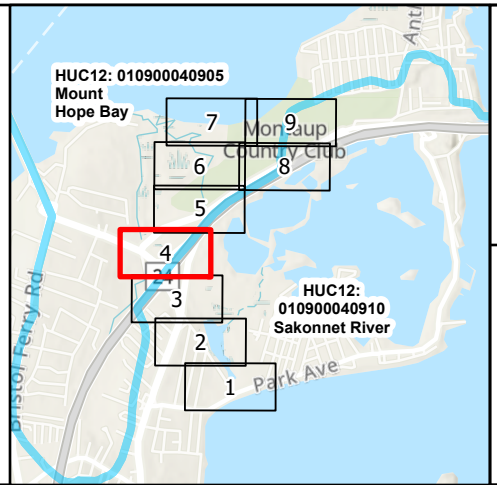
- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland
- 200 foot Contiguous Area of a River/Stream

Wetlands and Shoreline Features (POWER Field Delineated)

- Coastal Wetland
- Freshwater Wetland in the Vicinity of the Coast
- Freshwater Wetland in the Vicinity of the Coast (Approximate)
- Perennial Stream (Centerline) Field Delineated
- Streambank (Field Delineated)
- Streambank (Approximate)
- Estimated Wetland for Buffer Approximation

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Freshwater Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



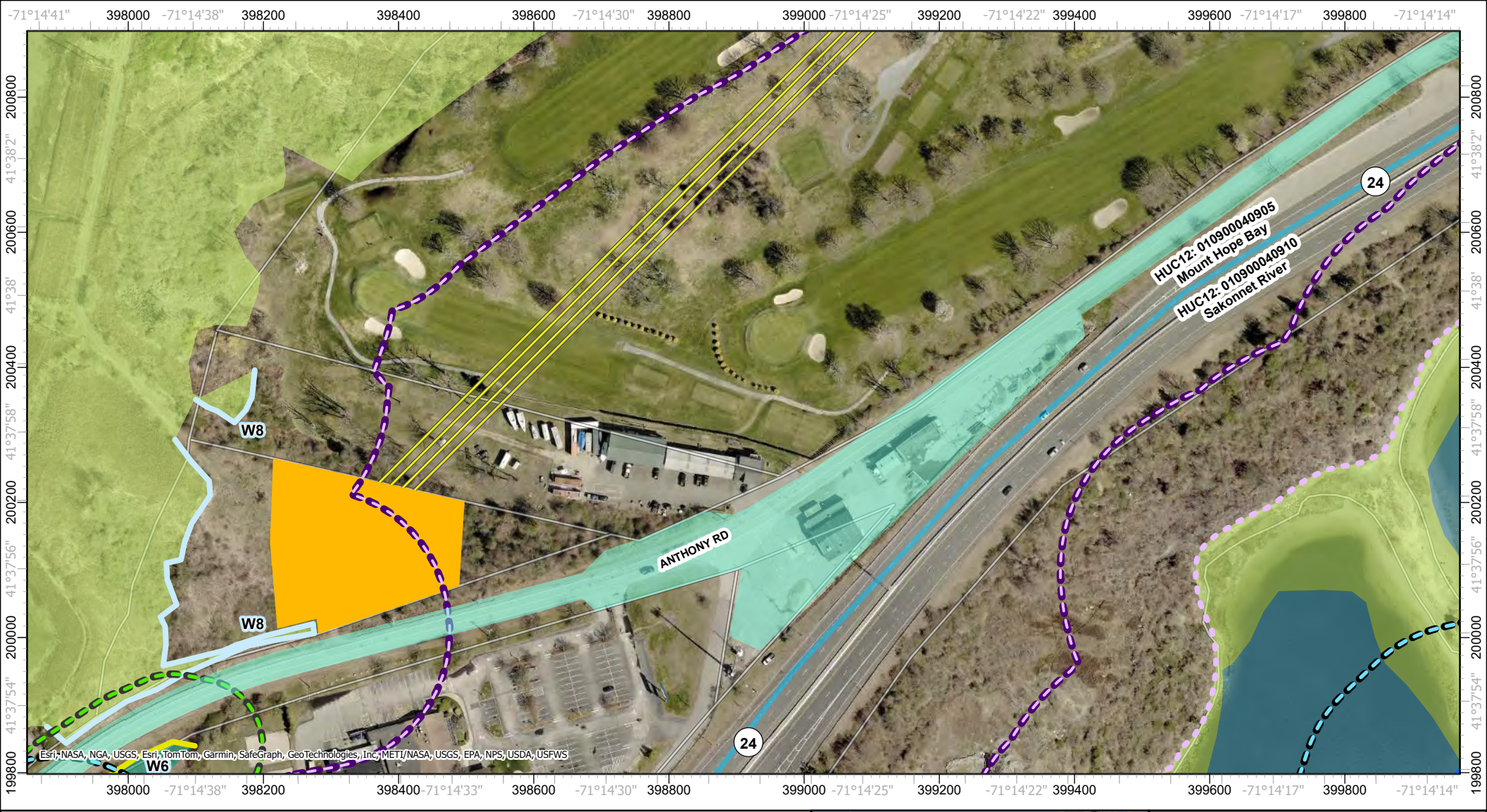
SOUTHCOAST WIND

FIGURE 3-1 PANEL 4
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS



LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- RWU North Parcel Horizontal Directional Drill Construction Area
- Portsmouth Tax Parcel Boundary
- Stream (National Hydrography Dataset) (USGS 2011)

Contiguous Area Boundary

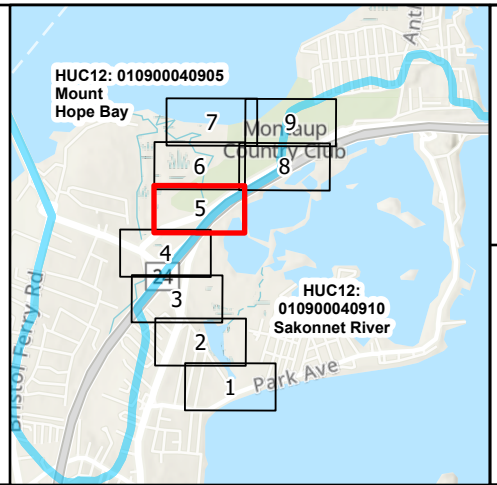
- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland
- 200 foot Contiguous Area of a River/Stream

Wetlands and Shoreline Features (POWER Field Delineated)

- Coastal Wetland
- Coastal Wetland (Approximate)
- Freshwater Wetland in the Vicinity of the Coast

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Freshwater Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



SOUTHCOAST WIND

FIGURE 3-1 PANEL 5
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

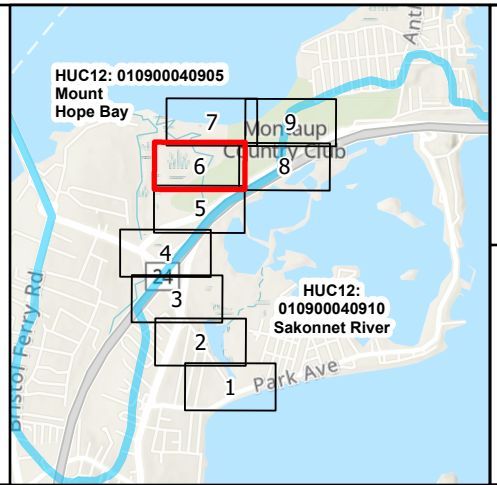
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Portsmouth Tax Parcel Boundary

Contiguous Area Boundary

- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland
- 200 foot Contiguous Area of a River/Stream

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



SOUTHCOAST WIND

FIGURE 3-1 PANEL 6
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

0 200
Feet

POWER ENGINEERS

LEGEND

- Horizontal Directional Drill Trajectory
- Portsmouth Tax Parcel Boundary

Contiguous Area Boundary

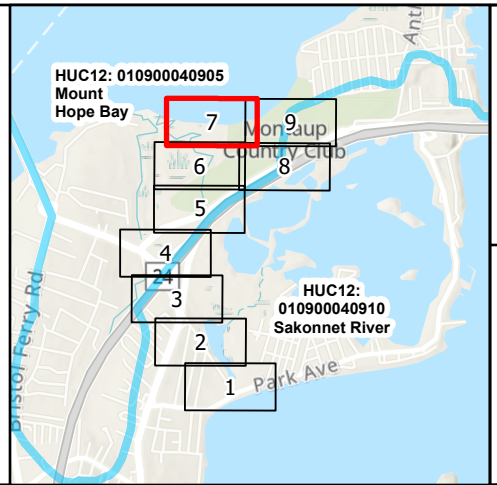
- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland

Wetlands and Shoreline Features (POWER Field Delineated)

- Top of Bluff
- Inland Extent of Beach
- Man-made Shoreline

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



SOUTHCOAST WIND

FIGURE 3-1 PANEL 7
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Culvert
- Onshore Export Cable Route Corridor Limit of Disturbance
- Montaup Horizontal Directional Drill Staging Area
- Portsmouth Tax Parcel Boundary
- Stream (National Hydrography Dataset) (USGS 2011)

Contiguous Area Boundary

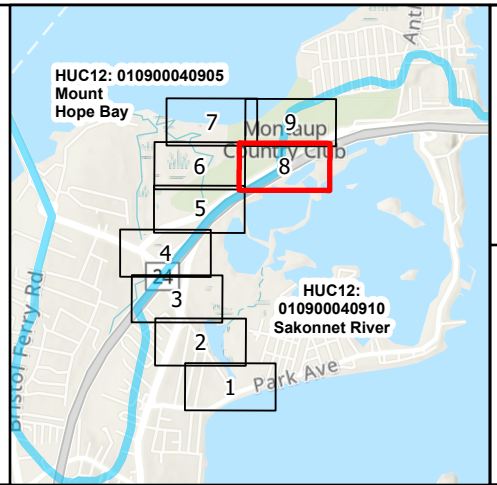
- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland
- 200 foot Contiguous Area of a River/Stream

Wetlands and Shoreline Features (POWER Field Delineated)

- Coastal Wetland (Approximate)
- Freshwater Wetland in the Vicinity of the Coast (Approximate)

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Freshwater Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



SOUTHCOAST WIND

FIGURE 3-1 PANEL 8
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Horizontal Directional Drill Trajectory
- Montaup Horizontal Directional Drill Staging Area
- Portsmouth Tax Parcel Boundary

Contiguous Area Boundary

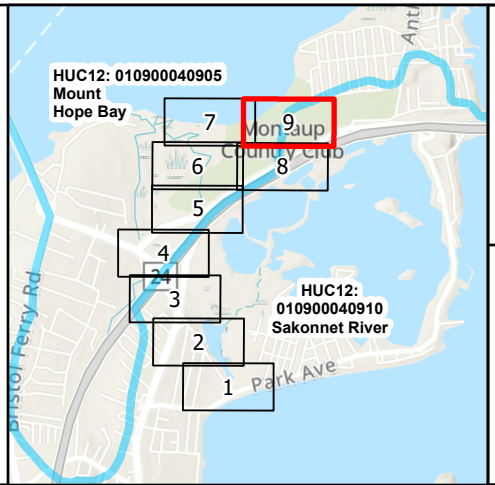
- 200 foot Contiguous Area of a Coastal Wetland
- 100 foot Contiguous Area of a Freshwater Wetland

Wetlands and Shoreline Features (POWER Field Delineated)

- Inland Extent of Beach

Wetlands (POWER Field Delineated and RIDEM (1993) Combined)

- Open Water
- Coastal Wetland
- Watershed Boundary Dataset (HUC12) (RIGIS 2007) Shown on the index map



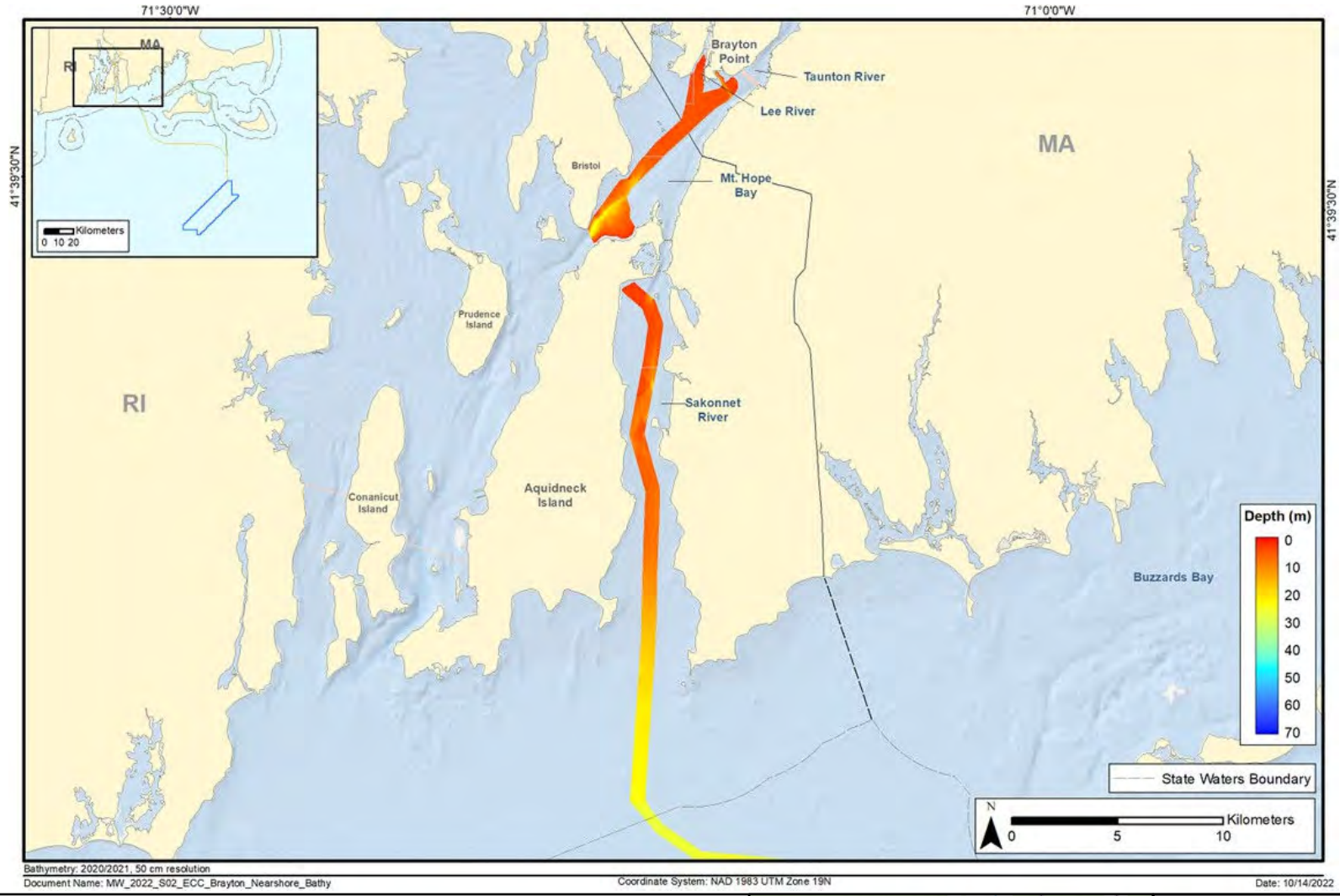
SOUTHCOAST WIND

FIGURE 3-1 PANEL 9
COASTAL AND FRESHWATER WETLANDS, SHORELINE FEATURES, AND WATERSHEDS

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

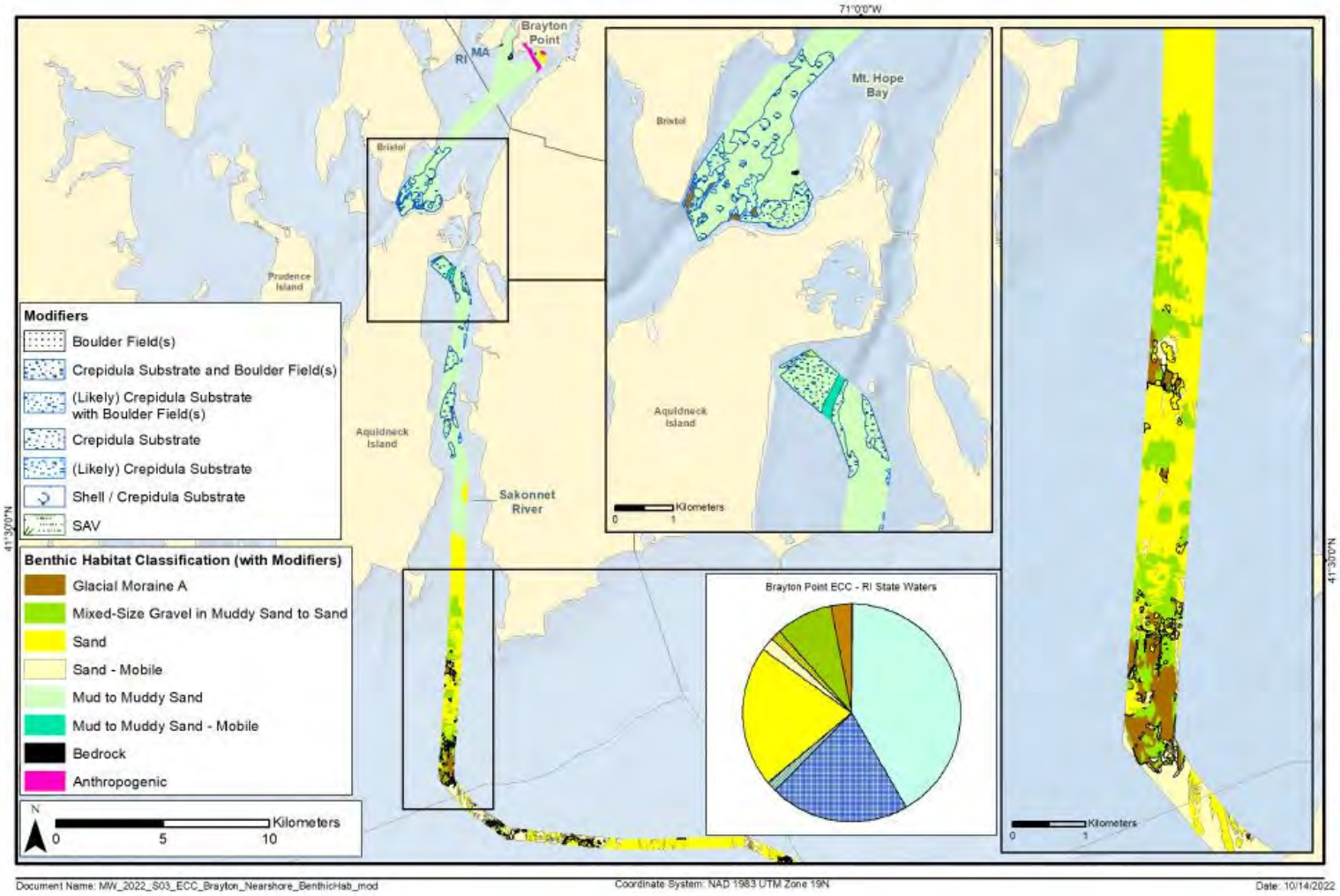
POWER ENGINEERS



DATA SOURCE: Inspire Environmental. 2022. Benthic Habitat Mapping to Support State Permitting Applications – Brayton Point ECC for RI State Waters and GLD

SOUTHCOAST WIND

FIGURE 3-2
BATHYMETRIC DATA AT THE BRAYTON POINT EXPORT CABLE CORRIDOR

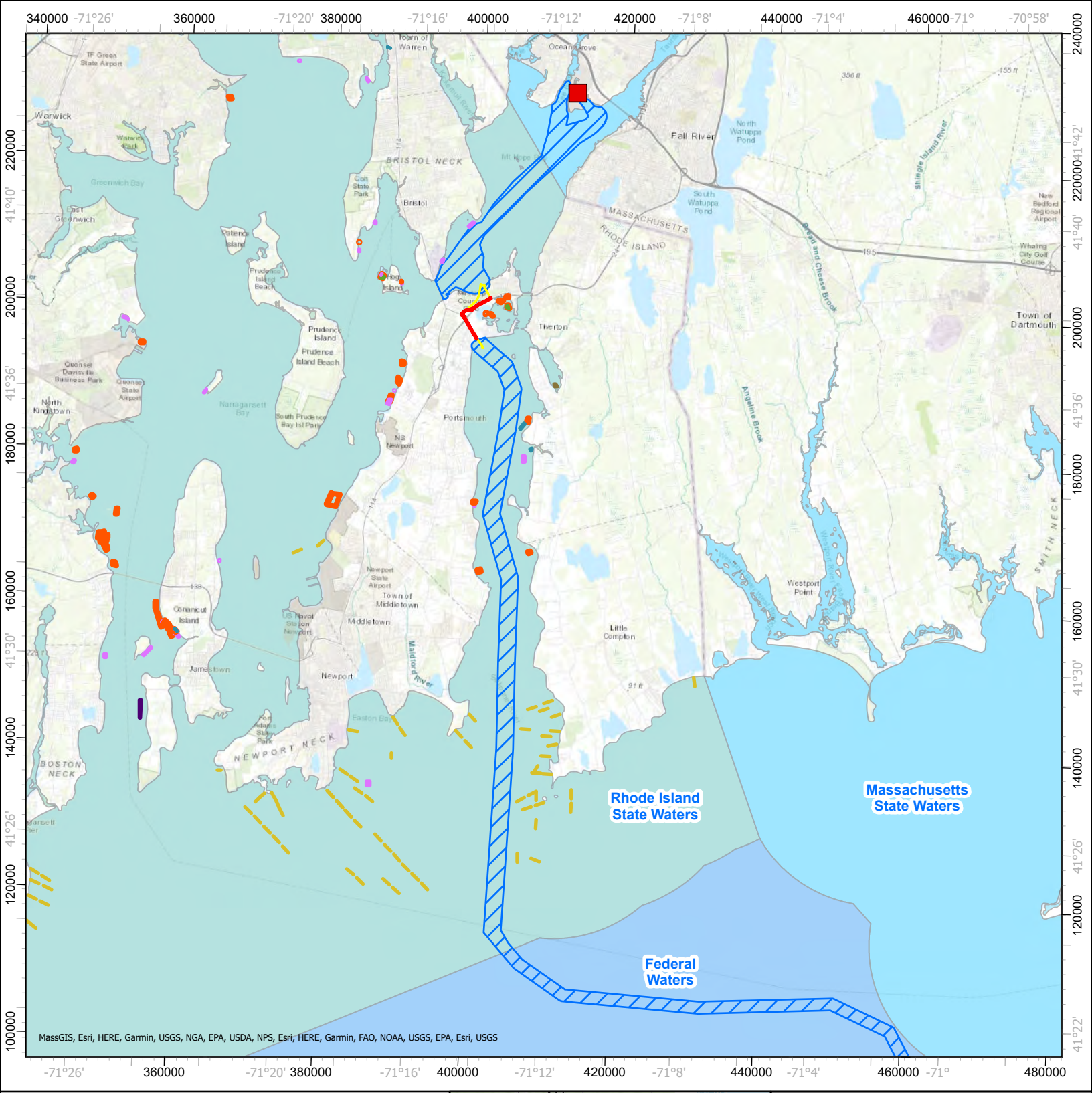


DATA SOURCE: Inspire Environmental. 2022. Benthic Habitat Mapping to Support State Permitting Applications – Brayton Point ECC for RI State Waters and GLD.

Fugro USA Marine Inc. 2019, 2020 and 2021. Marine Site Investigation Report. Construction and Operations Report, Appendix E."

SOUTHCOAST WIND

FIGURE 3-3
BENTHIC HABITAT TYPES WITH MODIFIERS AT THE BRAYTON POINT EXPORT CABLE CORRIDOR



LEGEND

- Brayton Point POI
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Brayton Point Export Cable Corridor
- Federal Waters
- Massachusetts State Waters
- Rhode Island State Waters
- Potential Locations of Floating Fish Traps (RIDEM Marine Fisheries 2020)

Aquaculture Leases (RIDEM Marine Fisheries 2021)

- Approved
- Expanded
- Preliminary Determination Application (PD App)
- Public Notice Application (PN App)
- Proposed
- Withdrawn/Expired

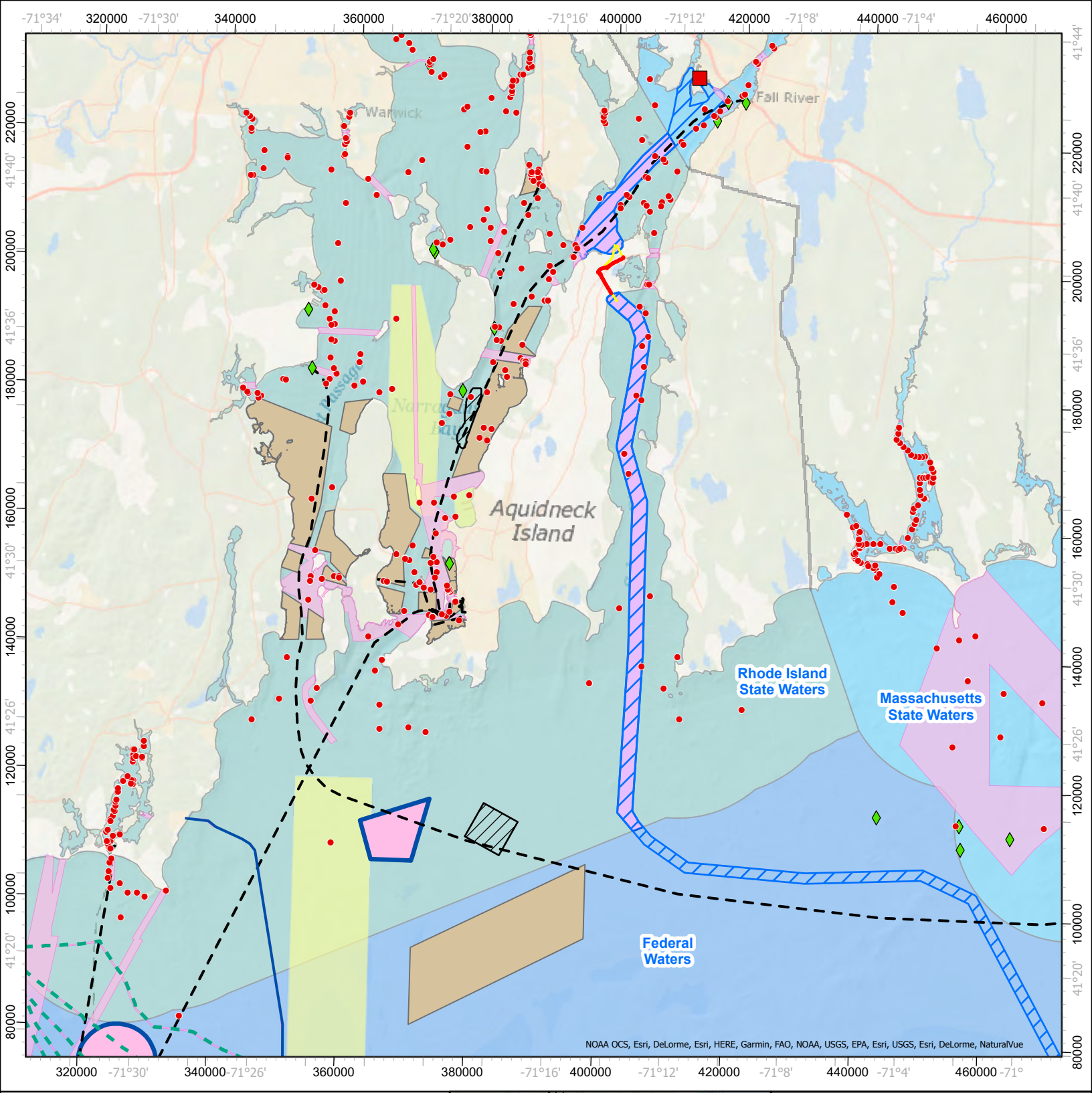
SOUTHCOAST WIND

FIGURE 3-4
AQUACULTURE LEASES NEAR THE BRAYTON POINT EXPORT CABLE CORRIDOR

Date: 2/23/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:210,000

0 5
Miles

POWER ENGINEERS



LEGEND

- Brayton Point POI
- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Brayton Point Export Cable Corridor
- CRMP Jurisdiction in RI Waters
- Submarine Cable (NOAA 2020)
- Block Island Transmission Cable (Northeast Ocean Data 2019)
- RI Ferry Route (RIGIS 2015)
- Buoy (NOAA and DOC 2020)
- Aid To Navigation (NOAA 2020)
- Anchorage Area (NOAA 2017)
- Ocean Disposal Site (NOAA 2022)
- Pilot Boarding Area (NOAA 2018)
- Submarine Cable Area (NOAA 2021)

Danger Zone and Restricted Area (NOAA 2022)

- Restricted Area
- Federal Waters
- Massachusetts State Waters
- Rhode Island State Waters

SOUTHCOAST WIND

FIGURE 3-5
OTHER MARINE USES

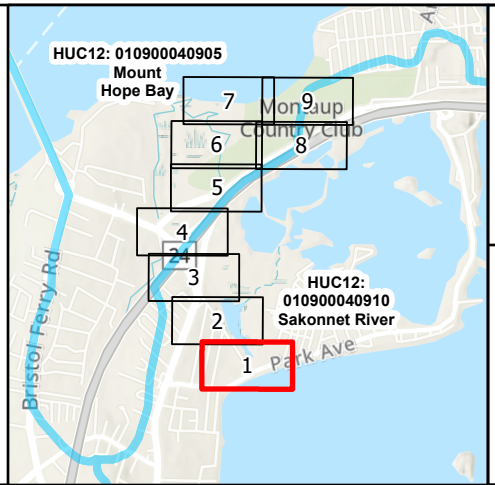
Date: 2/21/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:240,000

0 5
Miles

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Boyds Lane Horizontal Directional Drill Staging Area
- Horizontal Directional Drill Trajectory
- Soils (USDA-NRCS 2021)



SOUTHCOAST WIND

FIGURE 4-1 PANEL 1
SOILS MAPPING

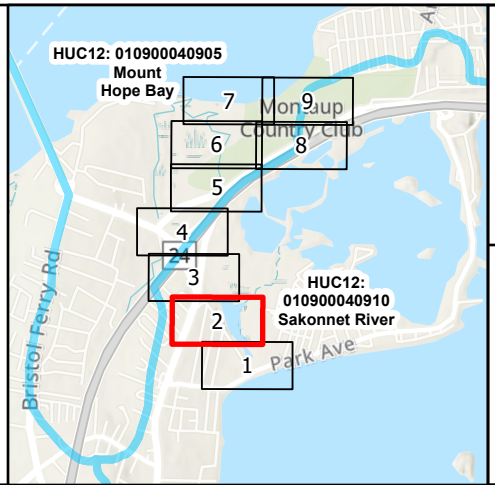
Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Soils (USDA-NRCS 2021)



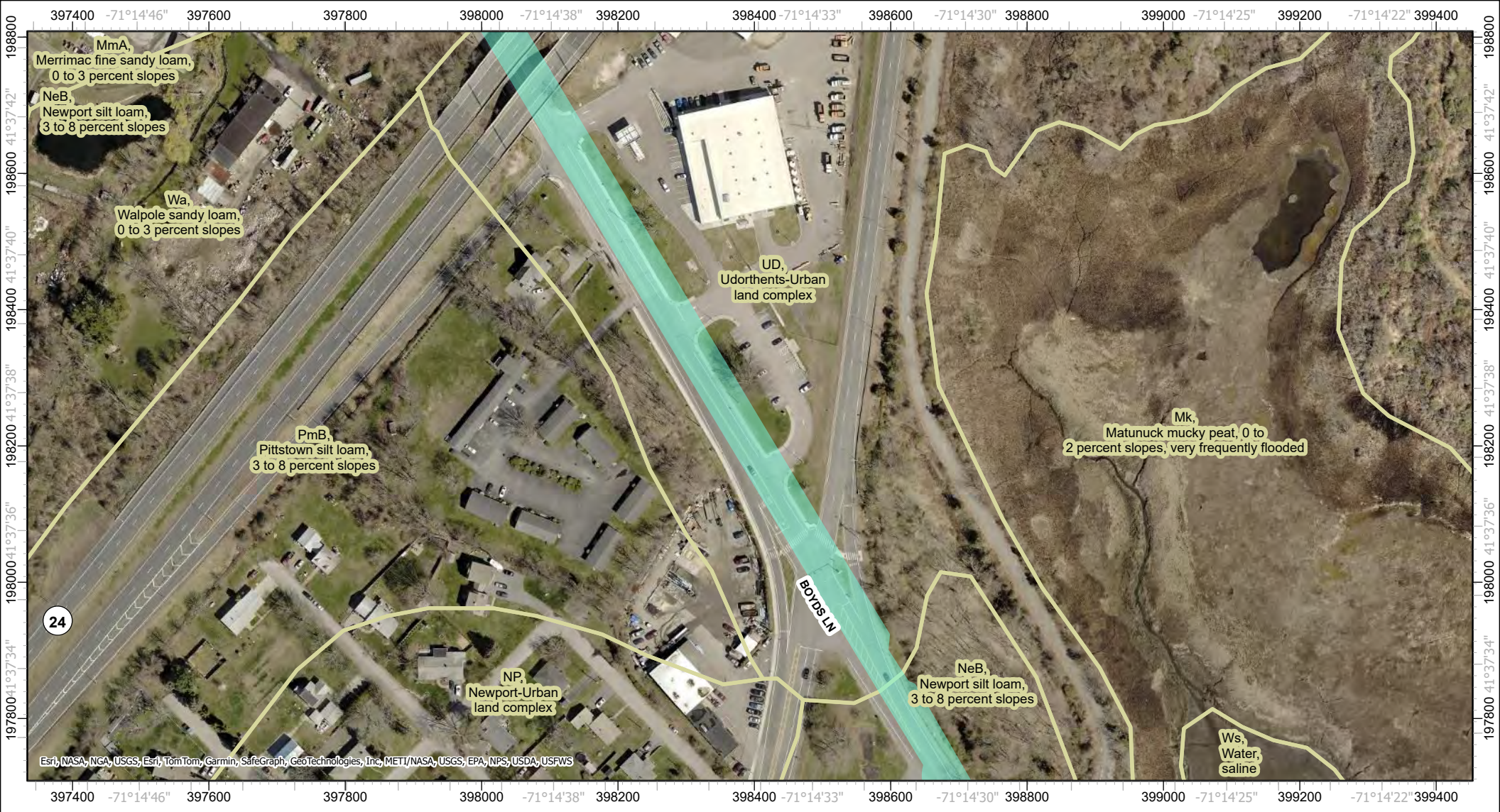
SOUTHCOAST WIND

FIGURE 4-1 PANEL 2
SOILS MAPPING

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

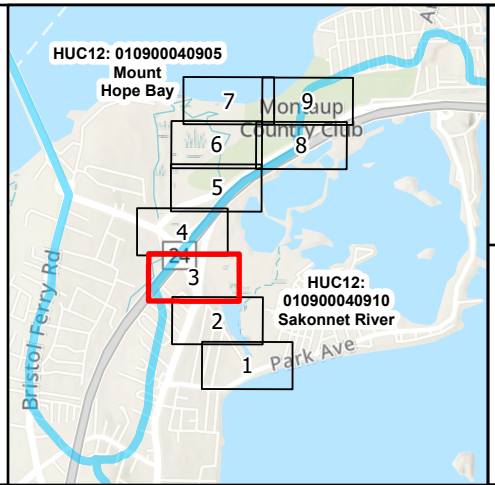
0 200
Feet

POWER ENGINEERS



LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Soils (USDA-NRCS 2021)



SOUTHCOAST WIND

FIGURE 4-1 PANEL 3
SOILS MAPPING

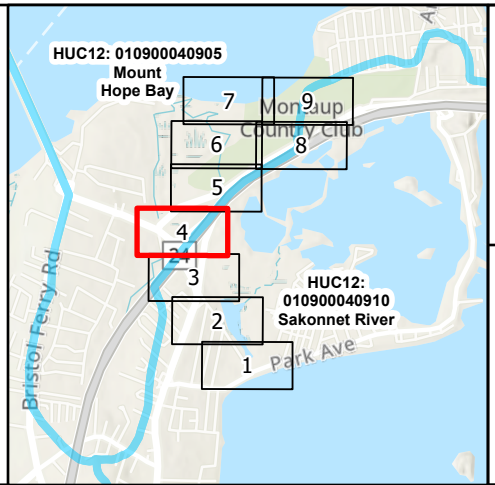
Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Potential Additional Staging Area
- Soils (USDA-NRCS 2021)



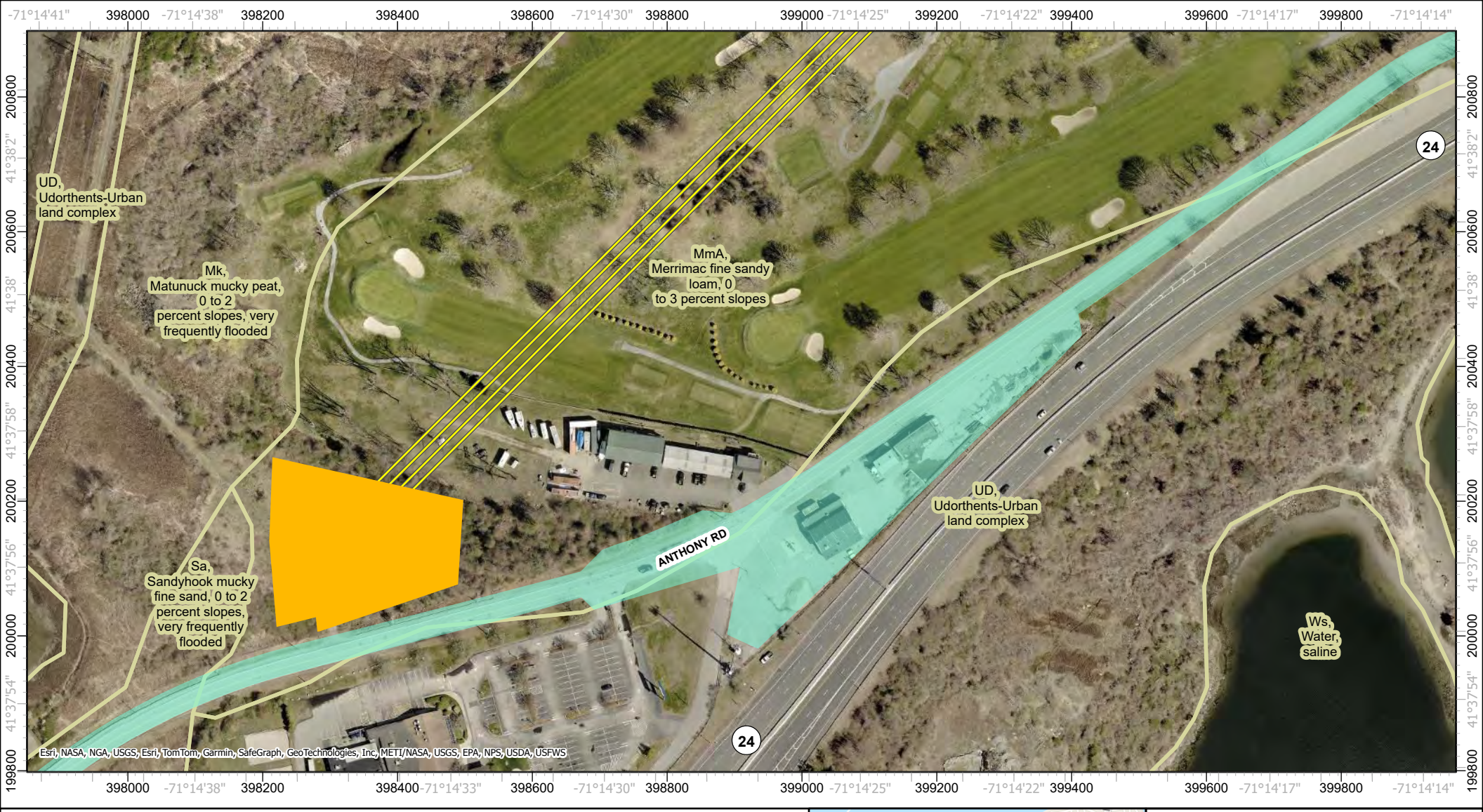
SOUTHCOAST WIND

FIGURE 4-1 PANEL 4
SOILS MAPPING

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

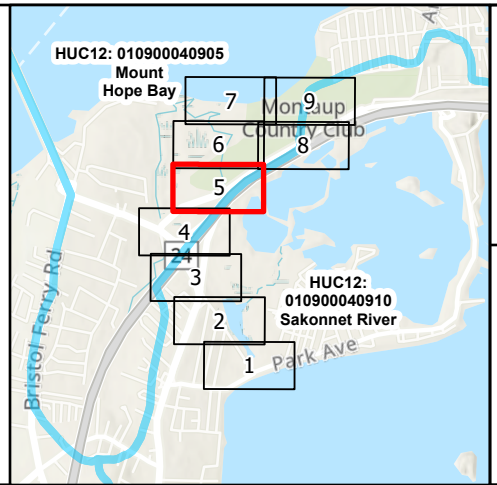
0 200
Feet

POWER ENGINEERS



LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- RWU North Parcel Horizontal Directional Drill Construction Area
- Horizontal Directional Drill Trajectory
- Soils (USDA-NRCS 2021)



SOUTHCOAST WIND

FIGURE 4-1 PANEL 5
SOILS MAPPING

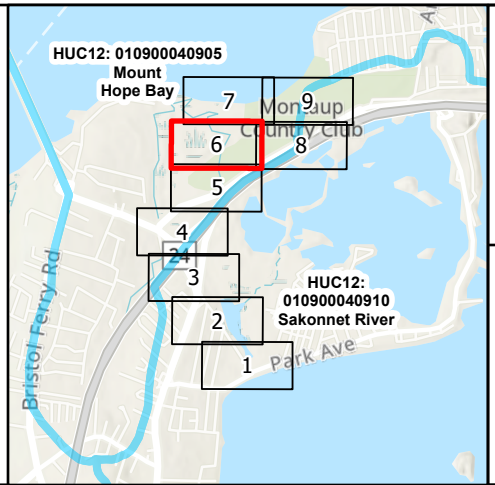
Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Soils (USDA-NRCS 2021)



SOUTHCOAST WIND

FIGURE 4-1 PANEL 6
SOILS MAPPING

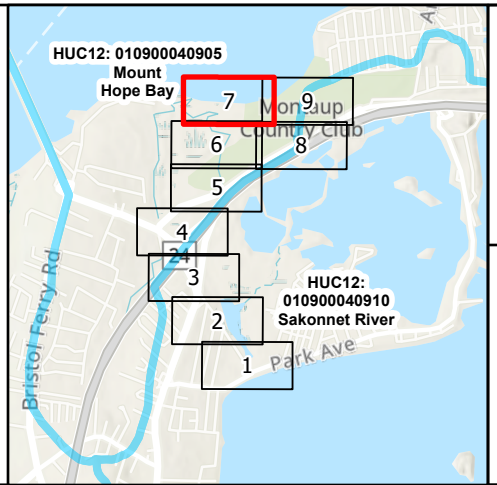
Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Horizontal Directional Drill Trajectory
- Soils (USDA-NRCS 2021)



SOUTHCOAST WIND

FIGURE 4-1 PANEL 7
SOILS MAPPING

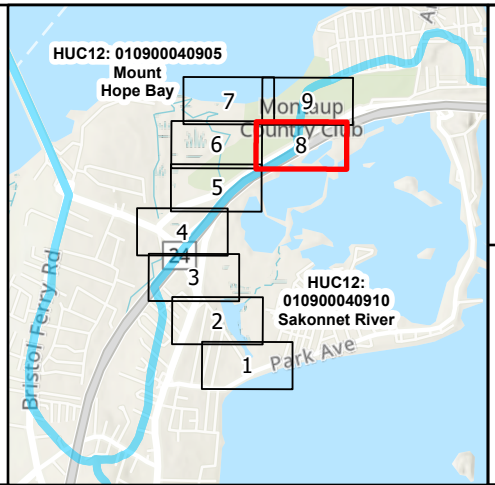
Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Montaup Horizontal Directional Drill Staging Area
- Soils (USDA-NRCS 2021)



SOUTHCOAST WIND

FIGURE 4-1 PANEL 8
SOILS MAPPING

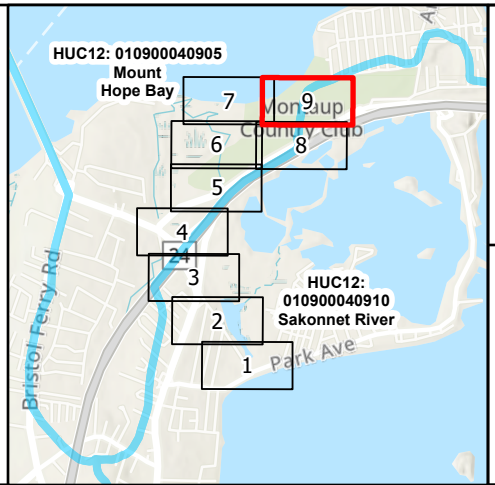
Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Montaup Horizontal Directional Drill Staging Area
- Horizontal Directional Drill Trajectory
- Soils (USDA-NRCS 2021)



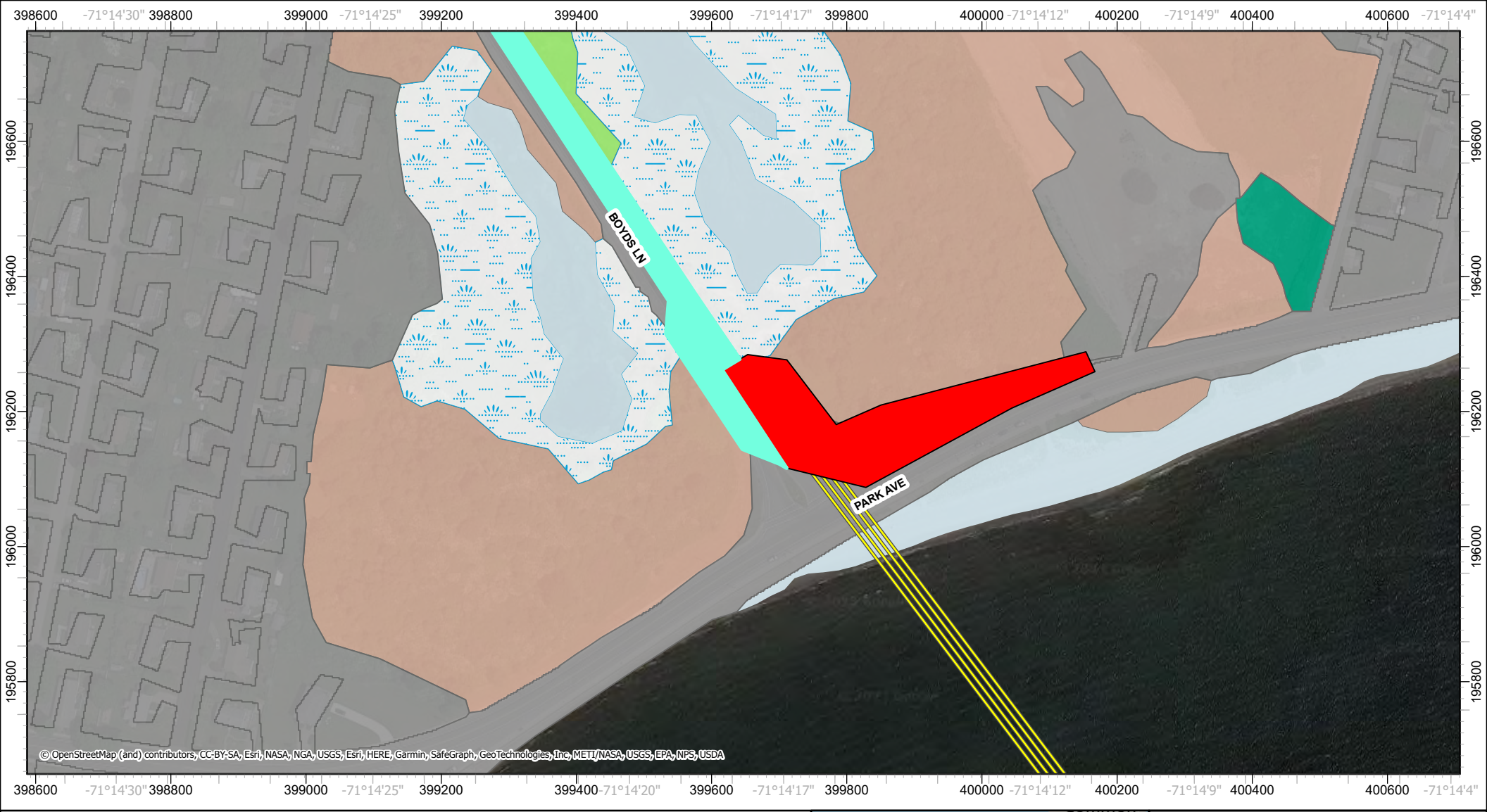
SOUTHCOAST WIND

FIGURE 4-1 PANEL 9
SOILS MAPPING

Date: 8/2/2024
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

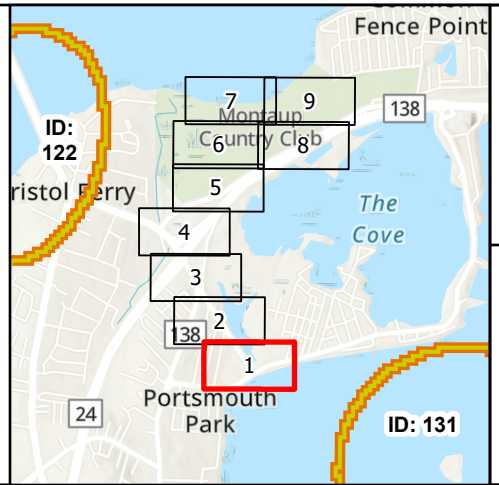


LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Boyds Lane Horizontal Directional Drill Staging Area

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Intertidal Shore
- Oak Forest
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



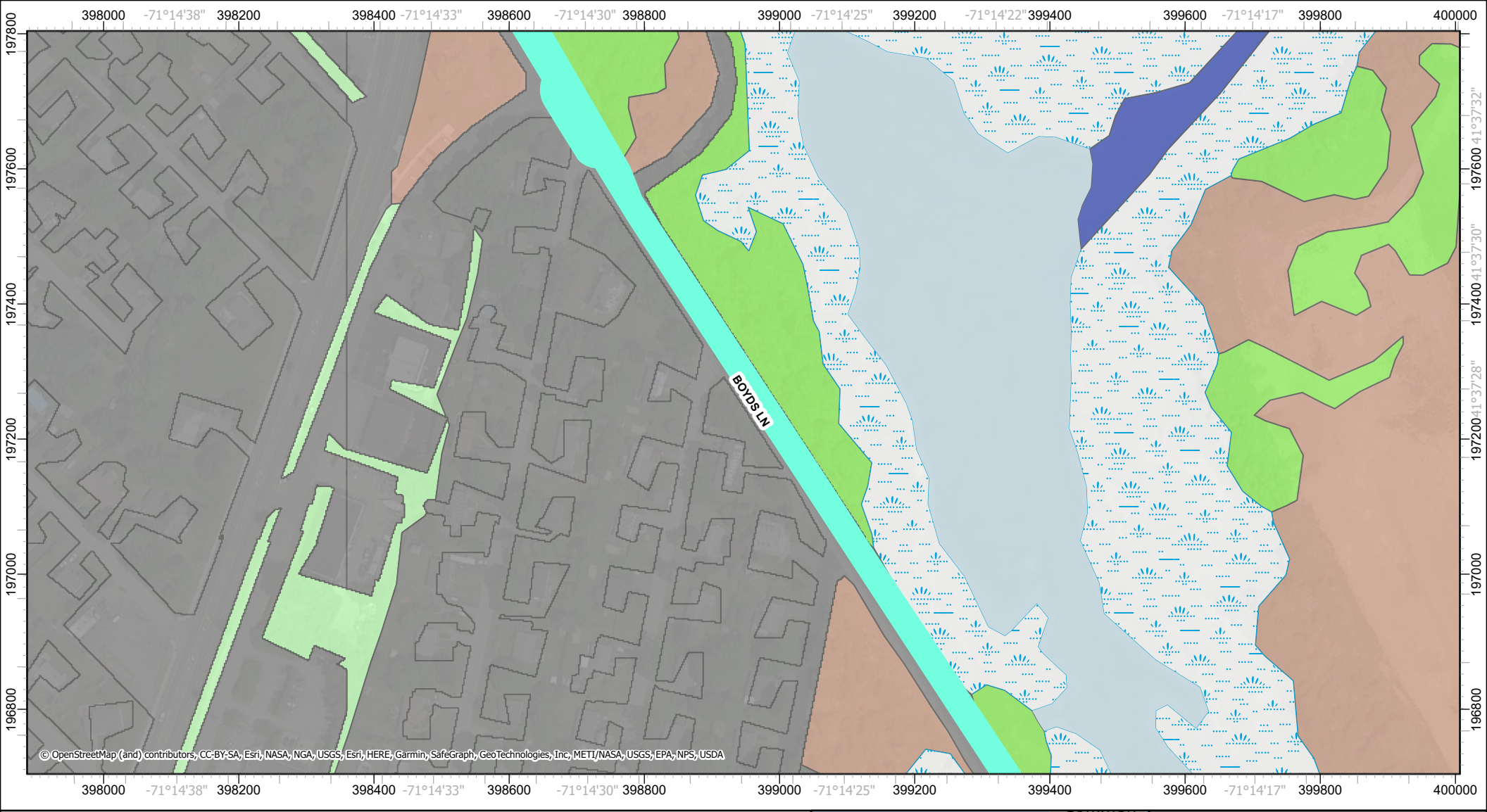
SOUTHCOAST WIND

FIGURE 4-2 PANEL 1
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

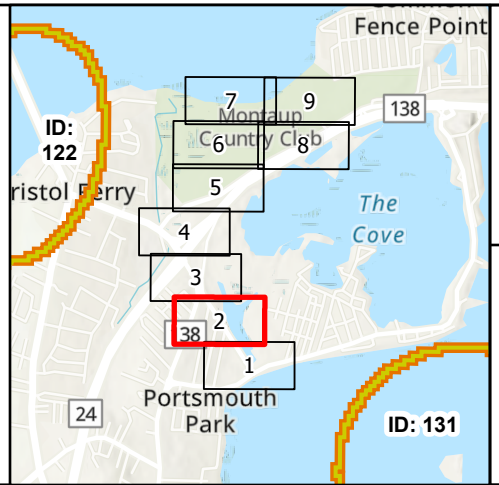


LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Intertidal Shore
- Tidal Creek
- Oak Forest
- Ruderal Grassland/Shrubland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



SOUTHCOAST WIND

FIGURE 4-2 PANEL 2
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

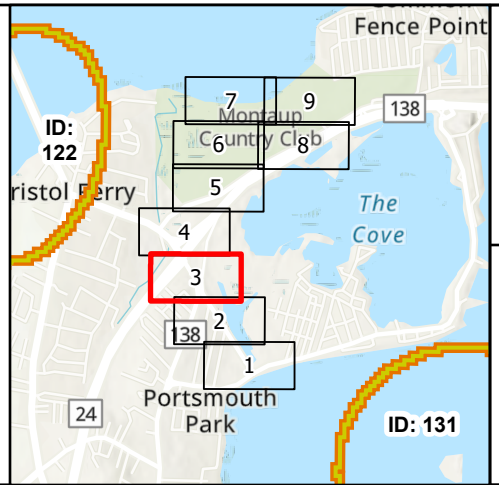
POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Intertidal Shore
- Fresh Water
- Emergent Marsh
- Shrub Swamp
- Oak Forest
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Cropland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



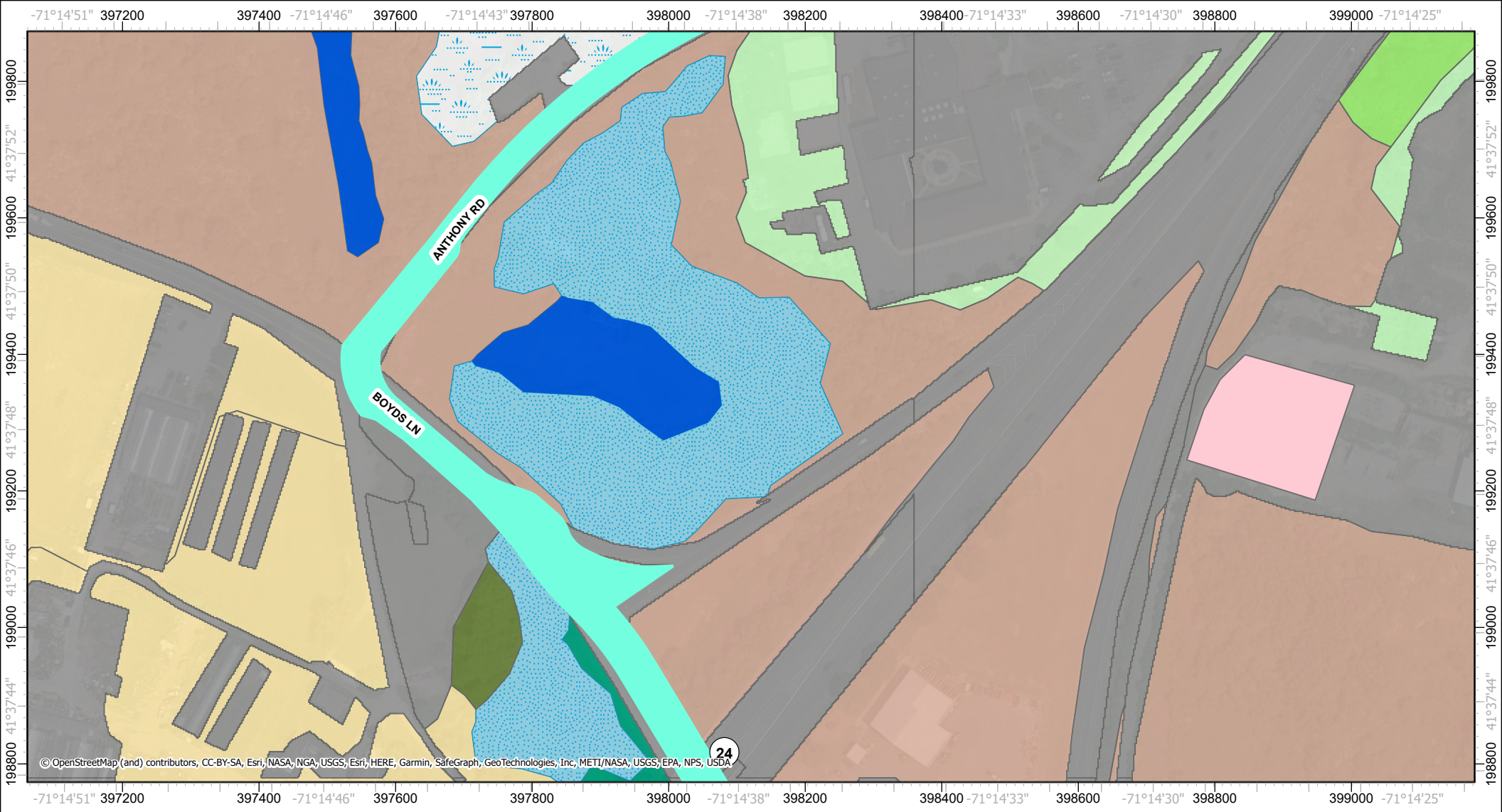
SOUTHCOAST WIND

FIGURE 4-2 PANEL 3
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

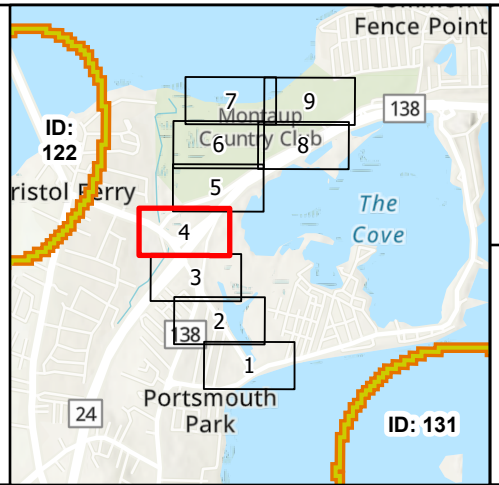


LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Potential Additional Staging Area

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Fresh Water
- Emergent Marsh
- Forested Swamp
- Oak Forest
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Cropland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



SOUTHCOAST WIND

FIGURE 4-2 PANEL 4
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

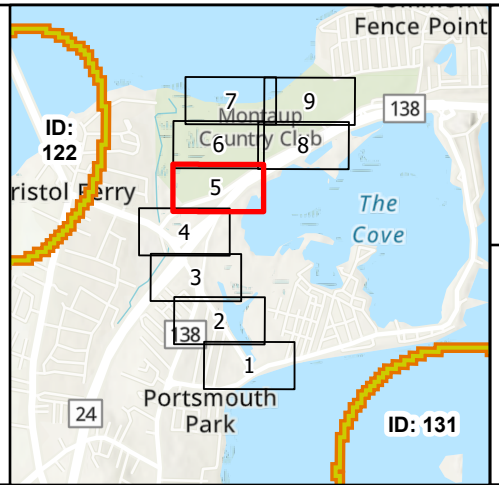
POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- RWU North Parcel Horizontal Directional Drill Construction Area

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Intertidal Shore
- Emergent Marsh
- Oak Forest
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



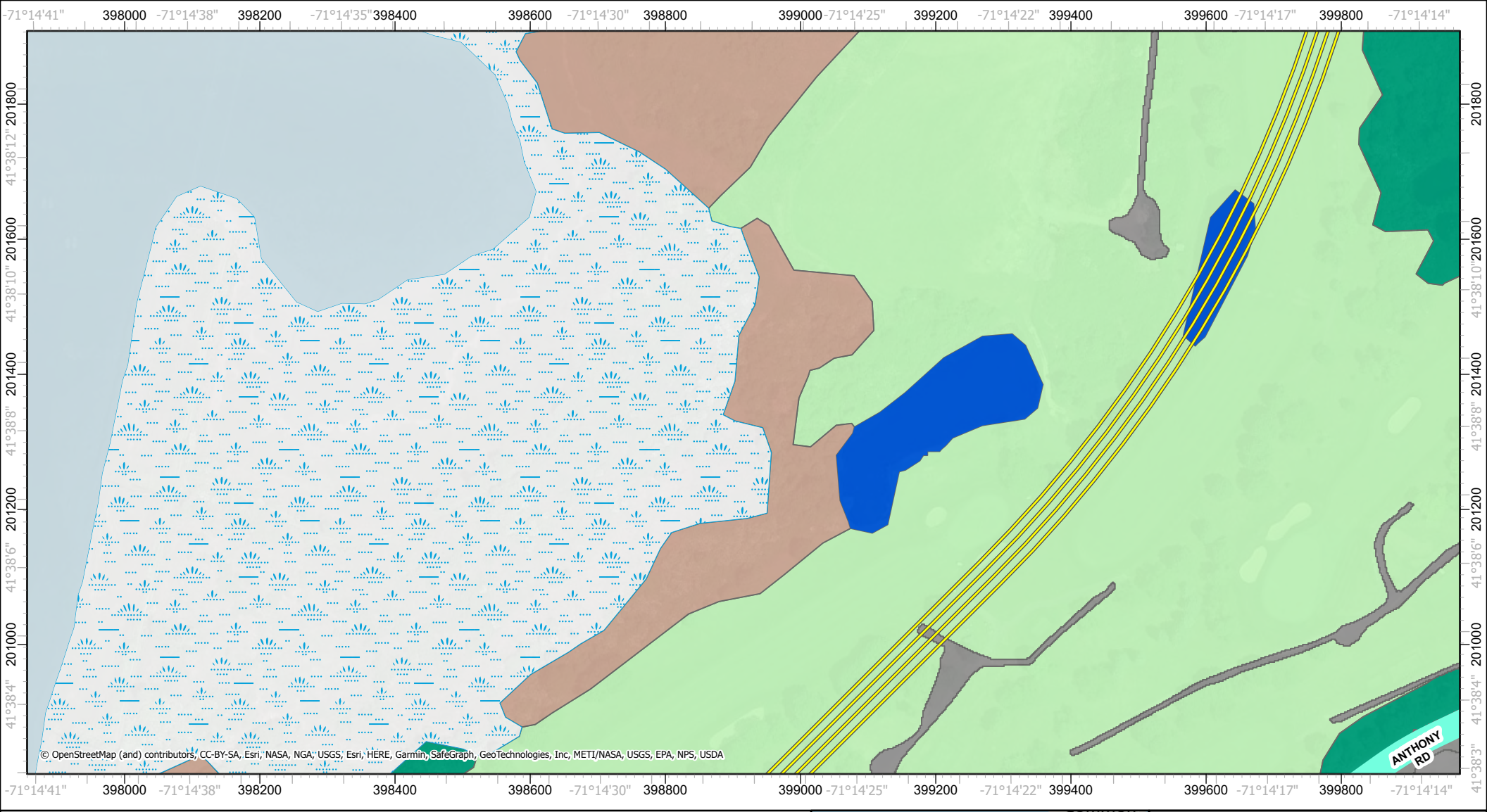
SOUTHCOAST WIND

FIGURE 4-2 PANEL 5
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

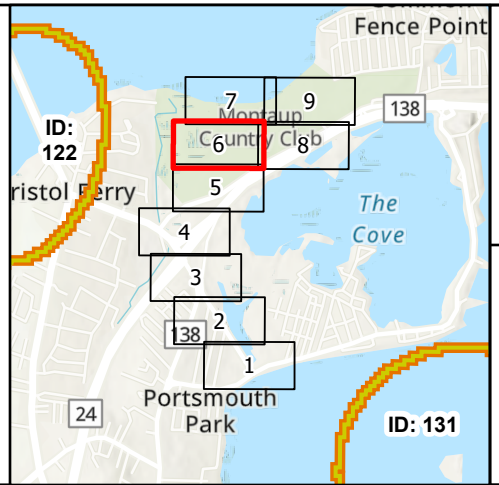


LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Intertidal Shore
- Fresh Water
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



SOUTHCOAST WIND

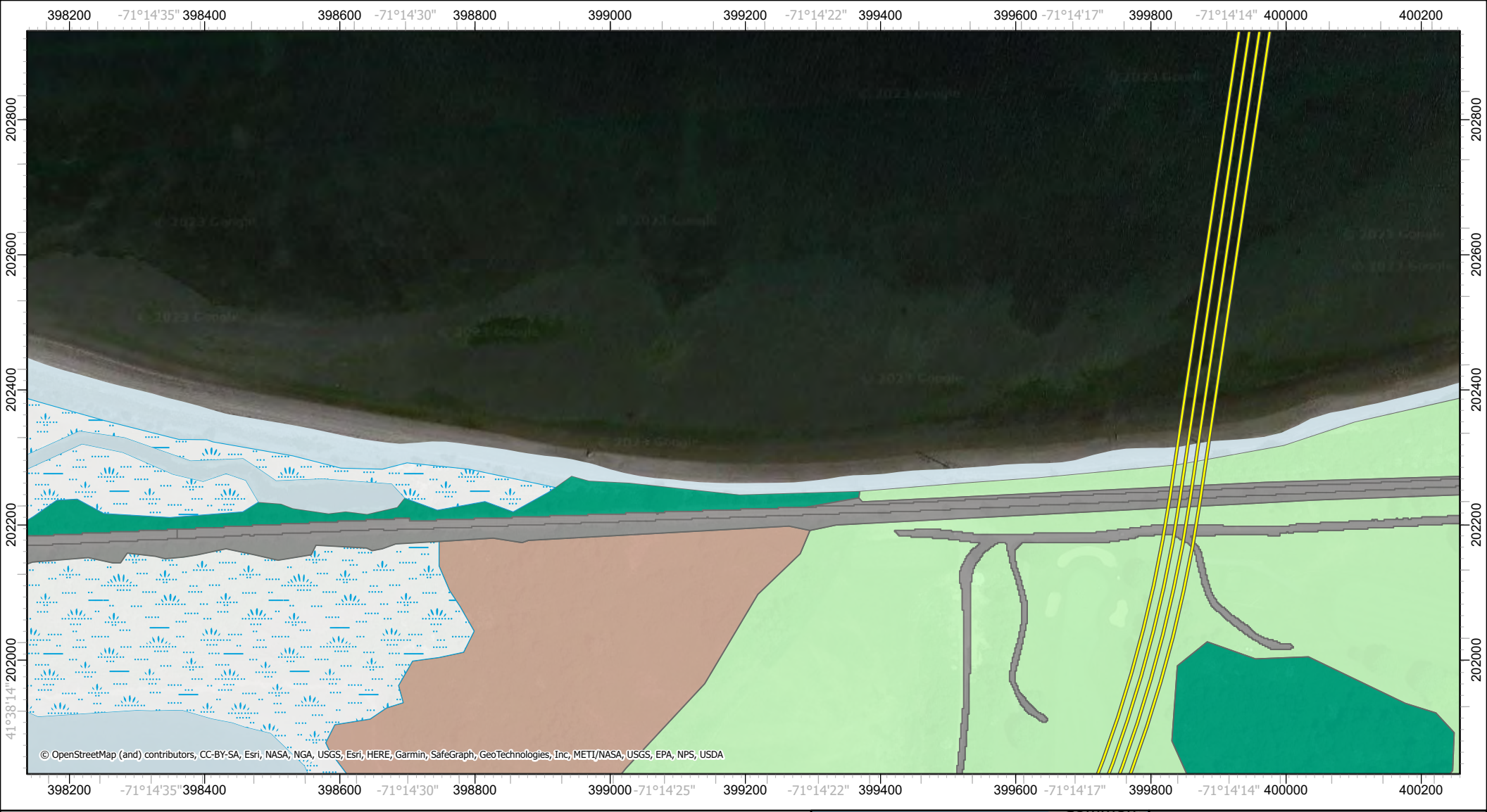
FIGURE 4-2 PANEL 6
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

0 200
Feet

POWER ENGINEERS

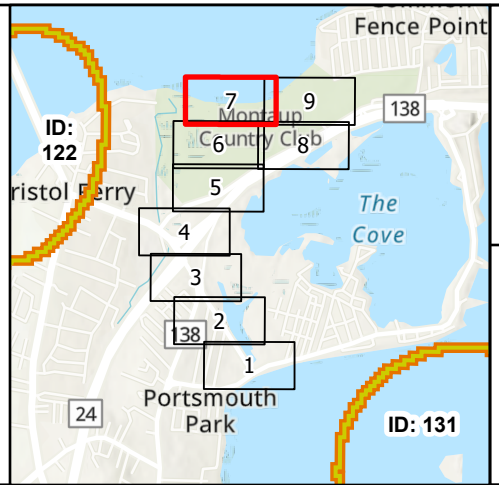


LEGEND

- Horizontal Directional Drill Trajectory

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Intertidal Shore
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



SOUTHCOAST WIND

FIGURE 4-2 PANEL 7
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

0 200
Feet

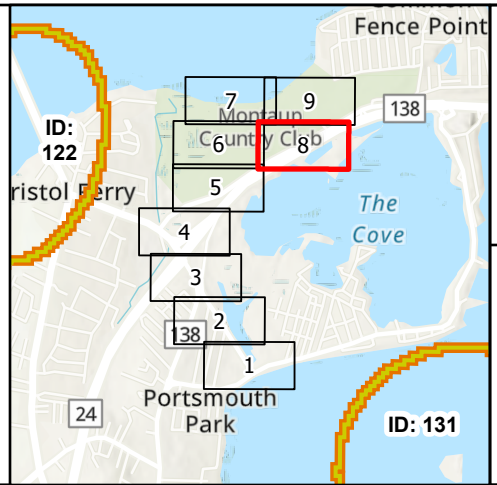
POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Montaup Horizontal Directional Drill Staging Area

Ecological Communities Classification (RIGIS 2011)

- Salt Marsh
- Intertidal Shore
- Fresh Water
- Oak Forest
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



SOUTHCOAST WIND

FIGURE 4-2 PANEL 8
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

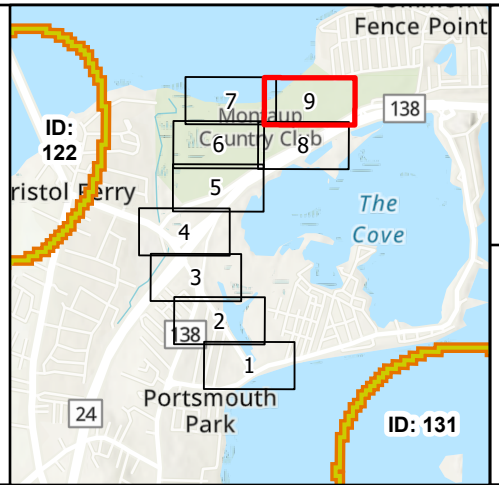
POWER ENGINEERS

LEGEND

- RI Historical Cemetery (RIGIS 2016)
- Horizontal Directional Drill Trajectory
- Montaup Horizontal Directional Drill Staging Area

Ecological Communities Classification (RIGIS 2011)

- Intertidal Shore
- Fresh Water
- Ruderal Forest
- Ruderal Grassland/Shrubland
- Urban/Recreational Grasses
- Urban/Suburban Built
- RI Natural Heritage Area (RIDEM 2021) (Outside of Project Area as shown on Index Figure)



SOUTHCOAST WIND

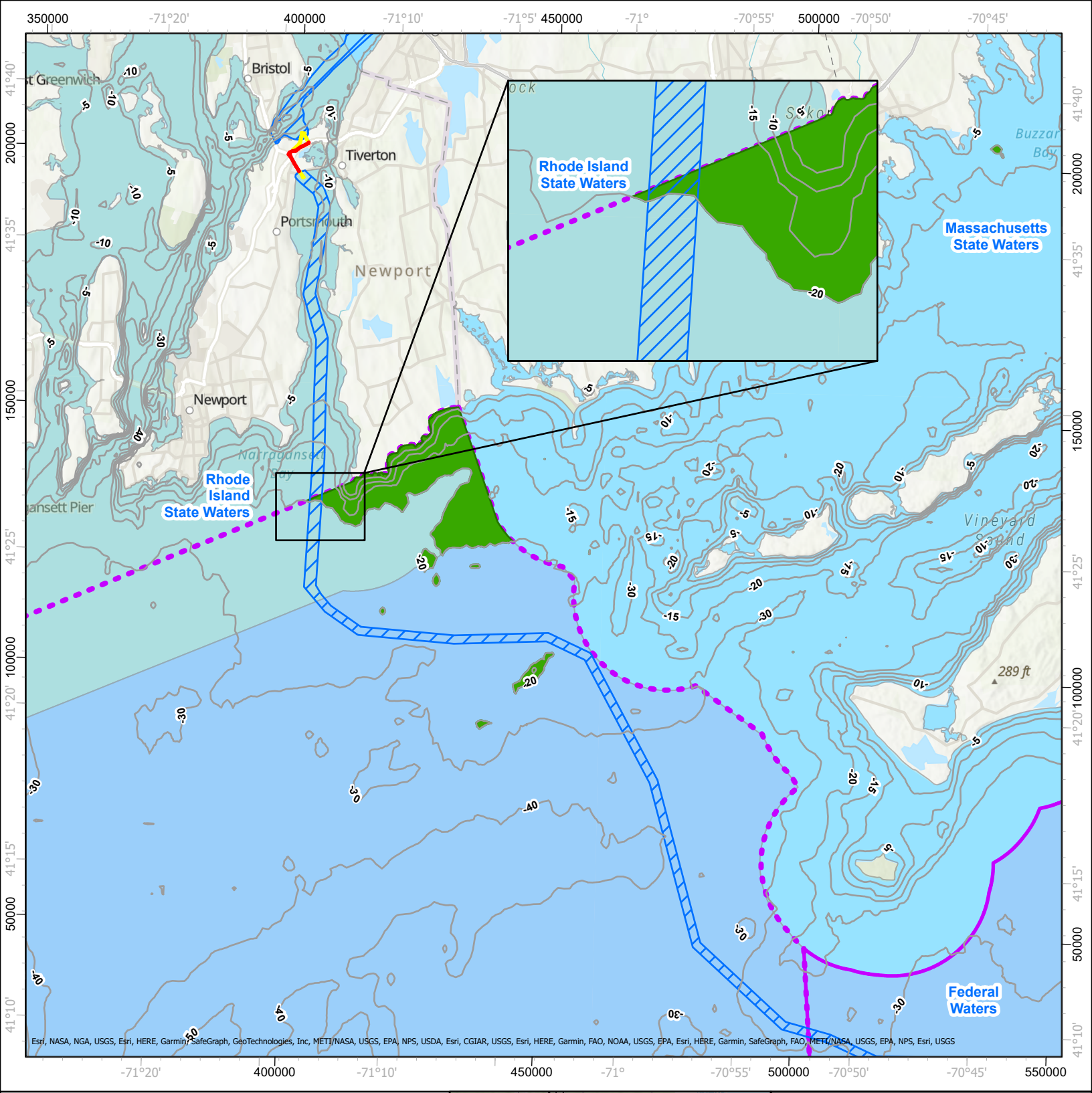
FIGURE 4-2 PANEL 9
VEGETATION COVER, RI NATURAL HISTORY SURVEY DATA, AND RI HPHC DATA

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

0 200
Feet

POWER ENGINEERS



LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Brayton Point Export Cable Corridor
- Potential Sea Duck Foraging Area (Bathymetry, 5-20 meters)
- RI Ocean SAMP (2010) Study Area
- Geographic Location Description Boundary (2018)
- Depth (meters)
- Federal Waters
- Massachusetts State Waters
- Rhode Island State Waters

SOUTHCOAST WIND

FIGURE 5-1
SEA DUCK FORAGING HABITAT DESIGNATED AS AREAS FOR PRESERVATION

Date: 2/22/2023
NAD 1983 2011 UTM Zone 19N
Scale: 1:300,000

0 6
Miles

POWER ENGINEERS

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment B: Route Alternatives Assessment

Revised: February 2023

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TABLE OF CONTENTS

Executive Summary ..... **iv**
1 Introduction **1**
2 Route Siting Factors **1**
2.1 Siting Factors Offshore and at Landfall **2**
2.2 Siting Factors Onshore **2**
3 Universe of Routes Considered **3**
3.1 Onshore Underground Export Cable Route Alternatives (Bypassing the Sakonnet River) **5**
3.1.1 Routes Landing at Second Beach in Middletown, RI (Route IDs 9-11) 5
3.1.2 Routes in Little Compton and Tiverton, RI (Route IDs 12-13) 11
3.1.3 Massachusetts-Only Route Alternative (Route ID 14) 17
3.2 Export Cable Corridor Alternatives **21**
3.2.1 Sakonnet River Routes 22
3.2.2 Narragansett Bay East Passage Route (Route ID 7) 24
3.2.3 Narragansett Bay West Passage Route (Route ID 8) 25
4 Construction Considerations **26**
4.1 Schedule Comparison **26**
4.2 Onshore Underground vs. Onshore Overhead Construction **27**
4.2.1 Need for Additional Infrastructure at Landing 27
4.2.2 Overhead Support Structures and Right-of-Way Requirements 27
5 Summary of Selected Alternative And Conclusions **28**

Attachment 1 – Universe of Routes Considered (Figure 5-2)
Attachment 2 – Indicative HVDC Overhead Structures

LIST OF TABLES

Table 1. Offshore and Onshore Export Cable Routes Considered [a] 4

LIST OF FIGURES

Figure 1. Overview of Universe of Routes Considered to Brayton Point 3
Figure 2. Second Beach, Middletown Landfall Alternative 6
Figure 3. Middletown Park and Natural Heritage Areas 7
Figure 4. Route 138, Aquidneck, RI 7
Figure 5. Route ID 9 Locus 8
Figure 6: Photos Along Paradise Ave (Left) and Berkeley Ave (Right), MIddletown, RI 9
Figure 7. Route ID 10 Locus 9
Figure 8. Route ID 11 Locus 10
Figure 9: Photos Along Mitchell's Lane, MIddletown, RI 11
Figure 10. Route ID 12 Locus 12
Figure 11. Sakonnet Point, Little Compton Landfall Alternative 12
Figure 12. Little Compton & Tiverton Parks, Wetlands and Natural Heritage Areas (Route ID 12) 14
Figure 13. Schooner Dr, Tiverton Landfall Alternative 15
Figure 14. Route ID 13 Locus 16
Figure 15. South Shore Beach, Little Compton Landfall Alternative (Route ID 13) 17
Figure 16. Route ID 14 Locus 18
Figure 17. Horseneck Beach, Westport Landfall Alternative (Route ID 14) 18
Figure 18. Westport Environmental Resource Areas (Route ID 14) 19
Figure 19. Environmental Justice Populations in Fall River & Westport, MA (Route ID 14) 20
Figure 20. Ferry Street, Fall River Landfall Alternative (Route ID 14) 21
Figure 21. Selected Alternative Route Locus 22
Figure 22. Route ID 6 Locus 22
Figure 23. Sakonnet River Bathymetry at Bridge Constrictions (2014/2015 NOAA/Public Data) 23
Figure 24. Route ID 7 Locus 24
Figure 25. Route ID 8 Locus 25

TABLE OF ACRONYMS

Acronym	Definition
ACP	Areas of Potential Concern
BOEM	Bureau of Ocean Energy Management
ECC	Export cable corridor
ft	Feet
HDD	Horizontal directional drilling
HVDC	High voltage direct current
ID	Identifier
ISO-NE	Independent System Operator for New England
km	Kilometer
MA	Massachusetts
MassDOT	Massachusetts Department of Transportation
mi	Mile
MW	Megawatt
NOAA	National Oceanic and Atmospheric Administration
PAPE	Preliminary Area of Potential Effects
POI	Point of interconnection
RI	Rhode Island
RI CRMC	Rhode Island Coastal Resources Management Council
RIDEM	Rhode Island Department of Environmental Management
RIDOT	Rhode Island Department of Transportation
RIGIS	Rhode Island Geographic Information System
RWU	Roger Williams University
SAMP	Special Area Management Plan

EXECUTIVE SUMMARY

SouthCoast Wind Energy LLC (SouthCoast Wind) is developing an offshore wind generation facility (Offshore Generation Facility) with capacity to generate 2,400 MW of clean, renewable energy. Transmission cables and interconnection facilities are necessary to deliver electricity from the SouthCoast Wind Offshore Generation Facility to the regional electric grid.

SouthCoast Wind considered and evaluated alternative potential points of interconnection (POIs) to the grid, offshore export cable corridors (ECCs), landfall site alternatives, onshore export cable routes, and transmission technologies. Some of these alternatives were eliminated based on technical or commercial feasibility assessments, or the inability of the alternative to address the identified interconnection need. Other alternatives that were found to be feasible and capable of addressing the identified need were further examined on the basis of constructability, operability, environmental impacts, estimated costs, and reliability assessments.

Brayton Point is the selected POI for 1,200 MW of clean, renewable energy because it is a robust interconnection point that can accommodate 1,200 MW, and it is a previously disturbed brownfield site formerly occupied by a coal burning power generation plant. SouthCoast Wind has power purchase agreements to deliver energy to Brayton Point. This analysis focuses on the siting process and alternatives assessment for the export cable routing from the Offshore Generation Facility to the onshore POI at Brayton Point.

SouthCoast Wind considered fourteen onshore and offshore export cable route combinations to reach Brayton Point, including:

- Overland route alternatives that would avoid cable installation in Narragansett Bay and the Sakonnet River, although they do require cable installation in Mt. Hope Bay:
  - Three routes landing in Middletown, RI
  - Two routes landing in Little Compton, RI
  - One route landing in Westport, MA
- Marine route alternatives:
  - Sakonnet River route:
    - "Selected Alternative" with an approximately 2.0-mile (mi) (3.2-kilometer [km]) intermediate onshore underground crossing in Portsmouth, RI
    - Sakonnet River North route (bypassing the Portsmouth, RI crossing)
  - Narragansett Bay East Passage route
  - Narragansett Bay West Passage route

The onshore route alternatives landing in Middletown and Little Compton were not selected due to the extended duration of construction, use conflicts, potential for effects on the local economy, lack of sufficient space on small roads, and potential environmental and cultural effects in sensitive areas. The onshore route alternative landing in Westport, MA was not selected due to fatal flaws crossing Westport Harbor via HDD or bridge-suspended cables.

As a result of the alternatives analysis screening process, SouthCoast Wind selected a proposed Project route (the Selected Alternative) that traverses approximately 5.3 mi (8.6 km) in Rhode Island Sound, approximately 11.0 mi (17.7 km) in the Sakonnet River, approximately 2.0 mi (3.2 km) underground, onshore in Portsmouth, and approximately 4.0 mi (6.4 km) in Mount Hope Bay (portion in Rhode Island state waters).

The proposed route would enable SouthCoast Wind to achieve the best balance between reasonable construction timeline and cost while not causing unacceptable harm to the social and natural environment. Based on the enclosed analysis, SouthCoast Wind has determined the proposed route would result in the least impacts and would allow for safe, practical, and long-term cable installation, maintenance, and operation as compared to the alternatives considered. Construction of the Project, as proposed, will provide access to a major renewable clean energy resource and will not cause unacceptable harm to the environment.

1 INTRODUCTION

SouthCoast Wind Energy LLC (SouthCoast Wind) is developing an offshore wind renewable energy generation facility (Offshore Generation Facility) in federal waters designated by the Bureau of Ocean Energy Management (BOEM) as OCS-A 0521. When fully built out, and with continuing advancements in wind technology, the SouthCoast Wind Offshore Generation Facility will supply an estimated 2,400 megawatts (MW) of offshore wind energy, enough to power more than a million homes.

Transmission and interconnection facilities are necessary to deliver electricity from the SouthCoast Wind Offshore Generation Facility to the regional electric grid. SouthCoast Wind considered and evaluated alternative potential points of interconnection (POIs) to the grid, offshore export cable corridors (ECCs), landfall site alternatives, onshore export cable routes, and transmission technologies. Some of these alternatives were eliminated based on technical or commercial feasibility assessments, or the inability of the alternative to address the identified interconnection need. Other alternatives that were found to be feasible and capable of addressing the identified need were further examined on the basis of constructability, operability, environmental impacts, estimated costs and reliability assessments.

Delivery of an estimated 2,400 MW of clean power will necessitate multiple POIs for several reasons, most notably that individual connections to the regional transmission system are limited by the Independent System Operator for New England (ISO-NE) to 1,200 MW maximum for reliability reasons. SouthCoast Wind considered multiple coastal interconnection points with suitable electrical characteristics, accessibility, and potential nearby land for the required substation/converter station facilities. Two POIs were selected: one at Brayton Point in Somerset, MA and one in Falmouth, MA. This analysis focuses on the export cable routing from the Offshore Generation Facility to the onshore POI at Brayton Point for the SouthCoast Wind 1 Project.

SouthCoast Wind has power purchase agreements to deliver 1,200 MW of offshore wind energy to Brayton Point in Somerset, Massachusetts. Brayton Point is a robust interconnection point that can accommodate 1,200 MW, and it is a previously disturbed brownfield site formerly occupied by a coal burning power generation plant. The first 1,200 MW delivered from the Offshore Generation Facility will be the SouthCoast Wind 1 Project.

2 ROUTE SITING FACTORS

SouthCoast Wind's routing analysis, environmental assessment of alternatives, and route selection involved significant efforts to evaluate a wide range of routing alternatives. The following steps were taken during the route selection process:

- Identify potential landfall locations capable of providing suitable areas for horizontal directional drilling (HDD) and installation of transition joint bays, where offshore export cable is spliced to onshore export cable.
- Identify a geographic area that incorporates the offshore route(s), the potential onshore route(s), the landfall location(s) the high voltage direct current (HVDC) converter station location, and the POI with the regional transmission system.
- Assess potential routing options within the geographic area that would best connect these routing elements.
- Evaluate each routing option for fatal flaws and only move forward with feasible options.
- Inventory and evaluate each route option based on engineering, environmental impact, constructability, permitting, reliability, and cost criteria.

2.1 Siting Factors Offshore and at Landfall

Identifying ECCs requires careful planning and route optimization, with considerations including:

- Offshore physical hazards, such as shipwrecks, unexploded ordnance, other existing and planned cables, and sea floor and subsurface obstructions,
- Economic and recreational use areas, such as commercial or recreational fishing, recreational boating and tourism, and anchoring,
- Protected marine areas, areas protected for biological, cultural, or historical purposes, and
- Available interconnection points.

Many factors were evaluated when selecting landfall locations. The selected landfall location needs to balance:

- Avoidance of marine and coastal resources such as submerged aquatic vegetation and coastal wetlands,
- Risk of cable exposure due to wave action and sediment migration, and
- Requirements for sea-to-shore HDD installation operations, such as onshore and offshore space, seabed conditions, and use conflicts.

Availability of physical space was evaluated for construction and installation activities within onshore HDD staging areas. SouthCoast Wind assessed land uses adjacent to potential landfall locations to inventory and avoid/minimize adverse environmental effects, identify potential for use of existing infrastructure, minimize disturbances to residential areas, avoid protected lands, and avoid adverse effects to historic districts, conservation districts, and businesses that could be impacted including nearby marine uses (i.e., fisheries, shellfish beds, marinas, beaches).

Water depth at the landfall approach was also an important factor because the drafts of the vessels to be used to support the HDD operations need to be considered as well as the effects from sea-state conditions, wave action, and surf zone on the vessels and cable assets. At the HDD punchout ("entry" and "exit") locations, where the offshore export cables will begin the approach to shore, the HDD offshore exit locations are likely to be on the order of 6.6 to 32.8 feet (ft) (2.0 to 10.0 m) in depth below mean sea level.

2.2 Siting Factors Onshore

Onshore export cable routes considered by SouthCoast Wind would be constructed underground, primarily along existing public road right-of-way. At the request of the Rhode Island Department of Environmental Management (RIDEM), overhead transmission lines were considered, in addition to underground transmission, which is SouthCoast Wind's preferred approach. This is discussed further in Section 4.2. Considerations for siting onshore export cables include the following:

- System operability and reliability – access for future inspection, operation, and maintenance.
- Engineering feasibility – route length, route bends and hard angles, adequate space to accommodate underground duct bank, manholes and transition joint bays.
- Construction feasibility – congestion with existing utility infrastructure, complex and trenchless crossings.

- Human/built environment – residential areas, environmental justice populations, densely developed areas, traffic congestion, potential for economic disruption, historic and archaeologic resources, sensitive cultural areas.
- Environmental Setting – conservation and public lands, flood hazard areas, freshwater and coastal wetlands and waters, state-listed rare species, public water supplies, and tree removal.

3 UNIVERSE OF ROUTES CONSIDERED

A summary of fourteen onshore and offshore export cable route combinations considered by SouthCoast Wind is presented below in Table 1 and shown on the Universe of Routes (Figure 1 below and Figure 5-2 in Attachment 1). The list captures a representative array of overland and in-water routes to the Brayton Point POI.

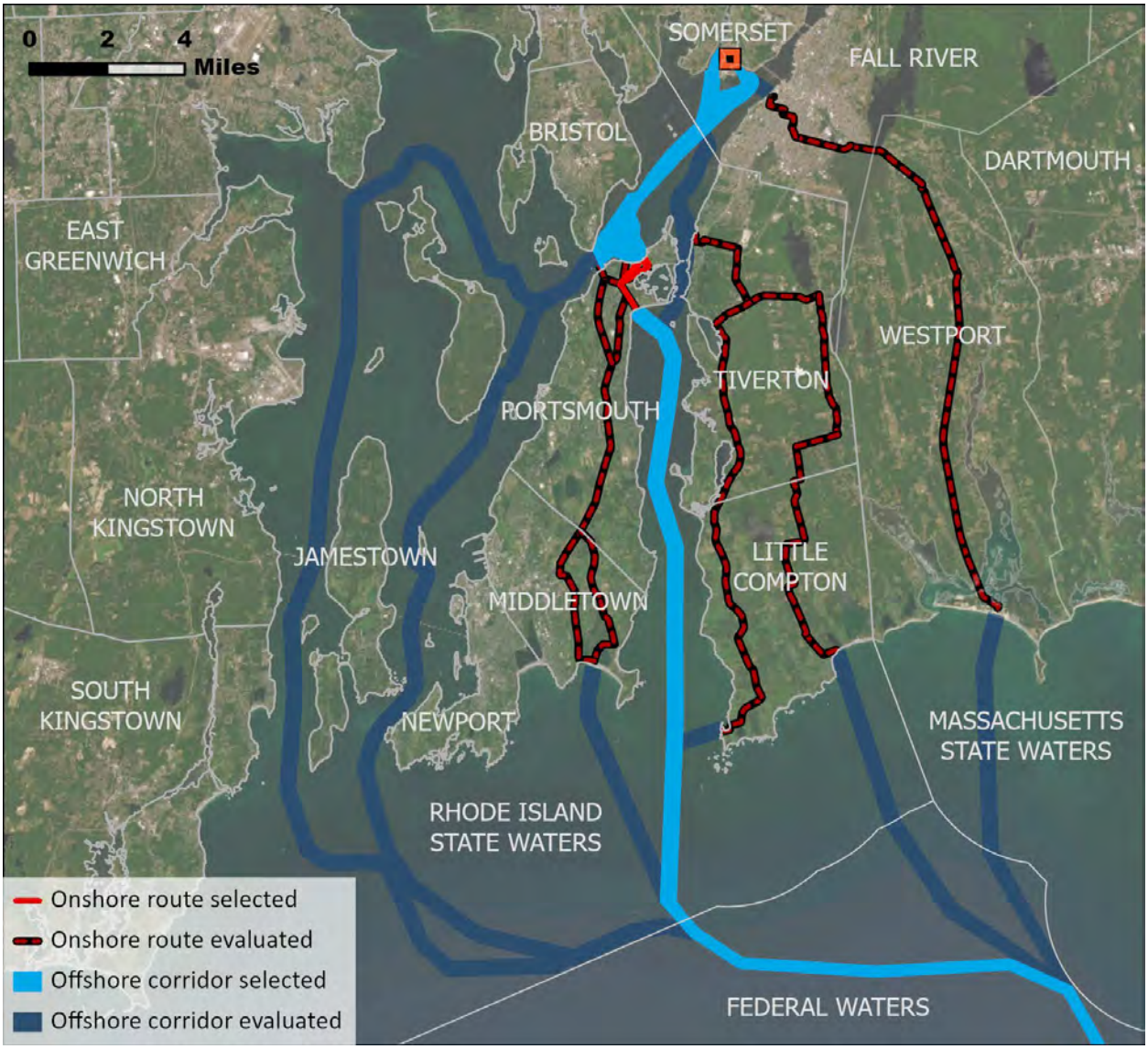


FIGURE 1. OVERVIEW OF UNIVERSE OF ROUTES CONSIDERED TO BRAYTON POINT

TABLE 1. OFFSHORE AND ONSHORE EXPORT CABLE ROUTES CONSIDERED [a]

Route Category	Route ID	Route Description	1st Intermediate Landfall	2nd Intermediate Landfall	Brayton Point Landfall	Length mi (km)							
						Offshore				Onshore			Total
						Federal waters [b]	RI state waters	MA state waters	Total	RI jurisdiction	MA jurisdiction	Total	
Sakonnet River with intermediate onshore crossing at Portsmouth	1	Sakonnet River to Boyds Ln. to Roger Williams University (RWU)	Boyds Ln. (Portsmouth, RI)	RWU (Portsmouth, RI)	Lee River	90.1 (145.0)	20.9 (33.7)	2.1 (3.4)	**113.2 (182.1)**	1.0 (1.6)	0.6 (0.9)	**1.5 (2.4)**	**114.7 (184.5)**
	2	Sakonnet River to Boyds Ln. to Montaup Country Club	Boyds Ln. (Portsmouth, RI)	Montaup Country Club (Portsmouth, RI)	Lee River	90.1 (145.0)	20.6 (33.2)	2.1 (3.4)	**112.9 (181.6)**	1.7 (2.7)	0.6 (0.9)	**2.2 (3.6)**	**115.1 (185.2)**
	3	Sakonnet River to Boyds Ln. to RIDEM/ Aquidneck Land Trust	Boyds Ln. (Portsmouth, RI)	DEM/Aquidneck Land Trust (Portsmouth, RI)	Lee River	90.1 (145.0)	20.8 (33.5)	2.1 (3.4)	**113.0 (181.9)**	1.0 (1.7)	0.6 (0.9)	**1.6 (2.6)**	**114.6 (184.5)**
	4	Sakonnet River to Boyds Ln. to Mt. Hope Bridge	Boyds Ln. (Portsmouth, RI)	Mt. Hope Bridge (Portsmouth, RI)	Lee River	90.1 (145.0)	21.2 (34.0)	2.1 (3.4)	**113.4 (182.5)**	1.2 (2)	0.6 (0.9)	**1.8 (2.9)**	**115.2 (185.3)**
	5	Sakonnet River to Boyds Ln. to RWU	Boyds Ln. (Portsmouth, RI)	RWU (Portsmouth, RI)	Taunton River	90.1 (145.0)	20.9 (33.7)	2.4 (3.9)	**113.5 (182.6)**	1.0 (1.6)	0.4 (0.7)	**1.4 (2.3)**	**114.9 (184.8)**
Offshore routes to Brayton Point	6	Sakonnet River north	--	--	Lee River	90.1 (145.0)	20.7 (33.3)	2.4 (3.9)	**113.2 (182.2)**	0	0.6 (0.9)	**0.6 (0.9)**	**113.8 (183.1)**
	7	Narragansett Bay East Passage	--	--	Lee River	90.4 (145.4)	30.4 (48.9)	2.1 (3.4)	**122.9 (197.7)**	0	0.6 (0.9)	**0.6 (0.9)**	**123.4 (198.6)**
	8	Narragansett Bay West Passage	--	--	Lee River	90.4 (145.4)	41.9 (67.4)	2.1 (3.4)	**134.4 (216.2)**	0	0.6 (0.9)	**0.6 (0.9)**	**134.9 (217.1)**
Routes with intermediate RI onshore crossing bypassing the Sakonnet River	9	Second Beach, Paradise Ave., & Rte. 138 to RWU	Second Beach (Middletown, RI)	RWU (Portsmouth, RI)	Lee River	90.1 (145.0)	11.8 (18.9)	2.1 (3.4)	**104.0 (167.3)**	11.0 (17.7)	0.6 (0.9)	**11.6 (18.6)**	**115.6 (185.9)**
	10	Second Beach, Paradise Ave., & Rte. 138 to Mt. Hope Bridge	Second Beach (Middletown, RI)	Mt. Hope Bridge (Portsmouth, RI)	Lee River	90.1 (145.0)	12.0 (19.3)	2.1 (3.4)	**104.2 (167.7)**	10.9 (17.6)	0.6 (0.9)	**11.5 (18.5)**	**115.7 (186.2)**
	11	Second Beach, Mitchell's Ln., & Rte. 138 to RWU	Second Beach (Middletown, RI)	RWU (Portsmouth, RI)	Lee River	90.1 (145.0)	11.8 (18.9)	2.1 (3.4)	**104.0 (167.3)**	11 (17.7)	0.6 (0.9)	**11.5 (18.5)**	**115.5 (185.9)**
	12	Rte. 77, Rte. 177, Fish Rd., & Souza Rd. to Schooner Dr.	Sakonnet Point (Little Compton, RI)	Schooner Dr. (Tiverton, RI)	Lee River	90.1 (145.0)	8.7 (14.1)	2.4 (3.9)	**101.3 (163)**	15.8 (25.4)	0.6 (0.9)	**16.3 (26.3)**	**117.6 (189.3)**
	13	South Shore Beach, Rte. 81, Rte. 177, Fish Rd., & Souza Rd. to Schooner Dr.	South Shore Beach (Little Compton, RI)	Schooner Dr. (Tiverton, RI)	Lee River	86.1 (138.5)	2.7 (4.4)	7.1 (11.4)	**95.9 (154.3)**	16.3 (26.3)	0.6 (0.9)	**16.9 (27.2)**	**112.8 (181.5)**
Massachusetts-only route	14	Horseneck Beach, Rte. 88, Rte. 6, Brayton Ave., & S. Main St. to Ferry St.	Horseneck Beach (Westport, MA)	Ferry St. (Fall River, MA)	Taunton River	83.8 (134.8)	0	7.6 (12.3)	**91.4 (147.1)**	0	17.3 (27.9)	**17.3 (27.9)**	**108.7 (174.9)**

Notes: Abbreviations are defined on the Abbreviation Table at the beginning of this document. Numbers may not compute precisely due to rounding.

[a] *This table summarizes 14 export cable routes considered, many of which were deselected. The list captures a representative array of route segment combinations considered by SouthCoast Wind.*

[b] *Offshore export cable route length in federal waters is subject to adjustment based on selection of final offshore substation platform location(s) in the Offshore Generation Facility. This will not impact the cable route lengths in RI state waters or MA state waters or any route comparisons presented here.*

3.1 Onshore Underground Export Cable Route Alternatives (Bypassing the Sakonnet River)

SouthCoast Wind evaluated the following cable landing and onshore route alternatives that would avoid cable installation in Narragansett Bay and the Sakonnet River (refer to Figure 1 and Figure 5-2 in Attachment 1):

- Three routes landing in Middletown, RI
- Two routes landing in Little Compton, RI
- One route landing in Westport, MA

Key evaluation factors for the onshore routes included:

- Environmental resources and conservation areas
- Archaeological resources and cultural resource areas
- Conflicts with residential uses
- Potential socioeconomic effects due to use and space conflicts in heavily developed commercial and tourism areas
- Avoidance of existing infrastructure and potential for effects on local communities, including environmental justice communities
- Space limitation for construction adjacent to small, two-lane roads
- Duration of construction activities and increased impacts with longer duration construction periods

These onshore routes would pass through sensitive environmental resources (multiple residential areas and conservation areas), increase traffic congestion over a greater length of onshore routing, and cost significantly more than equivalent distances of offshore cabling. There are also significant engineering and construction constraints that would be encountered along these routes, as described below.

Several narrow roads along these routes would require full-lane road closures during the installation phase, causing traffic congestion impacting multiple residential areas. Winding and narrow roadways may also present engineering constraints for the cable design due to the severe turns and angles in portions of the routes. Several historic candidate sites and historic cemeteries are located along the routes in Middletown and Little Compton. These routes would encounter culverted stream crossings and bridge crossings over abandoned railroad right-of-way, which would require more complex trenchless methods for conduit installation. For these reasons, onshore Route Identifiers (IDs) 9-11 (see Table 1) were dismissed from further consideration as impractical route alternatives.

These onshore export cable route alternatives are described in more detail below.

3.1.1 Routes Landing at Second Beach in Middletown, RI (Route IDs 9-11)

SouthCoast Wind evaluated three onshore underground routes landing in Middletown, RI. All three alternatives (Route ID 9, Route ID 10, and Route ID 11) would make landfall at the parking lot for Second Beach in Middletown via HDD under the municipal public beach from Sachuest Bay. An indicative landfall trajectory is shown in Figure 2, along with two potential onshore paths from the landfall site.

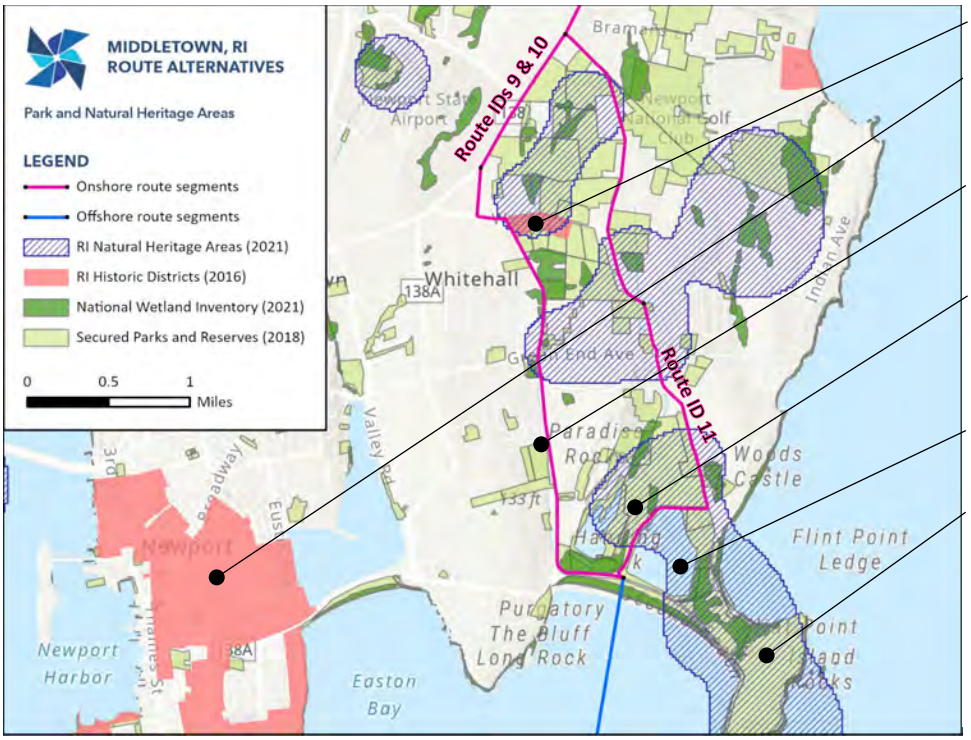
FIGURE 2. SECOND BEACH, MIDDLETOWN LANDFALL ALTERNATIVE

Second Beach is a dynamic beach system with mobile sediments, surrounded by wetlands, parks, and natural heritage areas. The Second Beach landfall site and routing abuts the Norman Bird Sanctuary, a 325-acre bird sanctuary, nature preserve, environmental education center, and museum. To the east is Sachuest Point National Wildlife Refuge, another nature preserve, occupying 242 acres which serve as an important stopover and wintering area for migratory birds, as well as a popular tourist destination for more than 65,000 annual visitors. To the west is Newport, a popular, year-round tourist destination and a designated Rhode Island historic district.

The route alternatives from the Second Beach landfall site would include approximately 11.0 miles (mi) (17.7 kilometer [km]) of onshore routing across Aquidneck Island through Middletown and Portsmouth, passing through multiple residential areas. Figure 3 maps the wetlands (dark green), parks and reserves (light green), natural heritage areas (blue hatch), and historic districts (pink) along Route IDs 9-11 through Middletown. Along these routes, there are fifteen aboveground cultural resources located within the Project's Preliminary Area of Potential Effects (PAPE), of which six are listed on the National Register.[1] The routes pass through High Value / High Vulnerability Habitat and Natural Heritage Areas 216 and 209 according to RIDEM and Rhode Island Geographic Information System (RIGIS). Additional sensitive receptors abut the routes, including wetlands, parks, reserves, emergency and rescue services facilities, schools, and government facilities, including but not limited to:

- Aquidneck Land Trust's Spruce Acres Farm
- Bloom Preschool
- The Island Child Care Center and Day School
- St. Mary's Rectory, St Mary's Episcopal Church
- Sea Rose Montessori School
- Aquidneck Island Christian Academy
- Portsmouth Historical Society
- Countryside Children's Center
- St. Barnabas Church
- Portsmouth Water and Fire District
- Portsmouth Town Hall
- Portsmouth Police Department
- Portsmouth Fire Department
- Paradise Ave, which parallels Maidford River

[1] *BOEM Alternative C-1 and C-2 Cultural Resource Due Diligence Report*



- **Bailey Farm**, a 45-acre 19th century farm.
- **Newport,** a popular, year-round tourist destination and a designated historic district.
- **Paradise School**, a historic property built in 1875, which sits on the edge of **Paradise Valley Park**.
- **Norman Bird Sanctuary**, a 325-acre bird sanctuary, nature preserve, environmental ed center, and museum.
- **Gardiner Pond**, a City of Newport drinking water supply area.
- **Sachuest Point National Wildlife Refuge,** a 242-acre nature preserve and important stopover and wintering area for migratory birds, also a popular tourist destination for more than 65,000 annual visitors.

FIGURE 3. MIDDLETOWN PARK AND NATURAL HERITAGE AREAS

All three route alternatives proceed north on Route 138, a busy four-lane road without a paved shoulder, abutted by commercial properties and some residences. It is important to note that Newport is a popular year-round tourist destination on the southwest corner of Aquidneck Island, and with the tourism comes accompanying traffic congestion. There are limited roads traversing Aquidneck Island, with Route 138 and Route 114 as the only major north-south routes, as shown in Figure 4. Installation of cables along one side of Aquidneck Island would likely impact traffic across the island.

Additional considerations distinguishing Route ID 9, Route ID 10, and Route ID 11 are described in the following subsections.

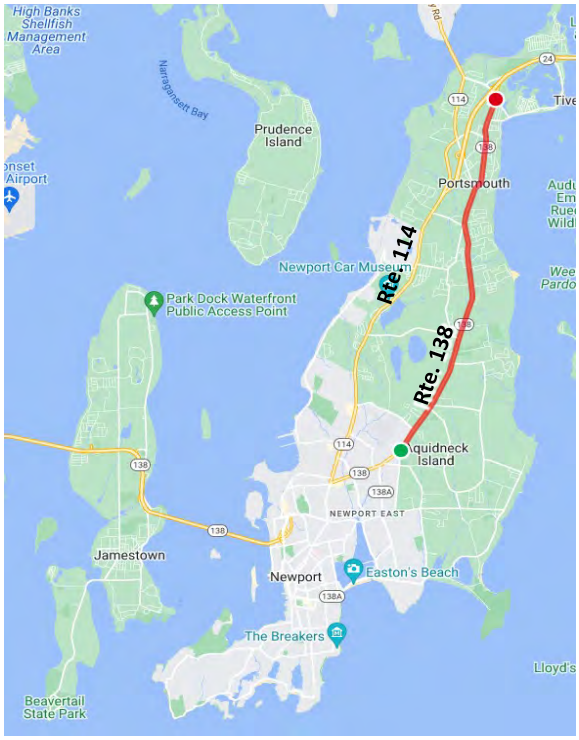


FIGURE 4. ROUTE 138, AQUIDNECK, RI

3.1.1.1 Paradise Ave., Rte. 138, Turnpike Ave, Rte. 114 (Route ID 9)

From the landfall at Second Beach, Route ID 9 would proceed inland through Middletown via Paradise Avenue and Route 138, crossing into Portsmouth to rejoin the Selected Alternative discussed in Section 3.2.1.1 (refer to Figure 5).

In addition to the abutting habitat, heritage areas, and sensitive receptors described in Section 3.1.1, Route ID 9 would also pass Paradise School, a historic property located along the route. Additional sensitive receptors that would abut Route ID 9 include:

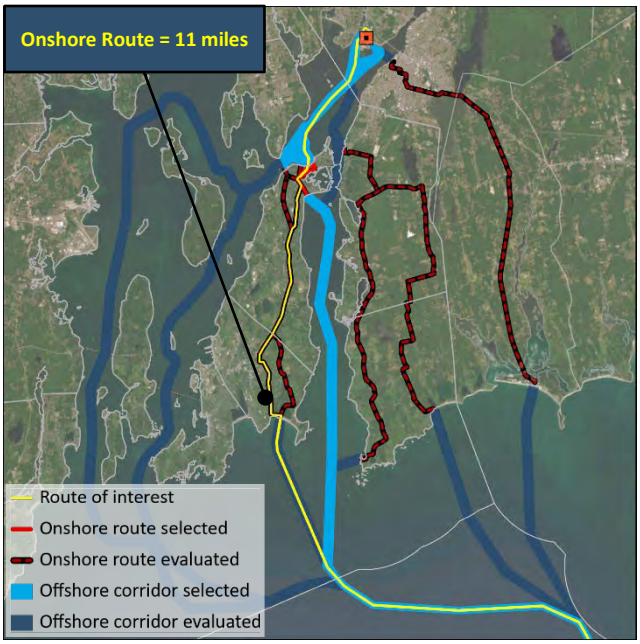


FIGURE 5. ROUTE ID 9 LOCUS

- Paradise Valley Park
- Middletown Historical Society
- Portsmouth Free Public Library
- Middletown Public Works
- Middletown Fire Department
- Beth Olam Cemetery
- Calvary United Methodist Church and Calvary Christian School
- Middletown Cemetery
- JH Gaudet Middle School and JH Gaudet Field
- St. Paul's Episcopal Church
- Portsmouth Nursery School
- Bradley School
- St. Anthony's Church
- Heritage Baptist Church
- U.S. Postal Service Post Office
- Rhode Island Department of Transportation (RIDOT) Portsmouth Maintenance Facility
- Aquidneck Island Land Trust Town Pond Trail

Based on a preliminary engineering review of the routes, the roadways along Paradise Avenue and Berkely Avenue do not appear to have many underground utilities. They are predominantly local, two-lane roads without a paved shoulder that provide limited space for construction without disturbing the abutting sensitive resources. The roads are frequently abutted by old stone walls, large trees with canopies overhanging the road, and overhead utility poles (see Figure 6 photos), and they pass through multiple residential areas.

FIGURE 6: PHOTOS ALONG PARADISE AVE (LEFT) AND BERKELEY AVE (RIGHT), MIDDLETOWN, RI

3.1.1.2 Paradise Ave., Rte. 138 (Route ID 10)

From the landfall at Second Beach, Route ID 10 would proceed inland through Middletown via Paradise Avenue until joining Route 138, like Route ID 9. Refer to Section 3.1.1 for additional considerations pertaining to all three route alternatives making landfall in Middletown.

Route ID 10 turns off Route 138 to continue north on Route 114, finally reaching the Mount Hope Bridge HDD staging area (refer to Figure 7). Turnpike Avenue and Bristol Ferry Road are busy, wide roadways with two to three travel lanes, paved shoulders, and sidewalks. The intersection at the approach to Mount Hope Bridge is also heavily used and construction activity would likely lead to traffic congestion near the HDD staging area.

In addition to the abutting habitat, heritage areas, and sensitive receptors described in Section 3.1.1, Route ID 10 would also pass through High Value / High Vulnerability Habitat and Natural Heritage Area 149 according to RIDEM and RIGIS mapping. Paradise School and Mount Hope Bridge, historic properties, are located on the route, which also would pass through the Revolutionary War Battle for Rhode Island Historic District.

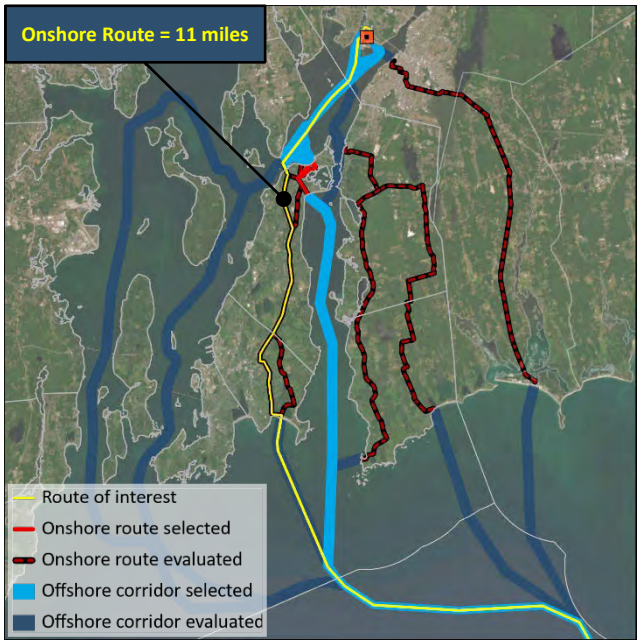


FIGURE 7. ROUTE ID 10 LOCUS

Additional sensitive receptors that would abut Route ID 10 include:

- Paradise Valley Park
- Middletown Historical Society
- Middletown Public Works
- Middletown Fire Department
- Beth Olam Cemetery
- Calvary United Methodist Church and Calvary Christian School
- Middletown Cemetery
- JH Gaudet Middle School and JH Gaudet Field
- Tripp Property Historical Landmark
- Turnpike Avenue Playground

3.1.1.3 Mitchell's Ln., Rte. 138 (Route ID 11)

From the landfall at Second Beach, Route ID 11 would head east along Hanging Rock Road, then travel via Mitchell's Lane to Route 138, rejoining the Selected Alternative (see Figure 8). Refer to Section 3.1.1 for additional considerations pertaining to all three route alternatives making landfall in Middletown.

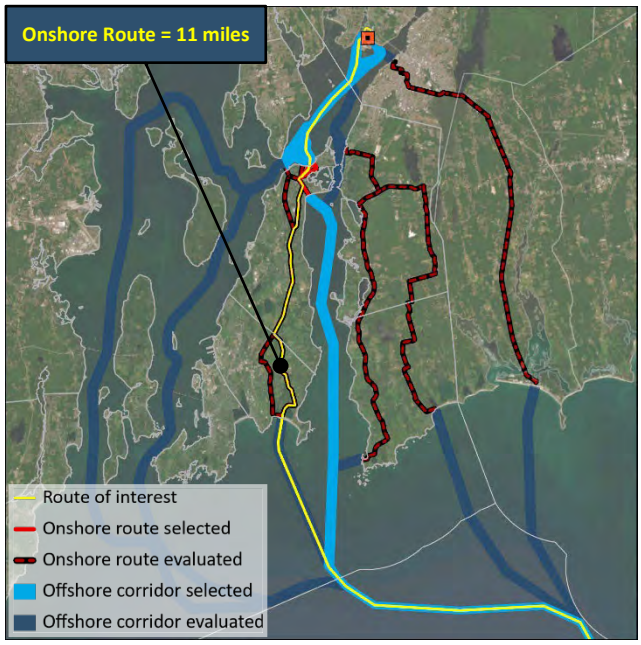


FIGURE 8. ROUTE ID 11 LOCUS

In addition to the abutting habitat, heritage areas, and sensitive receptors described in Section 3.1.1, Route ID 11 would pass through High Value / High Vulnerability Habitat and Natural Heritage Area 237 according to RIDEM and RIGIS mapping. This route would also pass Gardiner Pond, a City of Newport drinking water supply area, and Paradise Brook. Historic properties along the route would include Gardiner Pond Shell Midden and Union Church and Southernmost Schoolhouse. Additional sensitive receptors that would abut Route ID 11 include:

- Portsmouth Free Public Library
- Portsmouth Nursery School
- Bradley School
- St. Anthony's Church
- Heritage Baptist Church
- U.S. Postal Service Post Office
- RIDOT Portsmouth Maintenance Facility
- Aquidneck Island Land Trust Town Pond Trail
- Albro Woods Trailhead
- Howland Park
- Little Creek Preserve
- Norman Bird Sanctuary
- Newport Equestrian Academy
- Sakonnet Greenway Trail and Trailhead
- Newport National Golf Club

Based on a preliminary engineering review of the routes, Mitchell's Lane does not appear to have many underground utilities. It is a local, two-lane road without a paved shoulder that provides limited space for construction without disturbing the abutting sensitive resources. The road is frequently abutted by old stone walls, large trees with canopies overhanging the road, and overhead utility poles. As compared to Paradise Ave (associated with Route ID 9 and Route ID 10), Mitchell's Lane appears slightly narrower

and has less developed surroundings, passing by more nature reserves and natural heritage areas (see Figure 3 mapping and Figure 9 photos).

FIGURE 9: PHOTOS ALONG MITCHELL'S LANE, MIDDLETOWN, RI

For all three route alternatives (Route IDs 9-11), the southern portions in Middletown would be the most challenging to site and construct given the narrow roads and high prevalence of natural and historical resource areas. Due to the extended duration of construction, use conflicts, potential for effects on the local economy, lack of sufficient space on small roads, and potential effects on sensitive environmental, historic and cultural areas, Route ID 9, Route ID 10, and Route ID 11 were not selected.

3.1.2 Routes in Little Compton and Tiverton, RI (Route IDs 12-13)

The southeastern, ocean-facing coast of Little Compton was evaluated to identify suitable sites for cable landfall. The coastline alternates between residential properties along steep, rocky shoreline and uninhabited marsh and mudflats. There are very few areas providing a suitable approach, available land, or sufficient space to support onshore HDD activities and underground cabling. Two potential landfall sites were identified for evaluation at Sakonnet Point and South Beach. The routes starting in Little Compton (Route IDs 12-13) would be longer with lower feasibility than those starting in Middletown (Route IDs 9-11).

3.1.2.1 Sakonnet Point, Rte. 77 (Route ID 12)

Route ID 12 would make intermediate landfall at Sakonnet Point in Little Compton then travel via Route 77 to reach Schooner Drive in Tiverton (refer to Figure 10). An indicative landfall trajectory to Sakonnet Point surfacing in a 0.9-acre parking lot across from the Sakonnet Harbor is shown in Figure 11. The area is constrained, with the parking lot separated from water by only a narrow strip of riprap coast. The surface grades may not allow for sufficient HDD burial depth in the approach to the onshore HDD pit. Due to proximity to the marina and harbor, vessel traffic in this area is expected to be high.

This onshore route would be 15.8 mi (25.4 km) long and pass through multiple residential areas. Figure 12 maps the wetlands (dark green), parks and reserves (light green), natural heritage areas (blue hatch), and historic districts (pink) along Route ID 12 through Little Compton and Tiverton.

After making landfall, the onshore route would immediately pass by and temporarily restrict access to the public boat ramp. It also abuts the Haffenreffer Wildlife refuge, which is a destination for birding. Figure 12 shows how dense Little Compton is with wetlands, park and preserve land. Much of the area is preserved woodland and agricultural area.

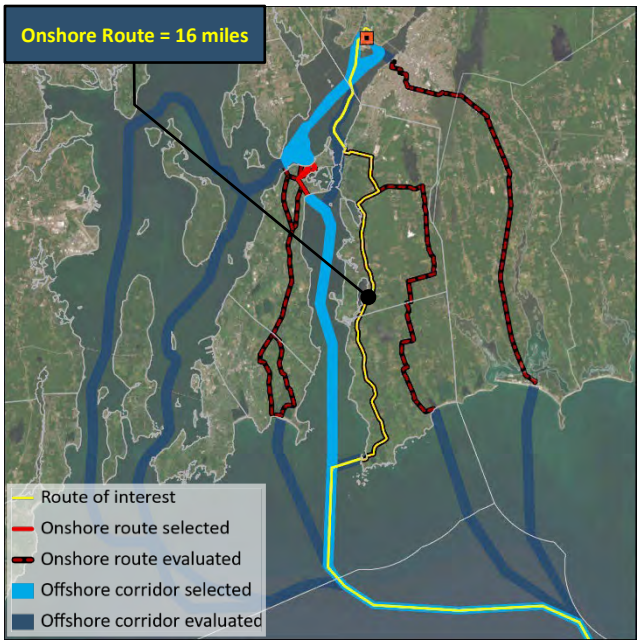


FIGURE 10. ROUTE ID 12 LOCUS

FIGURE 11. SAKONNET POINT, LITTLE COMPTON LANDFALL ALTERNATIVE

From the Sakonnet Point landfall, the route would head east and turns north, following Route 77 along the Sakonnet River coast through Little Compton and into Tiverton. Once in Tiverton, the route would turn east onto Route 177. Both Route 77 and Route 177 are busy two-lane roads with minimal paved shoulders, passing a very high prevalence of protected natural, historical, and agricultural areas. In Tiverton, Route 77 passes within 500 ft of Nonquit Pond and through the Tiverton Four Corners Historic District. The route would also pass adjacent to preserved woodland and agricultural land. Along this route, there are fifteen aboveground cultural resources located within the Project's PAPE, of which four are listed on the National Register.[2] The route would head north on Fish Road and then turns northwest on Souza Road. Both Fish Road and Souza Road are narrow two-lane roads without paved shoulders.

Souza Road turns into Schooner Drive, which is a steep access road to the dense residential Village at Mount Hope Bay and Boat House Waterfront Dining Restaurant. There are no other access roads to the restaurant, meaning that construction activities would impact not only the commercial operations at the Boat House but the residential Village at Mount Hope Bay, particularly if there is a road closure. Schooner Drive includes a bridge over an abandoned railroad right-of-way, which would require a trenchless installation method. Route ID 12 would re-enter the water from private property near where Mount Hope Bay and the Sakonnet River meet, north of the State Route 24 Bridge, shown in Figure 13.

This route would pass through Natural Heritage Areas 245, 219, 174, and 151 according to RIDEM and RIGIS mapping. Additional sensitive receptors would abut Route ID 12, including wetlands, parks, reserves, emergency and rescue services facilities, schools, and government facilities, such as:

- Sakonnet Point Marina
- Sakonnet Harbor Put In
- Town Landing Hiking Area
- Sakonnet Yacht Club
- Sakonnet Golf Course
- Wilbor House Museum
- John C Whitehead Preserve – Hope's Path
- Donovan Marsh
- Pachet Brook
- Borden Brook
- Amicable Church
- Audubon Emilie Ruecker Wildlife Reserve
- Pardon Gray Preserve and Trailhead
- West Place Animal Sanctuary
- Tiverton Town Farm Recreation Area
- Quaket Creek
- Pocasset Ridge Conservation Area
- Nanaquaket Pond
- White Wine Brook
- The Gathering Place Church
- Sin and Flesh Brook
- Tiverton Police Department
- Tiverton Public Works Department
- Fish Road Park and Ride Bus Station
- Village at Mount Hope Bay - Housing Development

Due to the extended duration of construction, use conflicts, potential for effects on the local economy, lack of sufficient space on small roads, and potential effects on sensitive environmental, historic, and cultural areas, this route was not selected.

[2] *BOEM Alternative C-1 and C-2 Cultural Resource Due Diligence Report*

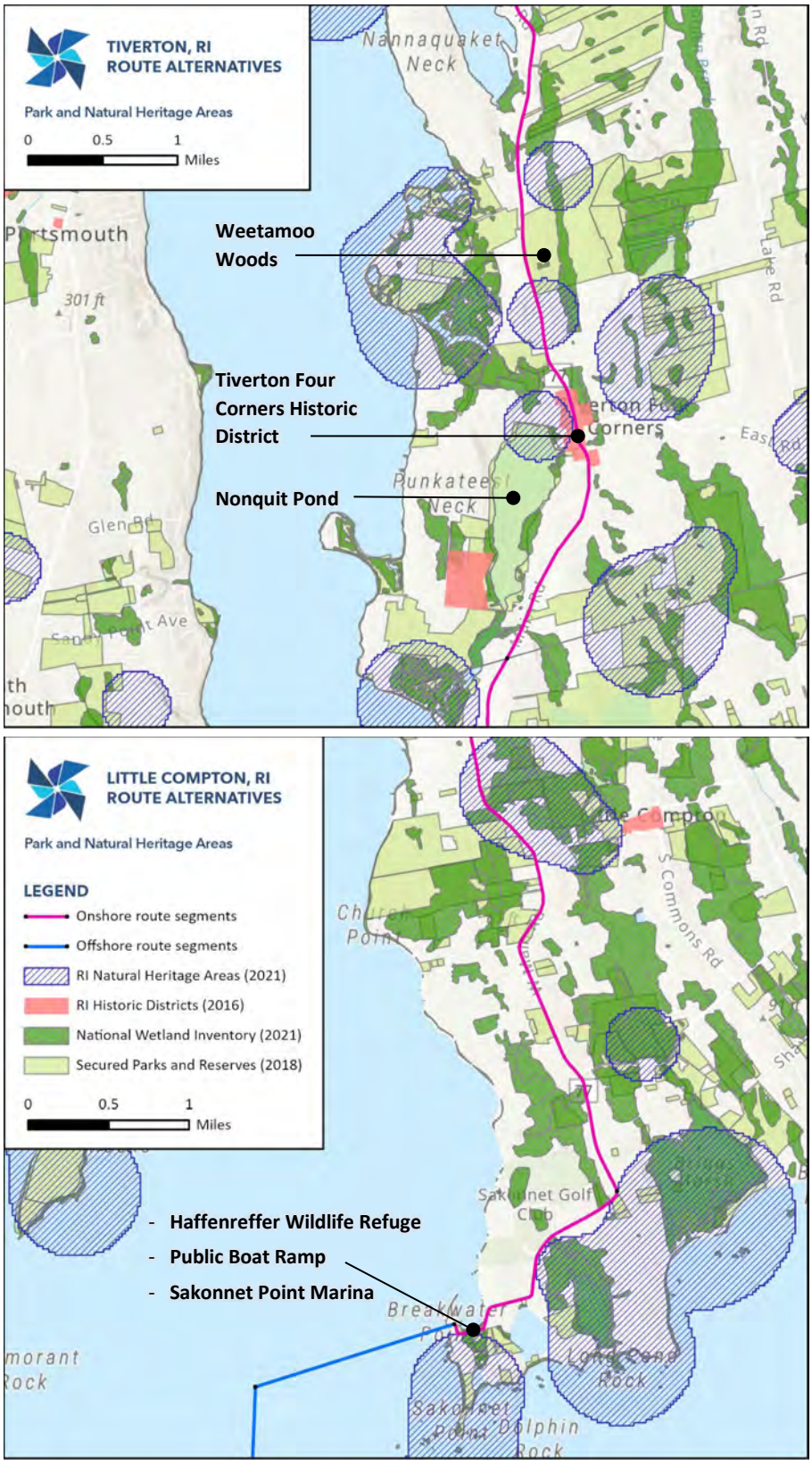


FIGURE 12. LITTLE COMPTON & TIVERTON PARKS, WETLANDS AND NATURAL HERITAGE AREAS (ROUTE ID 12)

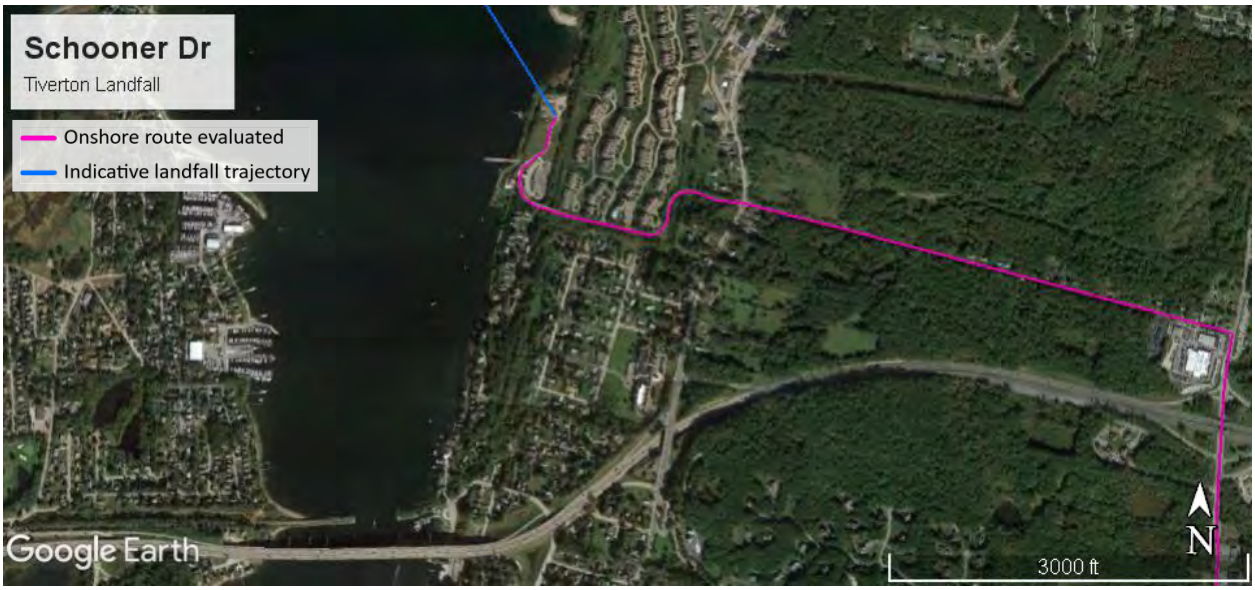


FIGURE 13. SCHOONER DR, TIVERTON LANDFALL ALTERNATIVE

3.1.2.2 South Shore Beach, Rte. 81 (Route ID 13)

Route ID 13 would make landfall at the parking lot at South Shore Beach in Little Compton then travel via Route 81 to reach Schooner Drive in Tiverton (refer to Figure 14). This route would be 16.3 mi (26.3 km) long and pass through multiple residential areas. The routes identified through Little Compton and Tiverton represent longer intermediate onshore crossings with lower feasibility than those through Middletown and Portsmouth.

This route would pass through Natural Heritage Areas 226, 183, and 151 according to RIDEM and RIGIS mapping. Additional sensitive receptors would abut Route ID 13, including wetlands, parks, reserves, emergency and rescue services facilities, schools, and government facilities, such as:

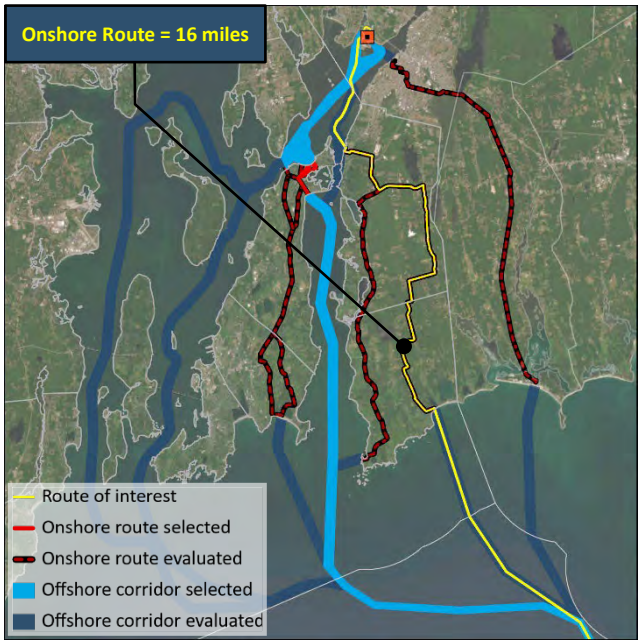


FIGURE 14. ROUTE ID 13 LOCUS

- Round Meadows Campground
- Tunipus Pond
- P. T. Marvell Preserve
- Goosewing Beach Preserve
- Henry Head Cemetery
- Sisson Brook
- Simmons Mill Management Area
- Little Compton Assistance Association – Food Distribution Center
- National Forest
- Victory Church RI, Inc
- Tiverton Public Library
- Community of Christ
- Town Farm Recreational Park
- Sin and Flesh Brook
- Tiverton Police Department
- Tiverton Public Works Department
- Fish Road Park and Ride Bus Station
- Sakonnet Early Learning Center
- Village at Mount Hope Bay Housing Development

Route ID 13 would make landfall in the parking area for South Shore Beach. An indicative landfall trajectory to South Shore Beach is shown in Figure 15. This is a low-lying area adjacent to Tunipus Pond and the P.T. Marvell Preserve, which is an ecosystem conservation area with walking trails for birding and wildlife observation. From landfall, the route would head west then northwest along South Shore Road.

This landfall and onshore route combination are not an ideal option for Project siting due to the proximity to conservation land and the narrow corridor of previously disturbed area. Project installation activities would necessitate full closure of South Shore Road and could bleed into shoulder areas. Road shoulders are narrow and often closely abutted by wetland vegetation or stone walls.

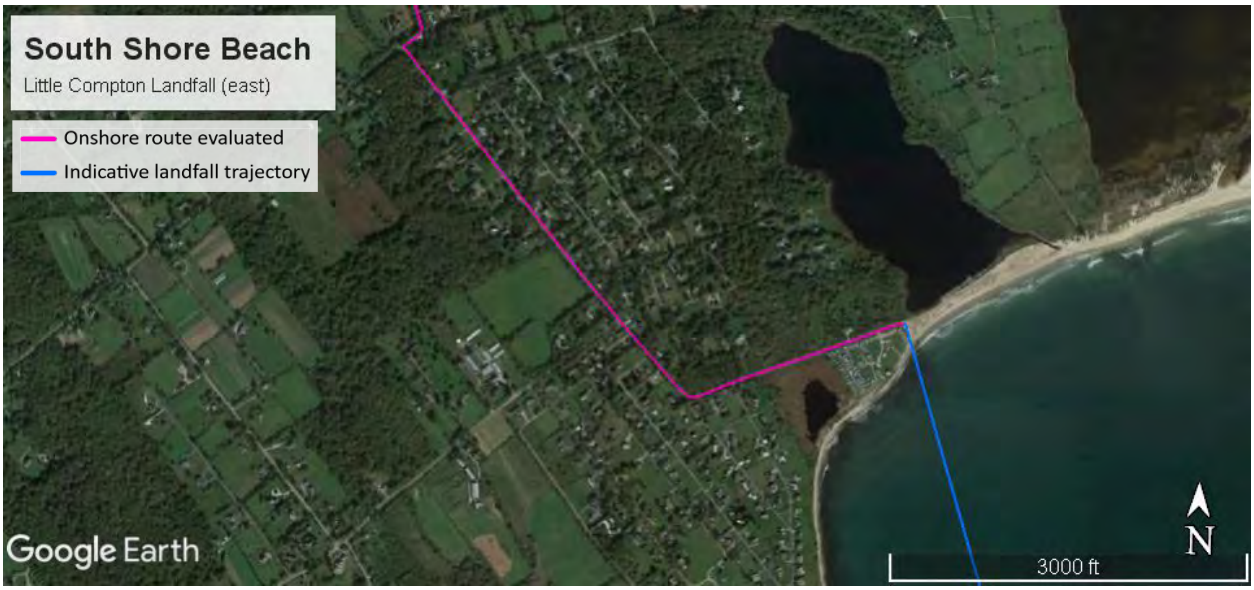


FIGURE 15. SOUTH SHORE BEACH, LITTLE COMPTON LANDFALL ALTERNATIVE (ROUTE ID 13)

From South Shore Road, the route would head north, crossing into Tiverton and periodically turning east toward Route 81. The roads through Little Compton and southern Tiverton are narrow, local two-lane roads without a paved shoulder that pass through multiple residential areas along this route. These local roads are frequently abutted by old stone walls, large trees with canopies overhanging the road, and overhead utility poles. The route would turn north onto Route 81 then west onto Route 177. Both Route 81 and Route 177 are busy two-lane roads. Route 81 has a wide paved shoulder. The route would head north on Fish Road and then turn northwest on Souza Road toward the Schooner Drive HDD site described with Route ID 12 and shown in Figure 13.

Due to the extended duration of construction, use conflicts, potential for effects on the local economy, lack of sufficient space on small roads, and potential effects on sensitive environmental, historic, and cultural areas, this route was not selected.

3.1.3 Massachusetts-Only Route Alternative (Route ID 14)

SouthCoast Wind evaluated an ECC from federal waters, through Buzzards Bay in Massachusetts to a landfall at Horseneck Beach, and an onshore export cable route through Westport and Fall River, Massachusetts (Route ID 14, refer to Figure 16).

The Westport onshore route alternative would commence with the offshore export cables making landfall at the Horseneck Beach parking lot in Westport via HDD. An indicative landfall trajectory to Horseneck Beach is shown in Figure 17. There are several restrictions to landing the export cables at the Horseneck Beach parking lot. Horseneck Beach is a high-energy, dynamic barrier system with mobile sediments. An extensive marsh system and the Westport River extend behind the barrier beach front (shown in Figure 18). The beach is also a popular seasonal recreation destination.

Once the export cables make landfall, the onshore export cables would continue underground onto John Reed Road and would need to cross Westport Harbor by HDD. Suspending the cables from the Norman Edward Fontaine Bridge was evaluated but was deemed infeasible. The bridge is a bascule bridge (also referred to as a drawbridge or a lifting bridge) that spans 75 ft (23 m) across the East Branch of the Westport River. Because the bridge is designed to open and close to accommodate vessels, it is not possible to suspend a continuous stretch of cable along the bridge deck. HDD is infeasible because there is no suitable place to land the cables on the north side of the Westport River. A landing at Westport Village was evaluated, but there is insufficient space, and this is a historical district with dense residential and commercial development (including a commercial fishing dock). In addition, Westport Harbor has extensive eelgrass and shellfish areas, which could not be avoided, as shown in Figure 18.

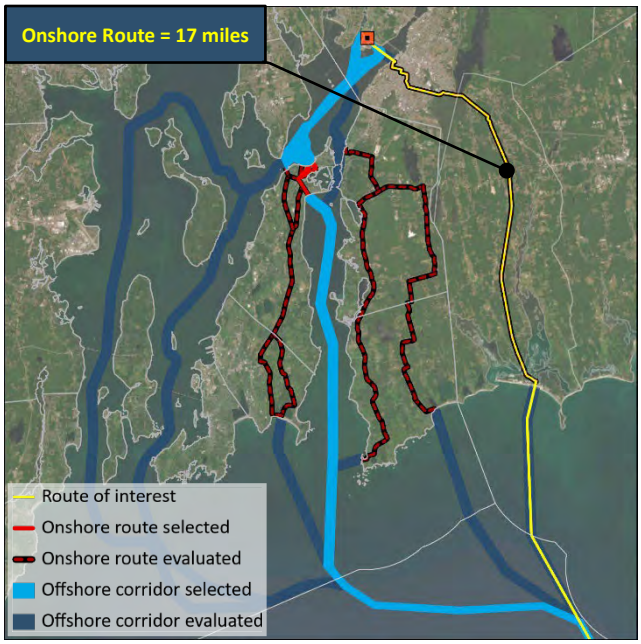


FIGURE 16. ROUTE ID 14 LOCUS

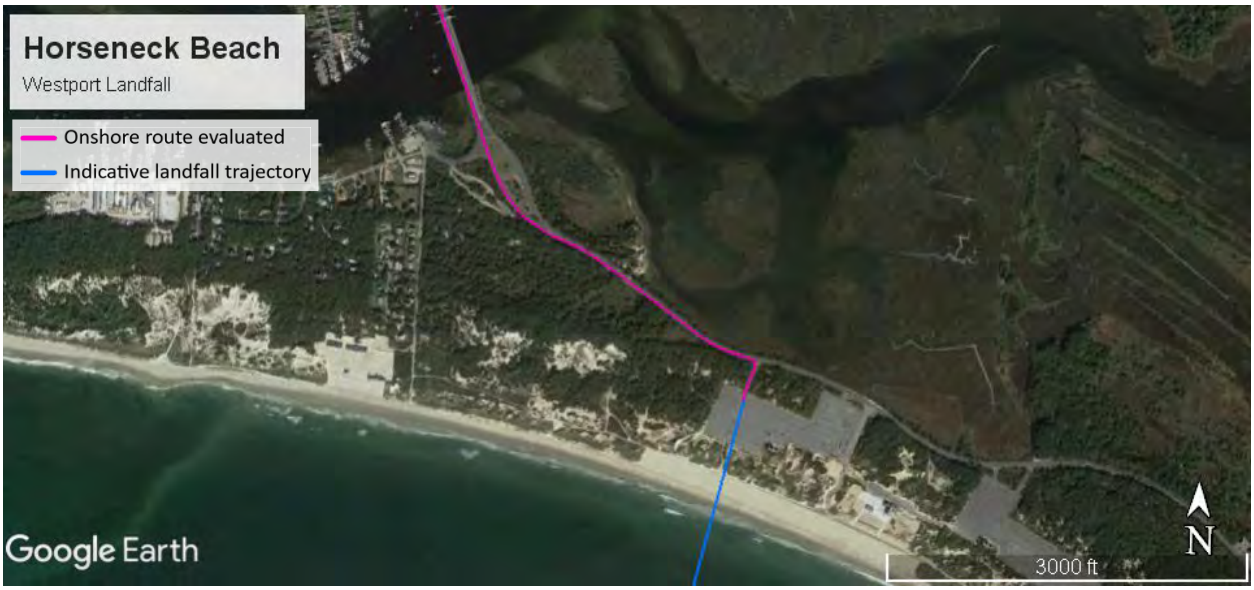


FIGURE 17. HORSENECK BEACH, WESTPORT LANDFALL ALTERNATIVE (ROUTE ID 14)

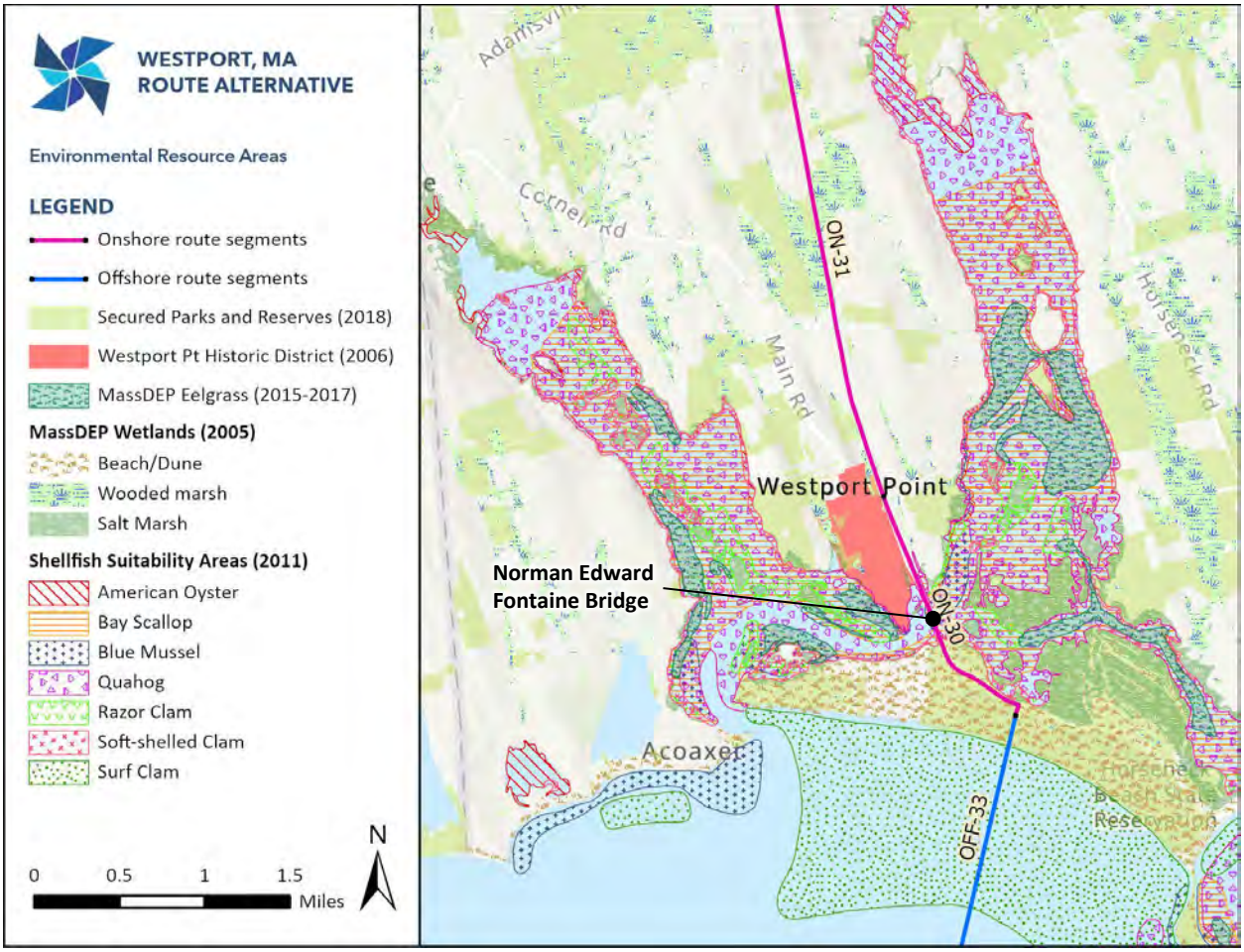


FIGURE 18. WESTPORT ENVIRONMENTAL RESOURCE AREAS (ROUTE ID 14)

Once on Route 88, the onshore export cable route would head north along Route 88 for approximately 12 mi (19 km) through Westport to the intersection with State Route 6. From Westport, Route 88 is a two-lane highway that eventually turns into four lanes as it approaches State Route 6. Large mature trees hang over the highway, and there would be a potential need for tree trimming or tree removal along the highway to accommodate construction. The onshore export cable route would then head in a westerly direction following State Route 6 for 1.2 mi (1.9 km) into the City of Fall River, where it would continue for 0.6 mi (1.0 km) to Brayton Avenue. The route would then merge onto Brayton Avenue in Fall River and continue west for approximately 1.5 mi (2.4 km). There are on- and off-ramps for State Route 24 located along Brayton Avenue, with high volumes of traffic that would require significant traffic management planning. The route would then head in a northwesterly direction following a network of Fall River municipal roadways including 0.3 mi (0.5 km) along Stafford Road, approximately 0.1 mi (0.2 km) along Plymouth Avenue, approximately 0.2 mi (0.3 km) along Second Street, approximately 0.3 mi (0.5 km) along Middle Street, 0.1 mi (0.2 km) along South Main Street, continue for 0.3 mi (0.5 km) following Bradford Avenue, merge onto Almond Street for 0.2 mi (0.3 km), and then ending at the Ferry Street parcel located one street crossing from the Taunton River.

Limiting the onshore routing to a minimal distance is preferred, as underground construction within public roadways can be disruptive and time consuming, and underground construction and materials are very costly. Any effects to sensitive environmental and cultural resources increase with increasing duration of a project. The same is true for socioeconomics, including any affected local businesses.

The potential intermediate site for the onshore export cables would be located at the intersection of Almond Street and Ferry Street in Fall River, Massachusetts. This segment of the route would require routing through densely populated city neighborhoods identified as environmental justice populations (see Figure 19). This segment also passes by other sensitive receptors including Saint Anne's Hospital, St. Anne's Shrine and a large recreational field at Kennedy Park, among others.

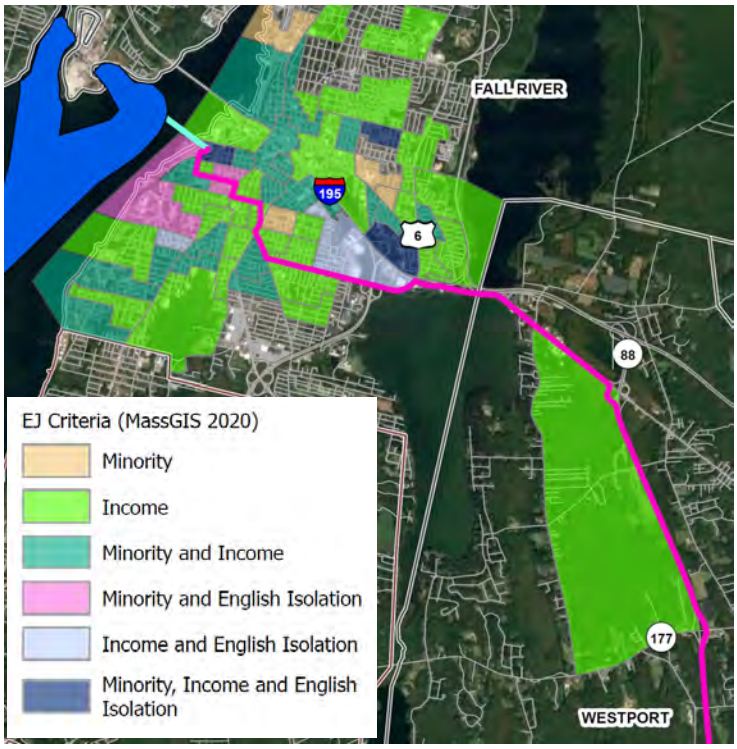


FIGURE 19. ENVIRONMENTAL JUSTICE POPULATIONS IN FALL RIVER & WESTPORT, MA (ROUTE ID 14)

As shown in Figure 20, a parcel on Ferry Street could serve as a potential HDD staging area to cross the Taunton River to make landfall at Brayton Point. The cables would need to pass from Fall River to Brayton Point via submarine cabling across the mouth of the Taunton River south of the Interstate Route 195 Braga Bridge. The submarine route across the Taunton River would cross a federal shipping/navigation channel and extend approximately 1.3 mi (2.1 km), which would overextend the length for a single continuous HDD. This would result in SouthCoast Wind implementing supplementary offshore cable installation techniques to bury the remainder of the export cables within the Taunton River beneath a federal shipping/navigation channel.

SouthCoast Wind determined that installing the cable system on the underside of the Braga Bridge to cross the Taunton River was infeasible due to Massachusetts Department of Transportation (MassDOT) requirements, bridge loading, and lack of adequate space underneath the bridge.[3]

This route alternative was dismissed due to a variety of engineering, construction, environmental, and other stakeholder concerns.

[3] According to the MassDOT Utility Accommodation Policy on State Highway ROW states, high-voltage electric power transmission line installations on bridge structures shall generally not be permitted except in extraordinary circumstances. Link Volume (mass.gov).

FIGURE 20. FERRY STREET, FALL RIVER LANDFALL ALTERNATIVE (ROUTE ID 14)

3.2 EXPORT CABLE CORRIDOR ALTERNATIVES

The Brayton Point POI was selected for the Project due to its robust capacity for energy injection into the existing electrical grid and the opportunity to redevelop the previously disturbed area of the former coal-fired power station property. SouthCoast Wind considered three marine route alternatives that proceed from the Offshore Generation Facility to Brayton Point, discussed in detail in the following sections:

- Sakonnet River
- Narragansett Bay East Passage
- Narragansett Bay West Passage

A summary of the route alternatives evaluated by SouthCoast Wind (and corresponding Route ID) is presented in Table 1 and the Universe of Routes considered is shown on (Figure 1 and Figure 5-2 in Attachment 1).

As discussed in Section 2.1, identifying ECCs requires careful planning and route optimization. Considerations include offshore physical hazards (such as shipwrecks and other submerged cultural resources, unexploded ordnance, other existing and planned cables, and sea floor and subsurface obstructions), economic and recreational use areas (such as commercial or recreational fishing, recreational boating and tourism, and anchoring), and areas protected for biological, cultural, or historical purposes.

3.2.1 Sakonnet River Routes

3.2.1.1 Intermediate Crossing at Portsmouth (Selected Alternative)

As a result of the alternatives analysis screening process, SouthCoast Wind selected a proposed Project route that traverses approximately 5.3 mi (8.6 km) in Rhode Island Sound, approximately 11.0 mi (17.7 km) in the Sakonnet River, approximately 2.0 mi (3.2 km) underground, onshore in Portsmouth, and approximately 4.0 mi (6.4 km) in Mount Hope Bay (portion in Rhode Island state waters). The Selected Alternative is shown in Figure 21.

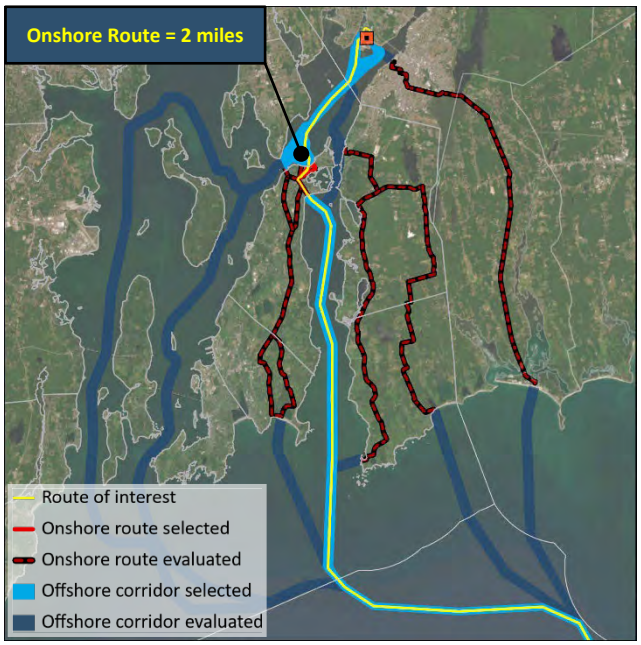


FIGURE 21. SELECTED ALTERNATIVE ROUTE LOCUS

The Selected Alternative avoids the constricted area in the Sakonnet River referred to as "The Hummocks" near the Stone Bridge, the former Sakonnet River Bridge, and the former railroad swing bridge. This route is the shortest overland route under Aquidneck Island that allows siting primarily along developed public ways and minimization of routing through residential areas. Limiting the onshore routing to a minimal distance is preferred, as underground construction within public roadways can be disruptive, time consuming, and underground construction and materials are very costly.

3.2.1.2 Sakonnet River North Route (Route ID 6)

Route ID 6 is an all-offshore/nearshore route from the Offshore Generation Facility to Brayton Point through the Sakonnet River, omitting any intermediate onshore crossings (refer to Figure 22), and proceeding north up the Sakonnet River through the Hummocks. The Hummocks consists of a ridge on the northeastern shore of Portsmouth between the Sakonnet River Bridge and the former Escape Road Bridge between Portsmouth and Tiverton.

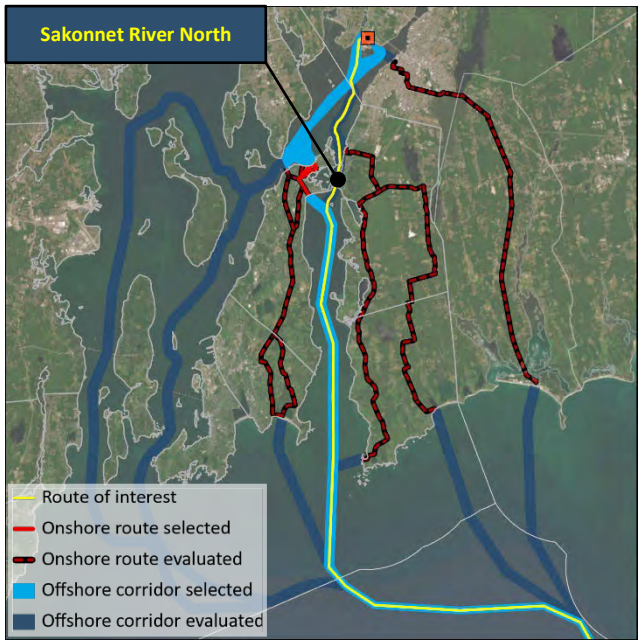


FIGURE 22. ROUTE ID 6 LOCUS

The approximate length of Route ID 6 would be 113.2 mi (182.2 km) offshore. Of the offshore length, 20.7 mi (33.3 km) would be in Rhode Island state waters.

There would be significant constraints and physical obstacles posed by this northern Sakonnet River route option. These include a narrow river channel with strong and swift currents and submerged obstacles and debris; the Stone Bridge located between Teddy's Beach in Portsmouth and Grinnell's Beach in Tiverton; a high volume of recreational moorings; two

charted submarine cable/pipeline crossing areas; crossing under the Sakonnet River Bridge (Routes 138 and 24); traversing around the concrete abutments which supported the former Sakonnet River Bridge; and maneuvering through the ruins charted on the National Oceanic and Atmospheric Administration (NOAA) nautical chart which are remnants from the removal of the Sakonnet River rail swing bridge last owned and operated by the Providence and Worcester Railroad.

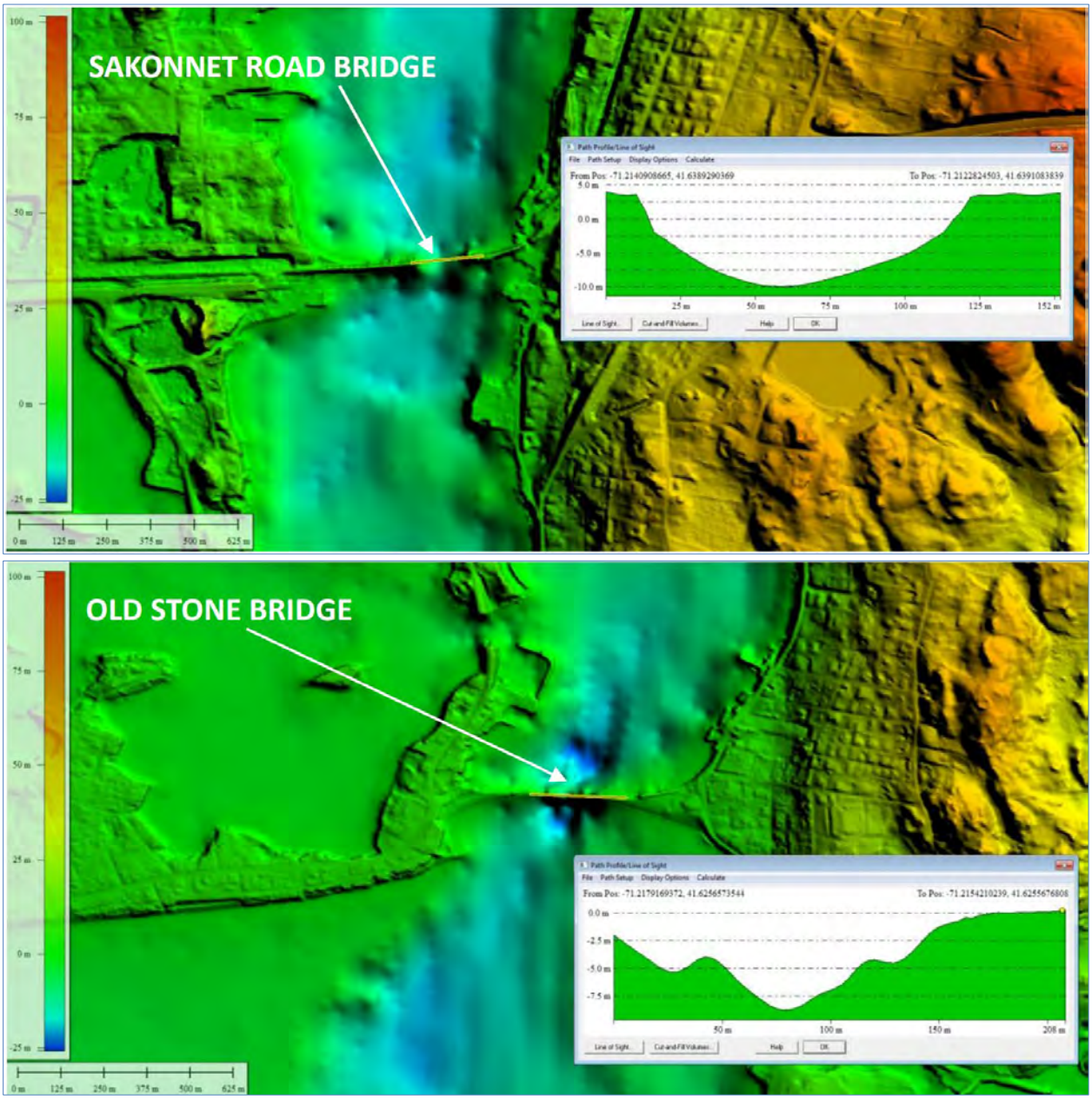


FIGURE 23. SAKONNET RIVER BATHYMETRY AT BRIDGE CONSTRICTIONS (2014/2015 NOAA/PUBLIC DATA)

This highly constrained portion of Route ID 6 contains rock and debris, including remains of the aforementioned former railroad bridge of Route ID 6. This area of the route also features heavily scoured seabed and strong currents. In addition to posing a risk to safe installation (which would likely also be disruptive to marine stakeholders detailed above), these characteristics are not suitable for burying cables to suitable depth and maintaining that burial depth, or for maintaining secondary cable protection on top of the cables (which may include placement of rock and/or mattresses). The strong

and concentrated tidal currents within The Hummocks area of the Sakonnet River could potentially expose the buried cables by eroding away the sediment cover over the cables, undermining the cables and creating a section of cable that is "suspended" above the seabed, and/or displacing secondary cable protection material. As a result, the cables would be at risk of becoming exposed and may require regular and disruptive maintenance to re-establish cable cover and protection over the operational life of the cables.

Route ID 6 was deselected from further consideration as a route for the offshore export cables due to the technical complexity, potential marine stakeholder interactions (e.g., recreational moorings; this area of the route experiences significant transit and mooring by recreational vessels), and hazards to safe, practical, and long-term cable installation, maintenance, and operation associated with routing the cables through the constricted area as described above.

3.2.2 Narragansett Bay East Passage Route (Route ID 7)

Route ID 7 would travel from the Offshore Generation Facility through the East Passage of Narragansett Bay and into Mount Hope Bay to reach Brayton Point (refer to Figure 24). The ECC in the East Passage would be aligned to the west of Rose Island, Gould Island and Dyer Island, and to the east of Spar Island. Constraints and physical obstacles that would be encountered would include:

- Relatively longer traverse through RI waters
- Crossing ten charted submarine cable/pipeline crossings and
- Use conflicts, including traversing areas with Navy restrictions, heavily used navigational channels, and Newport Harbor (heavily used recreational area)
- Crossing through a portion of a designated offshore disposal area before crossing under the Mount Hope Bridge (Route 114) into Mount Hope Bay, as depicted on the NOAA Nautical Chart.[4]

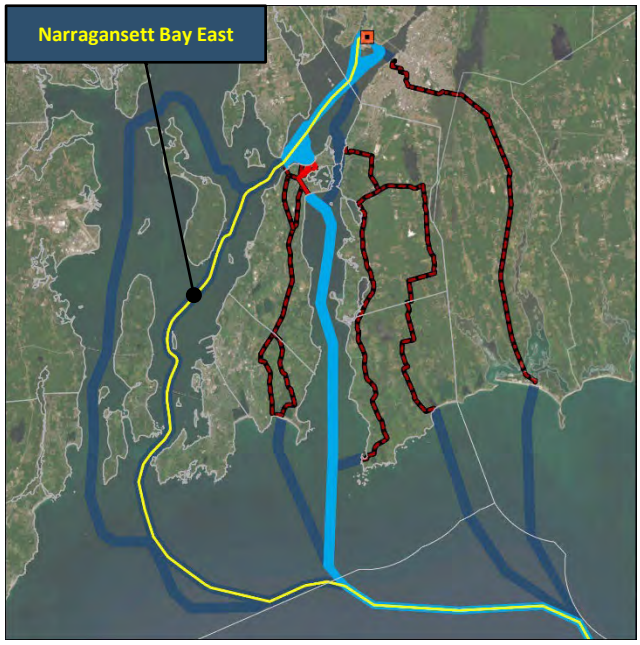


FIGURE 24. ROUTE ID 7 LOCUS

- Challenging seabed conditions and relatively longer traverse through RI areas with high potential for moraine Areas of Potential Concern (ACP)[5]
- Crossing the recreational boating Areas of Potential Concern

The approximate length of Route ID 7 would be 122.9 mi (197.8 km) offshore. Of the offshore length, 30.4 mi (48.9 km) would be in Rhode Island state waters. Route ID 7 was deselected due primarily to the potential conflicts with other marine stakeholders, including the United States (U.S.) Navy, which has a

[4] NOAA National Ocean Service Coast Survey. 2019. Chart 13221 Narragansett Bay, 63rd edition. https://charts.noaa.gov/PDFs/13221.pdf. June 2019.

[5] Areas of Potential Concern (ACPs) are identified and regulated by Rhode Island Coast Resources Management Council (RI CRMC) under the Ocean Special Area Management Plan (SAMP)

significant presence (U.S. Naval Station, U.S. Naval War College, Surface Warfare Officer School) and operations within the waters surrounding Newport (which would be traversed by this export cable route alternative), and are designated as restricted areas, regulated navigation areas, and naval anchorage. SouthCoast Wind engaged with the U.S. Navy during route planning stages to discuss route options under consideration. During this meeting, SouthCoast Wind was advised that the U.S. Navy would have conflicts with a route traversing the East Passage of Narragansett Bay (such as the Narragansett Bay East Passage Route [Route ID 7]) but would not have conflicts with the Selected Alternative.

Additionally, the area traversed by Route ID 7 is a commonly used navigational route that passes under the Claiborne Pell/Newport Bridge (Route 138) to Rhode Island Sound and contains numerous charted anchorages. The East Passage channel has a depth of approximately 60 ft and is used by all deep draft vessels and most tug and barge traffic entering and departing Narragansett Bay.[6] Newport Harbor and the federally established and maintained anchorage area nearby also receive significant marine traffic.[7] Because of these conflicts with navigation and other maritime uses, SouthCoast Wind deselected the East Passage as a feasible alternative for routing an ECC.

3.2.3 Narragansett Bay West Passage Route (Route ID 8)

Route ID 8 would travel from the Offshore Generation Facility through the West Passage of Narragansett Bay, then head east near Patience Island, ultimately reaching Brayton Point through Mount Hope Bay (refer to Figure 25). The approximate length of Route ID 8 would be 134.4 mi (216.3 km). Of the offshore length, 41.9 mi (67.4 km) would be in Rhode Island state waters. An ECC in the West Passage would be aligned to the west of Dutch Island, cross under the Jamestown Verrazzano Bridge (Route 138), to the east of the Plum Beach Light House, travel west of Hope Island, proceed to the north of Patience Island and Prudence Island, and then head southwesterly around Hog Island to the Mount Hope Bridge.

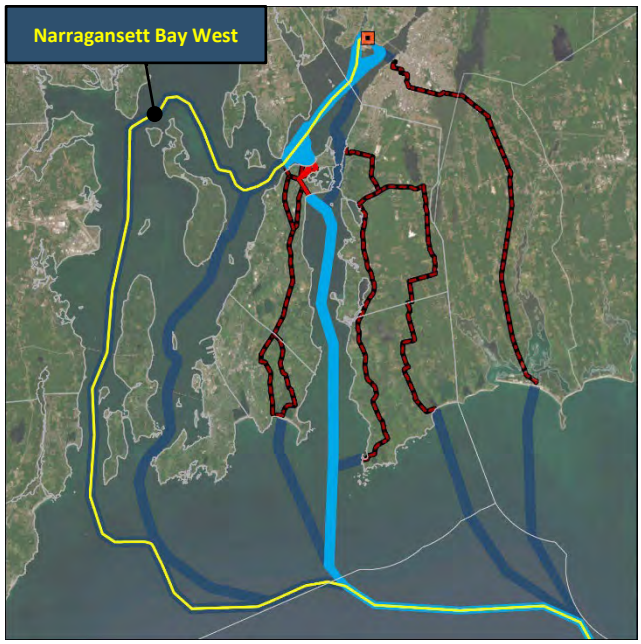


FIGURE 25. ROUTE ID 8 LOCUS

Route ID 8 was dismissed from further consideration due to a number of factors including:

- This is the longest route through RI waters evaluated – resulting in potential for impacts to sensitive resources and other ocean users from increased area occupied during construction and time to complete construction

[6] Rhode Island Coastal Resources Management Council (RI CRMC). 2010. Ocean Special Area Management Plan Chapter 7 Marine Transportation, Navigation and Infrastructure. July 23, 2010. http://www.crmc.ri.gov/samp_ocean/archive/700_marinetrans__7_23_fullsamp.pdf.

[7] RI CRMC. n.d. "Maps of Water Use Categories." http://www.crmc.ri.gov/maps/maps_wateruse.html. Accessed April 23, 2022.

- Crossing of the federally maintained 40-ft (12-m) navigation channel to Providence, regulated navigation areas
- Challenging seabed conditions and relatively longer traverse through areas with high potential for moraine ACP
- Crossing the recreational boating ACP
- Known unexploded ordnance areas recently identified in the lower West Passage of Narragansett Bay

Route ID 8 would involve crossing of several more existing cables/pipelines than the Selected Alternative. Route ID 8 would require crossing of six charted cable areas and one charted cable and pipeline area, while the Selected Alternative only crosses two charted pipeline areas (three crossings; see Table 4-2). At each cable crossing, secondary cable protection (in the form of mattresses and/or rock placement) is required, so the Roue ID 8 results in greater permanent seabed impacts in this way.

Route ID 8 would involve routing cables under multiple bridges, including the Jamestown Verrazzano Bridge which the proposed/planned Revolution Wind export cables are also planned to traverse beneath. In addition to proposing general cable routing hazards (i.e., due to scour, seabed debris, and old foundations), the Jamestown Verrazzano Bridge specifically would present a significant cable spacing bottleneck if multiple sets of planned cables were to be installed, resulting in challenges (including risk of cable damage) during cable installation and operations.

Other key constraints and physical obstacles that would be encountered by the route up the West Passage include the risks associated with burying and maintaining the offshore export cables within regulated navigation areas and anchorage areas, installing the cables within multiple shellfish management areas, and the requirement to cross through the Narragansett Bay National Estuarine Research Reserve surrounding Patience Island.

For these reasons, including feedback received from key stakeholders, conflicts with navigation and sensitive marine habitats, SouthCoast Wind deselected the West Passage as a feasible alternative for routing an ECC.

4 CONSTRUCTION CONSIDERATIONS

4.1 SCHEDULE COMPARISON

The Project schedule for the both the planning/development and construction phases were considered in the route alternatives assessment. The planning/development phase would include field surveys, community engagement and coordination, permitting, and site control. Of particular concern would be coordination with local communities, engagement with and responding to concerns of local stakeholders, and acquiring necessary real estate easements. In terms of environmental and socioeconomic impacts, the longer the duration of construction activities, the higher potential for impacts, and installing cable onshore takes longer than in water.

The overland route alternatives presented in Section 3.1 would require longer construction duration due to the complexity of working in developed areas with local abutters, traffic, and existing infrastructure to navigate. The estimated rate of installation for the onshore export cable duct bank is approximately 50 – 100 ft per day, depending on the number of active crews, available workspace, and the extent of

existing underground utility congestion. Offshore cable installation would progress substantially faster, at a rate of up to 1 mile per day for installation of one cable bundle under typical conditions.[8]

The overland route alternatives pass through coastal communities that are popular tourist destinations, particularly in the summer months. Constructing exclusively in the off-season (Labor Day to Memorial Day) could be a requirement of any community agreement. In-water construction will also have seasonal construction limitations due to use conflicts and environmental considerations, but because of the quicker progression of cable installation in water, multiple construction seasons are likely not required. The combination of slower rate of progress and seasonal restrictions would result in a significantly longer construction period for onshore cable runs (i.e., additional years), potentially resulting in increased environmental impacts, negatively affecting the host communities and delaying delivery of much-needed renewable energy to the region.

4.2 Onshore Underground vs. Onshore Overhead Construction

Electric utility companies typically favor installing new transmission lines overhead, either within existing utility right-of-way corridors or alongside roads. If there is space within the existing utility right-of-way corridor, this approach is more cost-effective, and the construction is often considered less disruptive to host communities than work within roadway. Although onshore underground construction has some challenges, SouthCoast Wind has determined that it is the most appropriate solution for the onshore selected route alternative crossing approximately two miles of Portsmouth, Rhode Island.

SouthCoast Wind does not propose to use overhead transmission for the Project's export cable system, for the reasons discussed below.

4.2.1 Need for Additional Infrastructure at Landing

The transition from underground (or submarine) cable to overhead line would require a transition station. The transition station would contain the cable terminations, disconnect and ground switches, cable monitoring, and other high voltage components. It is expected that each transition station would require a parcel of at least 0.9 acres for the equipment noted above.

4.2.2 Overhead Support Structures and Right-of-Way Requirements

The support structures required for HVDC transmission lines are substantial, ranging from approximately 80 ft to 120 ft in height. These structures require a clear right-of-way that is 100 ft to 150 ft in width. Attachment 2 to this report shows two conceptual overhead line and tower configurations. The right-of-way shown on the drawings needs to remain clear of permanent structures and vegetation more than 10 ft tall within the right-of-way limits. This "clear area" is for line maintenance, reliability, and safety reasons.

Visual and viewshed impacts are important concerns for these structures, as is finding available right-of-way space. The South Coast communities where the Project could make landfall have strong historic character and a high-density of preservation areas. Establishing a right-of-way corridor that meets the requirements of an HVDC overhead system is not viable. As such, no overhead transmission lines are currently envisioned for the Project.

[8] Soil conditions encountered and the magnitude of required pre- and post-installation works (including any remedial burial and secondary protection) may extend the overall offshore cable installation time.

5 SUMMARY OF SELECTED ALTERNATIVE AND CONCLUSIONS

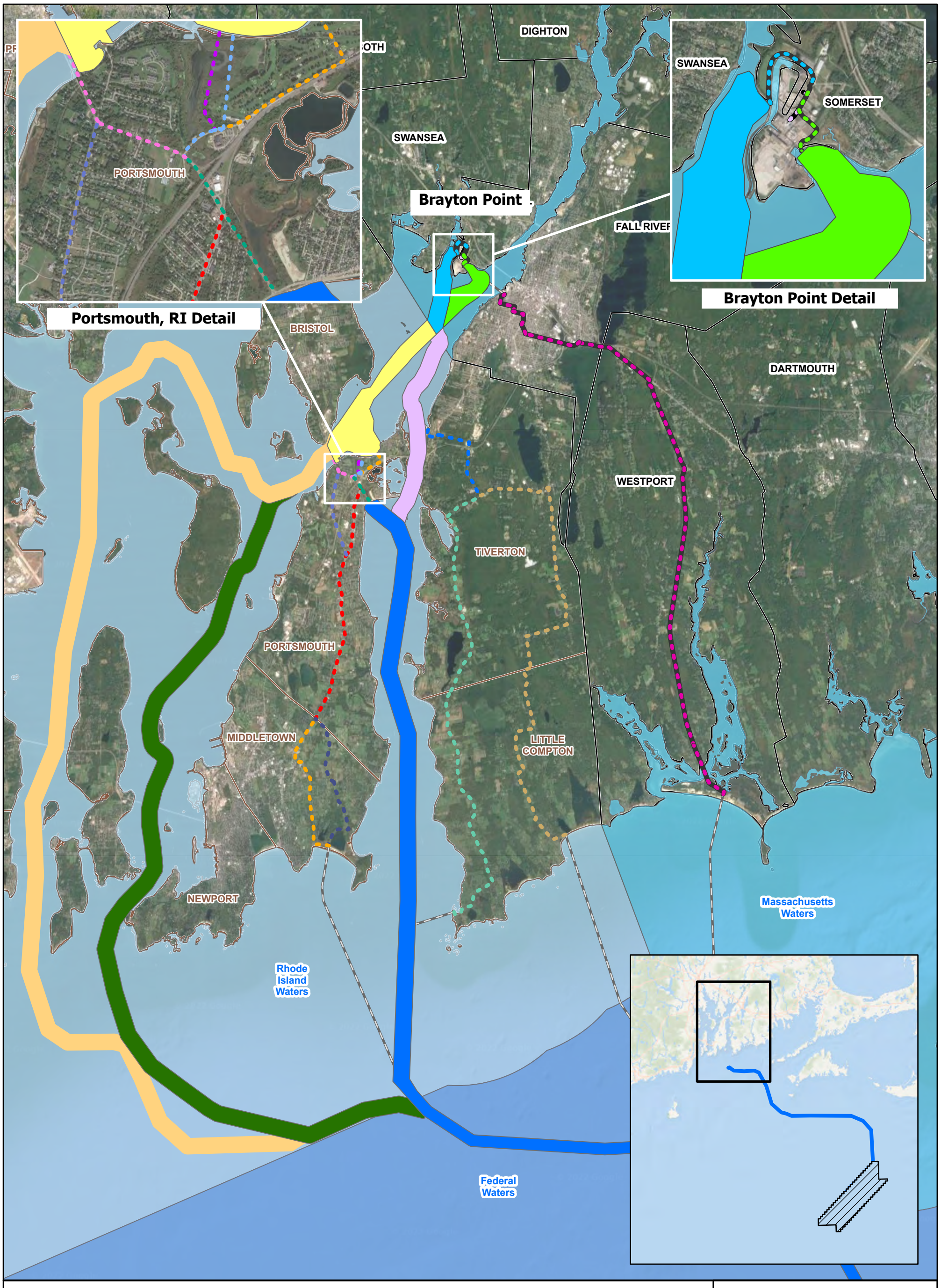
SouthCoast Wind evaluated multiple alternatives for both offshore and onshore components of the Project. The Brayton Point POI was selected for the Project due to its robust capacity for energy injection into the existing electrical grid and the opportunity to revitalize the brownfield site and use it for clean energy purposes. SouthCoast Wind performed a routing analysis to best connect the Offshore Generation Facility to the Brayton Point POI. Longer onshore crossings of Rhode Island and Massachusetts (through Middletown, Portsmouth, Little Compton, Tiverton, and Westport) as well as offshore routes through the East Passage and West Passage of Narragansett Bay and through the Sakonnet River with no intermediate crossing were deselected and later dismissed due to a variety of engineering, construction, environmental, and other concerns and impacts.

As a result of the alternatives analysis screening process, SouthCoast Wind selected the following proposed route:

- ECC routed north up the Sakonnet River with an intermediate onshore landfall and underground crossing of Portsmouth.
- Landfall in Portsmouth for the intermediate underground crossing of Aquidneck Island using HDD installation methods.
- Approximately 2.0 mi (3.4 km) of onshore, underground export cable route in Portsmouth from the intersection of Boyds Lane and Park Avenue running north on Boyds Lane and turning east on Anthony Road, re-entering the water via HDD installation methods.
- ECC routed through Mount Hope Bay from Rhode Island State waters to Massachusetts State waters.
- Final landfall from Mount Hope Bay to Brayton Point and interconnection to the POI at Brayton Point in Somerset, Massachusetts.
- POI at the existing Brayton Point onshore 345-kilovolt substation, and new HVDC converter station to be constructed at Brayton Point.

Based on the analysis performed, SouthCoast Wind undertook a thorough route selection process for both offshore and onshore components of the Project to evaluate the environmental impacts, social impacts, costs, and long-term maintainability to deliver energy from the Offshore Generation Facility to the regional transmission system at Brayton Point. SouthCoast Wind has determined the Selected Alternative would result in the least impacts to the social and natural environment and would allow for safe, practical, and long-term cable installation, maintenance, and operation as compared to the alternatives considered. Construction of the Project, as proposed, will provide access to a major renewable clean energy resource and will not cause unacceptable harm to the environment.

ATTACHMENT 1
UNIVERSE OF ROUTES CONSIDERED (FIGURE 5-2)



Rhode Island Offshore Export Cable Corridor (ECC)

- West Passage ECC
- East Passage ECC
- Sakonnet River North ECC
- Sakonnet River ECC
- Mount Hope Bay ECC

Intermediate Onshore Export Cable Route in Rhode Island

- Portsmouth Boyds Ln. Rte. Segment
- Portsmouth RWU/Anthony Rd. Rte. Segment
- Portsmouth Montaup CC/ Anthony Rd. Rte. Segment
- Portsmouth DEM/Aquidneck Land Trust Rte. Segment
- Portsmouth Mount Hope Bridge Rte. Segment
- Middletown/Paradise Ave. Rte. Segment
- Middletown/Mitchell's Ln. Rte. Segment
- Portsmouth/Route 138 Rte. Segment
- Portsmouth/Turnpike Ave. Rte. Segment
- Little Compton/Rte. 77
- Little Compton/Rte. 81
- Tiverton/Fish Road to Schooner Dr. Segment

Massachusetts ECC

- Lee River ECC
- Taunton River ECC

Onshore Cable Route in Massachusetts

- Preferred Route
- Noticed Alternative Route
- Onshore 345kV Transmission Route
- Westport/Fall River via Rte. 88

- Other Options in Universe of Routes
- Mayflower Wind Lease Area OCS A-0521
- Federal Waters
- Massachusetts Waters
- Rhode Island Waters
- Town Boundary Massachusetts
- Town Boundary Rhode Island

MAYFLOWER WIND
OFFSHORE WIND PROJECT

FIGURE 5-2
UNIVERSE OF ROUTES CONSIDERED

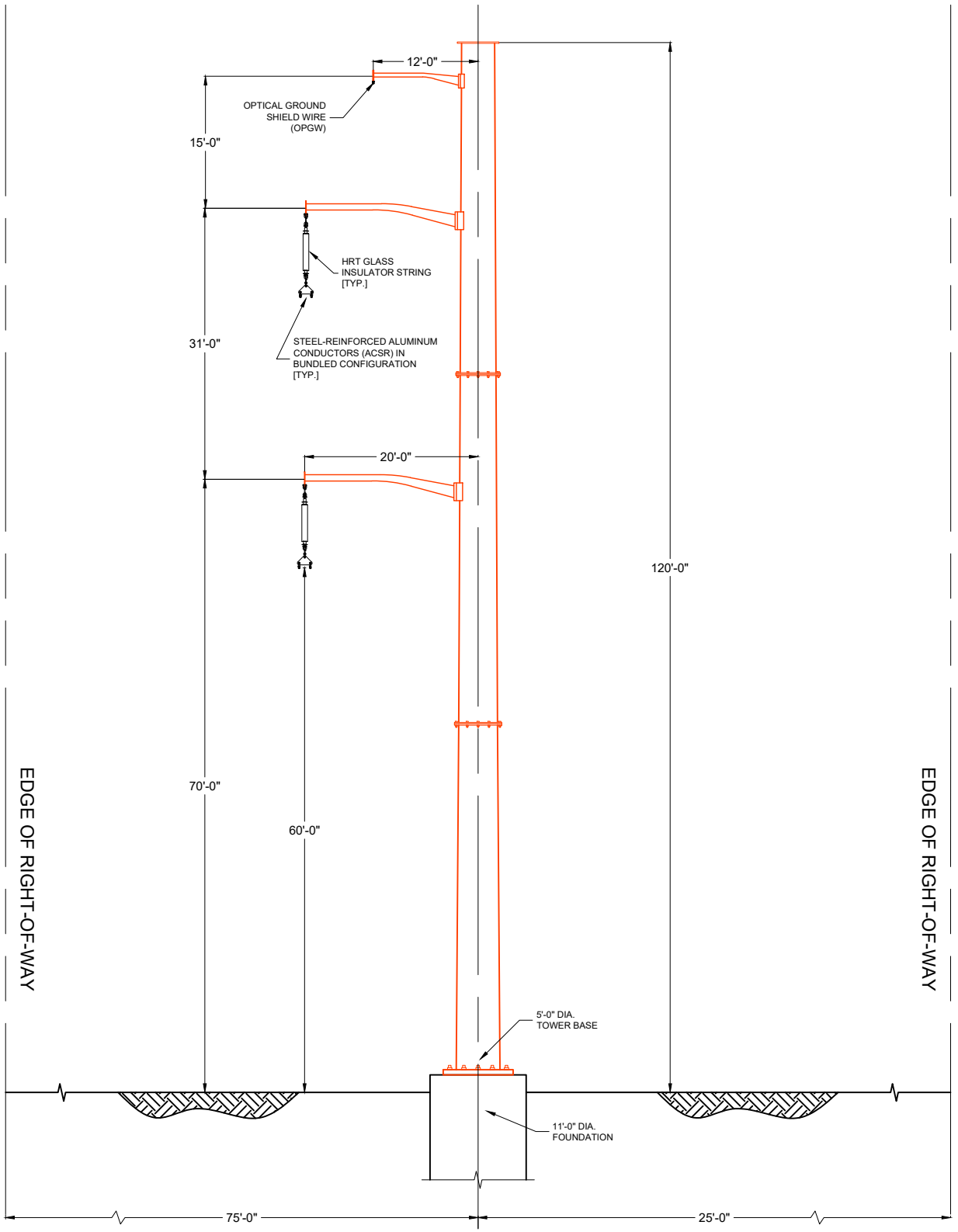
0 2 4
Miles

MAYFLOWER WIND

POWER ENGINEERS

Date: 5/26/2022

ATTACHMENT 2
INDICATIVE HVDC OVERHEAD STRUCTURES



COMPACT TOWER DESIGN

SCALE: NONE

-
-

NOTES:
1. PROPOSED STRUCTURE CONFIGURATION, R.O.W. WIDTH, AND DIMENSIONS ARE CONSIDERED 'INDICATIVE' AND ARE SUBJECT TO CHANGE DURING DETAILED ENGINEERING.

2. PROPOSED DESIGN IS BASED ON 'GOOD UTILITY PRACTICE' AND OTHER APPLICABLE REQUIREMENTS

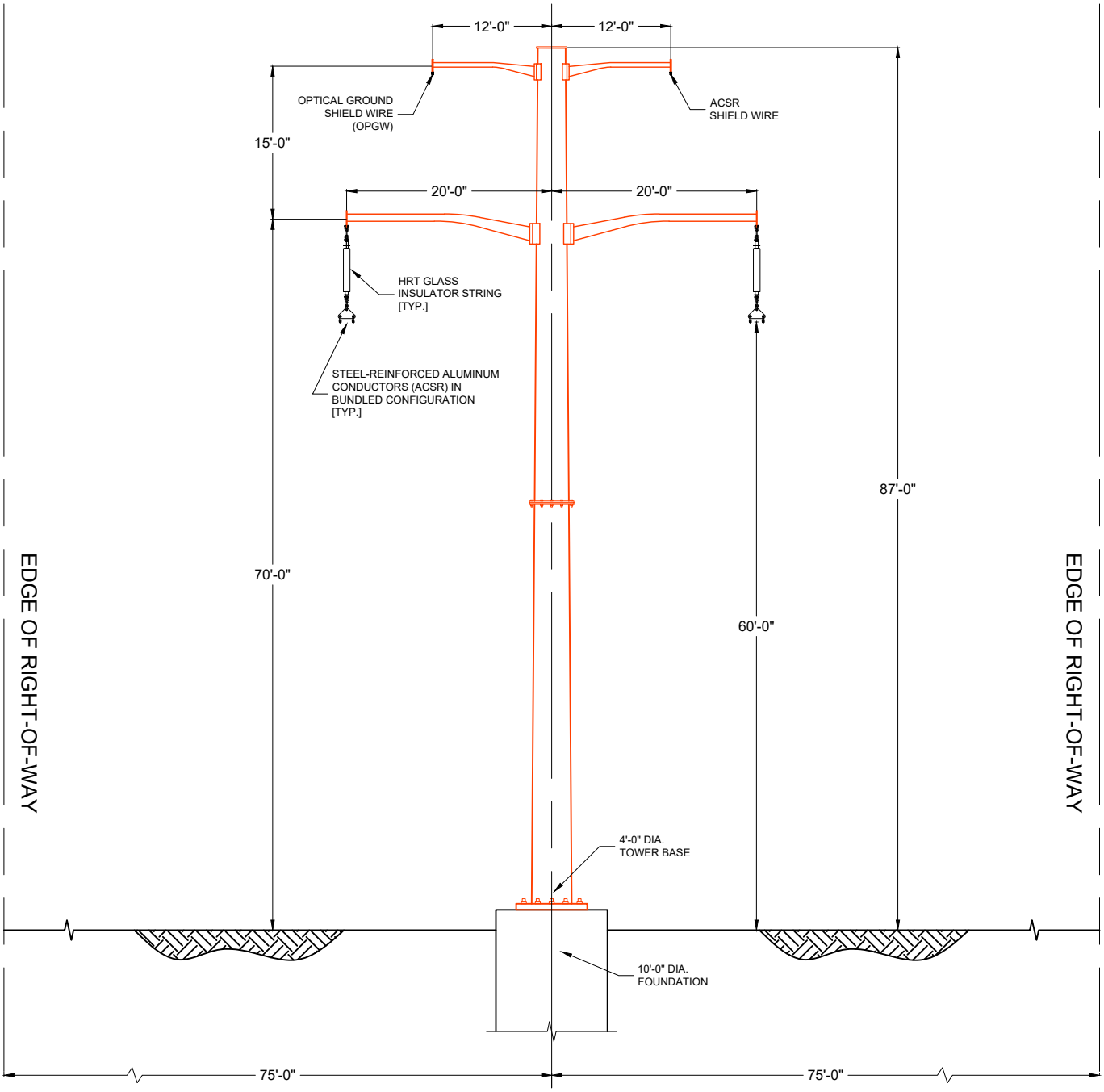
PSC

CONCEPTUAL
HIGH VOLTAGE DIRECT CURRENT
OVERHEAD LINE

REV: 20221220.15

SHEET: 1 OF 1

DWG FILENAME:Mayflower-OHL-20221220_1520.dwg



STANDARD TOWER DESIGN

SCALE: NONE

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-

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CONCEPTUAL
HIGH VOLTAGE DIRECT CURRENT
OVERHEAD LINE

REV: 20221220.15

SHEET: 1 OF 1

DWG FILENAME:Mayflower-OHL-20221220_1520.dwg

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment C: Offshore Export Cable Engineering Drawings

Revised: February 2023

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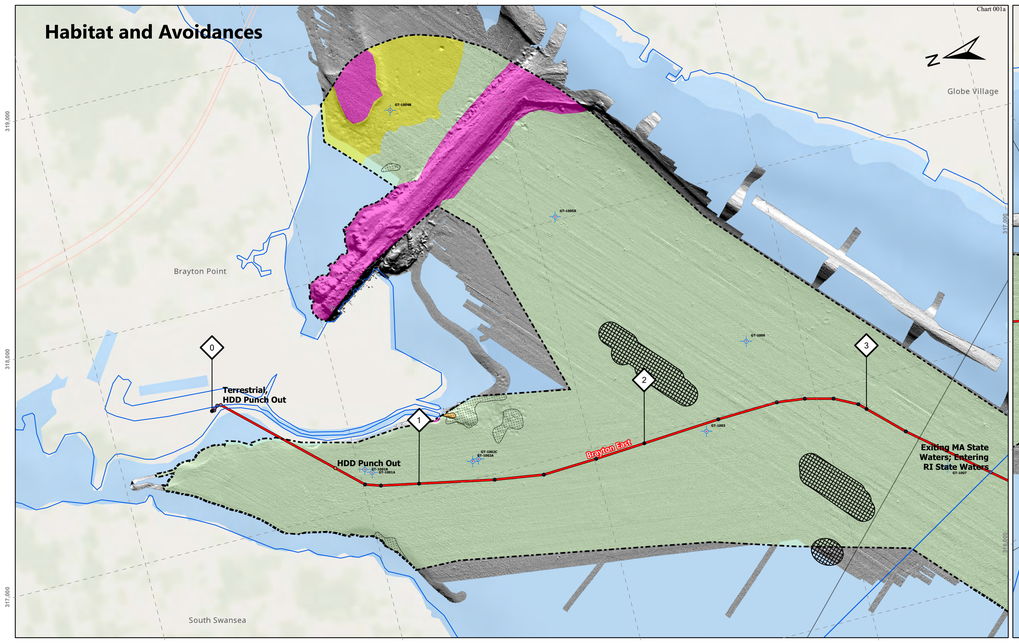
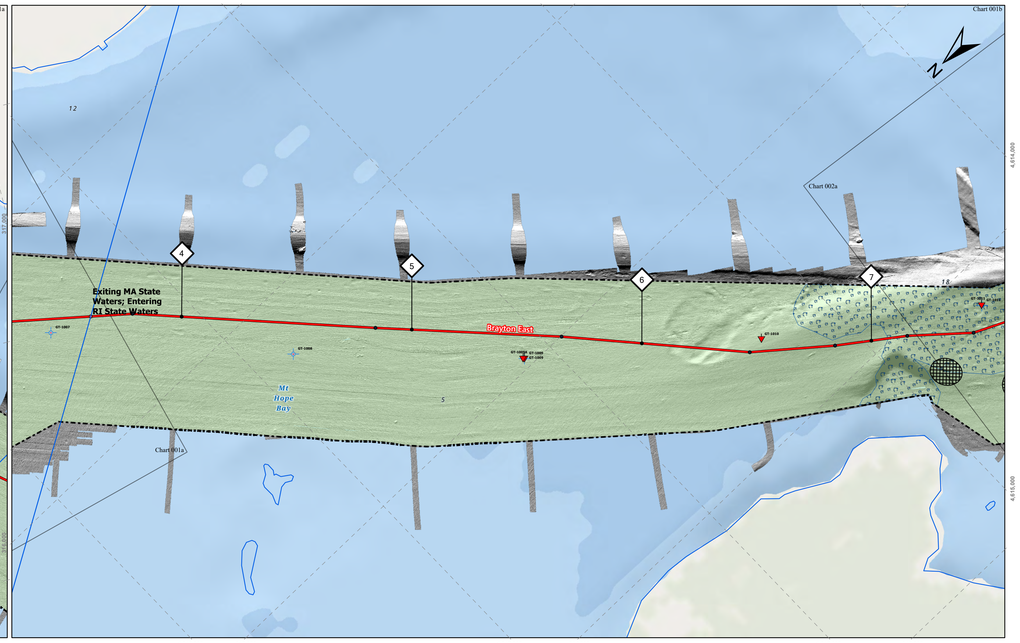
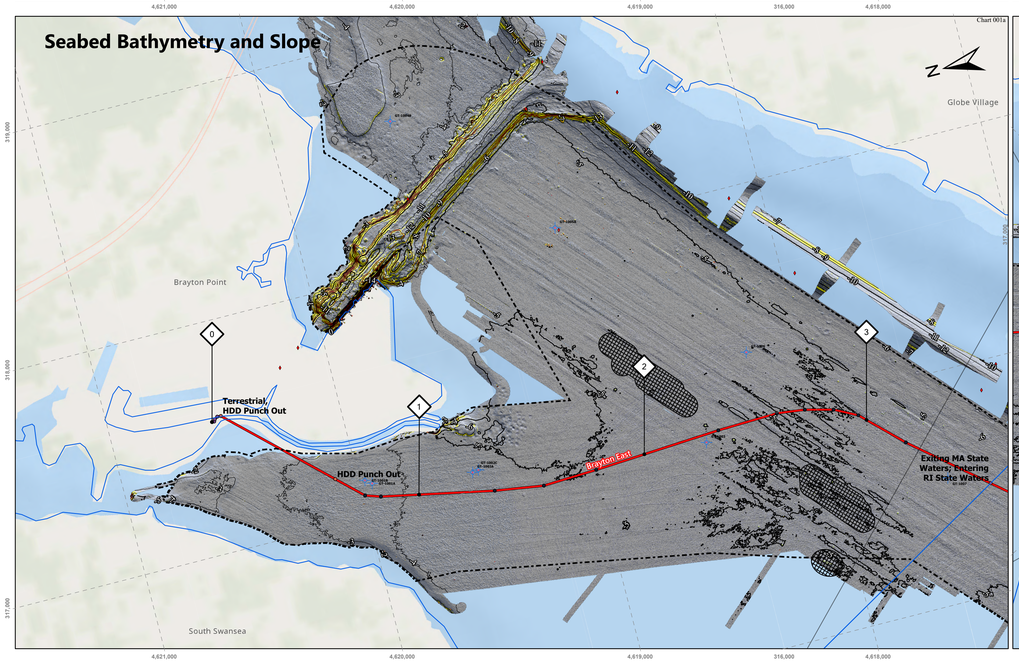
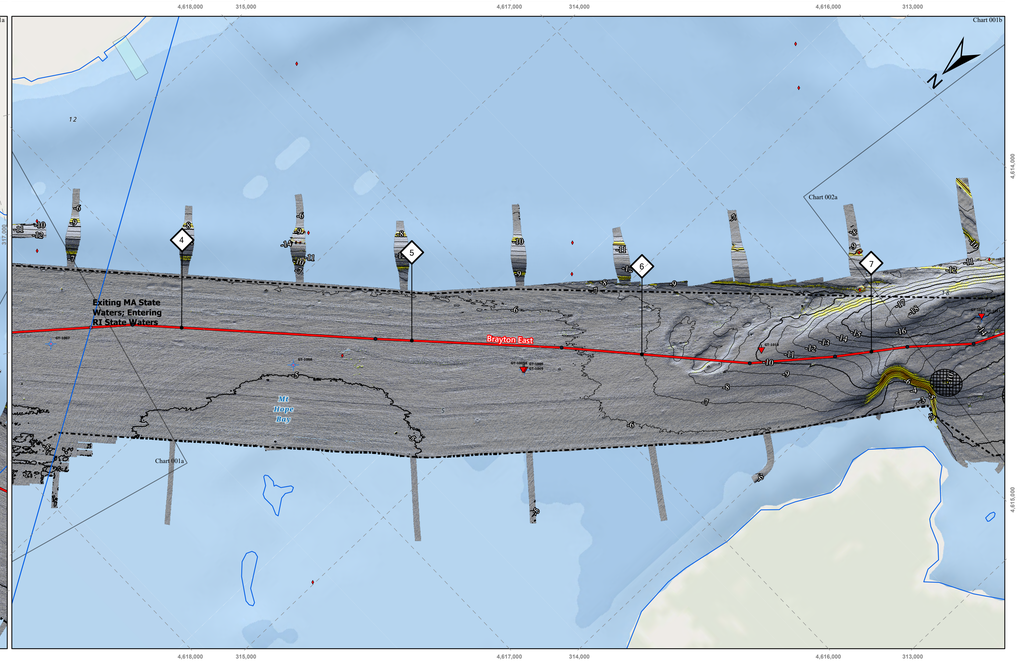
Habitat and Avoidances



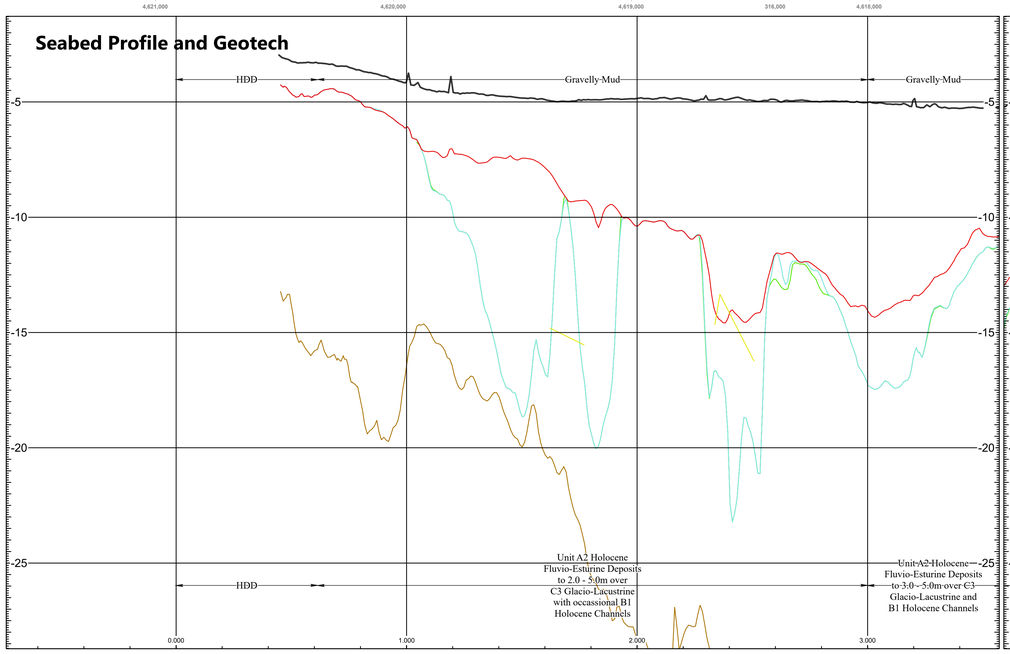


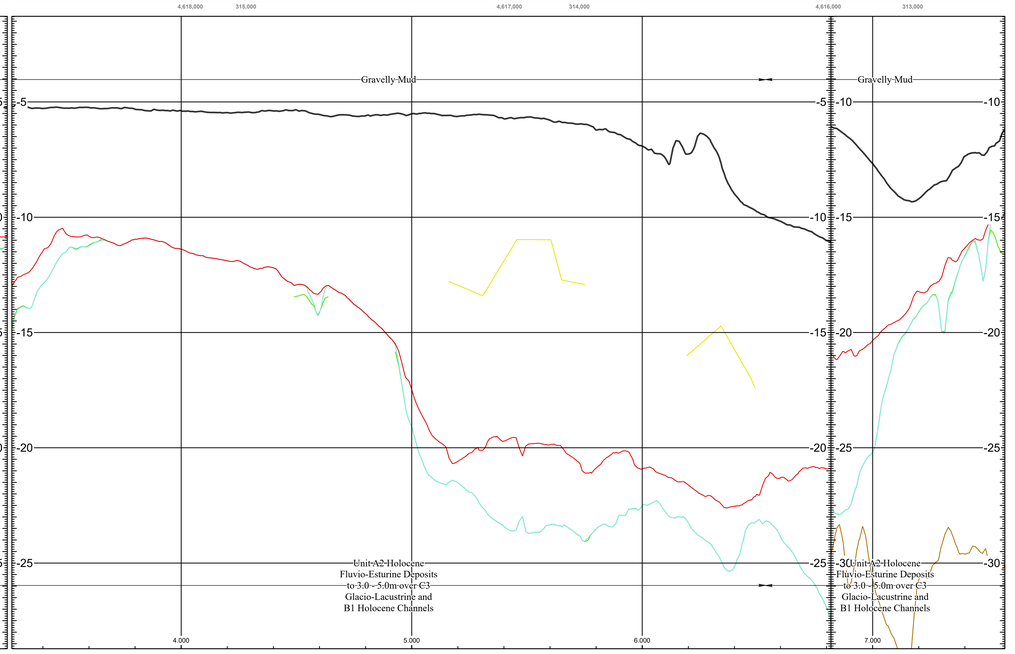
Seabed Bathymetry and Slope





Seabed Profile and Geotech





SOUTHCOAST WIND

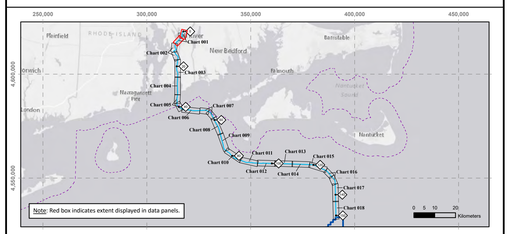
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 0.000 TO 7.588

2022 — Chart No. 001c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
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Benthic Habitat Modifier
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- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours

Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
- 1 to 4.9 - Gentle
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- Seabed Profile
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- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
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- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

1.) Fugro collected geophysical for the Brayton Point ECC from 7/14/21 to 12/14/21 and geotechnical data (vibracores and CPTs) was collected by Fugro from 9/30/21 to 10/18/21 and by Alpine from 10/4/21 to 11/10/21.

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5.) Data is underlain by a shaded relief rendering of MBES bathymetry in the background.

SOURCE - All survey data was provided by SouthCoast Wind

GEODETIC INFORMATION

Coordinate System: NAD 1983 UTM Zone 19N
EPSG: 26919
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

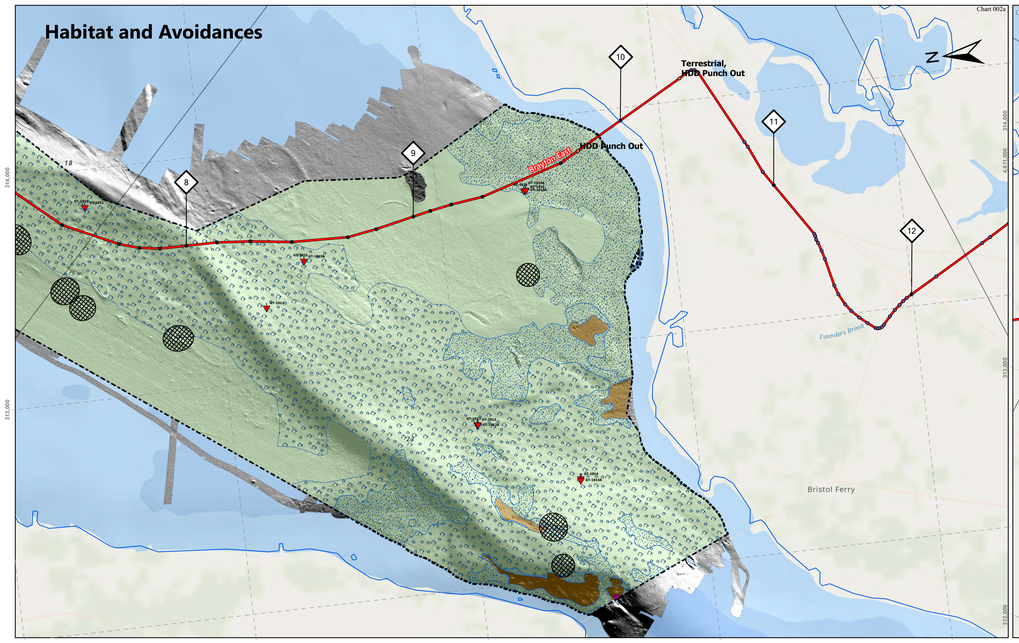
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -69.0000
Scale Factor: 0.9996

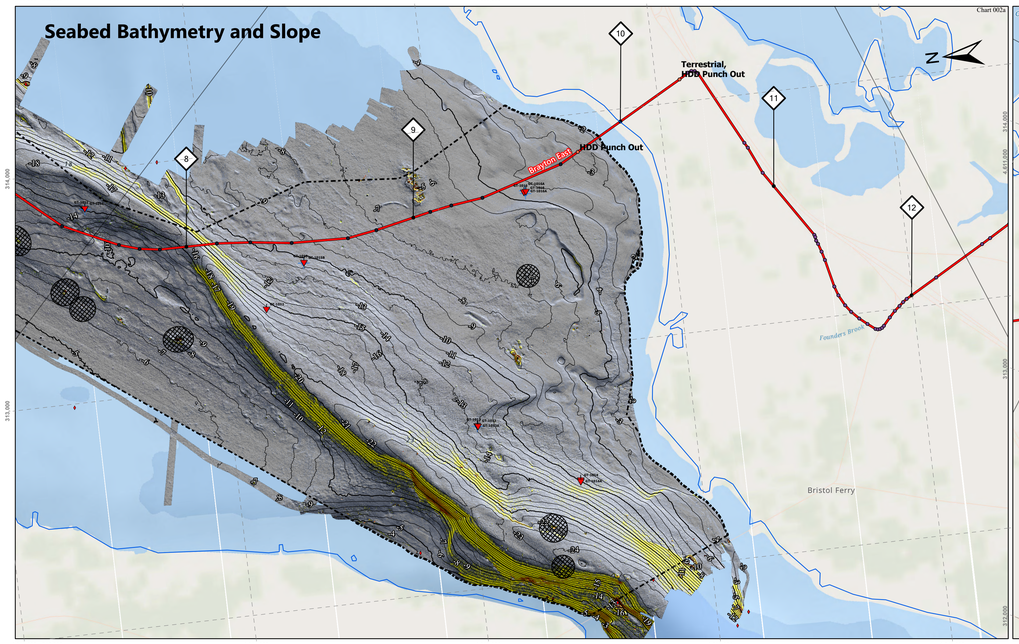
Scale 1:10,000

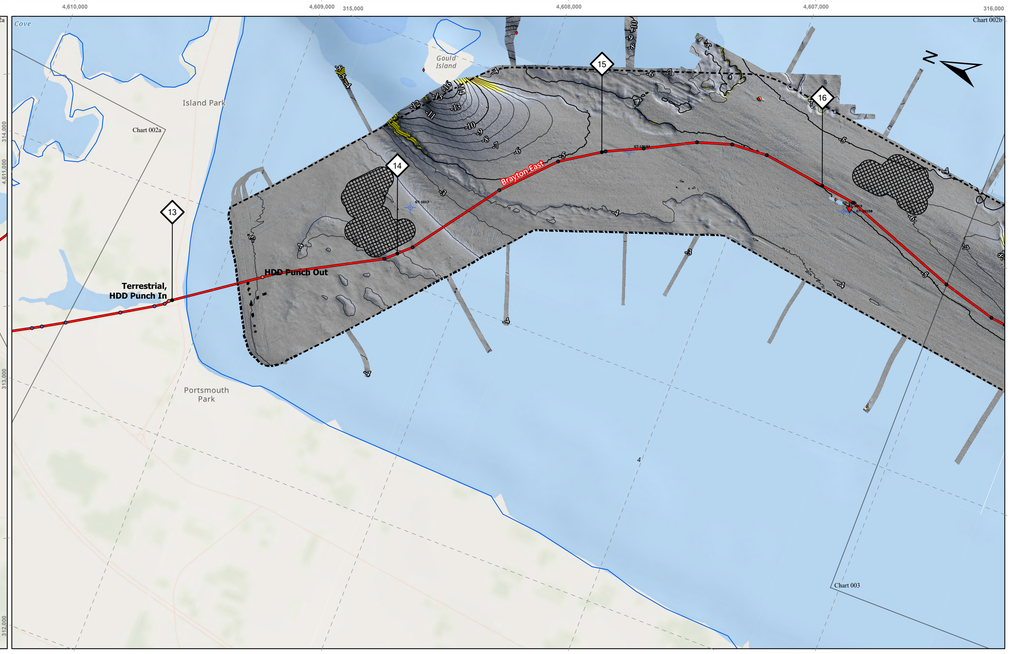
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

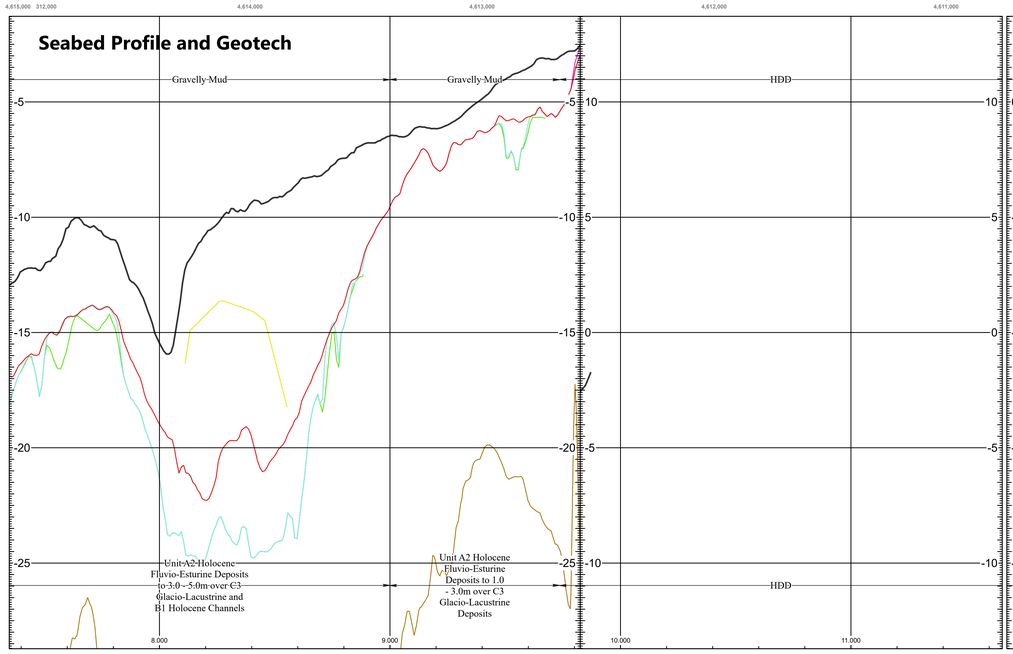
REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

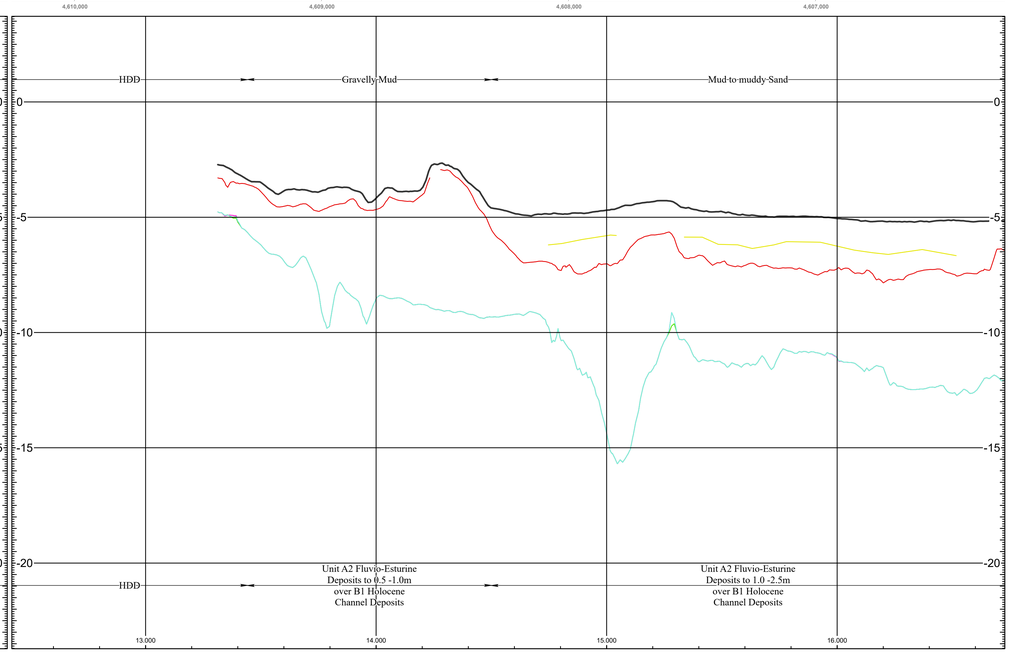
Project No: 2022 - 529 — Chart No: 001c - 018c











SOUTHCOAST WIND

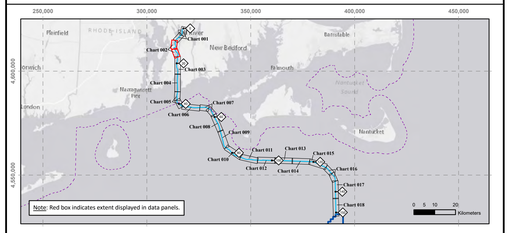
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 7.199 TO 17.000

2022 — Chart No. 002c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



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REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
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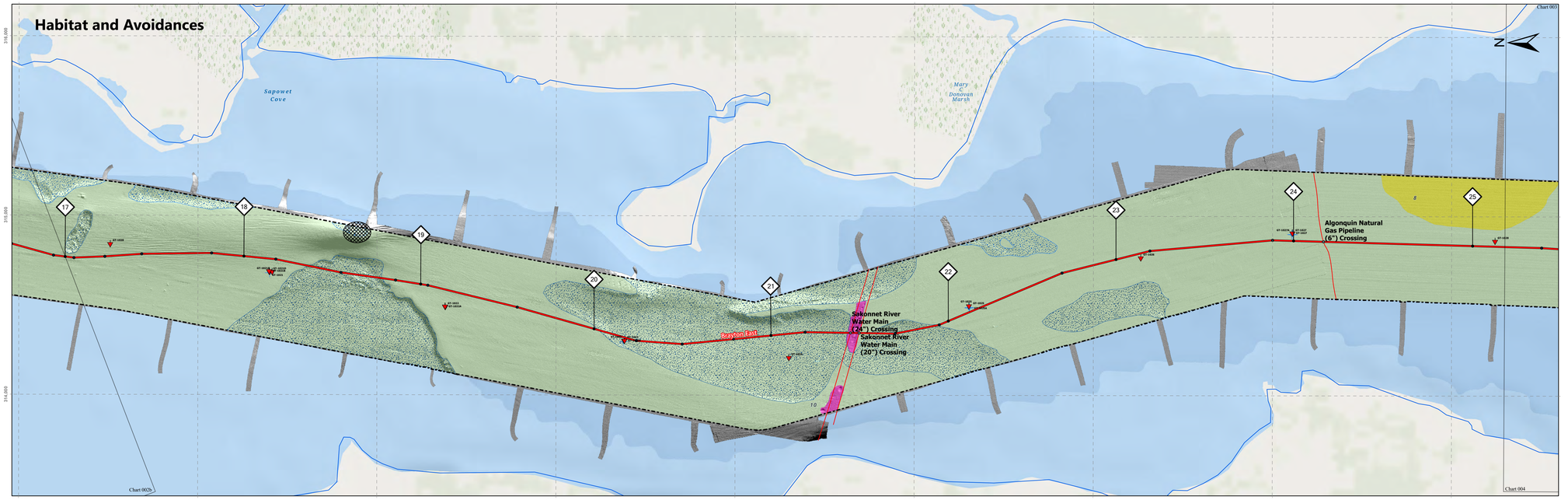
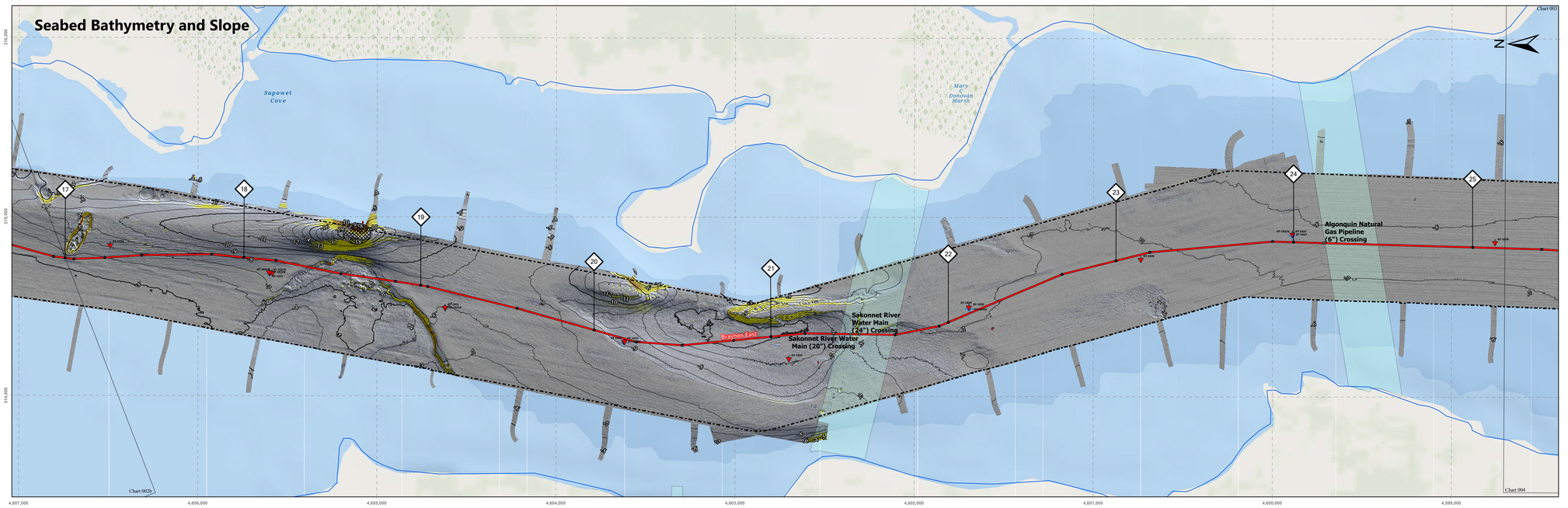
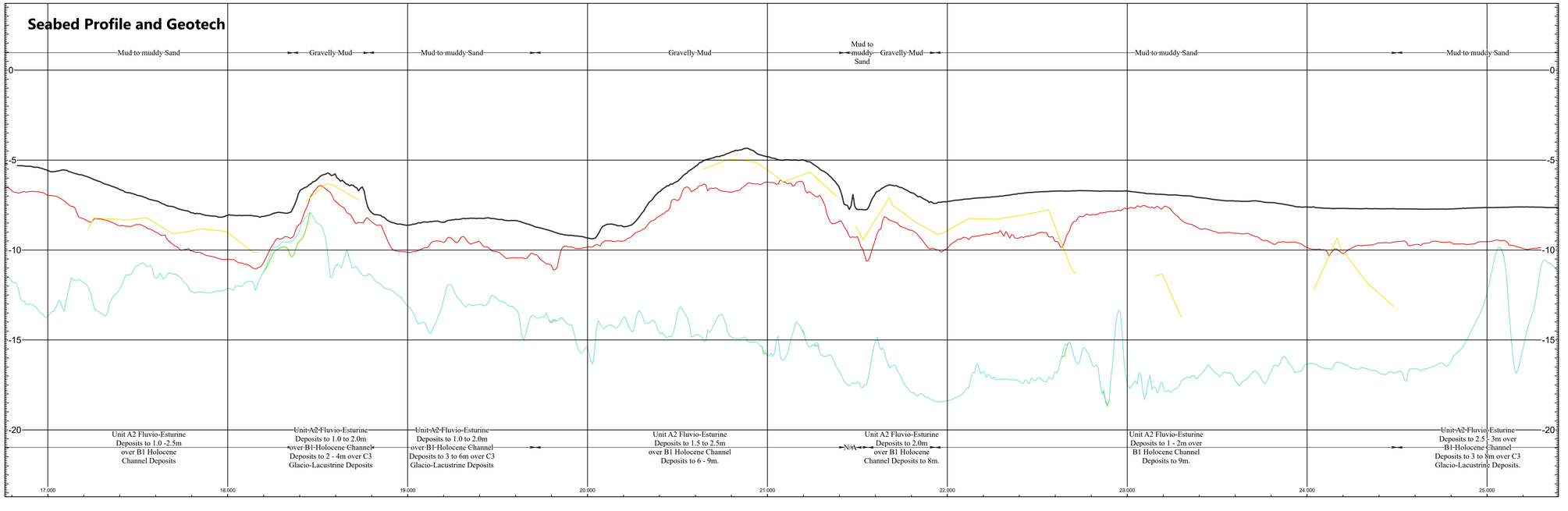
Project No: 2022 - 529 — Chart No: 002c - 018c







SOUTHCOAST WIND

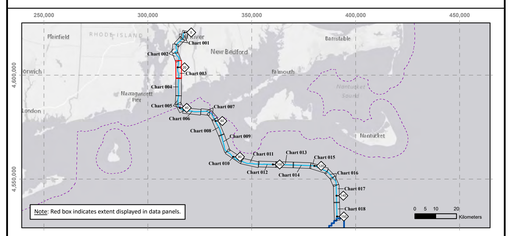
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 16.693 TO 25.480

2022 — Chart No. 003c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
- Sand
- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas

- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours

Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
- 1 to 4.9 - Gentle
- 5 to 9.9 - Moderate
- 10 to 14.9 - Steep
- >15 - Very Steep

SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
- H20 Base of Unit B1 (Holocene Channels)
- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

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5.) Data is underlain by a shaded relief rendering of MBES bathymetry in the background.

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GEODETIC INFORMATION

Coordinate System: NAD 1983 UTM Zone 19N
EPSG: 26919
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

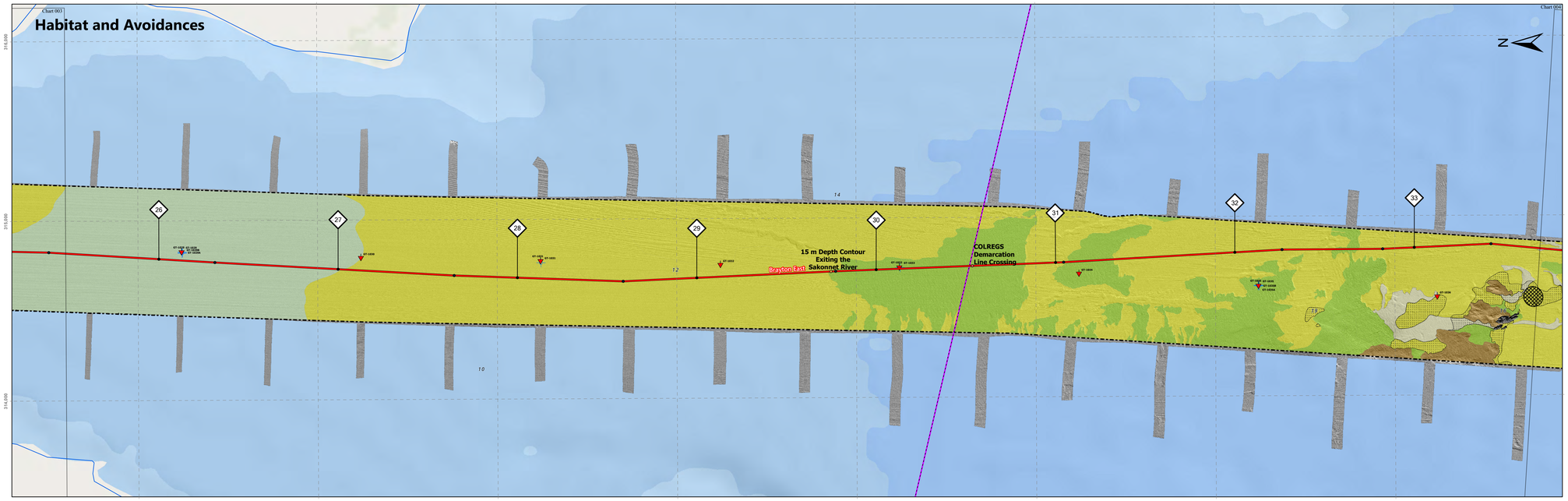
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -69.0000
Scale Factor: 0.9996

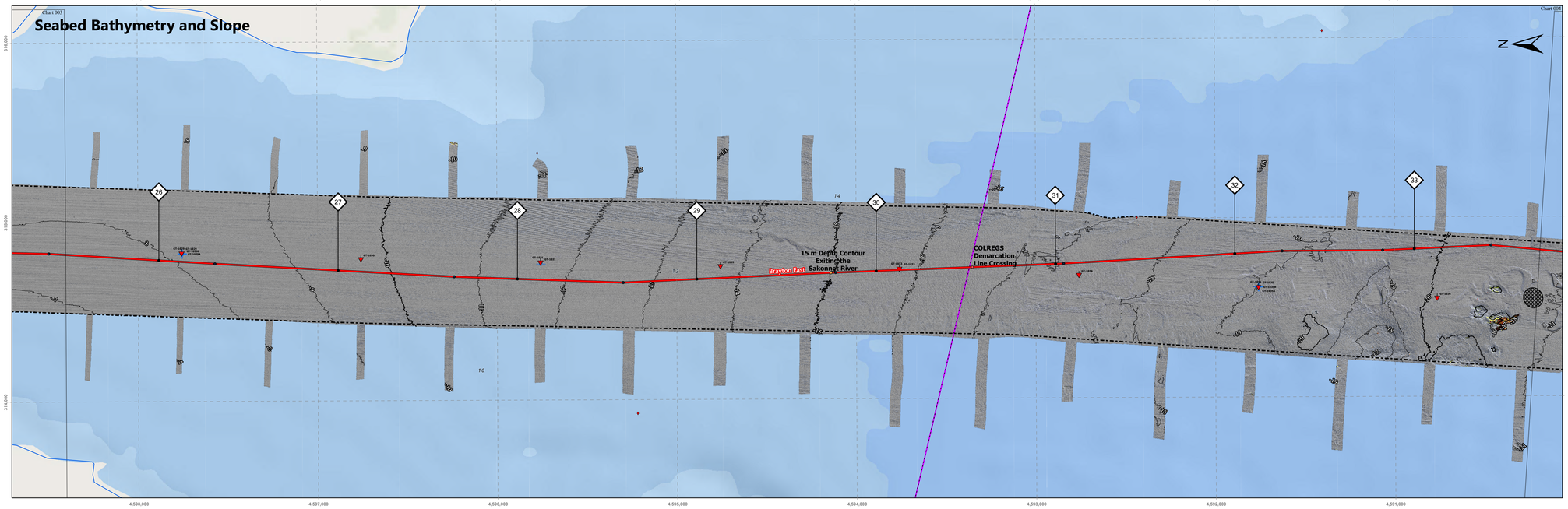
Scale 1:10,000

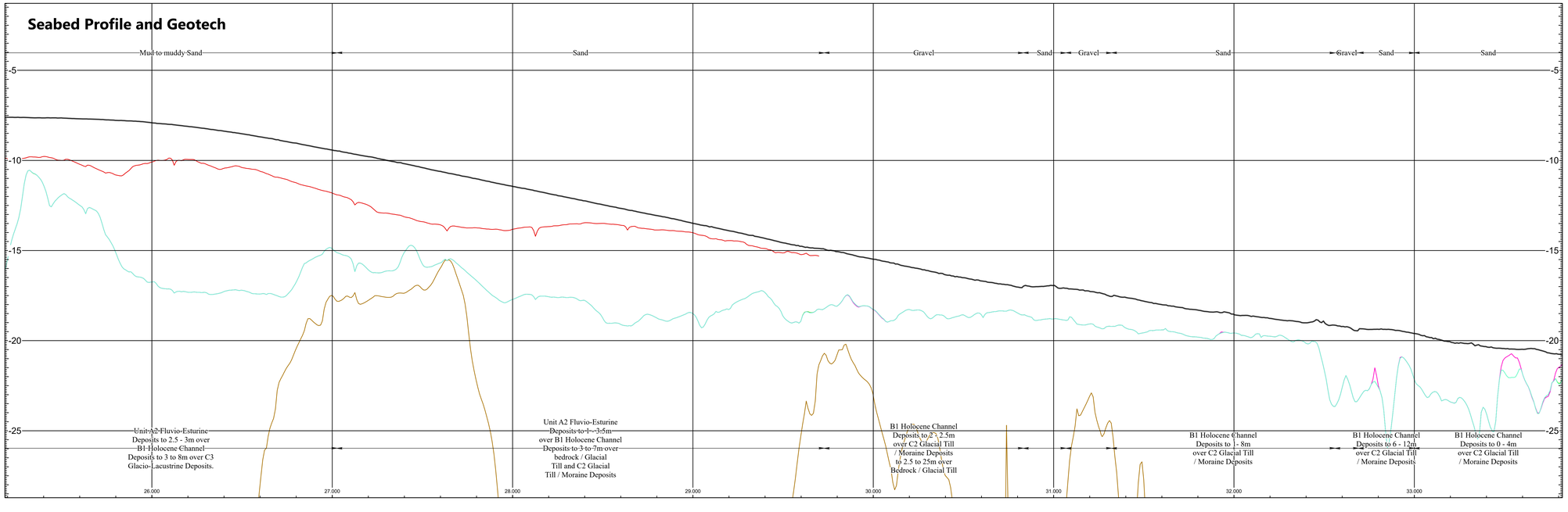
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 003c - 018c







SOUTHCOAST WIND

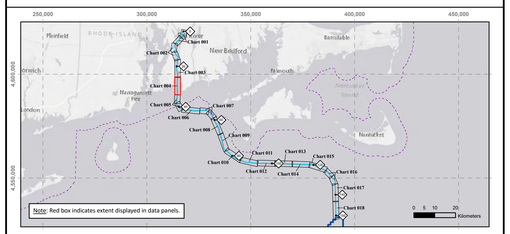
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 25.180 TO 33.827

2022 | Chart No. 004c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
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- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas
- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours
- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
- 1 to 4.9 - Gentle
- 5 to 9.9 - Moderate
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- >15 - Very Steep

SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
- H20 Base of Unit B1 (Holocene Channels)
- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary
- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

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GEODETIC INFORMATION

Coordinate System: NAD 1983 UTM Zone 19N
EPSG: 26919
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

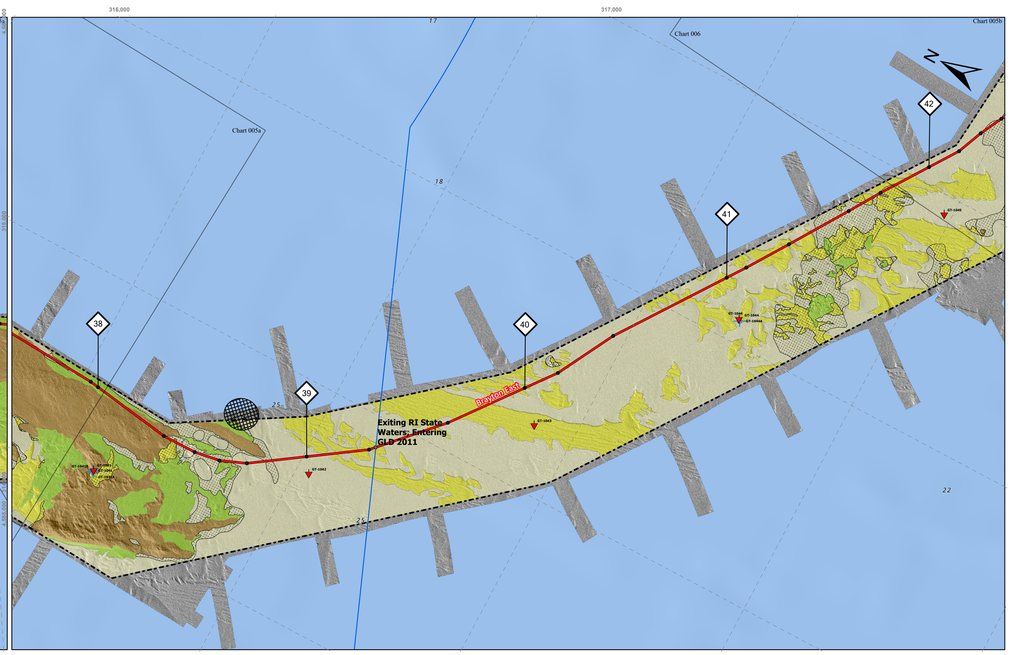
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -69.0000
Scale Factor: 0.9996

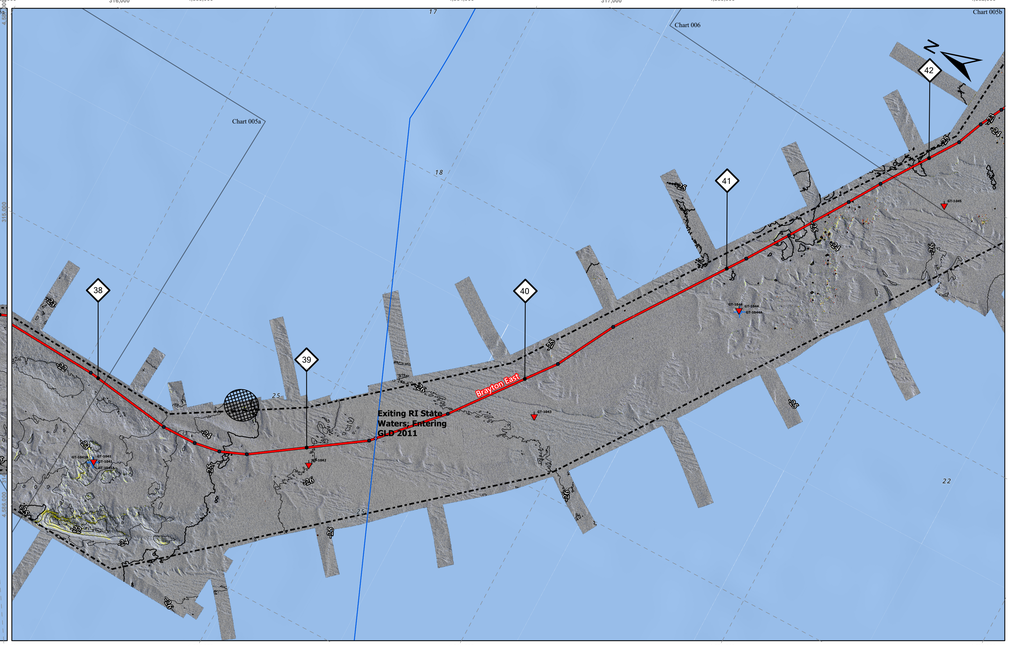
Scale 1:10,000

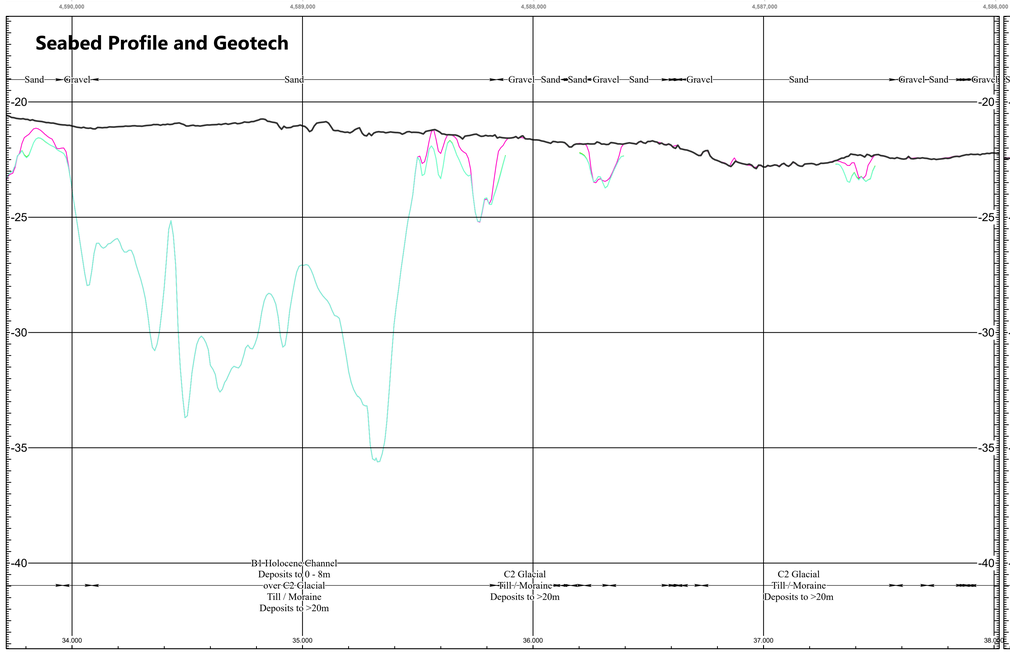
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 | Chart No: 004c - 018c







SOUTHCOAST WIND

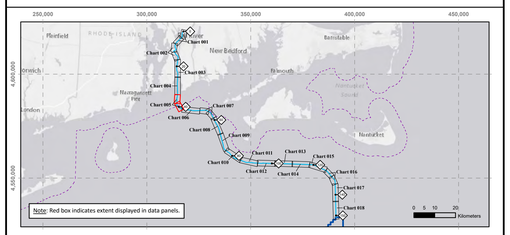
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 33.701 TO 42.396

2022 — Chart No. 005c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
- Sand
- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas
- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours
- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
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- >15 - Very Steep

SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
- H20 Base of Unit B1 (Holocene Channels)
- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary
- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

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GEODETIC INFORMATION

Coordinate System: NAD 1983 UTM Zone 19N
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Projection: Transverse Mercator
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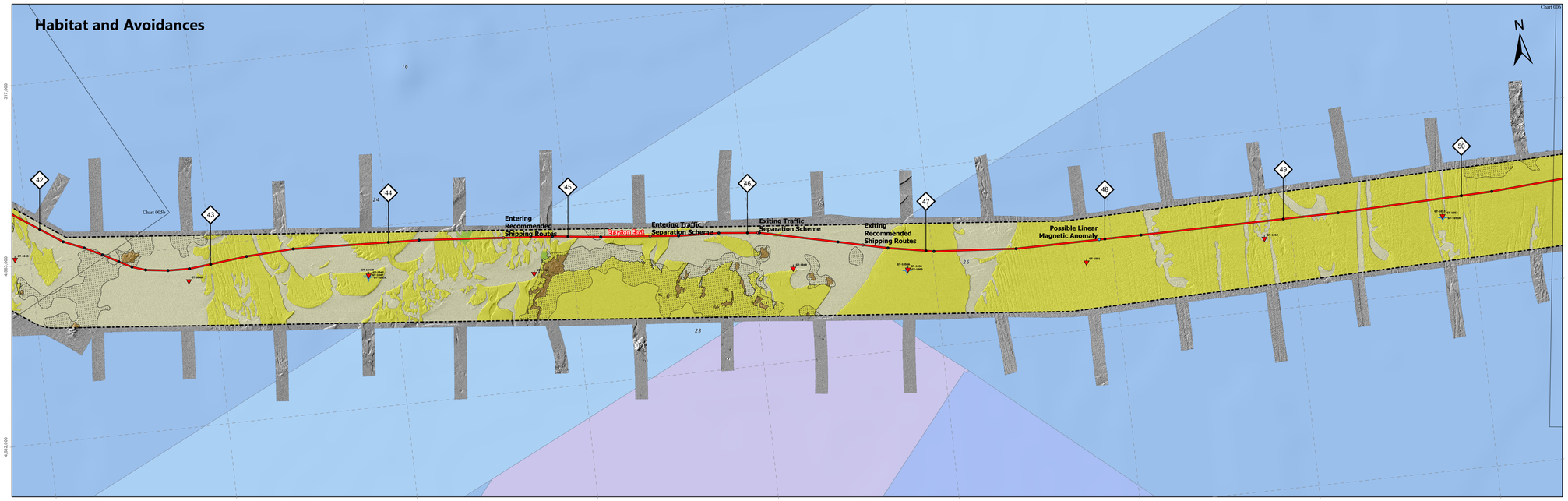
Central Meridian: -69.0000
Scale Factor: 0.9996

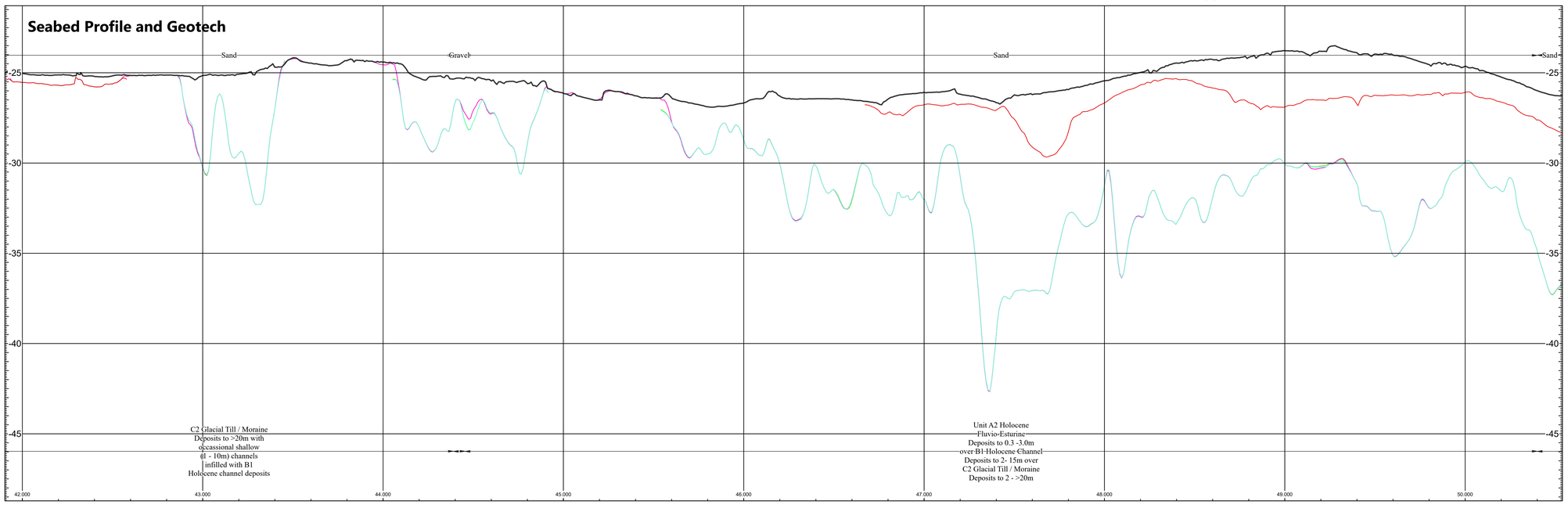
Scale 1:10,000

0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 005c - 018c





SOUTHCOAST WIND

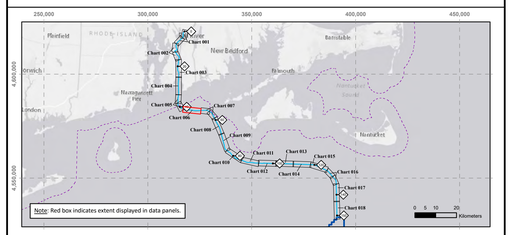
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 41.824 TO 50.570

2022 — Chart No. 006c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
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- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
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- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
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- (Likely) Crepidula Substrate with Boulder Field(s)
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- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
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- SAV

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- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
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- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
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- Traffic Separations Schemes
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SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
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- Minor Contours

- Pipeline Areas

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- Seabed Profile
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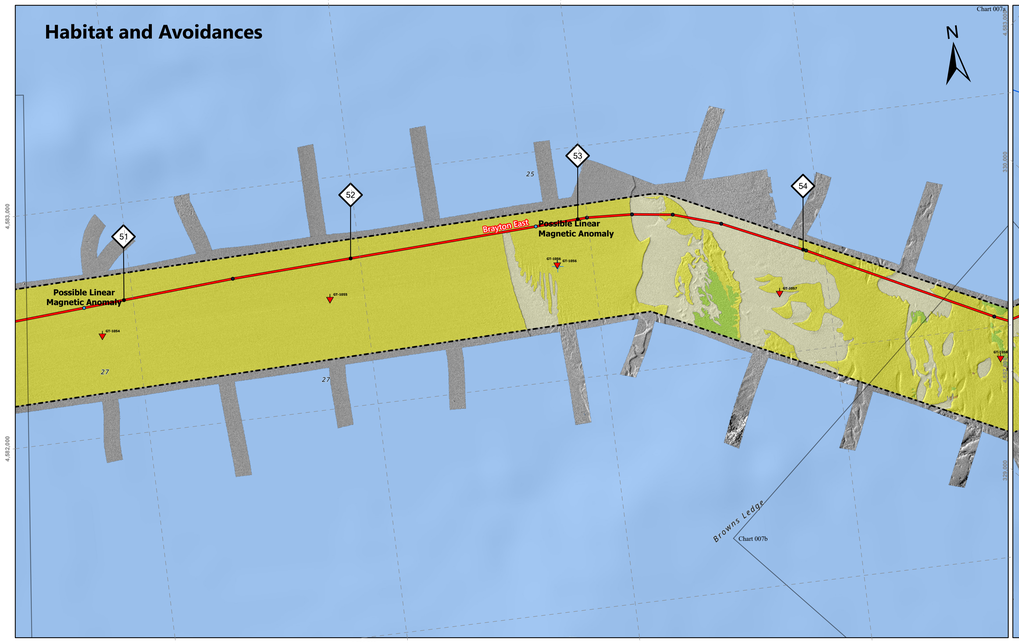
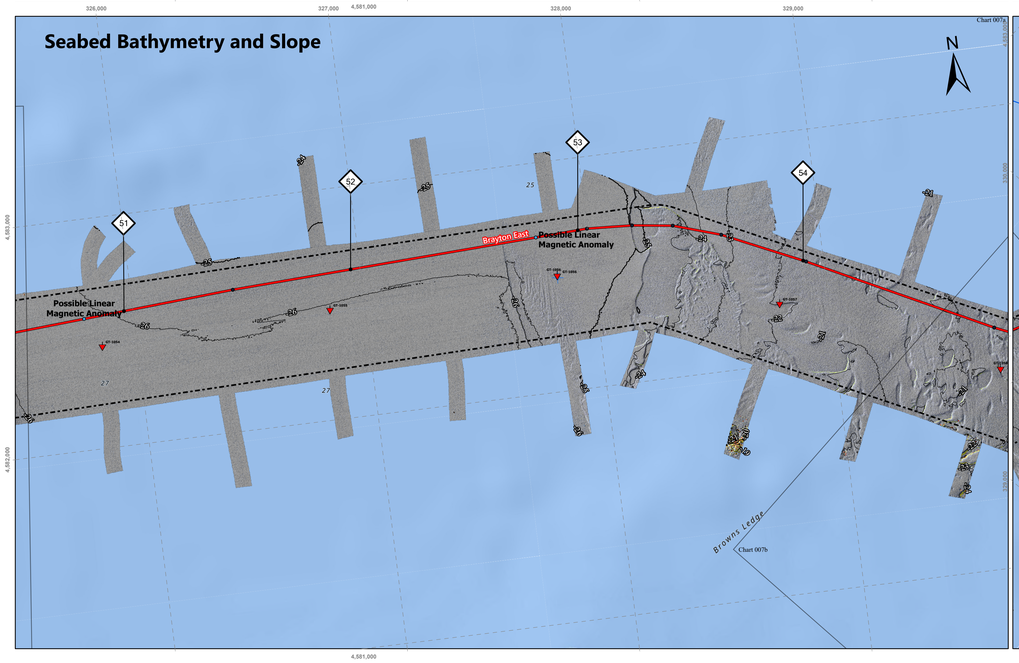
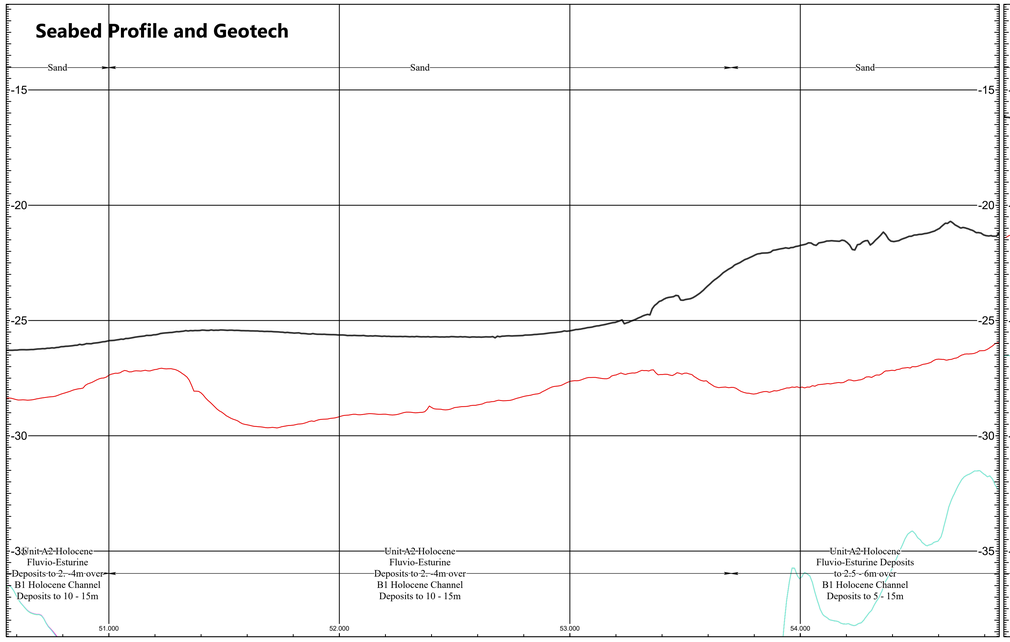
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 006c - 018c







SOUTHCOAST WIND

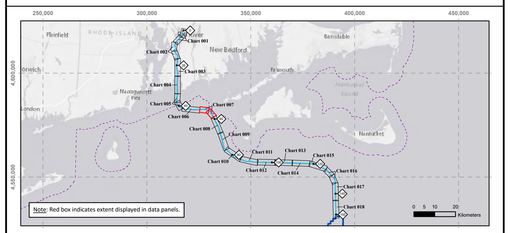
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 50.519 TO 59.138

2022 — Chart No. 007c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

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- Brayton East Route
- Brayton West Route
- Chart Panels
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- Glacial Moraine A
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Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas
- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours
- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
- 1 to 4.9 - Gentle
- 5 to 9.9 - Moderate
- 10 to 14.9 - Steep
- >15 - Very Steep

SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
- H20 Base of Unit B1 (Holocene Channels)
- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

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SOURCE - All survey data was provided by SouthCoast Wind

GEODETIC INFORMATION

Coordinate System: NAD 1983 UTM Zone 19N
EPSG: 26919
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -69.0000
Scale Factor: 0.9996

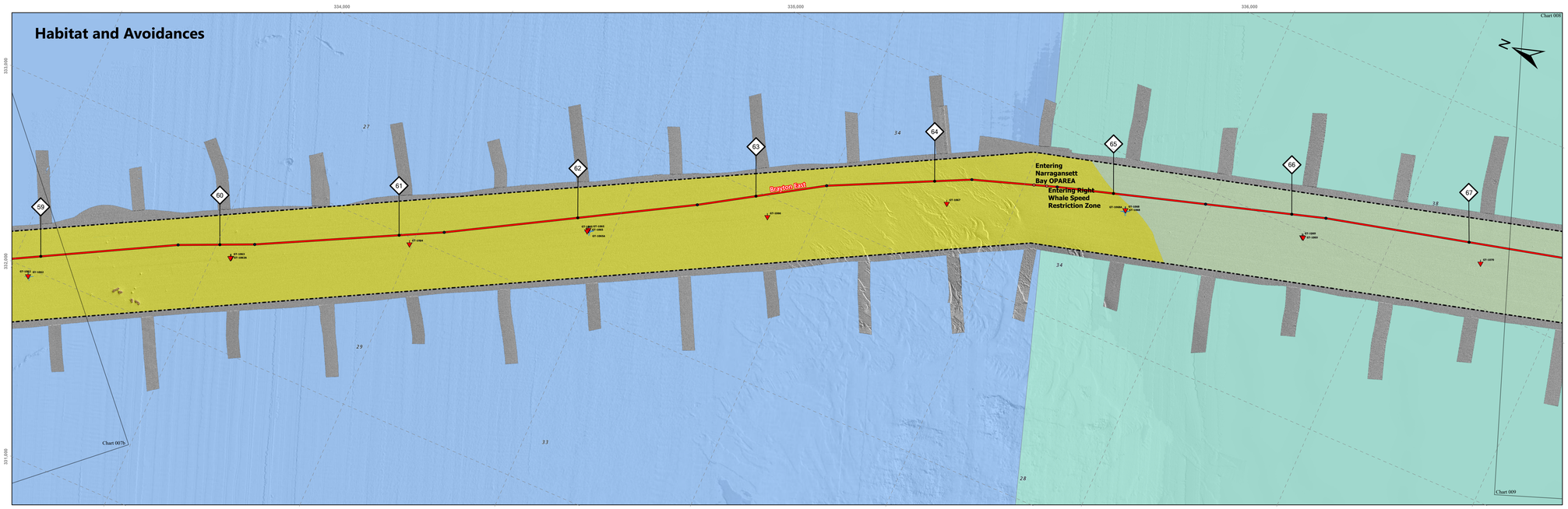
Scale 1:10,000

0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

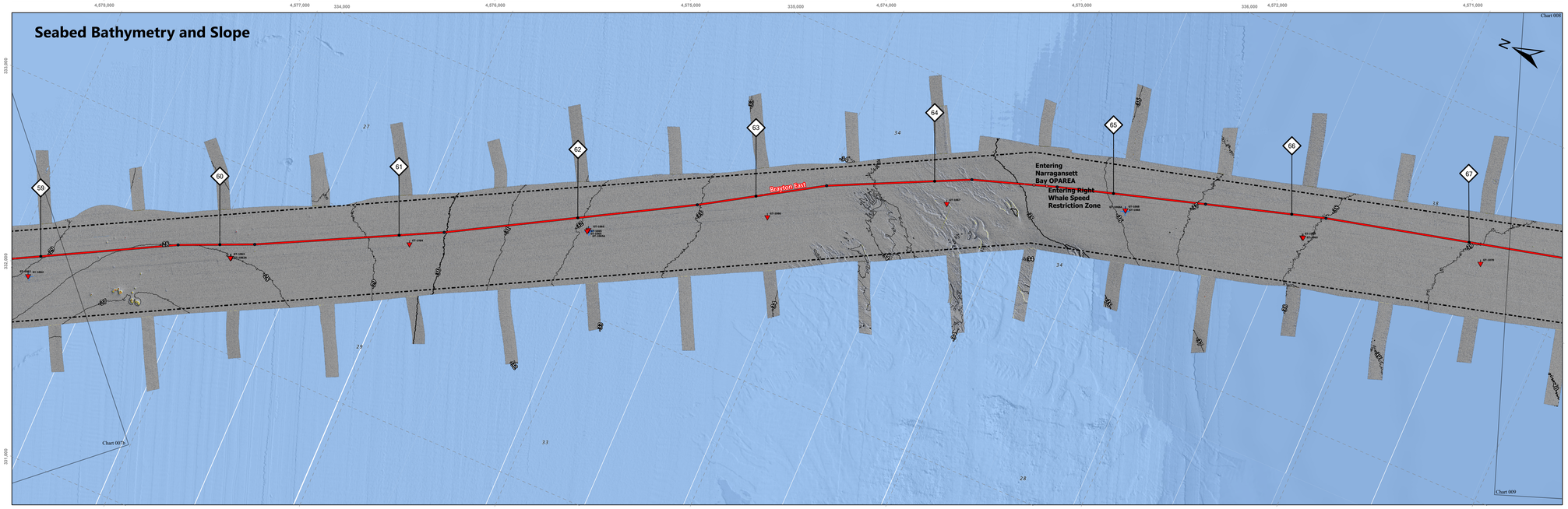
REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 007c - 018c

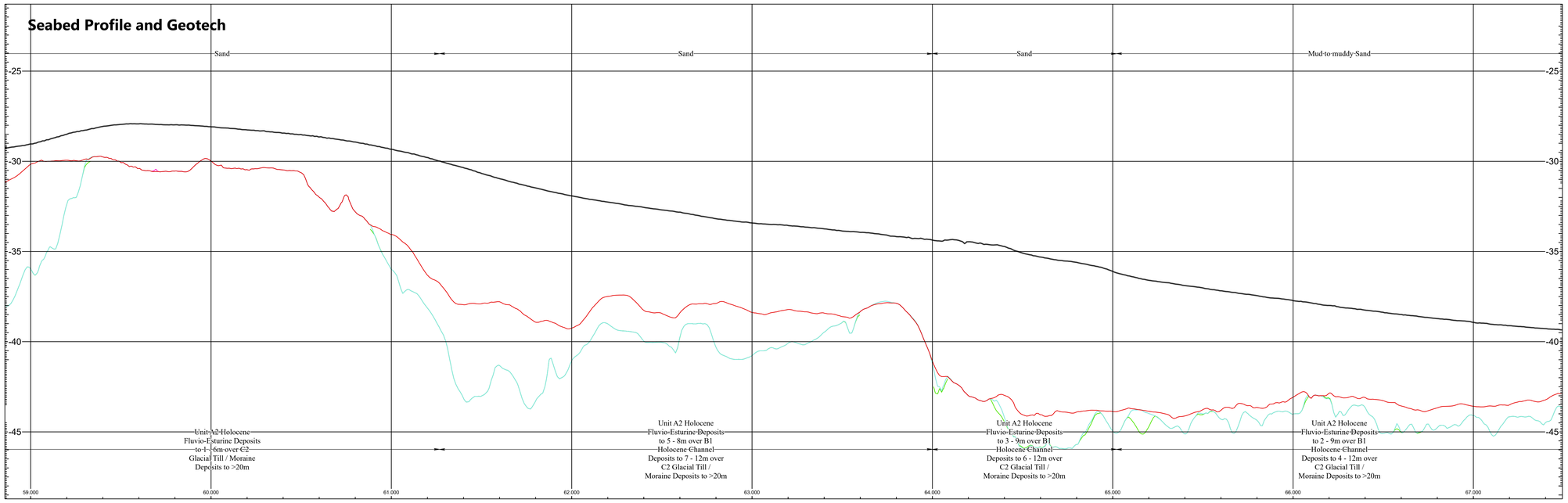
Habitat and Avoidances



Seabed Bathymetry and Slope



Seabed Profile and Geotech



SOUTHCOAST WIND

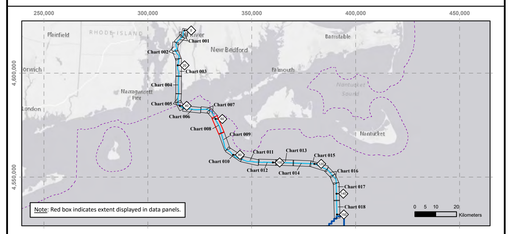
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 58.838 TO 67.527

2022 — Chart No. 008c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
- Sand
- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas

- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours

- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
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SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
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- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

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5.) Data is underlain by a shaded relief rendering of MBES bathymetry in the background.

SOURCE - All survey data was provided by SouthCoast Wind

GEODETIC INFORMATION

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Units: Meter

False Easting: 500,000.0000
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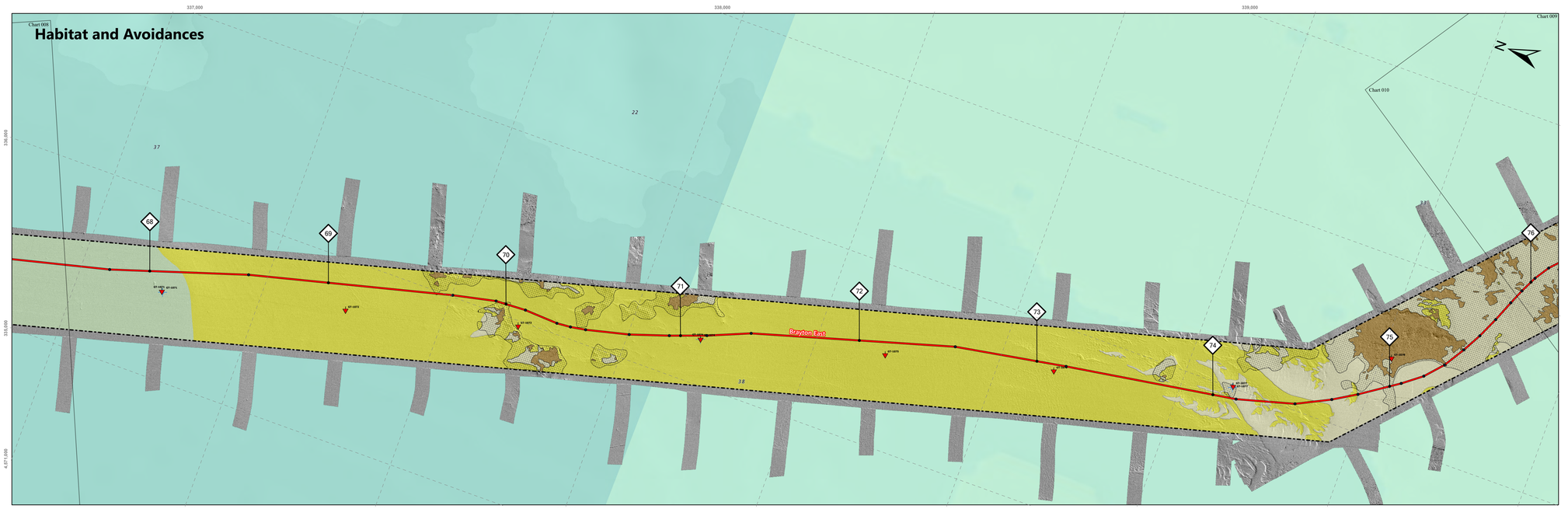
Scale Factor: 0.9996

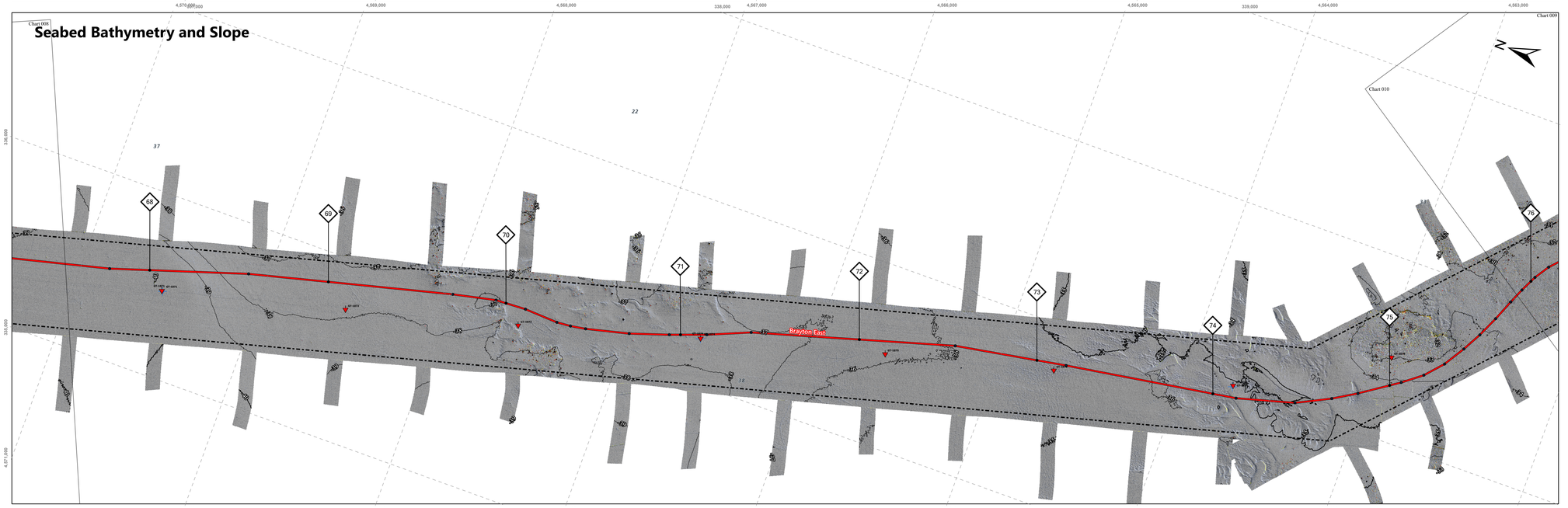
Scale 1:10,000

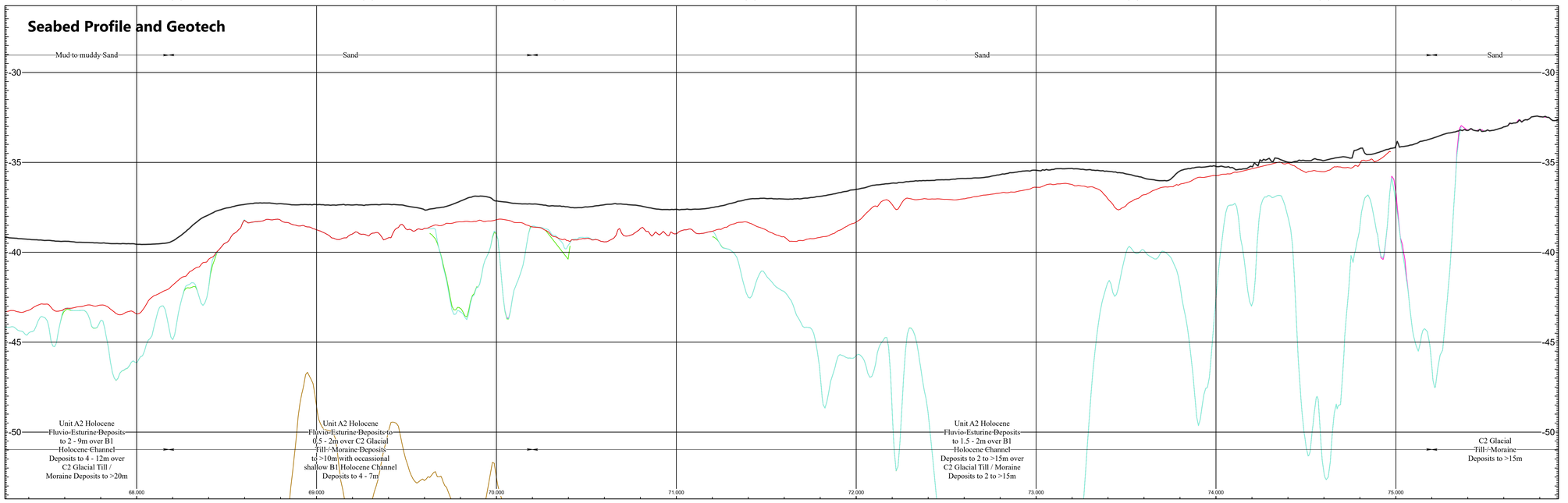
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 008c - 018c







SOUTHCOAST WIND

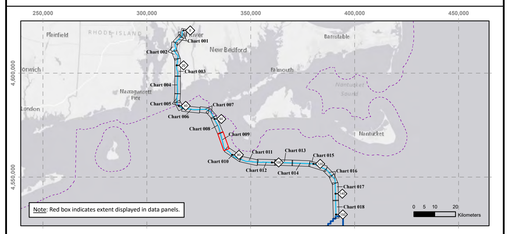
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART KP 67.227 TO 76.189

2022 — Chart No. 009c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
- Sand
- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas
- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours
- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
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SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
- H20 Base of Unit B1 (Holocene Channels)
- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary
- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

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GEODETIC INFORMATION

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Central Meridian: -69.0000
Scale Factor: 0.9996

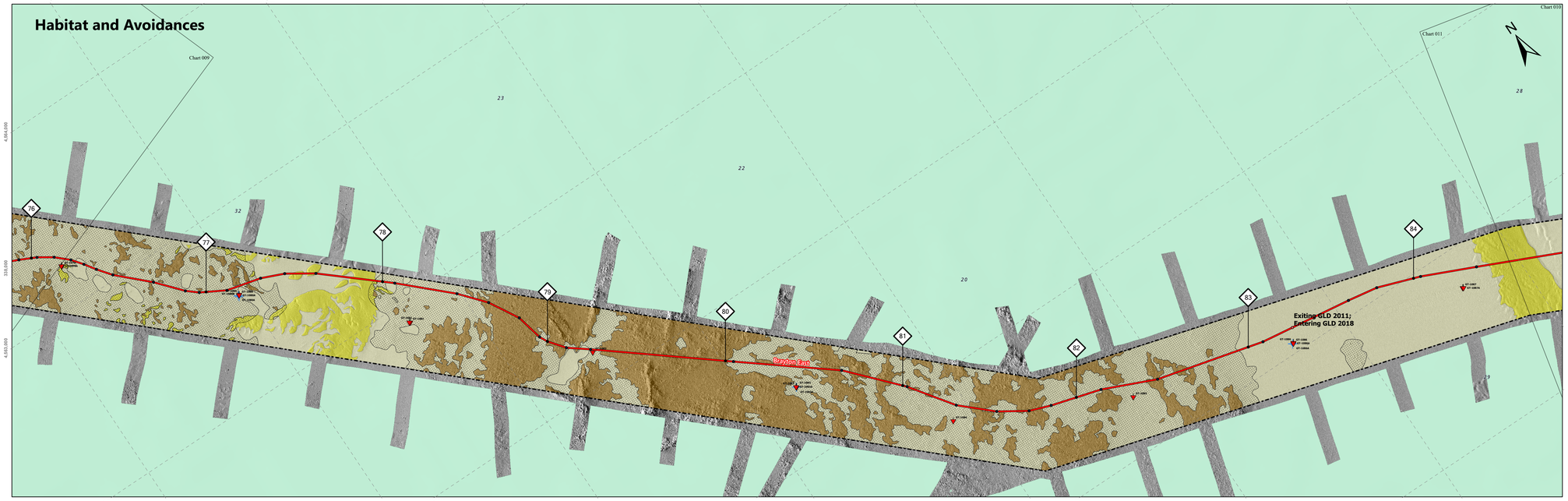
Scale 1:10,000

0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

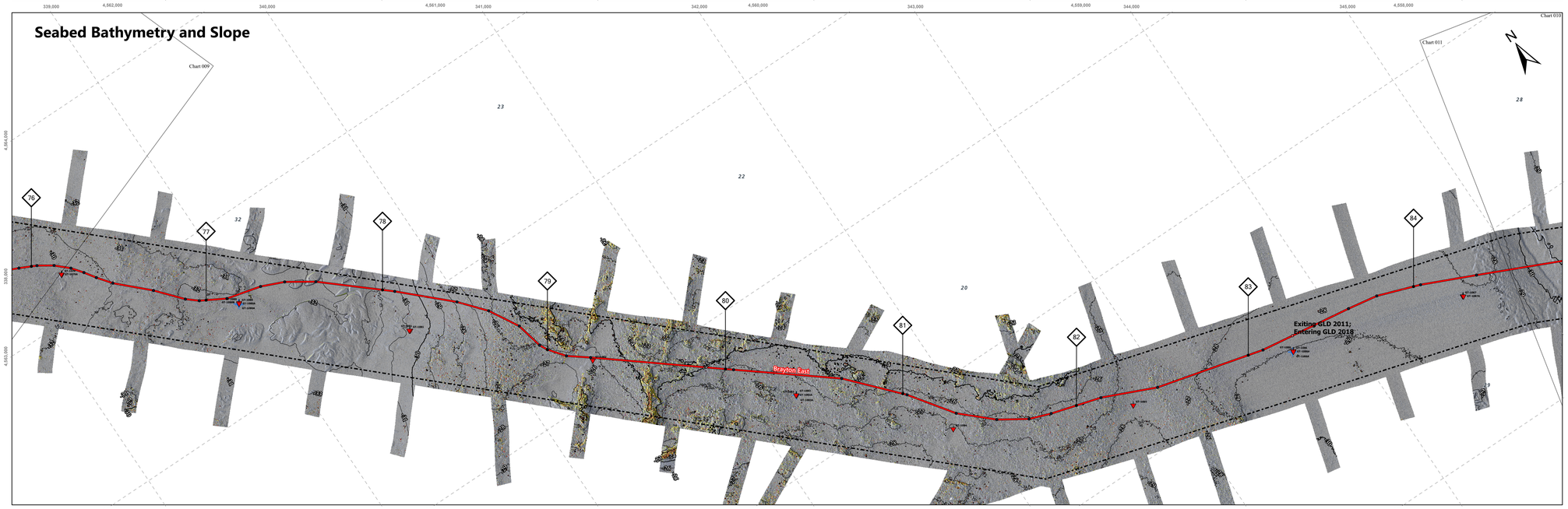
REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 009c - 018c

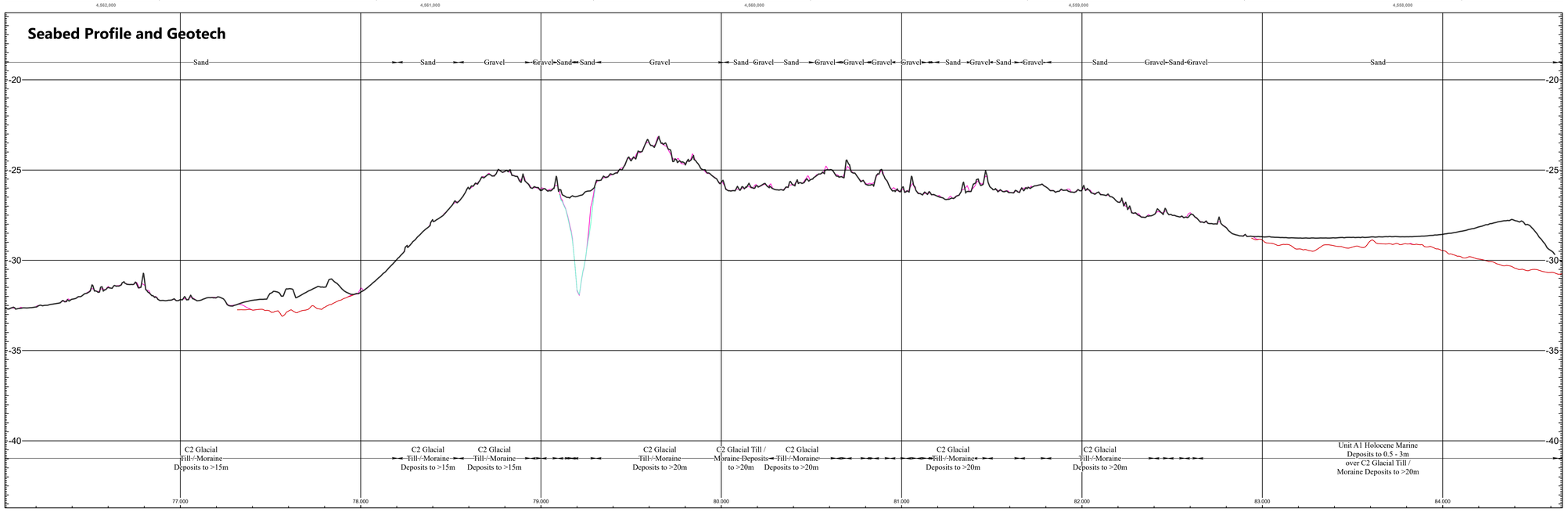
Habitat and Avoidances



Seabed Bathymetry and Slope



Seabed Profile and Geotech



SOUTHCOAST WIND

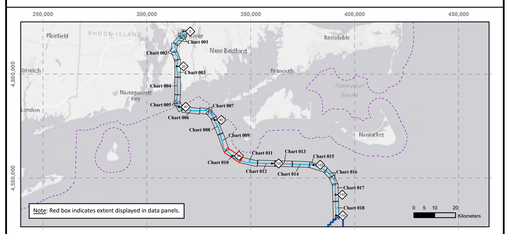
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 75.891 TO 84.843

2022 — Chart No. 010c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
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- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas

- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours

- Pipeline Areas

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SEABED PROFILE AND GEOTECH

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- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
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- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

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Scale 1:10,000

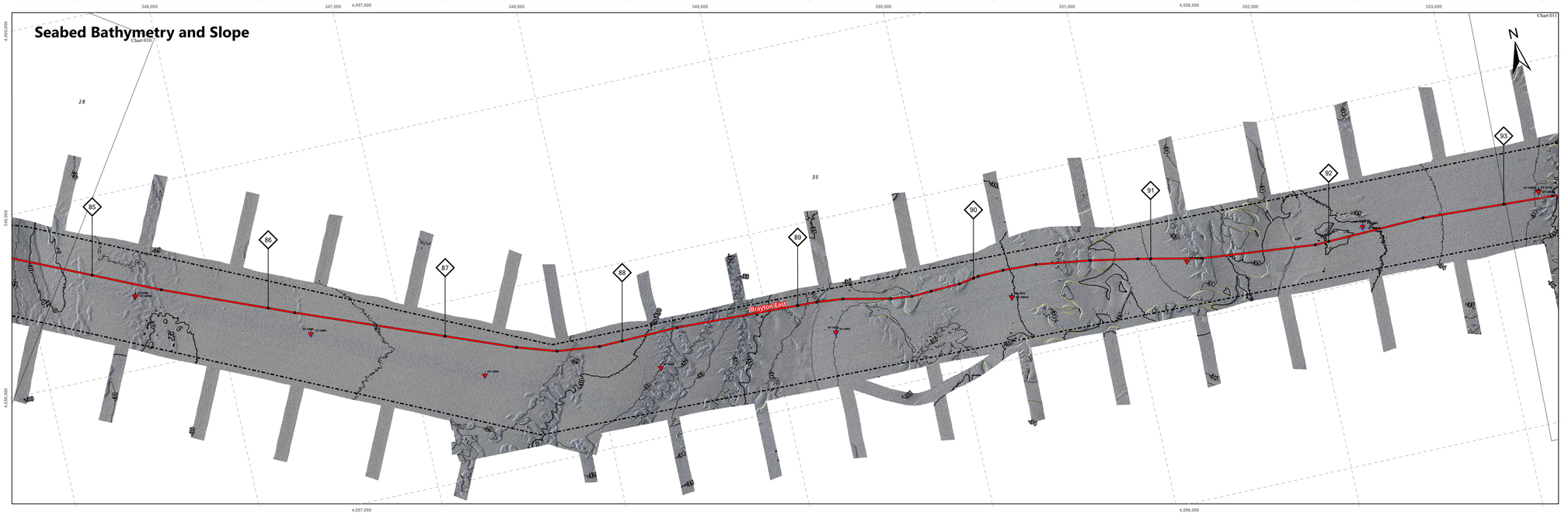
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

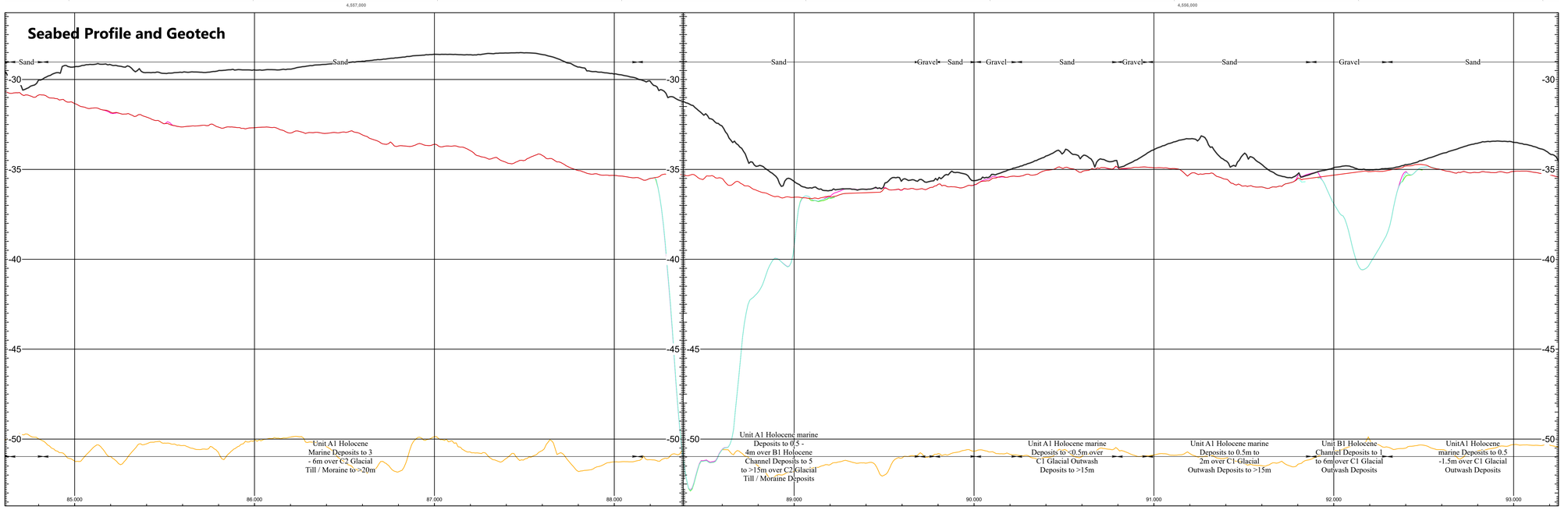
Project No: 2022 - 529 — Chart No: 010c - 018c

Habitat and Avoidances

Seabed Bathymetry and Slope



Seabed Profile and Geotech



SOUTHCOAST WIND

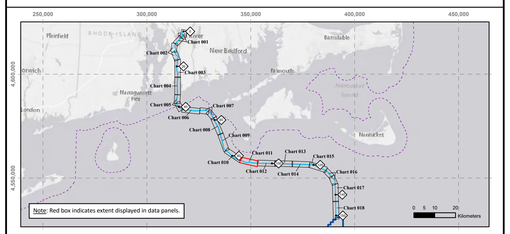
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 84.543 TO 93.312

2022 — Chart No. 011c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
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- Water Depth of Note

Geotechnical Sample Points
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- (Likely) Crepidula Substrate with Boulder Field(s)
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- Shipping Fairways Lanes and Zones
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- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours

- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
- 1 to 4.9 - Gentle
- 5 to 9.9 - Moderate
- 10 to 14.9 - Steep
- >15 - Very Steep

SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
- H20 Base of Unit B1 (Holocene Channels)
- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

1.) Fugro collected geophysical for the Brayton Point ECC from 7/14/21 to 12/14/21 and geotechnical data (vibracores and CPTs) was collected by Fugro from 9/30/21 to 10/18/21 and by *Alpine* from 10/4/21 to 11/10/21.

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4.)Eversource Supplemental Cables sourced from 2021 Massachusetts Ocean Management Plan Data Viewer via the Massachusetts Ocean Resource Information System (MORIS, 2022).

5.) Data is underlain by a shaded relief rendering of MBES bathymetry in the background.

SOURCE - All survey data was provided by SouthCoast Wind

GEODETIC INFORMATION

Coordinate System: NAD 1983 UTM Zone 19N
EPSG: 26919
Projection: Transverse Mercator
Datum: North American 1983
Units: Meter

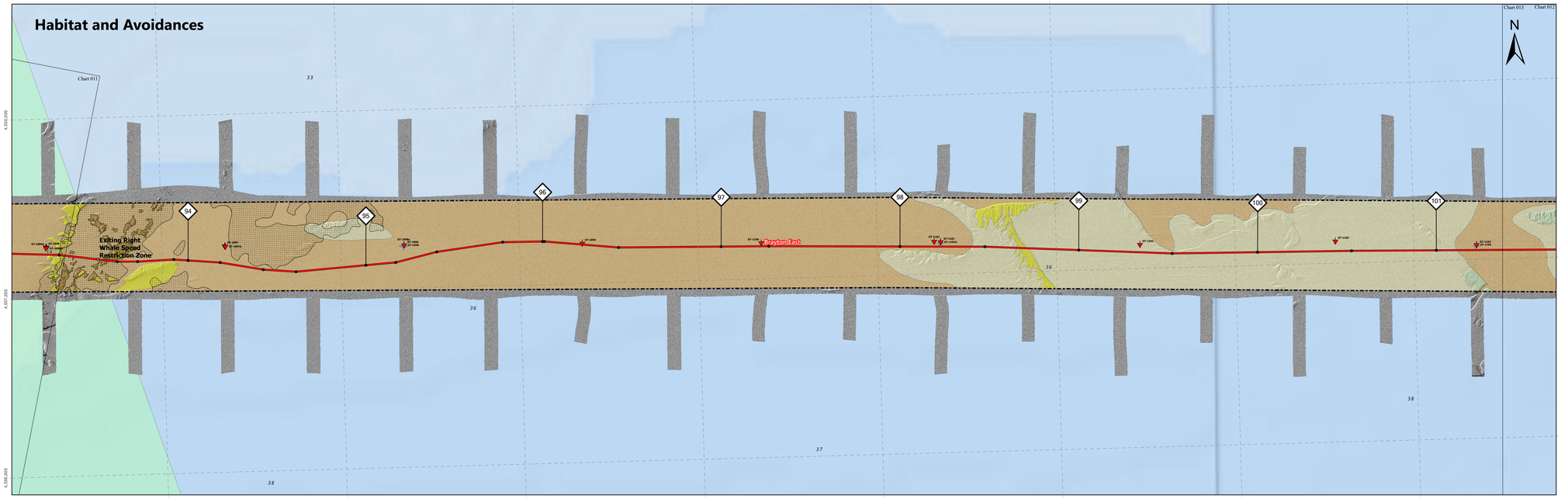
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: -69.0000
Scale Factor: 0.9996

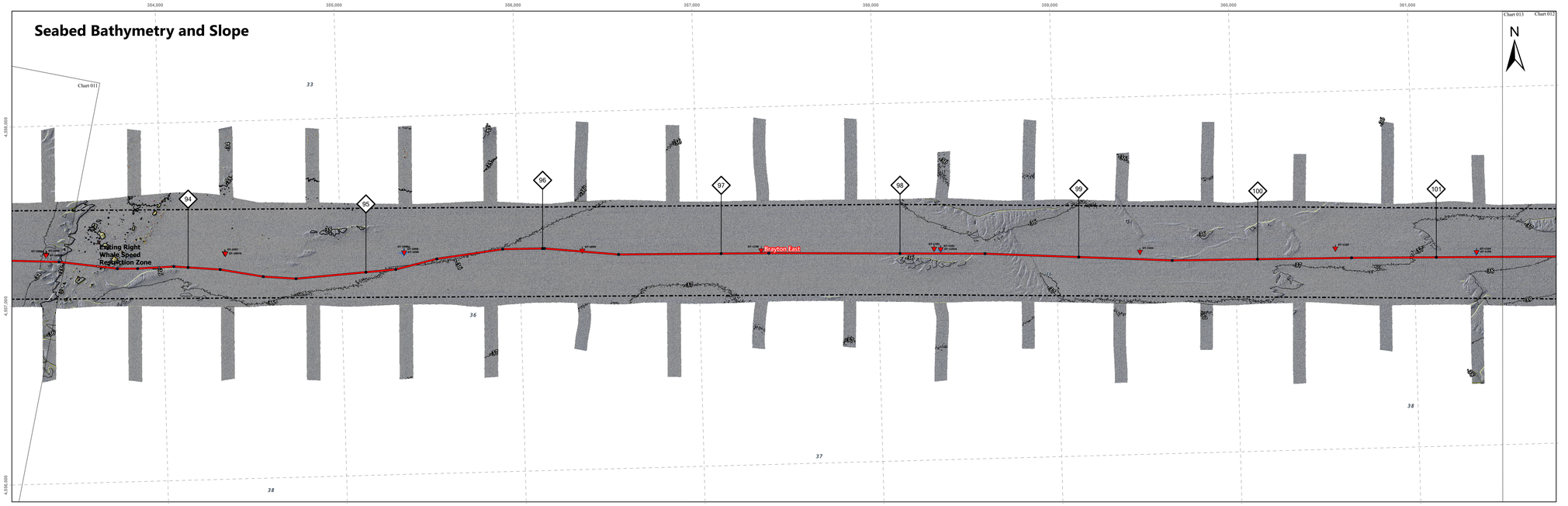
Scale 1:10,000

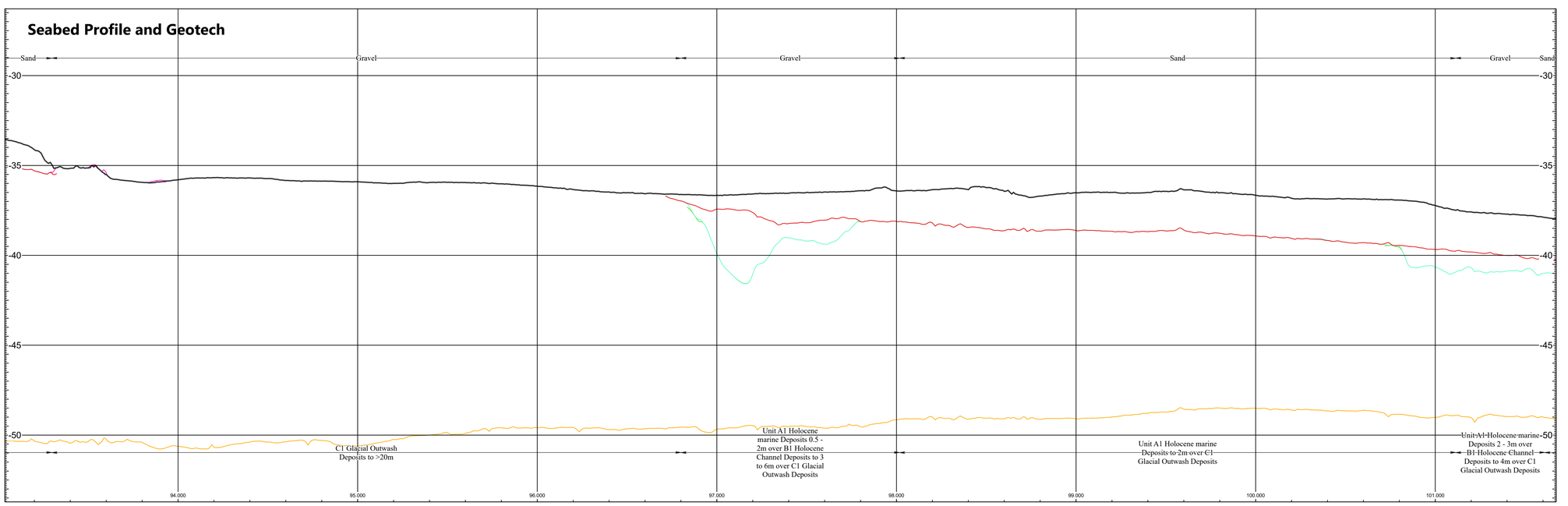
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 011c - 018c







SOUTHCOAST WIND

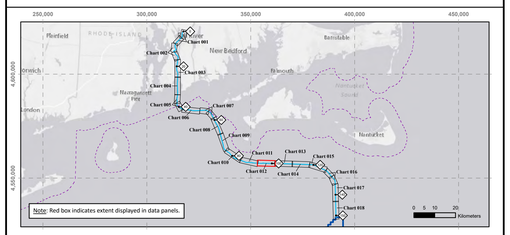
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 93.014 TO 101.674

2022 — Chart No. 012c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
- Sand
- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas

Utility Alignments
- Cable and/or Pipeline

- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours

- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
- 1 to 4.9 - Gentle
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SEABED PROFILE AND GEOTECH

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- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
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- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

NOTES

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SOURCE - All survey data was provided by SouthCoast Wind

GEODETIC INFORMATION

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Scale Factor: 0.9996

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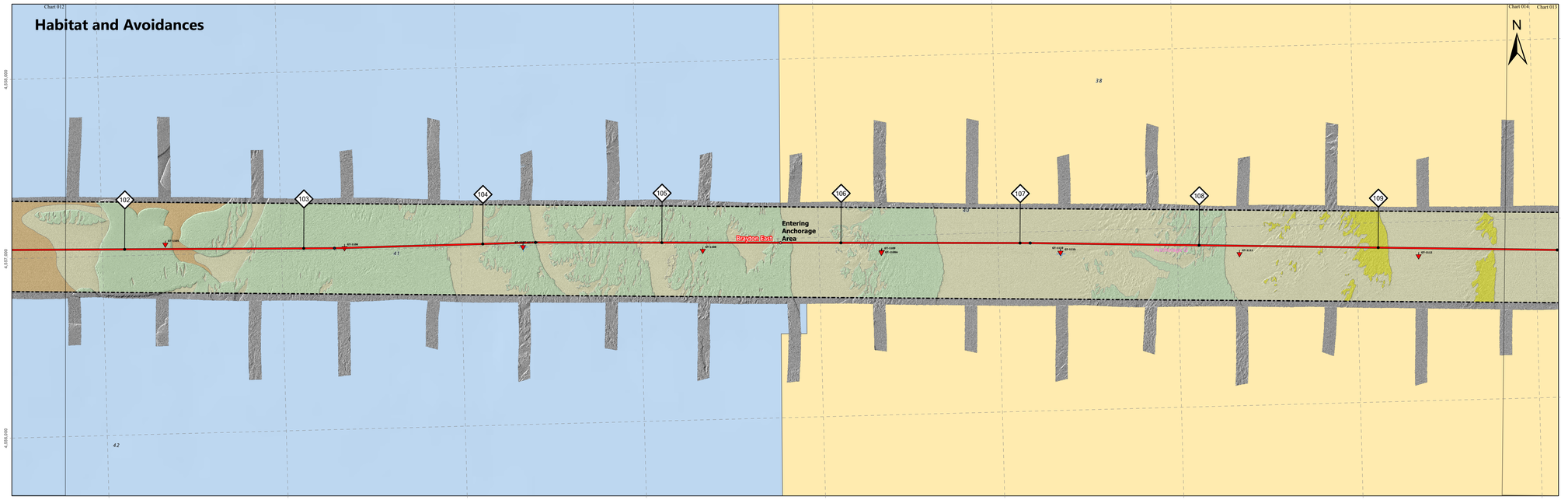
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

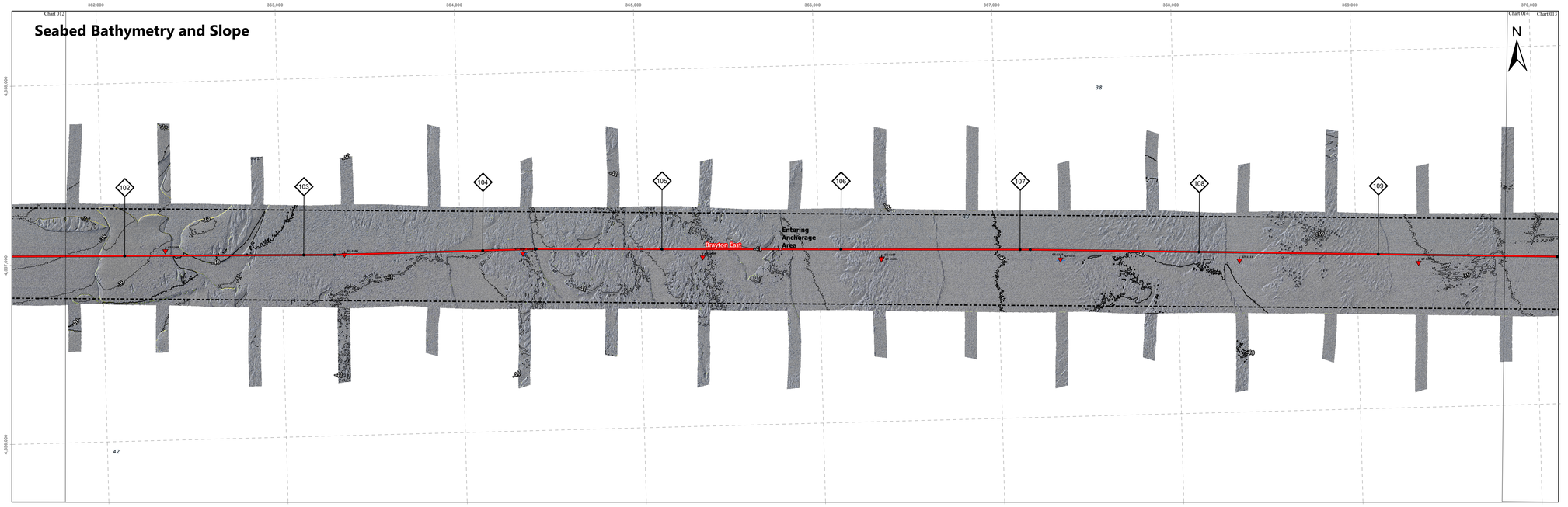
REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 012c - 018c

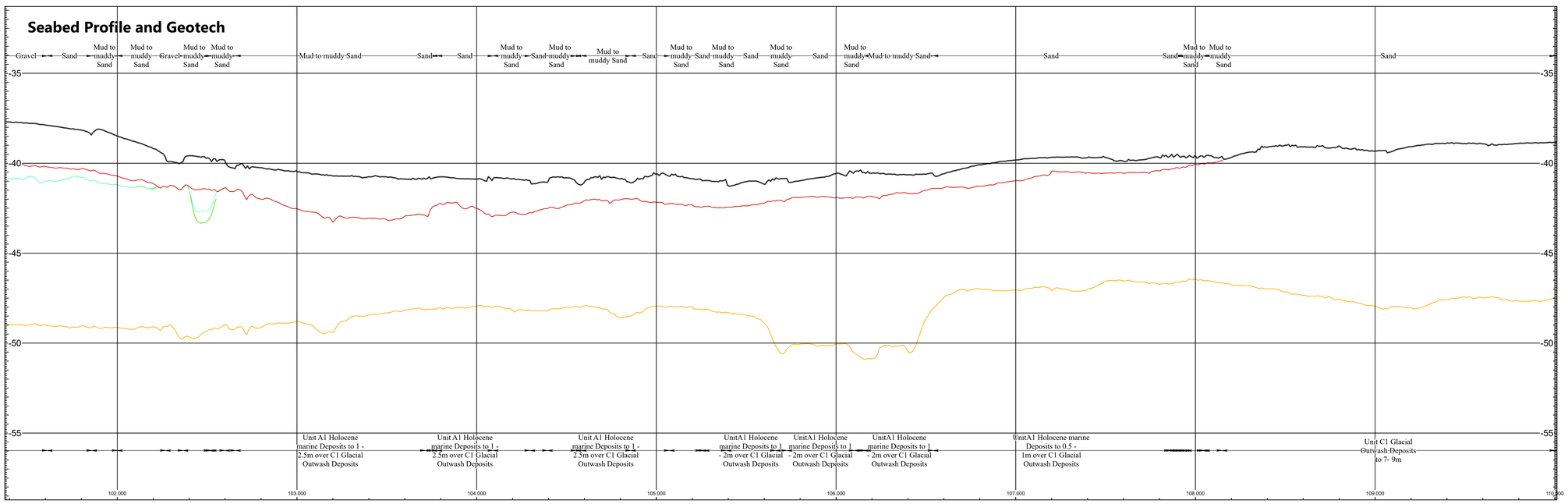
Habitat and Avoidances



Seabed Bathymetry and Slope



Seabed Profile and Geotech



SOUTHCOAST WIND

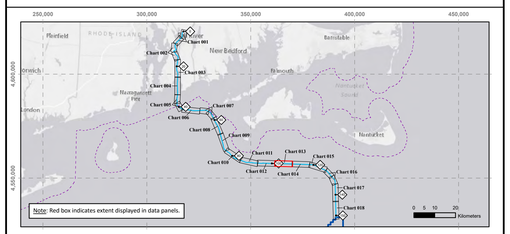
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 101.374 TO 110.012

2022 — Chart No. 013c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
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- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas
- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours
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SEABED PROFILE AND GEOTECH

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- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
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- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
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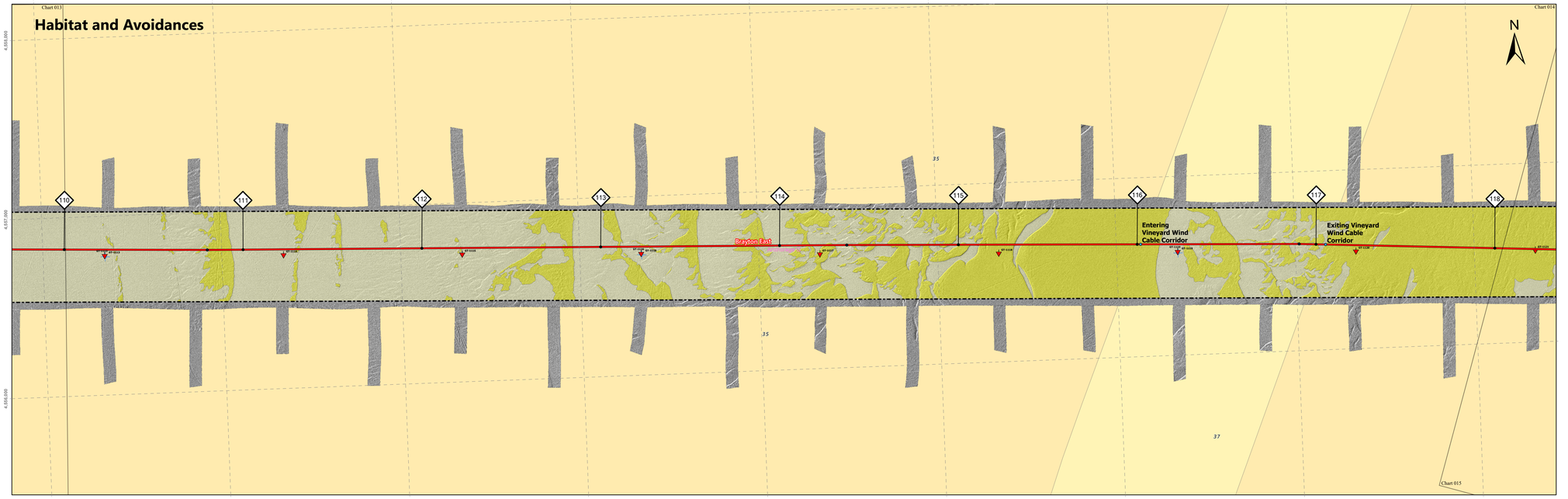
Scale Factor: 0.9996

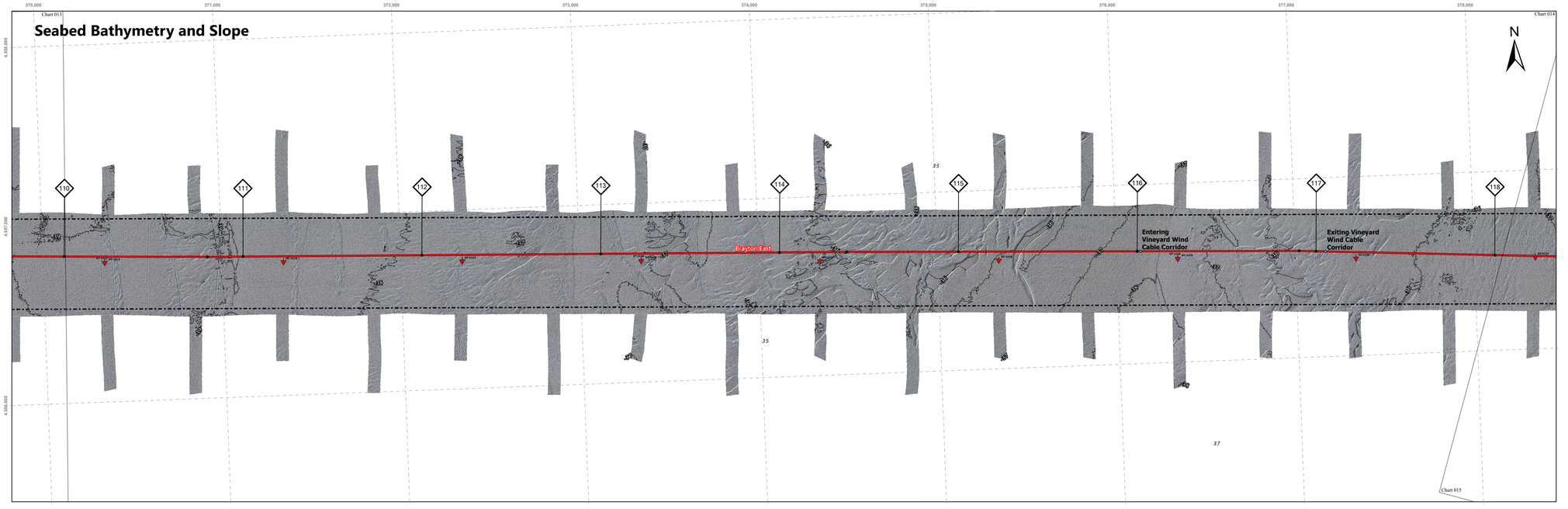
Scale 1:10,000

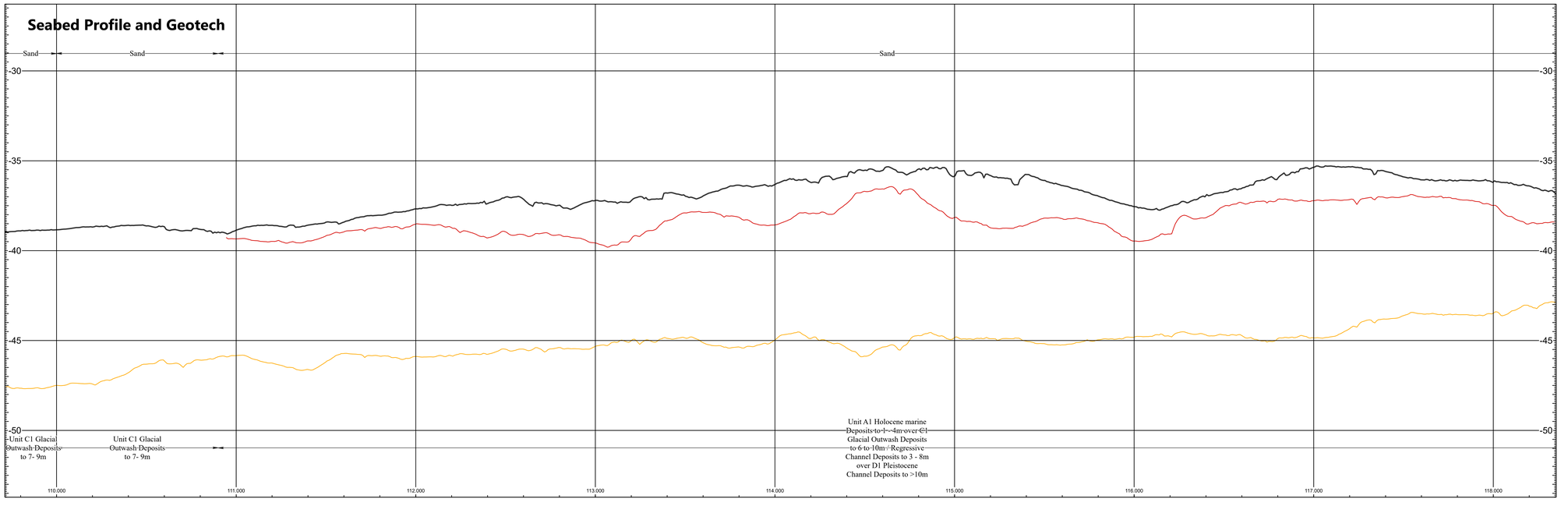
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 013c - 018c







SOUTHCOAST WIND

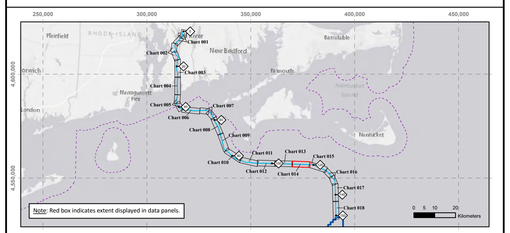
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 109.712 TO 118.350

2022 — Chart No. 014c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
- Sand
- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas

- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours

- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
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SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
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- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
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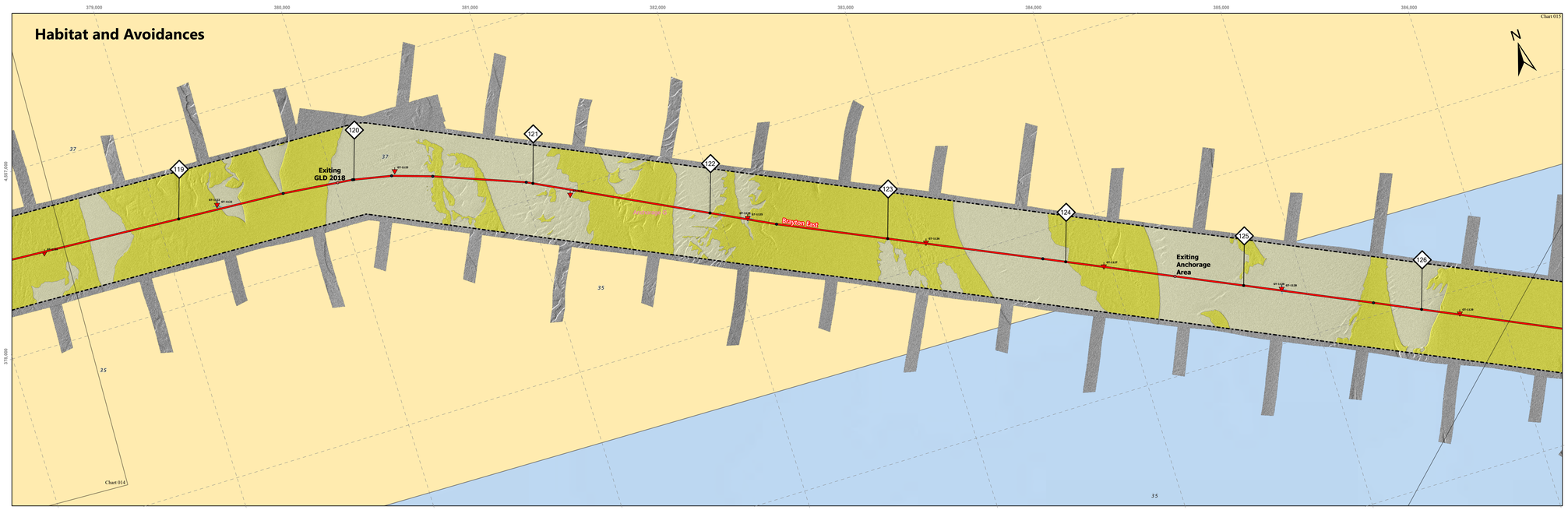
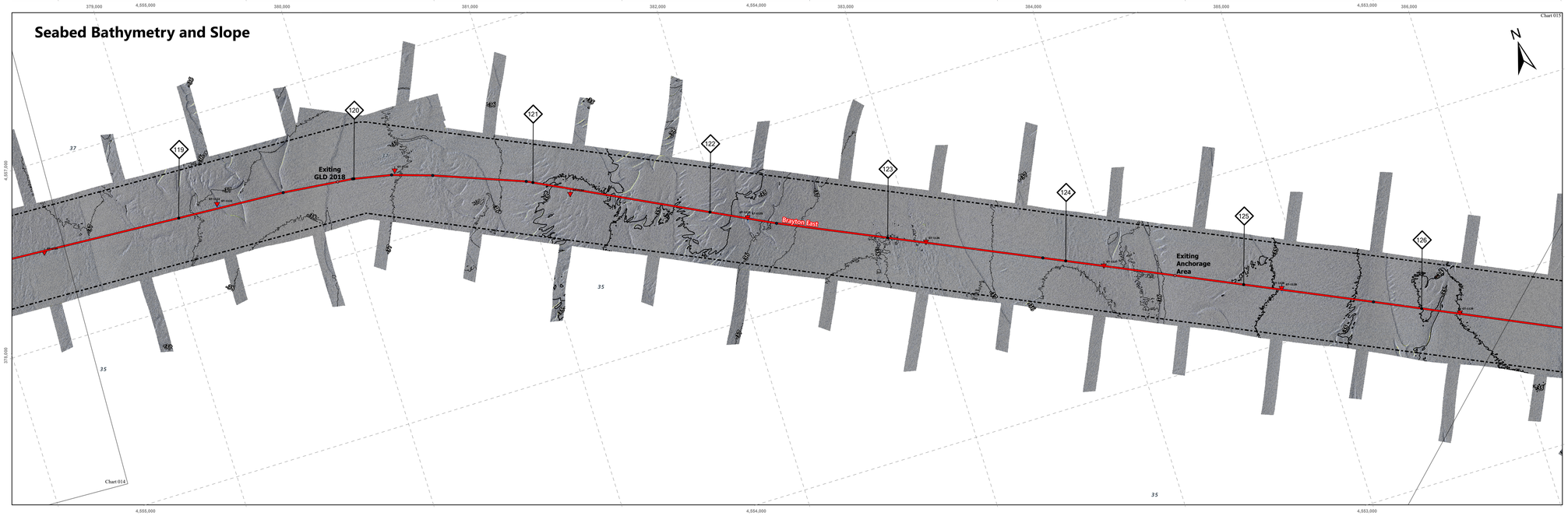
Scale 1:10,000

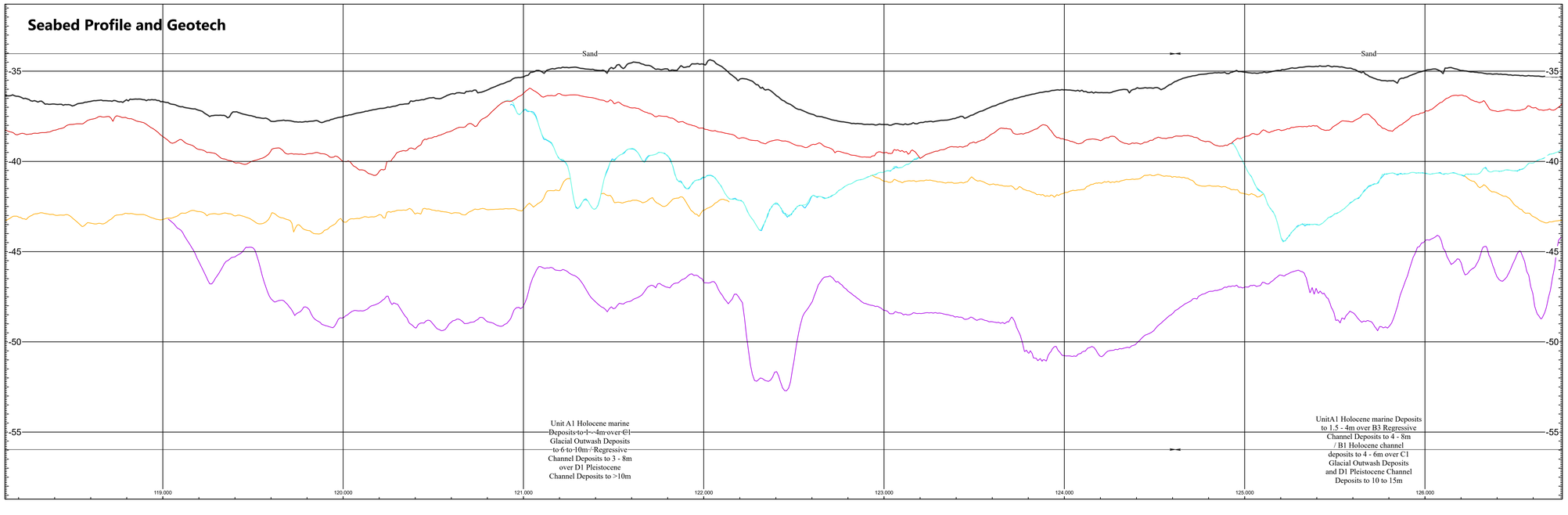
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 014c - 018c







SOUTHCOAST WIND

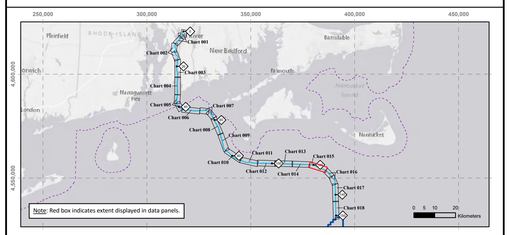
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 118.050 TO 126.800

2022 — Chart No. 015c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

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- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
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- Pipeline Crossing
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- Vibro Core

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- Boulder Field(s)
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- Cable and/or Pipeline

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- Particularly Sensitive Sea Area
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SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
- H20 Base of Unit B1 (Holocene Channels)
- H21 Base of Unit B3 (Pleistocene Channels)
- H30 Base of Unit C1 (Pleistocene Glacial Outwash Sands)
- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

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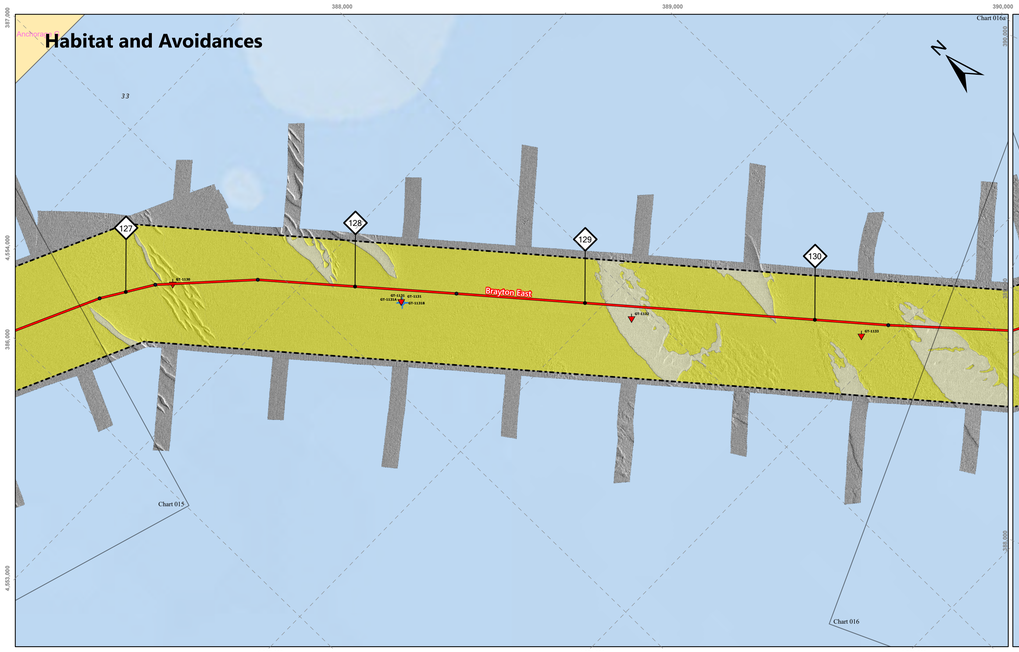
False Northing: 0.0000
Central Meridian: -69.0000
Scale Factor: 0.9996

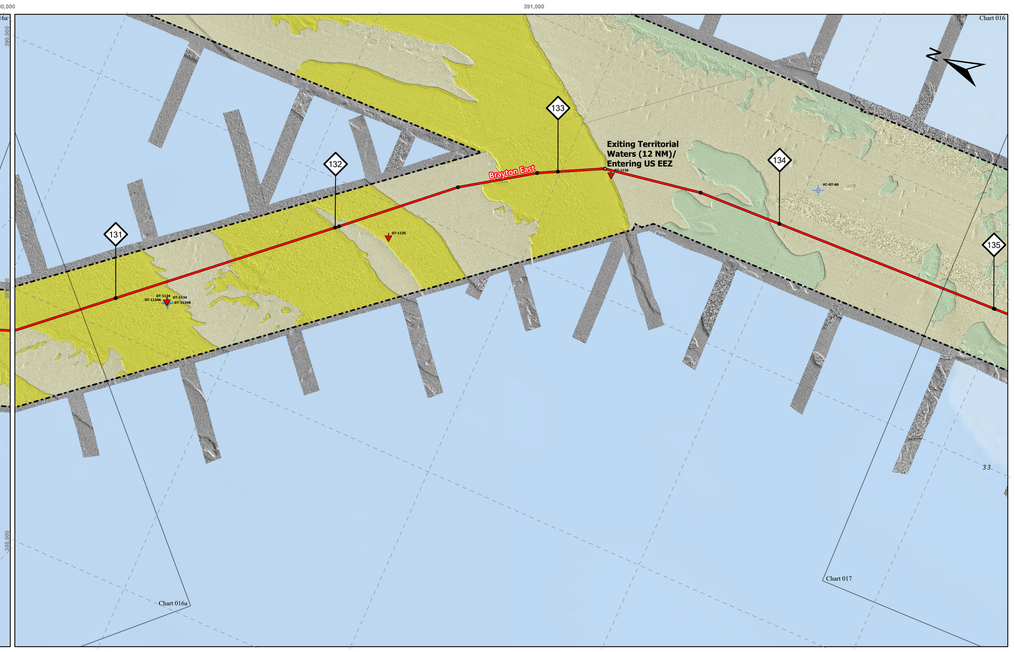
Scale 1:10,000

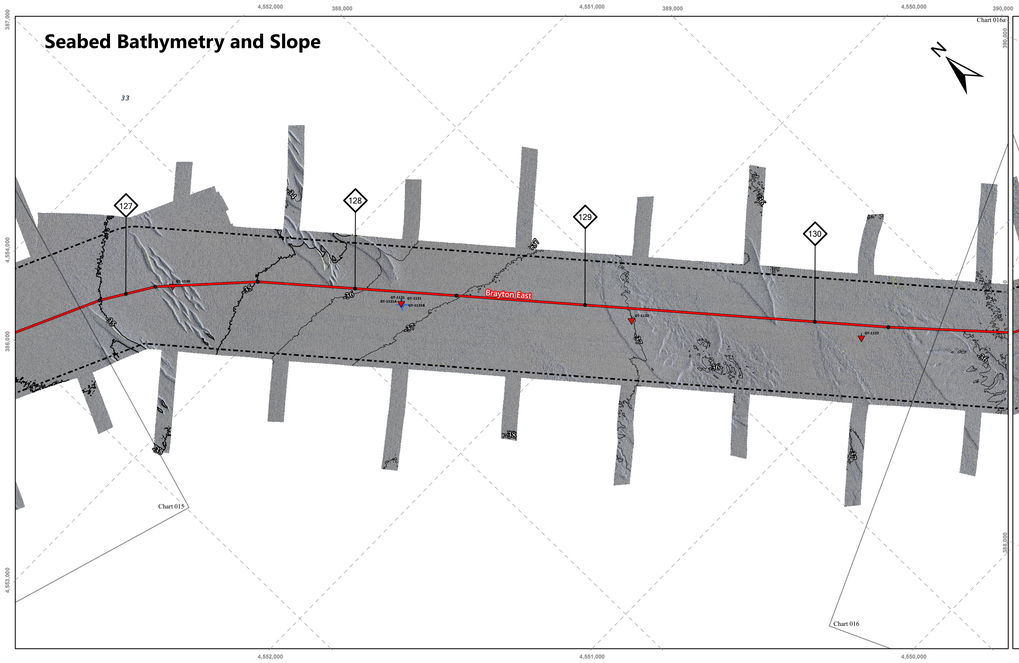
0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

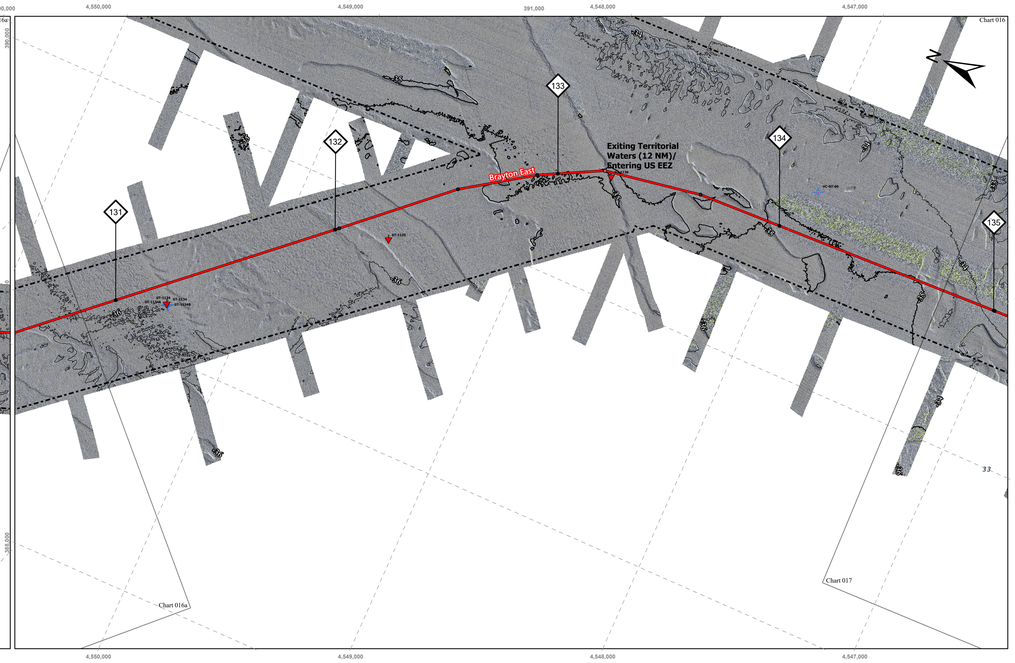
REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

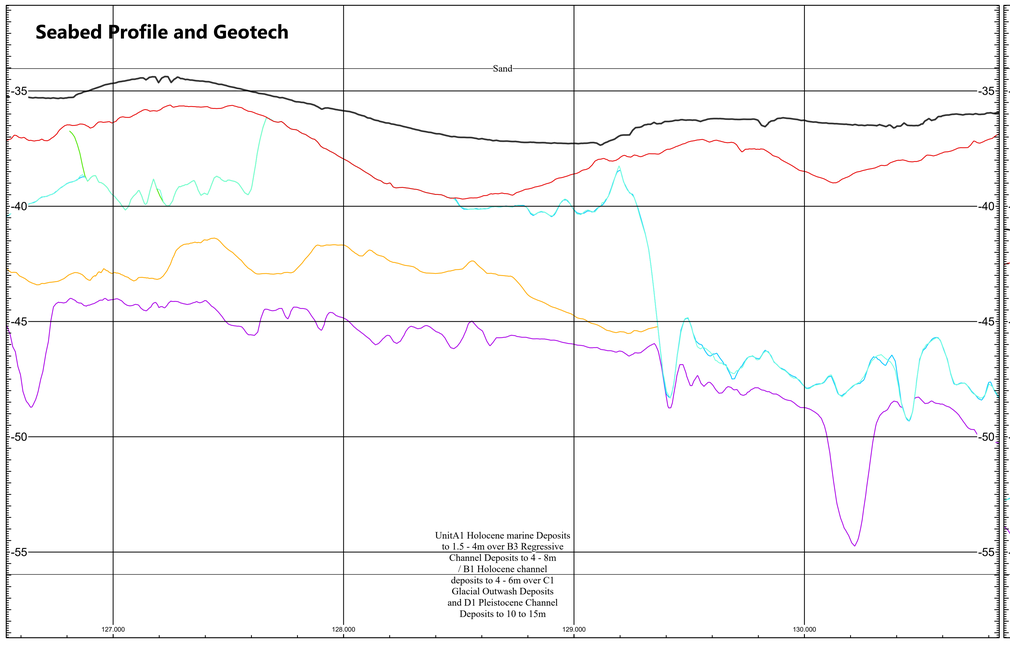
Project No: 2022 - 529 — Chart No: 015c - 018c

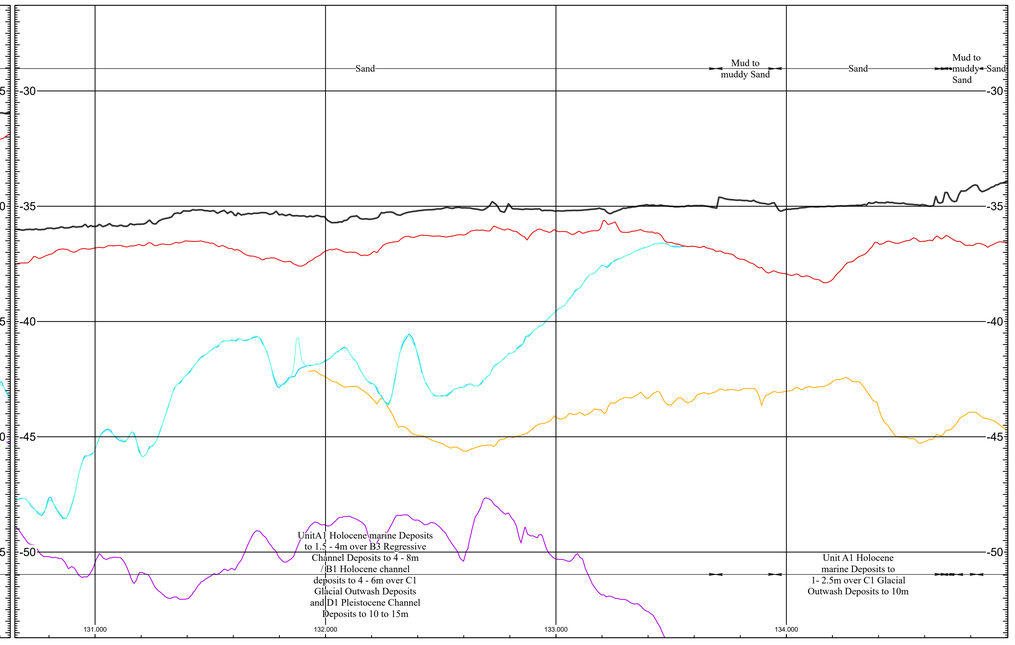












SOUTHCOAST WIND

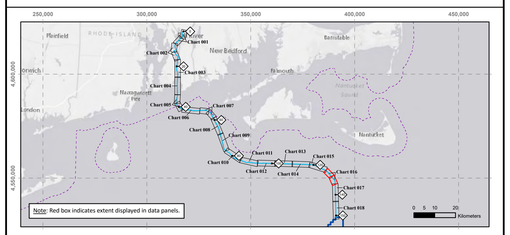
SOUTHCOAST WIND ENERGY LLC
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 126.500 TO 135.077

2022 — Chart No. 016c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

- Generated KP Scheme - Brayton East Route
- Brayton East Route
- Brayton West Route
- Chart Panels
- Survey Corridor
- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
- Bedrock
- Coarse Sediment
- Coarse Sediment - Mobile
- Glacial Moraine A
- Mixed-Size Gravel in Muddy Sand to Sand
- Mud to Muddy Sand
- Mud to Muddy Sand - Mobile
- Sand
- Sand - Mobile

Benthic Habitat Modifier
- (Likely) Crepidula Substrate
- (Likely) Crepidula Substrate with Boulder Field(s)
- Boulder Field(s)
- Crepidula Substrate
- Crepidula Substrate and Boulder Field(s)
- None
- Potential SAV
- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas
- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
- Speed Restrictions/Right Whales
- Traffic Separations Schemes
- Traffic Separation Schemes/Traffic Lanes

SEABED BATHYMETRY AND SLOPE

Bathymetry Contours
- Major Contours
- Minor Contours
- Pipeline Areas

Survey Slope Grid (degrees from horizontal)
- <1 - Very Gentle (not shown)
- 1 to 4.9 - Gentle
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- >15 - Very Steep

SEABED PROFILE AND GEOTECH

- Seabed Profile
- H01 Shallow Gas
- H10 Base of Unit A1 (Transgressive Marine Sands) and Unit A2 (Fluvio-Estuarine Deposits)
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- H40 Base of Unit D1 (Pleistocene Channels)
- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
- Depth to HP Boundary

- Primary Sediment & Subsurface Geology zones along the route

Note: Seafloor and sub-seafloor horizons extracted directly at proposed route from supplied multibeam bathymetry and horizon grids.
100x Vertical Exaggeration.

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GEODETIC INFORMATION

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Datum: North American 1983
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Scale Factor: 0.9996

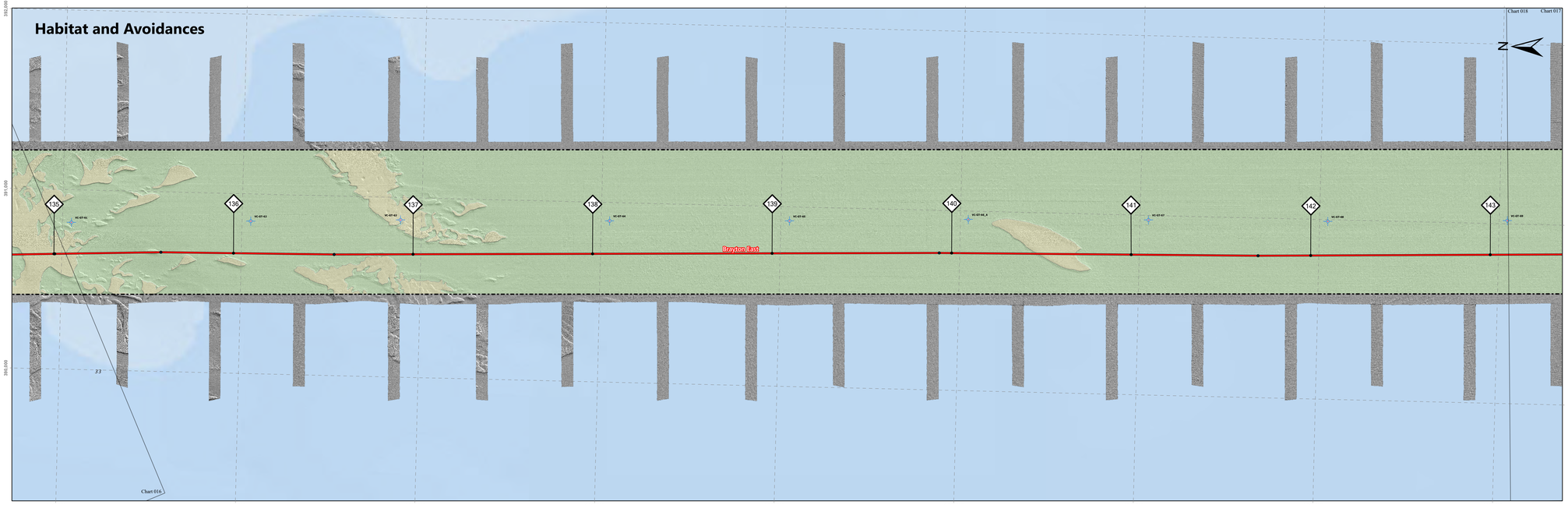
Scale 1:10,000

0 125 250 500 750 1,000 1,250 1,500 1,750 Meters

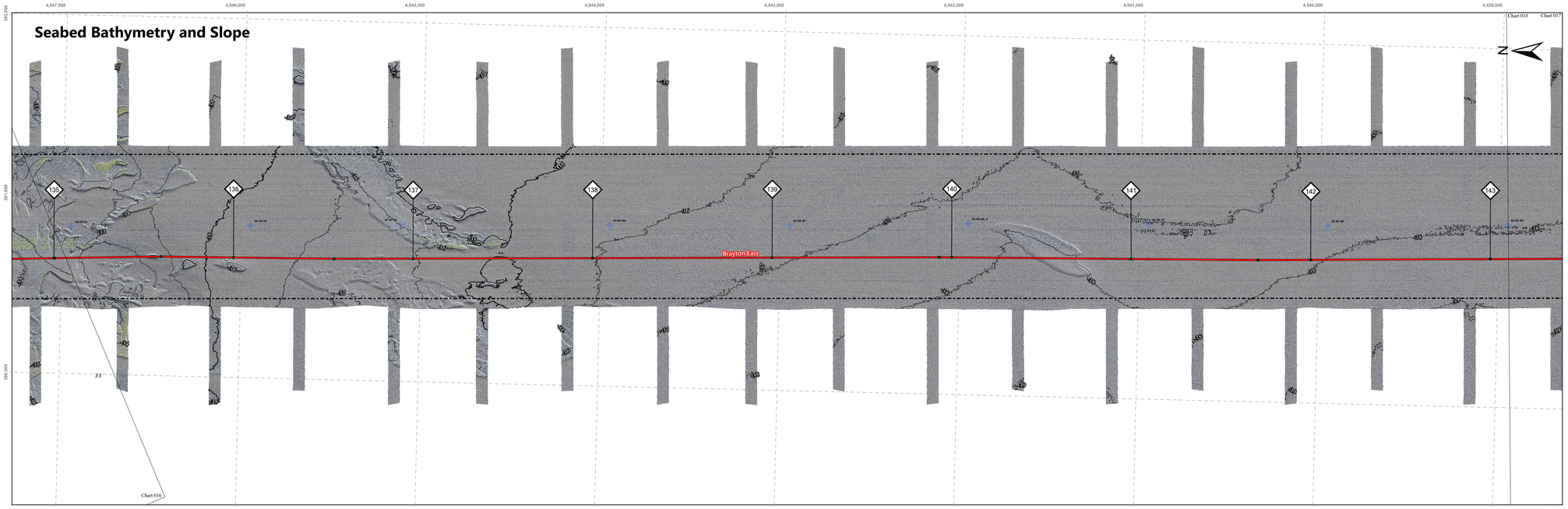
REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
0	12/20/2022	Draft	ARH / RS	SN / BQ	AN

Project No: 2022 - 529 — Chart No: 016c - 018c

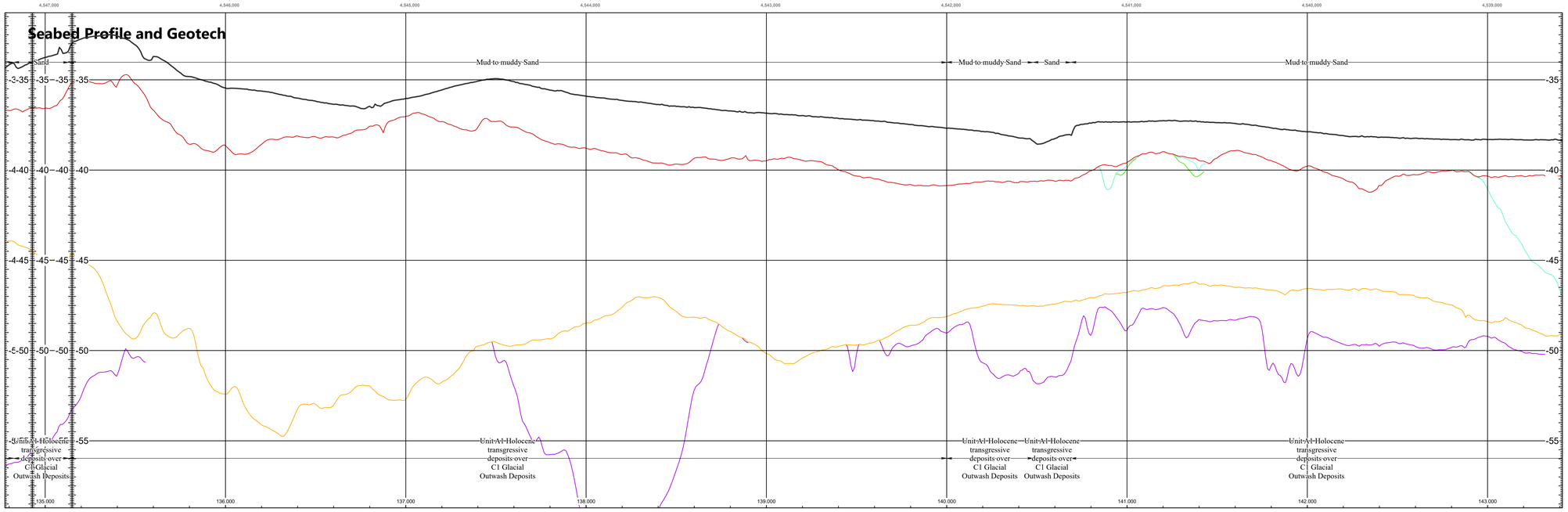
Habitat and Avoidances



Seabed Bathymetry and Slope



Seabed Profile and Geotech



SOUTHCOAST WIND

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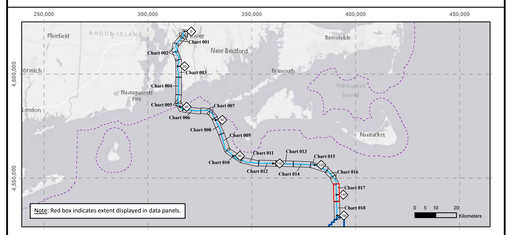
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 134.776 TO 143.415

2022 — Chart No. 017c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

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- Chart Panels
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- Maritime Boundary
- Avoidance Zones
- Lease Area
- State Waters
- COLREGS Demarcation Line Crossing
- Navigation Buoy

Brayton East RPLs
- Alter Course
- Possible Linear Magnetic Anomaly
- HDD
- Maritime Boundary
- Onshore
- Pipeline Crossing
- Water Depth of Note

Geotechnical Sample Points
- Seabed CPT
- Vibro Core

HABITAT AND AVOIDANCES

Benthic Habitat
- Anthropogenic
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- Boulder Field(s)
- Crepidula Substrate
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- SAV

Utility Alignments
- Cable and/or Pipeline

Shipping Lanes
- Areas to be Avoided
- Particularly Sensitive Sea Area
- Precautionary Areas
- Recommended Routes
- Anchorage Areas

- Vineyard Wind Corridor
- Shipping Fairways Lanes and Zones
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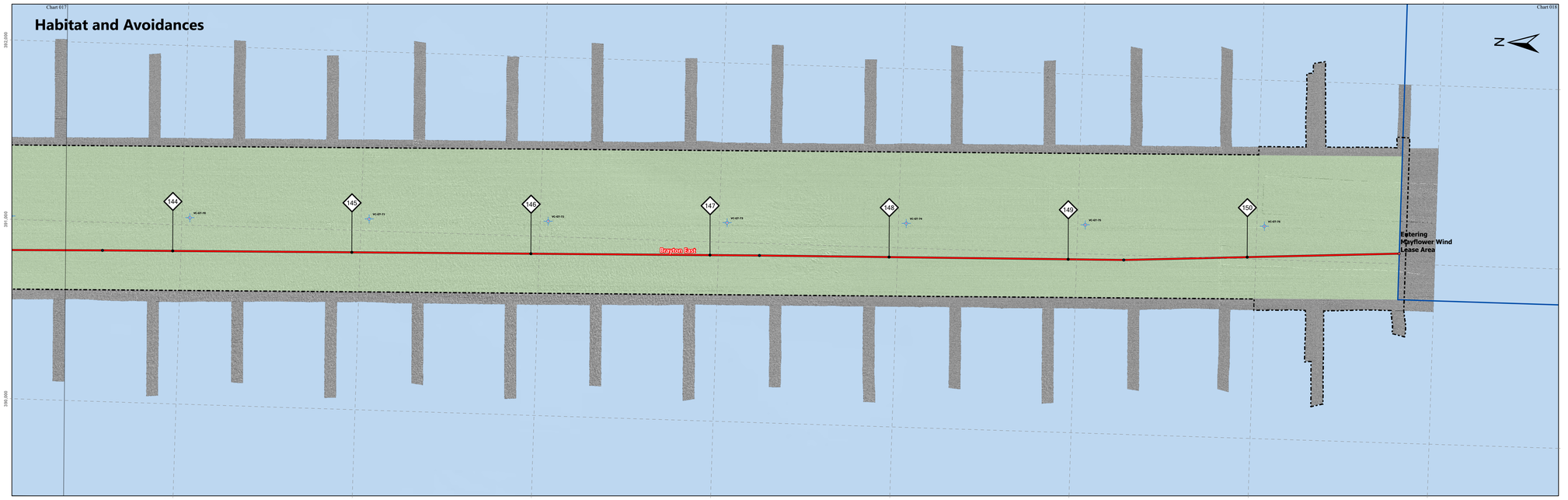
Project No: 2022 - 529 — Chart No: 017c - 018c

Habitat and Avoidances



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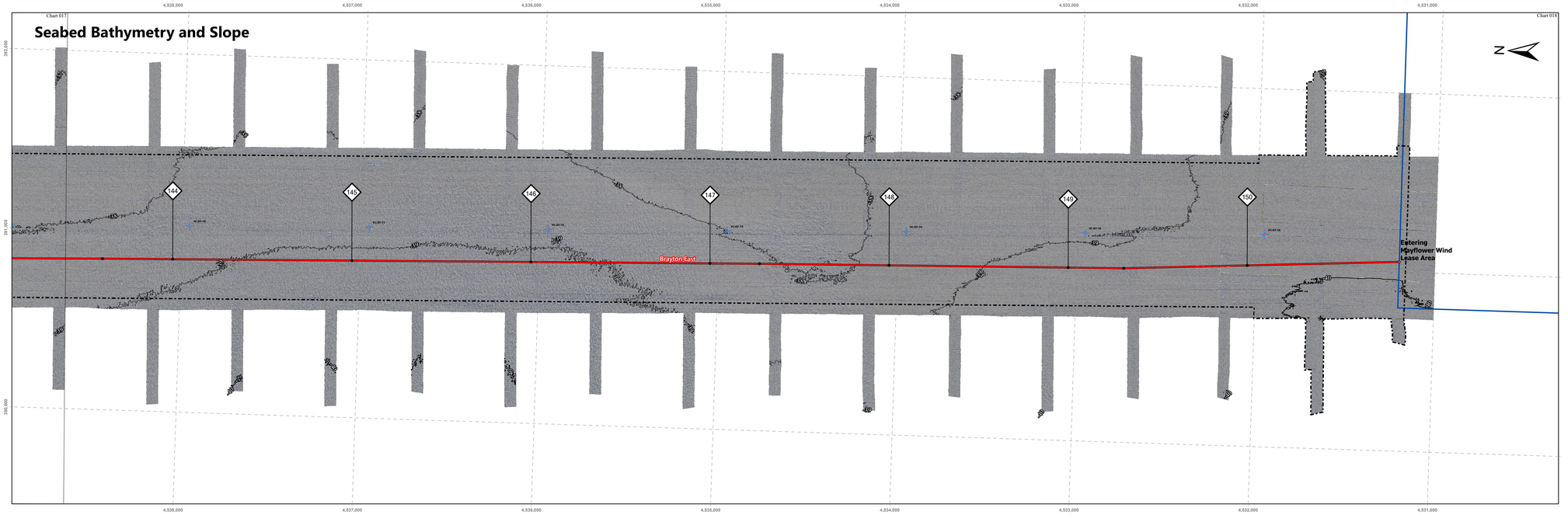

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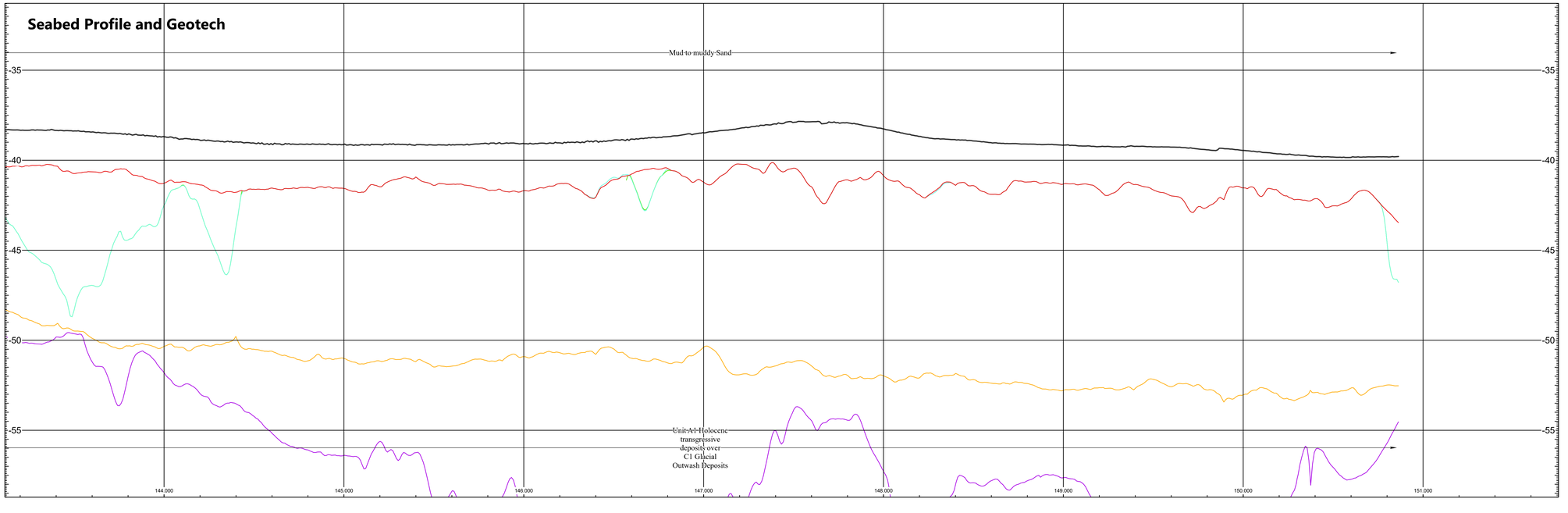

SOUTHCOAST WIND

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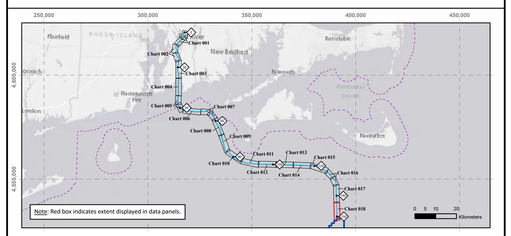
PRELIMINARY MICRO-ROUTING AND CABLE BURIAL RISK ASSESSMENT (CBRA)
OFFSHORE MASSACHUSETTS

PRELIMINARY EXPORT CABLE ALIGNMENT CHART
KP 143.115 TO 150.863

2022 — Chart No. 018c - 018c

XODUS GROUP, LLC.
Boston, Massachusetts
Tel: +1 857-263-1772

XODUS



LEGEND

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- H99 Interpreted Top of Bedrock/Glacial Till
- Depth to Top Glacial Deposits
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REV.	DATE	REMARKS	ORIGINATOR	DRAWN	CHECKED
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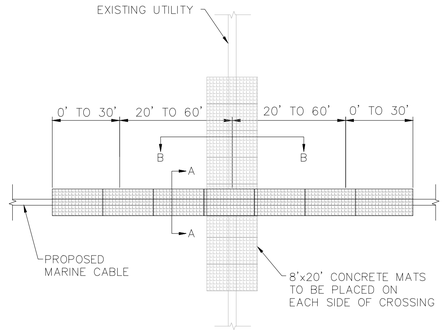
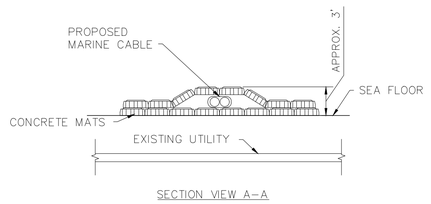
Project No: 2022 - 529 — Chart No: 018c - 018c



PLAN VIEW

EXISTING UTILITY CROSSING

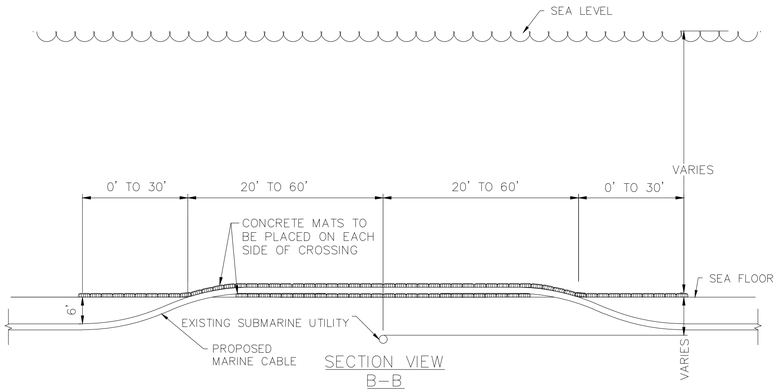
SCALE N.T.S.



SECTION VIEW A–A

EXISTING UTILITY CROSSING

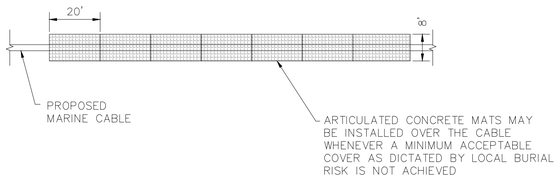
SCALE N.T.S.



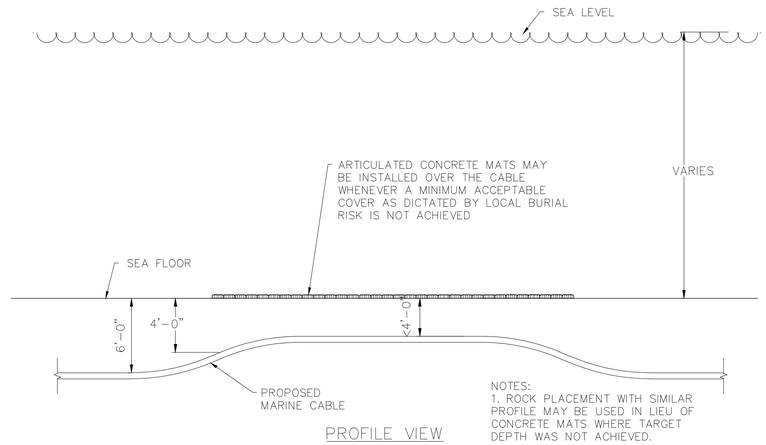
SECTION VIEW
B–B

EXISTING UTILITY CROSSING

SCALE N.T.S.



PLAN VIEW

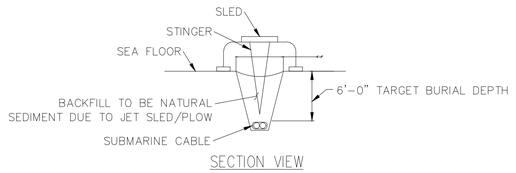


PROFILE VIEW

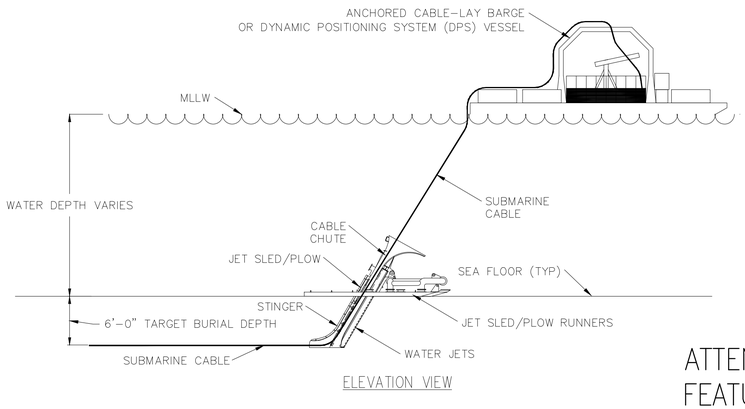
NOTES:
1. ROCK PLACEMENT WITH SIMILAR PROFILE MAY BE USED IN LIEU OF CONCRETE MATS WHERE TARGET DEPTH WAS NOT ACHIEVED.

SHALLOW PENETRATION DETAIL

SCALE N.T.S.



SECTION VIEW



ELEVATION VIEW

SUBMARINE CABLE INSTALLATION DETAIL

SCALE N.T.S.

ATTENTION: FOR CLEANER TEXT AND LINE FEATURES WHEN USING ADOBE TO VIEW THESE PDFS, TURN OFF THE "SMOOTH LINE ART" AND "ENHANCE THIN LINES" OPTIONS UNDER EDIT–PREFERENCES–PAGE DISPLAY

NOTES:
1. DRAWING ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.
2. PRELIMINARY CROSSING DESIGN. DIMENSIONS AND QUANTITIES Of MATTRESSES TO BE FINALIZED IN CONSULTATION WITH UTILITY OWNERS.

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
C	ISSUED FOR REVIEW	02/13/2023	LAS	JD	JD		
B	ISSUED FOR REVIEW	02/03/2023	BAJ	JD	JD		
A	ISSUED FOR REVIEW	01/14/2023	BAJ	TSG	TSG		

DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

SCALE: N.T.S.
FOR 22x34 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND
PERMIT DRAWINGS
SUBMARINE DETAILS

JOB NUMBER 172033 REV C
DRAWING NUMBER 1

172033 – Submarine Details – Environmental Permit.dwg

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment D: Onshore Engineering Drawings

Revised: September 2024

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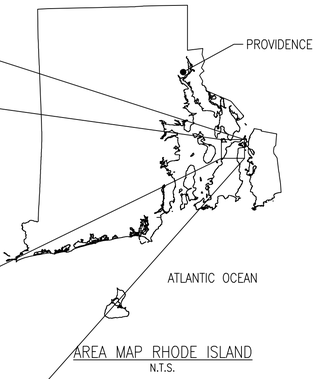
SOUTHCOAST WIND
30% UNDERGROUND EXPORT CABLE SYSTEM DESIGN
BOYDS LANE TO MONTAUP COUNTRY CLUB PARKING LOT

VICINITY MAP

0 500 1000 1500FEET

HORIZONTAL SCALE 1"= 500'



AREA MAP RHODE ISLAND
N.T.S.

PLANS: ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION
DATE ISSUED: FEBRUARY 2023

OWNER/APPLICANT:
SOUTHCOAST WIND ENERGY LLC
101 FEDERAL STREET
BOSTON, MA 02110

PREPARER:
POWER ENGINEERS CONSULTING, PC
2 HAMPSHIRE STREET, SUITE 301
FOXBOROUGH , MA 02035

NOTE: DRAWINGS ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.

Know what's **below.**
Call before you dig.

POWER ENGINEERS
PROJECT ENGINEER: TODD GOYETTE

POWER ENGINEERS
PROJECT NUMBER: 172033

ATTENTION: FOR CLEANER TEXT AND LINE FEATURES WHEN USING ADOBE TO VIEW THESE PDFS, TURN OFF THE "SMOOTH LINE ART" AND "ENHANCE THIN LINES" OPTIONS UNDER EDIT–PREFERENCES–PAGE DISPLAY

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
C	ISSUED FOR REVIEW	02/13/2023	BAJ	TSG	TSG		
B	ISSUED FOR REVIEW	02/03/2023	BAJ	TSG	TSG		
A	ISSUED FOR REVIEW	12/16/2022	BAJ	TSG	TSG		

DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

SCALE: AS SHOWN

FOR 22x34 DWG ONLY

POWER ENGINEERS

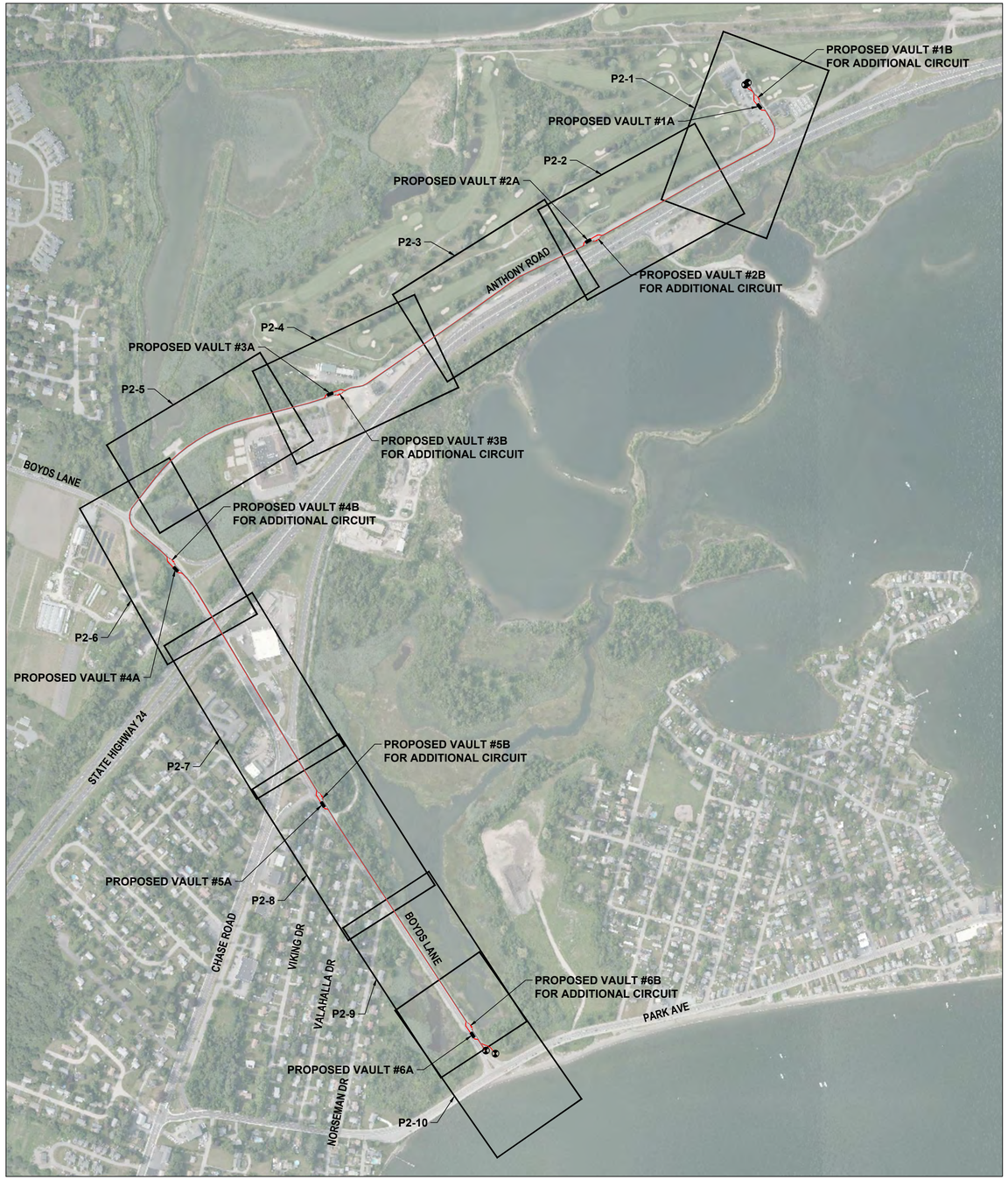
SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
COVER SHEET

JOB NUMBER 172033 REV C

DRAWING NUMBER G0–1

172033 – Mayflower Cover And Manifest Option 2 – Environmental Permit.dwg

DRAWING MANIFEST			
DRAWING NO.	TITLE/DESCRIPTION	REVISION	DATE
1	COVER	C	02/13/23
2	MANIFEST	C	02/13/23
3	NOTES	C	02/13/23
4	PLAN – STA. 00+00 TO 8+00	C	02/13/23
5	PLAN – STA. 8+00 TO 18+00	C	02/13/23
6	PLAN – STA. 18+00 TO 28+00	C	02/13/23
7	PLAN – STA. 28+00 TO 38+00	C	02/13/23
8	PLAN – STA. 38+00 TO 48+00	C	02/13/23
9	PLAN – STA. 48+00 TO 58+00	C	02/13/23
10	PLAN – STA. 58+00 TO 68+00	C	02/13/23
11	PLAN – STA. 68+00 TO 78+00	C	02/13/23
12	PLAN – STA. 78+00 TO 88+00	C	02/13/23
13	PLAN – STA. 88+00 TO 88+53	C	02/13/23
14	TYPICAL DUCT BANK SECTIONS	C	02/13/23
15	BOYDS LANE HDD PLAN & PROFILE	C	02/13/23
16	BOYDS LANE HDD LAYOUT	C	02/13/23
17	MONTAUP COUNTRY CLUB HDD PLAN & PROFILE	C	02/13/23
18	MONTAUP COUNTRY CLUB HDD LAYOUT	C	02/13/23
19	ROGER WILLIAMS UNIVERSITY HDD PLAN & PROFILE	C	02/13/23
20	ROGER WILLIAMS UNIVERSITY HDD LAYOUT	C	02/13/23
21	POTENTIAL ADDITIONAL STAGING AREA	C	02/13/23
22	TYPICAL HDD DETAIL	C	02/13/23



LEGEND

- HDD START/END
- SOIL BORE
- W — EXISTING WATER LINE
- G — EXISTING GAS LINE
- D — EXISTING STORM DRAINAGE LINE
- S — EXISTING SANITARY SEWER LINE
- E — EXISTING UNDERGROUND ELECTRIC LINE

GENERAL NOTES

1. THE UTILITIES AND NATURAL FEATURES SHOWN HEREON ARE BASED ON:
   - LEVEL D SURVEY PERFORMED BY DIPRETE ENGINEERING, 01/19/2022
   - GOOGLE EARTH 2020
   - OTHER FACILITIES MAY EXIST NOT DISCOVERED THROUGH THE RECORD CHECK. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION, BOTH HORIZONTAL AND VERTICAL, OF ALL UTILITIES THROUGH THE APPROPRIATE UTILITY COMPANIES. CALL BEFORE YOU DIG, 811 OR 1-888-344-7233.
2. STATE PLANE COORDINATE (HORIZONTAL DATUM): REFERENCES RHODE ISLAND PLAN COORDINATE SYSTEM – NAD83 1983, US FOOT.
3. STATE PLANE COORDINATE (VERTICAL DATUM): NAVD 1988. THE COORDINATE SYSTEM THAT THIS SURVEY WAS BASED UPON IS STATE PLANE NAD 88, US FOOT.
4. ALL VERTICAL RADII ARE 400', AND HORIZONTAL RADII ARE 50' UNLESS OTHERWISE NOTED.
5. WETLAND DELINEATIONS SHOWN ARE BASED ON FIELD SURVEYS CONDUCTED IN DECEMBER 2021 AND JANUARY 2022 AND RIGIS DATASET (1993).
6. DRAWINGS ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.

ENVIRONMENTAL LEGEND:

- RI_FEMA 100-YR FLOODZONE
- FRESHWATER WETLAND (FWVC)
- FRESHWATER WETLAND 100' CONTIGUOUS AREA
- COASTAL WETLAND
- COASTAL WETLAND 200' CONTIGUOUS AREA
- RIVER/STREAM 200' CONTIGUOUS AREA
- COASTAL DUNE
- COASTAL BEACH
- OPEN WATER
- PSCL PERENIAL STREAM CENTER LINE
- FWVC FRESH WATER WETLANDS IN THE VICINITY OF THE COAST
- + + MOORING FIELDS

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
- HDD LOCATION
- LIMIT OF DISTURBANCE (TYP)
- STRAW WATTLE/FILTER SOCK
- CATCH BASIN PROTECTION
- CULVERT
- PROPERTY LINE
- TREE PROTECTION
- PROPOSED TRANSITION JOINT BAY
- PROPOSED COMMUNICATIONS HANDHOLE
- TYPICAL CONCRETE WASH STATION

ATTENTION: FOR CLEANER TEXT AND LINE FEATURES WHEN USING ADOBE TO VIEW THESE PDFS, TURN OFF THE "SMOOTH LINE ART" AND "ENHANCE THIN LINES" OPTIONS UNDER EDIT–PREFERENCES–PAGE DISPLAY

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SOUTHCOAST WIND
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
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B	ISSUED FOR REVIEW	02/03/2023	BAJ	TSG	TSG		
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DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22
SCALE:	AS SHOWN	
FOR 22x34 DWG ONLY		

POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
GENERAL NOTES & MANIFEST

JOB NUMBER 172033 | REV C

DRAWING NUMBER G1-1

172033 – Mayflower Cover And Manifest Option 2 – Environmental Permit.dwg

ENVIRONMENTAL FIELD ISSUE PLAN SET GENERAL NOTES

GENERAL NOTES:

1. DRAWINGS ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.
2. PROPERTY AND BOUNDARY INFORMATION AND EXISTING UNDERGROUND UTILITIES SHOWN ARE FROM PUBLICLY AVAILABLE DATA AND ARE PROVIDED FOR REFERENCE PURPOSES ONLY. POWER ENGINEERS MAKES NO REPRESENTATION OR WARRANTY AS TO THE ACCURACY OR LOCATION OF THE INFORMATION SHOWN.
3. LIMITS OF DISTURBANCE (TYP) ARE DEPICTED AS A TYPICAL WORK CORRIDOR AND MAY SHIFT OR EXPAND TO ACCOMMODATE EXISTING UTILITY CROSSINGS, ROADWAY RESTRICTIONS, OR OTHER SAFETY CONSIDERATIONS.
4. SPLICE VAULT LOCATIONS ARE PRELIMINARY AND SUBJECT TO CHANGE BASED ON A DETAILED CABLE SYSTEM DESIGN.

EROSION AND SEDIMENT CONTROL GENERAL NOTES:

1. AREAS INSIDE THE LIMITS OF DISTURBANCE WILL BE RESTORED BY THE CONTRACTOR TO THEIR ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE, TO THE SATISFACTION OF SOUTHCOAST WIND.
2. CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR SITE SECURITY AND JOB SAFETY. ALL CONSTRUCTION ACTIVITY WILL BE IN ACCORDANCE WITH OSHA REGULATIONS AND LOCAL AND STATE REQUIREMENTS.
3. ALL MATERIALS ARE TO BE DISPOSED OF PER APPLICABLE LAWS AND REGULATIONS
4. DEWATERING ACTIVITIES WILL OCCUR OUTSIDE OF WETLANDS AND WATERCOURSES WITH APPROVED DEWATERING CONTROLS SUCH AS FILTER BAGS, FILTER SOCKS, WEIR TANKS OR DEWATERING BASINS. WHERE THIS IS NOT POSSIBLE, DEWATERING EFFLUENT WILL BE TRANSPORTED OFFSITE.
5. ALL WETLANDS AND WATERWAYS WILL BE FLAGGED PRIOR TO COMMENCING WORK ACTIVITIES AT THE SITE.
6. MAINTAIN UNDISTURBED VEGETATED BUFFERS BETWEEN WORK AREAS AND WETLANDS/WATERWAYS WHEREVER POSSIBLE.
7. LIMIT REMOVAL OF, AND DAMAGE TO, EXISTING VEGETATION WHEREVER POSSIBLE.
8. AVOID UNNECESSARY DISTURBANCE OF SITE SOILS WHEREVER POSSIBLE.
9. UPON COMPLETION OF CONSTRUCTION IN A GIVEN LOCATION (STRUCTURE, WORK AREA, ETC.), DISTURBED OR EXPOSED SOILS WILL BE STABILIZED WITH MULCH, BLANKETS OR SIMILAR TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICE ADEQUATE FOR PROVIDING TEMPORARY STABILIZATION WHILE VEGETATION BECOMES ESTABLISHED.
10. WHERE TEMPORARY EROSION CONTROL, OR PERMANENT SEED MIXES ARE PLACED, APPROPRIATE TEMPORARY MEASURES WILL BE TAKEN TO PREVENT SOIL EROSION WHILE SEED IS GERMINATING.
11. MULCH WILL NOT BE USED AS A TEMPORARY EROSION CONTROL PRACTICE IN DRAINAGEWAYS. MULCH PLACEMENT ON STEEP SLOPES (>3:1) WILL BE LIMITED TO HYDRAULIC MULCH OR ROLLED EROSION CONTROL PRODUCTS (E.G., EROSION CONTROL BLANKETS, ETC.).
12. SEEDING WILL OCCUR ONLY DURING SPECIFIED PLANTING SEASONS UNLESS OTHERWISE DIRECTED BY SOUTHCOAST WIND.
13. SEED MIXES WILL BE APPROVED BY THE SOUTHCOAST WIND ENVIRONMENTAL COMPLIANCE MONITOR PRIOR TO PLACEMENT. SEED MIXES WILL BE APPROPRIATE FOR THE SITE CONDITIONS (E.G. WETLAND, UPLAND, ETC.).
14. LOW GROWING, WOODY PLANT SPECIES AND ROOT SYSTEMS WILL BE RETAINED IN LOCATIONS WHERE WORK PADS AND ACCESS ROADS ARE NOT PROPOSED. CARE WILL BE TAKEN TO PROTECT SUCH PLANTS AND THEIR ROOT SYSTEMS FROM DAMAGE AND COMPACTION.
15. PERIMETER SEDIMENT CONTROL LOCATIONS SHOWN ON THE PLANS CONTAINED HEREIN ARE APPROXIMATIONS, AND MAY CHANGE DEPENDING ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION OR AS DIRECTED BY THE SOUTHCOAST WIND ENVIRONMENTAL COMPLIANCE MONITOR. PERIMETER SEDIMENT CONTROLS WILL NOT BE INSTALLED DIRECTLY IN WETLANDS WITHOUT PRIOR WRITTEN APPROVAL FROM THE SOUTHCOAST WIND ENVIRONMENTAL COMPLIANCE MONITOR.
16. WHERE RESOURCE AREAS OCCUR IMMEDIATELY ADJACENT TO AND DOWN GRADIENT FROM THE WORK, SEDIMENT PERIMETER CONTROLS (E.G. STRAW WATTLES, COMPOST FILTER SOCKS, EXCELSIOR SEDIMENT LOGS, STRAW BALES, REINFORCED SILT FENCE, ETC.) WILL BE PLACED BETWEEN THE RESOURCE AREA AND THE WORK ZONE PRIOR TO THE COMMENCEMENT OF WORK. PERIMETER CONTROLS WILL BE INSTALLED AS CLOSE TO THE AREA OF DISTURBANCE AS POSSIBLE. PERIMETER CONTROL SELECTION SHOULD OCCUR IN COORDINATION WITH THE SOUTHCOAST WIND ENVIRONMENTAL COMPLIANCE MONITOR.
17. PERIMETER SEDIMENT CONTROLS WILL BE PLACED ALONG THE DOWN SLOPE EDGE OF UNPAVED ACCESS ROADS AS INDICATED ON THE PLANS WHEREVER WETLANDS RESOURCES ARE CLOSER THAN 50' TO THE EDGE OF ROAD AND/OR ADJACENT TO SLOPES EXCEEDING A GRADE OF 3:1, OR AS DIRECTED BY THE SOUTHCOAST WIND ENVIRONMENTAL COMPLIANCE MONITOR.
18. DEWATERING AREAS, CONCRETE WASHOUT AREAS, AND TEMPORARY SOIL STOCKPILE AREAS SHOWN ON THE PLAN INDICATE ONLY THAT SUCH DEVICES AND PRACTICES MAY BE REQUIRED AND DO NOT APPROXIMATE LOCATIONS. FINAL LOCATIONS FOR SUCH DEVICES AND PRACTICES WILL BE DETERMINED DURING CONSTRUCTION AS FIELD CONDITIONS REQUIRE AND ALLOW. DEWATERING MAY BE REQUIRED IN ADDITIONAL LOCATIONS DEPENDING ON FIELD CONDITIONS DURING CONSTRUCTION.
19. INSTALL INLET PROTECTION IF CATCH BASINS PRESENT.
20. ALL EROSION AND SEDIMENT CONTROLS, DEVICES, AND PRACTICES WILL BE PROPERLY MAINTAINED, REPLACED, SUPPLEMENTED, OR MODIFIED AS NECESSARY THROUGHOUT THE LIFE OF THE PROJECT IN ORDER TO MINIMIZE SOIL EROSION AND TO PREVENT SEDIMENT FROM BEING DEPOSITED IN ANY WETLANDS OR COASTAL FEATURES.
21. SOIL STOCKPILES WILL BE CONTAINED WITHIN APPROVED CONSTRUCTION WORK ZONES OR DESIGNATED STOCKPILING AREAS.
22. WHERE POSSIBLE, SOIL STOCKPILES WILL NOT EXCEED 5 FEET HIGH IN HEIGHT. SOIL STOCKPILES WILL BE COVERED WITH MATTING, TARP, OR OTHER SIMILAR MATERIAL AND WEIGHTS AT THE END OF EACH CONSTRUCTION DAY IF NECESSARY. INSTALL PERIMETER CONTROLS AROUND ALL STOCKPILES IN CLOSE PROXIMITY TO WETLANDS CONTIGUOUS AREAS.
23. STONE, SOIL, OR OTHER FILL MATERIALS WILL NOT BE PLACED IN ANY WETLANDS, WATERBODIES, OR WATERWAYS BEYOND PERMITTED AREAS.
24. UPON PERMANENT STABILIZATION OF ALL DISTURBED SOILS, TEMPORARY EROSION AND/OR SEDIMENT CONTROLS WILL BE REMOVED FROM, AND DISPOSED OF PROPERLY, OFF-SITE.
25. ANY POTENTIALLY IMPACTED SOILS OR WATER ENCOUNTERED DURING CONSTRUCTION ACTIVITIES WILL BE MANAGED IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

EROSION AND SEDIMENT CONTROL MAINTENANCE DURING CONSTRUCTION:

1. ALL EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED FOR STABILITY AND PROPER FUNCTION AFTER EVERY RUNOFF PRODUCING STORM EVENT, OR AT LEAST WEEKLY. ALL NECESSARY REPAIRS WILL BE MADE IMMEDIATELY.
2. TRAPPED SEDIMENT WILL BE REMOVED FROM BEHIND PERIMETER CONTROL DEVICES BEFORE THE DEPOSITS REACH 50 PERCENT (1/2) OF THE ABOVE-GROUND HEIGHT OF THE DEVICE, UNLESS OTHERWISE NOTED, OR ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
3. IN DISTURBED AREAS WHERE ADEQUATE SEED STOCK IS NOT PRESENT, OR WHERE TOPSOIL HAS BEEN DISPLACED, SOILS WILL BE PREPARED IN A MANNER SUITABLE FOR SUPPORTING PLANT GROWTH PRIOR TO PLACING SEED, MULCH, AND OR OTHER EROSION CONTROL PRACTICES APPROPRIATE FOR THE SITE.

GENERAL CONSTRUCTION NOTES:

1. ONSHORE CONSTRUCTION PRACTICES WILL BE PERFORMED IN COMPLIANCE WITH THE FOLLOWING STANDARDS, AS APPLICABLE:
   - RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK
   - RHODE ISLAND STORMWATER DESIGN AND INSTALLATION STANDARDS MANUAL
   - RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT WETLAND BMP MANUAL

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
C	ISSUED FOR REVIEW	02/13/2023	BAJ	TSG	TSG		
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DSGN	JD	09/28/22
DRN	BAJ	09/22/22
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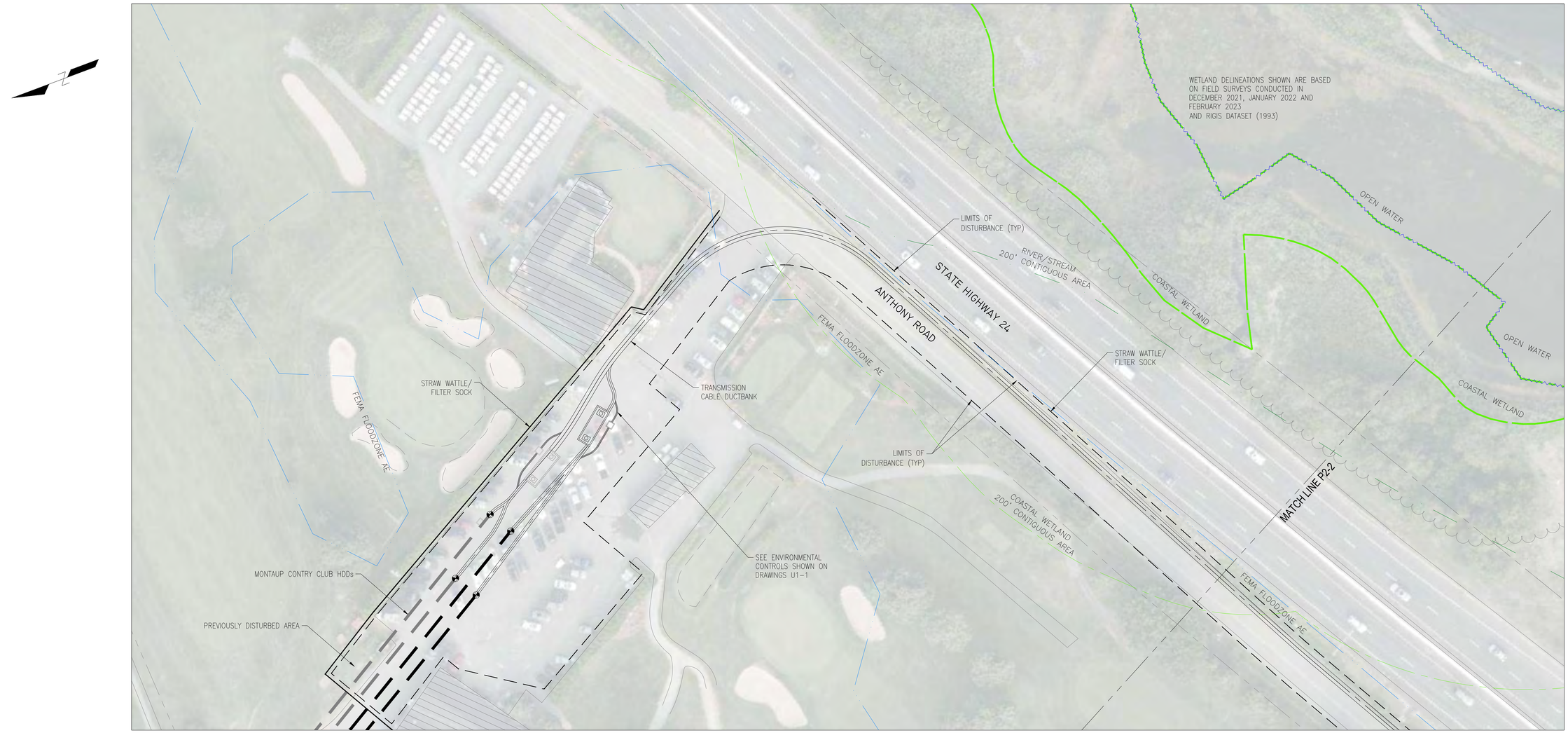
SCALE: NONE
FOR 22x34 DWG ONLY

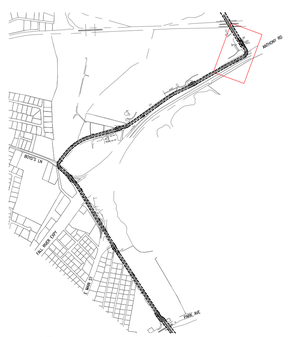
POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
GENERAL NOTES

JOB NUMBER 172033 | REV C
DRAWING NUMBER G1-2

172033 - PLAN & PROFILE - OPTION 2 - Environmental Permit.dwg





KEY

NOT TO SCALE

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
- HDD LOCATION
- LIMIT OF DISTURBANCE (TYP)
- STRAW WATTLE/FILTER SOCK
- CATCH BASIN PROTECTION
- CULVERT
- PROPERTY LINE
- TREE PROTECTION
- PROPOSED TRANSITION JOINT BAY
- PROPOSED COMMUNICATIONS HANDHOLE
- TYPICAL CONCRETE WASH STATION

PLAN VIEW

NOTES:

1. DRAWINGS ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.
2. CATCH BASIN INLET PROTECTION CONSISTING OF A SILTSACK WILL BE INSTALLED AT CATCH BASINS ALONG THE PROJECT ROUTE.
3. LIMITS OF DISTURBANCE (TYP) ARE DEPICTED AS A TYPICAL WORK CORRIDOR AND MAY SHIFT OR EXPAND TO ACCOMMODATE EXISTING UTILITY CROSSINGS, ROADWAY RESTRICTIONS OR OTHER SAFETY CONSIDERATIONS.
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5. DEWATERING AREAS, CONCRETE WASHOUT AREAS, AND TEMPORARY SOIL STOCKPILE AREAS SHOWN ON THE PLAN INDICATE ONLY THAT SUCH DEVICES AND PRACTICES MAY BE REQUIRED AND DO NOT APPROXIMATE LOCATIONS. FINAL LOCATIONS FOR SUCH DEVICES AND PRACTICES WILL BE DETERMINED DURING CONSTRUCTION AS FIELD CONDITIONS REQUIRE AND ALLOW. DEWATERING MAY BE REQUIRED IN ADDITIONAL LOCATIONS DEPENDING ON FIELD CONDITIONS DURING CONSTRUCTION.
6. TREES TO BE RETAINED WILL BE MARKED AND TREE PROTECTION MEASURES WILL BE IMPLEMENTED.
7. OUTDATED AERIAL IMAGERY DOES NOT REFLECT CURRENTLY PAVED/PREVIOUSLY DISTURBED MONTAUP COUNTRY CLUB LIMITS OF DISTURBANCE.

TO BOYDS LN HDD ➡

ENVIRONMENTAL LEGEND:

- RI_FEMA FLOODZONE AE
- FRESHWATER WETLAND
- FRESHWATER WETLAND 100' CONTIGUOUS AREA
- COASTAL WETLAND
- COASTAL WETLAND 200' CONTIGUOUS AREA
- RIVER/STREAM 200' CONTIGUOUS AREA
- COASTAL DUNE
- COASTAL BEACH
- OPEN WATER
- PSCL PERENIAL STREAM CENTER LINE
- MOORING FIELDS

0 20 40 80 120 FEET

HORIZONTAL SCALE: 1"= 40'

ATTENTION: FOR CLEANER TEXT AND LINE FEATURES WHEN USING ADOBE TO VIEW THESE PDFS, TURN OFF THE "SMOOTH LINE ART" AND "ENHANCE THIN LINES" OPTIONS UNDER EDIT–PREFERENCES–PAGE DISPLAY

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
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DRN	BAJ	09/22/22
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SCALE: 1" = 40'

FOR 22x34 DWG ONLY

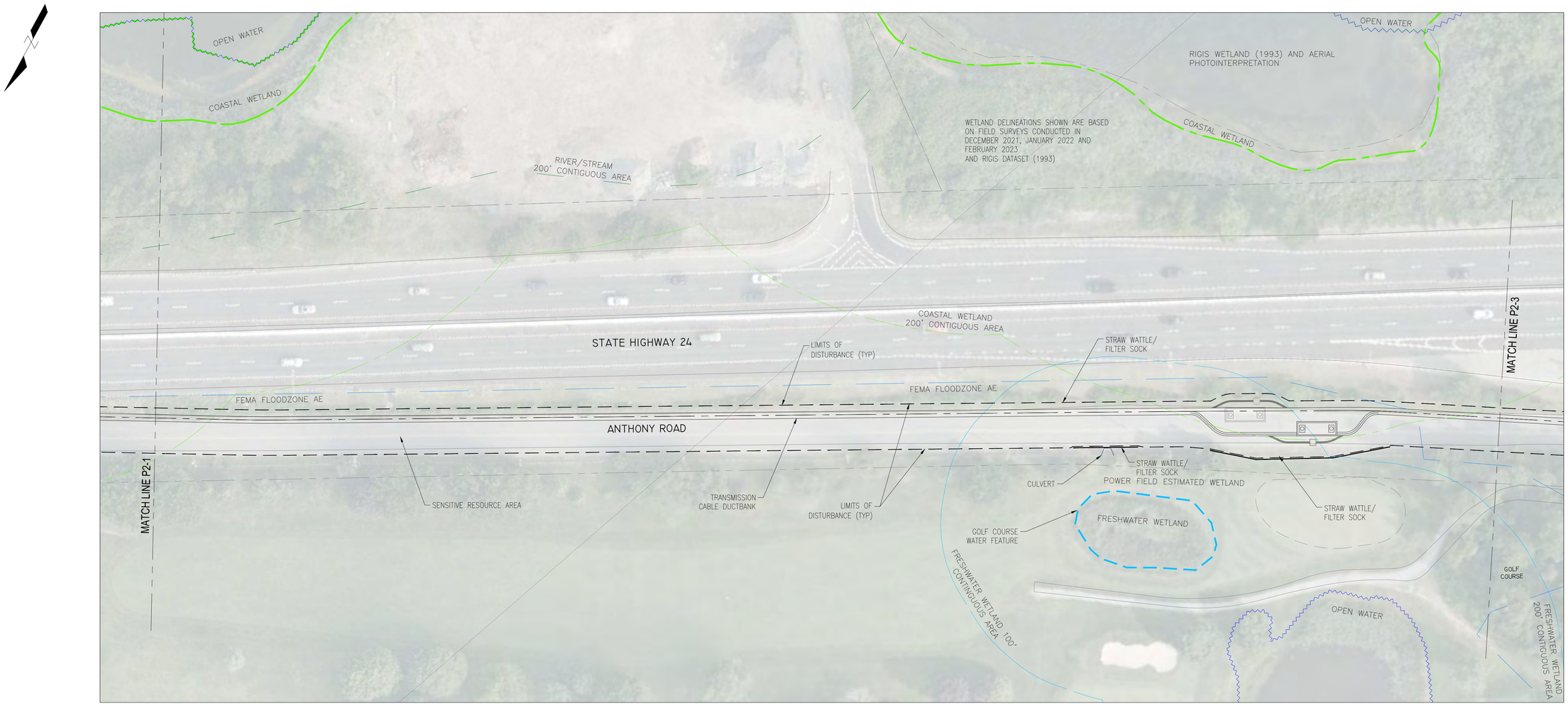
POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 | REV D

DRAWING NUMBER P2-1

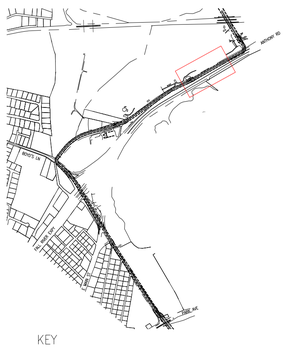
172033 – PLAN & PROFILE – OPTION 2 – Environmental Permit.dwg



← TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW

TO BOYDS LANE HDD →



KEY

NOT TO SCALE

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
- HDD LOCATION
- LIMIT OF DISTURBANCE (TYP)
- STRAW WATTLE/FILTER SOCK
- CATCH BASIN PROTECTION
- CULVERT
- PROPERTY LINE
- TREE PROTECTION
- PROPOSED TRANSITION JOINT BAY
- PROPOSED COMMUNICATIONS HANDHOLE
- TYPICAL CONCRETE WASH STATION

NOTES:

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ENVIRONMENTAL LEGEND:

- RI_FEMA FLOODZONE AE
- FRESHWATER WETLAND
- FRESHWATER WETLAND 100' CONTIGUOUS AREA
- COASTAL WETLAND
- COASTAL WETLAND 200' CONTIGUOUS AREA
- RIVER/STREAM 200' CONTIGUOUS AREA
- COASTAL DUNE
- COASTAL BEACH
- OPEN WATER
- PSCL PERENIAL STREAM CENTER LINE
- MOORING FIELDS

0 20 40 80 120 FEET

HORIZONTAL SCALE: 1"= 40'

ATTENTION: FOR CLEANER TEXT AND LINE FEATURES WHEN USING ADOBE TO VIEW THESE PDFS, TURN OFF THE "SMOOTH LINE ART" AND "ENHANCE THIN LINES" OPTIONS UNDER EDIT–PREFERENCES–PAGE DISPLAY

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
C	ISSUED FOR REVIEW	02/13/2023	BAJ	TSG	TSG		
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DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

SCALE: 1" = 40'

FOR 22x34 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND

AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS

ENVIRONMENTAL PLAN

JOB NUMBER 172033

REV C

DRAWING NUMBER P2-2

172033 – PLAN & PROFILE – OPTION 2 – Environmental Permit – Copy.dwg

← TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW

TO BOYDS LANE HDD →

KEY

NOT TO SCALE

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
- HDD LOCATION
- LIMIT OF DISTURBANCE (TYP)
- STRAW WATTLE/FILTER SOCK
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SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 | REV C

DRAWING NUMBER P2–3

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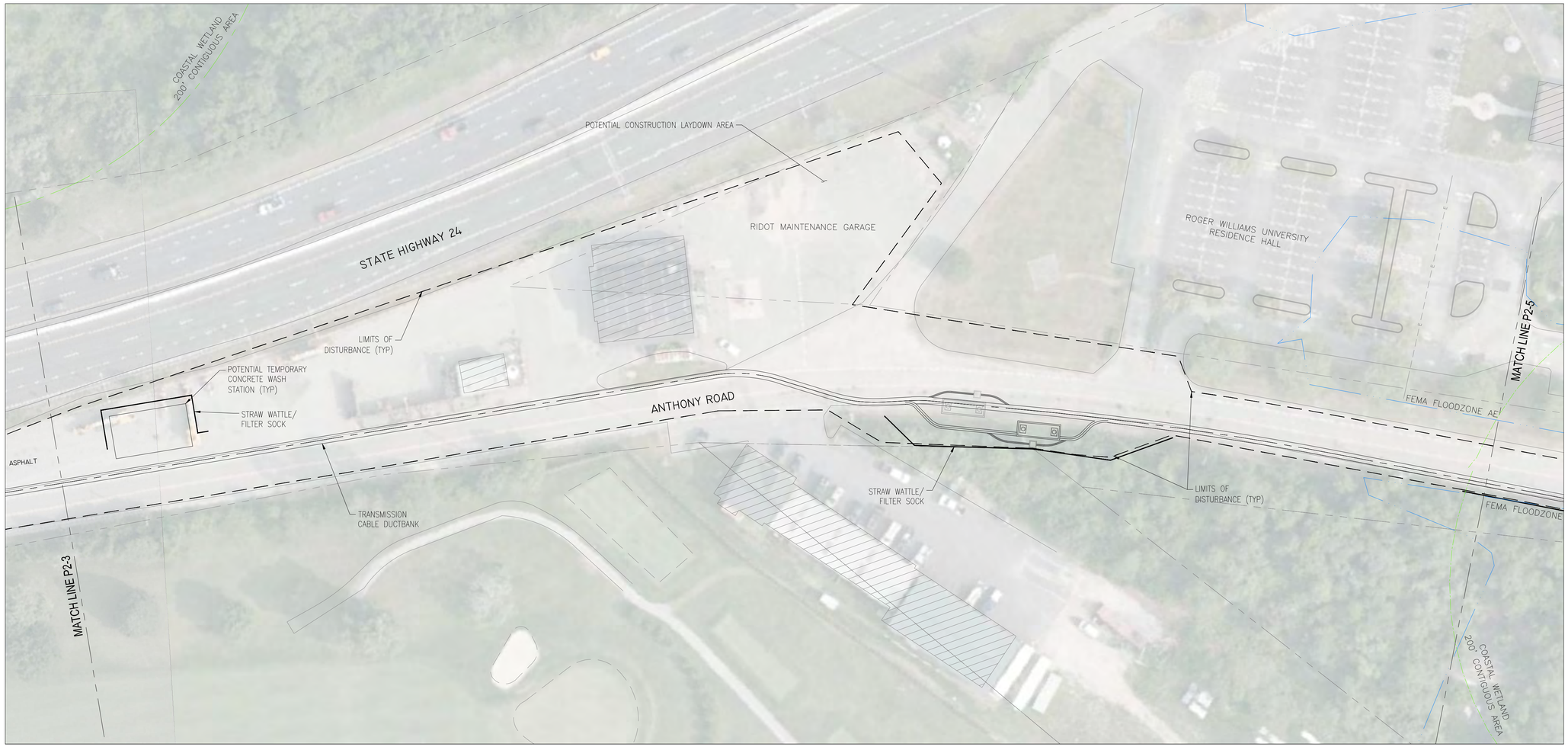

TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW

TO BOYDS LANE HDD

KEY

NOT TO SCALE

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
- HDD LOCATION
- LIMIT OF DISTURBANCE (TYP)
- STRAW WATTLE/FILTER SOCK
- CATCH BASIN PROTECTION
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0 20 40 80 120 FEET

HORIZONTAL SCALE: 1"= 40'

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SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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SCALE: 1" = 40'

FOR 22x34 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 | REV C

DRAWING NUMBER P2-4

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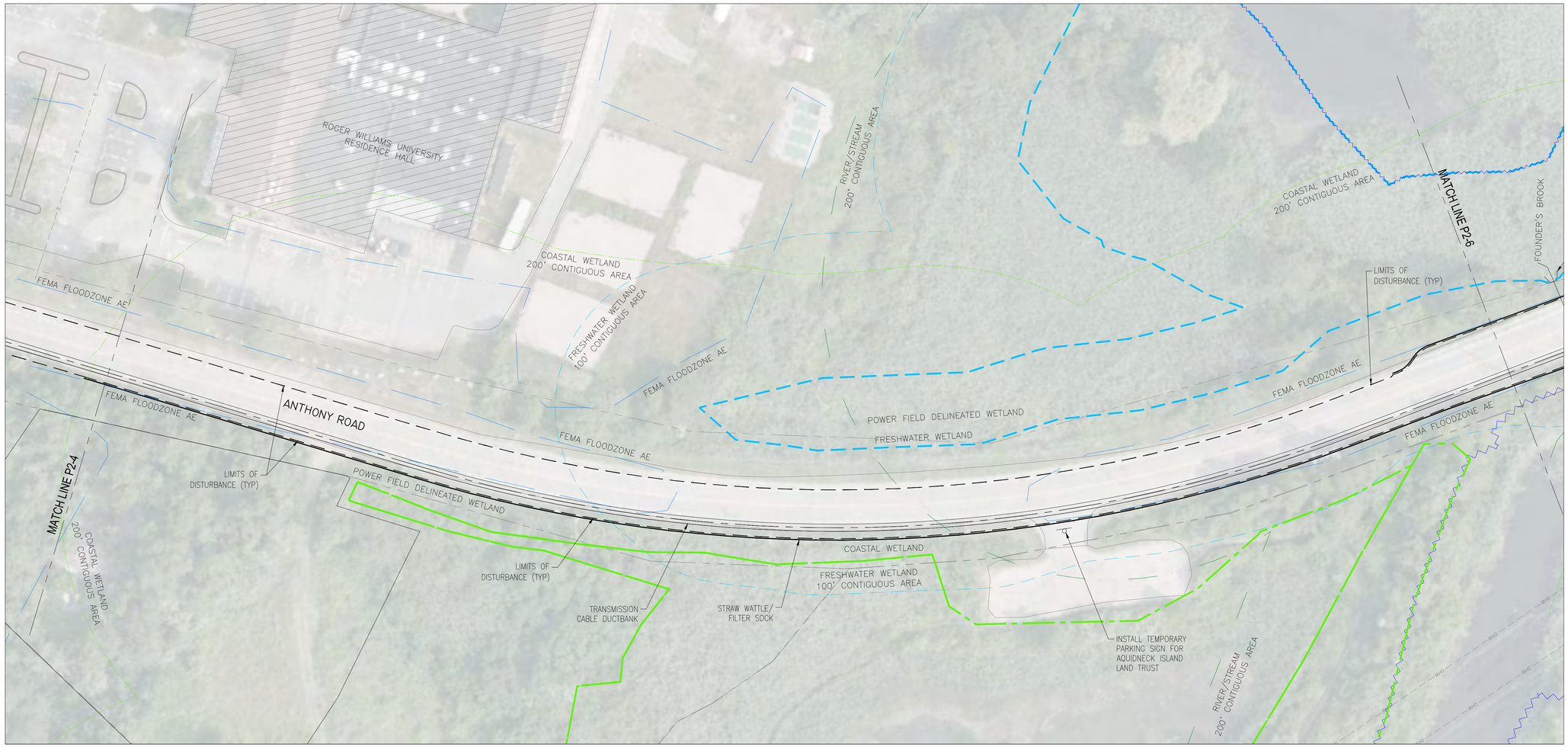

TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW

TO BOYDS LANE HDD

KEY

NOT TO SCALE

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
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0 20 40 80 120 FEET

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SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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FOR 22x34 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 REV C

DRAWING NUMBER P2-5

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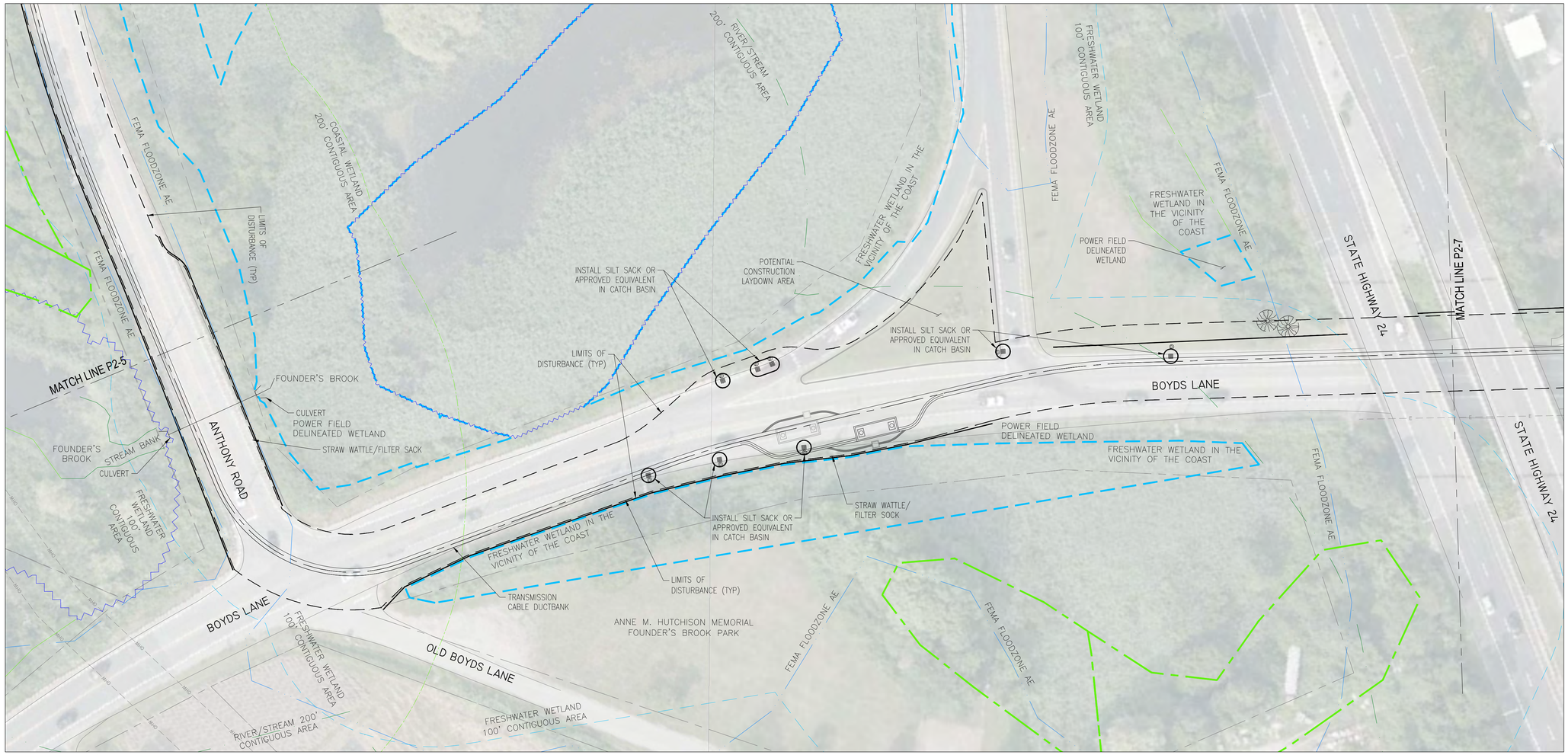
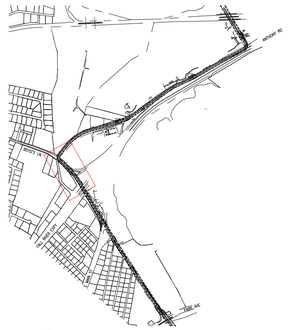


TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW

TO BOYDS LANE HDD



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SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
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SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 REV C

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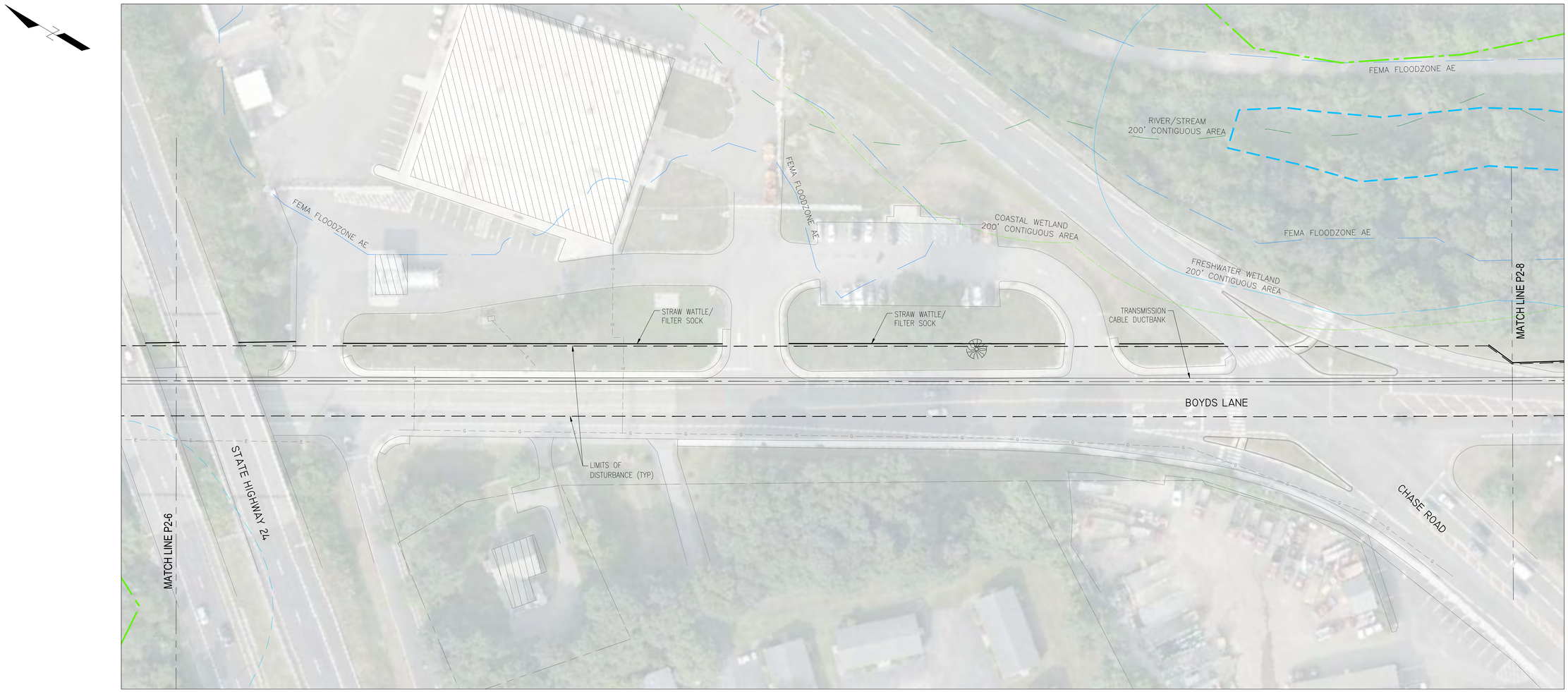
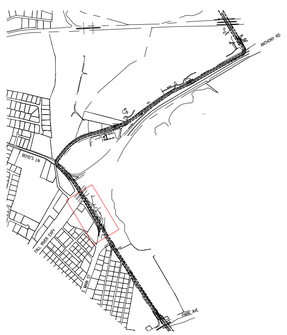


← TO MONTAUP COUNTRY CLUB PARKING LOT HDD

TO BOYDS LANE HDD →

PLAN VIEW



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- PSCL PERENIAL STREAM CENTER LINE
- MOORING FIELDS

0 20 40 80 120 FEET

HORIZONTAL SCALE: 1"= 40'

ATTENTION: FOR CLEANER TEXT AND LINE FEATURES WHEN USING ADOBE TO VIEW THESE PDFS, TURN OFF THE "SMOOTH LINE ART" AND "ENHANCE THIN LINES" OPTIONS UNDER EDIT–PREFERENCES–PAGE DISPLAY

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
C	ISSUED FOR REVIEW	02/13/2023	BAJ	TSG	TSG		
B	ISSUED FOR REVIEW	02/03/2023	BAJ	JD	TSG		
A	ISSUED FOR REVIEW	12/16/2022	BAJ	JD	TSG		

DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

SCALE: 1" = 40'

FOR 22x34 DWG ONLY

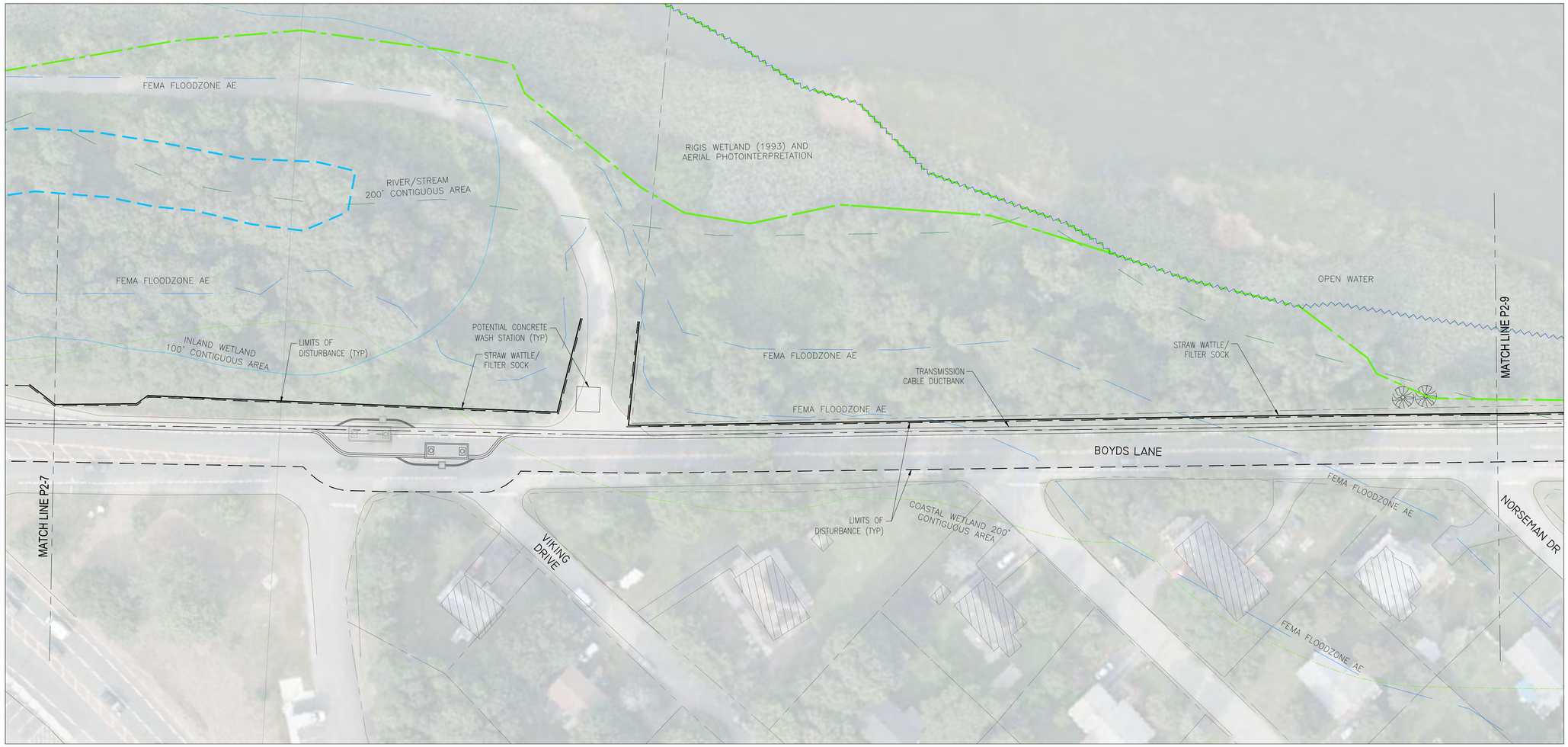
POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 | REV C

DRAWING NUMBER P2–7

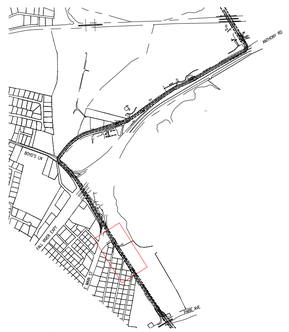
172033 – PLAN & PROFILE – OPTION 2 – Environmental Permit – Copy.dwg



← TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW

TO BOYDS LANE HDD →



KEY
NOT TO SCALE

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
- HDD LOCATION
- LIMIT OF DISTURBANCE (TYP)
- STRAW WATTLE/FILTER SOCK
- CATCH BASIN PROTECTION
- CULVERT
- PROPERTY LINE
- TREE PROTECTION
- PROPOSED TRANSITION JOINT BAY
- PROPOSED COMMUNICATIONS HANDHOLE
- TYPICAL CONCRETE WASH STATION

NOTES:

1. DRAWINGS ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.
2. CATCH BASIN INLET PROTECTION CONSISTING OF A SILTSACK WILL BE INSTALLED AT CATCH BASINS ALONG THE PROJECT ROUTE.
3. LIMITS OF DISTURBANCE (TYP) ARE DEPICTED AS A TYPICAL WORK CORRIDOR AND MAY SHIFT OR EXPAND TO ACCOMMODATE EXISTING UTILITY CROSSINGS, ROADWAY RESTRICTIONS OR OTHER SAFETY CONSIDERATIONS.
4. PERIMETER SEDIMENT CONTROL LOCATIONS SHOWN ON THE PLANS CONTAINED HEREIN ARE APPROXIMATIONS, AND MAY CHANGE DEPENDING ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION OR AS DIRECTED BY THE SOUTHCOAST WIND ENVIRONMENTAL COMPLIANCE MONITOR. PERIMETER SEDIMENT CONTROLS WILL NOT BE INSTALLED DIRECTLY IN WETLANDS WITHOUT PRIOR WRITTEN APPROVAL FROM THE SOUTHCOAST WIND ENVIRONMENTAL COMPLIANCE MONITOR.
5. DEWATERING AREAS, CONCRETE WASHOUT AREAS, AND TEMPORARY SOIL STOCKPILE AREAS SHOWN ON THE PLAN INDICATE ONLY THAT SUCH DEVICES AND PRACTICES MAY BE REQUIRED AND DO NOT APPROXIMATE LOCATIONS. FINAL LOCATIONS FOR SUCH DEVICES AND PRACTICES WILL BE DETERMINED DURING CONSTRUCTION AS FIELD CONDITIONS REQUIRE AND ALLOW. DEWATERING MAY BE REQUIRED IN ADDITIONAL LOCATIONS DEPENDING ON FIELD CONDITIONS DURING CONSTRUCTION.
6. TREES TO BE RETAINED WILL BE MARKED AND TREE PROTECTION MEASURES WILL BE IMPLEMENTED.

ENVIRONMENTAL LEGEND:

- RI_FEMA FLOODZONE AE
- FRESHWATER WETLAND
- FRESHWATER WETLAND 100' CONTIGUOUS AREA
- COASTAL WETLAND
- COASTAL WETLAND 200' CONTIGUOUS AREA
- RIVER/STREAM 200' CONTIGUOUS AREA
- COASTAL DUNE
- COASTAL BEACH
- OPEN WATER
- PSCL PERENIAL STREAM CENTER LINE
- MOORING FIELDS

0 20 40 80 120 FEET
HORIZONTAL SCALE: 1"= 40'

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

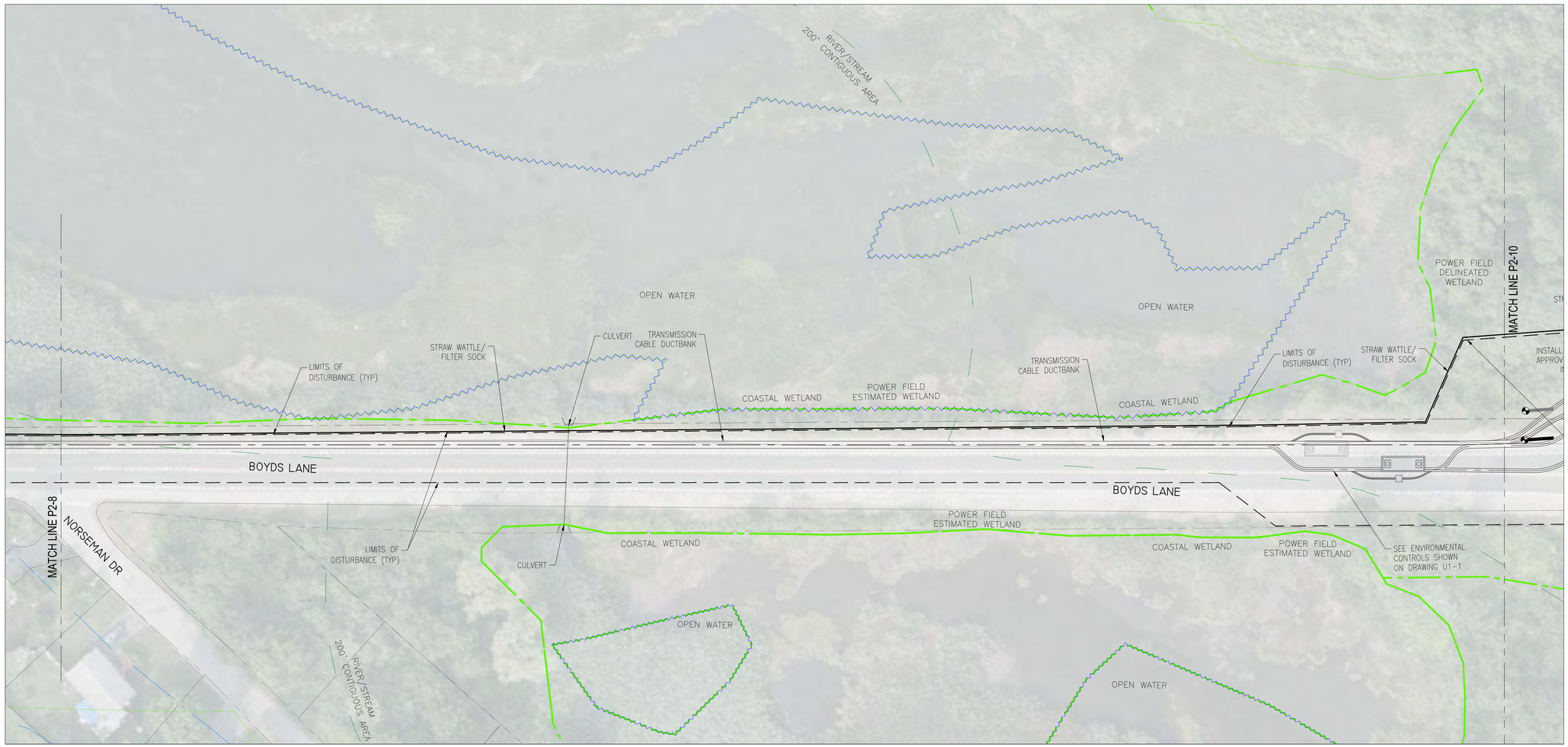
SCALE: 1" = 40'
FOR 22x34 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 | REV C
DRAWING NUMBER P2–8

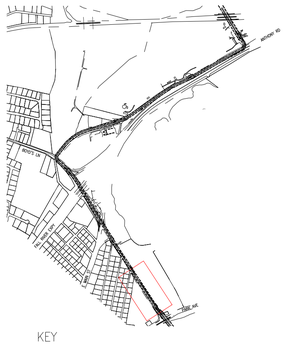
172033 – PLAN & PROFILE – OPTION 2 – Environmental Permit – Copy.dwg



← TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW

TO BOYDS LANE HDD →



KEY

NOT TO SCALE

LEGEND

- PROPOSED TRANSMISSION CABLE DUCTBANK
- HDD LOCATION
- LIMIT OF DISTURBANCE (TYP)
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- COASTAL BEACH
- OPEN WATER
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- MOORING FIELDS

0 20 40 80 120 FEET

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SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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DRN	BAJ	09/22/22
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FOR 22x34 DWG ONLY

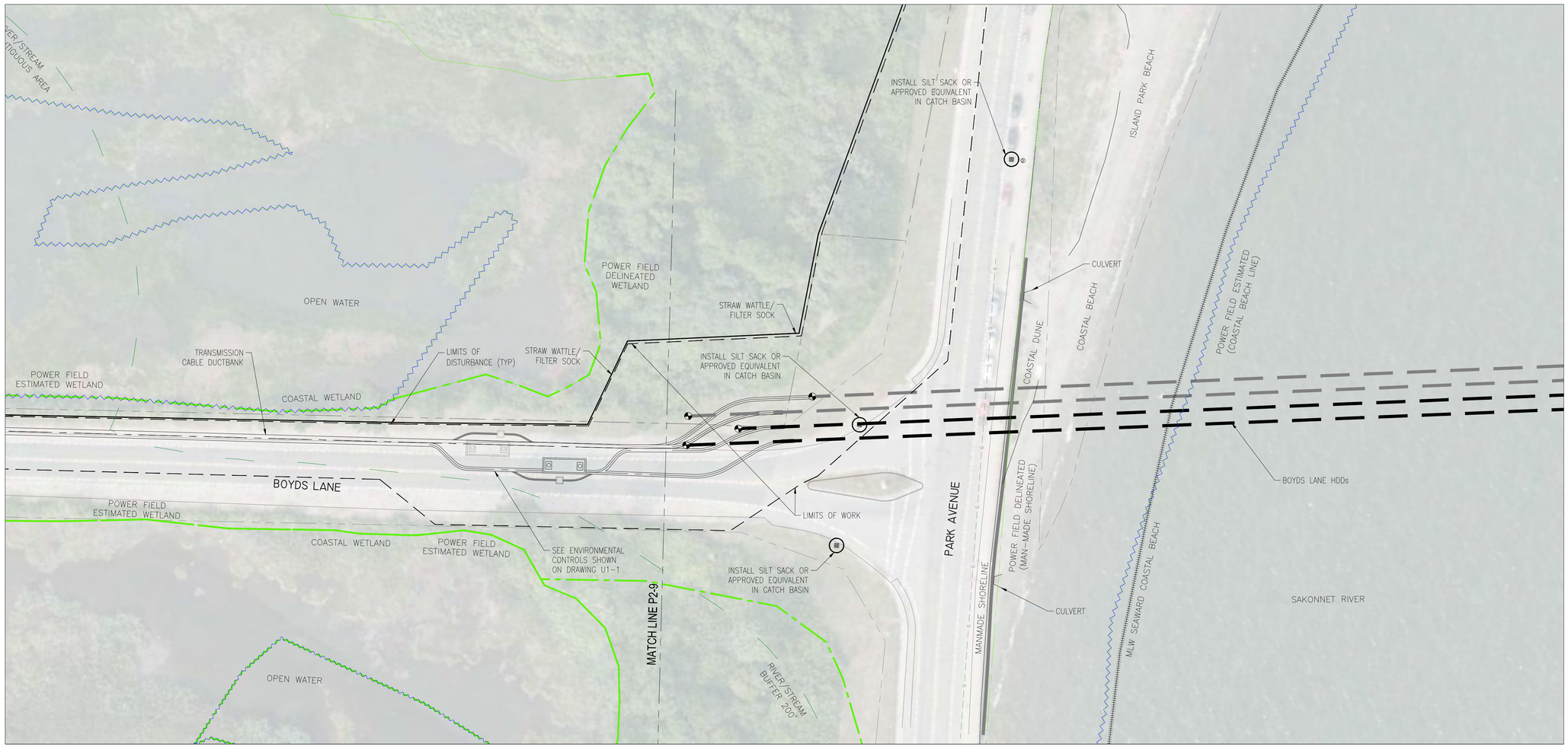
POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 REV C

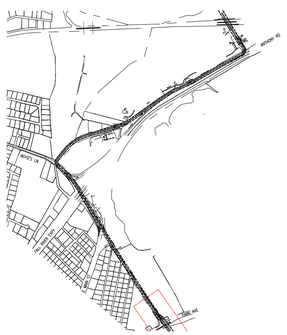
DRAWING NUMBER P2-9

172033 – PLAN & PROFILE – OPTION 2 – Environmental Permit – Copy.dwg



← TO MONTAUP COUNTRY CLUB PARKING LOT HDD

PLAN VIEW



KEY

NOT TO SCALE

LEGEND

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0 20 40 80 120 FEET

HORIZONTAL SCALE: 1"= 40'

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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A	ISSUED FOR REVIEW	12/16/2022	BAJ	JD	TSG		

DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

SCALE: 1" = 40'

FOR 22x34 DWG ONLY

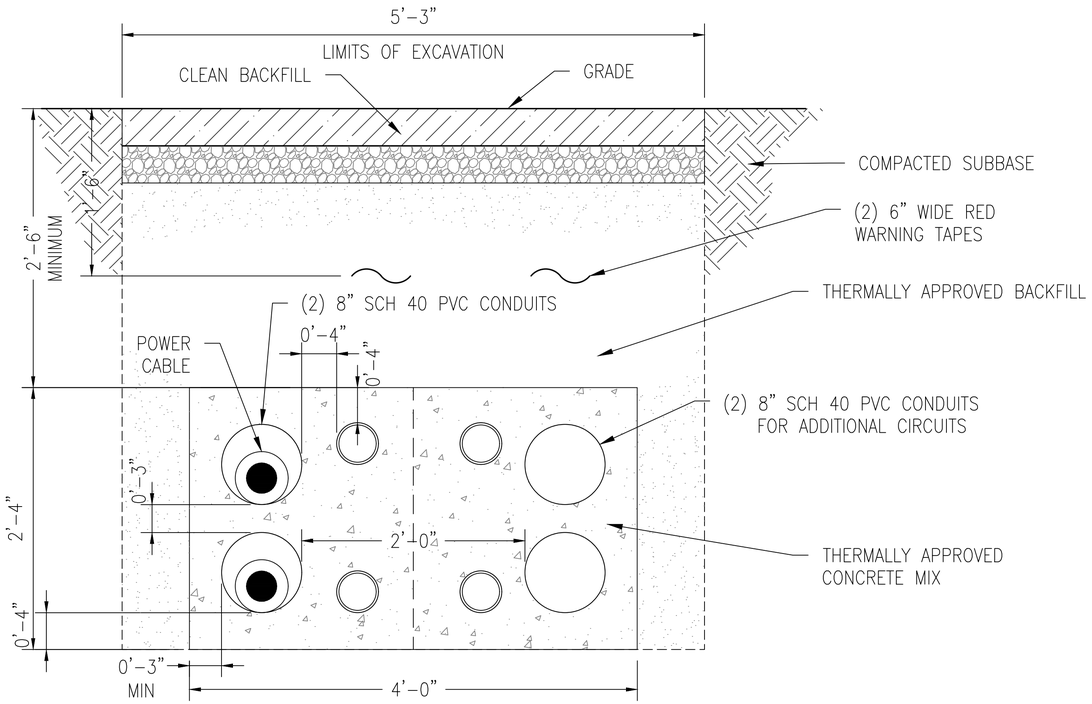
POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
ENVIRONMENTAL PLAN

JOB NUMBER 172033 | REV C

DRAWING NUMBER P2–10

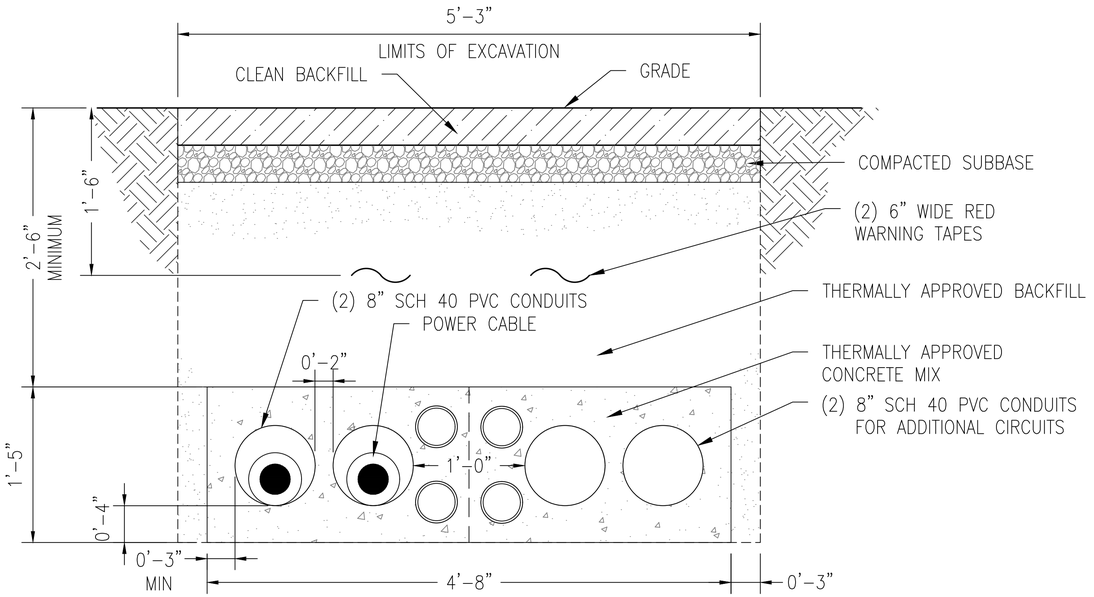
172033 – PLAN & PROFILE – OPTION 2 – Environmental Permit – Copy.dwg



DOUBLE CIRCUIT DUCT BANK OPTION 1

SECTION 1 U0-1

N.T.S.



DOUBLE CIRCUIT DUCT BANK OPTION 2

SECTION 2 U0-1

N.T.S.

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172033 – Mayflower Details – Environmental Permit.dwg

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SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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B	ISSUED FOR REVIEW	02/03/2023	BAJ	TSG	TSG		
A	ISSUED FOR REVIEW	03/02/2022	BAJ	TSG	TSG		

DSGN	TSG	03/02/22
DRN	BAJ	03/02/22
CKD	TSG	03/02/22

SCALE: AS SHOWN

FOR 22x34 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND

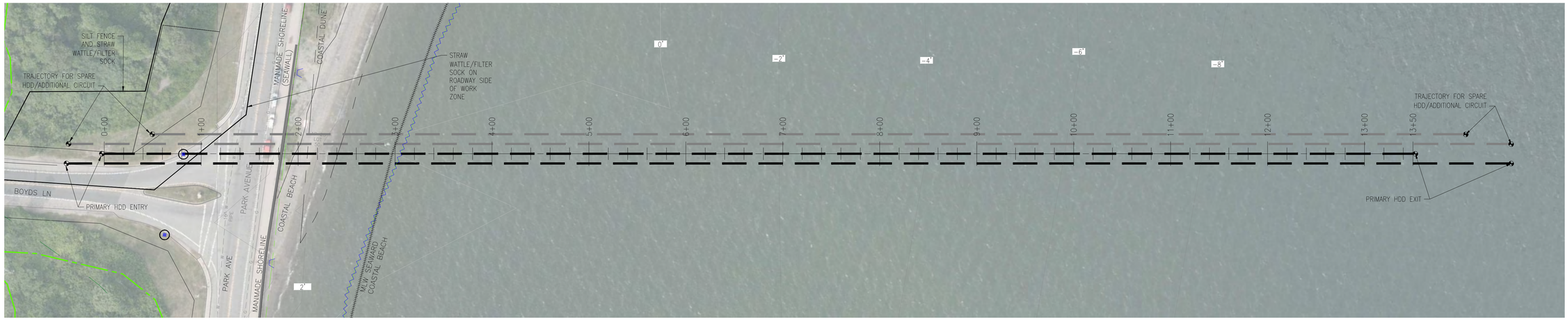
AQUIDNECK ISLAND DUCT BANK

TYPICAL DUCT BANK SECTIONS

JOB NUMBER 172033

REV C

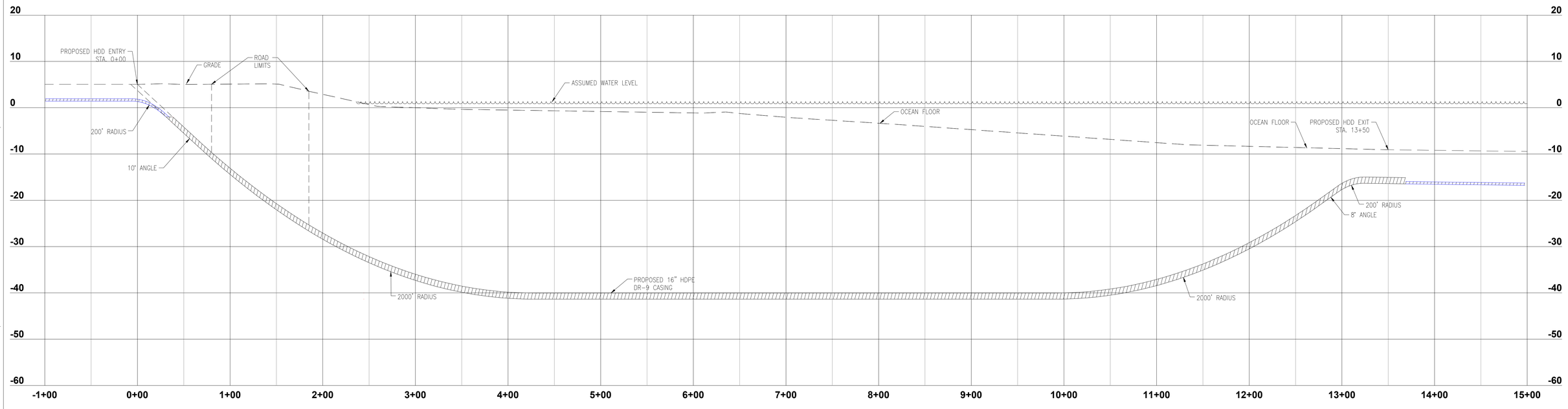
DRAWING NUMBER U0-1



PLAN VIEW

TO AQUIDNECK ISLAND

TO OFFSHORE COLLECTOR STATION



PROFILE VIEW

NOTES:

1. THE UTILITIES AND NATURAL FEATURES SHOWN HEREON ARE BASED ON FIELD SURVEYS, AERIAL PHOTOGRAPHY AND RECORD DOCUMENTS. OTHER FACILITIES MAY EXIST NOT DISCOVERED THROUGH THE RECORD CHECK. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION, BOTH HORIZONTAL AND VERTICAL, OF ALL UTILITIES THROUGH THE APPROPRIATE UTILITY COMPANIES. CALL BEFORE YOU DIG, 811 OR 1-800-344-7233.
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3. THE UTILITIES AND NATURAL FEAUTRES SHOWN HEREON ARE BASED ON:
   - GOOGLE EARTH 2020
   - TOWN OF PORTSMOUTH WEB GIS MAPS AND ONLINE PROPERTY INFORMATION
4. PROPERTY LINES ARE APPROXIMATE FOR DISCUSSION PURPOSES.

Know what's below. Call before you dig.

0 50 100 150 FEET
HORIZONTAL SCALE 1"= 50'

0 4 8 16 24 FEET
VERTICAL SCALE: 1"= 8'

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SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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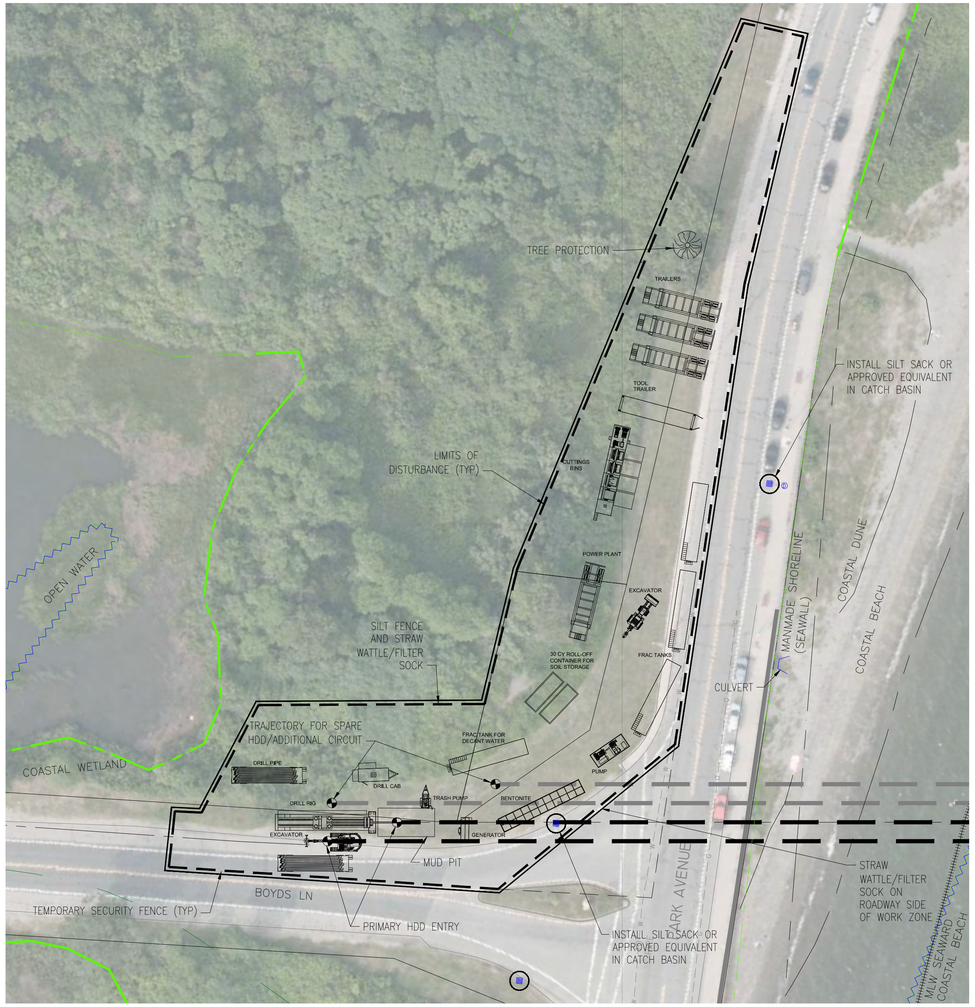
DSGN	TSG	08/10/2021
DRN	ASW	08/10/2021
CKD	TSG	08/10/2021

SCALE: AS SHOWN
FOR 24x36 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
BOYDS LN HDD
PLAN AND PROFILE

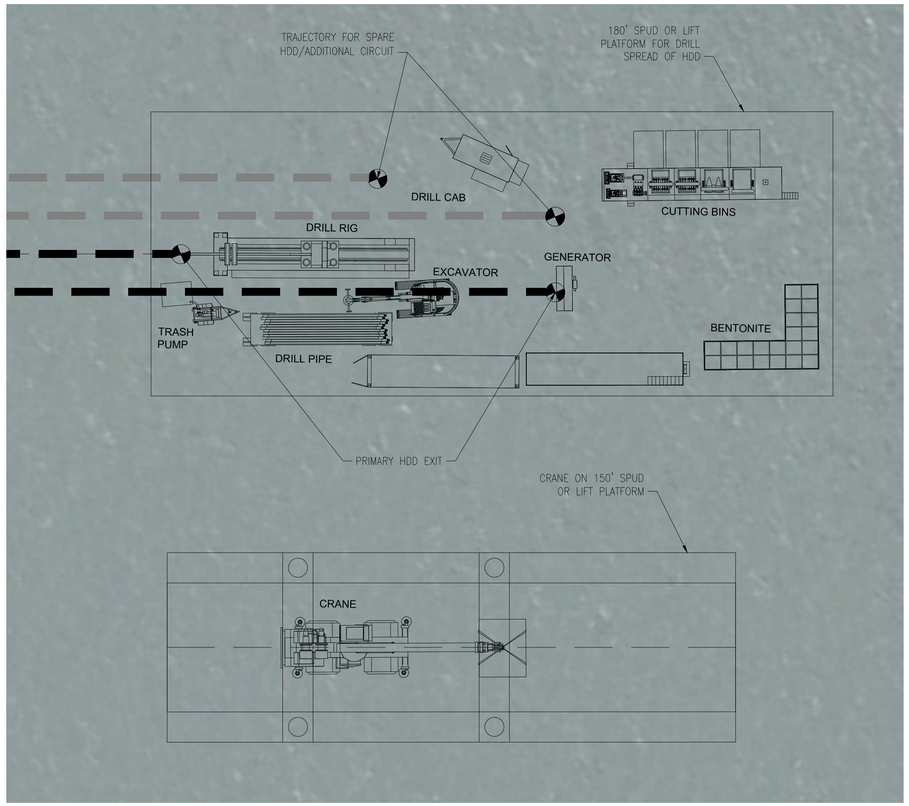
JOB NUMBER 172033
REV C
DRAWING NUMBER P2-1



ONSHORE HDD SETUP (TYP)

0 20 40 80 120 FEET

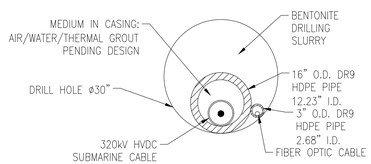
HORIZONTAL SCALE: 1"= 40'



OFFSHORE HDD SETUP (TYP)

0 10 20 40 60 FEET

HORIZONTAL SCALE: 1"= 20'



PROPOSED BORE DETAIL - OPTION 1 &2

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6. BOUNDARY OF ONSHORE WORK AREA IS PENDING FIELD VERIFICATION OF WETLANDS.

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A	ISSUED FOR REVIEW	12/16/2022	ASW	JD	TSG		

DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

SCALE: AS SHOWN
FOR 22x34 DWG ONLY

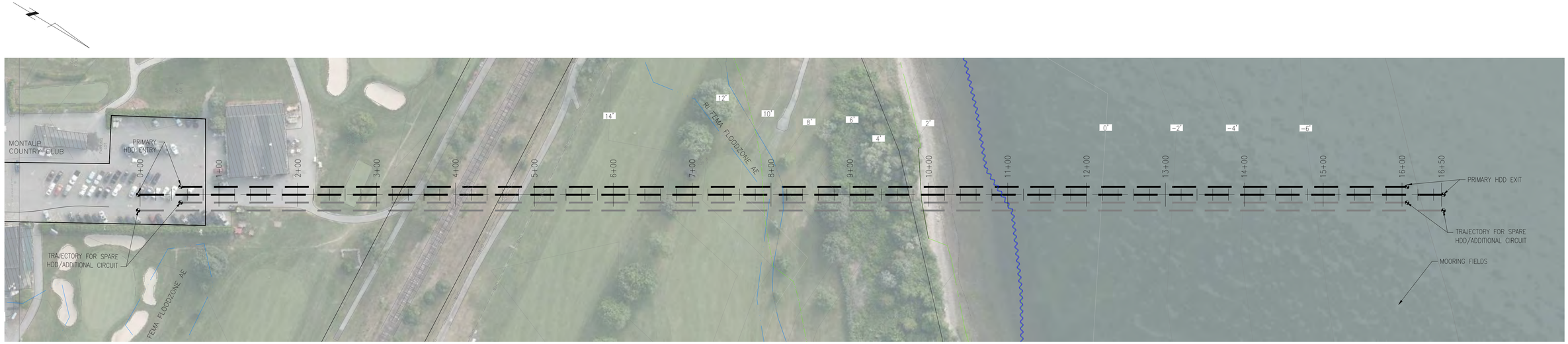
POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
BOYDS LN
HDD LAYOUTS

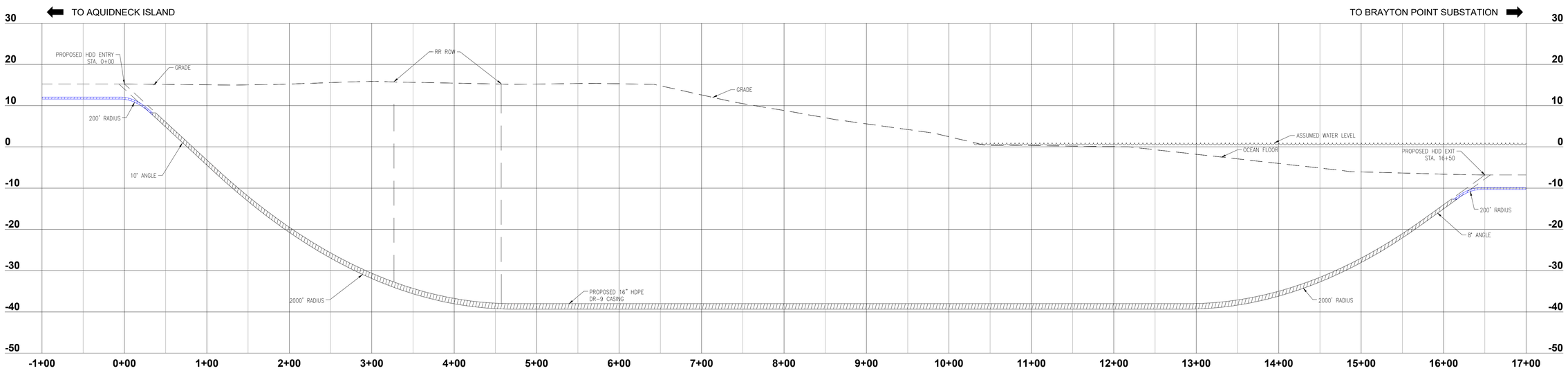
JOB NUMBER 172033 | REV C

DRAWING NUMBER U1-1

172033 - Aquidneck Island Boyds Ln HDD - Environmental Permit.dwg



PLAN VIEW



PROFILE VIEW

Know what's below. Call before you dig.

NOTES:

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4. PROPERTY LINES ARE APPROXIMATE FOR DISCUSSION PURPOSES.

0 60 120 180FEET
HORIZONTAL SCALE 1"= 60'

0 12 24 36 FEET
VERTICAL SCALE 1"= 12'

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
C	ISSUED FOR REVIEW	02/13/2023	BAJ	TSG	TSG		
B	ISSUED FOR REVIEW	02/03/2023	ASW	TSG	TSG		
A	ISSUED FOR REVIEW	12/16/2022	ASW	TSG	TSG		

DSGN	TSG	08/13/2021
DRN	ASW	08/13/2021
CKD	TSG	08/13/2021

SCALE: AS SHOWN
FOR 24x36 DWG ONLY

POWER ENGINEERS

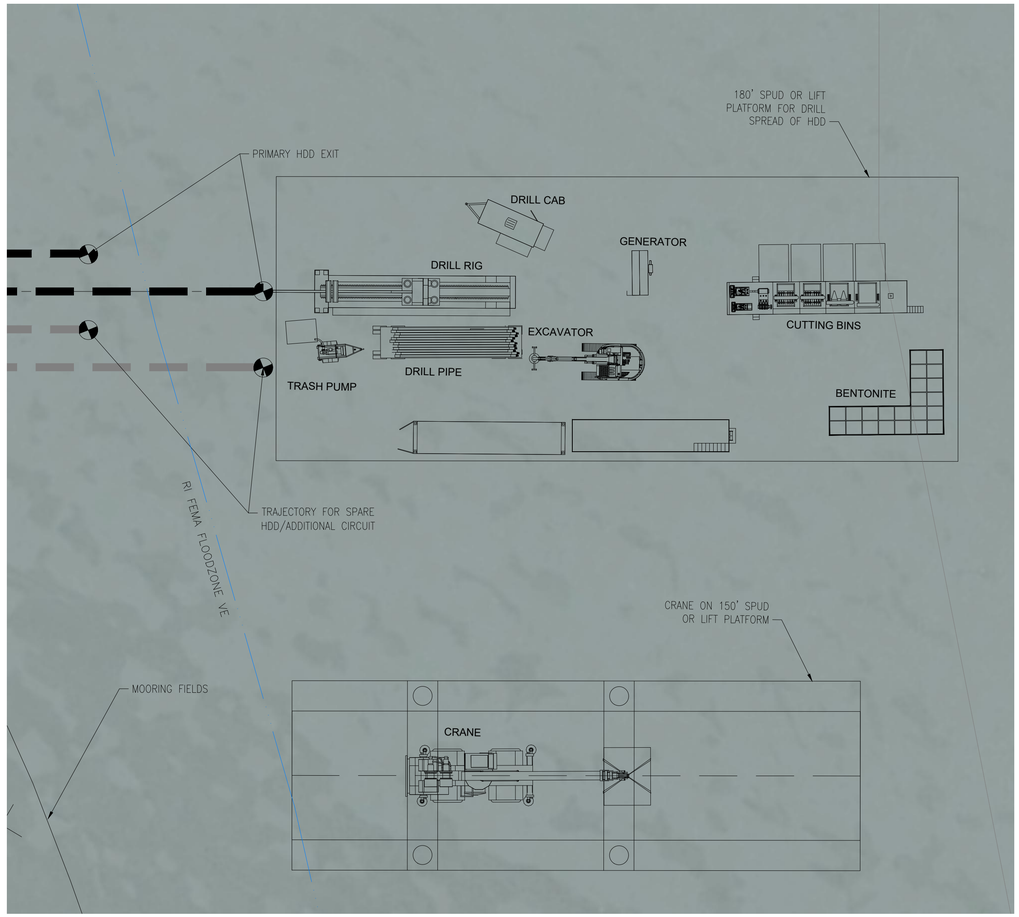
SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
MONTAUP COUNTRY CLUB PARKING LOT
PLAN AND PROFILE

JOB NUMBER 172033
REV C
DRAWING NUMBER P2-2

ONSHORE HDD SETUP (TYP)

0 15 30 60 90 FEET

HORIZONTAL SCALE: 1"= 30'



OFFSHORE HDD SETUP (TYP)

0 20 40 60 FEET

HORIZONTAL SCALE 1"= 20'

NOTES:

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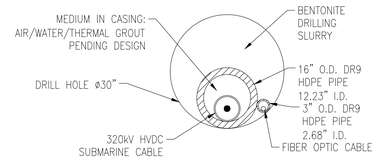
4. PROPERTY LINES ARE APPROXIMATE FOR DISCUSSION PURPOSES.
5. DRAWINGS ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.
5. OUTDATED AERIAL IMAGERY DOES NOT REFLECT CURRENTLY PAVED/PREVIOUSLY DISTURBED MONTAUP COUNTRY CLUB LIMITS OF DISTURBANCE.

811 Know what's below. Call before you dig.



PROPOSED BORE DETAIL

N.T.S.

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

REV	REVISIONS	DATE	DRN	DSGN	CKD	APPD	REFERENCE DRAWINGS
J	UPDATED DISTURBANCE AREA	09/04/2024	LAS	TSG	TSG		
I	UPDATED RAILROAD EASEMENT	12/06/2024	BAJ	TSG	TSG		
H	UPDATED RAILROAD ROW	10/28/2022	ASW	TSG	TSG		
G	RAILROAD STATIONS DETAILED	09/16/2022	LAS	TSG	TSG		
F	INCORPORATED SOUTHCOAST COMMENTS	04/29/2022	LAS	TSG	TSG		

DSGN	JD	09/28/22
DRN	BAJ	09/22/22
CKD	TSG	09/22/22

SCALE: AS SHOWN
FOR 22x34 DWG ONLY

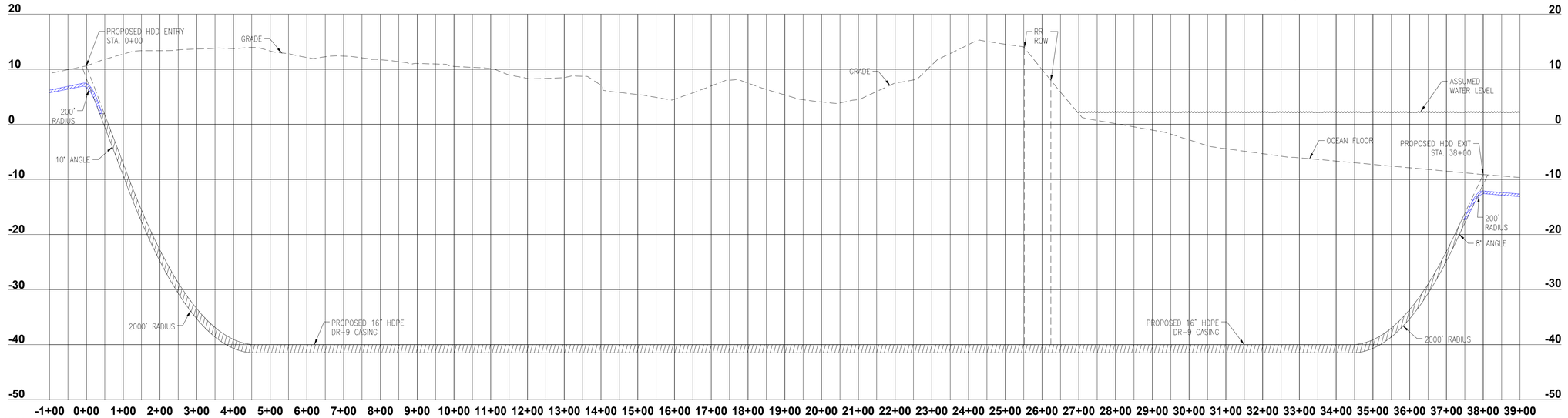
POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND DUCT BANK
PERMIT DRAWINGS
SOIL EROSION & SEDIMENT CONTROL PLANS
MONTAUP COUNTRY CLUB PARKING LOT HDD LAYOUTS

JOB NUMBER 172033
REV D
DRAWING NUMBER U1-2

172033 - Aquidneck Island Golf Course Parking Lot HDD - Environmental Permit.dwg

PLAN VIEW



PROFILE VIEW

NOTES:

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5. BOUNDARY OF ONSHORE WORK AREA IS PENDING FIELD VERIFICATION OF WETLANDS.
6. ROGER WILLIAMS UNIVERSITY IS AN ALTERNATIVE SITE

811 Know what's below. Call before you dig.

0 150 300 450 FEET
HORIZONTAL SCALE 1"= 150'

0 10 20 30 FEET
VERTICAL SCALE 1"= 10'

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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C	ISSUED FOR REVIEW	02/13/2023	BAJ	TSG	TSG		
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A	ISSUED FOR REVIEW	01/20/2023	ASW	TSG	TSG		

DSGN	TSG	12/10/2021
DRN	ASW	12/10/2021
CKD	TSG	12/10/2021

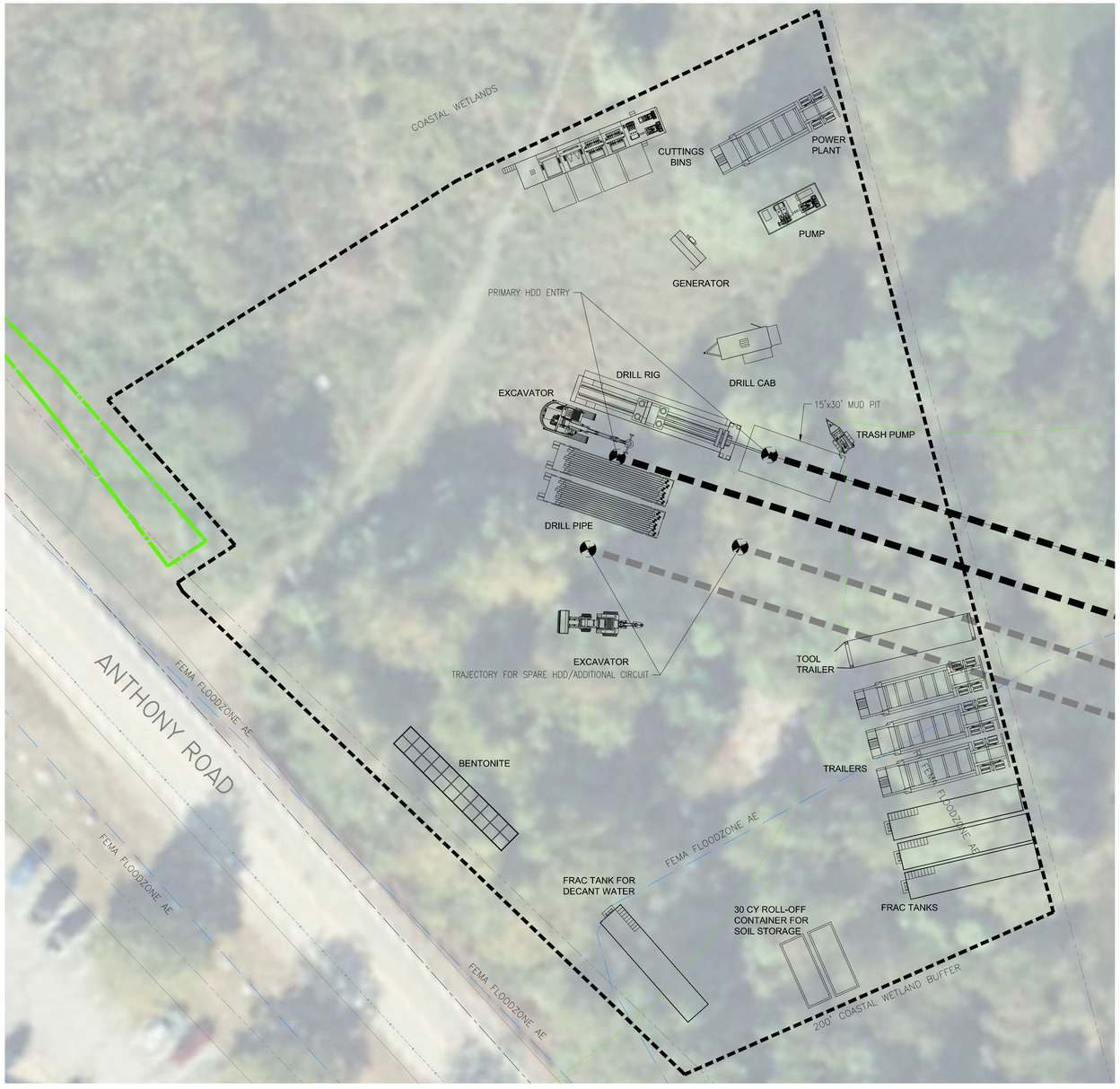
SCALE: AS SHOWN
FOR 24x36 DWG ONLY

POWER ENGINEERS

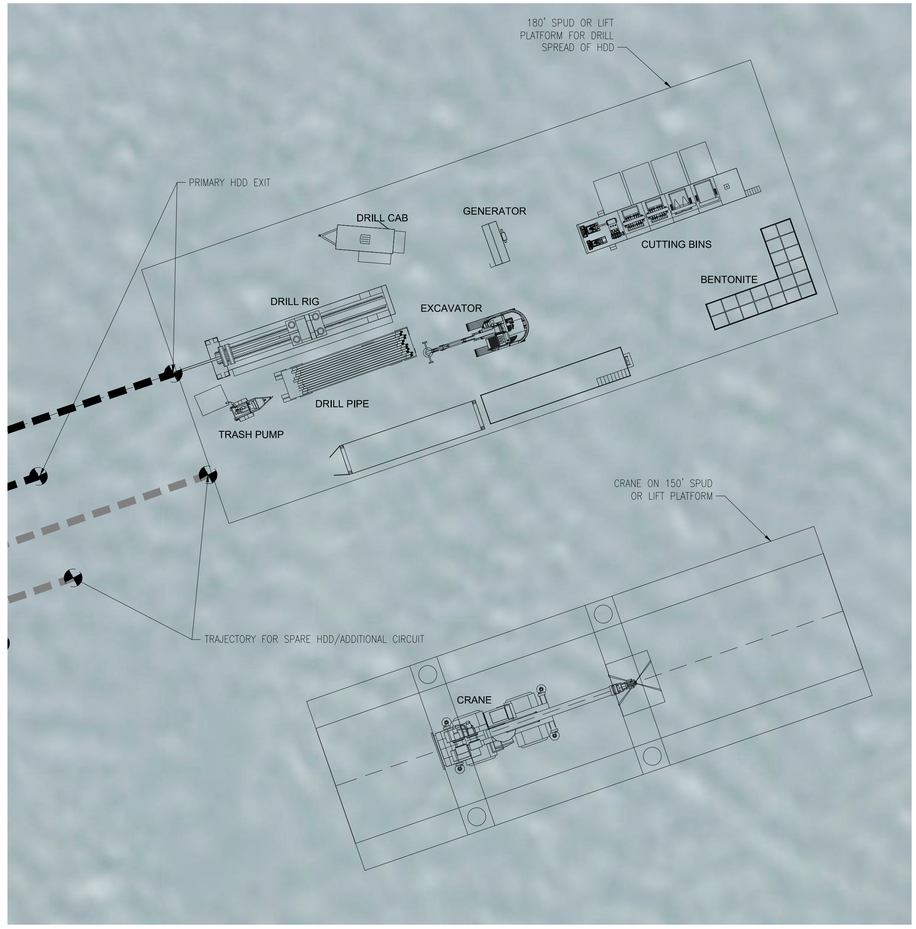
SOUTHCOAST WIND
AQUIDNECK ISLAND HDD
ROGER WILLIAMS UNIVERSITY
PLAN AND PROFILE

JOB NUMBER 172033 | REV C
DRAWING NUMBER P2-3

172033 - Aquidneck Island Residence Hall HDD - Environmental Permit.dwg



ONSHORE HDD SETUP (TYP)



OFFSHORE HDD SETUP (TYP)

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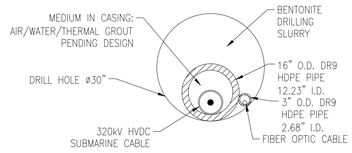
811 Know what's below. Call before you dig.

0 20 40 60 FEET
HORIZONTAL SCALE 1"= 20'



PROPOSED BORE DETAIL
N.T.S.

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SOUTHCOAST WIND ENERGY LLC
SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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B	ISSUED FOR REVIEW	02/03/2023	ASW	TSG	TSG		
A	ISSUED FOR REVIEW	01/20/2023	ASW	TSG	TSG		

DSGN	TSG	12/10/2021
DRN	ASW	12/10/2021
CKD	TSG	12/10/2021

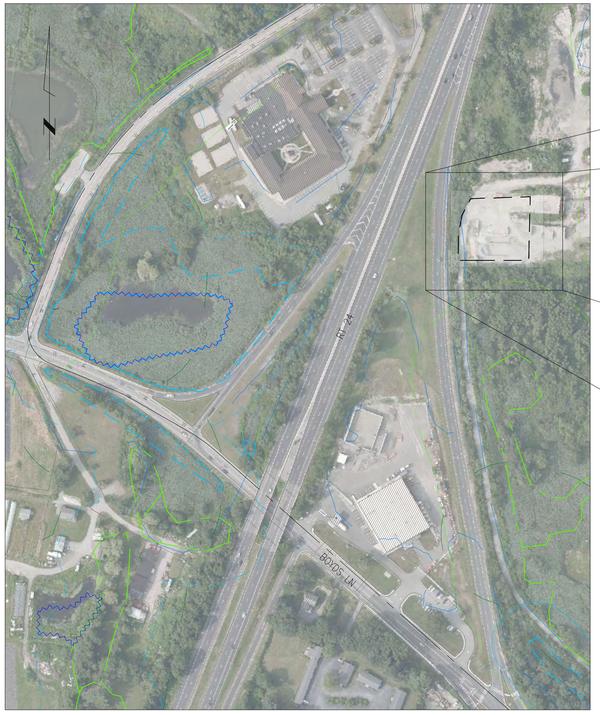
SCALE: AS SHOWN
FOR 24x36 DWG ONLY

POWER ENGINEERS

SOUTHCOAST WIND
AQUIDNECK ISLAND HDD
ROGER WILLIAMS UNIVERSITY HDD LAYOUTS

JOB NUMBER 172033
REV C
DRAWING NUMBER U1-3

172033 - Aquidneck Island Residence Hall HDD - Environmental Permit.dwg



0 100 200 400 600 FEET

HORIZONTAL SCALE: 1"= 200'

POTENTIAL ADDITIONAL STAGING AREA

0 10 20 40 60 FEET

HORIZONTAL SCALE: 1"= 20'

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0 20 40 60 FEET

HORIZONTAL SCALE 1"= 20'

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SOUTHCOAST WIND 1 PROJECT
PORTSMOUTH, RHODE ISLAND

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B	ISSUED FOR REVIEW	02/03/2023	ASW	JD	TSG		
A	ISSUED FOR REVIEW	12/16/2022	ASW	JD	TSG		

DSGN	TSG	08/10/2021
DRN	ASW	08/10/2021
CKD	TSG	08/10/2021

SCALE: AS SHOWN
FOR 24x36 DWG ONLY

POWER ENGINEERS

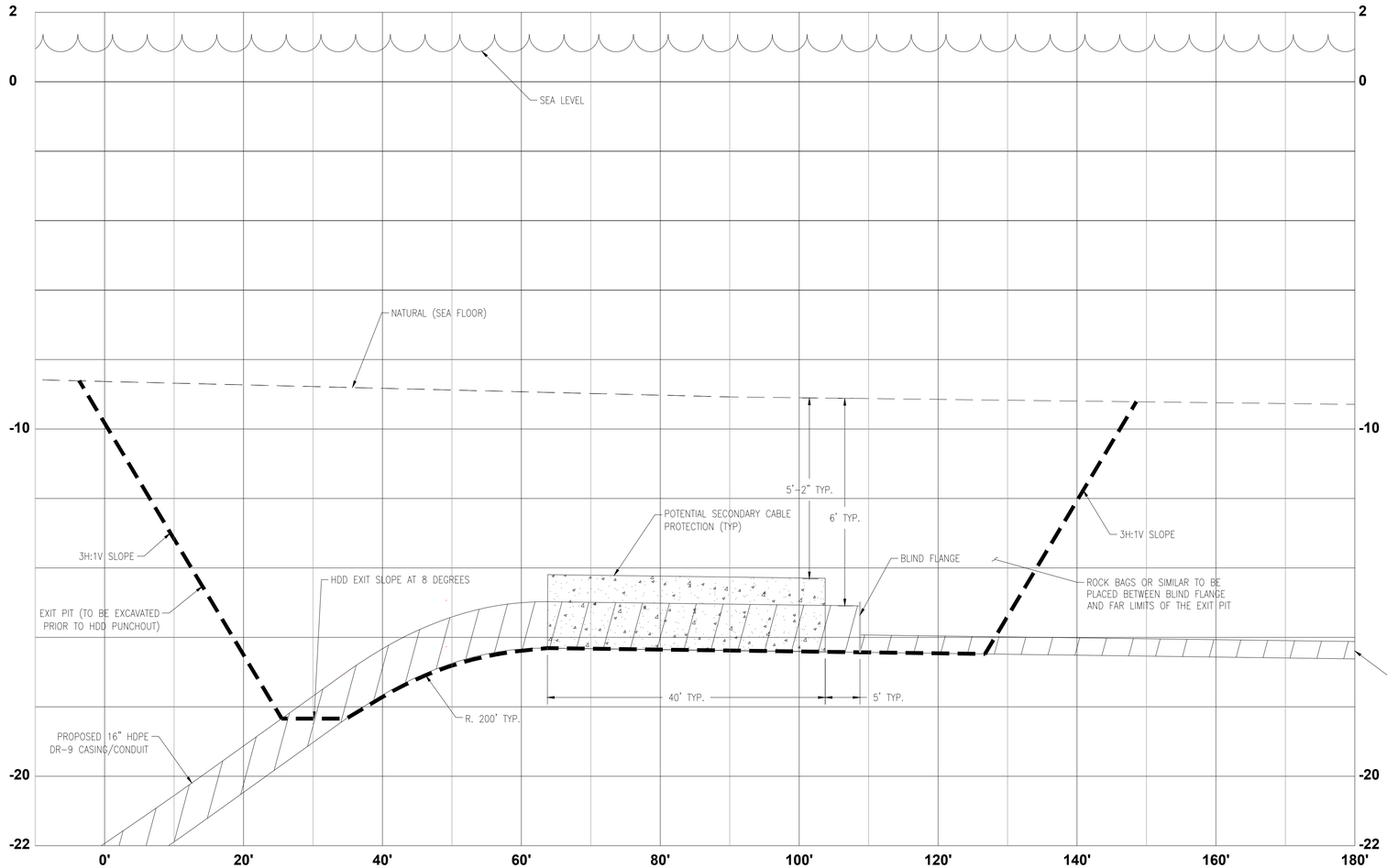
SOUTHCOAST WIND
AQUIDNECK ISLAND HDD
BOYDS LN
POTENTIAL ADDITIONAL STAGING AREA

JOB NUMBER 172033 REV C

DRAWING NUMBER U1-4

TYPICAL ELEVATION ⬅ ONSHORE

OFFSHORE ➡



PROFILE VIEW
HORIZONTAL DIRECTIONAL DRILL (HDD) OFFSHORE PIT (TYP)

NOTES:

1. PLAN AND PROFILE ALIGNMENT IS CONCEPTUAL AND NOT BASED ON PROJECT SPECIFIC FIELD SURVEY OR GEOTECHNICAL INVESTIGATION.
2. DRAWINGS ISSUED FOR PERMITTING, NOT FOR CONSTRUCTION.
3. SEDIMENTS TO BE DREDGED/EXCAVATED WILL BE SIDE-CAST ADJACENT TO THE EXCAVATION AND RETURNED TO THE EXCAVATION AS BACKFILL ONCE THE PROPOSED HDPE CONDUIT AND CABLE IS INSTALLED.
4. IN LIEU OF OPEN PIT, CONTRACTOR MAY ELECT TO USE GRAVITY CELL.
5. WATER DEPTH MAY VARY BASED ON SPECIFIC SITE CONDITIONS AND TIDAL RANGE.
6. TYPICAL HDD ASSEMBLY WILL INCLUDE 6.9" EXPORT CABLE WITHIN 16" HDPE DR-9 CASING/CONDUIT INSIDE OF A 30" BORE.

811 Know what's below. Call before you dig.

0 10 20 30 FEET
HORIZONTAL SCALE 1"= 10'

0 4 8 16 24 FEET
VERTICAL SCALE: 1"= 8'

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SOUTHCOAST WIND 1 PROJECT

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A	ISSUED FOR REVIEW	01/20/2023	ASW	JD	TSG		

DSGN	JD	01/20/23
DRN	BAJ	01/20/23
CKD	TSG	01/20/23
SCALE:	AS SHOWN	
FOR 22x34 DWG ONLY		

POWER ENGINEERS

SOUTHCOAST WIND
PERMIT DRAWINGS
TYPICAL HDD DETAIL

JOB NUMBER 172033 | REV C
DRAWING NUMBER P1-1

172033 - Typical HDD Detail - Environmental Permit.dwg

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment E: Cable Burial Risk Assessment (Confidential)

Revised: February 2023

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment F: Emergency Response Plan

Revision 1: March 2023

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1 EMERGENCY RESPONSE PLAN

SouthCoast Wind 1 Project contractors will be required to prepare emergency response plans (ERPs) applicable to each specific scope of work. The requirements for each of these plans are outlined below and will be included in the emergency response plans wherever relevant to the scope of work. The emergency response plans will be implemented along with the Project Oil Spill Response Plan (OSRP) [COP, Appendix AA].

The contractors will conduct all construction activities in a manner that will prevent a release of oil or hazardous material (OHM) to the environment and will be responsible for implementing oil spill prevention and response procedures for both onshore and offshore activities, including the following measures:

- Vessels, barges, equipment, and vehicles are to arrive on-site free of leaks. All hoses, spill control materials, and other oil or hydraulic components are to be inspected for wear and leaks.
- Spill prevention measures, including maintaining spill control materials onshore and onboard vessels and at the horizontal directional drilling (HDD) work sites, will be required based on the types and quantities of materials stored.
- Emergency spill control kits and placards will be maintained on-site and replenished, as needed.
- The contractor will provide an inventory of all oils, fuels, and lubricants to be stored on-site.
- The contractor will label and properly store and lock all potential OHM to avoid inadvertent spills or releases.
- Secondary containment devices will be required for all oil and fuel containing equipment that is either immobile or is be staged on-site.
- Any oil or fuel containers onboard vessels will be properly stored within leveled and secured cabinets.
- Secondary containment devices will be used during all refueling operations. Emergency spill kits, including oil absorbent booms during offshore construction, will be kept and maintained on-site through the construction-phase of the Project.
- If there is a spill of OHM, verbal notification must be given to SouthCoast Wind immediately after a release has occurred and is contained (after notification to first responders). As appropriate, the contractor will report the release to the United States Coast Guard (USCG) through the National Response Center (NRC), the RI CRMC, the RIDEM Hazardous Waste Division and the United States Environmental Protection Agency (USEPA) and/or appropriate regulatory agencies in accordance with all applicable regulations.
- The contractor is responsible for notifying the RIDEM, of any release onshore and receiving a Spill Release Tracking Number.
- The contractor is responsible for notifying the USCG through the NRC, as necessary, and the RIDEM of any release to the marine environment and receiving a Spill Release Tracking Number.

- A release in any amount may be reportable to the local fire department[1] (for onshore) and RIDEM.[2]
- The contractor will submit written spill information to SouthCoast Wind within one working day after a release has occurred.
- The contractor will supply SouthCoast Wind with a copy of all other documentation required by regulatory agencies related to the release, including documentation of soil, water, and solid surface clearance samples within five days of receipt by the contractor.

In the event of a release of OHM owned by the contractor (e.g., hydraulic fluid on a contractor-owned piece of equipment on onboard a vessel), the contractor is responsible for the following spill response steps:

1. Ensure safety – establish personal/public safety, warn people in the immediate vicinity, wear appropriate Personal Protective Equipment (PPE), assess the situation (never rush in and always determine the product spilled before taking action).
2. Ensure there are no ignition sources if spill is a flammable material, if necessary local fire department and the USCG can provide additional assistance.
3. Spill control – stop the flow at its source, stop the release, close valves, shut off pumps or plug holes/leaks.
4. Secure the area – limit access to the spill area, prevent unauthorized entry onto the site.
5. Spill containment – utilizing emergency spill control kits and other devices on-site, use spill absorbent material to contain the spill, if necessary, use a dike or any other method to prevent discharge into the water, if necessary, deploy floating boom around the vessel/barge to contain the spill to the local vicinity.
6. Spill clean-up – proper containment, place the waste material into a 55-gallon Uline Universal Drum (or similar) with a cover and label the container.
7. Spill reporting – as soon as the situation is under control, report incident to SouthCoast Wind and the appropriate authorities, complete a spill response reporting, report the spill to SouthCoast Wind within 24 hours. Reporting the spill to the applicable regulatory agencies (e.g., RIDEM and USCG, as necessary) within reporting timeline requirements may be immediately or as soon as two hours. Some examples include:
    - A sudden spill of OHM which exceeds a specified quantity (called a Reportable Quantity; such as more than 10 gallons of oil).
    - A spill of any amount of oil which results in a sheen on a surface water.

- The contractor is responsible for making all required notifications to regulatory agencies and to ensure that the release is properly responded to and in accordance with all applicable regulations.
- The contractor is responsible for notifying SouthCoast Wind's on-site environmental compliance monitor.

[1] Town of Portsmouth Fire Department – (401) 683-1200.
[2] RIDEM Emergency Response, 24-hour Spill/Emergency Line – 1-401-222-1360 (business hours) or 1-401-222-3070 (after hours). See, also, https://dem.ri.gov/programs/emergencyresponse/report-spill.php.

- The contractor is responsible for hiring contractors for the cleanup of releases of contractor-owned material, as needed.
- The contractor is responsible for disposing of OHM waste to a facility approved by SouthCoast Wind.
- Marine contractors conducting work activities within Rhode Island state waters will be responsible for finalizing a Spill Response Plan for marine activities consistent with SouthCoast Wind's plan and all applicable regulations.
- The contractor is responsible for instructing personnel on the operation and maintenance of equipment to prevent the accidental discharge or spill of OHM. Personnel will also be made aware of pollution control laws, rules, and regulations applicable to their work. The contractor will schedule and conduct spill prevention briefings with the construction crew to ensure adequate understanding of spill prevention measures. These briefings will highlight:
    - Precautionary measures to prevent spills.
    - Sources of spills, such as equipment failure or malfunction.
    - Standard operating procedures in case of a spill.
    - Equipment, materials, and supplies available for clean-up of a spill.
    - A list of known spill events.

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment G: Inadvertent Release of Drilling Muds Contingency Plan

Revision 1: March 2023

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TABLE OF CONTENTS

1 Inadvertent Release of Drilling Muds Contingency Plan 1

1.1 Introduction 1

1.2 Inadvertent Release Prevention 1

1.2.1 Monitoring of Drill Operations 1

1.2.2 Best Management Practices and Erosion Controls 2

1.3 Response to an Inadvertent Release 2

1.4 Mud Containment and Recovery 2

1.5 Reporting 3

1.6 Training 3

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1 INADVERTENT RELEASE OF DRILLING MUDS CONTINGENCY PLAN

This Inadvertent Release of Drilling Muds Contingency Plan (*aka* "frac-out plan") has been prepared by POWER Engineers Consulting in support of the SouthCoast Wind 1 Project. The intent is for the Contingency Plan to be further developed with additional details upon the selection of the contractor(s) and prior to the commencement of construction activities.

1.1 INTRODUCTION

Horizontal directional drilling (HDD) will be utilized during construction for the export cable sea-to-shore transitions from the Sakonnet River and Mount Hope Bay to Aquidneck Island in Portsmouth, RI. HDD operations have the potential to inadvertently release drilling fluids from a deep boring into the surface environment if fluids travel through overlying soils or bedrock fractures to the ground surface or surface waters, typically under high pressure conditions. The HDD contractor will implement the best management practices (BMPs) outlined in this plan to minimize the potential for adverse environmental impacts during the HDD activities.

1.2 INADVERTENT RELEASE PREVENTION

The drilling fluid is an essential element of HDD operations. The fluid serves many purposes including:

- Facilitating the installation of the HDD conduit.
- Removal of the drilled cuttings from the borehole.
- Maintaining the integrity of the borehole.
- Lubricating and cooling the drill bit.

SouthCoast Wind's HDD contractor will use a drilling fluid composed of bentonite clay or mud that will pose little to no threat to water quality or ecological resources should seepage occur. The main component of drilling fluids typically consists of naturally occurring bentonite clay (which is heavier than water with a density of ρ 1.10-1.40), other additives, and freshwater. Bentonite is a non-toxic, naturally occurring substance. The clay is insoluble and made-up of small particles that function as a "natural sealant" that fills the native formation surrounding the bore hole. Various non-toxic additives may be added to the drilling fluid to optimize the rheological properties (the deformation and flow of matter). The drilling fluids are recirculated and recycled throughout the HDD procedures.

Drilling fluids will be handled properly on-site and the disposal of the excess fluid properly at the completion of the Project. Prior to commencement of drilling operations, the drilling superintendent will establish an approved landfill or off-site facility for disposal of excess drilling fluids and drill cuttings.

1.2.1 Monitoring of Drill Operations

The HDD contractor will control an inadvertent release by careful monitoring of drilling fluid pressure, penetration rate, tooling/equipment selection and fluids design. The advancement of the drill string and down hole pressure will be continuously monitored to detect changes in pressure that could indicate an imminent inadvertent release of drilling muds. The circulation rate of drilling fluids and the bore path stability will also be monitored. During HDD operations, the HDD contractor will monitor ground surface conditions and surface waters along the drill path to check for evidence of an inadvertent release.

1.2.2 Best Management Practices and Erosion Controls

Prior to drilling operations, the HDD contractor will implement BMPs and sediment and erosion control procedures and containment measures for stormwater and drilling fluids within the HDD staging areas. The BMPs will be installed, monitored, repaired and replaced by the HDD contractor during drilling and back-reaming operations to prevent siltation and turbid discharges.

At the HDD staging areas, erosion controls will be implemented to contain and manage any drilling fluids. Methods may include, but are not limited to placement of turbidity screens, staked silt containment fence, straw bales, and/or earthen berms to contain and recycle drilling muds.

Other materials that will be provided as needed by the HDD contractor include, but are not limited to, the following: spill sorbent pads and booms, straw bales, sandbags, siltation fencing, polyethylene sheeting, extra pumps, hoses, 55-gallon drums, push brooms, sump pumps, vactor trucks, storage tanks and floating turbidity curtains for in-water use.

1.3 Response to an Inadvertent Release

Should an inadvertent release of drilling muds occur, the following measures will be taken by the HDD contractor:

- In the event of a loss of drilling fluid circulation, the HDD contractor will notify SouthCoast Wind and the environmental compliance monitor.
- Should an inadvertent release be detected and confirmed, the HDD contractor will:
    - Temporarily suspend advancement of the drill string, if safe to do so, and check the drill alignment for an inadvertent discharge to the ground surface or surface waters.
    - Temporarily suspend the pumping of drilling muds, if safe to do so.
    - If the return of drilling mud/fluid is less than the projected amount to be recovered, the HDD contractor will begin their search for the missing material. Once the drilling mud (release) is located, mud containment and recovery will be implemented.
- The HDD contractor will then evaluate the circumstances leading to the inadvertent return and make a determination on the response plan.

Alternative actions to ceasing circulation pressure may include, but are not limited to:

- Circulating the slurry lines.
- Adding non-toxic loss circulation materials pre-approved by the Project engineer to the drilling fluids mixture.
- Reducing drilling fluid pressures.
- Increasing the viscosity of the drilling fluids.
- Ceasing pumping and pulling the drill string back a few joints, allowing the existing drilling mud in the hole to solidify around the suspected fracture.

1.4 Mud Containment and Recovery

Should a release of drilling muds be confirmed, the HDD contractor will implement the following steps:

- Proceed to the inadvertent return location and perform an evaluation of the existing conditions.

- Identify whether the discharge has impacted a sensitive area such as a jurisdictional wetland or stream or a smaller drainage collector that leads directly to a jurisdictional wetland or stream and assess the amount and nature of the discharge.
- Should the release occur onshore, the contractor will contain the release by installing BMPs, erosion controls and other BMPs, and use a suction hose and/or vactor truck to remove the excess material.
- Should the release occur offshore in the marine environment, the contractor will assess if sea-state conditions allow for the deployment of divers to locate the release and to guide a suction hose of the pump to minimize both the removal of natural sea bottom and disturbance of any existing vegetation.
- Any released material will be carefully removed to avoid impacts to coastal, marine and freshwater resources.
- Any escaped drilling mud/fluid will be pumped into filter bags or directly into a vactor truck.
- If the release were to occur offshore, a barge will be used to transport a vactor truck should it be needed to respond to an in-water release.
- Clean-up with a vacuum system will commence within 24 hours of the detected release.
- Once the spill is contained, the escaped drilling mud/fluid will be properly disposed of in an approved upland disposal site, in accordance with local, state, and federal regulatory requirements. No drilling mud/fluid will be discharged in Rhode Island state waters.

1.5 REPORTING

After containment and recovery of the drilling material, a written report will be prepared by the HDD contractor. The report will indicate the location of the release, amount of drilling material discharged and the amount of drilling mud recovered, the process in which the drilling mud was recovered, and the area that was affected by the drilling discharge, including any recommended corrective actions that may need to be taken. SouthCoast Wind will make the appropriate notifications to the local, state and federal regulatory agencies (i.e., Rhode Island Department of Environmental Management (RIDEM) and Rhode Island Coastal Resources Management Council (RI CRMC)), in accordance with the permit stipulations.

1.6 TRAINING

Prior to the start of HDD operations, the HDD contractor will be responsible for training its operators, superintendent, mud system operator, and workers with respect to the prevention, monitoring, and response of inadvertent returns during the HDD operation. Training will include plan details, permitting conditions and requirements, locations of resource areas, lines of communication, lines of authority, contact names and phone numbers, and reporting procedures.

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment H: Photo Array

Revised: February 2023

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Photo 1: Island Park Beach looking south from Park Avenue and Boyds Lane.
Photo date: December 21, 2021

Photo 2: View looking west of a typical dune and beach at Island Park Beach along Park Avenue. Will be avoided by HDD
Photo date: December 21, 2020.

Photo 3: View looking west along the seawall (manmade shoreline) at the Boyds Lane landfall. Photo date: December 21, 2021.

Photo 4: View looking northwest from the proposed HDD location for sea-to-shore transition at Boyds Lane and Park Avenue. Photo date: December 21, 2021

Photo 5: View looking east from the proposed HDD location for sea-to-shore transition at Boyds Lane and Park Avenue. Photo Date: December 21, 2021

Photo 6: View looking northwest at the Boyds Lane intersection with the northbound Route 24 on-ramp. The onshore export cable route will proceed north along Boyds Lane. Photo date: December 21, 2021.

Photo 7: View looking north along Boyds Lane under Route 24 southbound overpass. The onshore export cable route will proceed north along Boyds Lane. Photo date: December 21, 2021

Photo 8: View looking east along Anthony Road. Photo date: December 21, 2021

Photo 9: View looking east along Anthony Road with Montaup Country Club on the left and Rt 24 southbound on the right. Photo date: December 21, 2021

Photo 10: View looking northeast from Anthony Road at the Montaup Country Club parking lot. Photo date: November 12, 2021

Photo 11: View looking north from the onshore HDD location at the Montaup Country Club.
Photo date: November 12, 2021

Photo 12: View looking northeast of shoreline features avoided by HDD at the Montaup HDD construction area.
Photo date: February 9, 2023

**Photo 13: View looking west of shoreline features avoided by HDD at RWU North Parcel HDD construction area.
Photo date: February 9, 2023**

**Photo 14: View looking southwest of active railroad avoided by HDD at RWU North Parcel construction area.
Photo date: February 9, 2023**

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment I: Wetland Field Review Technical Memorandum

Revised: February 2023

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MEMORANDUM

DATE: May 5, 2022 (Revised)

TO: Erin Healy, Kathleen Freeman, Lawrence Mott, Kelly Smith, Layheab Ly

C: Jamie Durand, POWER Engineers

FROM: Patrick Fellion
Wetland Ecologist

SUBJECT: 174444 Mayflower Wind Aquidneck Island Wetland Field Review

MESSAGE

Introduction

Mayflower Wind Energy LLC has proposed development of the Mayflower Wind Project, an up to 2,400 megawatt (MW) offshore wind renewable energy generation project (Project) located in lease area OCS-A 0521 (Lease Area) in federal waters approximately 20 nautical miles south of Nantucket, Massachusetts. As described in the Project's Construction and Operations Plan (COP), Project facilities include wind turbine generators, offshore substation platforms, inter-array cables, and offshore export cables, as well as onshore components, including the sea-to-shore transitions, onshore export cables, onshore substations, onshore high-voltage direct-current converter station, transmission lines, and points of interconnection. Mayflower Wind is pursuing two points of interconnection in Massachusetts including one on Cape Cod in the Town of Falmouth and one at Brayton Point in the Town of Somerset.

The Brayton Point export cable corridor route begins in the Lease Area in federal waters, traverses west to Rhode Island waters and turns north up the Sakonnet River, crosses Aquidneck Island to Mount Hope Bay, and runs north to the proposed interconnect at Brayton Point in Somerset, Massachusetts. The intermediate onshore crossing of Aquidneck Island in Portsmouth, Rhode Island would serve as the onshore route for the export cable and transition from the Sakonnet River to the Mount Hope Bay. The selected export cable route in Portsmouth would make landfall at the intersection of Boyds Lane and Park Avenue near Island Park Beach. The route would then proceed north along Boyds Lane to Anthony Road. From the Anthony Road intersection, Mayflower Wind has identified four route options that either head east along Anthony Road or continue north along Boyds Lane. Two separate HDD operations would be advanced, one from the south side of Portsmouth at Island Park Beach and one from the north side of Portsmouth into Mount Hope Bay. The route options include:

- Route 1 – Anthony Road via Roger Williams University-Baypoint Residence & Conference Center.
- Route 2 – Anthony Road via The Narragansett Electric Company (TNEC/National Grid) right-of-way.
- Route 3 – Anthony Road via Montaup Country Club.
- Route 4 – Boyds Lane and Mount Hope Bridge.

The purpose of this memorandum is to document the approximate location and character of field-delineated and/or reviewed coastal and freshwater wetlands along these route options. The information contained herein can be used as an internal screening tool during the route selection process.

Review Protocol and Methods

A two-person field team comprised of a Wetland Ecologist and an Environmental Specialist performed a field review to identify, characterize, and map coastal and freshwater wetland resources along the proposed underground export cable routes on Aquidneck Island. The review area included the public road rights-of-way along Boyds Lane, Anthony Road, and under the southern approach of the Mount Hope Bridge. Field reviews were conducted on December 21, 2021, and January 6, 2022.

The field team utilized a Juniper Geode GNS2 global navigation satellite system receiver paired with an iPad running ESRI Field Maps software with a project-specific base map to provide real time sub-meter accuracy resource mapping. In instances where wetland boundary inflection points were on private property beyond the public roadway, the location of these points were estimated and manually entered using Field Maps software. No wetland or stream boundary flags were left in the field.

Wetlands and waterbodies are considered "waters of the United States" and are subject to the federal Clean Water Act if they display evidence of three wetland indicators – predominance of hydrophytic (wetland) vegetation, hydric soils, and surface hydrology. This three-parameter approach was used by the field team to identify and delineate the wetlands in accordance with the *1987 United States Army Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the subsequent *Regional Supplement to the United States Army Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region* (United States Army Corps of Engineers 2012). Apart from unusual or atypical situations, evidence of wetland must be exhibited by all three parameters for an area or position to be designated as wetland.

In 1971, the Rhode Island General Assembly passed the Freshwater Wetlands Protection Act (Act) (Rhode Island General Laws § 2-1-18 et seq.) and authorized the Rhode Island Coastal Resources Management Council (CRMC) (Rhode Island General Laws SS 46-23 et seq.), protecting inland freshwater wetlands and coastal resources, respectively. Wetlands identified during the field review comply with the definition of "Freshwater Wetland" pursuant to the Act and/or coastal features and wetland resources consistent with definitions provided in current CRMC regulations (650-RICR-20-00-1 and 650-RICR-20-00-2).

Updated CRMC regulations relating to "Freshwater Wetlands in the Vicinity of the Coast" (650-RICR-20-00-9) go into effect on July 1, 2022. Under these new regulations, CRMC will no longer regulate "Riverbank Area" and "Perimeter Wetland" portions of freshwater wetlands in the vicinity of the coast. Under the new regulations, CRMC will regulate a Jurisdictional Area which includes the resource (i.e., wetland or stream) and a contiguous area extending 200 feet outward from a stream and 100 feet outward from a freshwater wetland. The contiguous area includes the resource's Buffer Zone, and Buffer. The field-delineated wetlands map included with this memorandum show the extent of contiguous areas associated with field delineated wetlands in accordance with the new regulations.

Field-reviewed Coastal and Freshwater Wetland Descriptions

POWER identified and mapped two coastal beach systems and 12 wetlands within the review area. Specific features identified as part of these systems during the review, and defined in the CRMC regulations (650-RICR-20-00-1.1.2.A.), include:

- Coastal Beaches;
- Coastal Wetlands;
- Coastal Headlands, Bluffs, and Cliffs;
- Manmade Shorelines;
- Dunes; and
- Freshwater Wetlands in the Vicinity of the Coast.

A brief description of each beach system or wetland is presented below and summarized in Table 1. Information included in the table includes wetland community type(s) assigned to wetlands as mapped by the National Wetland Inventory (NWI) per the wetlands and deepwater classification system (Federal Geographic Data Committee 2013) and the Rhode Island Geographic Information System (IEP, Inc. 1990) as well as flood hazard areas as identified on Federal Emergency Management Agency Flood Insurance Rate Maps. Soil series underlying wetland areas were determined from the United States Department of Agriculture Natural Resources Conservation Service's Web Soil Survey (2022) online interactive mapping system.

Furthermore, two nontidal perennial watercourses were identified during the field review and are described below. These resources had clearly defined bed and banks and exhibited indicators of year-round flow.

Environmental constraints maps showing mapped wetlands, watercourses, floodplains, field-reviewed resources, and their contiguous areas are presented in Appendix A. Photographs of resources are presented in Appendix B.

Coastal Beach Systems

Island Park Beach is located south of the intersection of Boyds Lane and Park Avenue and includes Coastal Beach, Dune, and Manmade Shoreline features. The beach consists of unconsolidated medium grained sand and rounded gravel from the low tide line to foredune. Dune habitat is comprised of wind- and/or wave-deposited sand with a vegetative community dominated by American beach grass (*Ammophila breviligulata*) and rugosa rose (*Rosa rugosa*). The upper limit of the dune abuts an approximately 36-inch diameter concrete seawall parallel with Park Avenue. Mapped soils underlying the area include Beaches, sand (Ba), and Udorthents-Urban land complex (UD), a non-hydric soil. The Island Park Beach has a 200-foot contiguous area.

Mount Hope Bridge Beach is located at the end of Old Pier Road and under the southern end of the Mount Hope Bridge. Shoreline features in this area include Coastal Beach, Coastal Wetland, Dune, Coastal Bluff, and Manmade Shoreline. The exposed beach consists of unconsolidated sand, mud, and cobble- to boulder-sized rocks. Intermixed within the beach are areas of sparsely vegetated intertidal salt marsh dominated by smooth cordgrass (*Spartina alterniflora*) and a fringe of common reed (*Phragmites australis*) along the high tide line. Atlantic ribbed mussels (*Geukensia demissa*) coexist within the salt marsh area. A small dune dominated by American beach grass is located directly under the bridge. The inland coastal bank consists of a low (2-3 foot high) scarp (i.e., bluff) or boulder armor (i.e., manmade shoreline). Mapped soils in this area include Ba. The Mount Hope Bridge Beach has a 200-foot contiguous area.

Estuarine and Freshwater Wetlands

Wetland W1 is a Freshwater Wetland in the Vicinity of the Coast located at the toe of embankment slope within a depression between Route 24 southbound, the Route 24 southbound Exit 2 ramp, and the eastern side of Boyds Lane (Figure 2 page 3 of 7). This wetland consists of a palustrine emergent marsh dominated by common reed and is <1 acre in size. Wetland W1 has a 100-foot contiguous area. The wetland appears to be anthropogenic in nature and may be a component of the highway stormwater treatment system. No defined outlet or inlets other than highway stormwater outfalls were observed. The wetland extends beyond the review area to the northeast. Soils underlying the wetland are mapped as Walpole sandy loam (Wa), a hydric soil.

Wetland W2 is a Freshwater Wetland in the Vicinity of the Coast located between Old Boyds Lane and the southwestern side of Boyds Lane north of Route 24 (Figure 2, page 3 of 7). This wetland is a palustrine emergent marsh dominated by common reed and appears to be >1 acre in size. National Hydrography Dataset (NHD) mapping indicates Founders Brook flows through this wetland and discharges into Wetland W6 on the north side of Boyds Lane. Wetland W2 has a 100-foot contiguous area. The wetland extends beyond the review area to the southwest. Soils underlying the wetland are mapped as Wa and UD.

Wetland W3 is a Freshwater Wetland in the Vicinity of the Coast located south of the railroad tracks under the Mount Hope Bridge north of the terminus of Boyds Lane (Figure 2 page 7 of 7). This wetland is a palustrine emergent marsh dominated by common reed and is <1 acre in size. Wetland W3 has a 100-foot contiguous area. The wetland is associated with, and drained by, an unnamed stream (Stream S1) which flows to the north and discharges into Mount Hope Bay. The wetland extends beyond the review area to the northeast and southwest. Soils underlying the wetland are mapped as Pittstown silt loam (PmB), a non-hydric soil.

Wetland W4 is a Freshwater Wetland in the Vicinity of the Coast that occupies a small depression north of the railroad tracks under the Mount Hope Bridge (Figure 2 page 7 of 7). This wetland is a palustrine emergent marsh dominated by common reed and extends beyond the review area to the west. The wetland is <1 acre in size and has a 100-foot contiguous area. No obvious outlet was observed. Soils underlying the wetland are mapped as PmB, a non-hydric soil.

Wetland W5 is a Freshwater Wetland in the Vicinity of the Coast located north of the intersection of Boyds Lane and Anthony Road (Figure 2 page 3 of 7). This wetland system contains Founders Brook and is classified as a riverine perennial unconsolidated bottom channel of unknown depth bordered by a palustrine emergent marsh dominated by common reed. The wetland appears to be >1 acre in size and separated from an adjacent coastal wetland by a linear upland berm. Wetland W5 has a 100-foot contiguous area. Soils underlying the wetland are mapped as Matanuck mucky peat (Mk), a hydric soil, and Water (W) (Founders Brook).

Wetland W6 is a Freshwater Wetland in the Vicinity of the Coast bounded by the Route 24 southbound Exit 2 ramp, Boyds Lane, and Anthony Road (Figure 2 page 3 of 7). This wetland system includes a palustrine emergent marsh dominated by common reed >1 acre in size and a shallow palustrine unconsolidated bottom pond (Town Pond). Wetland W6 has a 100-foot contiguous area. Founders Brook drains the system to the north via an approximately 5-foot-diameter concrete culvert under Anthony Road. Soils underlying the wetland are mapped as Sandyhook mucky fine sand (Sa), a hydric soil.

Wetland W7 is a Freshwater Wetland in the Vicinity of the Coast that occupies a small depression northeast of the eastern limit of Wetland W5 and north of Anthony Road (Figure 2 page 3 of 7). This wetland is a small (<1 acre) seasonally saturated palustrine forested wetland that

appears to be confined to a low area between Anthony Road, an upland berm parallel with Founders Brook on the west, and an elevated trail to the north. Wetland W7 has a 100-foot contiguous area. Dominant vegetation includes red maple (*Acer rubrum*) and eastern cottonwood (*Populus deltoides*) trees with an understory of multiflora rose (*Rosa multiflora*) and highbush blueberry (*Vaccinium corymbosum*). The wetland extends off the review area to the north and it is unknown if there is a hydrological connection to Founders Brook or other wetland system. Soils underlying the wetland within the review area are mapped as UD.

Wetland W8 is a Coastal Wetland located north of Anthony Road and east of the Aquidneck Land Trust Town Pond parking area (Figure 2 page 3 of 7). This wetland complex consists of estuarine emergent and palustrine emergent marshes dominated by common reed that cover >1 acre and a palustrine scrub-shrub swamp dominated by coastal sweet pepperbush (Cle*thra alnifolia*), dogwood (*Cornus* sp.), and highbush blueberry. Wetland W8 has a 200-foot contiguous area. The wetland extends north and west of the review area along Anthony Road and includes an embayment fed by the tidal portion of Founders Brook. Due to limited access, the inner portion of the wetland was not field verified but review of aerial photography shows an existing 115 kilovolt overhead transmission line traversing the wetland, with access to individual structures via a narrowly elevated gravel access road. The tidally-influenced portion of the wetland appears to have zones of intertidal unconsolidated shore, and intertidal persistent emergent marsh dominated by smooth cordgrass and common reed. Soils underlying the wetland are mapped as Sa and Mk, which are both hydric soils.

Wetland W9 is a Freshwater Wetland in the Vicinity of the Coast located on an undeveloped lot on the north side of Boyds Lane between Anthony Road and Maple Drive (Figure 2 page 3 of 7). This wetland is a palustrine emergent marsh dominated by common reed and extends beyond the review area to the northeast. The wetland appears to be <1 acre in size and has a 100-foot contiguous area. Soils underlying the wetland are mapped as PmB, a non-hydric soil.

Wetland W10 is a Coastal Wetland located on the east side of Boyds Lane north of Park Avenue (Figure 2 page 1 of 7). This estuarine system consists of an intertidal persistent emergent marsh dominated by common reed and salt hay grass (*Spartina patens*), intertidal unconsolidated shore, and subtidal unconsolidated bottom tidal pools and channels. Wetland W10 has a 200-foot contiguous area. Most of the wetland boundary lies on private property adjacent to Boyds Lane. Soils underlying the wetland are mapped as Mk, a hydric soil.

Wetland W11 is a Coastal Wetland located on the west side of Boyds Lane north of Park Avenue (Figure 2 page 1 of 7). This estuarine emergent wetland is a remnant salt marsh, as evidenced by presence of salt hay grass. Full tidal exchange is restricted due to an elevated 18-inch diameter culvert under Boyds Lane. Limited tidal exchange may occur during exceptional high tides or during storm surges. Despite the tidal restriction, this wetland is considered an estuarine emergent marsh dominated by common reed and salt hay grass and an unconsolidated bottom open water pond. Review of historic aerial photography indicates the pond is permanently flooded. Wetland W11 has a 200-foot contiguous area. Most of the wetland boundary is located on private property adjacent to Boyds Lane. Soils underlying the wetland are mapped as Mk, a hydric soil.

Wetland W12 is a Freshwater Wetland in the Vicinity of the Coast located on the north side of Anthony Road on the Montaup Country Club property (Figure 2 page 4 of 7). This small wetland system (<1 acre) consists of a small pond with a palustrine emergent marsh fringe and appears to be anthropogenic in nature (i.e., golf course water feature). Wetland W12 has a 100-foot contiguous area. The wetland receives direct stormwater flow from a culvert along Anthony Road.

No defined outlet was observed. Soils underlying this wetland are mapped as Quonset gravelly sandy loam, a non-hydric soil.

Watercourses

Stream S1 is an unnamed perennial stream located along the south side of the railroad tracks near the Mount Hope Bridge (Figure 2 page 7 of 7). This small stream is approximately 5 feet wide and is characterized by a sand and gravel substrate with steep partially vegetated banks. The stream drains Wetland W3 and conveys flow along the south side of the railroad tracks and turns sharply to the north as it passes under the tracks via a 12-inch-diameter terra cotta culvert. The stream resurfaces for approximately 30 feet before entering another culvert (20-inch-diameter high-density polyethylene) for approximately 150 feet under a residential yard. This culvert discharges streamflow directly onto the Mount Hope Bridge beach and subsequently drains into Mount Hope Bay. Stream S1 has a 200-foot contiguous area.

Stream S2 is Founder's Brook, a perennial watercourse that flows north and discharges into Mount Hope Bay (Figure 2 page 3 of 7). Based on field indicators and available mapping, Founders Brook is a nontidal resource. Within the review area, Founders Brook drains Wetlands W5 and W6 and passes under Anthony Road via an approximately 5-foot-wide round concrete culvert. On the north side of Anthony Road, the brook is semi-ponded with a mucky sand substrate and is approximately 14 feet wide, >2 feet deep, and contained within Wetland W5. On the south side of Anthony Road, the brook has a mucky sand substrate, is approximately 6 feet-wide, <1 foot-deep and has low banks within Wetland W6. Stream S2 has a 200-foot contiguous area. Review of National Hydrography Dataset and topographic maps show Founders Brook continuing upstream under Boyds Lane and along the northwestern side of Route 24. Despite thorough searching, the field team could not locate a culvert conveying the brook between Wetlands W2 and W6 under Boyds Lane. If present, the culvert is likely obscured by the dense stands of common reed present in wetlands on both sides of Boyds Lane.

Summary and Conclusions

Mayflower Wind's proposed Brayton Point export cable corridor route has an intermediate onshore crossing of Aquidneck Island in Portsmouth, Rhode Island. As identified in the COP, Mayflower is evaluating several alternative crossings of Aquidneck Island. Onshore cable installation will be within public roadways or other previously-disturbed areas, wherever feasible. In December 2021 and January 2022, POWER Engineers performed a field review to identify wetlands and watercourses adjacent to public roadways along these routes.

Based on the field review, POWER identified and mapped 12 wetlands and two perennial streams along the onshore routes. Additionally, POWER mapped and described existing coastal beach community systems at Island Park Beach and the Mount Hope Bridge Beach.

Segments of the Route 1 option (0.23 miles east along Anthony Road via Roger Williams University), Route 2 option (0.21 miles east along Anthony Road via TNEC/National Grid right-of-way), and Route 3 option (0.87 miles east along Anthony Road via Montaup Country Club) are located off public road rights-of-way and were not reviewed due to lack of survey access agreements. Based on review of aerial photography, NWI, and Rhode Island wetlands mapping, a significant portion of the Route 2 option north of Anthony Road traverses estuarine and/or palustrine wetland areas within an existing overhead electric transmission line corridor. Upland areas along the Route 2 option appear to be limited to a narrow existing access road serving the existing transmission structures. Apart from the coastal beach, Route 3 option north of Anthony Road in the Montaup Country Club does not appear to cross additional wetland areas. The Route 4 option (via Boyds Lane and Mount Hope Bridge) is located entirely in public road rights-of-way and was completely reviewed.

To fulfill CRMC permitting and review requirements, Mayflower Wind may be required to conduct additional wetland delineation activities along the selected route, including flagging and/or extension of wetland boundaries. Access agreements will need to be in place prior to conducting survey work on private property.

Lastly, new CRMC regulations, including major changes regarding jurisdictional area, buffer zones, and buffers will go into effect on July 1, 2022. The field-delineated wetlands map included with this memorandum show the extent of contiguous areas associated with field delineated wetlands in accordance with the new regulations. Permit applications submitted on or after the effective date will need to comply with the new regulations.

Patrick Fellion
Wetland Ecologist

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Table 1. Summary of wetland resources identified within or immediately adjacent to the proposed Mayflower Wind underground export cable route review area across Aquidneck Island in Portsmouth, Rhode Island.

Resource ID	NWI-mapped Classification[1]	State-mapped Wetland Type[2]	Field-verified CRMC Coastal Shoreline Features								FEMA Flood Zone[3]
			Coastal Beach	Coastal Barrier	Coastal Wetland	Headland, Bluff, and Cliff	Rocky Shoreline	Man-made Shoreline	Coastal Dune	Freshwater Wetland in the Vicinity of the Coast	
Island Park Beach	E2US	Not Mapped	X					X	X		VE (BFE 17')
Mount Hope Bridge Beach	E2US	EUS	X		X	X		X	X		VE (BFE 15')
Wetland W1	Not Mapped	Not Mapped								X	AE
Wetland W2	PEM	FOB, SSA								X	AE
Wetland W3	Not Mapped	Not Mapped								X	Not Mapped
Wetland W4	Not Mapped	Not Mapped								X	Not Mapped
Wetland W5	Not Mapped	ROW								X	AE
Wetland W6	PEM	EMA, POW								X	AE
Wetland W7	E2EM	EEM								X	AE
Wetland W8	E2EM	EEM			X						AE
Wetland W9	Not Mapped	Not Mapped								X	Not Mapped
Wetland W10	E2EM, E2US	EEM			X						VE (BFE 17')
Wetland W11	PEM	EEM			X						VE (BFE 17')

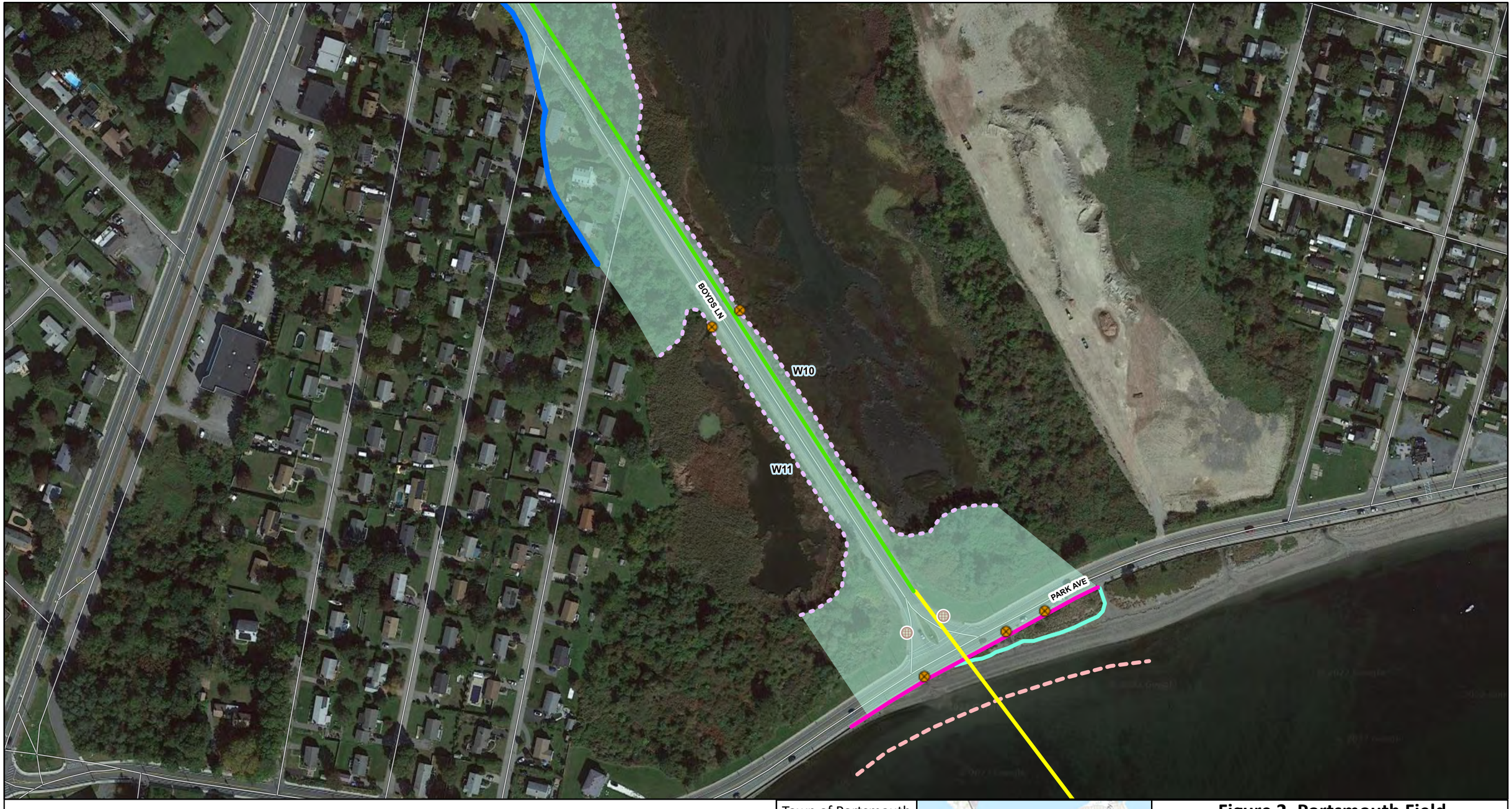
Resource ID	NWI-mapped Classification[1]	State-mapped Wetland Type[2]	Field-verified CRMC Coastal Shoreline Features								FEMA Flood Zone[3]
			Coastal Beach	Coastal Barrier	Coastal Wetland	Headland, Bluff, and Cliff	Rocky Shoreline	Man-made Shoreline	Coastal Dune	Freshwater Wetland in the Vicinity of the Coast	
Wetland W12	Not Mapped	Not Mapped								X	AE
Stream S1	Not Mapped	Not Applicable									AE
Stream S2 (Founders Brook)	Not Mapped	ROW									AE

[1] NWI Classification Codes. E2US = Estuarine intertidal unconsolidated shore; E2EM = Estuarine intertidal emergent; PEM = Palustrine emergent.

[2] Rhode Island Wetland Types. EUS = Marine/Estuarine Unconsolidated Shore; EEM = Estuarine Emergent Wetland; EMA = Emergent Wetland: Marsh/Wet Meadow; FOB = Forested Wetland: Deciduous; SSA = Scrub-shrub Wetland: Shrub Swamp; ROW = Riverine Nontidal Open Water.

[3] FEMA Flood Zones. VE (BFE) = Areas subject to inundation by the 1-percent-annual-chance flood event with additional hazards due to storm-induced velocity wave action with Base Flood Elevation; AE = Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods.

APPENDIX A
WETLAND MAPPING



Common Underground Route
Selected Onshore Route Variant 1
Selected Onshore Route Variant 2
Selected Onshore Route Variant 3
Horizontal Directional Drill Exit Point
Culvert
Drain Manhole

Wetland Resource Area
Coastal Dune
Coastal Wetland (Approximate)
Man-made Shoreline
MLW/Seaward Edge Coastal Beach (Approximate)
Contiguous Area Boundary
Contiguous Area

Town of Portsmouth
Newport County,
Rhode Island

NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet

April 25, 2022

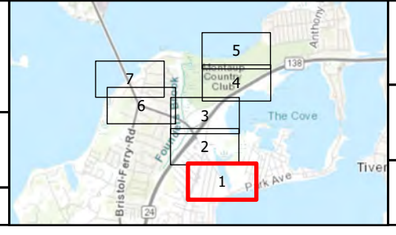


Figure 2. Portsmouth Field Delineated Wetlands

MAYFLOWER WIND

0 100 200
Feet

- Common Underground Route
- Selected Onshore Route Variant 1
- Selected Onshore Route Variant 2
- Selected Onshore Route Variant 3
- Horizontal Directional Drill Exit Point
- Culvert
- Drain Manhole

Wetland Resource Area

- Coastal Wetland (Approximate)
- Freshwater Wetland in the Vicinity of the Coast
- Freshwater Wetland in the Vicinity of the Coast
- Contiguous Area Boundary
- Contiguous Area

Town of Portsmouth
Newport County,
Rhode Island

NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet

April 25, 2022

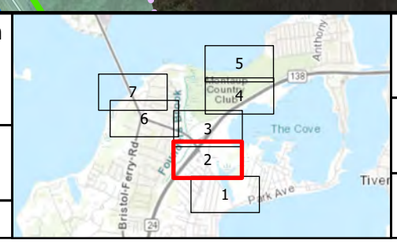
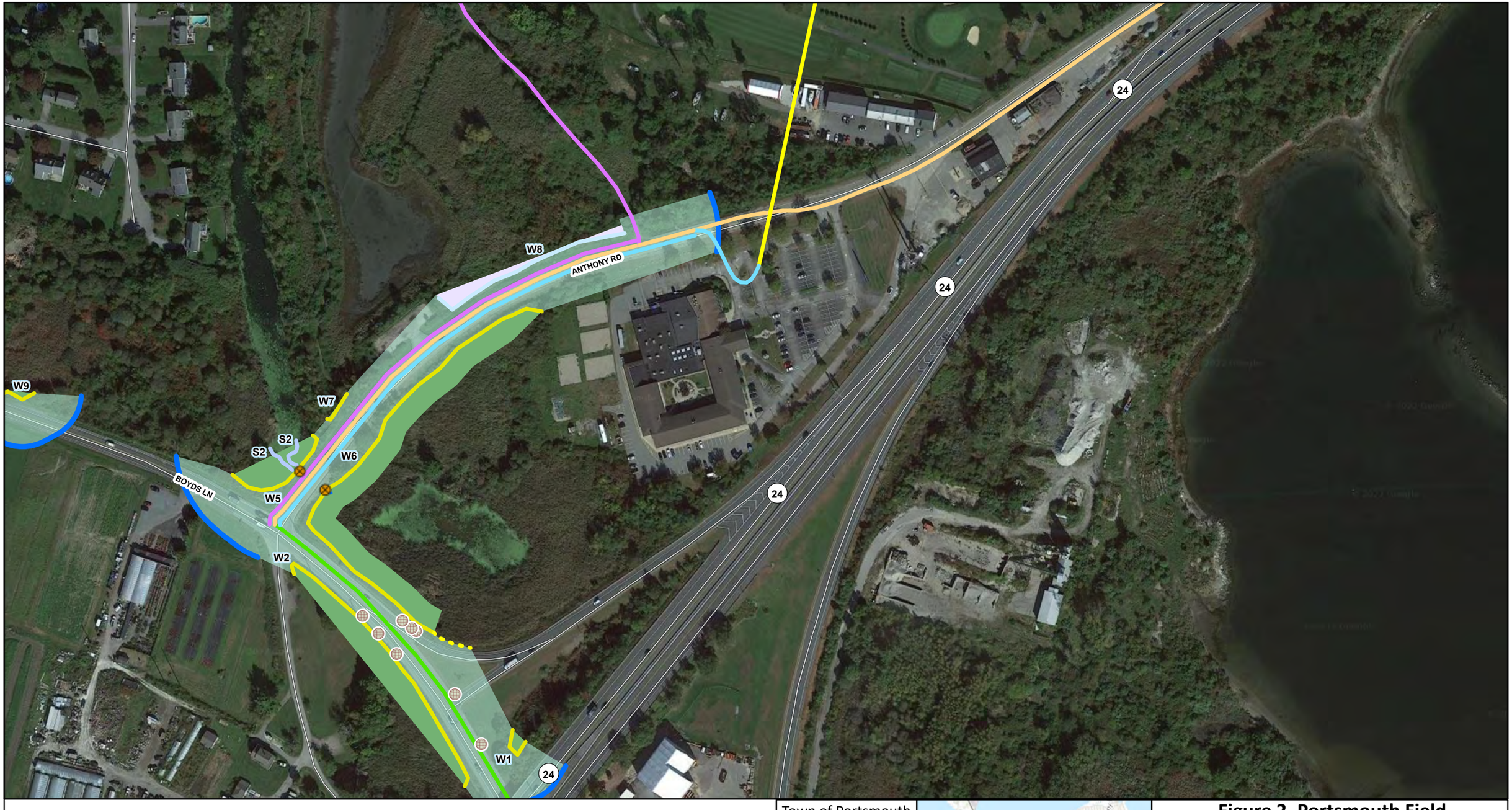


Figure 2. Portsmouth Field Delineated Wetlands

MAYFLOWER WIND

0 100 200
Feet



Common Underground Route
Selected Onshore Route Variant 1
Selected Onshore Route Variant 2
Selected Onshore Route Variant 3
Horizontal Directional Drill Exit Point

Culvert
Drain Manhole

Wetland Resource Area
Coastal Wetland
Freshwater Wetland in the Vicinity of the Coast
Freshwater Wetland in the Vicinity of the Coast (Approximate)

Perennial Stream (Centerline)
Streambank
Streambank (Approximate)
Coastal Wetland
Freshwater Wetland in the Vicinity of the Coast
Contiguous Area Boundary
Contiguous Area

Town of Portsmouth
Newport County,
Rhode Island

NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet

April 25, 2022

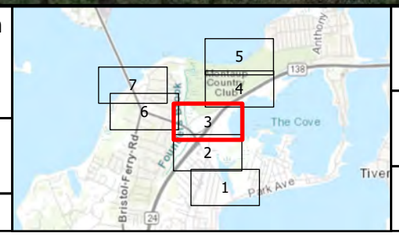


Figure 2. Portsmouth Field Delineated Wetlands

MAYFLOWER WIND

0 100 200
Feet

Common Underground Route
Selected Onshore Route Variant 1
Selected Onshore Route Variant 2
Selected Onshore Route Variant 3
Horizontal Directional Drill Exit Point

Culvert
Drain Manhole

Wetland Resource Area

Freshwater Wetland in the Vicinity of the Coast (Approximate)
Contiguous Area Boundary
Contiguous Area

Town of Portsmouth
Newport County,
Rhode Island

NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet

April 25, 2022

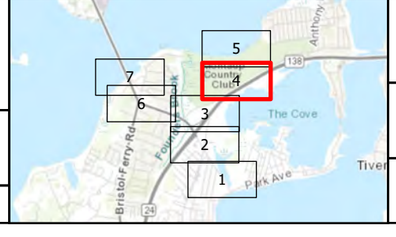


Figure 2. Portsmouth Field Delineated Wetlands

MAYFLOWER WIND

0 100 200
Feet

Common Underground Route
Selected Onshore Route Variant 1
Selected Onshore Route Variant 2
Selected Onshore Route Variant 3
Horizontal Directional Drill Exit Point
Culvert
Drain Manhole
Contiguous Area Boundary
Contiguous Area

Town of Portsmouth
Newport County,
Rhode Island

NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet

April 25, 2022

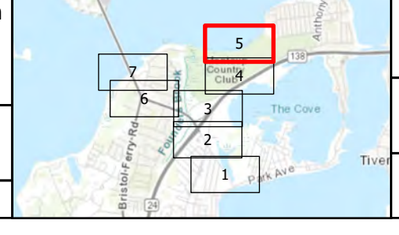
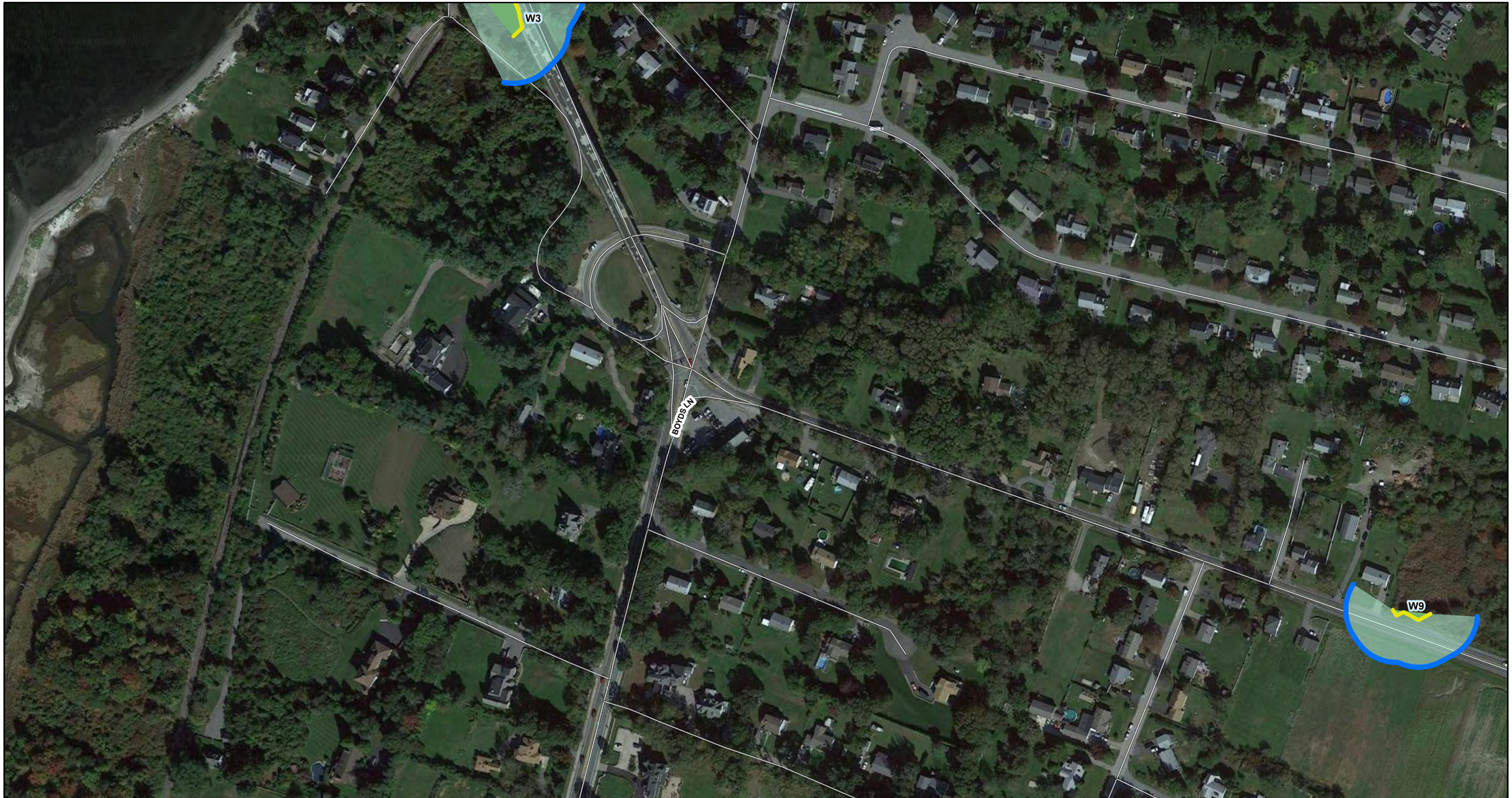


Figure 2. Portsmouth Field Delineated Wetlands

MAYFLOWER WIND

0 100 200
Feet



- Common Underground Route
- Selected Onshore Route Variant 1
- Selected Onshore Route Variant 2
- Selected Onshore Route Variant 3
- Horizontal Directional Drill Exit Point
- Culvert
- Drain Manhole

Wetland Resource Area

- Freshwater Wetland in the Vicinity of the Coast
- Freshwater Wetland in the Vicinity of the Coast
- Contiguous Area Boundary
- Contiguous Area

Town of Portsmouth
Newport County,
Rhode Island

NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet

April 25, 2022

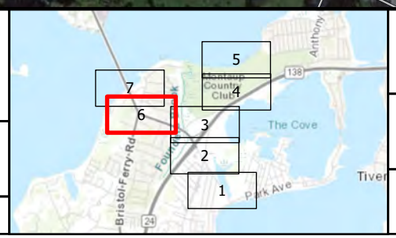


Figure 2. Portsmouth Field Delineated Wetlands

MAYFLOWER WIND

0 100 200
Feet

Common Underground Route
Selected Onshore Route Variant 1
Selected Onshore Route Variant 2
Selected Onshore Route Variant 3
Horizontal Directional Drill Exit Point

Culvert
Drain Manhole

Wetland Resource Area
Coastal Dune
Coastal Headlands, Bluffs, Cliffs
Freshwater Wetland in the Vicinity of the Coast

Perennial Stream (Centerline)
Man-made Shoreline
MLW/Seaward Edge Coastal Beach (Approximate)
Coastal Wetland
Freshwater Wetland in the Vicinity of the Coast
Contiguous Area Boundary
Contiguous Area

Town of Portsmouth
Newport County,
Rhode Island

NAD 1983 State Plane
Massachusetts Mainland
FIPS 2001 Feet

April 25, 2022

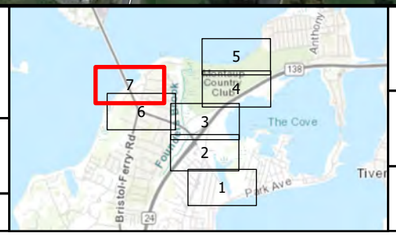


Figure 2. Portsmouth Field Delineated Wetlands

MAYFLOWER WIND

0 100 200
Feet

APPENDIX B
PHOTOGRAPHIC DOCUMENTATION

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 1	**Date:** 12/21/2021

Direction Photo Taken:

Southeast

Description:

Island Park Beach from Park Avenue and Boyds Lane.

See Figure 2 page 1 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 2	**Date:** 12/21/2021

Direction Photo Taken:

Southwest

Description:

Typical Dune and Coastal Beach at Island Park Beach along Park Avenue; shows concrete seawall parallel with Park Ave.

See Figure 2 page 1 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 3	**Date:** 12/21/2021

Direction Photo Taken:

Northwest

Description:

Proposed HDD location for sea-to-shore transition at Boyds Lane and Park Avenue.

See Figure 2 page 1 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 4	**Date:** 12/21/2021

Direction Photo Taken:

Northeast

Description:

Proposed HDD location for sea-to-shore transition at Boyds Lane and Park Avenue.

See Figure 2 page 1 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 5	**Date:** 12/21/2022

Direction Photo Taken:

Northwest

Description:

View of nearshore resources under Mount Hope Bridge including Coastal Wetland and Coastal Beach.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 6	**Date:** 12/21/2021

Direction Photo Taken:

Southeast

Description:

View of nearshore resources under Mount Hope Bridge including Coastal Beach, Coastal Wetland, Coastal Headland, and Dune.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 7	**Date:** 12/21/2021

Direction Photo Taken:

Southwest

Description:

View of nearshore resources under Mount Hope Bridge including Coastal Headland, Coastal Beach, and Dune.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 8	**Date:** 12/21/2021

Direction Photo Taken:

Northeast

Description:

View from top of Coastal Headland toward Mount Hope Bay.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 9	**Date:** 12/21/2021

Direction Photo Taken:

Northeast

Description:

Wetland W1 (Freshwater Wetland in the Vicinity of the Coast) dominated by common reed on north side of Boyds Lane and adjacent to Route 24 southbound.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 10	**Date:** 12/21/2021

Direction Photo Taken:

Northwest

Description:

Wetland W2 (Freshwater Wetland in the Vicinity of the Coast) dominated by common reed adjacent to south side of Boyds Lane and Route 24 southbound.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 11	**Date:** 12/21/2021

Direction Photo Taken:

South

Description:

Wetland W3 (Freshwater Wetland in the Vicinity of the Coast) dominated by common reed under Mount Hope Bridge.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 12	**Date:** 12/21/2021

Direction Photo Taken:

South

Description:

Wetland W4 (Freshwater Wetland in the Vicinity of the Coast) dominated by common reed under Mount Hope Bridge.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 13	**Date:** 1/6/2022

Direction Photo Taken:

Northeast

Description:
Wetland W5 (Freshwater Wetland in the Vicinity of the Coast) dominated by common reed on northern side of intersection of Anthony Road and Boyds Lane.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 14	**Date:** 1/6/2022

Direction Photo Taken:

Southeast

Description:
Wetland W6 (Freshwater Wetland in the Vicinity of the Coast) dominated by common reed on southern side of intersection of Anthony Road and Boyds Lane.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 15	**Date:** 1/6/2022

Direction Photo Taken:

Northeast

Description:

Wetland W8 (Coastal Wetland) dominated by common reed on the north side of Anthony Road.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 16	**Date:** 1/6/2022

Direction Photo Taken:

North

Description:

Wetland W9 (Freshwater Wetland in the Vicinity of the Coast) dominated by common reed located north of Boyds Lane.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 17	**Date:** 12/21/2021

Direction Photo Taken:

Northwest

Description:

Wetland W10 (Coastal Wetland) on east side of Boyds Lane.

See Figure 2, page 1 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 18	**Date:** 12/21/2021

Direction Photo Taken:

Northwest

Description:

Facing the culvert in Wetland W10 which connects to Wetland W11 under Boyds Lane.

See Figure 2, page 1 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 19	**Date:** 12/21/2021

Direction Photo Taken:

Northeast

Description:

Wetland W11 (Coastal Wetland) on west side of Boyds Lane.

See Figure 2, page 1 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 20	**Date:** 1/6/20212

Direction Photo Taken:

North

Description:

Wetland W12 (Freshwater Wetland in the Vicinity of the Coast) in the Montaup Country Club on the north side of Anthony Road.

See Figure 2, page 4 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 21	**Date:** 12/21/2021

Direction Photo Taken:

Southwest

Description:

Facing upstream at Stream S1, a perennial stream along the railroad track near the Mount Hope Bridge.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 22	**Date:** 12/21/2021

Direction Photo Taken:

Northwest

Description:

Facing downstream at the end of Stream S1 where it discharges onto the Mount Hope Bridge beach.

See Figure 2, page 7 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 23	**Date:** 1/6/2022

Direction Photo Taken:

Northwest

Description:

Facing downstream at Stream S2 (Founders Brook) and Wetland W5 from Anthony Road.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 24	**Date:** 1/6/2022

Direction Photo Taken:

Southwest

Description:

Facing upstream end of culvert draining Stream S2 (Founders Brook) and Wetland W6 under Anthony Road.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 25	**Date:** 1/6/2022

Direction Photo Taken:

North

Description:

Facing north towards Anthony Road from Roger Williams University Baypoint Community's eastern parking lot.

See Figure 2, page 3 of 7.

PHOTOGRAPHIC LOG

Client Name: Mayflower Wind	**Site Location:** Portsmouth, RI	**Project No.** 174444

Photo No. 26	**Date:** 1/6/2022

Direction Photo Taken:

South

Description:

Facing south towards Route 24 from Roger Williams University Baypoint Community's eastern parking lot.

See Figure 2, page 3 of 7.

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment J: USFWS IPaC Consultation

Revised: February 2023

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
Phone: (603) 223-2541 Fax: (603) 223-0104
http://www.fws.gov/newengland

In Reply Refer To: March 30, 2022
Project Code: 2022-0026203
Project Name: Mayflower Wind - Rhode Island

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.

About Official Species Lists

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

Endangered Species Act Project Review

Please visit the "**New England Field Office Endangered Species Project Review and Consultation**" website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

https://www.fws.gov/newengland/endangeredspecies/project-review/index.html

NOTE Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

Additional Info About Section 7 of the Act
Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

Candidate species that appear on the enclosed species list have no current protections under the ESA. The species' occurrence on an official species list does not convey a requirement to consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

Migratory Birds

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

https://www.fws.gov/birds/policies-and-regulations.php

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

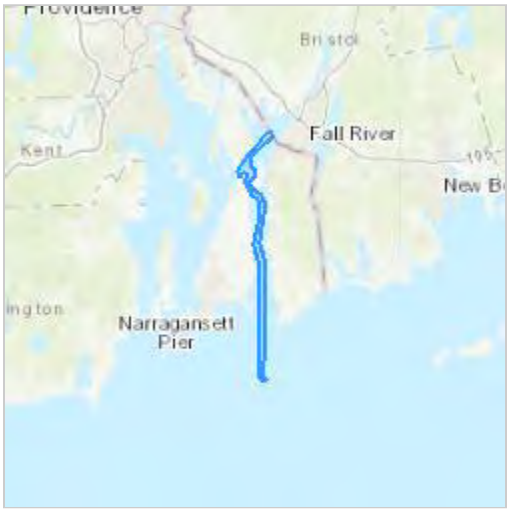
New England Ecological Services Field Office
70 Commercial Street, Suite 300
Concord, NH 03301-5094
(603) 223-2541

Project Summary

Project Code: 2022-0026203
Event Code: None
Project Name: Mayflower Wind - Rhode Island
Project Type: Power Gen - Wind - Offshore
Project Description: Mayflower Wind Energy LLC (Mayflower Wind) is currently in the planning process for a new offshore wind renewable energy generation project located within federal lease area OCS-A 0521. The Lease Area is approximately 127,388 acres (51,552 hectares) located in federal waters off the southern coast of Massachusetts, approximately 26 nautical miles (nm) (48 kilometers [km]) south of the island of Martha's Vineyard and 20 nm (37 km) south of Nantucket, Massachusetts. There will be up to 149 positions in the Lease Area to be occupied by wind turbine generators (WTG) and offshore substation platforms (OSP). Construction is anticipated to commence between 2023 and 2025, after all necessary permits and authorizations have been obtained. At present, Mayflower Wind is evaluating an export cable route through Rhode Island state waters up the Sakonnet River, across Aquidneck island to Mt. Hope Bay, and north to Brayton Point in Somerset, MA.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@41.54401275,-71.22357773666229,14z



Counties: Bristol and Newport counties, Rhode Island

Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Birds

NAME	STATUS
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Insects

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

IPaC User Contact Information

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Lead Agency Contact Information

Lead Agency: Bureau of Ocean Energy Management

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment K: Magnetic Field Modeling Report

Revised: February 2023

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May 17, 2022

Mayflower Wind Energy LLC
110 Federal Street
Boston, MA 02110

Re: Magnetic Field Analysis Report for Rhode Island (RI) Energy Facility Siting Board (EFSB) Application Submittal

Dear Sir or Madam:

This cover letter accompanies the Magnetic Field Analysis Report for the Mayflower Wind Brayton Point Project Cable Systems that was prepared by POWER Engineers, Inc. (POWER Engineers). The Magnetic Field Analysis Report summarizes model-predicted reasonable maximum magnetic field (MF) levels for the proposed Mayflower Wind offshore and onshore export cables that will deliver approximately 1,200 MW of clean, renewable energy from offshore wind generated in federal waters to a point of interconnection to the regional transmission system at Brayton Point in Somerset, Massachusetts. The export cable system includes two high-voltage direct current (HVDC) power cables at a nominal voltage of +/-320 kV DC and one dedicated communications cable.

The POWER Engineers modeling analysis is focused on magnetic fields because the electric fields arising from the voltage on the offshore export cables will be completely shielded by cable materials, and there will also be no aboveground electric fields from the onshore underground conductors due to shielding by the cables. This cover letter was prepared to compare the model-predicted MF levels for the HVDC export cables at the proposed landfall site and along the onshore underground route segment in Rhode Island to health-protective exposure guidelines, and to assess the potential for harmful impacts to marine organisms, including commercially and recreationally important fish species and benthic organisms, from the MF levels predicted for the HVDC offshore export cables.

In Rhode Island, the proposed export cable route includes a short, intermediate onshore crossing of Portsmouth after the HVDC cables come onshore *via* horizontal directional drilling (HDD) beneath Island Park Beach at depth (based on the preliminary site-specific engineering design, estimated to be 25 feet [7.6 meters] and 40 feet [12.2 meters] for the two conductors). The HVDC cables will cross Aquidneck Island for approximately 2 miles (3.2 km) in underground duct banks installed along proposed routes following Boyd's Lane and Anthony Road.

Mayflower Wind also identified a design variation to the Project intended to provide flexibility for the future expansion of the electric system in the Brayton Point area to accommodate the likely need to connect additional new renewable energy generation. This “Noticed Variation” would facilitate the delivery of up to an additional 1,200 MW of renewable clean energy by “right-sizing” certain facilities (primarily trenching and conduits for onshore underground transmission cables) while minimizing overall impacts to the community and environment. The Noticed Variation would involve sizing underground infrastructure on Aquidneck Island for the HVDC export cables to include spare conduits at landfall and onshore that would be capable of accommodating an additional 1,200 MW HVDC circuit consisting of an additional two power cables and one communications cable.

Mayflower Wind is committed to fully developing and delivering energy from its offshore Lease Area and believes it is prudent and efficient planning to provide for the potential that all the energy from the Lease Area could be delivered to points of interconnection at or near Brayton Point, pending additional study of regional grid considerations as part of the interconnection process managed by ISO New England. Mayflower Wind wishes to provide for this contingency to do the right thing by not only prudently planning but also avoiding/minimizing impacts to the community and the environment. Developing the project in this way would mean less disturbance of the natural and developed environment by conducting earthwork and civil construction onshore in a single campaign.

Peak maximum DC MF levels ranging from 181 to 433 milligauss (mG) were obtained at 1 meter above the ground surface for the three representative HVDC onshore duct bank configurations that were modeled, including a single circuit duct bank, a double circuit duct bank, and an alternate double circuit duct bank. The Noticed Variation model cases evaluate the double circuit duct bank with one 1,200 MW circuit installed. Although the Noticed Variation does not include a request for approval of additional export cables at this time, for informational purposes only, results are also presented for an indicative future scenario with a second 1,200 MW circuit installed.

For each duct bank configuration, the MF levels drop off very rapidly with increasing lateral distance from the cables, for example, ranging from 3.5 to 30.5 mG at 25 feet (7.6 meters) from the duct bank centerlines and 0.47 to 8.0 mG at 50 feet (15.2 meters) from the duct bank centerlines. For the Island Park Beach (Boyd's Lane) landfall site, a peak maximum MF level of 261 mG was obtained at the ground surface above the cable centerline; due to the approximately 21 foot (6.4 meter) separation distances of the +/- conductors at the landfall site, MF levels at the landfall site fall off more slowly with lateral distance than for the onshore duct bank configurations, with decreased MF levels of 174 mG and 79 mG at lateral distances of 25 feet and 50 feet, respectively, from the centerline between the two unbundled cables. On Aquidneck Island along the proposed onshore export cable route, the earth's steady (DC) geomagnetic field has a magnitude of approximately 512 mG, meaning that only MF levels in the immediate vicinity of the onshore underground duct banks along Boyd's Lane will appreciably differ from the earth's DC geomagnetic field.

The state of Rhode Island has not adopted standards for electric and magnetic fields (EMFs) from HVDC transmission lines or other sources that can be compared to the model-predicted DC MFs. There are also no US federal standards limiting general public or occupational exposure to EMFs from HVDC transmission lines. Scientists have not reported any confirmable chronic health risks for the weak steady EMFs associated with HVDC power transmission; this is consistent with the fact that humans have lived for tens of thousands of years in the presence of the earth's DC geomagnetic field, which is not known to adversely interact with biological processes or directly affect human health.

As summarized in Table 1, international health and safety organizations have established health-based exposure guidelines for DC MFs (also known as steady MFs) applicable to both the general public and occupational populations based on preventing transient sensory effects including vertigo and nausea. In particular, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) has established a general public exposure guideline of 4,000,000 mG for steady MFs (ICNIRP, 2009). This exposure guideline encompasses safety factors in order to be sufficiently protective of the general public. Given potential harms to individuals with implantable medical devices possibly containing ferromagnetic materials (*e.g.*, pacemakers and cardiac defibrillators), ICNIRP recommends that such individuals not be exposed to steady MFs above 5,000 mG (ICNIRP, 2009). More recently, the International Committee on Electromagnetic Safety (ICES) within the Institute of Electrical and Electronics Engineers (IEEE) conducted an updated review of the scientific and medical research literature, and retained its safety guidelines for general public exposure to steady MFs of 1,180,000 mG and 3,530,000 mG for head and trunk exposure and limb exposure, respectively (IEEE, 2019). Importantly, each of these health-protective MF guidelines are far above the modeled DC MFs predicted for either the ground surface at the Island Park

Beach landfall site or at a height of 1 meter along Boyd's Lane in Portsmouth for the representative onshore underground duct bank configurations.

Table 1 DC MF Guidelines Established by Health and Safety Organizations

Organization	MF Guideline
General Public	
International Commission on Non-Ionizing Radiation Protection (ICNIRP) (exposure to any part of the body)	4,000,000 mG[(a)]
Institute of Electrical and Electronics Engineers (IEEE) Standard C95.6	1,180,000 mG[(b)] 3,530,000 mG[(c)]
Occupational	
International Commission on Non-Ionizing Radiation Protection (ICNIRP)	20,000,000 mG[(d)] 80,000,000 mG[(e)]
American Conference of Governmental and Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs)	20,000,000 mG[(f)] 200,000,000 mG[(g)] 5,000 mG[(h)]

Notes:
DC = Direct Current; MF = Magnetic Field; kV/m = Kilovolts Per Meter; mG = Milligauss.
(a) Applies to exposures to any part of the body (ICNIRP, 2009).
(b) Applies to head and of trunk exposure (IEEE, 2019).
(c) Applies to exposure of limbs (IEEE, 2019).
(d) Applies to head and of trunk exposure (ICNIRP, 2009).
(e) Applies to exposure of limbs (ICNIRP, 2009).
(f) ACGIH TLV for general workplace whole body exposure (ACGIH, 2020).
(g) ACGIH TLV for general workplace limb exposure (ACGIH, 2020).
(h) ACGIH TLV for workers with implanted ferromagnetic or electronic medical devices (ACGIH, 2020).

The entire offshore export cable route will consist of HVDC submarine cables, and the POWER Engineers Magnetic Field Analysis predicted DC MF levels at the seafloor (or above the concrete mattress for the unburied installation case) associated with three representative installation scenarios for the HVDC offshore export cables: (1) the typical installation case that will be used wherever practicable, where the two DC conductors are bundled together (along with a communications cable) and buried at a target depth of 2 meters, (2) a worst-case installation case where the bundled conductors are laid directly on the seafloor surface and covered by a concrete mattress, such as at a cable crossing location, and (3) an unbundled installation case where the two DC conductors are separately buried approximately 50 meters (164 feet) apart at a target depth of 2 meters– to be used as needed to ensure safe installation and repair of the separate cables, as well as to minimize risk of damage to both cables from threats such as anchor strike. As shown in the POWER Engineers Magnetic Field Analysis Report, the highest modeled MF levels for these offshore export cable installation scenarios would occur directly above the cables (peaking at 123 mG for the typical installation case, and ranging from 1,909 to 3,785 mG across the two other possible installation cases), with a rapid reduction in MF levels with increasing lateral and vertical distance from the cables, *e.g.*, decreasing proportional to the square of the distance from the bundled cables. For example, for the two bundled cable installation scenarios where MF cancellation is increased by the bundling of two cables with current in equal but opposite polarity, the analysis shows 93->99% reductions in MF levels at lateral distances of ±25 feet (±7.6 meters) from the cable bundle centerlines as compared to the maximum MF levels directly above the cable bundles; and at lateral distances of ±25 feet, there is little difference in MF levels for the buried *versus* the surface-laid cables. Only for the two atypical installation cases, cases (2) and (3), will MF levels above the offshore export cables appreciably differ from the earth's steady (DC) geomagnetic field, and only within short distances from the cables.

No regulatory thresholds or guidelines for allowable EMF levels in marine environments have been established for either HVDC or HVAC transmission. There is a growing body of evidence suggesting that

EMFs from HVDC cables may be perceptible to some electromagnetic (EM)-sensitive marine species, but there remains a lack of evidence indicating potential harmful impacts at the population- or community-level for the various types of marine species which may experience exposure to DC EMFs from submarine export cables (CSA Ocean Sciences Inc. and Exponent, 2019; Gill and Desender, 2020; SEER, 2022; Taormina *et al*., 2018). Several different types of studies have been conducted in recent years, including experimental field studies, experimental laboratory studies, and field surveys, with a limited number of inconsistent findings of subtle behavioral responses and physiological changes from some studies. For example, Hutchison *et al*. (2020) observed minor behavioral responses of both Little skates (*Leucoraja erinacea*) and American lobsters (*Homarus americanus*) for *in situ* enclosure experiments conducted on top of the Cross Sound Cable (CSC), a buried submarine HVDC cable (330 MW, ±150 kV) that runs between Connecticut and Long Island. They did not report evidence of a barrier effect as both species were observed to freely cross over the cable, but their findings included several responses indicative of increased exploratory/foraging behavior for the Little skate, and more limited evidence of a subtle behavioral exploratory response for the American lobster. Despite the usage of highly elevated DC MF levels, laboratory experimental studies have frequently reported an absence of evidence of adverse biological responses. For example, Taormina *et al*. (2020) conducted laboratory experiments of juvenile European lobsters (*Homarus gammarus*) for higher DC MF gradients (as high as 2,250 mG), observing no changes in sheltering behavior or exploratory behavior. For a laboratory study where several different types of marine benthic (seafloor) species were exposed to highly elevated DC MFs (37,000 mG) over several week time periods, Bochert and Zettler (2004) observed no differences in survival between exposed and control test organisms that included North Sea prawn (*Crangon crangon*), round crab (*Rhithropanopeus harrisii*), glacial relict isopod (*Saduria entomon*), blue mussel (*Mytilus edulis*), and young flounder (*Plathichthys flesus*).

It is important to distinguish the types of subtle behavioral responses and physiological changes that have been observed in some research studies from evidence of potential harmful impacts at the population- and community-level (Taormina *et al*., 2018). Moreover, since exposures to elevated MF levels from submarine cables will be limited to small areas along the seafloor in the immediate vicinity of the submarine export cables, it is important to consider the low exposure potential of most marine species. For example, because they breathe at the sea surface and have large migratory ranges, marine mammals such as sea turtles and whales would not be expected to spend significant amounts of time at the seafloor in the vicinity of specific submarine export cables. Overall, although knowledge gaps remain and there is a need for continued research, the weight of the currently available evidence does not provide support for concluding there would be population-level harms to marine species from EMF associated with HVDC submarine transmission.

This conclusion regarding a lack of evidence of population-level harms to marine species from HVDC-related EMFs is supported by findings from recent governmental reports and expert state of the science reviews. For example, the U.S. Bureau of Ocean Energy Management (BOEM) released a report in 2019 aimed at summarizing what is currently known about potential EMF impacts in coastal marine environments, with a specific focus on fish species of commercial or recreational importance in southern New England (CSA Ocean Sciences Inc. and Exponent, 2019). This report includes an 8-page executive summary, a 36-page technical discussion, and a 7-page reference list with 92 specific citations. It addresses potential risks to marine species posed by both AC and DC fields. Overall, based on its review of the state of the knowledge regarding potential EMF-related impacts on marine life, the authors concluded, "The operation of offshore wind energy projects is not expected to negatively affect commercial and recreational fishes within the southern New England area. Negligible effects, if any, on bottom-dwelling species are anticipated. No negative effects on pelagic [*i.e*., in upper layers of the open sea] species are expected due to their distance from the power cables buried in the seafloor" (CSA Ocean Sciences Inc. and Exponent, 2019). This conclusion is based on the growing number of recent research studies published by US and European researchers, as well as information available from fish surveys conducted in Europe where both AC and DC submarine export cables have been operated in coastal environments for more than a decade.

With respect to findings from fish surveys in Europe, the study authors concluded, "During this time, many surveys have been conducted to determine if fish populations have declined following offshore wind energy project installation. The surveys have overwhelmingly shown that offshore wind energy projects and undersea power cables have no effect on fish populations [72,80,81,82]. Fish assessed as part of these surveys include flounder and other flatfish, herring, cod, and mackerel. These are similar to species harvested along the U.S. Atlantic coast" (CSA Ocean Sciences Inc. and Exponent, 2019).

Another recent example is the review of the current knowledge relevant to EMF-related risks to marine organisms from electric cables and marine renewable energy devices that was included in the Ocean Energy Systems (OES)- Environmental 2020 State of the Science Report: Environmental Effects of Marine Renewable Energy Development Around the World. OES-Environmental, which currently consists of 16 partner nations, was established in 2010 by the International Energy Agency (IEA) Ocean Energy Systems (OES). The 2020 EMF review, which was authored by Andrew B. Gill and Marieke Desender of the United Kingdom's Centre for Environment, Fisheries and Aquaculture Science, discussed how a number of targeted studies have contributed to an increase in the knowledge base since the analogous publication in the 2016 State of the Science Report, which highlighted significant gaps in the knowledge base. Gill and Desender (2020) observed that new research, including both field and laboratory studies, has included some detectable EMF-related effects and responses (*e.g*., behavioral, physiological, developmental, and genetic) on a limited number of individual species, but emphasized that these findings are not generally for EMF strengths associated with marine renewable energy (MRE) projects. Overall, based on their updated review of the available science, Gill and Desender (2020) concluded, "Based on the knowledge to date, biological or ecological impacts associated with MRE subsea power cables may be weak or moderate at the scale that is currently being considered or planned. It is important, however, to acknowledge that this assessment comes from a handful of studies and that data about impacts are scarce, so significant uncertainties concerning electromagnetic effects remain." While this conclusion is not specific to DC cables, many of the recent studies discussed in the review were for DC fields. Gill and Desender (2020) highlighted the continued lack of conclusive evidence as to any harmful effects and the need for additional research targeting other receptor species, sensitive life stages, and different EMF exposures (sources, intensities).

Most recently, in February 2022, the U.S. Offshore Wind Synthesis of Environmental Effects Research (SEER) webinar #4 "Electromagnetic Fields & Vessel Collision: Effects on Marine Life from Offshore Wind Energy" included the following conclusion: "Overall, the effects of EMF have been considered minor to negligible and a less significant issue than other environmental effects at OSW [offshore wind] farms, but confidence remains low" (SEER, 2022).

In summary, for a conservative modeling analysis that assumed cable currents based on maximum (100 percent capacity) wind farm output[1], modeled DC MFs predicted for the ground surface at the Island Park Beach (Boyd's Lane) landfall site and at a height of 1 meter along Boyd's Lane in Portsmouth are well-below health-based exposure guidelines for DC MFs. In addition, MF modeling for the offshore export cables showed that DC MF levels will be increased only for small areas along the seafloor around certain localized cable locations where conservative (and atypical) installation conditions are present, contributing to highly localized deviations from the earth's DC geomagnetic field. As discussed above, the weight of the currently available scientific evidence does not provide support for concluding there would be population-level harm to marine species from EMFs associated with HVDC submarine transmission.

[1] The wind farm is expected to operate at an annual-average capacity factor of around 50 percent; thus, much of the time, the actual output and MF attributable to the Project export cables will be correspondingly lower than the values discussed in this letter, which are for maximum output.

Sincerely,

GRADIENT

Christopher M. Long, Sc.D., DABT
Principal
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2022-05-17

MAYFLOWER WIND

Brayton Point Project Cable Systems

Magnetic Field Analysis

Revision 0

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174444

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MAGNETIC FIELD ANALYSIS

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MAYFLOWER WIND

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"Issued For" Definitions:

- "Prelim" means this document is issued for preliminary review, not for implementation
- "Appvl" means this document is issued for review and approval, not for implementation
- "Impl" means this document is issued for implementation
- "Record" means this document is issued after project completion for project file

TABLE OF CONTENTS

INTRODUCTION **1**

METHODOLOGY AND INPUT DATA **1**

CABLE INSTALLATION SCENARIOS **2**

SUBMARINE CABLE SCENARIOS OFFSHORE AND AT LANDFALL 2
Case 1: HVDC offshore, bundled configuration, 6.6 ft (2.0 m) burial depth 2
Case 2: HVDC offshore, bundled, on seafloor under a 1.0 ft (0.3 m) thick concrete mattress 3
Case 3: HVDC offshore, non-bundled, cables separated by 164 ft (50 m), 6.6 ft (2.0 m) burial depth 3
Case 4: HVDC landfall horizontal directional drills (HDD), beach case under Island Park Beach near Boyd's Lane and Park Avenue 3
ONSHORE CABLE SCENARIOS 4
Case 5: HVDC onshore, single circuit duct bank, 3.2 ft (0.96 m) burial depth 4
Case 6: HVDC onshore, double circuit duct bank, 3.3 ft (1.01 m) burial depth 4
Case 7: HVDC onshore, alternate double circuit duct bank, 3.4 ft (1.03 m) burial depth 5
Case 8: HVAC onshore, single circuit duct bank (two cables per phase), 3.3 ft (1.01 m) burial depth 6

MAGNETIC FIELD RESULTS **7**

APPENDIX A – CABLE GEOMETRIES **12**

APPENDIX B – CIRCUIT GEOMETRIES **14**

INTRODUCTION

This report documents a magnetic field study completed by POWER Engineers, Inc. (POWER) for Mayflower Wind Energy, LLC (Mayflower). The study examines eight (8) cable configurations associated with the portions of the Mayflower Wind project in the Rhode Island and Massachusetts jurisdictions, both offshore in state waters and onshore on Aquidneck Island and Brayton Point. These configurations are listed below and described in the Cable Installation Scenarios section. Preliminary cable sizes and drawings of the circuit configurations are located in Appendix A and Appendix B.

1. HVDC offshore, bundled configuration, 6.6 ft (2.0 m) burial depth[1].
2. HVDC offshore, bundled, on seafloor under a 1.0 ft (0.3 m) thick concrete mattress.
3. HVDC offshore, non-bundled, cables separated by 164 ft (50 m), 6.6 ft (2.0 m) burial depth.
4. HVDC landfall horizontal directional drills (HDD), beach case under Island Park Beach near Boyd's Lane and Park Avenue. Cable depths are 25 ft (7.6 m) and 40 ft (12.2 m) below the surface with a 15 ft (4.6 m) horizontal separation.
5. HVDC onshore, single circuit duct bank, 3.2 ft (0.96 m) burial depth.
6. HVDC onshore, double circuit duct bank, 3.3 ft (1.01 m) burial depth.
7. HVDC onshore, alternate double circuit duct bank, 3.4 ft (1.03 m) burial depth.
8. HVAC onshore, single circuit duct bank (two cables per phase), 3.3 ft (1.01 m) burial depth.

POWER has calculated magnetic field in milligauss (mG) for the above configurations. Interpretation of results and comparison to industry limits will be performed by others. Human exposure to electric fields is negligible when a cable includes a grounded sheath and/or armor. This is the case for the Mayflower wind project. Therefore, calculation of the small external electric fields due to voltages induced on cable sheaths and/or armor is not included in the study.

METHODOLOGY AND INPUT DATA

Magnetic fields are the result of electron flow (current) in conductors. DC current produces a static magnetic field and AC current produces a time varying magnetic field. POWER used the COMSOL Multiphysics finite element software (version 5.6) for the analysis and verified results with hand calculations. Currents in each case are assumed to be balanced. This means that the currents for all conductors in each case sum to zero.

Magnetic field results for the seabed installation scenarios were reported at the sea floor. The offshore exception to this is Case 2 where fields are reported at the surface of the cement mattress. Per typical industry practice, onshore magnetic fields are reported at 3.28 ft (1.0 m) above ground. The onshore exception is the landfall beach case. While it is standard practice to report EMF values at a height of 1 meter above the ground surface, we assumed that a person could be lying flat on the beach. Therefore, we conservatively reported the landfall magnetic field results at the ground surface. Magnetic fields are proportional to current and inversely proportional to the distance from the current carrying conductor. Therefore, magnetic fields at any non-zero height above the surface will be lower than what is reported at the surface.

[1] Burial depths in this document are from the surface of the seafloor or surface of the earth to the top of the respective cable.

When conductor groups include currents flowing in opposite directions, they can be arranged so that external magnetic fields partially cancel. Better cancellation of magnetic fields is achieved by reducing the spacing between the conductors. However, spacing between conductors is sometimes constrained by other factors. For example, the cable spacing of the un-bundled cables offshore in Case 3 is determined to facilitate safe installation and repair of the separate cables, as well as to minimize risk of damage to both cables from threats such as anchor strike. Conductor spacing within onshore duct banks is also constrained by thermal considerations. Multi-circuit results reported in the next section are based on geometric arrangements that maximize magnetic field cancellation. Table 1 summarizes the study inputs.

Table 1. Study Inputs

Parameter	Value	Comments
AC Frequency	60 Hz	
Nominal AC voltage	345 kV	Line-to-line rms. Maximum voltage is 362 kV.
Total AC Power	1200 MW	
AC current per cable	1120 Amps rms [a]	Based on two cables per phase.
Nominal DC voltage	±320 kV	Pole-to-ground
Total DC Power	1200 MW	600 MW on each pole.
DC current per cable	1974 Amps DC	Based on one cable per pole and 5% reduced pole voltage.
AC cable sheath current	0 Amps	Based on single point sheath bonding.
GCC current	0 Amps	Induced voltage and current in the GCCs are neglected [b].
DC sheath and armor current	0 Amps	No voltage induced due to static magnetic fields.
Non-magnetic material μ_r	1.0	Magnetic permeability of soil, air, water, Al, Cu, stainless steel.

[a] *Calculated at 0.95 per unit voltage, 0.95 power factor, and rounded up to the nearest 10 amps. Total current per phase is 2240 Amps rms.*

[b] *GCC currents have minor cancelling effects that would slightly reduce surface level magnetic fields. Neglecting these currents results in a slightly overestimated magnetic field.*

CABLE INSTALLATION SCENARIOS

Submarine Cable Scenarios Offshore and at Landfall

Mayflower Wind selected Model Cases 1-4 to capture representative configurations for the HVDC submarine transmission systems offshore and in the sea-to-shore transition at landfall. Some or all of these configurations will be present in the installed project equipment.

Case 1: HVDC offshore, bundled configuration, 6.6 ft (2.0 m) burial depth

This model case represents the typical configuration offshore, with all offshore export cables (two submarine power cables and one submarine communications cable) installed together in a bundled configuration and buried in the seabed. Mayflower Wind will install the offshore export cables in a bundled configuration where practicable.

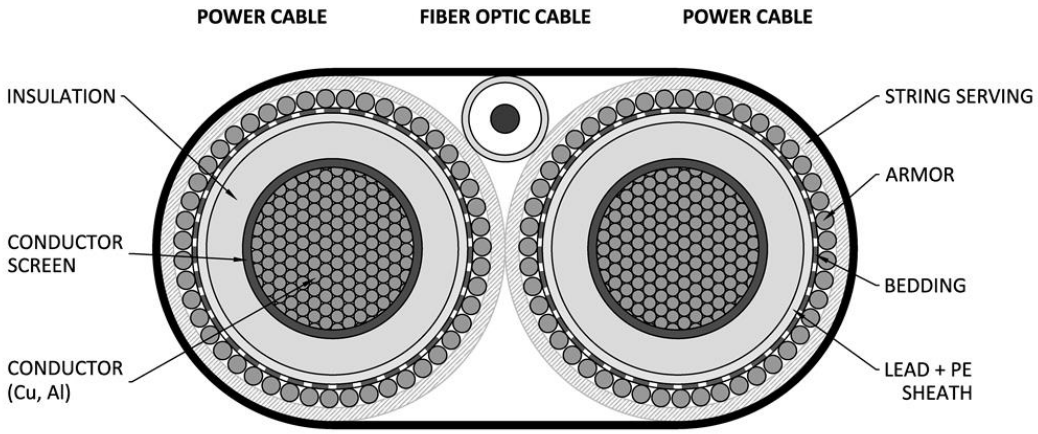


Figure 1: Typical HVDC Offshore Export Cable Bundled Configuration

Case 2: HVDC offshore, bundled, on seafloor under a 1.0 ft (0.3 m) thick concrete mattress

This model case represents the bundled configuration offshore, as described in Case 1 and illustrated in Figure 1**.** However, in certain local areas (including at crossings of existing pipelines such as those in the Sakonnet River), cable burial in the seabed may not be possible. In this case, the cables will be protected by means of secondary protection material (i.e., mattresses, rock) placed on top of the cables after installation. A typical example with representative geometry and thickness of cover is presented in this model case.

Case 3: HVDC offshore, non-bundled, cables separated by 164 ft (50 m), 6.6 ft (2.0 m) burial depth

As noted in Case 1, Mayflower Wind will install the offshore export cables in a bundled configuration where practicable. However, there may be portions of the route, including the approach to the landfall HDDs, where the cables must be installed separately (non-bundled). In this case, adequate separation will need to be maintained between the cables to ensure that they can be safely installed, maintained, and repaired (if needed). This model case represents a typical horizontal spacing between separately installed offshore export cables.

Case 4: HVDC landfall horizontal directional drills (HDD), beach case under Island Park Beach near Boyd's Lane and Park Avenue.

One cable is at a depth of 25 ft (7.6 m) below the surface and the other is at a depth of 40 ft (12.2 m). The horizontal spacing between cables is 15 ft (4.6 m). The offshore export cables will be brought to shore at each landfall location via HDD. Each submarine power cable will be installed in a separate HDD borehole and conduit. The trajectory of the HDDs will result in deeper burial of the cables beneath sensitive nearshore areas, including under Island Park Beach which is depicted in this model case. The cable depth represented in this model case is the current preliminary design depth of the cables at the landfall location at Boyd's Lane on Aquidneck Island.

Onshore Cable Scenarios

Mayflower Wind selected Model Cases 5-8 to capture representative configurations for the HVDC and HVAC underground transmission systems onshore. These configurations were evaluated as part of the preliminary engineering effort for the Project.

Case 5: HVDC onshore, single circuit duct bank, 3.2 ft (0.96 m) burial depth

This Model Case captures a typical configuration for an underground, concrete-encased duct bank that can accommodate two HVDC power cables and one dedicated communications cable.

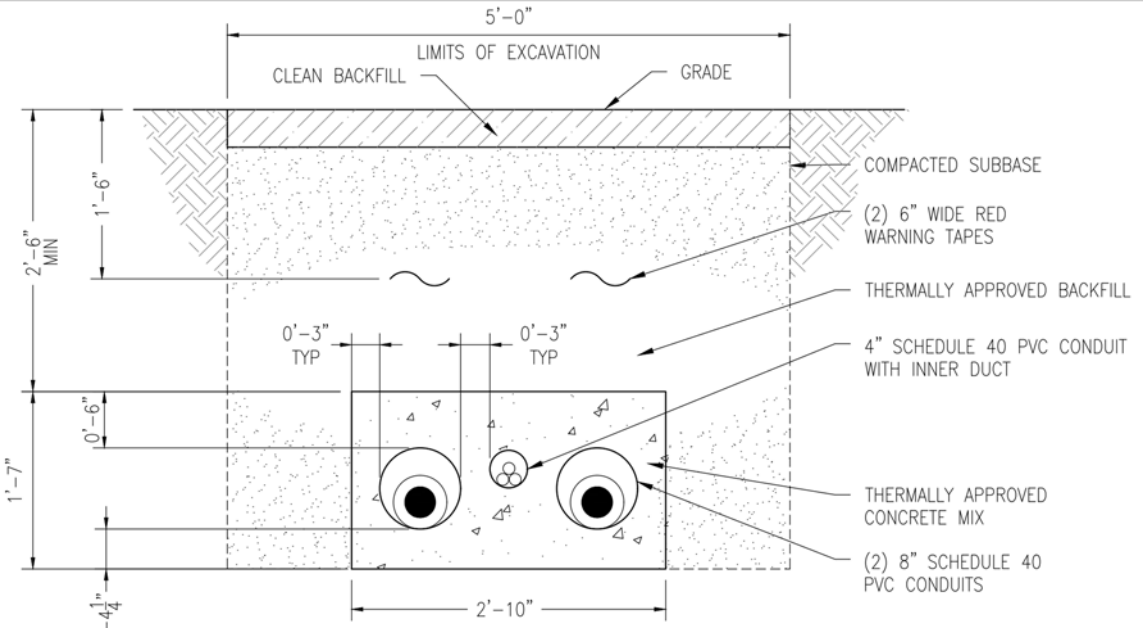


Figure 2: Typical HVDC Onshore Trench without the Noticed Variation

Case 6: HVDC onshore, double circuit duct bank, 3.3 ft (1.01 m) burial depth

This Model Case captures Mayflower Wind's Noticed Variation.

Mayflower Wind has identified a design variation to the Project, referred to as the Noticed Variation, which would involve the design and conditional construction of certain right-sized transmission facilities along the same onshore routes to enable the delivery of up to an additional 1,200 MW of renewable clean energy. The Noticed Variation would involve sizing underground infrastructure to include spare conduits and vaults at landfall and onshore, capable of accommodating an additional 1200 MW HVDC circuit.

Model Case 6 represents a typical configuration for an underground, concrete-encased duct bank that can accommodate four power cables and associated communication and ancillary cables in a single trench.

The Magnetic Field Results section reports results for the Noticed Variation, which includes two spare conduits for an additional circuit, as shown in Figure 3**.** Although the Noticed Variation does not incl

ude a request for approval of additional export cables at this time, for informational purposes only, results are also presented for an indicative future scenario with a second 1200 MW circuit installed.

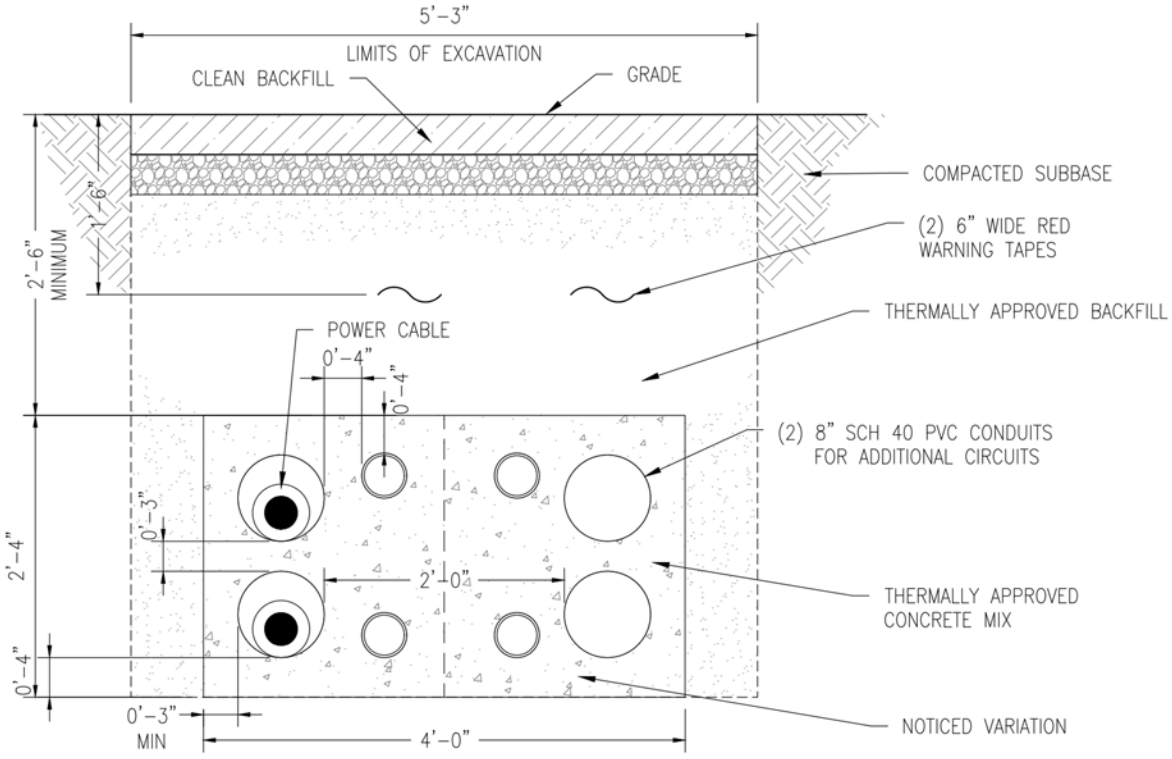


Figure 3: Typical HVDC Onshore Trench with the Noticed Variation

Case 7: HVDC onshore, alternate double circuit duct bank, 3.4 ft (1.03 m) burial depth

This Model Case captures an alternate configuration for Mayflower Wind's Noticed Variation.

Model Case 7 represents an alternate configuration for an underground, concrete-encased duct bank that can accommodate four power cables and associated communication and ancillary cables in a single trench.

The Magnetic Field Results section reports results for the scenario with two spare conduits for an additional circuit**.** Although the Noticed Variation does not include a request for approval of additional export cables at this time, for informational purposes only, results are also presented for an indicative future scenario with a second 1200 MW circuit installed.

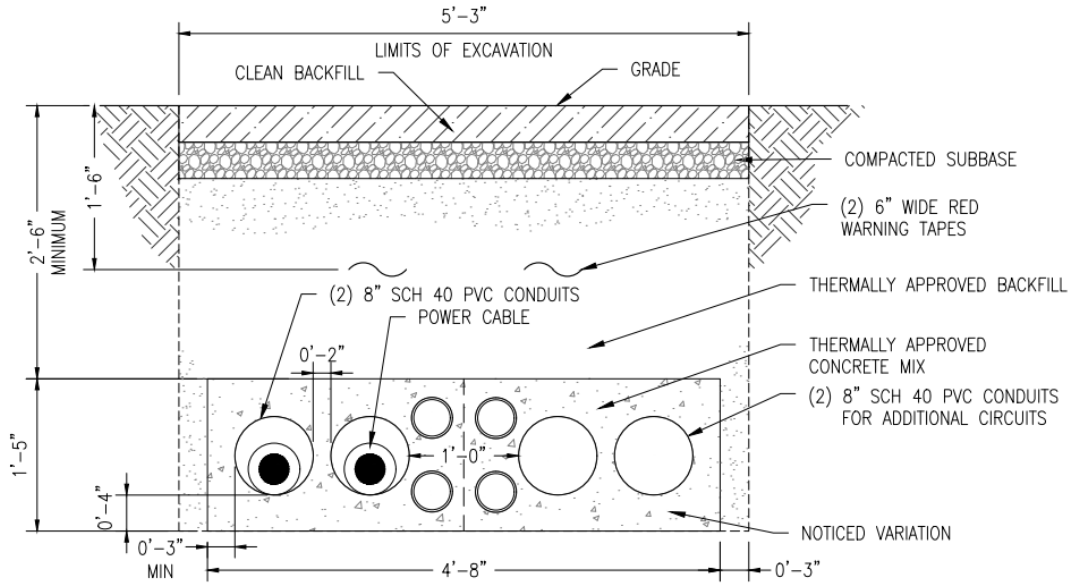


Figure 4: Alternate HVDC Onshore Trench with the Noticed Variation

Case 8: HVAC onshore, single circuit duct bank (two cables per phase), 3.3 ft (1.01 m) burial depth

This Model Case captures the typical configuration of an underground, concrete-encased duct bank that can accommodate three HVAC phases (each with two power cables per phase) and associated communication and ancillary cables in a single trench.

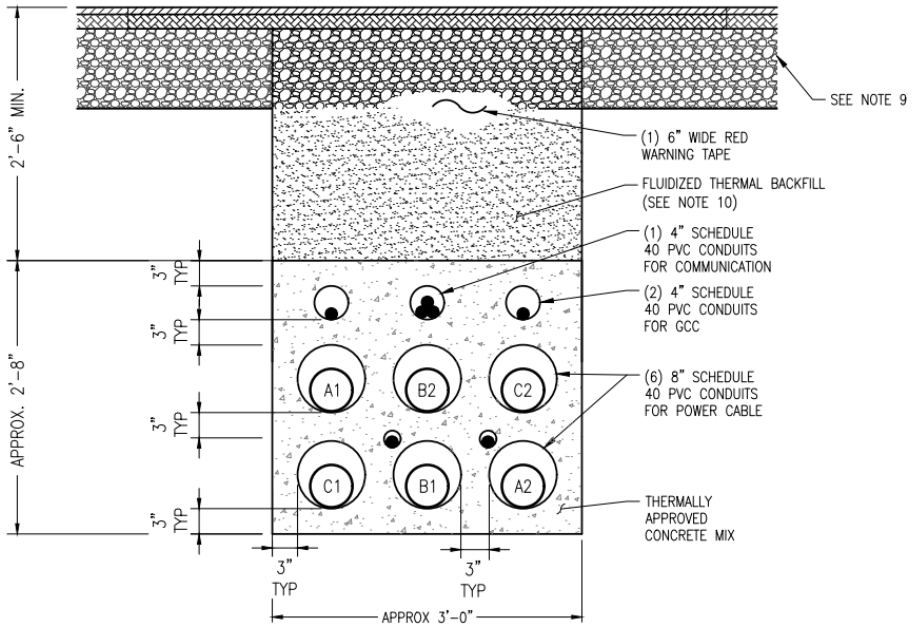


Figure 5: Typical HVAC Onshore Trench

MAGNETIC FIELD RESULTS

Table 2 lists the peak magnetic field results for each case. Corresponding profile plots are located in Figures 6 through 13.

Table 2. Study Results

Case		Magnetic Field [a] (milligauss [b])				Figure
		Max	10 ft	25 ft	50 ft	
1	HVDC offshore, bundled, 6.6 ft burial depth.	123	38.7	8.4	2.2	6
2	HVDC offshore, bundled, on seafloor under a 1.0 ft concrete mattress.	3785	55.7	9.0	2.2	7
3	HVDC offshore, non-bundled, 164 ft cable separation, 6.6 ft burial depth.	1909	1120	579	360	8
4	HVDC landfall HDD, beach case, 25 ft, and 40 ft burial depths.	261	250	174	79.0	9
5	HVDC onshore, single circuit duct bank, 3.2 ft burial depth.	433	140	30.5	8.0	10
6	HVDC onshore, double circuit duct bank, 3.3 ft burial depth.	252 (181) [c]	101 (37.4)	20.6 (3.9)	5.2 (0.53)	11
7	HVDC onshore, alternate double circuit duct bank, 3.4 ft burial depth.	259 (188) [c]	95.8 (34.9)	18.9 (3.5)	4.7 (0.47)	12
8	HVAC onshore, single circuit duct bank (2 cables per phase), 3.3 ft burial depth.	66.7 [d]	13.9	1.5	0.20	13

[a] Magnetic field results at maximum and at varying distances from the centerline (or from cable in separated offshore case).
[b] Milligauss is a unit of magnetic flux density; however, the generic term "magnetic field" is used throughout this document.
[c] Values in parenthesis include an additional 1200-MW circuit with identical loading.
[d] Field values for the AC case are root-mean-square (rms).

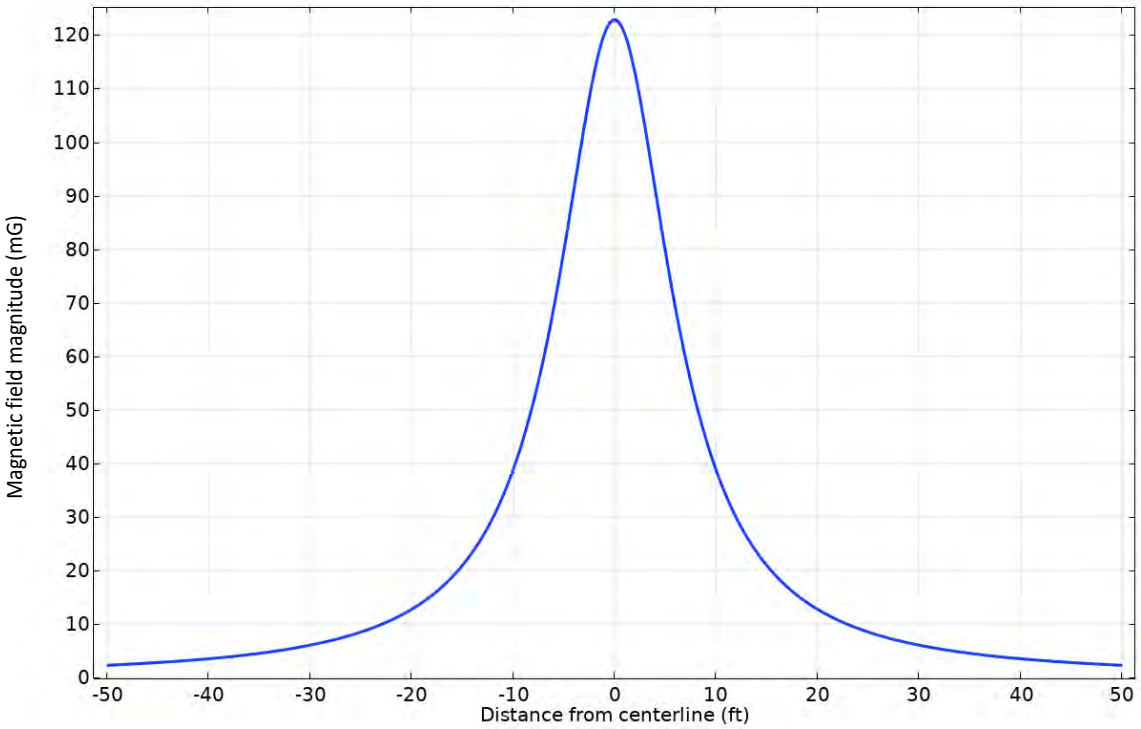


Figure 6. Magnetic field at the seafloor for Case 1: HVDC offshore, bundled, 6.6 ft (2.0 m) burial depth.

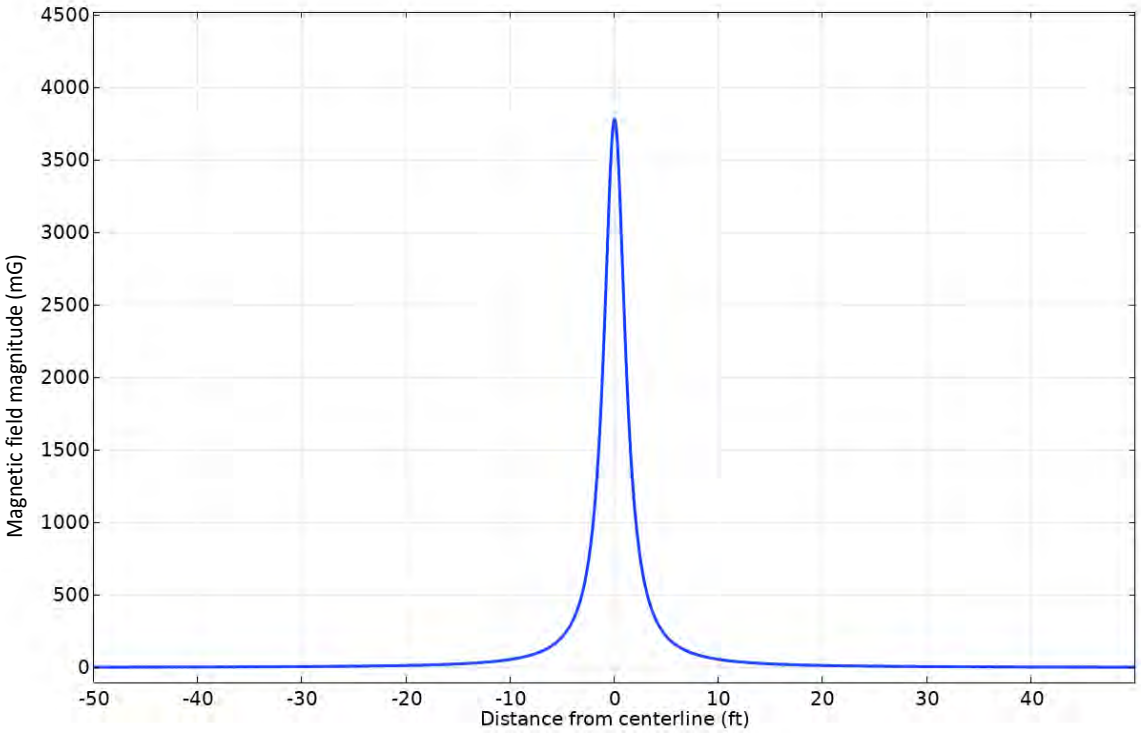


Figure 7. Magnetic field above the concrete mattress for Case 2: HVDC offshore, bundled, 1.0 ft (0.3 m) concrete mattress.

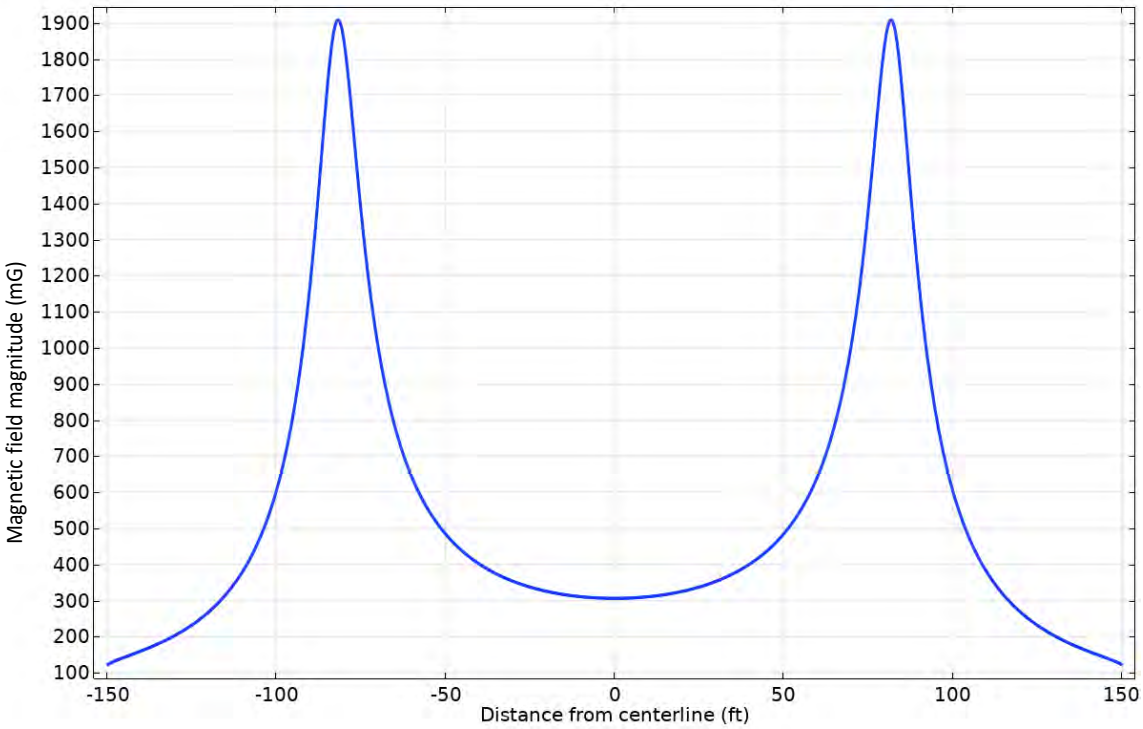


Figure 8. Magnetic field at the seafloor for Case 3: HVDC offshore, non-bundled 164 ft (50 m) separation, 6.6 ft (2.0 m) burial depth.

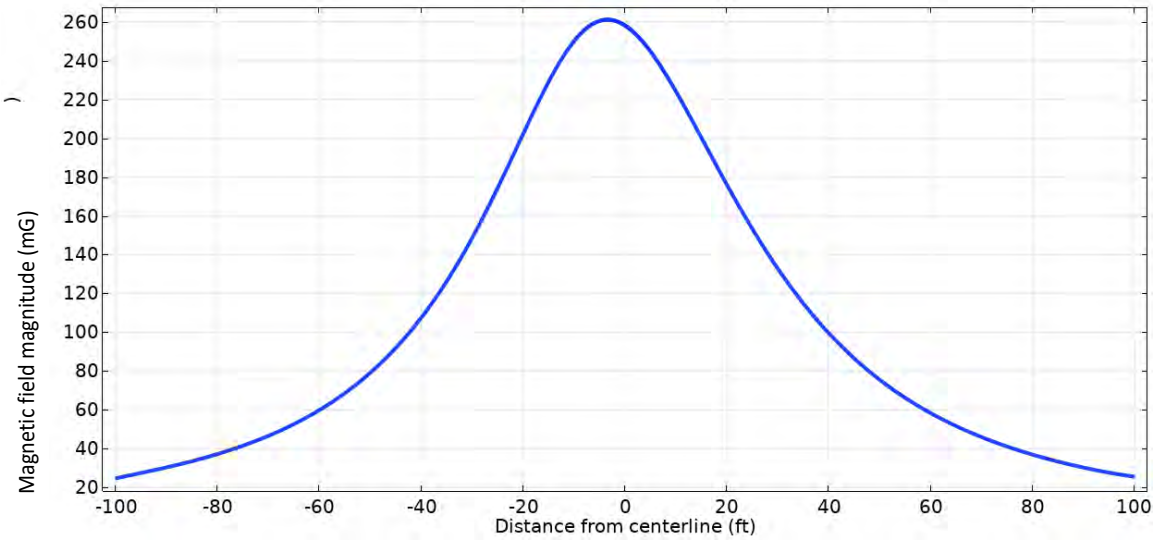
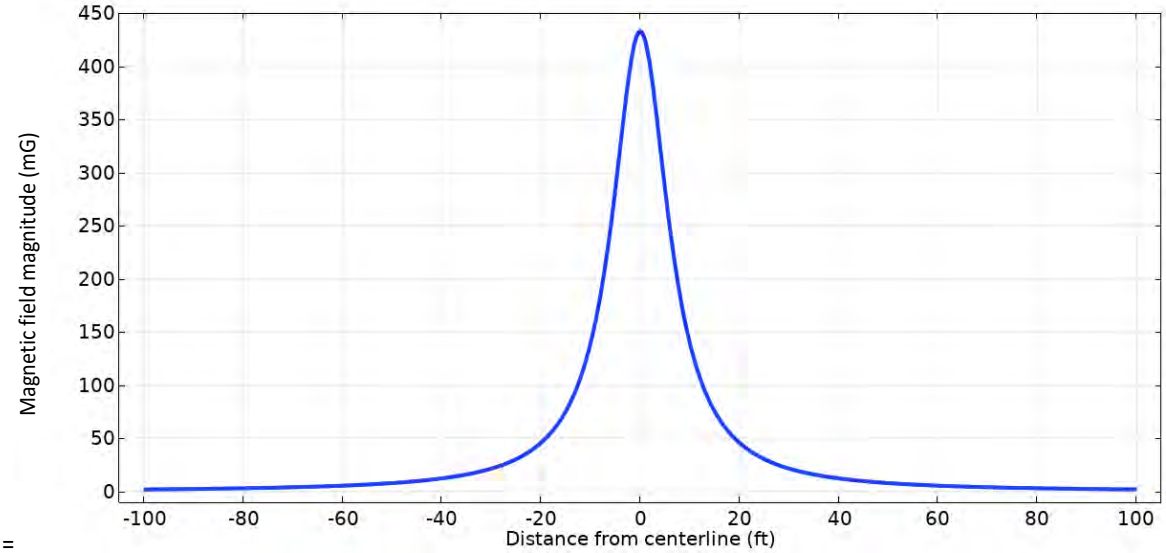


Figure 9. Magnetic field at the surface for Case 4: HVDC HDD landfall case, 25 ft (8.2 m) and 40 ft (12.2 m) burial depths and 15 ft (4.6 m) horizontal spacing.



=

Figure 10. Magnetic field at the earth surface for Case 5: HVDC onshore, single circuit, 3.2 ft (0.95 m) burial depth.
(Model case does not include spare conduits for the Noticed Variation)

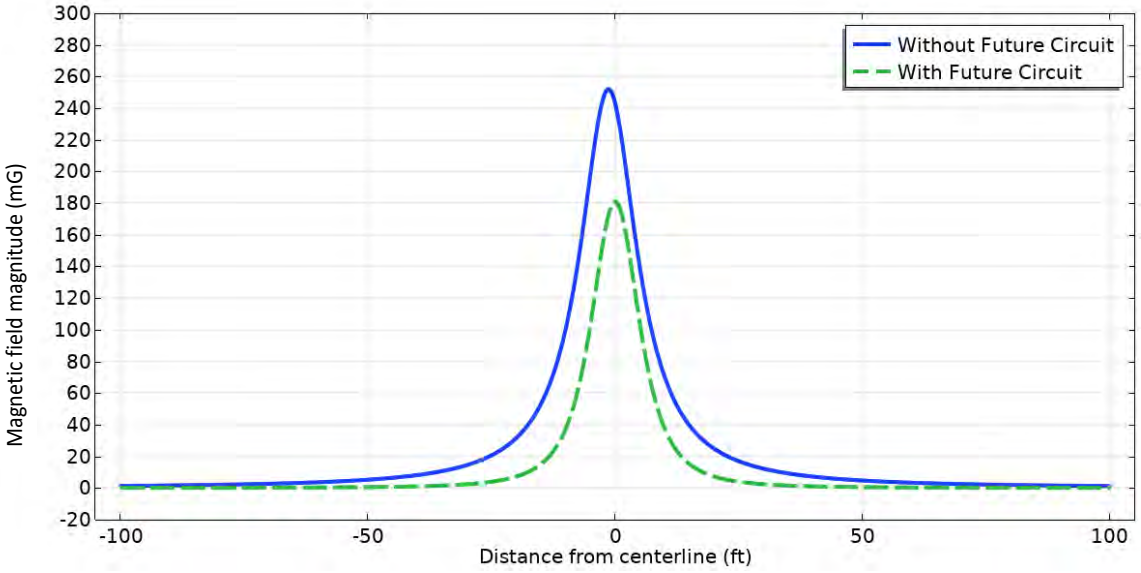


Figure 11. Magnetic field at the earth surface for Case 6: HVDC onshore double circuit duct bank, 3.3 ft (1.01 m) burial depth.

Note: *The blue line predicts MF for the Noticed Variation with empty spare conduits (as proposed). The green dashed line is an indicative future scenario that predicts MF with a second 1200 MW circuit installed. The reduction is due to field cancelling effects introduced by the second circuit.*

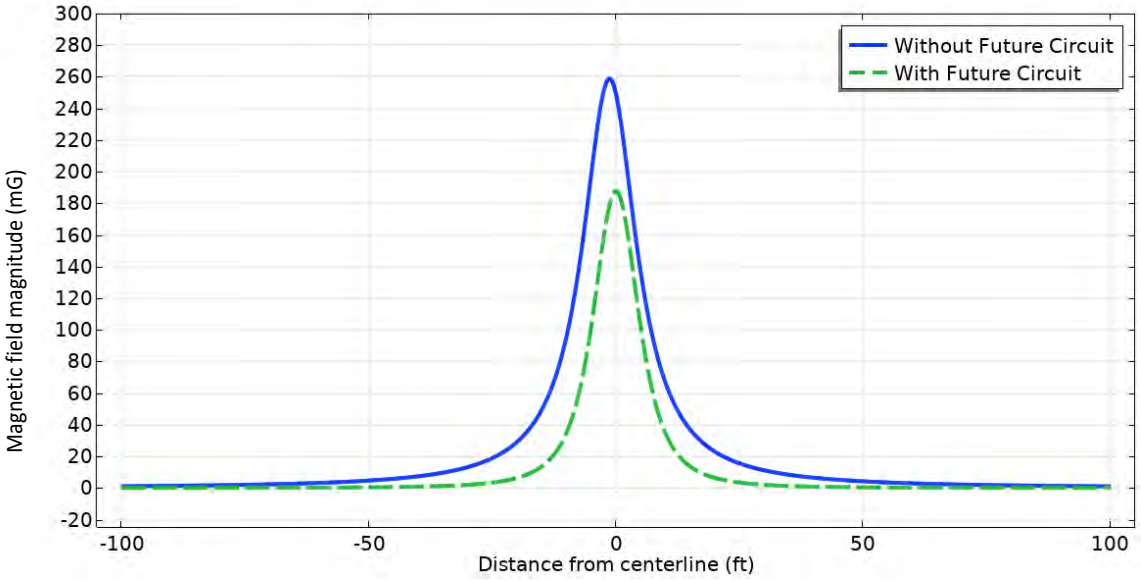


Figure 12. Magnetic field at the earth surface for Case 7: HVDC onshore alternate double circuit duct bank, 3.4 ft (1.03 m) burial depth.

Note: *The blue line predicts MF for the Noticed Variation with empty spare conduits (as proposed). The green dashed line is an indicative future scenario that predicts MF with a second 1200 MW circuit installed. The reduction is due to field cancelling effects introduced by the second circuit.*

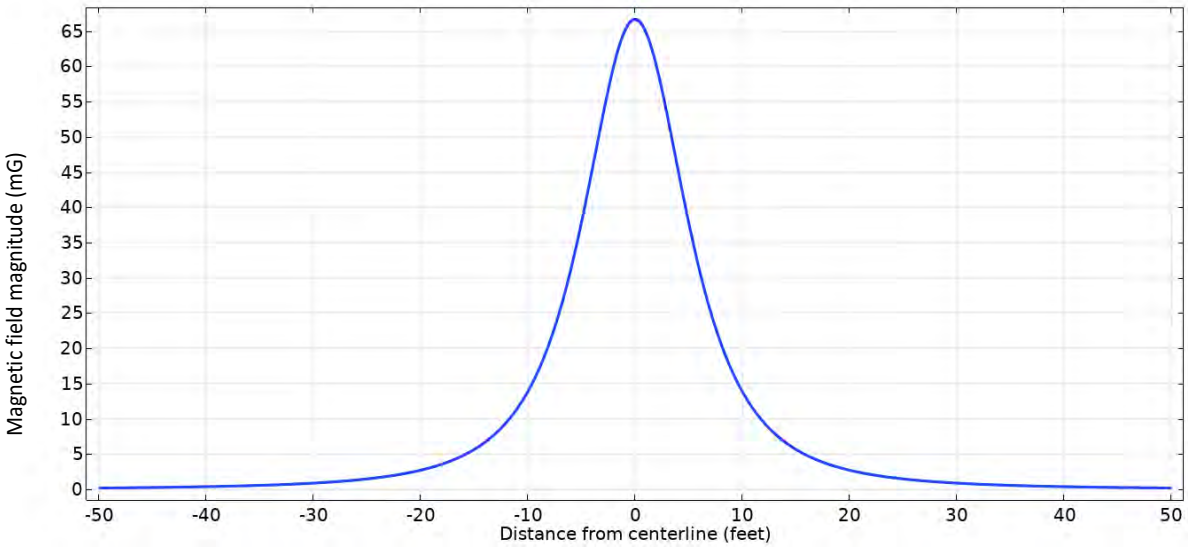
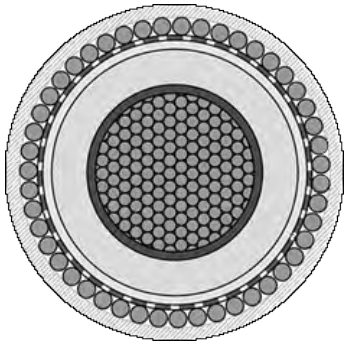


Figure 13. Magnetic field at the surface of the earth for Case 8: HVAC onshore, 3.3 ft (1.01 m) burial depth.

APPENDIX A – CABLE GEOMETRIES

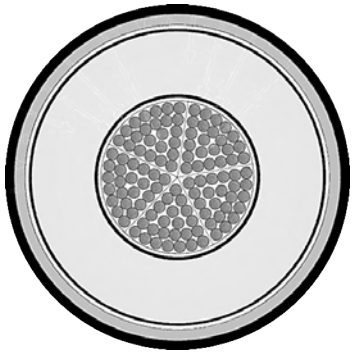
Approximate Submarine ±320 kV DC Cable Geometry (cable size provided by Mayflower)

Conductor core diameter: ≈48 mm (≈1.9 in)
Cable outer diameter: ≈133 mm (≈5.2 in)



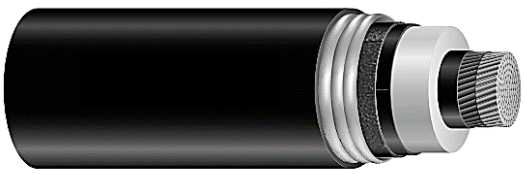
Approximate Underground ±320 kV DC Cable Geometry (cable size provided by Mayflower)

Conductor core diameter: ≈63 mm (≈1.9 in)
Cable outer diameter: ≈119 mm (≈5.2 in)



Approximate Underground 345 kV AC Cable Geometry (3000 kcmil cable size estimated by POWER based on desired ampacity of 1004 Amps AC rms per cable).

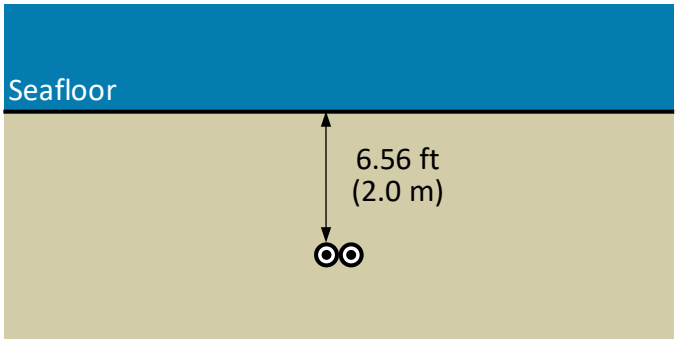
Conductor core diameter: ≈48 mm (≈1.89 in)
Cable outer diameter: ≈140 mm (≈5.5 in)



APPENDIX B – CIRCUIT GEOMETRIES

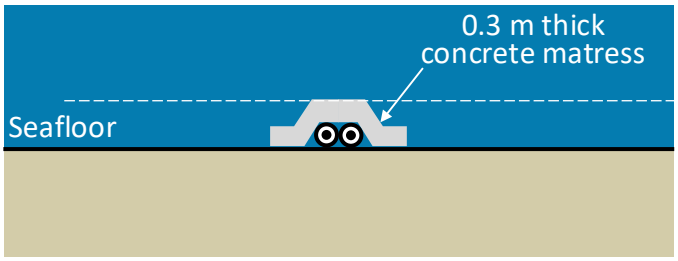
The drawings below are simplified diagrams showing relative cable placement. Depths are measured from the seafloor or earth surface to the top of the respective cable. Horizontal separation is measured from cable centers. Horizontal separation for bundled is therefore equal to one cable diameter.

Case 1: ±320 kV DC offshore, bundled configuration.



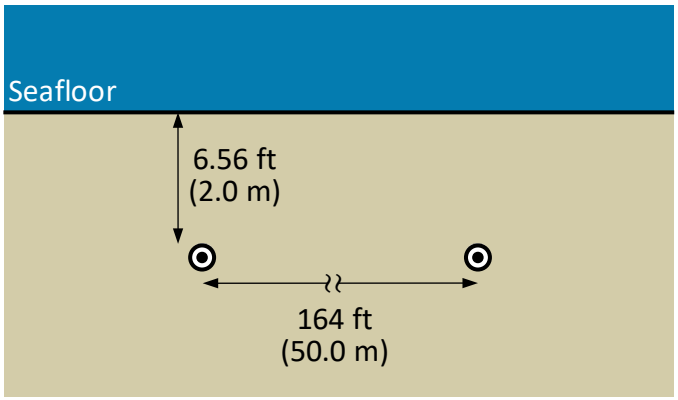
Magnetic field is measured at the sea floor.

Case 2: ±320 kV DC offshore, bundled and covered with concrete mattress.



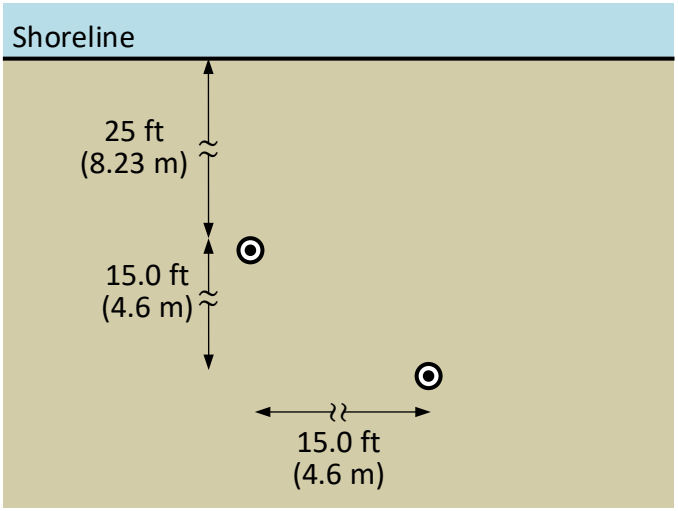
Magnetic field is measured along the dashed line (0.3 meters above top of cables).

Case 3: ±320 kV DC offshore, non-bundled.



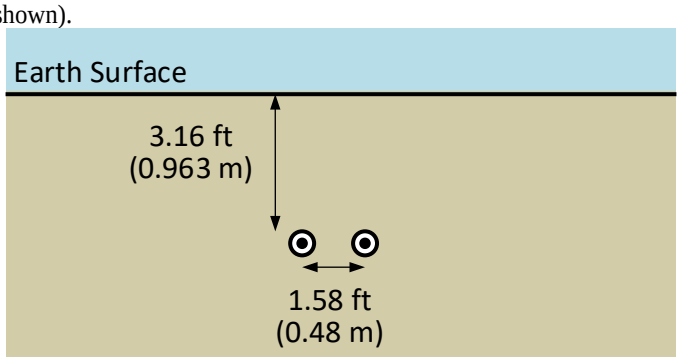
Magnetic field is measured at the sea floor.

Case 4: ±320 kV DC HDD landfall case under Island Park Beach near Boyd's Lane and Park Avenue.



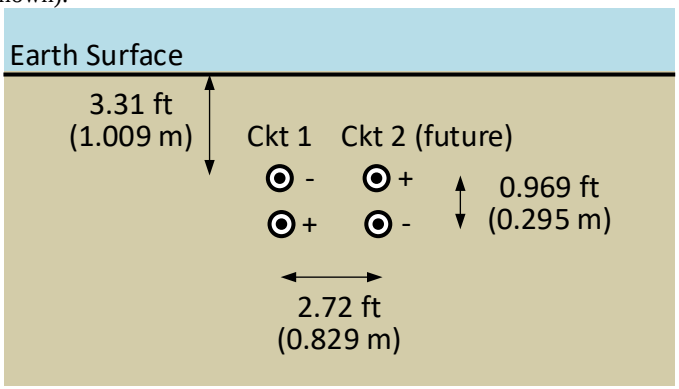
Magnetic field is measured at the beach surface.

Case 5: ±320 kV DC HVDC onshore, single circuit duct bank (conduit, engineered backfill, marketer tape etc. not shown).



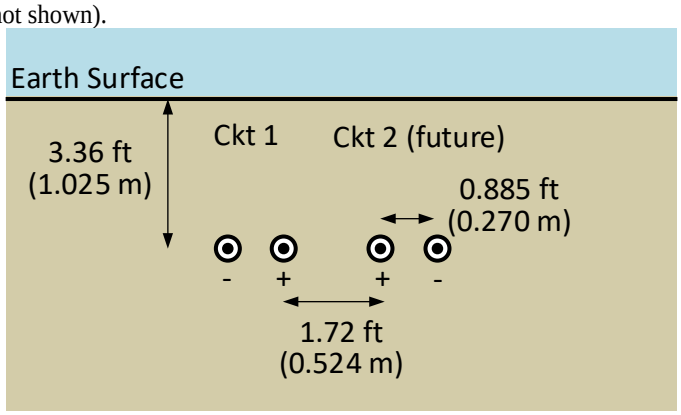
Magnetic field is measured at 3.28 ft (1 m) above the ground surface.

Case 6: ±320 kV DC HVDC onshore, double circuit duct bank (conduit, engineered backfill, marketer tape etc. not shown).



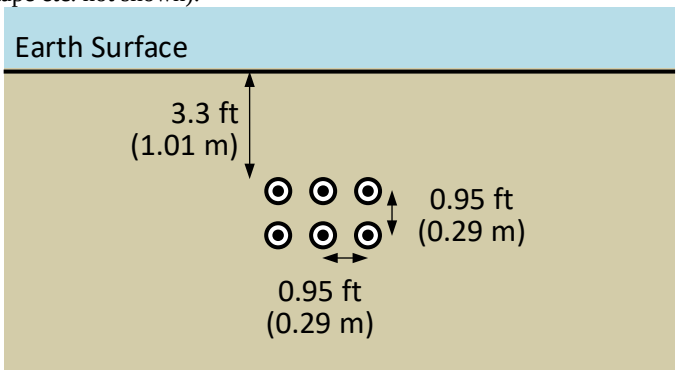
Magnetic field is measured at 3.28 ft (1 m) above the ground surface.

Case 7: ±320 kV DC HVDC onshore, alternate double circuit duct bank (conduit, engineered backfill, marketer tape etc. not shown).



Magnetic field is measured at 3.28 ft (1 m) above the ground surface.

Case 8: 345 kV HVAC onshore single circuit (two cables per phase) duct bank conduit, engineered backfill, marketer tape etc. not shown).



Magnetic field is measured at 3.28 ft (1 m) above the ground surface.
Phasing top: A1-B2-C2, bottom: C1-B1-A2. Results assume the angle of A1 equals the angle of A2; likewise, with B1, B2 and C1, C2.

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment L: Hydrodynamics and Sediment Dispersion Modeling Report

Revised: July 2024

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SOUTHCOAST WIND

Appendix F3. Hydrodynamic and Sediment Transport Modeling Report

Updated Brayton Point Export Cable Burial Assessment

Document Revision	B
Issue Date	May 2024

Hydrodynamic and Sediment Transport Modeling for the Brayton Point Export Cable Burial Assessment

SouthCoast Wind Energy LLC | USA

13 May 2024 –Final Report Rev B

Daniel L. Mendelsohn, Innovative Environmental Science
J. Craig Swanson, Swanson Environmental

EXECUTIVE SUMMARY

SouthCoast Wind LLC (SouthCoast Wind) is in the process of developing an offshore wind renewable energy generation project (Project) located in federal waters off the southern coast of Massachusetts in the Outer Continental Shelf (OCS) Lease Area OCS-A 0521 (Lease Area). The Project will deliver electricity to the grid via subsea export cables installed within the Brayton Point Export Cable Corridor (ECC) that will make landfall at Brayton Point in Somerset, Massachusetts. Subsea export cables may also be installed within the Falmouth variant ECC that would make landfall in Falmouth, MA should Falmouth be selected as the POI for Project 2.

The Brayton Point ECC, which is the focus of this report, has been defined through which the export cables will run from the Lease Area to landfall at Brayton Point. For this study, it is assumed that the cables will be buried at a conservative trench depth scenario of approximately 3 m (9.8 ft) using one or more of several burial methods, which may include use of jet trenching and mechanical trenching. For purposes of this study, jet trenching is considered the most representative burial scenario. A jet-trencher uses high pressure jets to fluidize the seabed sediments forcing some fraction of them into the water column through the burial process. This report presents an assessment of sediment plume dispersion (Total Suspended Solids [TSS] in the water column and seabed deposits) associated with the installation of the export cables between the Lease Area and Brayton Point landing(s), including the nearshore horizontal directional drilling (HDD) entry points that will be used to bring the cable ashore. In alignment with the Bureau of Ocean Energy Management (BOEM) guidelines, for the Construction and Operations Plan (COP) (BOEM, 2020, revised 2023), this study addresses the following:

- Concentrations of excess sediment suspended in the water column (as total suspended solids) following seafloor disturbance during cable installation
- Extent and thickness of sediment re-deposited to the seafloor following suspension.

A regional and local high-resolution, site-specific hydrodynamic model application was developed to simulate the metocean conditions over the extent of the offshore and nearshore / Narragansett Bay segments (i.e Mount Hope Bay and the Sakonnet River) of the Brayton Point ECC. The model was verified and validated against site-specific measurements and then applied to drive scenarios of the sediment plume dispersion from trenching and HDD-related dredging activities.

Surface sediment grab sample data was collected along the ECC at 23 sites used in the modeling. The data showed that the nearshore / Narragansett Bay segments were mostly characterized by high fractions of the fine grade silt and clay sediment classes. Offshore, the sediments tended to have higher fractions of fine sand to coarse sand classes with an occasional pocket of silt or very fine sand.

The results of the sediment dispersion modeling indicated that the water column concentration (TSS) and the sediment deposition pattern and thickness were most heavily influenced by the properties of the trench sediments (i.e. grain size distribution) disturbed during the jet trenching operations and localized current velocities. The dimensions of the trench, the advance rate, and the loss rate (a conservative loss rate of 25 percent representative of the jetting or mechanical trenching and 100 percent for the HDD pit dredging side cast) to the water column, specified the total amount of

sediments re-suspended, but the response was short lived for all but the finest grade sediments (silts and clays).

Suspended Sediment Concentrations

The fine- grained classes settle more slowly than the larger grain size sediments meaning that the suspended silt and clay sediments tend to be transported farther with the tidal currents than coarser sediments, increasing higher water column concentrations and durations of plumes. The Mount Hope Bay and the Sakonnet River segments, where higher fractions of fine-grained silt and clay are found in the sediments, exhibit this impact. The higher- level concentrations (100 mg/L and up) were somewhat contained in the Sakonnet River but covered a larger area in Mount Hope Bay where a part of the export cables ran perpendicular to the currents which, combined with the fine grade resuspended sediments, increased the overall material transport extending the maximum 100 mg/L concentration a little over 1 km (0.62 mi). Concentrations reached levels of 500 mg/L but were short lived and persist for approximately 30 minutes to an hour. Concentrations in the range of 200 mg/L or more were not expected to endure for longer than about 2 hours, while the lowest concentrations, in the 10 mg/L range may last many hours after re-suspension.

In regions with large grain sizes, sediments quickly dropped back to the sea floor keeping concentrations low, and within a few meters of the Trenching tool. The associated deposition footprint area was also small. Concentrations of 100mg/L were predicted to be within 50 m (160 ft) of the route centerline and decreased rapidly (less than 15 minutes). The sections of the offshore ECC segment that had higher fractions of the fine grade sediments had higher transport of the model predicted TSS concentrations showing the 100 mg/L concentration extending to 300 m (984 ft). The 100 mg/L TSS concentration level or greater covered a total of 2,457 ha (6,070 ac) along the 152 km (94 mi) length of the Brayton Point ECC.

The HDD exit pit dredging impacts were smaller compared with the impact resulting from cable installation. The source was assumed to be at a single point and continuous over a 16-hour period, releasing 100 percent of the dredged material into the water column. The TSS concentrations exceeding 100 mg/L travelled a maximum distance of 1.2 km (0.75 mi) and dissipated in approximately 2 hours at the Brayton Point site, and were similar at the Mount Hope Bay Entrance site on the north side of Aquidneck Island, but half that at the Aquidneck site in the Sakonnet River site. The area coverage of the 100 mg/L or greater level was contained within an average of 12 ha (29 ac).

Sediment Deposition Coverage and Thickness

The sediment deposition footprint resulting from the cable installation activities occurred relatively locally along the majority of the ECC route where the mass settles out quickly. Deposition thicknesses of 1 mm (0.04 in) and greater are generally limited to a corridor with a maximum width of 30 - 35 m (100 – 115 ft) around the cable centerline. In the areas where there are finer grain sediments, the 1 mm (0.04 in) thickness contour distance can increase locally to 165 m (540 ft) from the ECC indicative centerline.

The sedimentation footprint for HDD sites was very small with a maximum coverage of the 1 mm (0.04 in) thickness contour of approximately 5.7 ha (14 ac), extending a maximum distance of 212 m (695 ft)

and 9.72 ha (24.0 ac) for the 0.5 mm (0.02 in) thickness contour, extending a maximum distance of 294 m (965 ft) from the HDD site. Deposition thicknesses are greater if the location of the release is fixed. Cable burial operations are mobile, and thus will produce smaller maximum deposit thicknesses. The total coverage of the 1 mm (0.04 in) and 0.5 mm (0.02 in) thickness levels along the entire ECC route was 361 ha (892 ac) and 531 ha (1,312 ac), respectively.

In summary, despite conservative model assumptions, water column TSS concentrations and seabed deposition sediment thickness and extent as a result of the cable installation/burial operations and HDD exit pit dredging remain generally localized and of short duration.

TABLE OF CONTENTS

Executive Summary iii

1 Introduction 1-1

1.1 Project Objective 1-1

1.2 Project Description 1-1

2 Methodology 2-1

2.1 Hydrodynamic Model 2-2

2.2 Hydrodynamic Model Technical Description 2-2

2.3 Sediment Transport Model 2-4

2.4 Sediment Model Technical Description 2-4

3 Hydrodynamic Modeling 3-1

3.1 Hydrodynamic Model Application 3-1

3.2 Environmental Forcing 3-3

3.3 Model Validation Results 3-5

3.4 Validation of Model Predicted Water Surface Elevations 3-5

3.5 Validation of Model Predicted Currents 3-11

3.6 Project Scenario 3-17

4 Sediment Transport Modeling 4-1

4.1 Brayton Point Export Cable Corridor Description 4-1

4.2 Sediment Source Terms 4-3

4.3 Export Cable Corridor Sediment Characteristics 4-4

4.4 Brayton Point ECC Sediment Model Application 4-5

4.5 Sediment Transport Model Results 4-7

4.6 Water Column Concentration 4-8

4.7 Sediment Deposition on the Seabed 4-21

5 Discussion and Conclusions 5-1

6 References 6-1

Appendix 1 - Brayton Point ECC Surface Sediment Grab Sample Grain Size Distribution 6-1

LIST OF FIGURES

Figure 1-1. Overview of the Project Area and Brayton Point Export Cable Corridor.....1-2
Figure 3-1. Large Grid and Bathymetry DeVeloped for the Hydrodynamic Model Application.....3-1
Figure 3-2. Higher Resolution Nested Grid of Narragansett Bay with a Focus on the Sakonnet River and Mount Hope Bay also Showing the Gridded Bathymetry.....3-2
Figure 3-3. Time Series of Wind Speeds During the Hydrodynamic Model Validation Period.....3-3
Figure 3-4. Wind Rose for the Hydrodynamic Model Validation Period. Data from the SouthCoast Wind Offshore Metocean Buoy.....3-4
Figure 3-5. Observation Stations Used for Developing Model Forcing and Model Validation. Inset Shows A SUBSET of kilometer (KP) Markers Along Brayton Point ECC Indicative Centerline.....3-5
Figure 3-6. Comparison of Modeled and Observed Water Surface Elevations at NOAA Sandy Hook, Montauk, Woods Hole, and Nantucket Tide Stations. Water Surface Elevations are Plotted Relative to MSL.....3-8
Figure 3-7. Comparison of Modeled and Observed Water Surface Elevations at NOAA Newport, Providence, Quonset Point, and Fall River Tide Stations. Water Surface Elevations are Plotted Relative to MSL.....3-9
Figure 3-8. CComparison of Modeled and NOAA Predicted Current Speed at Fall River.....3-12
Figure 3-9. Comparison of Modeled and Observed Bottom Current Speed at the Offshore SouthCoast Wind Metocean Buoy.....3-13
Figure 3-10. Comparison of Modeled and Observed Bottom Direction at the Offshore SouthCoast Wind Metocean Buoy.....3-13
Figure 3-11. Peak Ebb (Top) and Flood (Bottom) Current Speeds.....3-16
Figure 3-12. Current Roses from Model PredIcted Bottom Currents At Points Along ECC.....3-18
Figure 4-1. Map of the Brayton Point ECC Showing the Segments Used for Results Discussion and the Locations of the HDD Connection Sites Analyzed.....4-2
Figure 4-2. Grain Size Distribution Along the Brayton Point Export Cable Corridor With an inset of the Brayton Point Area. (SouthCoast WIND, 2021A).....4-6
Figure 4-3. Map of Maximum Sediment Concentration in the Mount Hope Bay Portion of the Export Cable Installation, KP0 to KP10.....4-9
Figure 4-4. Map of Maximum Sediment Concentration in the Sakonnet River Portion of the Export Cable Installation, KP15 to KP34.....4-10
Figure 4-5. Map of an Example Instantaneous Sediment Concentration at in the Sakonnet River Portion of the Export Cable Installation, KP15 to KP34.....4-11
Figure 4-6. Map of Maximum Sediment Concentration Associated with the Offshore Export Cable Installation, KP34 to KP55.....4-14
Figure 4-7. Map of Maximum Sediment Concentration Associated with the Offshore Export Cable Installation, KP55 to KP78.....4-15
Figure 4-8. Map of Maximum Sediment Concentration Associated with the Offshore Export Cable Installation, KP78 to KP105.....4-16
Figure 4-9. Map of Maximum Sediment Concentration Associated with the Offshore Export Cable Installation, KP105 to KP125.....4-17

Figure 4-10. Map of Maximum Sediment Concentration Associated with the Offshore Export Cable Installation, KP125 to KP152. 4-18
Figure 4-11. Map of Maximum Sediment Concentration Associated with the Excavation Activities at the Three HDD Connection Pits at Brayton Point (Left Map), and Mount Hope Bridge and Aquidneck Island (Right Map). 4-20
Figure 4-12. Map of Maximum Seabed Sediment Deposition Thickness in the Mount Hope Bay Portion of the Export Cable Installation, KP0 to KP10. 4-23
Figure 4-13. Map of Maximum Seabed Sediment Deposition Thickness in the Sakonnet River Portion of the Export Cable Installation, KP15 to KP34 4-24
Figure 4-14. Map of Maximum Seabed Sediment Deposition Along the First Part of Offshore Segment 1 of the Export Cable Installation, KP34 to KP55. 4-26
Figure 4-15. Map of Maximum Seabed Sediment Deposition Along the Second Part of Offshore Segment 1 of the Export Cable Installation, KP55 to KP78. 4-27
Figure 4-16. Map of Maximum Seabed Sediment Deposition Along the First Third of Offshore Segment 2 of the Export Cable Installation, KP78 to KP105. 4-28
Figure 4-17. Map of Maximum Seabed Sediment Deposition Along the Middle Third of Offshore Segment 2 of the Export Cable Installation, KP105 to KP125. 4-29
Figure 4-18. Map of Maximum Seabed Sediment Deposition Along the Last Third of Offshore Segment 2 of the Export Cable Installation, KP125 to KP152. 4-30
Figure 4-19. Map of Maximum Seabed Sediment Deposition Associated with the Excavation Activities at the Three HDD Connection Pits at Brayton Point (Left Map), and Mount Hope Bridge and Aquidneck Island (Right Map). 4-32

LIST OF TABLES

Table 2-1. Breakdown of Sediment Classifications by Particle Diameter. 2-6
Table 3-1. Percentiles of Wind Speeds During the Hydrodynamic Model Validation Period as Recorded at the SouthCoast Wind Offshore Metocean Buoy 3-4
Table 3-2. Tidal Harmonic Constituent Characteristics (NOAA, 2007). 3-6
Table 3-3. Summary of Statistics at Water Surface Elevation Observation Stations Based on Comparison of Model Predicted to Observed Time Series of Data. 3-10
Table 3-4. Summary of Comparison of Harmonic Analysis Output of Constituent Amplitude for Both Modeled and Observed Data from Observation Stations Within the Model Domain. 3-10
Table 3-5. Summary of Comparison of Harmonic Analysis Output of Constituent Phase for Both Modeled and Observed Data from Observation Stations Within the Model Domain. 3-11
Table 3-6. Summary of Current Speed Statistics at Fall River. 3-12
Table 3-7. Summary of Current Speed Statistics at the SouthCoast Wind Metocean Buoy 3-14
Table 3-8. Summary of Current Speed Statistics Along the ECC. 3-17
Table 4-1. Distance and Surface Area of Each Trench Section. 4-2
Table 4-2. Summary of Export Cable Burial Activities Simulated. 4-4
Table 4-3. Summary of HDD Pit Excavation Activities Simulated. 4-4
Table 4-4. Area Coverage for Selected TSS Concentration Thresholds in Mount Hope Bay and the Sakonnet River (KP0 – KP34) 4-12
Table 4-5. Area Coverage for Selected TSS Concentration Thresholds for the Offshore Export Cable Segments (KP34 – KP152). 4-13
Table 4-6. Summary of Total Area Coverage for Selected TSS Concentration Thresholds Over the Length of the ECC 4-17
Table 4-7. Time for TSS Concentrations to Drop Below Selected Levels Along the ECC After the End of the Cable Installation Activities 4-19
Table 4-8. Area Coverage for Selected TSS Concentration Thresholds for the Three HDD Pit Excavation Activities 4-20
Table 4-9. Time for TSS to Drop Below Selected Levels at the HDD Sites After the End of the Release 4-21
Table 4-10. Area Coverage for Seabed Sedimentation Thickness Thresholds in Mount Hope Bay and the Sakonnet River (KP0 – KP34) 4-22
Table 4-11. Area Coverage for Seabed Sedimentation Thickness Thresholds Along the Offshore Export Cable Segments (KP34 – KP152). 4-25
Table 4-12. Summary of Total Area Coverage for Selected Sediment Deposition Thresholds Over the Length of the Export Cable Corridor. 4-31
Table 4-13. Area Coverage for Seabed Sedimentation Thickness Thresholds for the Three HDD Pit Excavation Activities. 4-32

Abbreviations and Acronyms

ac	Acre(s)
BOEM	Bureau of Ocean Energy Management
CFR	Code of Federal Regulations
COP	Construction and Operations Plan
ECC	Export Cable Corridor
ft	Foot/feet
ha	Hectare(s)
HDD	Horizontal Directional Drilling
km	Kilometer(s)
KP	Kilometer Point
kts	Knots
LiDAR	Light Detection And Ranging
m	Meter(s)
mi	Statute mile(s)
MLLW	Mean Lower Low Water
m^3/hr	Cubic meters per hour
mm	millimeter
mi/hr	Miles per hour
m/s	Meters per second
mg/L	Milligrams per liter
NCEP CFSR	National Centers for Environmental Prediction Climate Forecast System Reanalysis
NOAA	National Oceanic and Atmospheric Administration
nm	Nautical mile(s)
N/m^2	Newtons per meter squared
OCS	Outer Continental Shelf
OSP	Offshore Substation Platform
PSD	Particle Size Distribution
QQ	Quantile-Quantile
TSS	Total Suspended Solids
WTG	Wind Turbine Generator

1 INTRODUCTION

SouthCoast Wind, LLC (SouthCoast Wind) proposes to develop an offshore wind renewable energy generation project (Project) located in federal waters off the southern coast of Massachusetts in the Outer Continental Shelf (OCS) Lease Area OCS-A 0521 (Lease Area). The Project will deliver electricity to the grid via subsea export cables installed within the Brayton Point Export Cable Corridor (ECC) that will make landfall at Brayton Point in Somerset, Massachusetts. Subsea export cables may also be installed within the Falmouth variant ECC that would make landfall in Falmouth, MA should Falmouth be selected as the POI for Project 2.

The Brayton Point ECC, which is the focus of this report, has been defined through which export cables will run from the Lease Area to landfall at Brayton Point. The cables will be buried at a conservative trench depth scenario of approximately 3 m (9.8 ft) using one or more of several burial methods, which may include use of jet trenching and mechanical trenching which are considered a conservative representation for burial scenarios in this study. A jet trenching system uses high pressure jets to fluidize the seabed sediments releasing some fraction of the sediments into the water column through the burial process and the stinger (arm with water jets along its length that is lowered into the sediment to create the trench) of the jet-trencher creates the trench within the bed to lay the cable. A similar process occurs with the mechanical trenching however a chain cutter is used instead of water jets. This report presents an assessment of sediment plume dispersion (Total Suspended Solids [TSS] and deposits) associated with the installation of the export cables between the Lease Area and landing(s), and the nearshore HDD entry/exit points used for subsurface cable installation for the shoreline landings.

1.1 PROJECT OBJECTIVE

The Bureau of Ocean Energy Management (BOEM) produced regulations and guidelines for preparing the Construction and Operations Plan (COP) and conducting specific technical studies to support COP development.

Consistent with BOEM's *Information Guidelines for a Renewable Energy Construction and Operations Plan (COP)* (BOEM, 2020, revised 2023), the objectives of this sediment plume dispersion assessment are to:

- Model disturbances associated with cable installation, including near shore HDD entry,and specifically the resulting:
  - Suspended sediments in the water column (TSS)
  - Redeposition of disturbed and suspended sediments including thickness and extenton the seabed

Results from the sediment plume dispersion assessment provide quantitative and qualitative information to support the SouthCoast Wind COP.

1.2 PROJECT DESCRIPTION

The SouthCoast Wind Lease Area is located offshore of the southern coast of Massachusetts, approximately 49 kilometers (km) [26 nautical miles (nm)] south of Martha's Vineyard and 37 km (20 nm) south of Nantucket shown in Figure 1-1.

The Project layout will align to a 1 nm x 1 nm grid with an east-west and north-south orientation, as agreed upon across the entire Massachusetts/Rhode Island (MA/RI) Wind Energy Areas. The Project will consist of up to 149 positions within the Lease Area, to be occupied by Wind Turbine Generators (WTGs) and Offshore Substation Platforms (OSPs), connected with inter-array cables. Power will be transmitted to shore via submarine offshore export cables installed within two export cable corridors, the Brayton Point ECC and the Falmouth ECC. Falmouth modeling is covered in a separate report.

The offshore export cables within the Brayton Point ECC will travel from the Lease Area in Federal waters, through Rhode Island Sound, and up the Sakonnet River to make an intermediate landfall at the north end of Aquidneck Island (Portsmouth, RI). The cables will then cross Aquidneck Island (Portsmouth, RI) onshore and exit the island in Mount Hope Bay to ultimately reach the Brayton Point landfall. The cables are planned to be buried within the seabed along the Brayton Point ECC.

Additional details regarding the Project description and construction and installation methods are available in Section 3 of the COP. Specific details regarding construction methods used in this assessment are provided in Section 4 of this report.

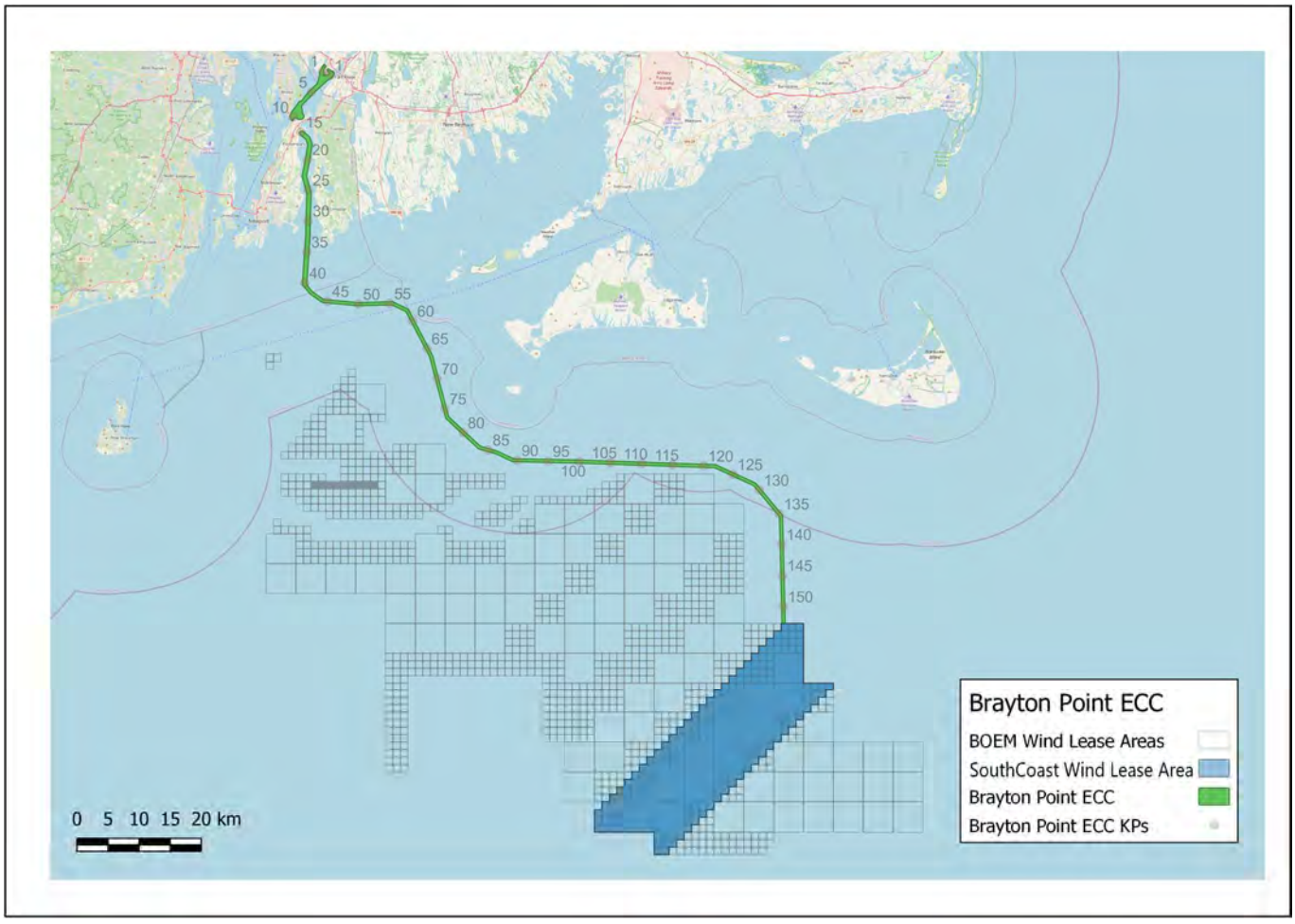

FIGURE 1-1. OVERVIEW OF THE PROJECT AREA AND BRAYTON POINT EXPORT CABLE CORRIDOR.

2 METHODOLOGY

The goal of this study was to determine the impacts of SouthCoast Wind's proposed Brayton Point ECC export cable installation activities on the environment. The impacts were evaluated in terms of excess suspended sediment water column concentrations and sediment deposition footprint and thickness. The approach to evaluate the concentration and deposition impacts was to use two numerical models to simulate the hydrodynamics in the study area and the transport and dispersion of sediments resuspended from the cable burial activities during the construction phase of the Project, respectively.

The two models used have been developed over many years to perform this specific type of evaluation. The hydrodynamic model used was the Delft3D-FLOW model system (Deltaris, 2018a) which was applied to develop currents and circulation from the tides, winds, and river flow. The model was applied in two parts; a large-scale application to the offshore area from the New York Bight to east of Cape Cod to capture the dynamics along the Brayton Point ECC from the SouthCoast Wind Lease Area to the entrance of the Sakonnet River and a second fine grid nested model application to Narragansett Bay with a focus on the Sakonnet River and Mount Hope Bay cable corridor portions. A more detailed description of the Delft3D model and its application is provided in Section 3.

The sediment transport model used was the Delft3D, D-WAQ PART (Deltaris, 2018b), particle transport model system. The PART model is integrated with the FLOW model allowing direct input of the hydrodynamic model predicted currents into the transport model. The model was used to simulate excess suspended sediment transport and dispersion, predicting the water column concentration and sediment deposition, resulting from the proposed cable embedment activities. A description of the D-WAQ PART model and its application is provided in Section 4.

The hydrodynamic model was set up and run to predict the tidal and wind driven currents in the region. A time period was selected that would be consistent with the likely allowable dredge windows, commonly during the late fall/early winter months, and where both currents and water surface elevation observations were available for comparison with the model predictions. The product of the hydrodynamic modeling was a time and space varying current field, predicted from the tide and wind forcing, capturing several spring (higher tidal amplitude/more energy) and neap (lower tidal amplitude/lower energy) conditions as well as weather systems passages. The simulations were run long enough to generate current predictions that would encompass the duration of the proposed cable burial activities.

Time series of model predicted water surface elevation was collected at the nested grid interface with the large-scale model and used to drive the Narragansett Bay fine resolution application to generate currents in the bay. The simulation was run for the same time period as the offshore large scale application simulation.

The simulations were specified to take the sediment characteristics (sediment grain size distribution as sampled along the route) and cable burial tool characteristics representative of jet trenching/mechanical trenching (volume of source sediments resuspended, cable burial advance rate etc.) as well as the environmental conditions (water depth, currents), into account. The cable burial simulations were initiated at the Brayton Point terminus of the ECC and run seaward. Because of the ECC design where the cable crosses land at the northern end of Aquidneck Island, the simulation was split in two sections; the Mount Hope Bay section and the Sakonnet River to offshore section. The analysis was performed assuming that all concentrations and deposited sediments were

"excess sediments", i.e. in excess of natural conditions. Therefore, the effects are presented as isolated effects of the construction that occur, which would be added to the natural conditions.

The results of the sediment transport and dispersion simulations were predictions of the extent and duration of suspended sediment concentrations within the water column along the route and the final sediment deposition characteristics (pattern and thickness) associated with each proposed activity.

2.1 HYDRODYNAMIC MODEL

The circulation characteristics are an important input to the sediment transport modeling. A hydrodynamic model application of the study area was developed using Delft3D-FLOW, a multi-dimensional model system that has been applied successfully in numerous circulation studies around the world. This section provides details of the Delft3D-FLOW model system.

2.2 HYDRODYNAMIC MODEL TECHNICAL DESCRIPTION

The numerical hydrodynamic modeling system Delft3D-FLOW solves the unsteady shallow water equations in two (depth-averaged) or three dimensions. The systems of equations are based on the full Navier-Stokes equations with the shallow water approximation applied and consist of the horizontal equations of motion, the continuity equation, and the transport equations for conservative constituents. The equations are formulated in orthogonal curvilinear co-ordinates or in spherical co-ordinates on the globe.

In Delft3D-FLOW models with a rectangular grid (Cartesian frame of reference) are considered as a simplified form of a curvilinear grid. The hydrodynamic module applies the sigma co-ordinate transformation in the vertical, which maps both the water surface and bottom topography to the upper and lower grid boundaries, resulting in a smooth representation of each. This also results in a high computing efficiency because of the constant number of vertical layers over the whole computational domain.

The flow is forced by tide at the open boundaries, wind stress at the free surface, pressure gradients due to free surface gradients (barotropic) or density gradients (baroclinic). Source and sink terms are included in the equations to model the discharge and withdrawal of water.

The hydrodynamic module is based on the full Navier-Stokes equations with the shallow water approximation applied. The equations are solved with a highly accurate unconditionally stable solution procedure. The supported features are:

- two co-ordinate systems, i.e. Cartesian and spherical, in the horizontal directions;
- two grid systems in the vertical direction; the boundary fitted sigma grid and the horizontal layer Z-grid;
- domain decomposition both in the horizontal and vertical direction;
- tide generating forces (only in combination with spherical grids);
- simulation of drying and flooding of inter-tidal flats (moving boundaries);
- density gradients due to a non-uniform temperature and salinity concentration distribution (density driven flows);
- for 2D horizontal large eddy simulations the horizontal exchange coefficients due to circulations on a sub-grid scale (Smagorinsky concept);

- turbulence model to account for the vertical turbulent viscosity and diffusivity based on the eddy viscosity concept;
- selection from four turbulence closure models: k-", k-L, algebraic and constant coefficient;
- the effect of the Earth's rotation (Coriolis force).
- shear stresses exerted by the turbulent flow on the bottom based on a Chézy, Manning or White-Colebrook formulation;
- enhancement of the bottom stresses due to waves;
- automatic conversion of the 2D bottom-stress coefficient into a 3D coefficient;
- wind stresses on the water surface modelled by a quadratic friction law;
- space varying wind and barometric pressure (specified on the flow grid or on a coarser meteo grid), including the hydrostatic pressure correction at open boundaries (optional);
- simulation of the thermal discharge, effluent discharge and the intake of cooling water at any location and any depth in the computational field (advection-diffusion module);
- the effect of the heat flux through the free surface;
- online analysis of model parameters in terms of Fourier amplitudes and phases enabling the generation of co-tidal maps;
- drogue tracks;
- advection-diffusion of substances with a first order decay rate;
- online simulation of the transport of sediment (silt or sand) including formulations for erosion and deposition and feedback to the flow by the baroclinic pressure term, the turbulence closure model and the bed changes;
- the influence of spiral motion in the flow (i.e. in river bends). This phenomenon is especially important when sedimentation and erosion studies are performed;
- modeling of obstacles like 2D spillways, weirs, 3D gates, porous plates and floating structures;
- wave-current interaction, taking into account the distribution over the vertical;
- many options for boundary conditions, such as water level, velocity, discharge and weakly reflective conditions;
- several options to define boundary conditions, such as time series, harmonic and astronomical constituents;
- option for linear decay of conservative substances, and
- online visualization of model parameters enabling the production of animations.

2.3 SEDIMENT TRANSPORT MODEL

Sediment transport associated with the cable burial activities was simulated using the Deltares Delft3D D-WAQ PART model. The model requires inputs defining the environment (e.g. water depths, currents) and the construction activity loading (e.g. sediment grain size, resuspended volume) and produces predictions of the associated sediment plume and seabed deposition. Details of the model and theory are provided in the following sections.

The particle tracking module, D-WAQ PART, is a 3-dimensional far-field water quality model. It estimates a dynamic concentration distribution by following the tracks of thousands of particles in time and space (in the water column). The model calculates TSS concentrations and sedimentation patterns resulting from activities that cause sediment resuspension. The model requires a spatial and time varying circulation field (typically from hydrodynamic model output as described in the last section), definition of the water column bathymetry, and parameterization of the sediment disturbance (source). The model predicts the transport, dispersion and settling of suspended sediment released to the water column.

The focus of the model is on the far-field (i.e. beyond the initial disturbance) processes affecting the fate of suspended sediment. The model uses a specification of the suspended sediment source strength (i.e. material resuspension volume/mass flux), initial vertical distribution of sediments and the sediment grain-size distribution to represent losses (loads) to the water column. The losses are developed from a parameterization of different types of mechanical or hydraulic dredges, sediment dumping practices or other sediment activities such as jetting or mechanical trenching for cable or pipeline burial. Multiple sediment types or grain size fractions can be simulated simultaneously and are tracked separately but can impact each if specified. In addition, multiple loads and locations can be simulated as can discharges from moving sources.

2.4 SEDIMENT MODEL TECHNICAL DESCRIPTION

D-WAQ PART is a 3-dimensional particle tracking model that is particularly useful for mid- to far-field water quality modeling. It calculates a dynamic concentration distribution by following the tracks of thousands of particles with time. The model provides a detailed description of concentration distributions, resulting from instantaneous or continuous releases of materials such as salt, oil, temperature or sediments as in the present study. The materials can be simulated as conservative or simple decaying substances.

D-WAQ PART is a random walk particle tracking model, which is based on the principle that the movement of dissolved (or particulate) substances in water can be described by a limited (large) number of discrete particles that are subject to advection due to the currents and by horizontal and vertical dispersion. The movement of the particles consists therefore of two elements. For each time-step, the first step is the advection step due to the shear stresses from currents (bottom) and wind (surface). The second step is the random walk step in which the size and direction of the movement is a random process but is related to the horizontal and vertical dispersion.

The particle-based (Lagrangian) scheme represents the total mass of sediments suspended over time, and provides a method to track suspended sediment without any loss of mass as compared to Eulerian (continuous) models due to the nature of the numerical approximation used for the conservation equations. Thus, the method is not subject to artificial diffusion near sharp concentration gradients and can easily simulate all types of sediment sources.

In D-WAQ PART, two modules are available:

- Tracer module: simulation of conservative or first order decaying substances; and
- Oil spill module: simulation of oil spills with floating and dispersed oil fractions (special license required).

In this study only the tracer module was used. The tracer module is very flexible and is designed to be configured for sediment simulations of the user's design.

The physical components in the system are:

- discharges due to human activities or released naturally that may be instantaneous and/or continuous;
- settling and erosion of suspended matter;
- concentration- dependent settling velocity.

Physical processes or phenomena D-WAQ PART can represent include:

- the dynamics of patches close to an outfall location;
- simple first-order decay processes like the decay of several fractions of oil;
- vertical dispersion for well-mixed systems;
- horizontal dispersion due to turbulence. According to turbulence theory this dispersion increases in time.
- the effects of time-varying wind fields;
- the effects of bottom-friction;
- the existence of a plume at the outfall (rather than a point-source) by starting the simulation from a circular plume with an estimated or field-measured radius.
- settling of particles, where a concentration dependent settling, subject to a minimum and maximum settling velocity, can be specified;
- settled mass is collected in an additional bottom layer.

D-WAQ PART can in theory simulate an unlimited number of particles and substances. The only restriction is the available memory of the hardware. The coupling between the hydrodynamic module, Delft3D-FLOW, and D-WAQ PART is streamlined such that the current fields developed by the hydrodynamic model can be read directly into the particle model.

If detailed sediment data is available the sediments are broken out into 4 to 6 classes based on the grain size distribution, i.e. the fraction of the total sediment sample in each class. Each class is defined by a range of particle sizes and the density of that class material (Shelley, 1988; CERC, 1984; Wentworth, 1922). The system used in the sediment model is the Wentworth scale as presented in Table 2-1. Sediment grain size is important in determining the fall velocity (settling rate) of resuspended sediments. The fall velocity is determined from a form of the Stokes Law equation for common grains (rather than spheres) where the grain diameter is measured by the median sieve size (CERC, 1984.)

For a given activity and grain size distribution the amount of mass released in each class is calculated as a function of the volume of material resuspended, the fraction that is sediments, the density of the sediments and the fraction of the total mass in that class. A user input number of particles are released at each time step for each sediment class. The mass of each particle is determined as the mass in each sediment class divided by the number of particles.

Horizontal transport, settling, and turbulence-induced suspension of each particle is computed independently by the model for each time step. Particle advection is based on the relationship that a particle moves linearly (in 3-dimensions) with a local velocity obtained from the hydrodynamic field for a specified model time step. Diffusion is assumed to follow a simple random walk process defined as the square root of the product of an input diffusion coefficient and the time step.

TABLE 2-1. BREAKDOWN OF SEDIMENT CLASSIFICATIONS BY PARTICLE DIAMETER.

Sediment Classification	Particle Diameter (mm)
Clay	< 0.0039
Silt	0.0039 - 0.0625
Very Fine Sand	0.062 - 0.125
Fine Sand	0.125 - 0.25
Medium Sand	0.25 - 0.50
Coarse Sand	0.5 - 1.0

In a well-mixed, horizontally uniform flow, the vertical dispersion coefficient may be estimated from the mixing length and the turbulent kinetic energy. The empirical relationships for the turbulent kinetic energy at the bed and at the surface are taken from the k-L turbulence model used in Delft3D-FLOW, incorporating the shear stresses, resulting in a vertical dispersion model. The depth-dependency of the vertical dispersion coefficient is eliminated by depth-averaging to avoid particles gathering at the bottom or surface. D-WAQ PART allows linear scaling of the depth-averaged dispersion coefficient to allow for a reduction in vertical mixing due to stratification in the 3D models. Vertical diffusion is also scaled by an input coefficient and can be in the up or down direction.

Particle settling rates are calculated using Stokes equations based on the size and density of each particle class. Enhanced settling rates in the combined particle classes due to clumping are important for clay and fine-silt sized particles, bound by upper and lower concentration limits.

If the bed shear stress at any location is less than the critical shear stress for sedimentation, a particle that comes into contact with the bottom at that location will remain attached to the bottom (sedimentation). For sedimentation, D-WAQ PART creates an extra model layer for sediment at the bed. If the bed shear stress at any location is greater than the critical shear stress for sedimentation, a particle that comes in contact with the bottom at that location will be reflected back into the water column. If the bed shear stress at any location is greater than the critical shear stress for erosion, all deposited particles at that location (i.e. particles located in the extra bed-sediment layer) will be returned to the water column instantaneously.

For each model time step the suspended concentration of each sediment class as well as the total concentration is computed on a concentration grid. The concentration grid is a uniform rectangular grid with a user-specified cell size and overall area coverage that is independent of the resolution of the hydrodynamic data used to calculate transport. This allows for a finer resolution for determination of plume concentrations, avoiding concentration underestimation using the usually larger hydrodynamic model grid cells. The concentration grid is also used for sediment material deposited on the sea floor. Deposition is calculated as the sum of the mass of the sediment class particle that accumulates in a cell.

3 HYDRODYNAMIC MODELING

A hydrodynamic model application was developed to generate spatial and time varying currents for use in the sediment transport and dispersion modeling. The model application was validated against observations of water surface elevation and currents for the period of November 10, 2020 – December 22, 2020; this period was also used as the timeframe for simulating the cable installation in the sediment transport modeling scenarios.

3.1 HYDRODYNAMIC MODEL APPLICATION

The hydrodynamic model application to the SouthCoast Wind Brayton Point ECC study area began with the development of a system of two grids, one overall large grid and a fine resolution nested grid. The large grid extended from New York Harbor through the New York Bight to an area approximately 40 km (25 mi) east of Cape Cod (and 60 km [37 mi] east of the Lease Area) covering the entire Brayton Point ECC with boundaries far removed from the Lease Area and Brayton Point ECC. Previous experience (Crowley and Mendelsohn, 2011) had shown that the extent of the large grid was necessary to capture the circulation and transport in the offshore areas associated with the BOEM MA/RI Lease Areas. The extent of the large grid and the gridded bathymetry is presented in Figure 3-1

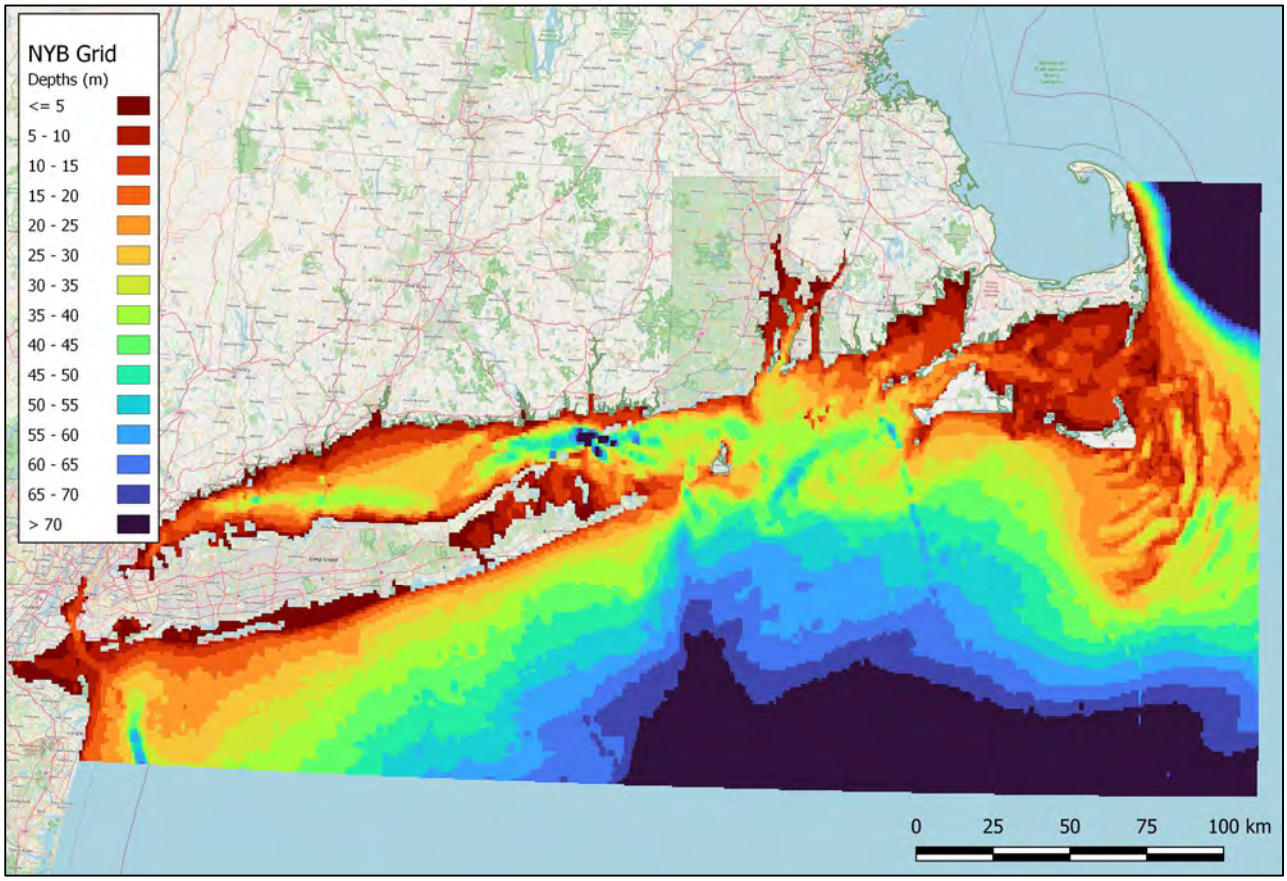

FIGURE 3-1. LARGE GRID AND BATHYMETRY DEVELOPED FOR THE HYDRODYNAMIC MODEL APPLICATION.

The nested grid was used to increase the resolution in Narragansett Bay with a focus on the Sakonnet River and Mount Hope Bay (Figure 3-2). The open boundaries extended offshore into Rhode Island Sound and were forced with time series output generated by the offshore large- scale grid.

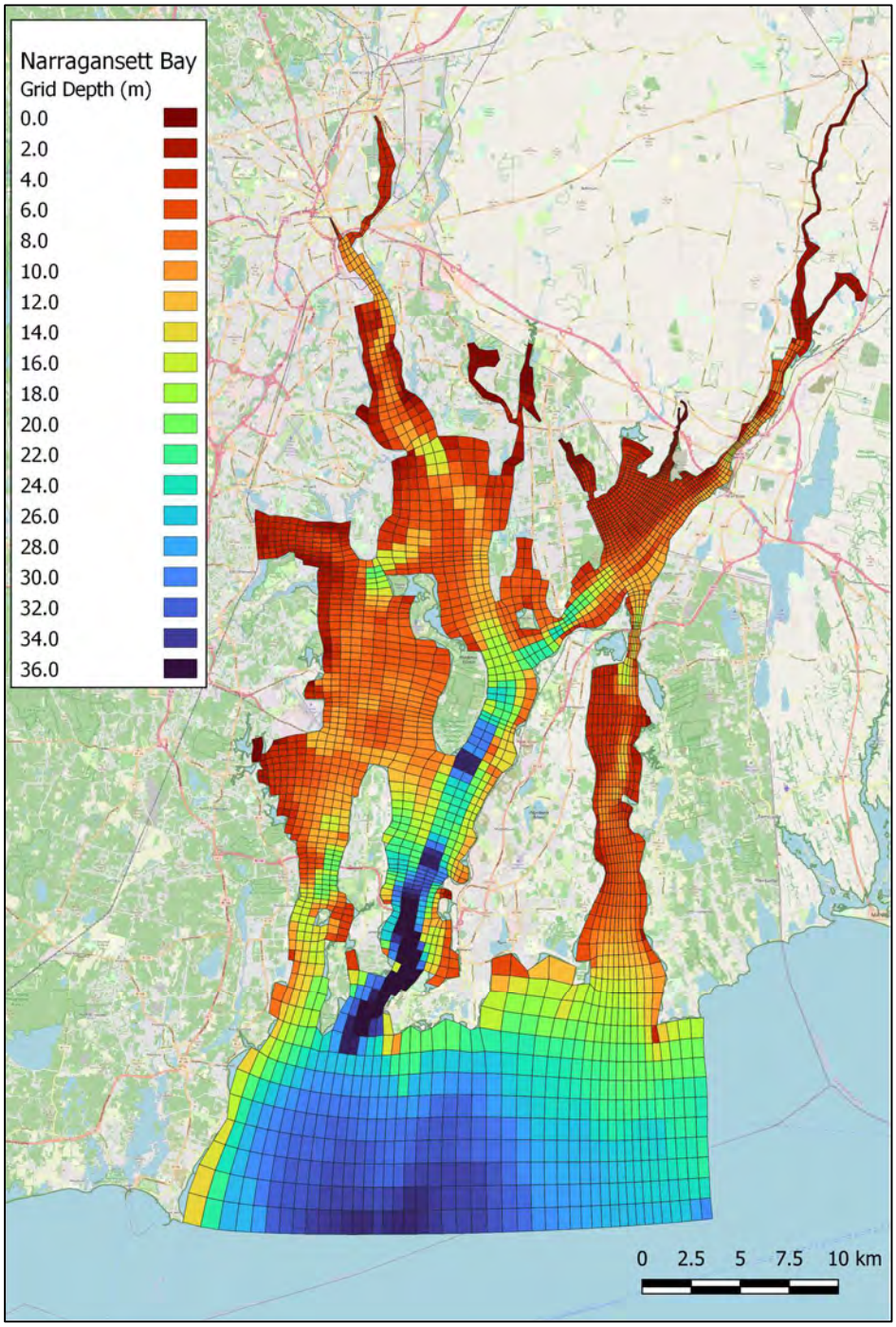

FIGURE 3-2. HIGHER RESOLUTION NESTED GRID OF NARRAGANSETT BAY WITH A FOCUS ON THE SAKONNET RIVER AND MOUNT HOPE BAY ALSO SHOWING THE GRIDDED BATHYMETRY.

The bathymetry for both grids was developed from a combination of sources including the General Bathymetric Chart of the Oceans GEBCO 08 Grid, NOAA Northeast Atlantic Coastal Relief Model (NOAA, 1999) and measurements along the ECC taken for the Project (SouthCoast Wind G&G Survey, 2021a).

3.2 ENVIRONMENTAL FORCING

The model forcing included the open boundary specification of astronomic tides and surface winds. The tidal forcing was obtained from the TPXO 7.2 Global Inverse Tide Model (Egbert and Erofeeva, 2002) and was specified along the southern and eastern boundaries. Ocean currents and circulation in the study area are complex and influenced by several main factors. These include wind-driven processes, tides, and density gradients driven by offshore interaction with adjacent estuaries, and radiative and sensible heat flux through the air-sea interface (Codiga and Ullman, 2010). Throughout the domain however, tidal currents are the predominant force driving circulation (Spaulding and Gordon, 1982), with wind and density variations playing a smaller role. Further, the tides in this region are dominated by the M2 astronomical constituent (Spaulding and Swanson, 2008, Spaulding and White, 1990). Surface winds were applied based on the observations from the SouthCoast Wind metocean buoy, available at 4 m (13 m) above mean sea level (MSL) at a 10-minute timestep and Quonset Point, RI - Station ID: 8454049, 2.1 m (6.97) ft. above MSL at a 6-minute timestep. A timeseries of the wind speeds for the validation timeframe is presented in Figure 3-3 and the wind rose is provided in Figure 3-4. The corresponding wind speed percentiles for this period are summarized in Table 3-1.

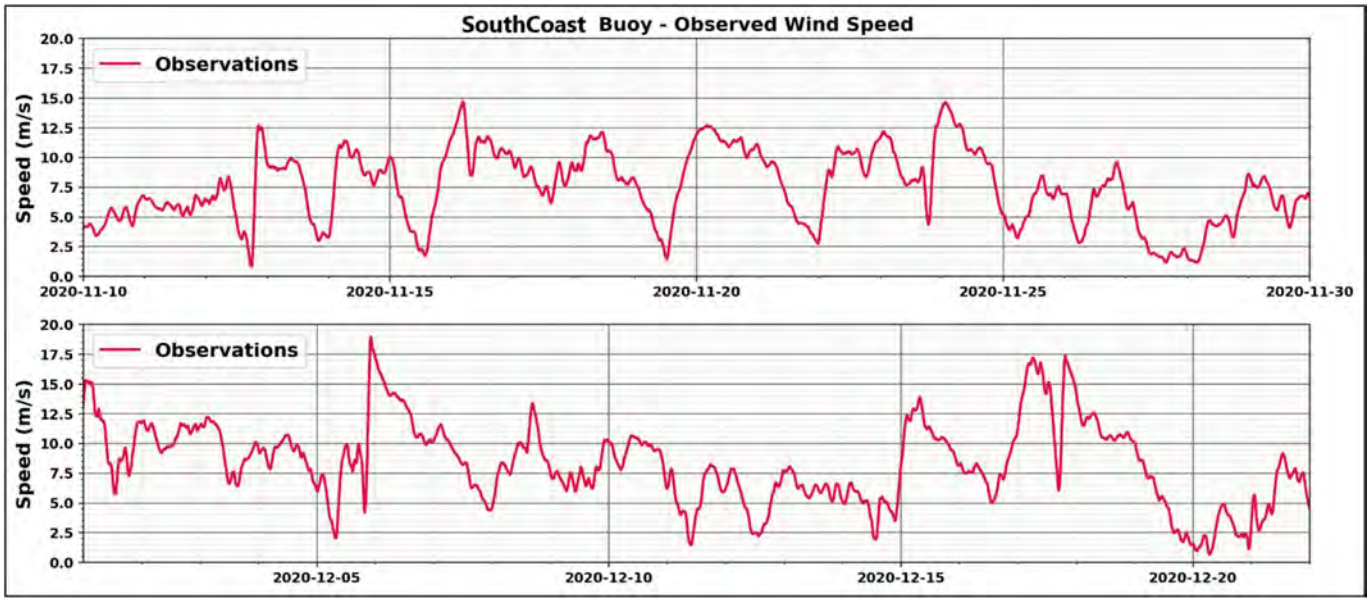

FIGURE 3-3. TIME SERIES OF WIND SPEEDS DURING THE HYDRODYNAMIC MODEL VALIDATION PERIOD.

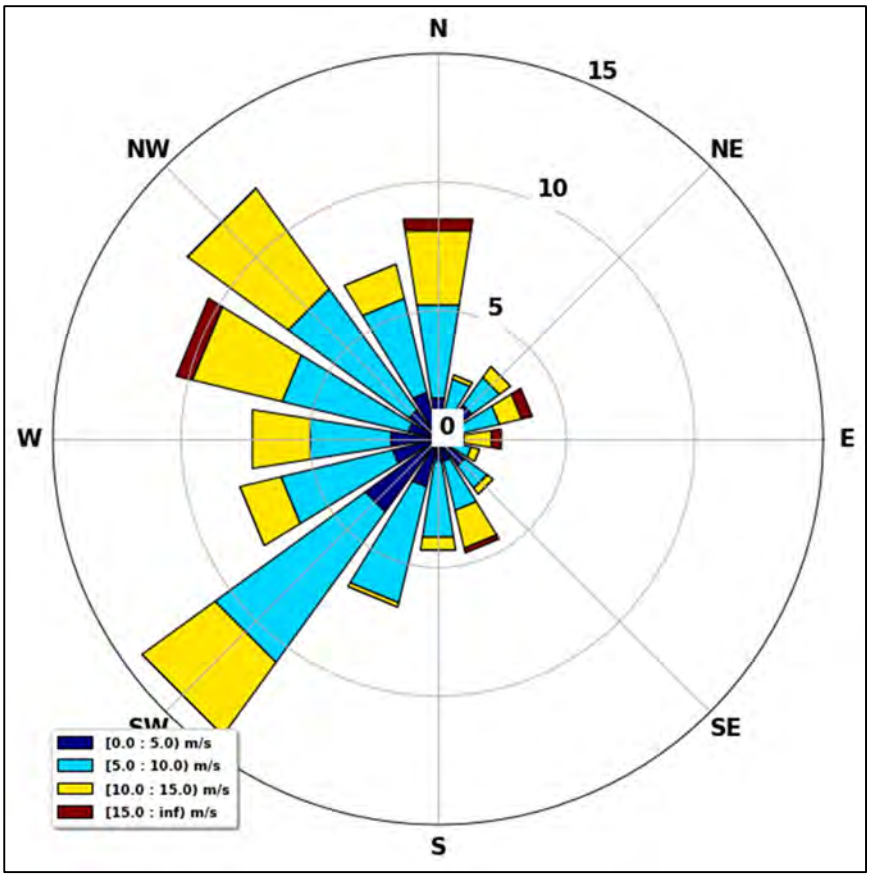

FIGURE 3-4. WIND ROSE FOR THE HYDRODYNAMIC MODEL VALIDATION PERIOD. DATA FROM THE SOUTHCOAST WIND OFFSHORE METOCEAN BUOY.

TABLE 3-1. PERCENTILES OF WIND SPEEDS DURING THE HYDRODYNAMIC MODEL VALIDATION PERIOD AS RECORDED AT THE SOUTHCOAST WIND OFFSHORE METOCEAN BUOY.

	Observed Wind Speed Statistics During Model Validation Period (m/s)
Minimum	0.19
Mean	7.78
Maximum	18.81
Percentiles	
5	2.12
10	3.16
25	5.34
50	7.74
75	10.27
90	12.00
95	13.31

3.3 Model Validation Results

The model application was validated against observations of water elevations and currents within the region. The locations of the various observation stations are shown in Figure 3-5.

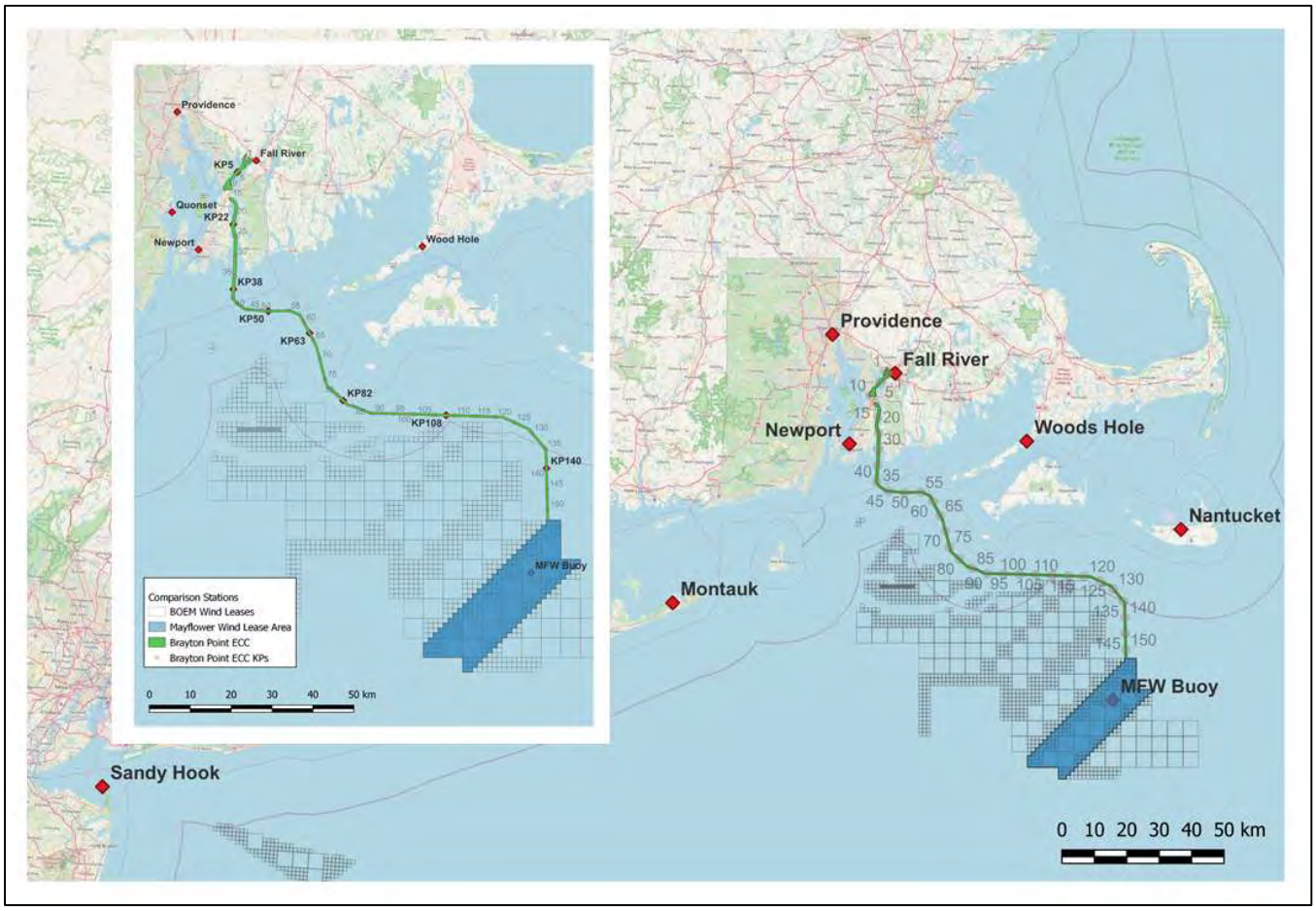

FIGURE 3-5. OBSERVATION STATIONS USED FOR DEVELOPING MODEL FORCING AND MODEL VALIDATION. INSET SHOWS A SUBSET OF KILOMETER (KP) MARKERS ALONG BRAYTON POINT ECC INDICATIVE CENTERLINE.

3.4 Validation of Model Predicted Water Surface Elevations

Water surface elevations (WSEs) predominately reflect the influence of tides, though can also be affected by winds, wind driven waves, and offshore pressure related sea level variations, particularly in coastal areas during storms. Model predictions of water surface elevations were compared to observations to evaluate how well the model was capturing water level variation in the region, particularly the water level variation from tides since the area is known to be tidally dominated (Spaulding and Swanson, 2008, Spaulding and White, 1990). The validation included multiple components including: (1) a qualitative comparison of time series, (2) a statistical comparison of model vs observation time series statistics, (3) statistical comparison of the tidal harmonics developed through harmonic decomposition of observed and predicted time series data. Harmonic decomposition refers to the

output of a signal processing analysis that removes any non-periodic elements (such as set up or set down from winds) and then further breaks the tidal signal down in to its individual cyclical astronomical components (e.g. the semi-diurnal M2 component that dominates the tides in this region) that can be defined by their amplitude, period and phase. NOAA describes harmonic constituents as follows:

> *There are hundreds of periodic motions of the Earth, Sun, and Moon that are identified by astronomy. Each of these motions or "constituents" in a set of harmonic constants is a mathematical value describing the effect that cyclical motion of the Earth, Sun, Moon system has on the tides. There are 37 which normally have the greatest effect on tides and are used as the tidal harmonic constituents to predict tidal conditions for a location.*
>
> *A couple of examples:*
> - *M2 – The largest lunar constituent – is related to the direct gravitational effect of the Moon on the tides. The Earth rotates on its axis every 24-hours, but the Moon is orbiting in the same direction as the Earth's rotation. It takes a location on the Earth an additional 50 minutes to "catch up" to the Moon. This results in a tidal signal (M2) which has 2 peaks every 24-hours and 50 minutes.*
> - *S2 – The largest solar constituent – is related to the direct gravitational effect of the Sun on the tides. The Earth rotates on its axis every 24-hours. This results in a tidal signal (S2) which has 2 peaks every 24-hours.*

Water surface elevation data was obtained for the study time period from the following NOAA tide stations:

- Station 8531680: Sandy Hook, NJ
- Station 8510560: Montauk, NY
- Station 8452660: Newport, RI
- Station 8447930: Woods Hole, MA
- Station 8454000: Providence, RI
- Station 8454049: Quonset Point, RI
- Station 8447386: Fall River, MA

The five largest tidal harmonic components calculated from modeled and observed water surface elevation time series were compared at each of the NOAA tide stations (Figure 3-5). The five harmonic constituents compared were M2, S2, N2, K1, and O1 and their respective periods are presented in Table 3-2 below.

TABLE 3-2. TIDAL HARMONIC CONSTITUENT CHARACTERISTICS (NOAA, 2007).

Name	Constituent	Speed in degrees/hour	Period in hours
M2	Principal lunar semidiurnal constituent	28.98	12.42
S2	Principal solar semidiurnal constituent	30.00	12.00
N2	Larger lunar elliptic semidiurnal constituent	28.44	12.66
K1	Lunar diurnal constituent	15.04	23.93
O1	Lunar diurnal constituent	13.94	25.82

Plots of the model predicted and observed water surface elevation (WSE) time series are presented in Figure 3-6 through Figure 3-7 for stations located as shown in Figure 3-5. These plots illustrate that the model was able to capture the semi-diurnal nature of the tides, the shifts in water level due to storms and the variation of tidal range across the region. The tide range varies across the region, though the peak tidal amplitude is less than 1.25 m (4.10 ft) in most locations at most times.

The model predicted time series plotted in Figure 3-6 were generated by the large grid application and show that there is a large variation in tidal amplitudes and storm response across the domain which the model was able to predict. The Woods Hole station missed some of the variability likely due to complex coastal topography in the area. As will be shown below, the tidal harmonics are well represented at that station none the less.

The time series presented in Figure 3-7 were generated using the nested grid model application and again it can be seen that the model is able to adequately reproduce the tidal variability and the storm (wind) related offsets. This is a good indication that the model predictions are robust across the domain for many different types of areas as environmental conditions within the Brayton Point ECC study area.

The differences between model predictions and observations were evaluated quantitatively through the calculation of different statistical measures including the root mean square error (RMSE), and the correlation coefficient (R). Both of these measures are calculated on a point to point basis, i.e. the model predictions and the observations are compared one to one at every time step. As it essentially uses the absolute value of the differences, positive and negative differences do not average, making it an unforgiving measure of the difference between the model and the observations.

The root mean square error is a measure of the variance of the error (difference between the model prediction and the observation at a given time), defined by the equation is shown below.

$$RMSE = \sqrt{\overline{(model - obs)^2}}$$

The correlation coefficient is a measure of the variance of the error and is the standard of deviation of the difference between model predictions and observations, the equation is shown below.

$$R = \frac{covariance\ (model, obs)}{STD_{model} * STD_{obs}}$$

A summary of the statistics is shown in Table 3-3. With the exception of Woods Hole as was seen in the earlier comparison, the RMSE and correlation coefficient show an excellent fit between the model predictions and the observations, with a RMSE on the order of 0.1 m/s.

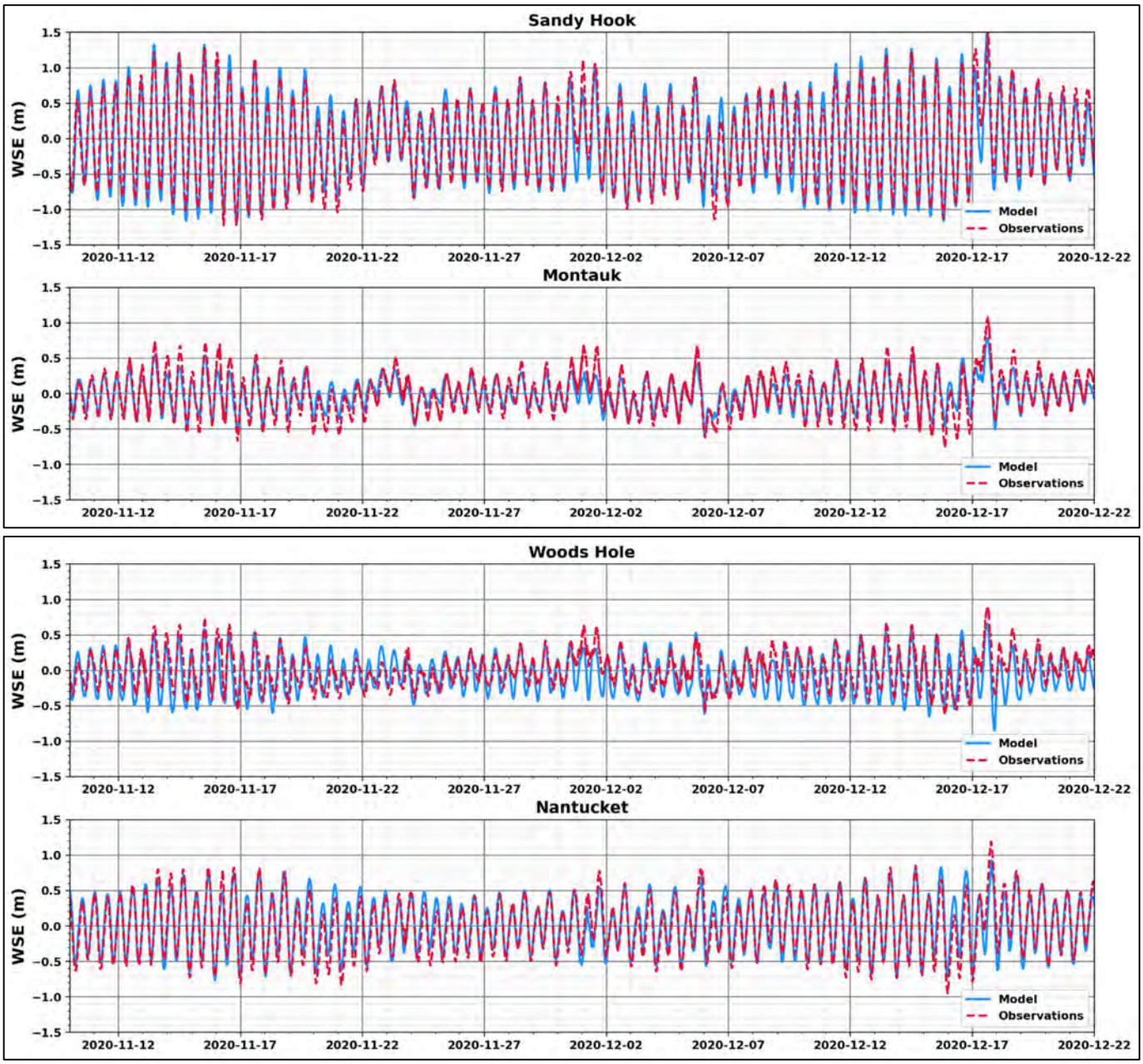

FIGURE 3-6. COMPARISON OF MODELED AND OBSERVED WATER SURFACE ELEVATIONS AT NOAA SANDY HOOK, MONTAUK, WOODS HOLE, AND NANTUCKET TIDE STATIONS. WATER SURFACE ELEVATIONS ARE PLOTTED RELATIVE TO MSL.

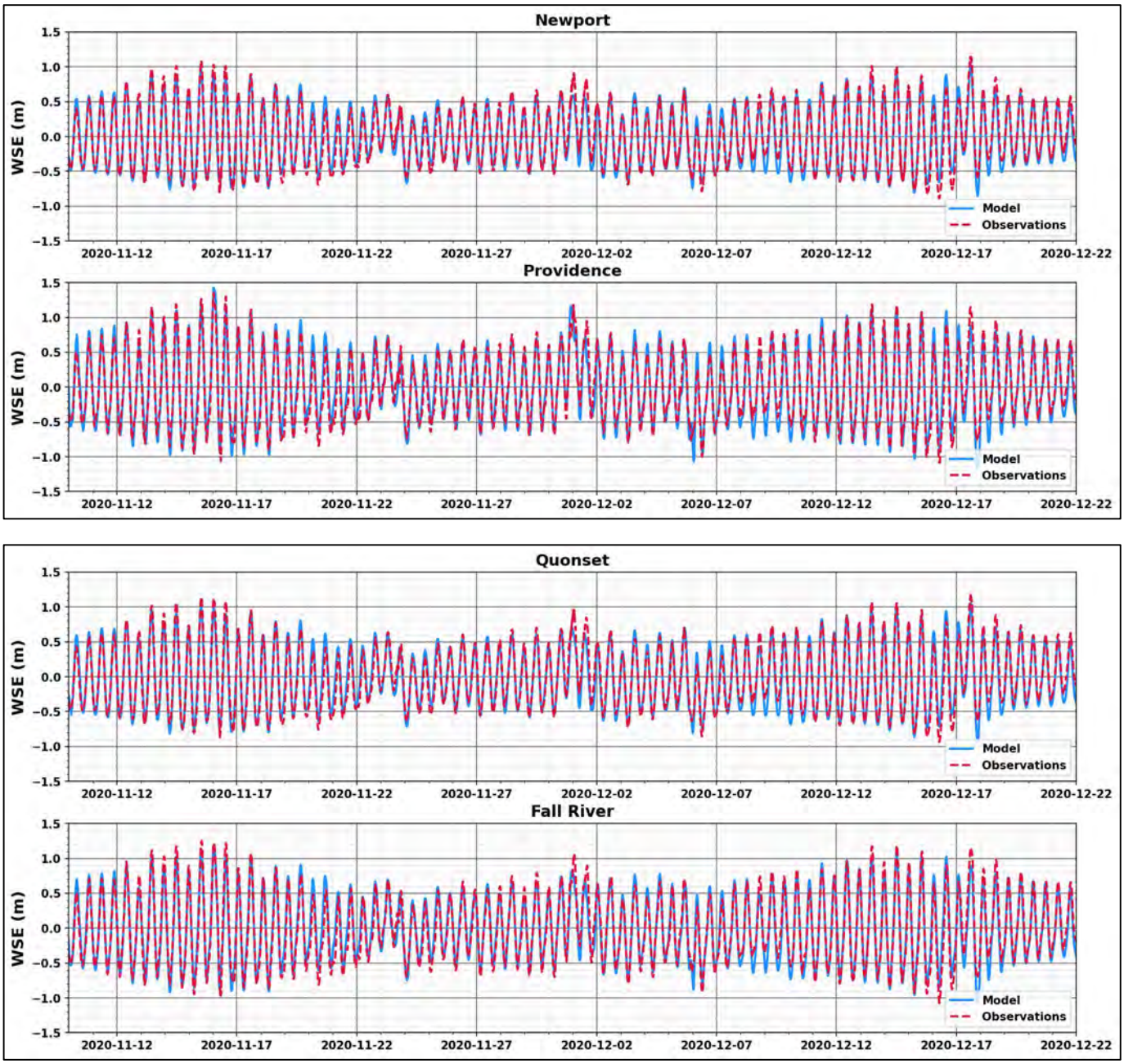

FIGURE 3-7. COMPARISON OF MODELED AND OBSERVED WATER SURFACE ELEVATIONS AT NOAA NEWPORT, PROVIDENCE, QUONSET POINT, AND FALL RIVER TIDE STATIONS. WATER SURFACE ELEVATIONS ARE PLOTTED RELATIVE TO MSL.

TABLE 3-3. SUMMARY OF STATISTICS AT WATER SURFACE ELEVATION OBSERVATION STATIONS BASED ON COMPARISON OF MODEL PREDICTED TO OBSERVED TIME SERIES OF DATA.

Station	RMSE (m/s)	R (-)
Sandy Hook	0.09	0.96
Montauk	0.13	0.92
Woods Hole	0.22	0.77
Nantucket	0.10	0.95
Newport	0.08	0.97
Fall River	0.09	0.96
Quonset Point	0.08	0.97
Providence	0.09	0.96

A harmonic decomposition was performed on both the observed and modeled time series at the observation locations. The harmonic constituents of the modeled and observed amplitude and phase at the eight comparison stations are summarized in Table 3-4 and Table 3-5, respectively. The results show that the M2 constituent dominates across all the sites and that the model is able to reproduce the variation in water surface elevation from the tides across the domain very well. The tables also provide the differences between model and observed characteristics. Differences in tidal amplitude vary up to a high of 0.09 m (2.95 ft) at Woods Hole, they are less than that in the majority.

TABLE 3-4. SUMMARY OF COMPARISON OF HARMONIC ANALYSIS OUTPUT OF CONSTITUENT AMPLITUDE FOR BOTH MODELED AND OBSERVED DATA FROM OBSERVATION STATIONS WITHIN THE MODEL DOMAIN.

		Amplitude (m)					
		Sandy Hook	Montauk	Woods Hole	Nantucket	Newport	Fall River
M2	**Model**	0.72	0.23	0.33	0.46	0.54	0.62
	Obs	0.69	0.30	0.24	0.46	0.52	0.61
	Difference	0.03	-0.07	0.09	0.00	0.02	0.01
N2	**Model**	0.20	0.07	0.08	0.11	0.13	0.14
	Obs	0.18	0.09	0.08	0.13	0.14	0.16
	Difference	0.03	-0.02	0.00	-0.01	-0.01	-0.02
K1	**Model**	0.17	0.08	0.07	0.11	0.07	0.06
	Obs	0.12	0.08	0.08	0.11	0.07	0.07
	Difference	0.05	-0.01	-0.01	0.00	-0.01	-0.01
S2	**Model**	0.13	0.06	0.06	0.04	0.09	0.10
	Obs	0.12	0.06	0.05	0.05	0.10	0.12
	Difference	0.01	0.01	0.01	0.00	-0.01	-0.01
O1	**Model**	0.04	0.04	0.05	0.08	0.04	0.03
	Obs	0.05	0.05	0.06	0.08	0.04	0.04
	Difference	-0.01	0.00	0.00	0.00	0.00	-0.01

TABLE 3-5. SUMMARY OF COMPARISON OF HARMONIC ANALYSIS OUTPUT OF CONSTITUENT PHASE FOR BOTH MODELED AND OBSERVED DATA FROM OBSERVATION STATIONS WITHIN THE MODEL DOMAIN.

		Constituent Phase (degrees)					
		Sandy Hook	Montauk	Woods Hole	Nantucket	Newport	Fall River
M2	Model	127	153	121	245	115	121
	Obs	122	163	151	249	117	124
	Difference	5	-10	-30	-4	-2	-2
N2	Model	327	348	321	69	314	322
	Obs	315	350	346	67	312	320
	Difference	12	-2	-26	2	1	1
K1	Model	14	183	192	216	177	186
	Obs	22	192	200	223	182	188
	Difference	-8	-9	-9	-7	-5	-2
S2	Model	174	32	359	161	6	12
	Obs	173	43	20	153	9	17
	Difference	1	-11	-21	8	-4	-5
O1	Model	291	304	295	314	297	301
	Obs	286	300	299	317	294	298
	Difference	5	4	-4	-3	3	3

3.5 VALIDATION OF MODEL PREDICTED CURRENTS

The model predictions of currents were validated to available observations. The objective of the comparison is to evaluate how well the model can recreate the magnitude and pattern of currents, particularly near the seabed where the sediments will be resuspended and transported by the currents during cable installation processes. Current data available to compare to the model predictions consisted of NOAA predictions of current velocities (along channel velocities) at the Fall River station, and current observations at the offshore SouthCoast Wind metocean buoy in the Lease Area, both as located in Figure 3-5.

The Fall River bottom station is located adjacent to the dredged channel at a depth of approximately 9 m (30 ft) deep relative to MSL. The NOAA predicted current velocities, at that depth, were compared to model predictions at the corresponding depth. Figure 3-8 shows a comparison of current velocities. The NOAA predictions are provided as a singular directionless velocity, deemed to be aligned with the channel as there is little variability in current direction within channels in narrow waterways dominated by tides; as such the modeled speed plot shows the varying velocity in the along channel direction. The modeled current speeds match very well with the NOAA predicted speeds, with differences typically within a few centimeters per second in a total range of approximately 40 cm/s. The results of a statistical comparison between the model predictions and the observations at Fall River are presented in

Table 3-6.

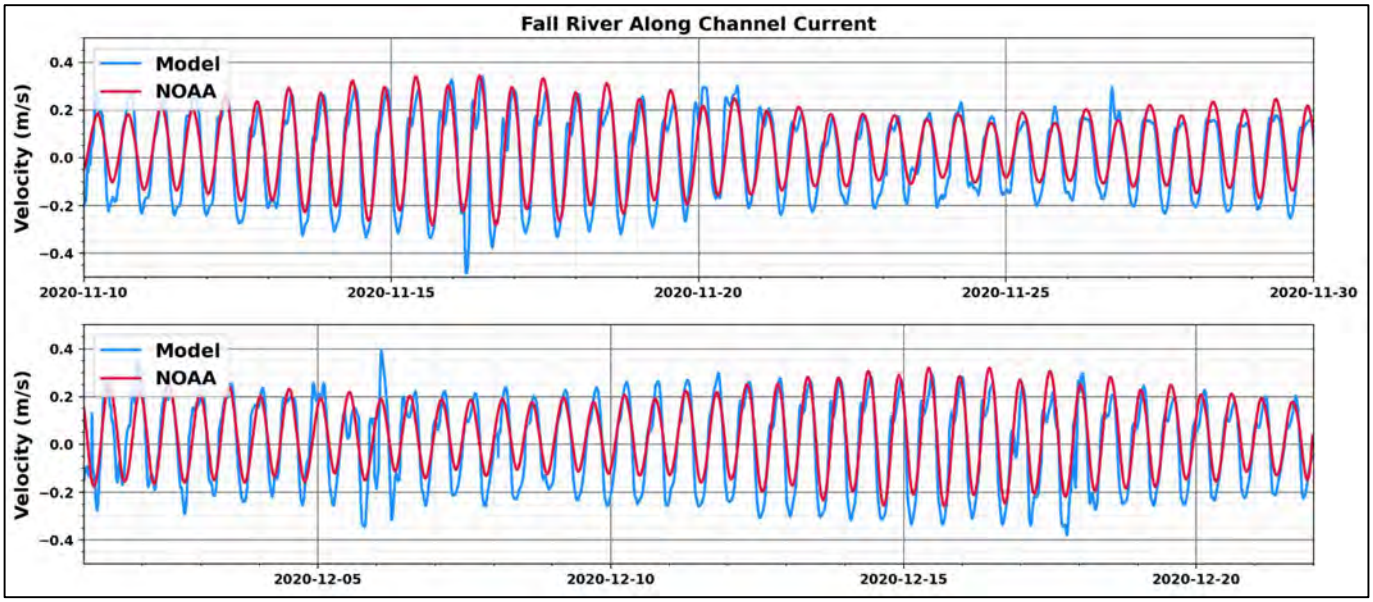

FIGURE 3-8. CCOMPARISON OF MODELED AND NOAA PREDICTED CURRENT SPEED AT FALL RIVER.

TABLE 3-6. SUMMARY OF CURRENT SPEED STATISTICS AT FALL RIVER.

	Model (m/s)	NOAA (m/s)	Difference (m/s)
Minimum	-0.48	-0.41	-0.07
Maximum	0.39	0.37	0.02
Percentiles			
5	-0.27	-0.27	0.00
10	-0.24	-0.22	-0.02
25	-0.16	-0.12	-0.05
50	0.05	0.09	-0.04
75	0.16	0.18	-0.02
90	0.22	0.24	-0.02
95	0.25	0.28	-0.03

The SouthCoast Wind metocean buoy is located in approximately 47 m (154 ft) of water and has a vertical profile of current observations available, with observations extending to 41 m (135 ft). The near bottom observed currents were compared to model predictions near the bottom. Figure 3-9 shows a comparison of speeds at 39 m (128 ft) depth, and the associated observed and predicted current directions are shown in Figure 3-10. The

comparison was made at the 39 m (128 ft) level as the signal in the observations was missing more data at the 41 m (135 ft) depth.

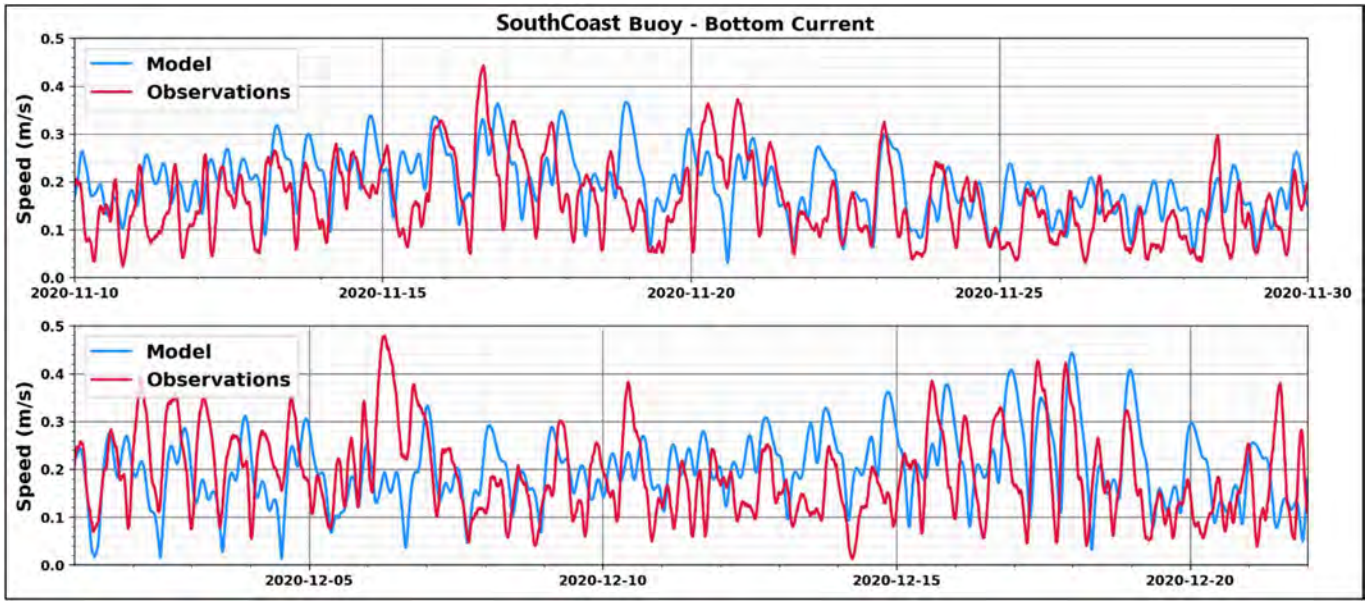

FIGURE 3-9. COMPARISON OF MODELED AND OBSERVED BOTTOM CURRENT SPEED AT THE OFFSHORE SOUTHCOAST WIND METOCEAN BUOY.

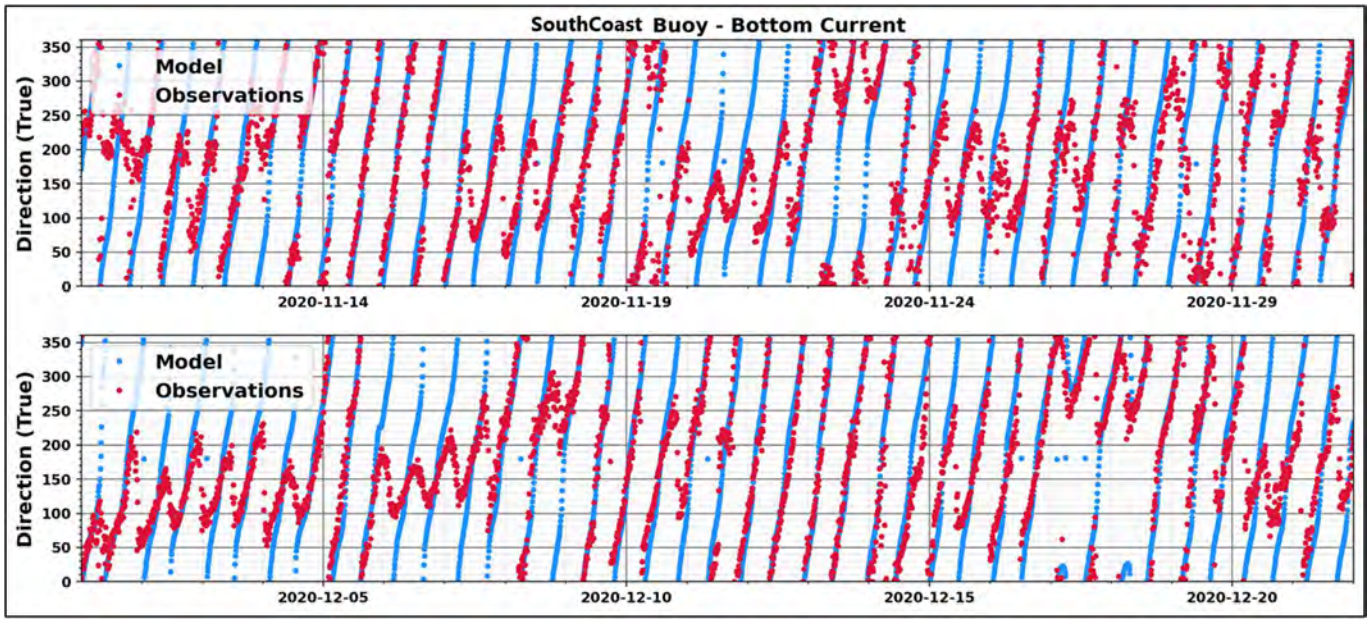

FIGURE 3-10. COMPARISON OF MODELED AND OBSERVED BOTTOM DIRECTION AT THE OFFSHORE SOUTHCOAST WIND METOCEAN BUOY.

The figures show that the model recreates the overall magnitude and trends of the current speeds and the general rotary nature of the currents, however the model does not capture the directionality in all instances. The

observed currents during this period show more tendency to flow towards the north and east, deviating from the more definite rotary characteristics than was captured by the model. This may be due to the currents during storm events and also influences of larger offshore currents that are not included in the model. At locations closer to shore from this offshore location it is expected that the current regime is more tidally dominated and outside the influences of the larger scale circulation offshore.

A statistical analysis of the observed and model predicted currents was also performed for the SouthCoast Wind metocean buoy location. The minimum, mean and maximum current speeds comparing the model predicted and observed are presented in Table 3-7 along with a range of current speed percentiles. The comparison of these statistics shows that the model is within 0.07 m/s (0.14 kts) on average and has a difference less than 0.05 m/s (0.1 kts) at all percentile levels indicating that while the direction may not always be aligned with the observations the model is predicting the correct proportion and variability of bottom current speeds.

TABLE 3-7. SUMMARY OF CURRENT SPEED STATISTICS AT THE SOUTHCOAST WIND METOCEAN BUOY.

	Model (m/s)	Observation (m/s)	Difference (m/s)
Minimum	0.01	0.00	0.01
Maximum	0.44	0.51	-0.07
Percentiles			
5	0.09	0.05	0.04
10	0.11	0.07	0.05
25	0.15	0.11	0.04
50	0.19	0.16	0.03
75	0.24	0.23	0.01
90	0.29	0.30	-0.01
95	0.32	0.34	-0.02

The currents vary throughout a given day and vary day to day as a function of the solar and lunar cycles; most variability is captured in the spring/neap cycle which refers to a two-week period where there are periods of larger tidal amplitudes (spring tides) and smaller amplitudes (neap tides) and these periods are connected by transitional or mean tides. The northeast is dominated by semi-diurnal M2 tides, which results in two high tides and two low tides per day. As a result of these tides, the currents ebb (flow out) and flood (flow in) twice a day. This causes current speeds to continuously ramp up and down in intensity and the directions to oscillate by 180 degrees (e.g. in and out of Narragansett Bay).

In some places the tidal currents are rectilinear, meaning primarily a singular flood and ebb direction with little time at directions between the two, whereas other regions have more rotary like currents which still have predominant ebb and flood however also have a more gradual transition between the two. Plots of the near bottom current speeds across the entire domain for peak ebb and peak flood currents are provided in Figure 3-9. While each plot represents an instant in time, they illustrate the relative spatial variability of peak current speeds across the region. Along the majority of the ECC, the peak current speeds are relatively low (<0.3 m/s), with a few regions with higher peaks such as near the Lease Area termination, a small portion southwest of Martha's

Vineyard and then within the Sakonnet River and Mount Hope Bay where peaks increase to approximately >0.5 m/s; however, these peaks are not experienced the majority of the time.

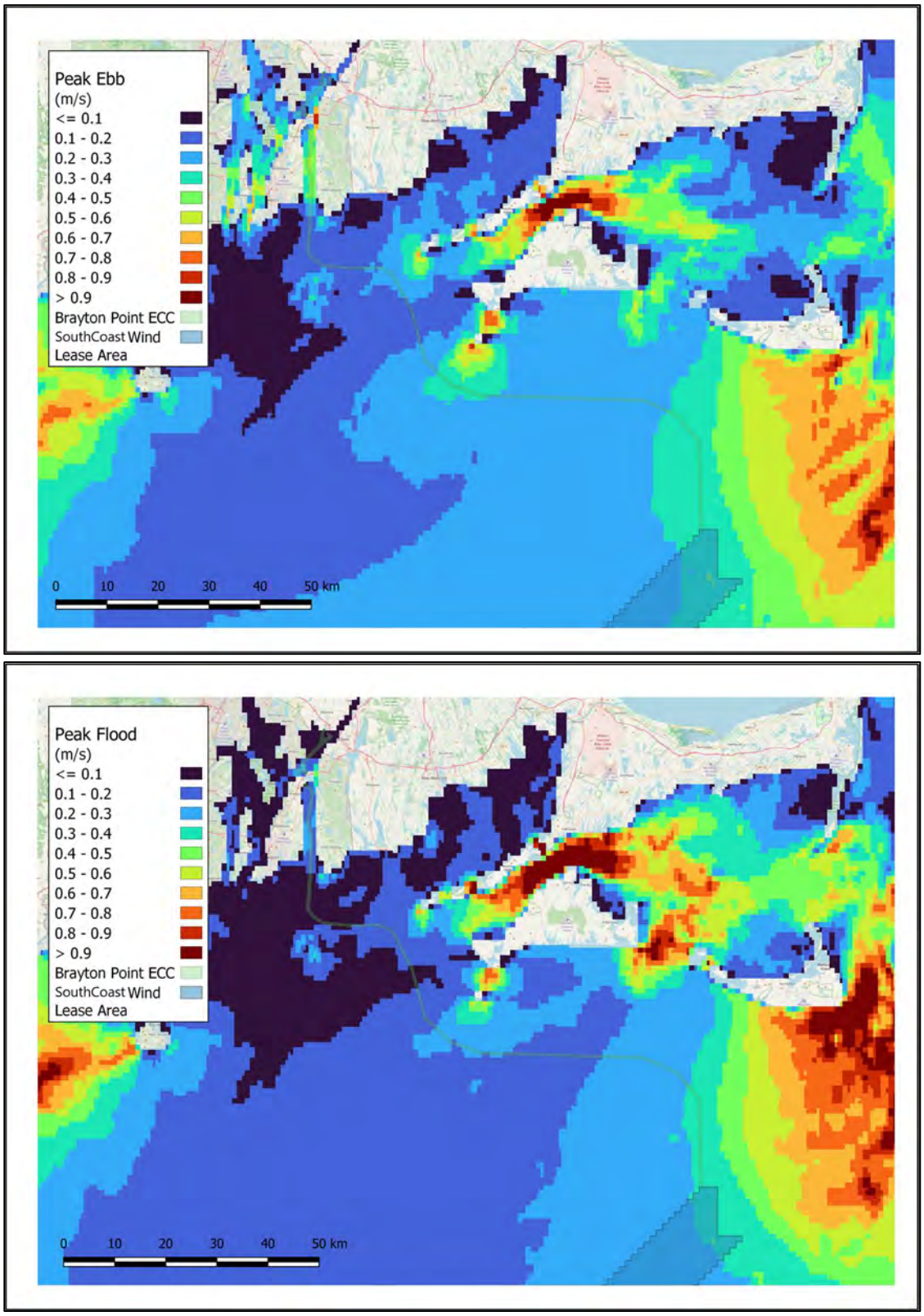

FIGURE 3-11. PEAK EBB (TOP) AND FLOOD (BOTTOM) CURRENT SPEEDS.

3.6 PROJECT SCENARIO

The three-dimensional time varying current fields of validated hydrodynamic model were stored and used in the sediment transport modeling. The near bottom currents at a set of stations aligned with different KPs were queried to assess the current regime along the ECC that will be relevant to the sediment transport. A map showing the current roses at the specific locations is presented in Figure 3-12 and a summary of statistics of the current speeds at these locations is provided in Table 3-8. The current roses show that the bottom speeds are relatively weak, and less than 0.15 m/s more than half the time at most stations except KP22 and KP140. The latter two stations are areas of relatively higher current speeds within the Sakonnet River and offshore near the Lease Area, respectively. The directions differ along the ECC in response to the changing circulation patterns which are shaped by the shoreline and offshore bathymetric features, however at all locations the tidal influence is dominant and the currents shift in direction continuously.

TABLE 3-8. SUMMARY OF CURRENT SPEED STATISTICS ALONG THE ECC.

	Current Speed Statistics (values in m/s)							
	KP5	KP22	KP38	KP50	KP63	KP82	KP108	KP140
Minimum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	0.56	1.16	0.30	0.30	0.30	0.55	0.37	0.45
Percentiles								
5	0.02	0.04	0.01	0.02	0.05	0.06	0.04	0.10
10	0.03	0.07	0.02	0.04	0.06	0.07	0.05	0.12
25	0.06	0.12	0.03	0.06	0.09	0.11	0.08	0.16
50	0.09	0.19	0.04	0.08	0.12	0.15	0.11	0.21
75	0.12	0.25	0.07	0.12	0.15	0.21	0.16	0.26
90	0.15	0.30	0.12	0.15	0.18	0.26	0.20	0.31
95	0.17	0.33	0.18	0.17	0.20	0.31	0.23	0.34

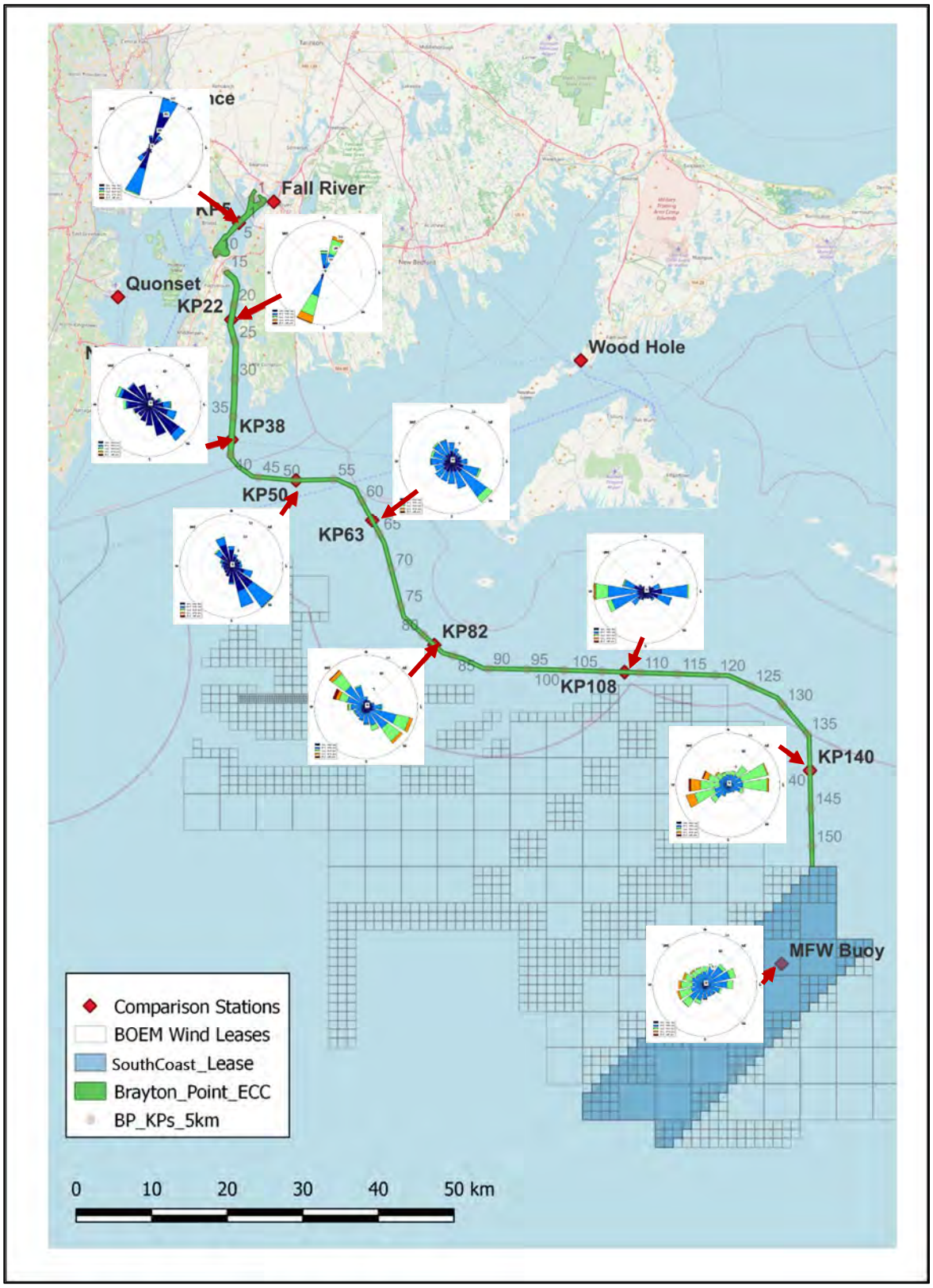

FIGURE 3-12. CURRENT ROSES FROM MODEL PREDICTED BOTTOM CURRENTS AT POINTS ALONG ECC.

4 SEDIMENT TRANSPORT MODELING

The goal of this study was to determine the effects of proposed cable burial activities, evaluated in terms of water column concentrations of suspended sediment and sediment deposition patterns and thickness. The model application focused on "excess" sediment concentrations and did not incorporate natural background concentrations. The concentrations are therefore considered excess above any background levels. The effects were assessed through sediment dispersion, transport, and deposition modeling. This section provides a description of the sediment model application to the Brayton Point ECC development assessment and the resulting model predictions.

4.1 BRAYTON POINT EXPORT CABLE CORRIDOR DESCRIPTION

The planned Brayton Point export cable ECC connecting the Lease Area to land at Somerset, MA can be considered as two basic parts for modeling purposes: the portion of the ECC in Mount Hope Bay and the rest of the ECC extending from the head of the Sakonnet River to Lease Area. For the following analyses, the ECC will be further divided into four segments for discussion purposes: Mount Hope Bay, the Sakonnet River, Offshore Segment 1 (from the Sakonnet River entrance at KP34 to KP78) and Offshore Segment 2 (from KP78 to the north end of the Lease Area at KP152). A map of the Brayton Point ECC showing the four sections and the HDD sites is presented in Figure 4-1.

Starting at the Brayton Point terminus of the ECC, the submarine portion of the cables run from an HDD connection point used to bring the cables from shore, roughly 325 m (1,066 ft) offshore of the Brayton Point landfall, 9.5 km (5 nm) in a southwest direction to another HDD offshore exit point approximately 285 m (935 ft) offshore of the northern end of Aquidneck Island near the Mount Hope Bay entrance just west of Common Fence Point. The cables will cross Aquidneck Island and exit the island via HDD connection point, approximately 340 m (1,116 ft) offshore of Island Park at the head of the Sakonnet River.

The three HDD connection pits will be referred to as the Brayton Point, Mount Hope Bay entrance north of Aquidneck Island, and south of Aquidneck Island at the north end of the Sakonnet River excavation pits, respectively. Each of the excavation pits are assumed to be 45.7 m wide x 18.3 m long x 1.7 m deep (150 ft x 60 ft x 5.6 ft) for the purpose of this analysis.

Each export cable then runs approximately 18 km (9.7 nm) down the length of the Sakonnet River to the entrance at Rhode Island Sound at KP34. The ECC continues south to KP40 then heads east across the mouth of Buzzards Bay to KP55, south again to KP80 and east across the north end of the MA/RI lease areas to KP130 and finally south to the SouthCoast Wind Lease Area at KP 152.

Each of the cable ECC segments and the HDD exit point sites were evaluated individually to determine the re-suspended sediment concentration in the water column, the deposition pattern and dimensions (spread and thickness), at and around the cable burial or HDD excavation site activities. The total surface area of the burial trench, based on the assumed 1 m (3.3 ft) wide trench, is presented in Table 4-1. The surface area associated with each HDD pit excavation is also presented in the table, as well as the amount of time in each the excavation activities take for each segment assuming continuous operation in that segment at the 200 m/hr advance rate.

TABLE 4-1. DISTANCE AND SURFACE AREA OF EACH TRENCH SECTION.

Section	Approximate Distance	Trench Surface Area (based on 1.0 m [3.3 ft] trench width)	Duration of Excavation Activities (hrs)
Mount Hope Bay	9.5 km (5.9 mi)	0.95 ha (2.4 ac)	47.5
Sakonnet River	18 km (11.2 mi)	1.8 ha (4.5 ac)	90
Offshore Segment 1	44 km (27.3 mi)	4.4 ha (10.9 ac)	220
Offshore Segment 2	74 km (46.0 mi)	7.4 ha (18.3 ac)	370
HDD Connection Pit	45.7 m x 18.3 m (150 ft x 60 ft)	0.084 ha (0.207 ac)	16

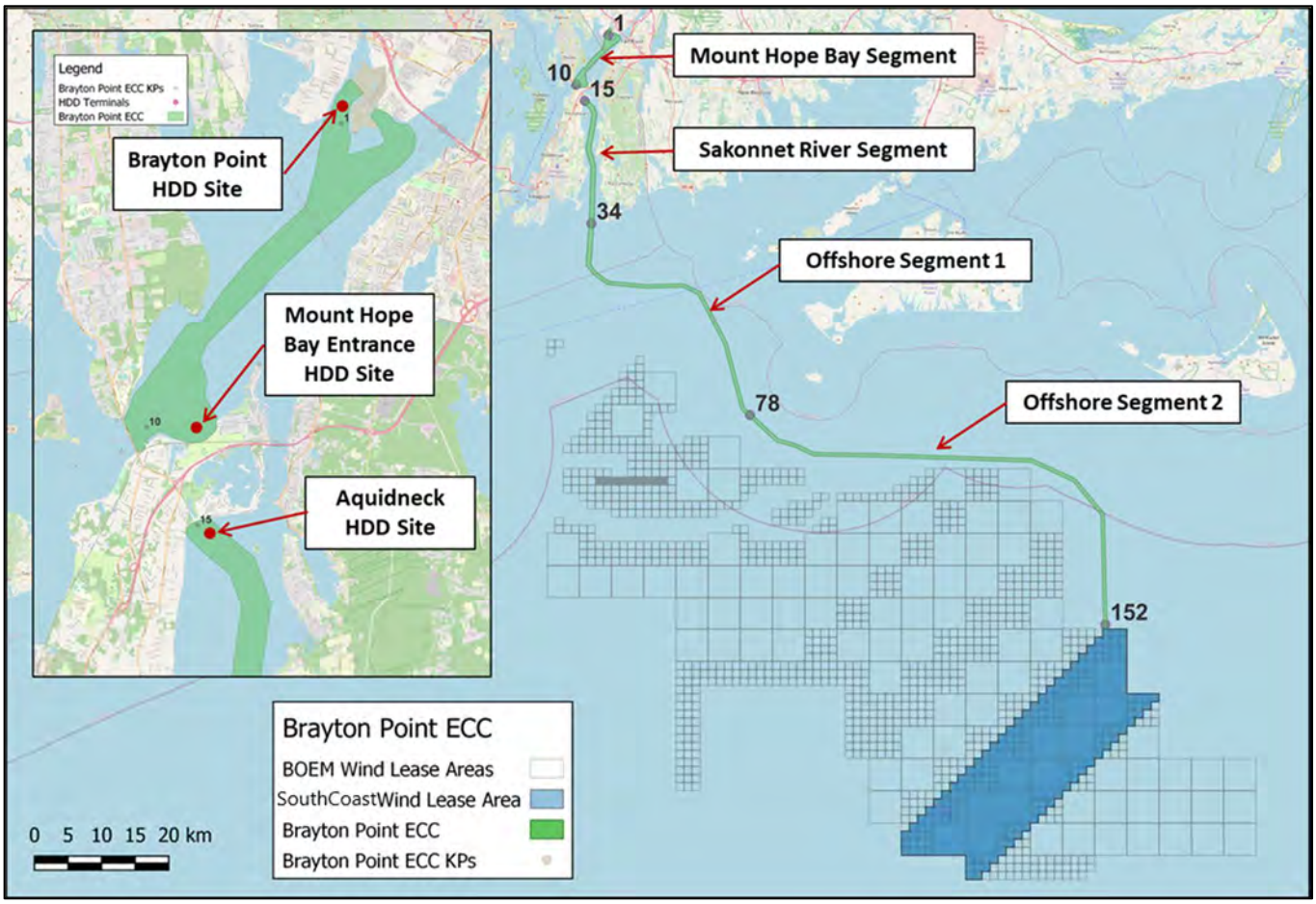

FIGURE 4-1. MAP OF THE BRAYTON POINT ECC SHOWING THE SEGMENTS USED FOR RESULTS DISCUSSION AND THE LOCATIONS OF THE HDD CONNECTION SITES ANALYZED.

4.2 SEDIMENT SOURCE TERMS

Two different subsea excavation techniques are likely to be employed for the cable burial trenching and the HDD pit excavation construction activities. For the cable burial activities, mechanical plow or jetting sediment excavation methods were assumed, while suction dredging was assumed for the HDD pit excavation. Losses (i.e. sediments resuspended to the water column) from each of these activities were represented in the D-WAQ PART model by characterizing the source strength, vertical distribution, and grain-size distribution of the sediment load. Details describing the parameterization of each method are provided below.

The cable burial activities were simulated with an advance rate of 200 m/hr (656 ft/hr). The trench dimensions were specified as 3 m (9.8 ft) deep by 1 m (3.3 ft) wide for the length of the export cables, resulting in a production rate of 600 m^3/hr (21,189 ft^3/hr) for the cable burial. An excavation production rate of 180 m^3/hr (6,356 ft^3/hr) was specified for the HDD pits suction dredging.

Using the source term specifications and the grain size distributions along the ECC, a loading time series was developed for each of the components listed in Table 4-1. The loading was subdivided into five-minute production segments, calculated as the cross-sectional area of the trench times the distance travelled by the jetting equipment in one time step (i.e. 50 m^3 [1766 ft^3] and 16.67 m [54.7 ft]) for injection into the water column over the entire length of the export cables.

Each five-minute load was comprised of six grain size mass components based on the local grain size distribution along that segment of the ECC, a loss rate of 25 percent, the production volume, the volume mass/moisture content ratio and the sediment density and released into the water column. The vertical distribution of the sediments resuspended was centered at 1.5 m (4.9 ft) above the bottom, whereby the majority of the sediment is released close to the seabed. The 100 percent release volume is a conservative value for these types of operations based on previous experience but is used in the absence of contractor data for the specific jetting or mechanical equipment to be used for the actual cable burial in the Sakonnet River, Mt. Hope Bay and Rhode Island Sound.

Suction dredge equipment was specified to be used to excavate the HDD connection pit at each of the sea-to-shore transition points in Mount Hope Bay and in the Sakonnet River. A suction dredger uses a vacuum to excavate a sediment slurry from the seabed and the fluidized sediment is released through a discharge pipe to a spoil area on the seafloor nearby. Contractor estimates indicate that the dredger can operate at a production rate of 180 m^3/hr (6,356 ft^3/hr) with a 50% efficiency (i.e. 50% water plus 50% sediments). For implementation in the modeling, it is assumed that 100 percent of the fluidized sediment will be lost to the water column as it is released from the discharge pipe (i.e. sediment will be side-cast adjacent to the excavation site). The discharged sediment is initialized within the model at a single point in the water column, 1.5 m (4.9 ft) above the seafloor. A summary of the export cable burial and the HDD pit excavation activities simulation parameters are presented in Table 4-2 and Table 4-3, respectively.

TABLE 4-2. SUMMARY OF EXPORT CABLE BURIAL ACTIVITIES SIMULATED.

Export Cable Burial Activities	
Excavation method	Mechanical or jet trenching
Advance Rate	200 m/hr (656 ft/hr)
Production Rate (Based on 1 m wide x 3 m deep trench)	600 m^3/hr (21,189 ft^3/hr)
Release amount	25 percent
Release height	Centered 1.5 m (4.9 ft) above local seabed
Total Duration	727.5 hrs (30.3 days)

TABLE 4-3. SUMMARY OF HDD PIT EXCAVATION ACTIVITIES SIMULATED.

Export Cable Burial Activities	
Excavation method	Suction dredge
Production Rate (Based on 10 ft x 20 ft, 14 ft deep pit)	180 m^3/hr (6,356 ft^3/hr)
Release amount	100 percent
Release height	Centered 1.5 m (4.9 ft) above local seabed
Total Duration (3 pits)	48 hrs (2 days)

4.3 EXPORT CABLE CORRIDOR SEDIMENT CHARACTERISTICS

The sediment loading also takes into account the spatial variability of the sediments characteristics along the ECC with respect to the grain size distributions and the water content. For this assessment sediment surface grab samples were taken along the ECC. The samples were obtained as part of site investigation field studies performed for the Project (AECOM, 2022). A total of 36 samples were taken of which 23 were on the Brayton Point ECC and were used to characterize the sediments for the modeling. The remaining samples were taken as controls for use in the lab analysis. The samples were processed to determine the grain size distribution from both sieve and hydrometer and to provide the moisture content and specific gravity. More recently, additional data were collected along the Brayton Point ECC and at HDD pit locations in the Lee River (Stantec, 2024) which were incorporated into the Brayton Point HDD simulations.

The grain size analysis was used to determine the percent of sediments in the six different sediment classification bins as defined in Table 2-1 using the Wentworth grade scale. The moisture content and specific gravity were estimated from the data and used to determine the percent of the trench that would be considered solids and to define the sediment density in the model. Since seabed sediments have moisture (water), this means that the trench volume is not entirely comprised of sediment.

The sediment characteristics along the Brayton Point ECC which were used in the modeling are presented in Figure 4-2 where the inset shows the new data on the Lee River side of Brayton Point. In Mount Hope Bay the figure shows that the sediments contain large fraction (over 50 percent) of silt and clay with the remainder divided roughly evenly among the 4 sand bins. At the mouth of the Sakonnet River (southern end) and moving into Rhode Island Sound the predominant sediment fraction is fine sand mixed with coarse and medium sand.

Along the Brayton Point ECC to the west of Martha's Vineyard the sediments contain fine and very fine sand but become medium to coarse south of Martha's Vineyard and remain a mix of predominantly fine and medium sand for the remaining segments to the Lease Area. The tabulated details of the grain size distributions can be found in Appendix 1 - Brayton Point ECC Surface Sediment Grab Sample Grain Size Distribution.

The grain size distributions were parsed into segments with a dividing line at the mid-point between sediment samples for use in the model. The load development assumed a constant sediment grain size distribution based on the sample between midpoints. There was no additional information available on the transition of sediment characteristics (grain size fractions) between measurements so the modeling did not interpolate between samples. A hard transition was therefore made to the next segment's values at each of the mid-points between samples.

4.4 Brayton Point ECC Sediment Model Application

Based on the ECC, trench dimensions, and near surface sediment data, the model was run for each segment described in the preceding sections. The model was used to predict the trajectory and fate of the resuspended sediment resulting from the jetting and suction excavation activities.

At each time step sediment particles are released into the water column in proportion to the spatially varying sediment class distribution as determined from the surface grab samples analyzed. For each sediment class over 1,250,000 particles were released over the loading period of the simulations. Each particle is advected laterally by tidal currents as predicted by the Delft3D hydrodynamic model application (described in Section 1) at every time step in the model. The three-dimensional currents vary time and space and therefore the sediment model is predicting the sediment transport and deposition for a single discrete event. For this study a start date was chosen for a time period that would be likely to embark on the cable burial operations and was coordinated with a time when there was in-situ data for model validation as presented in Section 1. The final selected dates placed the simulation between November and December 2020.

At each time step of the model simulation sediment concentrations in the water column were calculated both on the hydrodynamic model grid as well as on a rectangular grid measuring approximately 20 m by 20 m (65 ft x 65 ft) in the horizontal and 1 m (3.28 ft) in the vertical dimension. For each model time step, water column concentrations of total suspended sediments were calculated based on the mass of sediment per unit volume of water for each class of sediments and stored in terms of mass per cubic meter.

Concentrations are calculated on a grid of finite dimension and therefore provide a concentration average, based on the cell volume and mass within that cell, at each time step and thus in reality there may be some highly localized peaks above the model predicted concentrations, directly above the cable burial tool representative of a jet / mechanical trenching.

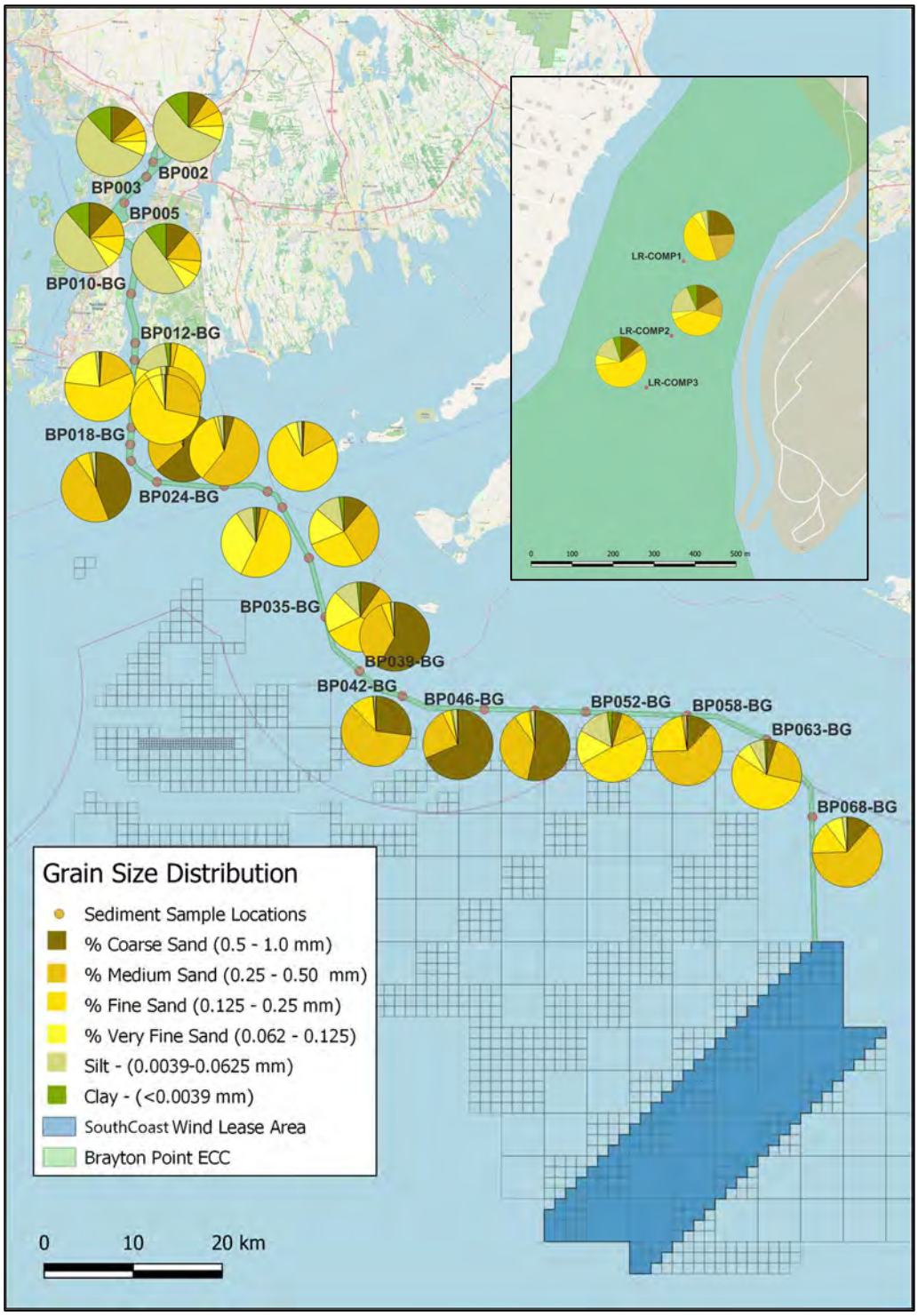

FIGURE 4-2. GRAIN SIZE DISTRIBUTION ALONG THE BRAYTON POINT EXPORT CABLE CORRIDOR WITH AN INSET OF THE BRAYTON POINT AREA. (SOUTHCOAST WIND, 2021A)

Individual sediment particles also have a downward (fall) velocity which is variable depending on both the particle size of the sediment class (settling velocity) and the environmental conditions. There is some upward movement potential associated with the parameterized vertical mixing but the general trend is for the particles to settle to the seabed where larger particles settle faster than smaller ones. Once a sediment particle has settled onto the bottom it remains as placed (no-resuspension is assumed).

Deposited mass was calculated based on particle deposition locations overlain on the same rectilinear 20 m by 20 m (65 ft x 65 ft) grid. The deposition for each cell calculated by the model are also averages across finite grid cell area. There may be some highly localized points (i.e., in line with the jetting) where deposition accumulations exceed that of the predicted deposition as output by the model. The mass in each cell across the seabed is stored at each time step (therefore always accumulating) in units of mass per square meter.

The model was also used to simulate the sediment dispersion from the HDD pit suction dredging. Three HDD-associated sediment release scenarios were modeled, corresponding to the Brayton Point, Mount Hope Bay entrance and Aquidneck Sakonnet River HDD connection offshore sites. Based on specifications provided by SouthCoast Wind, 1,427.2 m^3 (50,400 ft^3) of sediment were to be entrained in the suction device and discharged at a nearby site over a period of approximately 16 hours.

A similar methodology was applied for these HDD pit excavation scenarios as was done for the jet/mechanical trenching scenarios concerning the sediment type, with the same sediment classification being used and the sediment distribution being determined based on the closest grab sample. The same 20 m by 20 m (65 ft by 65 ft) horizontal grid was used to calculate concentration and deposition output. A five-minute time step was used for all of the HDD simulations.

The results of the model simulations are presented in the following sections. The sections address the potential impacts for the Mount Hope Bay jetting, the Sakonnet River jetting, the two offshore jetting activities and the HDD activities, respectively.

4.5 SEDIMENT TRANSPORT MODEL RESULTS

The D-WAQ PART model was used to perform simulations for each construction activity. All modeling assumed continuous operation for each phase of the construction. Note that reported concentrations are those predicted above the background concentration in the study area.

The results from the model runs are presented below in maps showing the predicted TSS concentrations and subsequent deposition for each activity. Specifically, two sets of graphics were developed for each scenario:

(i) A map of time-integrated maximum instantaneous TSS concentrations (mg/L), which shows peak TSS for any cell at any time step in the model domain throughout full water column.
(ii) Seabed deposition (thickness in mm) following the modeled activity.

The results are depicted in multiple figures for the scenario. The subsections below discuss the figures for the scenario result and summarize the results in tabular form. Two main sections address the water column TSS concentrations and the deposition thickness resulting from the sediments settling to the seabed. The results in each of those sections are divided into 3 sub-sections representing the impacts on two Narragansett Bay segments, (Mount Hope Bay and the Sakonnet River), two offshore segments, (the portion of the ECC between

KP34 and KP78, and the portion on the ECC between KP78 and KP152), and the HDD pit excavation activities impacts, respectively.

4.6 WATER COLUMN CONCENTRATION

The water column concentrations presented are the maximum TSS concentration above background anywhere in the water column at each 20 m x 20 m (65 ft x 65 ft) concentration grid cell over the total duration of the cable installation. Ambient TSS load and concentrations have been monitored in Mount Hope Bay for many years, related to concerns for impacts of the three waste water treatment plants that discharge into the bay and rivers feeding the bay (EPA, 2016, Abdelrhman 2016, Desbonnet et.al., 1992). Ambient TSS concentrations were observed ranging regularly from 2 mg/L to 19 mg/L, with a mean of in the range of 11 mg/L (FERC, 2005).

4.6.1 Mount Hope Bay and Sakonnet River Sediment Concentrations, KP0 - KP34

A map of the maximum water column TSS associated with the cable installation activities in the Mount Hope Bay (KP0 – KP10) and Sakonnet River (KP15 – KP34) portions of Narragansett Bay are presented in Figure 4-3 and Figure 4-4. The transport and dispersion of resuspended sediments in the two water bodies are similar.

Mount Hope Bay is an enclosed partially mixed estuary with a dynamic tidal regime, effectively transporting and dispersing the resuspended sediments over a wide area as can be seen in the figure. The level of maximum concentrations predicted in the estuary was primarily a result of the relatively high concentrations of silt and clay in the sediments as seen in the grain size distribution data (Figure 4-2 and Appendix 1 - Brayton Point ECC Surface Sediment Grab Sample Grain Size Distribution). The small grain size of the silt and clay particles mean that they settle more slowly than sand classes allowing additional time for transport and spreading through tidal circulation.

Mount Hope Bay has two openings, (to the south and southwest), and is open to the tidally influenced Taunton River at the head of the bay in the northeast corner. The tidal dynamics drive the currents along a predominantly southwest-northeast axis which aligns with the majority of the Brayton Point ECC, transporting the resuspended sediments along the ECC axis. The higher TSS concentrations are consequently seen to follow the ECC as well. The exception is the area near the southwest entrance to the bay where the ECC turns south towards the HDD connection north of Aquidneck Island. Along that section of the ECC the suspended sediments (and the maximum TSS concentrations) were transported perpendicular to the ECC.

The Sakonnet River is similarly an enclosed partially mixed estuary with a dynamic tidal regime, transporting and dispersing the resuspended sediments over a wide area. The river also has relatively high concentrations of silt and clay in the sediments as seen in the grain size distribution. For the most part the tidal currents along the length of the estuary are aligned with the ECC except near the head of the Sakonnet River where the ECC is in a southeast-northwest direction. In that area the tidal currents are oblique to the ECC and some higher TSS concentrations are seen to extend farther from the cable installation centerline. There is also a section of higher speed currents over the portion of the ECC that run past Fogland Point, midway along the river, where maximum TSS concentrations follow the currents off the ECC centerline.

Figures 4-3 and 4-4 show a time-integrated picture of the modeled maximum concentration over the entire trenching simulation; concentrations are not at the level shown all at once, but occur over time as the cable installation progresses. As an example, the concentration in the Sakonnet River at an instant in time is presented in Figure 4-5. In the figure, the sediment plume is seen being transported to the north, away from the trenching operation but is dispersed and diminishes to near background levels within a few kilometers. At any given

location, the high concentrations dimmish rapidly and the low concentrations diminish to background in only a few hours.

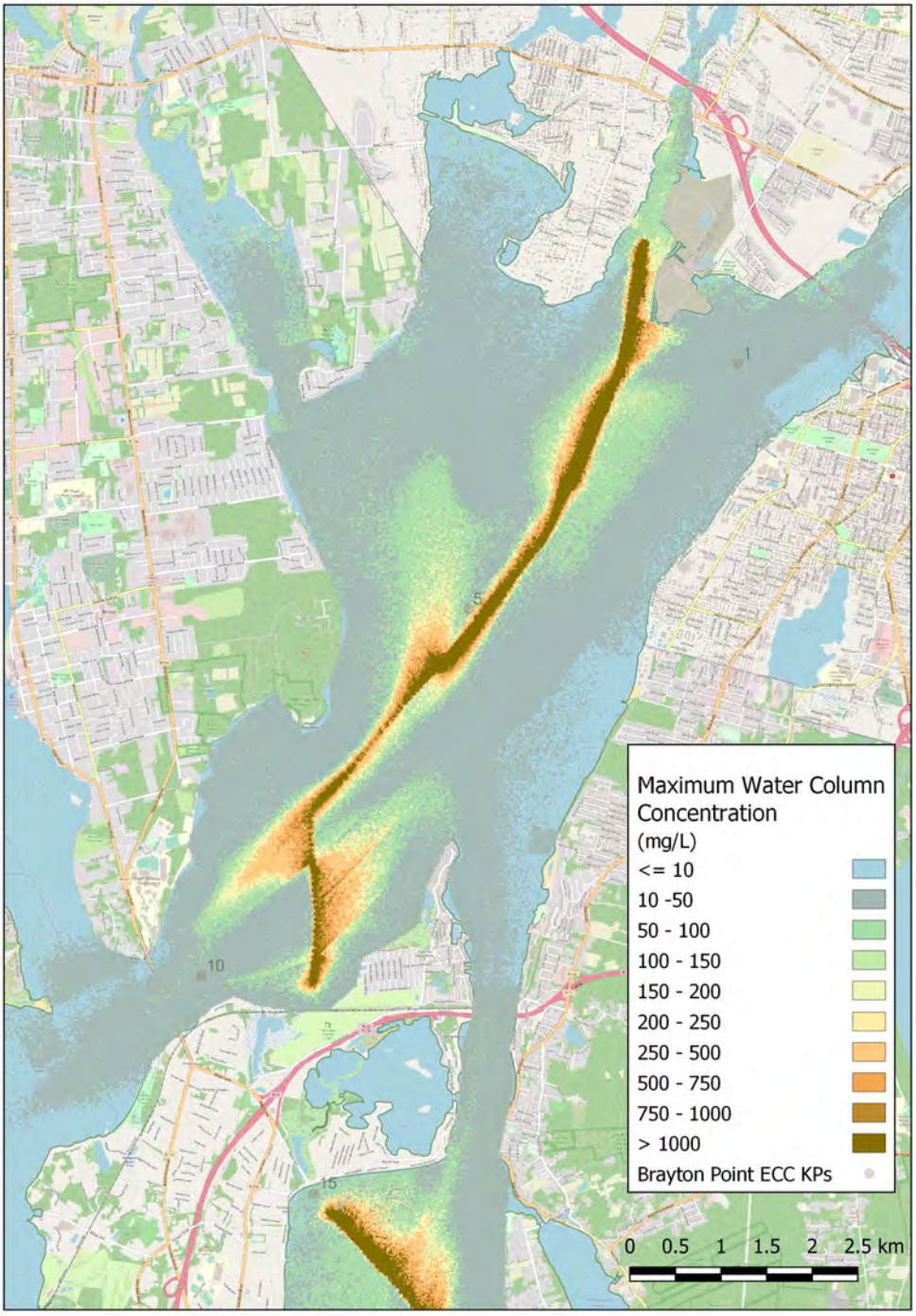

FIGURE 4-3. MAP OF MAXIMUM SEDIMENT CONCENTRATION IN THE MOUNT HOPE BAY PORTION OF THE EXPORT CABLE INSTALLATION, KP0 TO KP10.

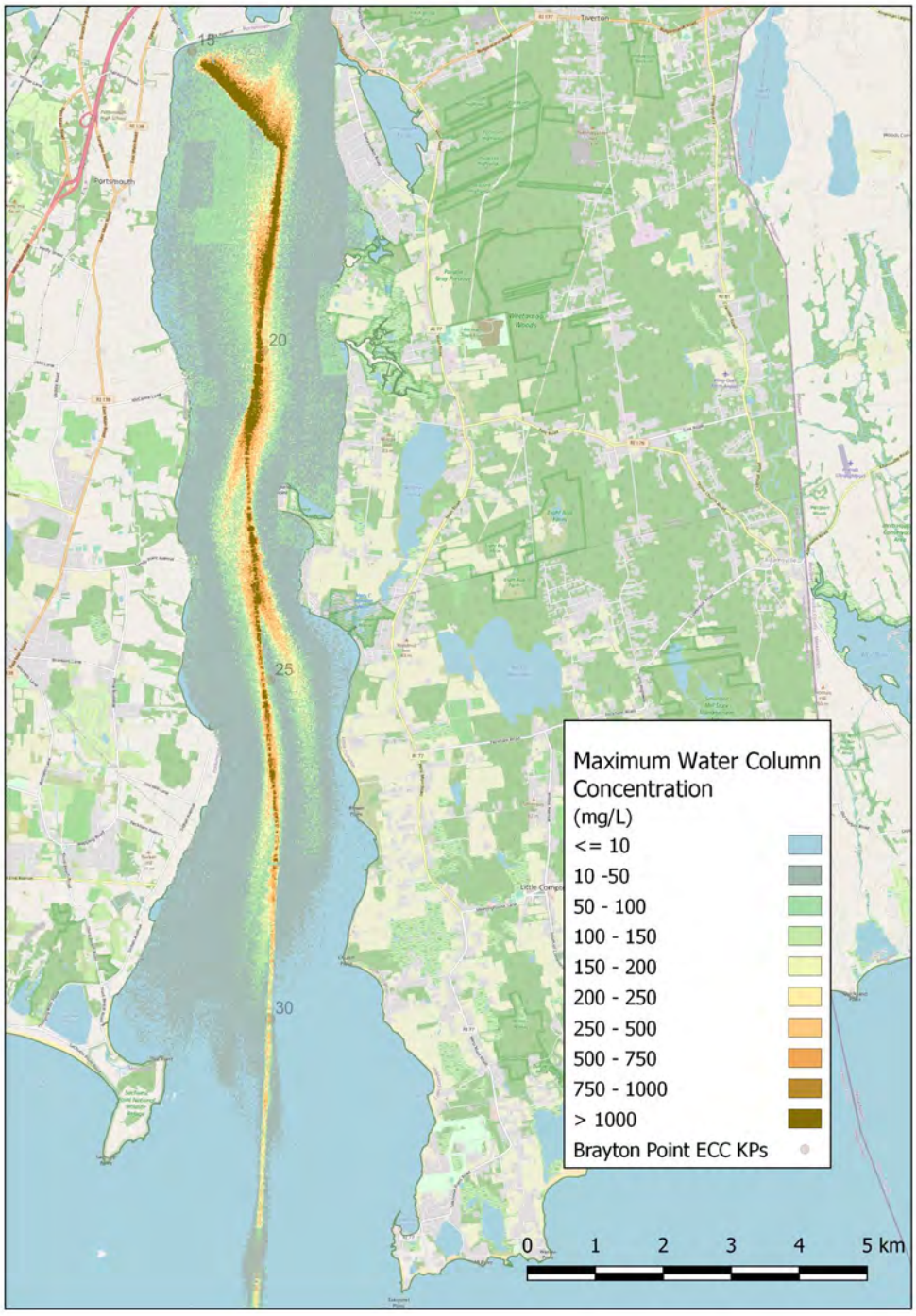

FIGURE 4-4. MAP OF MAXIMUM SEDIMENT CONCENTRATION IN THE SAKONNET RIVER PORTION OF THE EXPORT CABLE INSTALLATION, KP15 TO KP34.

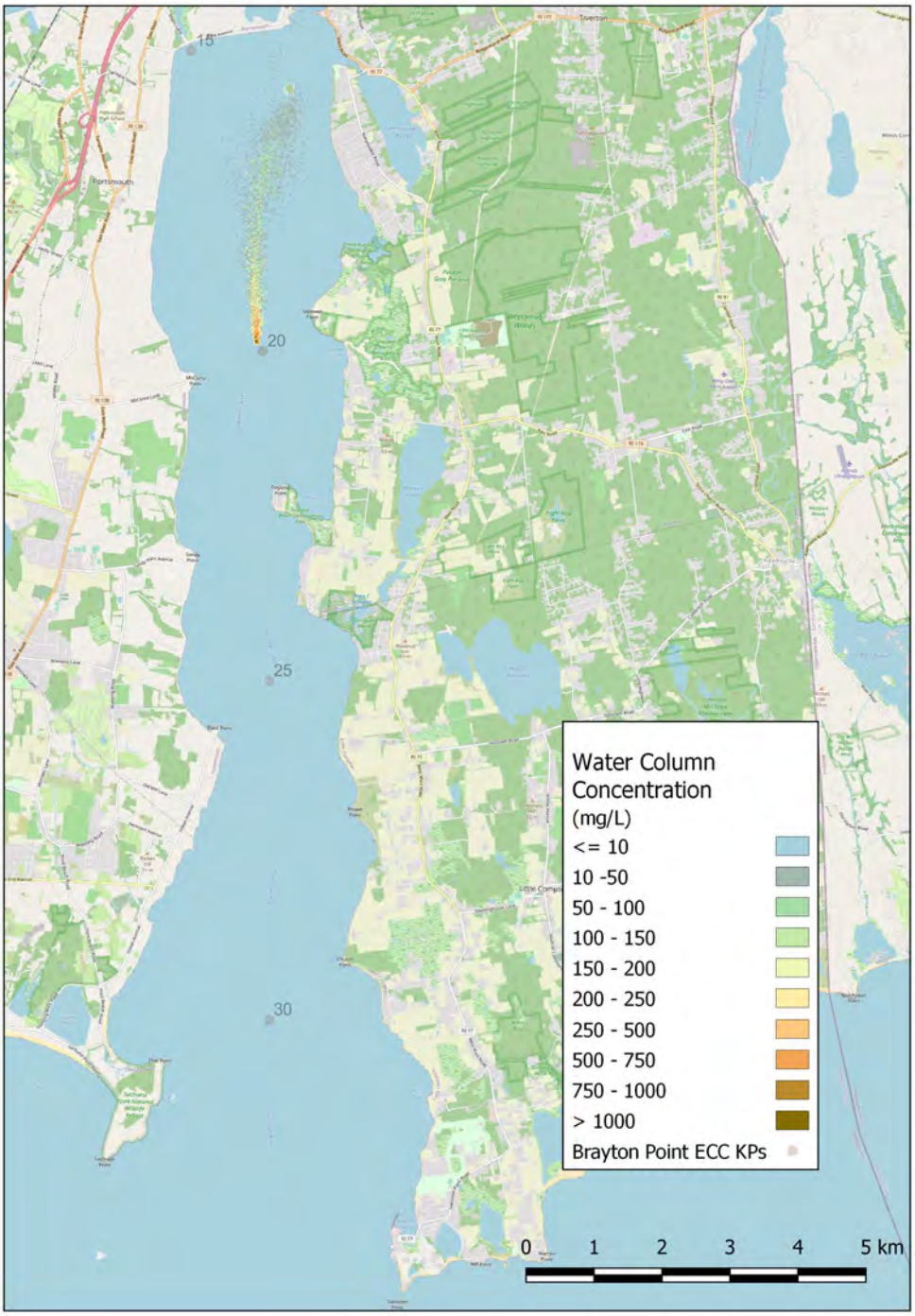

FIGURE 4-5. MAP OF AN EXAMPLE INSTANTANEOUS SEDIMENT CONCENTRATION AT IN THE SAKONNET RIVER PORTION OF THE EXPORT CABLE INSTALLATION, KP15 TO KP34.

The maximum water column TSS concentration results are summarized in Table 4-4, describing the area coverage at selected TSS concentration threshold and the distance that the TSS concentration extends from the cable installation centerline. While the lower concentration numbers in the table indicate that 10 mg/L could be observed at a maximum distance of 4.4 km (2.7 mi) from the ECC in Mount Hope Bay and up to 3.3 km (2.1 mi) from the ECC in the Sakonnet River, the more biologically keyed threshold of 100 mg/L was contained within approximately 1.2 km (0.74 mi) and 0.62 km (0.38 mi) for Mount Hope Bay and the Sakonnet River, respectively. The area coverage of the threshold TSS concentration levels of 100 mg/L maximum TSS concentration in Mount Hope Bay and the Sakonnet River were 542 ha (1340 ac) and 668 ha (1650 ac), respectively.

TABLE 4-4. AREA COVERAGE FOR SELECTED TSS CONCENTRATION THRESHOLDS IN MOUNT HOPE BAY AND THE SAKONNET RIVER (KP0 – KP34).

TSS Threshold (mg/L)	Mount Hope Bay Area Coverage (ha) KP0 - KP10	Maximum Distance from Indicative ECC Centerline (km)	Sakonnet River Area Coverage (ha) KP15 - KP34	Maximum Distance from Indicative ECC Centerline (km)
10	3625	4.40	3477	3.37
50	1015	1.83	1330	1.46
100	542	1.16	668	0.61
150	402	0.99	488	0.44
200	334	0.74	391	0.39
250	293	0.57	321	0.22
500	184	0.32	175	0.0
>1000	101	0.15	84	0.0

4.6.2 Offshore Sediment Concentrations, KP34 - KP152

The maximum water column TSS concentrations from the cable installation process offshore, between the mouth of the Sakonnet River and the SouthCoast Wind Lease Area are presented in Figure 4-6 and Figure 4-8 and a summary table of TSS concentration areal coverage and distance from the installation centerline is presented in Table 4-5. The results are noticeably different than those of the Mount Hope Bay and Sakonnet River areas. The segment of the ECC extending directly south from the mouth of the Sakonnet showed a fairly small signature of even the 10 mg/L TSS concentration level between KP34 and KP45. A signature tidal oscillation was seen but again small through KP45 but increasing towards KP78. In addition, the higher TSS concentrations remained close to the centerline from the Sakonnet River entrance through KP55. It can be seen from the grain size distribution (Figure 4-2) that the amount of slit and clay is only a small fraction of the total sediment distribution and larger sized particle dominate indicating that the settling would be faster and therefore less transport occurred through that area.

The small grain size fractions increase in their proportion of the distribution between KP55 and KP78 which led to more transport and dispersion and greater area coverage away from the ECC. The areal coverage at the selected TSS concentration thresholds for the Offshore Segment 1 portion of the cable installation route were similar if not lower in each case than those of the Mount Hope Bay and Sakonnet River areas although the length of the ECC through this segment is more than 2 times as long as the Sakonnet River and 4.5 times as long as the Mount Hope

Bay segment. The 10 mg/L TSS concentration extended up to 2.2 km (1.3 mi) away from the cable installation centerline but the 100 mg/L threshold concentration is contained within 0.37 km (0.23 mi).

The Offshore Segment 2 segment (KP78 – KP152) of the export cable installation impacts are presented in Figure 4-8. There was a length of relatively low impact between KP78 and KP100 in this segment which was due to the predominance of large sediment grain sizes. The TSS concentrations and their extent were low in the area. This is true for most of the offshore segments of the ECC, where concentrations of 100mg/L were predicted to be within 50 m (160 ft) of the centerline, and to decreased quickly.

In the stretch of the ECC to the east of KP100 the grain size distribution changes to favor smaller particle sizes again and the 10 mg/L TSS concentration limit extent increased to a maximum distance of 1.65 km (1 mi) commensurately. The 100 mg/L concentration limit reaches 0.37 km (0.23 mi) as in the previous segment, but the higher concentration thresholds are all contained in smaller areas closer to the ECC centerline.

The effects of the rotary tidal current oscillations observed in the SouthCoast Wind metocean buoy currents and the hydrodynamic model predicted currents can be seen in the 10 mg/L concentration footprint in Figure 4-8. Rather than a rectilinear (back and forth motion) tidal pattern in the sediment concentrations, the concentrations can be seen to make an almost helical pattern between KP100 and KP152. The currents are fairly strong in that region but the grain size distribution shows a predominance of larger sizes which resulted in lower water column concentrations.

TABLE 4-5. AREA COVERAGE FOR SELECTED TSS CONCENTRATION THRESHOLDS FOR THE OFFSHORE EXPORT CABLE SEGMENTS (KP34 – KP152).

TSS Threshold (mg/L)	Offshore Segment 1 Area Coverage KP34 - KP78 (ha)	Maximum Distance from Indicative ECC Centerline (km)	Offshore Segment 2 Area Coverage KP78 - KP152 (ha)	Maximum Distance from Indicative ECC Centerline (km)
10	3408	2.18	6629	1.65
50	1163	0.75	1354	0.71
100	662	0.37	585	0.37
150	437	0.23	340	0.17
200	312	0.13	216	0.10
250	232	0.09	148	0.09
500	80	0.0	32	0.0
>1000	11	0.0	3	0.0

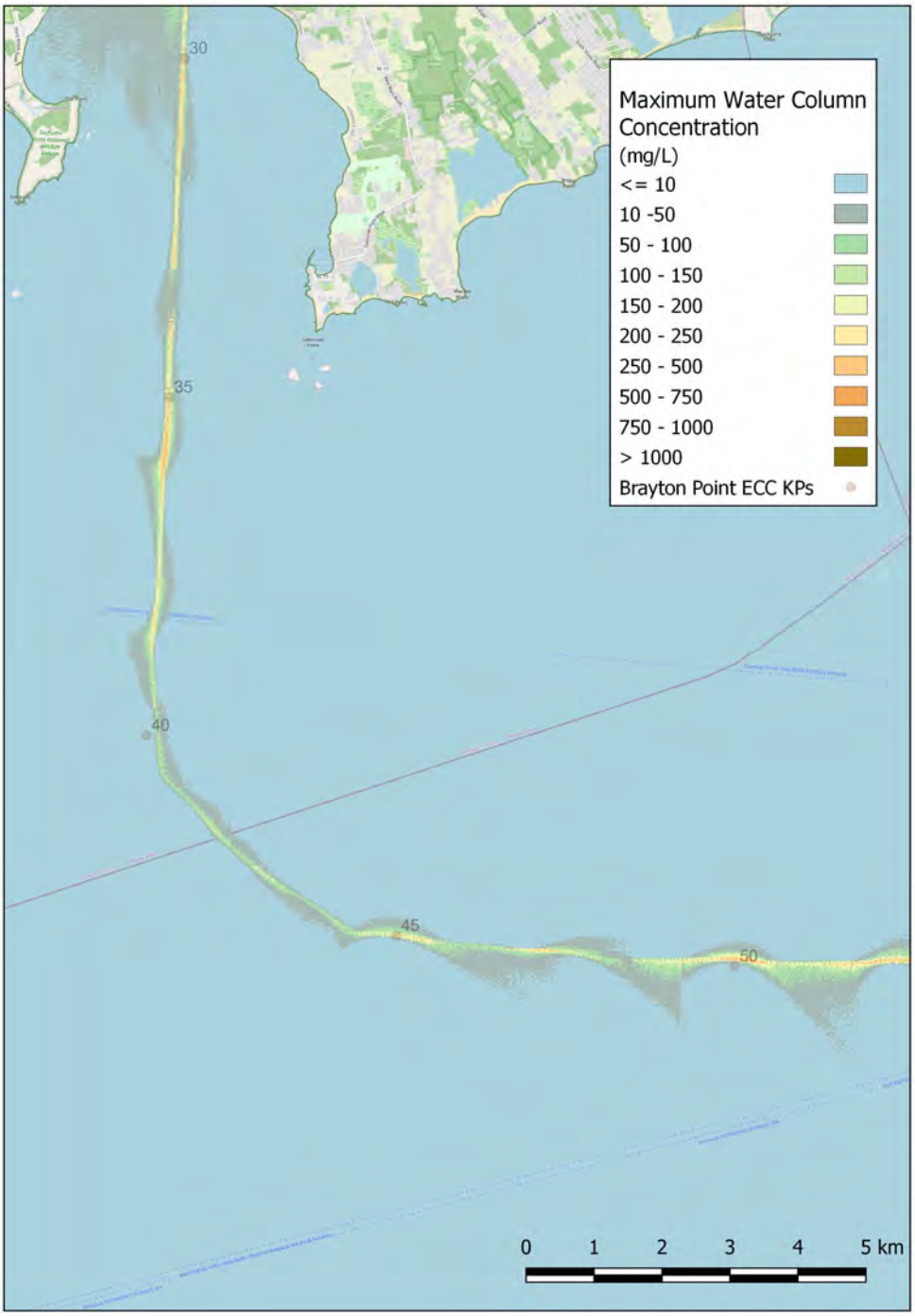

FIGURE 4-6. MAP OF MAXIMUM SEDIMENT CONCENTRATION ASSOCIATED WITH THE OFFSHORE EXPORT CABLE INSTALLATION, KP34 TO KP55.

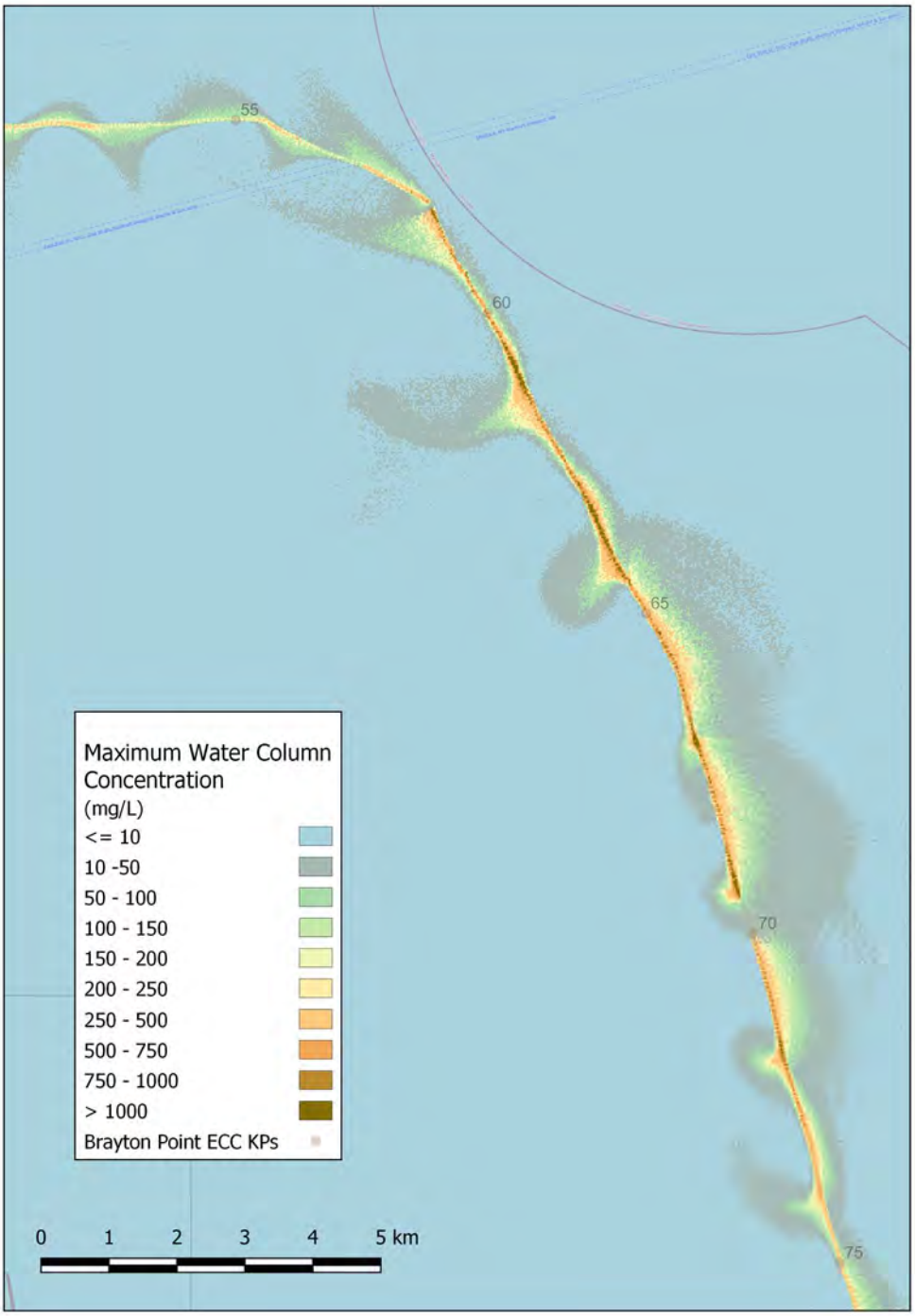

FIGURE 4-7. MAP OF MAXIMUM SEDIMENT CONCENTRATION ASSOCIATED WITH THE OFFSHORE EXPORT CABLE INSTALLATION, KP55 TO KP78.

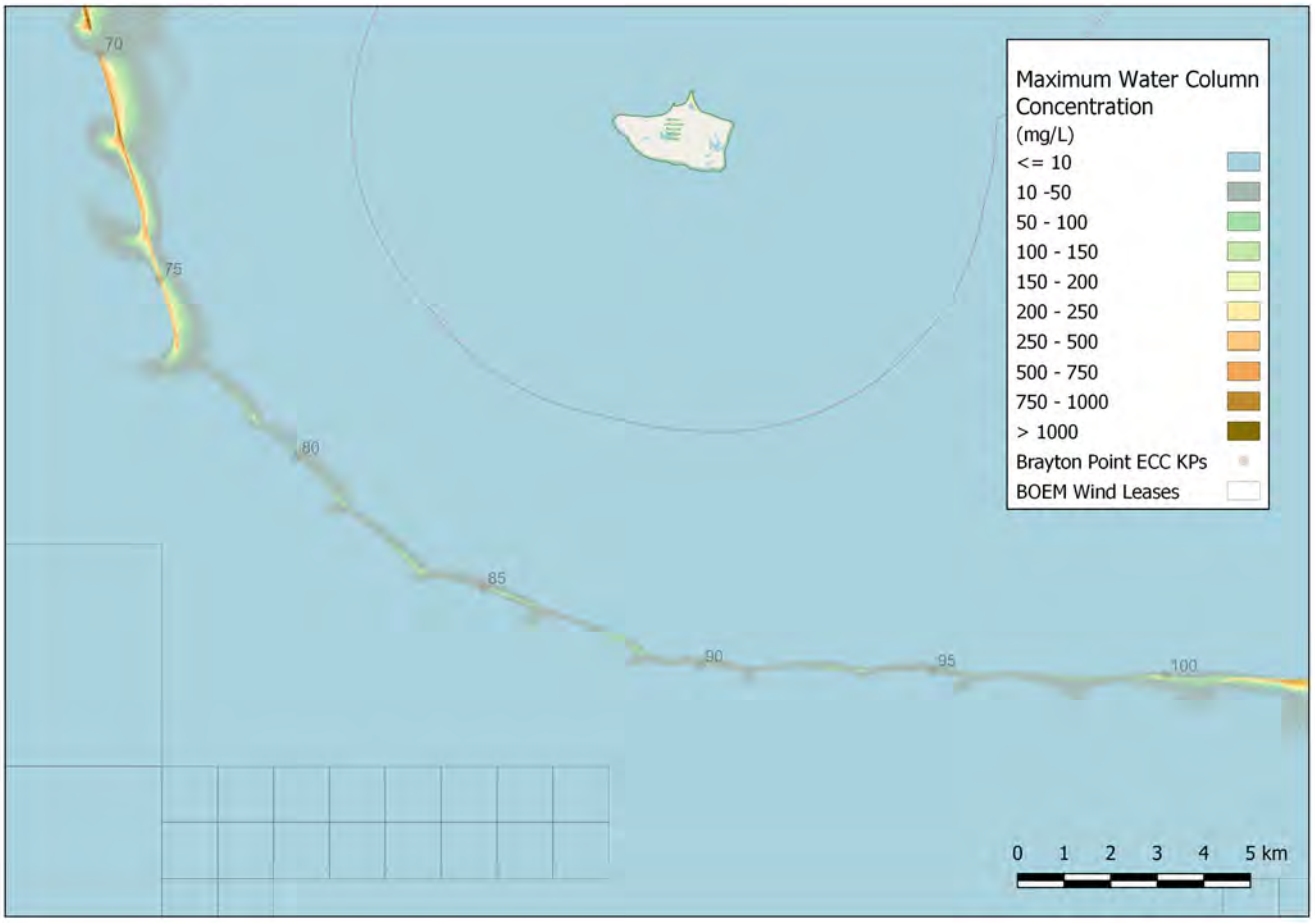

FIGURE 4-8. MAP OF MAXIMUM SEDIMENT CONCENTRATION ASSOCIATED WITH THE OFFSHORE EXPORT CABLE INSTALLATION, KP78 TO KP105.

Reviewing Table 4-6 in light of Table 4-4 and Table 4-5, it can be seen that half or more of the impacts were experienced in the Mount Hope Bay and Sakonnet River segments, at less than 30 km (19 mi), (20 percent of the total length), as opposed to 118 km (73 mi) for the offshore segments. This was particularly true of the higher TSS concentration levels examined.

It is of interest to understand how the resuspended TSS and associated concentrations disperse over time. This provides an additional metric to better understand the physical impacts and their environmental consequences. A summary of the duration of the TSS plume after the cessation of the installation activities at selected concentration levels for each of the ECC segments examined above is presented in Table 4-7.

The duration of the water column concentrations in Mount Hope Bay were fairly slow to decrease as the relatively higher currents in the bay appear to have kept the sediment suspended longer than in slower current areas. The same was true of the Sakonnet River although to a lesser extent where the higher concentrations settled out quickly.

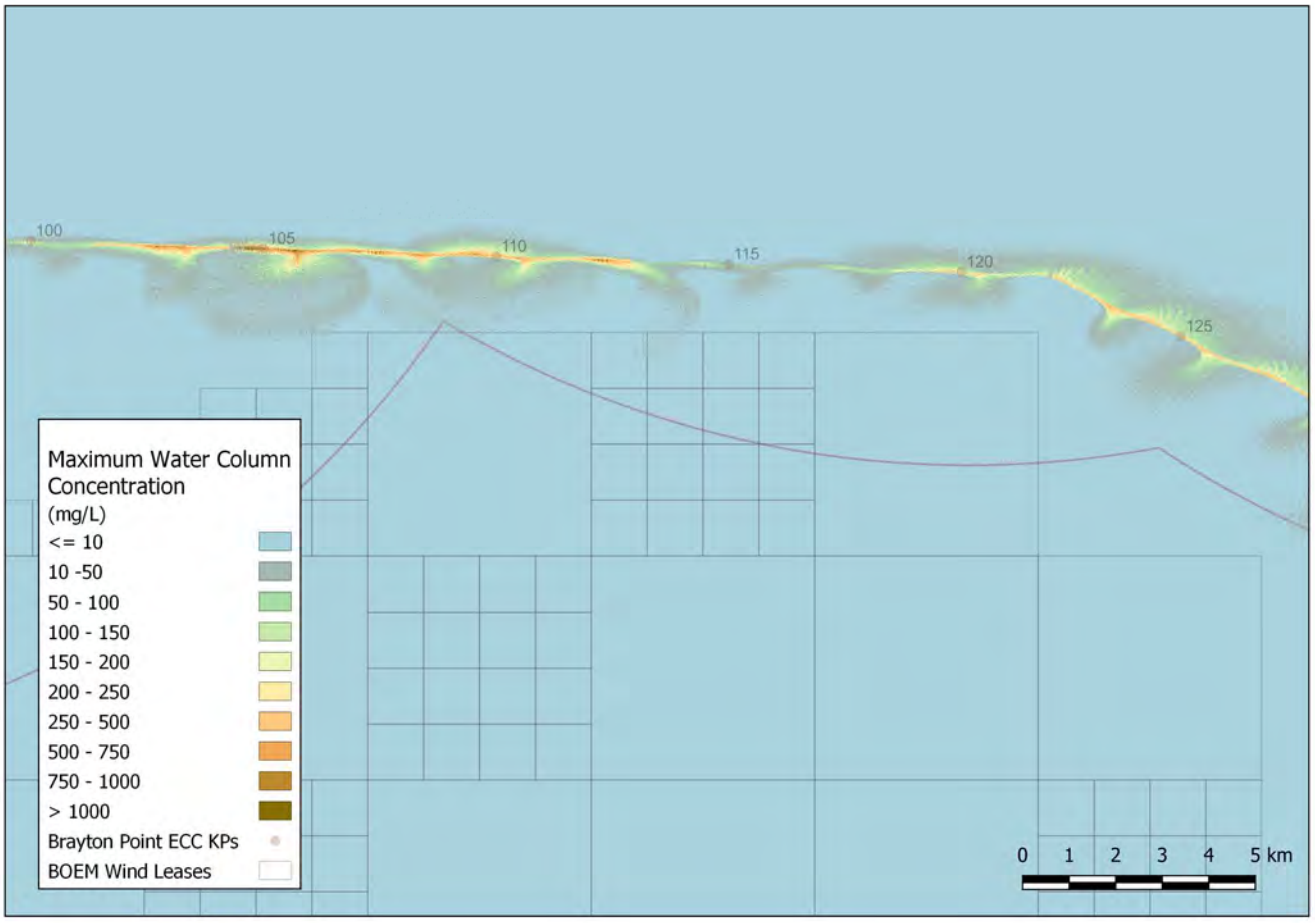

FIGURE 4-9. MAP OF MAXIMUM SEDIMENT CONCENTRATION ASSOCIATED WITH THE OFFSHORE EXPORT CABLE INSTALLATION, KP105 TO KP125.

TABLE 4-6. SUMMARY OF TOTAL AREA COVERAGE FOR SELECTED TSS CONCENTRATION THRESHOLDS OVER THE LENGTH OF THE ECC.

TSS Threshold (mg/L)	Total Area Coverage KP0 - KP152 (ha)
10	17140
50	4863
100	2457
150	1668
200	1253
250	993
500	470
>1000	199

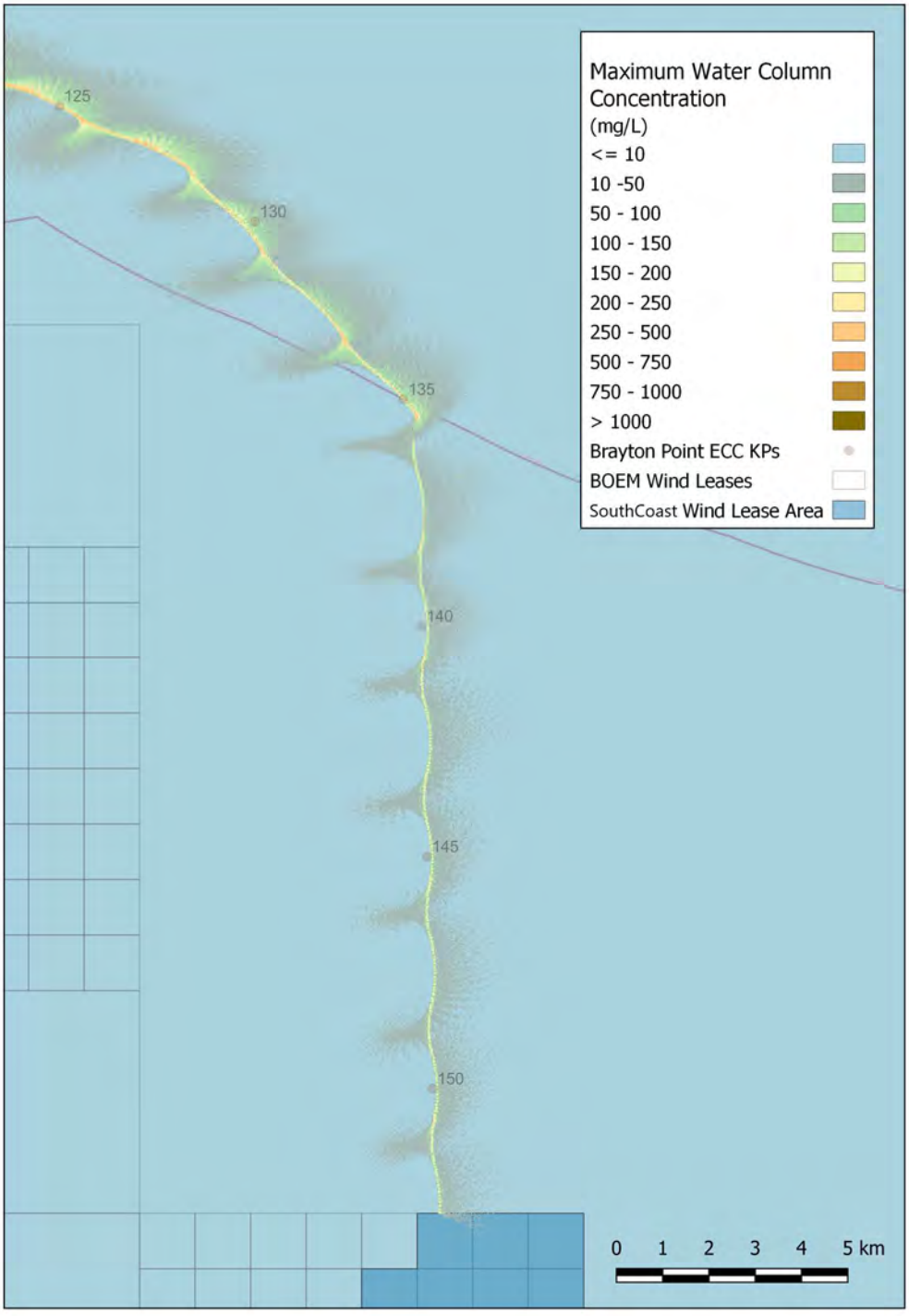

FIGURE 4-10. MAP OF MAXIMUM SEDIMENT CONCENTRATION ASSOCIATED WITH THE OFFSHORE EXPORT CABLE INSTALLATION, KP125 TO KP152.

The offshore segments cleared more rapidly than in Mount Hope Bay and the Sakonnet River but the very fine sand and silt content in Offshore Segment 1 between KP55 and KP78 increase the duration at the selected concentration threshold levels evaluated in comparison to the remainder of the offshore route.

In all areas excluding Mount Hope Bay and a portion of Offshore Segment 1, the TSS concentration fell below the 100 mg/L threshold in less than 20 minutes. These results indicate that the water column TSS concentration impacts from the export cable installation activities were contained to within or near the Brayton Point ECC and were short lived.

TABLE 4-7. TIME FOR TSS CONCENTRATIONS TO DROP BELOW SELECTED LEVELS ALONG THE ECC AFTER THE END OF THE CABLE INSTALLATION ACTIVITIES

TSS Concentration (mg/L)	Mount Hope Bay KP0 - KP10 (min)	Sakonnet River KP10 – KP34 (min)	Offshore Segment 1 KP34 – KP78 (min)	Offshore Segment 2 KP78 – KP152 (min)
10	2980	1465	725	255
50	860	465	215	95
100	280	20	175	35
150	160	20	115	15
200	140	20	95	15
250	120	20	95	15
500	100	0	35	0
>1000	60	0	15	0

4.6.3 HDD Pit Excavation Sediment Concentrations

The impacts of the HDD excavation were examined in the same manner as the cable installation impacts. Figure 4-11 shows the model predicted extent of the maximum water column TSS concentration at each of the HDD sites overlain on the ECC. The Brayton Point HDD pit results shown on the map in the left figure indicate that the impacts of the dredging activities there were mostly contained within the ECC though as a result of on the tidal currents some sediment was transported up the Lee River. For the Mount Hope Bay entrance and the Aquidneck pit excavation activities a short tail of 50 mg/L TSS concentration extends across the ECC centerline in each extending a maximum of 2.3 km (1.4 mi) from the Mount Hope Bay pit and 1.0 km (0.62 mi) from the Aquidneck pit. The 100 mg/L threshold TSS concentration was contained within 1.2 km (0.75 mi) and was primarily within the ECC boundaries and the 200 mg/L concentration threshold was contained within the ECC boundaries in all cases. It should be noted that for the Mount Hope Bay and Aquidneck sites there is a fairly strong tidal influence that transports the sediment plume in back and forth across the ECC as a result of the excavation activities extending through more than a tidal cycle. Beginning at other stages of the tide the plume is likely to vary from the image presented, albeit with similar levels of impact.

The areal coverage of the 10 mg/L or higher TSS concentration ranged from a high of 60 ha (150 ac) at the relatively high energy Mount Hope Bay site to 38 ha (94 ac) at the low energy Brayton Point site. The 100 mg/L TSS concentration threshold covered no more than 12 ha (30 ac) at any of the sites.

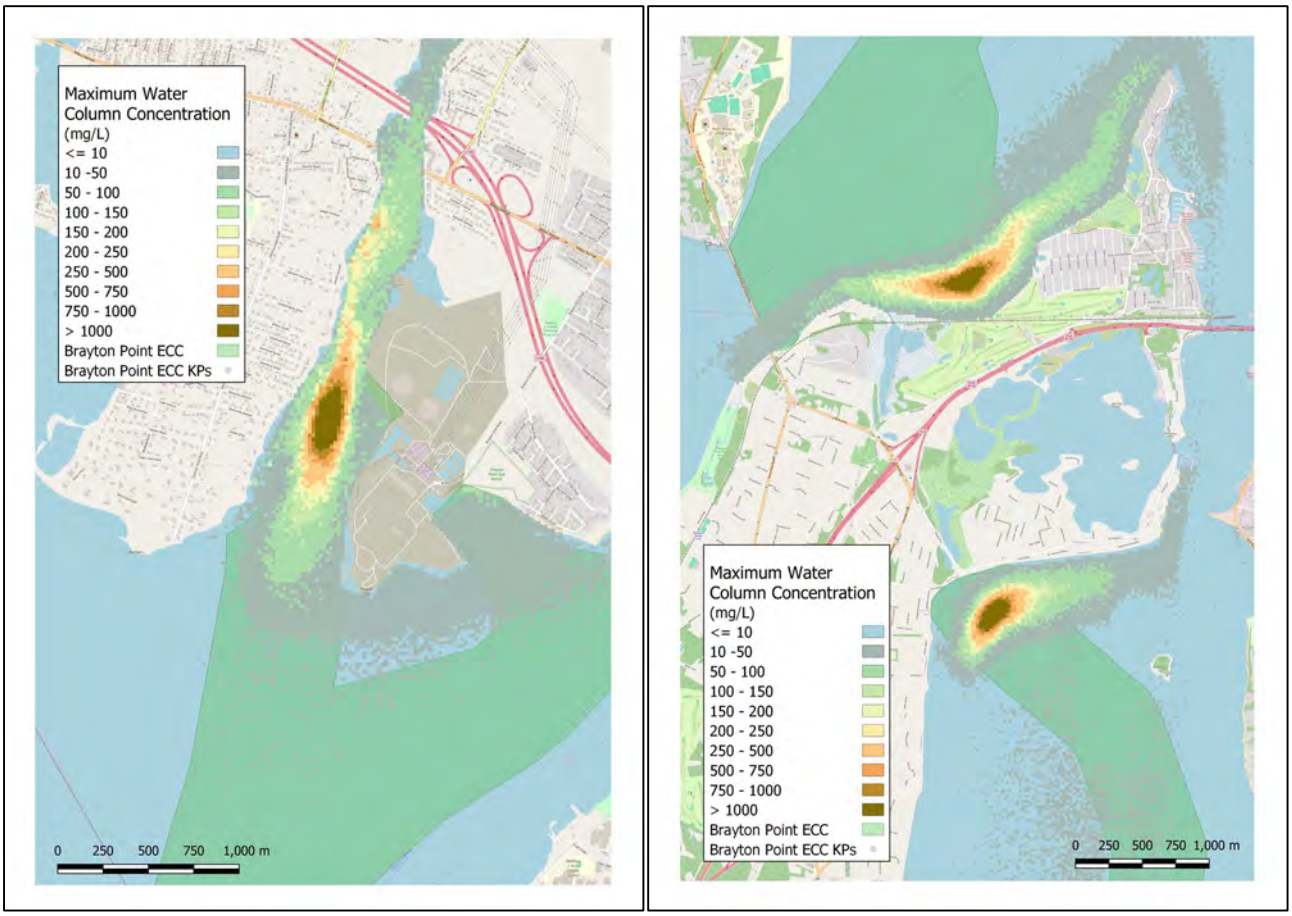

FIGURE 4-11. MAP OF MAXIMUM SEDIMENT CONCENTRATION ASSOCIATED WITH THE EXCAVATION ACTIVITIES AT THE THREE HDD CONNECTION PITS AT BRAYTON POINT (LEFT MAP), AND MOUNT HOPE BRIDGE AND AQUIDNECK ISLAND (RIGHT MAP).

TABLE 4-8. AREA COVERAGE FOR SELECTED TSS CONCENTRATION THRESHOLDS FOR THE THREE HDD PIT EXCAVATION ACTIVITIES.

TSS Threshold (mg/L)	Brayton Pt HDD Pit Area Coverage (ha)	Maximum Distance from Release (km)	Mount Hope Bay HDD Pit Area Coverage (ha)	Maximum Distance from Release (km)	Aquidneck HDD Pit Area Coverage (ha)	Maximum Distance from Release (km)
10	38.52	2.67	59.64	3.28	38.08	3.52
50	12.96	2.18	19.16	2.28	13.72	1.00
100	6.76	1.22	12.32	1.19	8.24	0.77
150	4.92	1.20	8.60	0.97	6.40	0.47
200	3.80	1.13	6.60	0.72	5.24	0.36
250	3.12	0.36	5.36	0.51	4.32	0.31
500	1.60	0.19	3.00	0.29	2.52	0.21
>1000	0.80	0.11	1.32	0.19	1.40	0.14

The amount of time required for the water column TSS concentration to drop below the 200 mg/L threshold was less than 100 min at all of the HDD pit areas (Table 4-9). The concentrations sank below the selected thresholds relatively quickly, the lower concentration of 50 mg/L persisted for several hours at the both the Brayton Point and Mount Hope Bay entrance site.

TABLE 4-9. TIME FOR TSS TO DROP BELOW SELECTED LEVELS AT THE HDD SITES AFTER THE END OF THE RELEASE

TSS Concentration (mg/L)	Brayton Pt-HDD Duration (min)	Mount Hope Bay-HDD Duration (min)	Aquidneck-HDD Duration (min)
10	1620	960	800
50	180	340	160
100	120	160	100
150	80	120	80
200	60	100	80
250	60	80	60
500	20	40	40
>1000	20	20	20

4.7 SEDIMENT DEPOSITION ON THE SEABED

The ultimate fate of the resuspended sediments is to resettle onto the seabed. Depending on the amount and type of sediments resuspended and the local current regime they can settle close to or far from the resuspension point at the cable installation operations. These factors also affect the sedimentation depth, i.e. how thick a layer the deposited sediments can create. As with the water column concentrations the farther the sediments are transported the more area they cover when settling, but at a lower thickness than if the entire mass settles near the resuspension point.

This is an important factor in determining the potential for impacts due to smothering of organisms that live near or on the seabed. Each of the segments described above were examined to determine the seabed deposition depth and areal coverage, the results of which are presented in the following sections.

4.7.1 Mount Hope Bay and Sakonnet River Sediment Deposition, KP0 to KP34

The model- predicted deposition thickness and area coverage settled sediments associated with the export cable installation operations in Mount Hope Bay and the Sakonnet River are presented in Figure 4-12 and Figure 4-13, respectively. Referring to the figures there is a very clear line of deposition that follows the ECC because the majority of sediment resuspended fell back to the seabed fairly quickly, and therefore in line with the cable route. There is a minor exception to the quick deposition in the area of the Mount Hope Bay entrance where the strong

currents run in and out of the bay perpendicular to the ECC at that point. As seen in the water column concentrations, a portion of the sediments were transported away from the ECC with the currents and therefore settled elsewhere as well. In that they were transported, they were also dispersed and the sediment deposition thickness in that area was consequentially smaller.

A summary of the deposition thickness and footprint area coverage statistics is presented in Table 4-10. The highest deposition thicknesses were contained primarily within a 20 m (65 ft) corridor around the ECC centerline. The 1 mm (0.04 in) deposition depth extended to a maximum of 124 m (406 ft) and 161 m (528) and the 0.5 mm (0.02 in) depth extended to 267 m (876) and 202 m (663) in Mount Hope Bay and the Sakonnet, respectively. Thinner deposits are found at larger distances related to the silt and clay particles that have low fall velocities and therefore experience greater travel distances. Depositions exceeding 1 mm (0.4 in) cover a maximum area of 58 ha (143 ac) in the Sakonnet and 42 ha (104 ac) in Mount Hope Bay for a combined total of 100 ha (247 ac) in the two.

TABLE 4-10. AREA COVERAGE FOR SEABED SEDIMENTATION THICKNESS THRESHOLDS IN MOUNT HOPE BAY AND THE SAKONNET RIVER (KP0 – KP34).

Thickness Threshold (mm)	Mount Hope Bay Area Coverage KP0 - KP10 (ha)	Maximum Distance from Indicative ECC Centerline (m)	Sakonnet River Area Coverage KP15 - KP34 (ha)	Maximum Distance from Indicative ECC Centerline (m)
0.5	91	267	127	202
1	42	124	58	161
1.5	28	85	43	122
2	22	64	39	87
5	12	15	35	24
>10	1	<10	20	<10

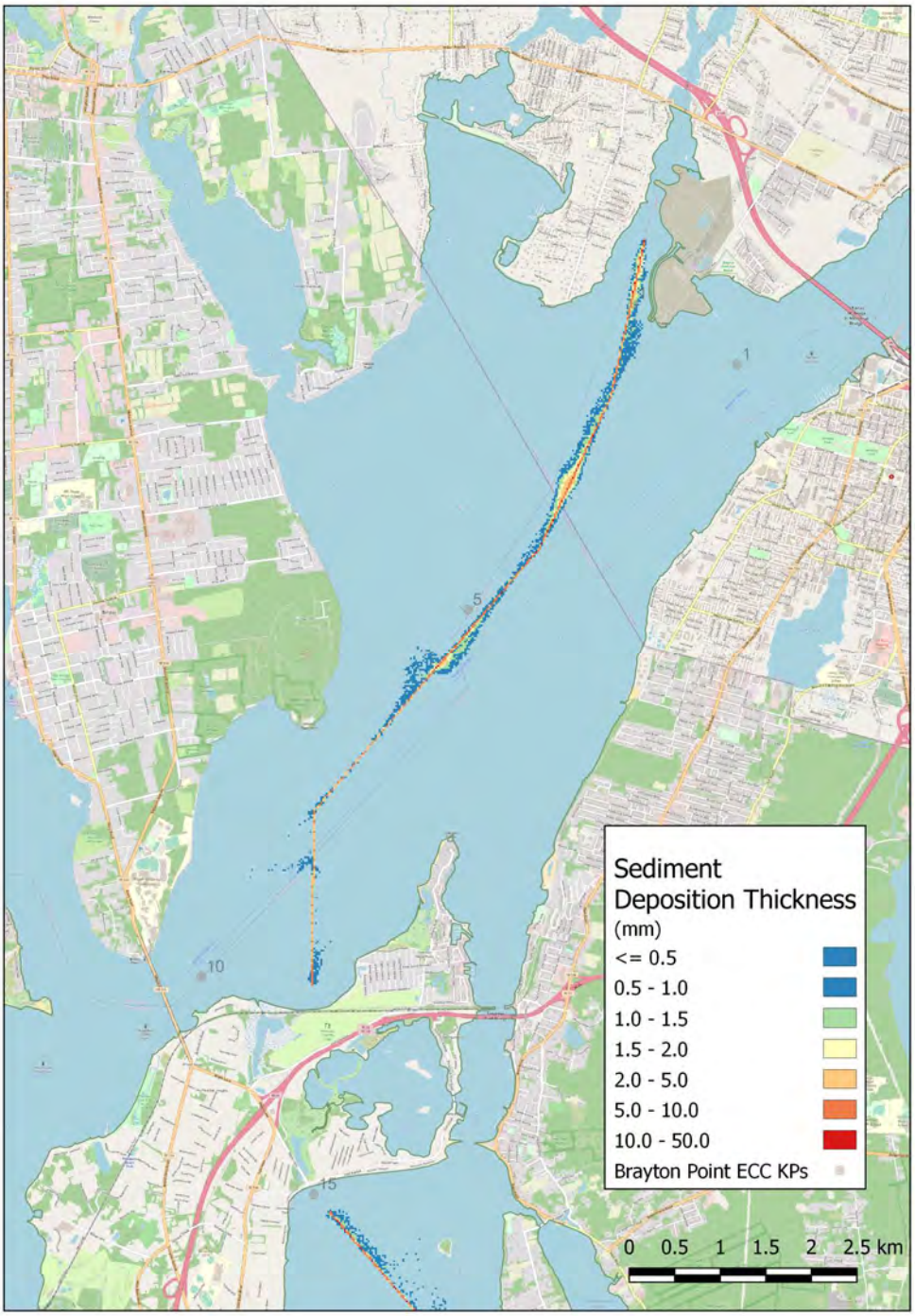

FIGURE 4-12. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION THICKNESS IN THE MOUNT HOPE BAY PORTION OF THE EXPORT CABLE INSTALLATION, KP0 TO KP10.

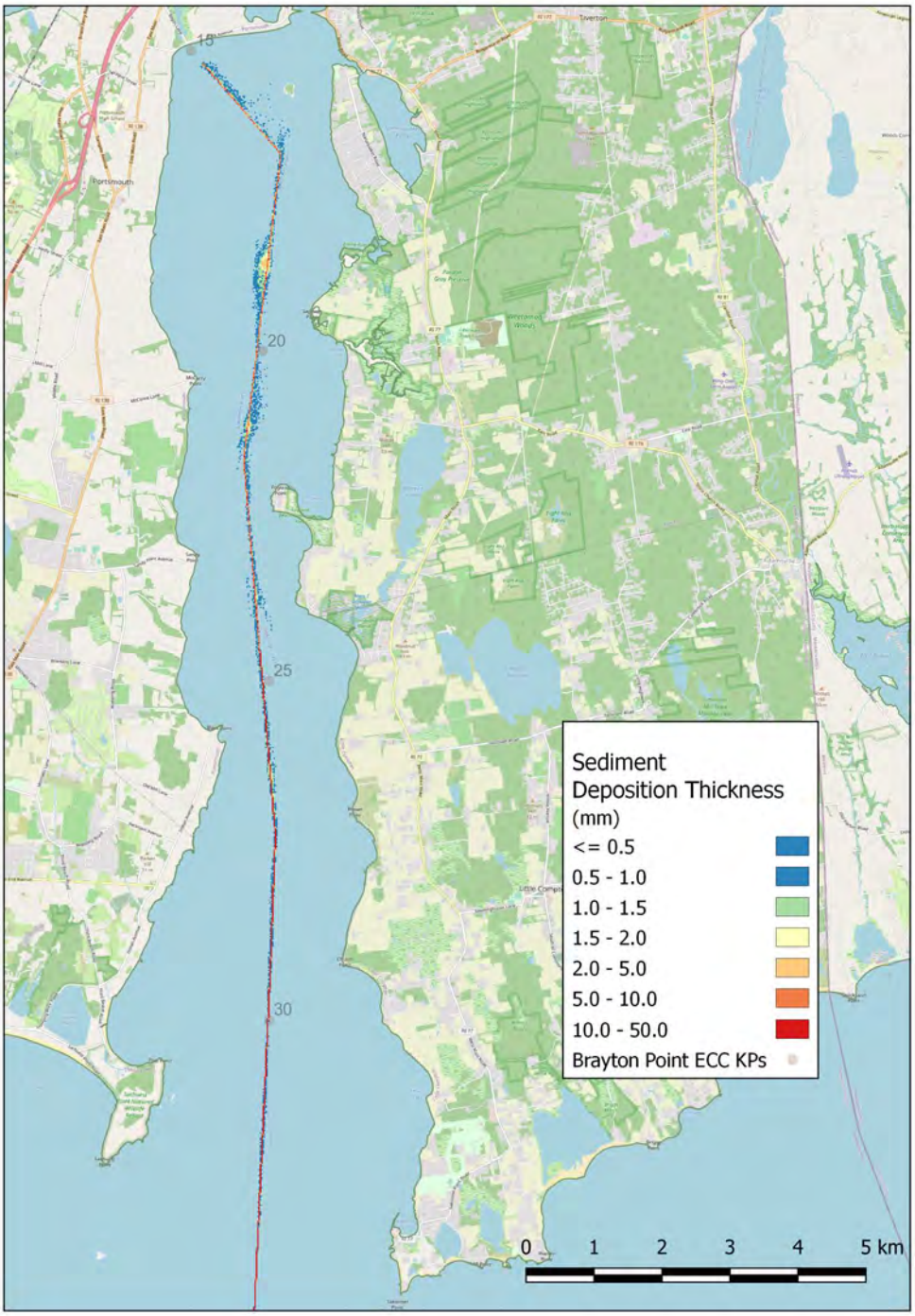

FIGURE 4-13. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION THICKNESS IN THE SAKONNET RIVER PORTION OF THE EXPORT CABLE INSTALLATION, KP15 TO KP34 .

4.7.2 Offshore Sediment Deposition, KP34 to KP152

The model- predicted deposition thickness and area coverage settled sediments associated with the export cable installation operations offshore are presented in Figure 4-14 and Figure 4-15 for Offshore Segment 1 and Figure 4-16 through Figure 4-18 for Offshore Segment 2. The deposition coverage along the offshore segments of the export cable installation process was smaller than in the Mount Hope Bay and Sakonnet River segments.

Suspended sediment falling quickly to the seabed and resulting in the line of deposition following the ECC was even more pronounced offshore. There was little deposition outside of the 20 m (65 ft) installation corridor and none outside of the ECC boundaries. The maximum extent of the deposition footprint in the offshore areas was in the region of KP105 where the 0.5 mm (0.02 in) thickness extended 179 m (587 ft) but the maximum 1 mm (0.04 in) thickness extended 59 m (194) from the installation centerline in the area around KP58. A summary of the deposition thickness and footprint area coverage statistics is presented in Table 4-11.

Depositions exceeding a 1 mm (0.4 in) thickness covered a maximum area of 165 ha (407 ac), seen in the Offshore Segment 2 segment and 96 ha (237 ac) in the Offshore Segment 1 River segment for a total area coverage of 261 ha (645 ac) for the entire 118 km (64 nm) length of the offshore ECC. The area covered by 0.5 mm (0.02 in) or greater thickness was 179 ha (442 ac) and 134 ha (331 ac) for the Offshore Segment 2 and Offshore Segment 1 segments, respectively. The total for the entire offshore length of the export cable covered with a deposition thickness of 0.5 mm (0.02 in) or more was 313 ha (773 ac).

TABLE 4-11. AREA COVERAGE FOR SEABED SEDIMENTATION THICKNESS THRESHOLDS ALONG THE OFFSHORE EXPORT CABLE SEGMENTS (KP34 – KP152).

Thickness Threshold (mm)	Offshore Segment 1 Area Coverage KP34 - KP78 (ha)	Maximum Distance from Indicative ECC Centerline (m)	Offshore Segment 2 Area Coverage KP78 - KP152 (ha)	Maximum Distance from Indicative ECC Centerline (m)
0.5	134	88	179	179
1	96	59	165	50
1.5	93	46	163	31
2	92	31	161	28
5	81	<10	121	<10
>10	7	<10	16	<10

The total area coverage at selected deposition thicknesses over the entire length (KP0 to KP152) of the ECC is presented in Table 4-12.

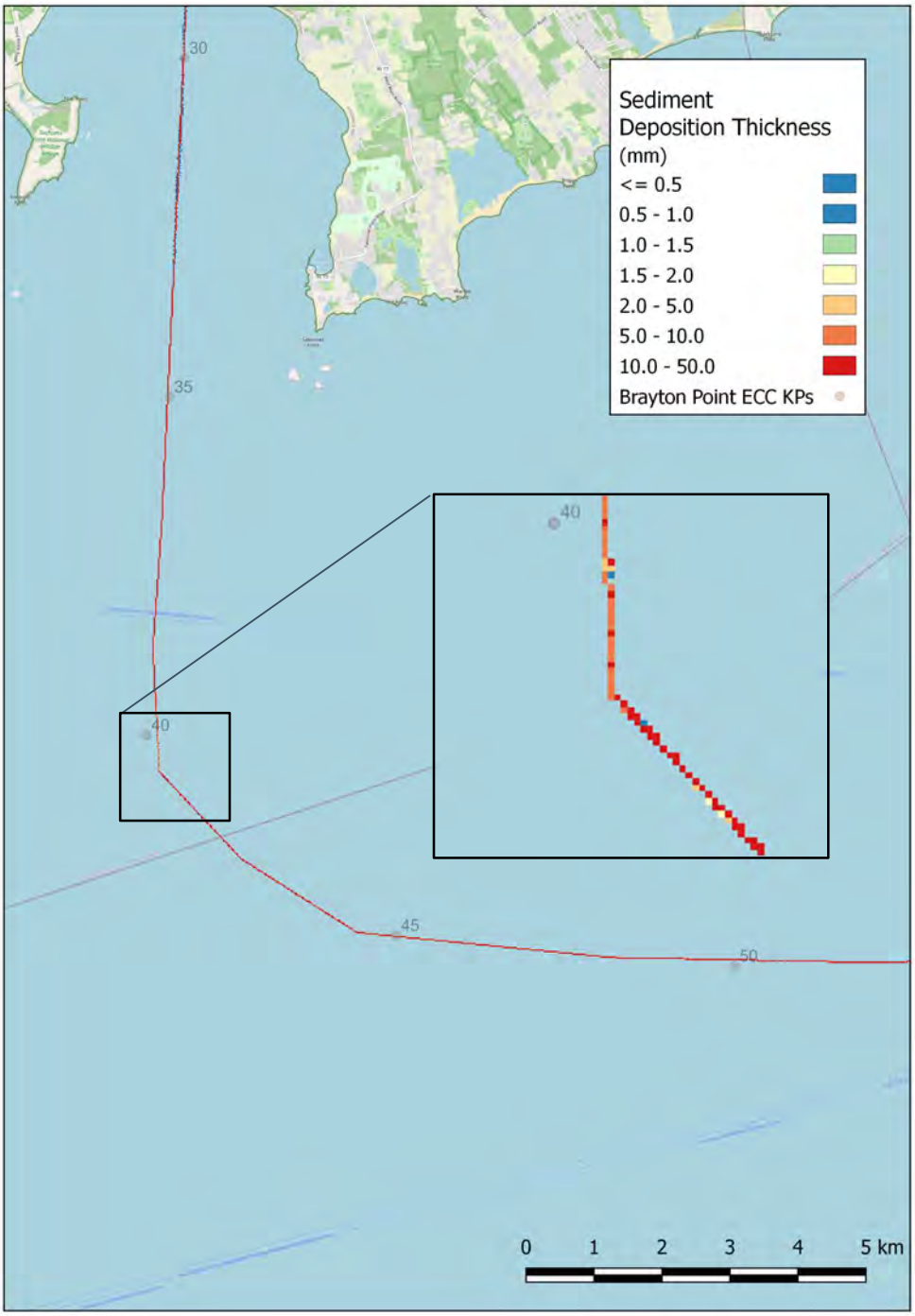

FIGURE 4-14. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION ALONG THE FIRST PART OF OFFSHORE SEGMENT 1 OF THE EXPORT CABLE INSTALLATION, KP34 TO KP55.

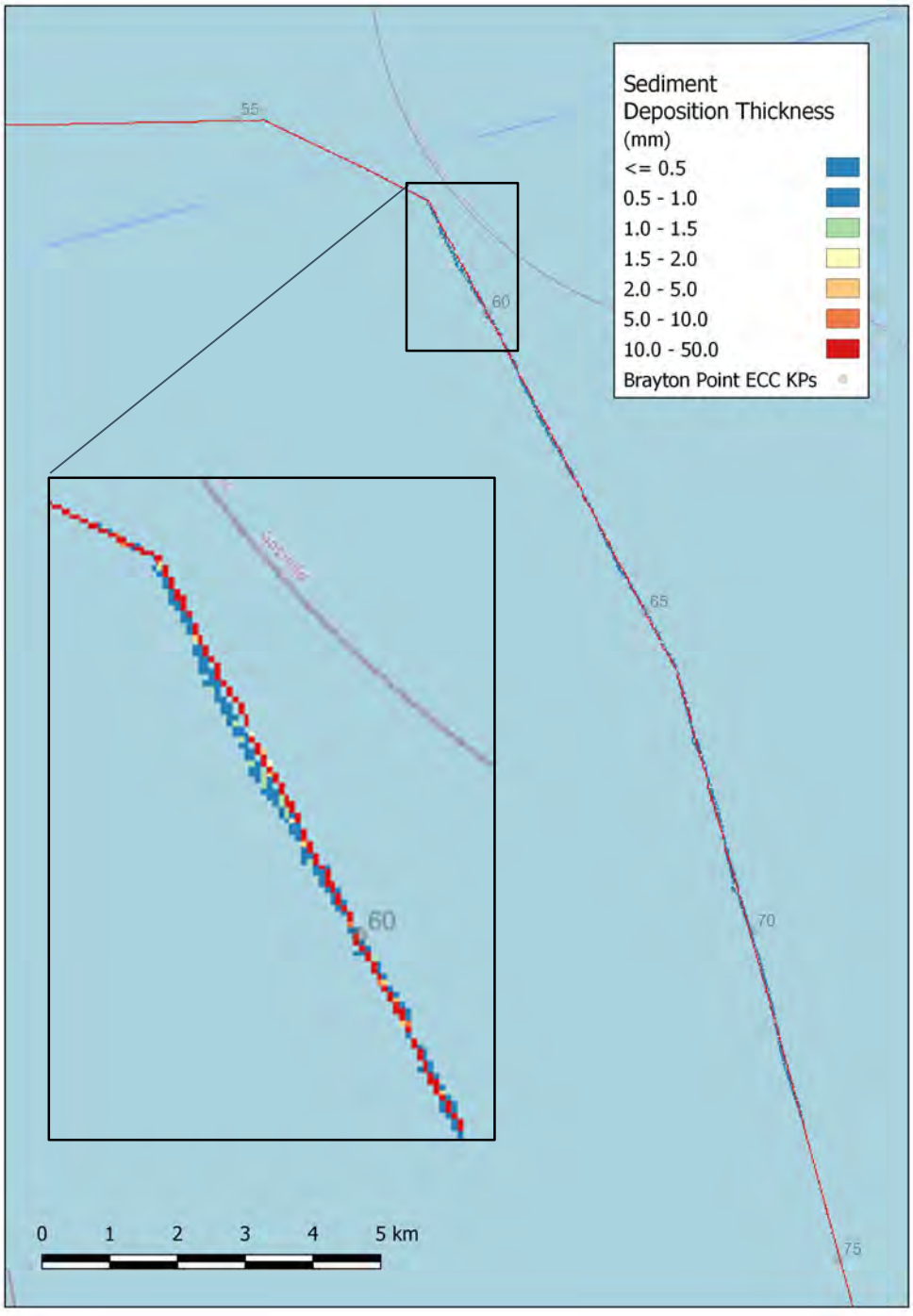

FIGURE 4-15. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION ALONG THE SECOND PART OF OFFSHORE SEGMENT 1 OF THE EXPORT CABLE INSTALLATION, KP55 TO KP78.

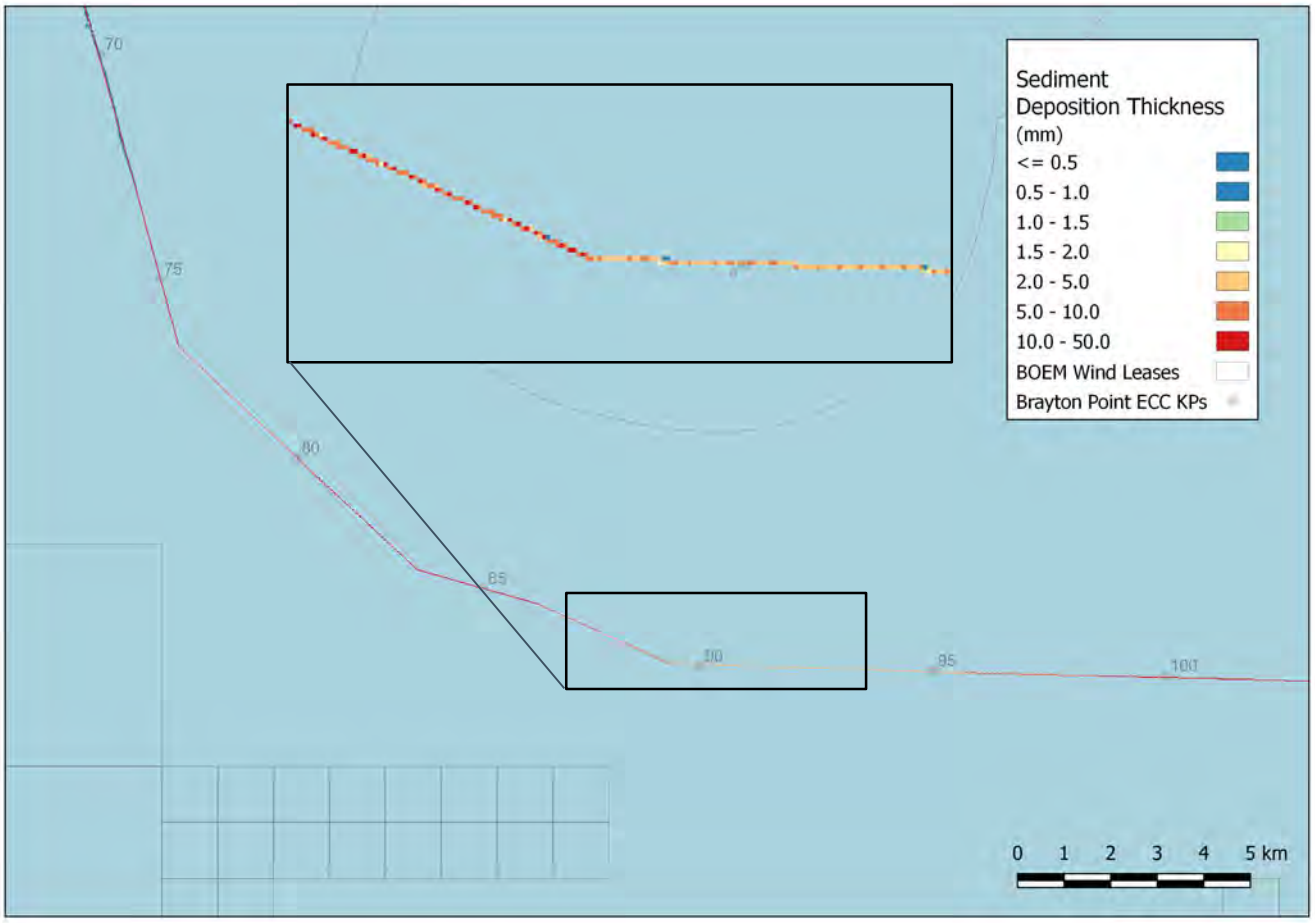

FIGURE 4-16. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION ALONG THE FIRST THIRD OF OFFSHORE SEGMENT 2 OF THE EXPORT CABLE INSTALLATION, KP78 TO KP105.

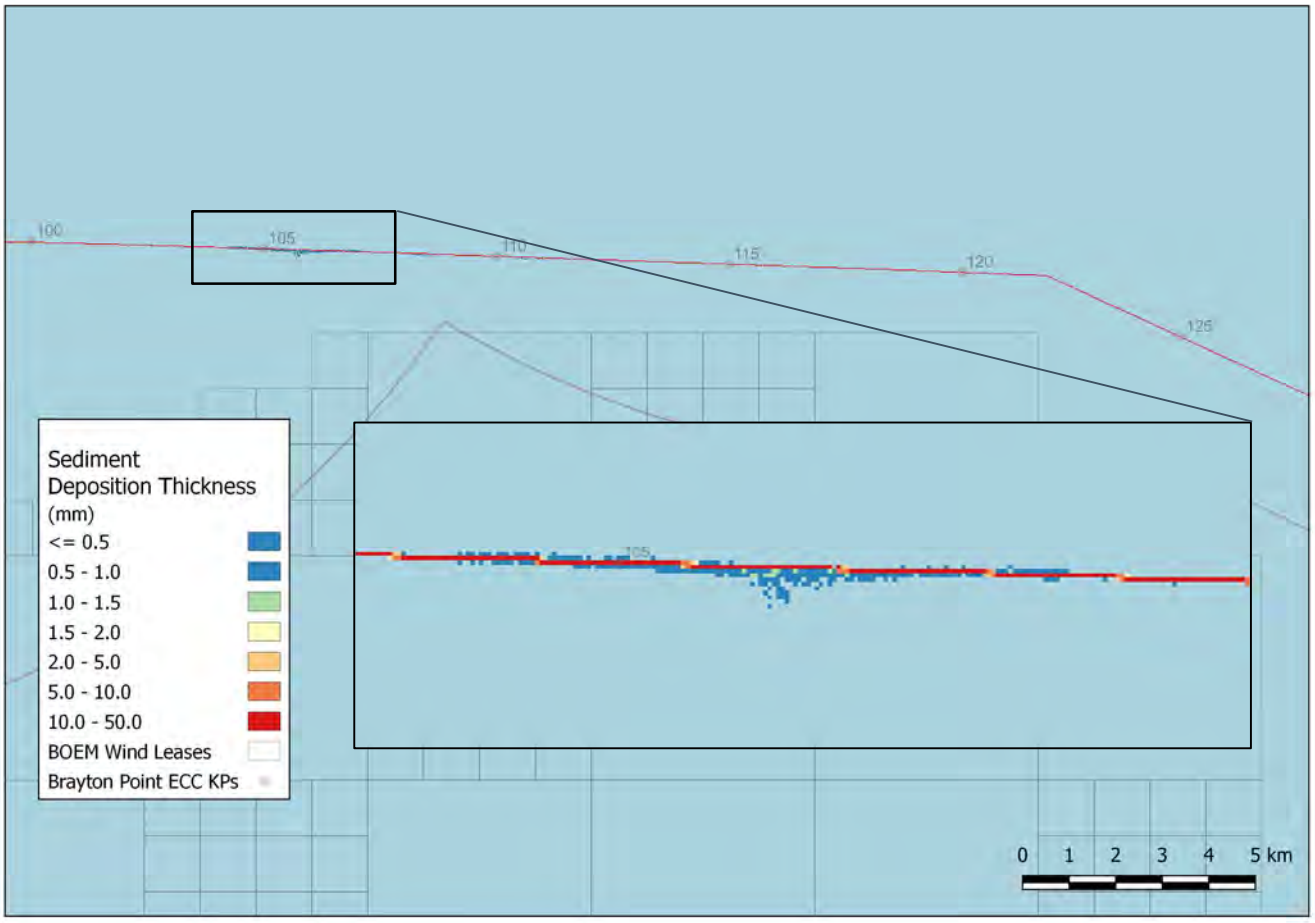

FIGURE 4-17. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION ALONG THE MIDDLE THIRD OF OFFSHORE SEGMENT 2 OF THE EXPORT CABLE INSTALLATION, KP105 TO KP125.

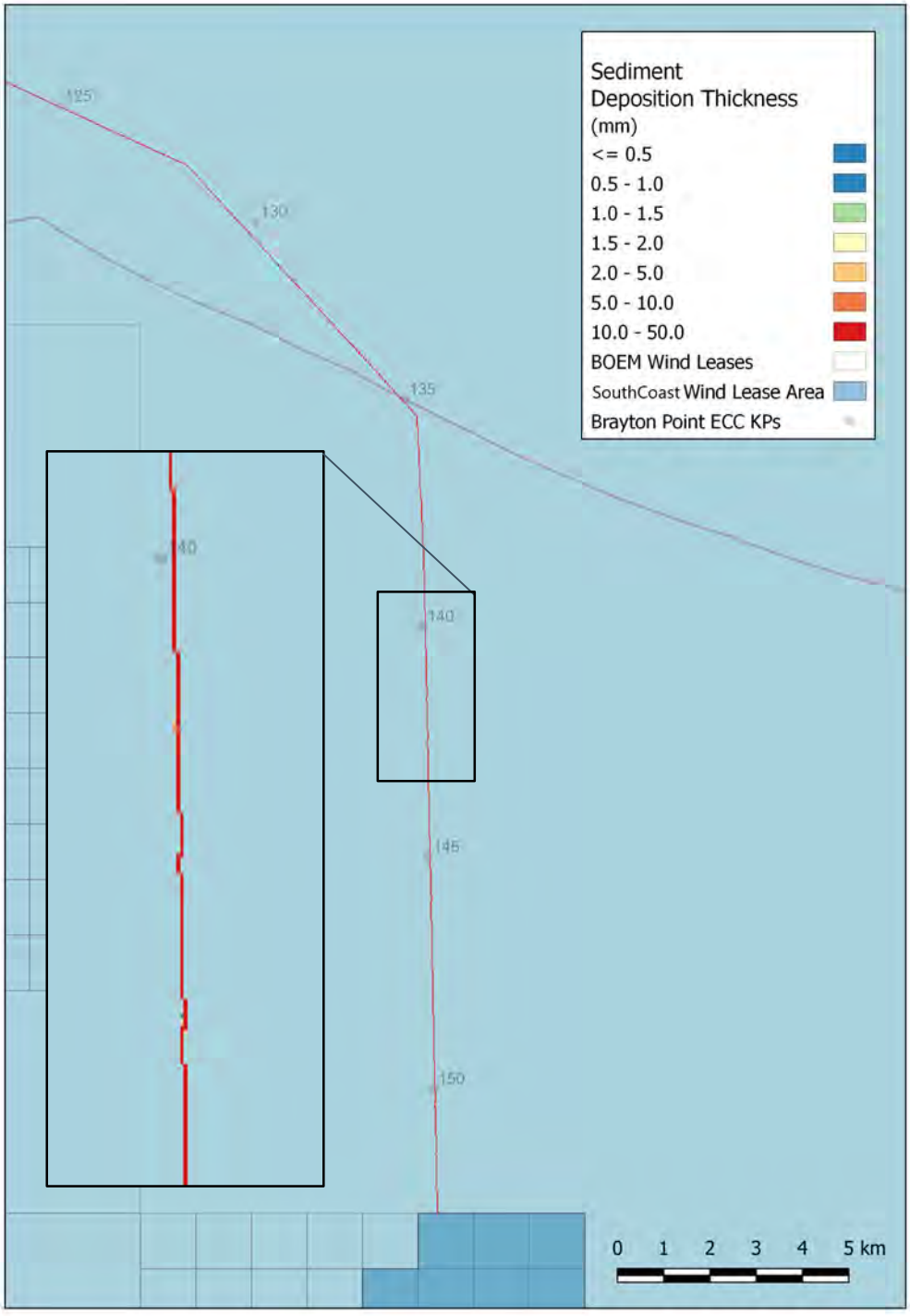

FIGURE 4-18. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION ALONG THE LAST THIRD OF OFFSHORE SEGMENT 2 OF THE EXPORT CABLE INSTALLATION, KP125 TO KP152.

TABLE 4-12. SUMMARY OF TOTAL AREA COVERAGE FOR SELECTED SEDIMENT DEPOSITION THRESHOLDS OVER THE LENGTH OF THE EXPORT CABLE CORRIDOR.

Deposition Thickness (mm)	Total Deposition Coverage KP0 - KP152 (ha)
0.5	531
1	361
1.5	326
2	315
5	223
>10	23

4.7.3 HDD Pit Excavation Sediment Concentrations

The deposition patterns and depths resulting from sediment resuspension from the HDD pit excavation activities are shown in Figure 4-19. A summary of the deposition thickness and footprint area statistics is presented in Table 4-13. As shown in Figure 4-9, the deposition footprint is small and completely contained within the ECC for all three of the HDD sites. The distance from the excavation site of the 1 mm (0.04 in) thickness threshold was less than a maximum of 158 m (518 ft), at the Brayton Point site but was 212 m (695 ft) and 202 m (662 ft) at the Mount Hope Bay and Aquidneck sites, respectively. The 0.5 mm (0.02 in) thickness coverage extended to a maximum of 230 m (755 ft) from the Brayton Point site, 294 m (965 ft) from the Mount Hope Bay site and 246 m (807 ft) from the Aquidneck site.

The areal coverage of the 1 mm (0.4 in) threshold thickness or greater were small, at 2.88 ha (7.11 ac), 5.68 ha (14.03 ac) and 4.52 ha (11.17 ac) for the Brayton Point, Mount Hope Bay and Aquidneck sites, respectively. The lower threshold thickness of 0.5 mmm (0.02 in) area coverages were 5.16 ha (12.75 ac), 9.72 ha (24.02 ac) and 6.88 ha (17.00 ac) at the Brayton Point, Mount Hope Bay and Aquidneck sites, respectively. The numbers indicate that the sediment deposition at the HDD sites had limited impact on the surrounding seabed areas and are well within the ECC in all cases as can be seen in the figures as well.

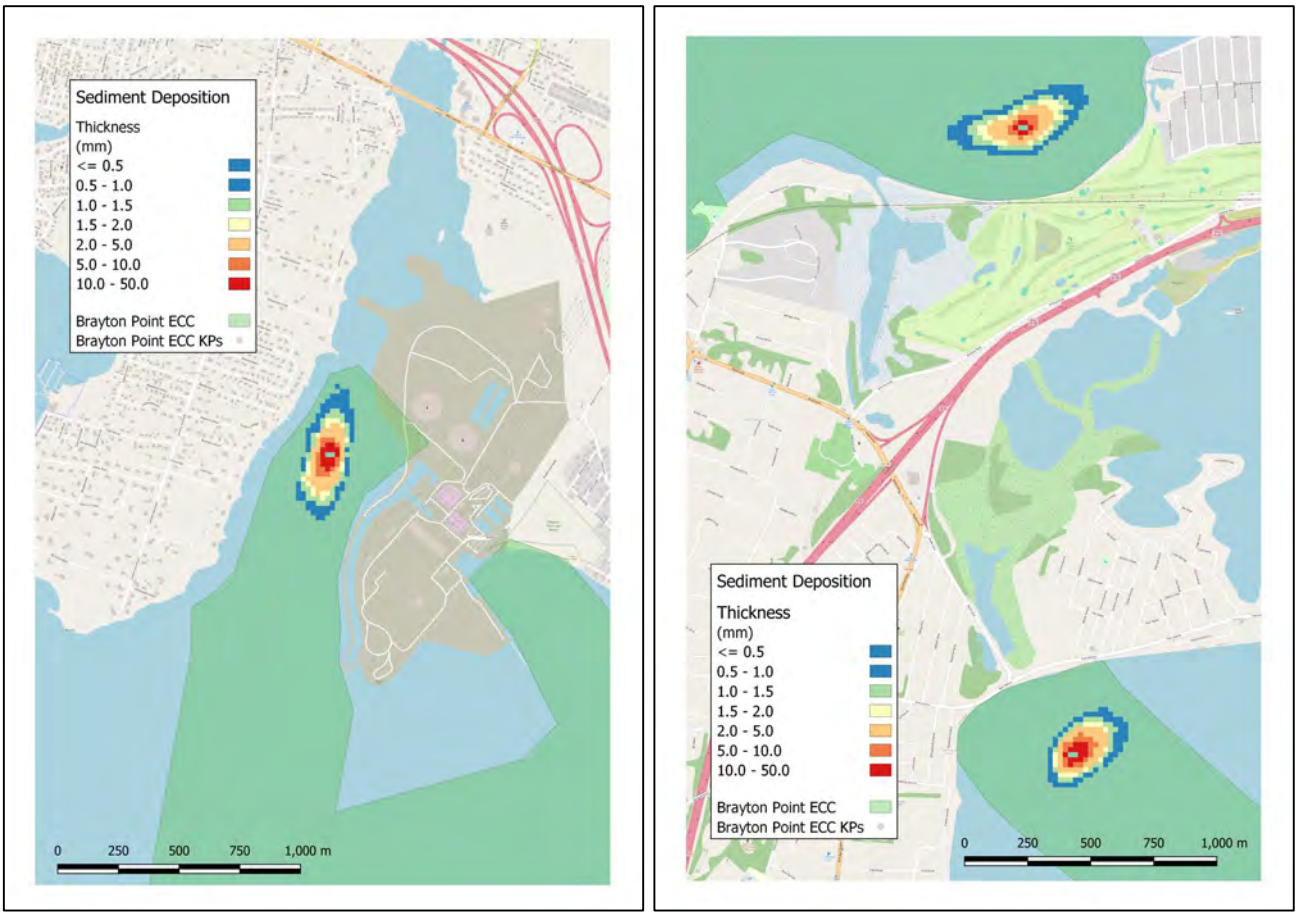

FIGURE 4-19. MAP OF MAXIMUM SEABED SEDIMENT DEPOSITION ASSOCIATED WITH THE EXCAVATION ACTIVITIES AT THE THREE HDD CONNECTION PITS AT BRAYTON POINT (LEFT MAP), AND MOUNT HOPE BRIDGE AND AQUIDNECK ISLAND (RIGHT MAP).

TABLE 4-13. AREA COVERAGE FOR SEABED SEDIMENTATION THICKNESS THRESHOLDS FOR THE THREE HDD PIT EXCAVATION ACTIVITIES.

Thickness Threshold (mm)	Brayton Pt HDD Pit Area Coverage (ha)	Maximum Distance from Release (m)	Mount Hope Bay HDD Pit Area Coverage (ha)	Maximum Distance from Release (m)	Aquidneck HDD Pit Area Coverage (ha)	Maximum Distance from Release (m)
0.5	5.16	230	9.72	294	6.88	246
1	2.88	158	5.68	212	4.52	202
1.5	1.96	139	3.80	173	3.48	170
2	1.56	114	2.84	134	2.80	158
2.5	1.20	95	2.16	114	2.40	141
5	0.64	58	0.88	59	1.24	102
>10	0.24	32	0.32	33	0.60	70

5 DISCUSSION AND CONCLUSIONS

The results of the sediment dispersion modeling study indicated that the water column concentration and the sediment deposition pattern and thickness were most heavily influenced by the properties of the trench sediments disturbed during the cable burial operations and localized current velocities. The dimensions of the trench, the advance rate and the loss rate to the water column, specified the total amount of sediments re-suspended, but the response was short lived for all but the finest grade sediments (silts and clays). A conservative loss rate of 25 percent was assumed for the cable burial operations.

A hydrodynamic model application over the area stretching from the New York Bight to Cape Cod with a fine resolution nested grid for Narragansett Bay was applied to predict the three- dimensional currents and circulation that were used in the sediment model to transport the resuspended sediments. Wind observations from the SouthCoast Wind metocean buoy and from the NOAA weather station at Quonset Point were used along with TPXO model tide data to drive the hydrodynamic model. The model- predicted surface elevations and currents were successfully validated using NOAA tide and current stations and the vertical profile of currents at the SouthCoast Wind metocean buoy. This procedure assured that the sediment transport from the currents were a reasonable reflection of actual currents that the cable installation operations will likely encounter in the study area.

Surface sediment grab sample data was collected along the ECC at 23 sites used in the modeling. The data showed that the Mount Hope Bay and Sakonnet River segments were mostly characterized by high fractions of the fine grade silt and clay sediment classes (greater than 50 percent), through Mount Hope Bay and the Sakonnet River segments. Offshore, the sediments tended to have higher fractions of fine sand to coarse sand classes with an occasional pocket of silt or very fine sand.

In regions with large clast sizes, sediments re-suspended from the cable burial operations quickly dropped back to the sea floor keeping TSS concentrations low and localized; concentrations above ambient background were limited to within a few meters of the burial tool. The deposition area coverage was small as a result. This was true for most of the offshore segments of the ECC where concentrations of 100mg/L were predicted to be within 50 m (160 ft) of the route and decreased rapidly (less than 15 minutes). The segments of the ECC between KP32 and KP45 and between KP78 and KP100 are particular examples of this, where the currents were low and the sediment grain size distribution favored the larger materials. The sections of the offshore route that were seen to have higher fractions of the fine grade sediments exceeded that response in the model predictions showing the 100 mg/L concentration extending to greater than 300 m (984 ft). These areas are seen between KP55 and KP78 and again in the area of KP100 to KP110.

The sediment deposition footprint resulting from the cable installation activities occurred relatively locally. Along the majority of the route a large fraction of the mass settles out quickly and does not get transported far by the currents. Deposition thicknesses of 1 mm (0.04 in) are generally limited to a corridor with a maximum width of 30 - 35 m (100 – 115 ft) around the cable centerline. In the areas where there are finer grain sediments, the 1mm (0.04 in) thickness contour distance can increase locally to 165 m (540 ft) from the ECC as seen in the area of KP105.

The fine grade materials tend to settle slowly compared to the larger grain size sediments, meaning that the resuspended silt, clay and even very fine sands tend to be transported farther with the tidal currents than the

coarser components and correspondingly higher water column concentrations and longer durations of plumes were predicted from the model. This was the case along the Mount Hope Bay and Sakonnet River segments of the ECC where much of Mount Hope Bay and the Sakonnet River were impacted at low concentration levels.

The higher-level suspended sediment concentrations (100 mg/L TSS and up) were somewhat contained in the Sakonnet River but covered a larger area in Mount Hope Bay. Near the Mt. Hope Bay Aquidneck landing, currents running perpendicular to the EC coupled with fine grade resuspended sediments, increased the overall material transport extending the maximum 100 mg/L concentration a little over 1 km (0.62 mi). Concentrations reached levels of 500 mg/L but were short lived and persisted for approximately 30 minutes to an hour. Concentrations in the range of 200 mg/L or more are not expected to endure for longer than about 2 hours, while the lowest concentrations, in the 10 mg/L range may last several hours after re-suspension.

The conditions creating suspended sediments at the HDD excavation sites were different than those investigated for the cable burial routes. The source was assumed to be at a single point and continuous over a 16- hour period, releasing 100 percent of the dredged material into the water column. The sediments at the three HDD sites were similar (each taken from the nearest surface grab sample site), where, excluding the rock/cobble component, they were comprised of approximately 50 percent silt and 11 percent clay and therefore the material settled relatively slowly to the seabed. Concentrations of 100 mg/L were transported to a maximum of 1.2 km (0.75 mi) from the HDD site but dissipated in approximately two hours. The area coverage of the 100 mg/L or greater level was contained within an average of 12 ha (30 ac).

The sedimentation footprint however was very small with a maximum coverage of the 1 mm (0.04 in) thickness contour of only 5.7 ha (14 ac), extending a maximum distance of 212 m (695 ft) and 9.7 ha (24 ac) for the 0.5 mm (0.02 in) thickness contour, extending a maximum distance of 294 m (965 ft) from the HDD site.

In summary, despite conservative model assumptions, water column concentrations and seabed deposition thickness and extent from the cable burial operations and HDD exit pit dredging remain generally localized and of short duration.

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APPENDIX 1 - BRAYTON POINT ECC SURFACE SEDIMENT GRAB SAMPLE GRAIN SIZE DISTRIBUTION

SampleID	Easting	Northing	Longitude	Latitude	%Coarse Sand (0.5-1.0 mm)	%Medium Sand (0.25-0.50 mm)	%Fine Sand (0.125-0.25 mm)	%VeryFine Sand (0.062-0.125 mm)	%Silt-(0.0039-0.0625 mm)	%Clay (<0.0039 mm)
21SU-MW0521-BP002	316865.8	4618773.5	-71.20092	41.69969	7.3	6	5.5	5.3	44.5	8.4
21SU-MW0521-BP003	316084.7	4617116.5	-71.20979	41.68460	10.4	6	3.9	5.6	46.4	9.8
21SU-MW0521-BP005	313608.3	4614216.1	-71.23862	41.65792	8.2	8.2	6.3	5.2	32.5	7.8
21SU-MW0521-BP010-BG	314381.2	4604007.4	-71.22618	41.56621	8.8	11.8	5.4	6.2	38.5	8
21SU-MW0521-BP012-BG	314848.1	4598463.4	-71.21887	41.51642	0.4	3.1	48.1	28.2	17.6	2.4
21SU-MW0521-BP013-BG	314775.6	4596531.2	-71.21915	41.49902	1.1	17.4	57.9	21.1	1.7	0.2
21SU-MW0521-BP017-BG	314420.4	4588971.3	-71.22108	41.43089	1	23.4	63.6	7.8	2.4	0.3
21SU-MW0521-BP018-BG	314287.3	4587062.6	-71.22208	41.41368	0.8	27.7	63.5	6.5	1.3	0.2
21SU-MW0521-BP019-BG	314377.4	4585235.9	-71.22045	41.39726	21.6	22.7	3.2	0.4	1	0.1
21SU-MW0521-BPT07-BG	317290.1	4582870.9	-71.18491	41.37664	59.6	28.1	4.7	0.4	0.9	0.2
21SU-MW0521-BP024-BG	324846.7	4582428.0	-71.09448	41.37433	4.6	56.2	34.5	1.7	2.6	0.4
21SU-MW0521-BPT08-BG	329719.7	4581796.7	-71.03607	41.36969	0.9	16.1	75.1	5.3	2.3	0.3
21SU-MW0521-BP028-BG	331367.1	4580016.0	-71.01589	41.35401	2.1	3.8	50.9	33.5	8	1.3
21SU-MW0521-BPT09-BG	334364.8	4574333.1	-70.97852	41.30347	10.9	28.8	26.8	16.5	11.2	2.2
21SU-MW0521-BP035-BG	336209.3	4567713.5	-70.95472	41.24425	8.7	19.5	33.7	17.6	10.1	1.4
21SU-MW0521-BP039-BG	340050.6	4561525.3	-70.90729	41.18931	37.1	22.8	2.7	0.2	1	0.1
21SU-MW0521-BP042-BG	344859.7	4558726.7	-70.84926	41.16505	25.6	58.1	10.1	0.2	1	0.2
21SU-MW0521-BP046-BG	354060.6	4557245.5	-70.73928	41.15342	20.8	7.3	1.2	0.2	0.7	0.1
21SU-MW0521-BP049-BG	359766.8	4557113.7	-70.67128	41.15324	43.9	30.1	5.9	0.5	1.6	0.2
21SU-MW0521-BP052-BG	365453.9	4556948.1	-70.60349	41.15271	4.5	13.2	46.5	15.1	14.6	2
21SU-MW0521-BP058-BG	376862.7	4556558.9	-70.46749	41.15102	12	62.4	22.9	0.9	1.4	0.2
21SU-MW0521-BP063-BG	385790.7	4553858.8	-70.36062	41.12801	4.5	22.8	53.6	7.1	6.7	1
21SU-MW0521-BP068-BG	390918.1	4545193.7	-70.29801	41.05068	11.3	63.1	15	8	2.2	0.2
21SU-MW0521-A080-BG	390041.4	4563662.8	-70.31175	41.21689	0.2	0.4	48.4	48.8	2.3	0.2
21SU-MW0521-BPALT02	317652.6	4618421.7	-71.19136	41.69671	0.15	20.9	14.25	7.5	46.8	10.6
21SU-MW0521-C01-BG	383725.7	4562652.0	-70.38688	41.20691	0.2	3.3	91.3	2.8	2.3	0.3
21SU-MW0521-C02-BG	386552.5	4562690.3	-70.35318	41.20765	0.2	24.6	67.6	3.9	3.4	0.6
21SU-MW0521-C03-BG	385169.1	4561339.7	-70.36942	41.19529	0.2	0.6	82.1	15	2.2	0.3
21SU-MW0521-C04-BG	383714.5	4560170.0	-70.38654	41.18455	0.2	3.6	86.5	6.7	2.9	0.4
21SU-MW0521-C05-BG	386499.5	4560086.7	-70.35333	41.18420	0.2	5.7	87.2	3.2	3.6	0.4

SampleID	Easting	Northing	Longitude	Latitude	%Coarse Sand (0.5-1.0 mm)	%Medium Sand (0.25-0.50 mm)	%Fine Sand (0.125-0.25 mm)	%VeryFine Sand (0.062-0.125 mm)	%Silt-(0.0039-0.0625 mm)	%Clay (<0.0039 mm)
21SU-MW0521-C05-BG-DUP	386499.5	4560086.7	-70.35333	41.18420	0.2	4.1	90.4	3.1	2.3	0.3
21SU-MW0521-C16-BG	325252.4	4589128.9	-71.09157	41.43474	0.2	0.3	32	66	1.8	0.2
21SU-MW0521-C17-BG	322854.2	4587722.4	-71.11984	41.42155	0.2	0.4	18.4	78.5	2.5	0.4
21SU-MW0521-C17-BG-DUP	322854.2	4587722.4	-71.11984	41.42155	0.2	0.4	22.5	74.1	2.8	0.4
21SU-MW0521-C19-BG	386562.5	4562674.3	-70.35306	41.20751	0.2	0.4	25.5	71.6	2.4	0.3
21SU-MW0521-C20-BG	386562.5	4562674.3	-70.35306	41.20751	0.2	0.4	31.3	65.8	2.3	0.3
LR-COMP1	317164.7	4620259.9	-71.19778	41.71313	17.8	15.8	32.7	4.3	3.0	1.0
LR-COMP2	317135.3	4620078.0	-71.19808	41.71148	14.4	12.3	36.1	4.7	18.0	6.0
LR-COMP3	317073.9	4619951.4	-71.19878	41.71033	13.1	3.2	55.7	6.5	15.0	5.0

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment M: Benthic Habitat Mapping Report

Revised: February 2023

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MAYFLOWER WIND

Benthic Habitat Mapping to Support State Permitting Applications - Brayton Point ECC for RI State Waters and GLD

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Table of Contents

Revision History i

Table of Contents ii

List of Attachments iii

List of Tables iv

List of Figures v

Glossary ix

Executive Summary x

1. Introduction 1

1.1 Mayflower Wind Project Overview and Layout 1

1.2 Benthic Assessment Survey and Reporting History 2

1.3 Benthic Habitat Mapping Assessment Purpose and Objectives 3

2. Input Data and Methods 5

2.1 Input Data 5

2.1.1 Geophysical Data and Derived Data Products 5

2.1.2 Ground-Truth Data 6

2.2 Benthic Habitat Mapping Approach 11

3. Results 12

3.1 Summary of Benthic Assessment Results Across Surveys 12

3.2 Benthic Habitat Types 13

3.2.1 Glacial Moraine and Bedrock 13

3.2.2 Mixed-Size Gravel in Muddy Sand to Sand 15

3.2.3 Coarse Sediment Habitats 15

3.2.4 Sand Habitats 15

3.2.5 Mud to Muddy Sand Habitats 16

3.2.6 *Crepidula* Substrate 16

3.2.7 Submerged Aquatic Vegetation 16

3.3 Benthic Habitat Distributions 19

4. Discussion 26

5. References 31

List of Attachments

Attachment A Inventory of Benthic Sample Types Collected at Each Sampling Location Across Surveys

Attachment B Summary Benthic Ground-Truth Data Analysis Results

List of Tables

Page

Table 1-1. Mayflower Wind Project Components for the Brayton Point ECC 2

Table 1-2. Unique Benthic Stations Sampled Across the Study Area 3

Table 1-3. Benthic Stations Sampled Across the Study Area During Each Survey 3

Table 1-4. Benthic Sampling Techniques Across Surveys 3

Table 2-1. Benthic Ground-truth Parameters with Corresponding BOEM COP Requirements and Guidelines 9

Table 3-1. Color-coded Key to Benthic Habitat Types with Modifiers and Related Groupings for Ground-truth Tables and Plots 18

Table 3-2. Composition & Characteristics of Mapped Benthic Habitat Types within the Brayton Point Export Cable Corridor in GLD Portion of Federal Waters 21

Table 3-3. Characteristics of Mapped Benthic Habitat Types as Informed by Benthic Ground-truth Data within the Brayton Point Export Cable Corridor in Federal Waters (GLD) 22

Table 3-4. Composition & Characteristics of Mapped Benthic Habitat Types within the Brayton Point Export Cable Corridor in RI State Waters 23

Table 3-5. Characteristics of Mapped Benthic Habitat Types as Informed by Benthic Ground-truth Data within the Brayton Point Export Cable Corridor in RI State Waters, *continued on next page* 24

List of Figures

Figure Page

Figure 1-1. Location of the Mayflower Wind Lease Area with potential wind turbine generator (WTG)/offshore substation platform (OSP) foundation positions and offshore export cable corridors (ECCs) 1

Figure 1-2. Location of the Brayton Point ECC and offshore areas designated by Rhode Island Coastal Resources Management Council (RI CRMC) for consistency review, known as the Geographic Location Description (GLD) 2

Figure 1-3. Locations sampled for benthic ground-truth data across all field surveys at the Brayton Point offshore export cable corridor (1 of 2) 3

Figure 1-4. Locations sampled for benthic ground-truth data across all field surveys at the Brayton Point offshore export cable corridor (2 of 2) 4

Figure 1-5. Generalized benthic habitat mapping workflow diagram 5

Figure 2-1. Schematic depicting a standard geophysical survey vessel set-up and data collection (after Garel et al., 2019) 6

Figure 2-2. Bathymetric data at the Brayton Point ECC (1 of 2) 7

Figure 2-3. Bathymetric data at the Brayton Point ECC (2 of 2) 8

Figure 2-4. Backscatter data over hillshaded bathymetry at the Brayton Point ECC (1 of 2) 9

Figure 2-5. Backscatter data over hillshaded bathymetry at the Brayton Point ECC (2 of 2) 10

Figure 2-6. Examples of side-scan sonar (SSS) data showing soft benthic habitats of sand and mud (left) and heterogeneous and complex habitats of glacial moraine (right) 11

Figure 2-7. Examples of SSS data showing individual objects on the seafloor, identified as boulders (left) and debris (right) 12

Figure 2-8. Example of SSS data where individual small boulders and cobbles cannot be individually detected but where textures and patterns, paired with ground-truth data, indicate the presence of these features within a sand matrix 13

Figure 2-9. Boulder fields and surficial boulders (>0.3 m) individually identified ("picked") from the geophysical data shown here on side-scan sonar data. Individual boulder picks were aggregated and mapped as boulder fields according to procedures detailed in COP Appendix E, MSIR 14

Figure 2-10. CMECS ternary diagram with Mayflower Wind's geological seabed sediment interpretation categories, as detailed in COP Appendix E, MSIR 15

Figure 2-11. Ripple scour depressions (RSDs) visible in SSS data 16

Figure 2-12. Simplified schematic diagram showing input data and outputs for the benthic habitat mapping process conducted by INSPIRE 17

Figure 2-13. Examples of data reviewed during the benthic habitat mapping process: CMECS Substrate Subgroup on backscatter over hillshaded bathymetry, with overlays of data products derived from the geophysical data, namely boulder fields, boulder picks, and the geoform of glacial moraine; inset PV images are from SPI/PV stations collected in Summer 2021 18

Figure 2-14. Geological seabed interpretations refined to benthic habitat types with modifiers..... 19

Figure 3-1. Plots showing the categorical variability (left) and percentage of predominance (right) of Substrate Subgroup across all portions of the Study Area give a high-level depiction of which areas have more heterogeneous stations; sampling effort (# replicate samples collected) is overlaid to evaluate its effects. Categorical variability values range from 0 to 1, with 1 indicating high variability and heterogeneity. Percentage of predominance values range from 0 to 100%, with 100% indicating the category at that station was fully dominant (all replicates were categorized the same way). 20

Figure 3-2. Plots showing the categorical variability (left) and percentage of predominance (right) of Biotic Subclass across all portions of the Study Area give a high-level depiction of which areas have more heterogeneous stations; sampling effort (# replicate samples collected) is overlaid to evaluate its effects. Categorical variability values range from 0 to 1, with 1 indicating high variability and heterogeneity. Percentage of predominance values range from 0 to 100%, with 100% indicating the category at that station was fully dominant (all replicates were categorized the same way). 21

Figure 3-3. Glacial Moraine A habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Subgroup assessed from ground-truth data; inset images for Station BP039-BP110 show three paired replicate PV images (top) and SPI images (bottom), with images from Summer 2021 22

Figure 3-4. Mixed-Size Gravel in Muddy Sand to Sand habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Subgroup assessed from ground-truth data; inset PV images for Stations BPT05-1 and BPT05-4 show the range of gravel distribution within these habitats 23

Figure 3-5. Coarse Sediment – Mobile with Muddy Gravelly Sand habitat and scattered boulders and smaller areas of Coarse Sediment – Mobile with Boulder Field(s) habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Subgroup assessed from ground-truth data..... 24

Figure 3-6. Sand and Sand – Mobile habitats as detected in backscatter data over hillshaded bathymetry, and predominant Substrate Subgroup assessed from ground-truth data; side-scan sonar inset shows ripples; inset image from BP062 shows three paired replicate PV images (top) and SPI images (bottom) and the single PV captured at transect Station BPT15-9, with images from Summer 2021 25

Figure 3-7. Mud to Muddy Sand – Crepidula Substrate habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Group

assessed from ground-truth data; PV images from Stations BPT03-5 and BPT03-6 show complete cover of Crepidula 26

Figure 3-8. Benthic habitat types with modifiers mapped at the Brayton Point ECC (1 of 2) and pie chart of habitat composition 27

Figure 3-9. Benthic habitat types with modifiers mapped at the Brayton Point ECC (2 of 2) and pie charts of habitat composition 28

Figure 3-10. Benthic habitat types with modifiers and individual large boulders (>0.3 m) mapped at the Brayton Point ECC (1 of 2) 29

Figure 3-11. Benthic habitat types with modifiers and individual large boulders (>0.3 m) mapped at the Brayton Point ECC (2 of 2) 30

Figure 3-12. Benthic habitat types with modifiers mapped and ground-truth CMECS Substrate Subgroup or Substrate Group at the Brayton Point ECC (1 of 2) 31

Figure 3-13. Benthic habitat types with modifiers mapped and ground-truth CMECS Substrate Subgroup or Substrate Group at the Brayton Point ECC (2 of 2) 32

Figure 3-14. Benthic habitat types with modifiers mapped and ground-truth CMECS Biotic Subclass at the Brayton Point ECC (1 of 2) 33

Figure 3-15. Benthic habitat types with modifiers mapped and ground-truth CMECS Biotic Subclass at the Brayton Point ECC (2 of 2) 34

Figure 3-16. Benthic habitat types with modifiers mapped and ground-truth CMECS Attached Fauna presence at the Brayton Point ECC (1 of 2) 35

Figure 3-17. Benthic habitat types with modifiers mapped and ground-truth CMECS Attached Fauna presence at the Brayton Point ECC (2 of 2) 36

Figure 3-18. Benthic habitat types with modifiers mapped and ground-truth sensitive taxa presence at the Brayton Point ECC (1 of 2) 37

Figure 3-19. Benthic habitat types with modifiers mapped and ground-truth sensitive taxa presence at the Brayton Point ECC (2 of 2) 38

Figure 3-20. Benthic habitat types with modifiers mapped and ground-truth non-native taxa presence at the Brayton Point ECC, possible *Didemnum* spp. at BP041 recorded in Summer 2021 39

Figure 4-1. Map of ECCs depicting segments where various seafloor preparation and installation temporary disturbances activities, such as sand wave clearance, boulder clearance and removal, and anchoring, are anticipated to occur 40

Figure 4-2. Export cable corridor and four optional locations for four HDD pits on both sides of Aquidneck Island along with benthic habitat types with modifiers 41

Figure 4-3. Indicative cable route and corridor in RI State Waters and state data on SAV beds; distances between SAV beds and the indicative cable route and corridor are indicated 42

Figure 4-4. Likely presence of SAV mapped based on distinct side-scan sonar data at the east edge of the cable corridor south of Aquidneck Island....43

Figure 4-5. Glacial moraines as identified in the RI Ocean Special Area Management Plan and glacial moraines distribution as mapped by Mayflower Wind....44

Figure 4-6. Habitats crosswalked to juvenile cod HAPC at the Brayton Point ECC, along with the 20-m depth contour....45

Figure 4-7. Habitats crosswalked to winter flounder egg and spawning adult EFH at the Brayton Point ECC 46

Glossary

Acronym	Definition
APC	Areas of particular concern
BOEM	Bureau of Ocean Energy Management
CMECS	Coastal and Marine Ecological Classification Standard
COP	Construction and Operations Plan
ECC	Export Cable Corridor
EFH	Essential Fish Habitat
EMF	Electric and magnet field
FGDC	Federal Geographic Data Committee
ft	feet
GLD	Geographic Location Description
HAPC	Habitat Area of Particular Concern
HDD	horizontal directional drilling
IAC	Inter-Array Cable
in	inch
INSPIRE	INSPIRE Environmental
km	kilometer
m	meter
MA	Massachusetts
MA/RI WEA	Massachusetts/Rhode Island Wind Energy Area
MBES	multibeam echosounder
mm	millimeter
MSIR	Marine Site Investigation Report
nm	nautical mile
NMFS	NOAA National Marine Fisheries Greater Atlantic Regional Fisheries Office Habitat Conservation and Ecosystem Services Division
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
OSP	Offshore Substation Platform
PV	Plan View
RI	Rhode Island
SAV	submerged aquatic vegetation
SPI	Sediment Profile Imaging
SSS	side-scan sonar
WTG	Wind Turbine Generator
YOY	young-of-the-year

Executive Summary

Mayflower Wind proposes to develop the entire Mayflower Wind Lease Area OCS-A 0521 as an offshore wind renewable energy project. There will be up to 149 positions in the Lease Area occupied by up to 147 wind turbine generators (WTGs) and up to five offshore substation platforms (OSPs). The 149 positions will conform to a 1.0 nm x 1.0 nm (1.9 km x 1.9 km) grid layout with an east-west and north-south orientation, which is aligned with layouts across the entire Massachusetts/Rhode Island Wind Energy Area (MA/RI WEA). Submarine inter-array cables (IACs) will connect WTGs and OSPs within the Lease Area. Offshore export cables will run through export cable corridors (ECCs) from the OSPs in the Lease Area to two points of interconnection at the regional electric transmission grid located at Falmouth, MA and at Brayton Point in Somerset, MA. Horizontal directional drilling will be used at all cable landfalls to avoid impacts to sensitive coastal resources. Project activities, design parameters, and associated potential impacts through seafloor disturbance are presented in further detail in Volume I, Section 3 of the Mayflower Wind Construction and Operations Plan (COP) available at https://www.boem.gov/renewable-energy/state-activities/mayflower-wind.

The purpose of this benthic habitat mapping report and associated data is to provide detailed information about the physical and biological characteristics and spatial distribution of benthic habitats found within the Study Area, which includes the subtidal seafloor of the Brayton Point ECC where it crosses the portion of Federal Waters designated as Geographic Location Description (GLD) areas identified in the Rhode Island Ocean Special Management Plan (OSAMP), and then Rhode Island State Waters. The Project requires approvals from various state agencies, including the Rhode Island Energy Facility Siting Board, the Coastal Resources Management Council (CRMC), and the Rhode Island Department of Environmental Management (RIDEM). Most relevant to this report, CRMC regulations in both the Coastal Resources Management Program, or "Red Book", (650-RICR-20-00-1 et seq.) and the OSAMP (RI CRMC, 2010) include requirements pertaining to identification and evaluation of benthic habitats. This report provides the baseline data and information necessary to support CRMC's review of any Project impacts on benthic habitats under its regulations.

Mayflower Wind has collected extensive geophysical data and ground-truth data to support the mapping and characterization of habitats within the Study Area. The geophysical data used to support benthic habitat mapping not only meet the recommended resolution specified in the Bureau of Ocean Energy Management's (BOEM) Geophysical, Geotechnical, and Geohazard Guidelines (BOEM, 2020a) and the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Greater Atlantic Regional Fisheries Office Habitat Conservation and Ecosystem Services Division's (NMFS) recommendations (NMFS, 2021), but were also collected with state-of-the-art equipment and are provided at the highest resolution possible. The benthic habitat data provided here should be viewed as the most accurate representation of the seafloor possible using the high-resolution geophysical and ground-truth data collected.

Six primary benthic habitat types were mapped within the Study Area: Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, Mud to Muddy Sand, and Bedrock. When habitats were updated with modifiers, a total of 19 habitat types were mapped within the Study Area including mobile habitats characterized by ripples, discrete areas with boulder fields, and discrete areas with *Crepidula* (slipper shell) cover. Sand, Sand – Mobile, and Mud to Muddy Sand habitat types were the most prevalent habitats mapped at the Brayton Point ECC with smaller areas of Glacial Moraine A at the Southwest Shoal and in Rhode Island Sound. Areas of Mixed-Size Gravel in Muddy Sand to Sand were mapped in Rhode Island Sound and areas of Mud to Muddy Sand with *Crepidula* Substrate were interspersed with Mud to Muddy Sand in the Sakonnet River and Mount Hope Bay near Aquidneck Island. The benthic habitats and their characterizing sediments and benthic

biological communities as mapped for this Mayflower Wind assessment generally agree with several recently published studies (LaFrance et al., 2019; Hale et al., 2018; Shumchenia and King, 2019; Shumchenia et al., 2016) related to benthic habitats and fauna within Narragansett Bay, which include the Sakonnet River and/or Mount Hope Bay.

Identified habitats of particular relevance to RI state agency review include submerged aquatic vegetation (SAV), glacial moraine, and those habitats that may be utilized by juvenile cod and spawning winter flounder and their eggs. SAV beds were mapped by the state near the mouth of the Sakonnet River, located over 1 km from the edges of the Brayton Point ECC. Based on distinct side-scan sonar signatures in the geophysical data, SAV and/or macroalgae may be present in the vicinity of the Brayton Point ECC in the Sakonnet River at Aquidneck Island, but this has not yet been field-verified. The area will be surveyed for SAV prior to construction, as necessary, to guide horizontal directional drilling (HDD) placement. A distinction was made between Glacial Moraine A and Glacial Moraine B habitats to distinguish between areas of unconsolidated geological debris (A) and consolidated geological debris (B). All glacial moraine mapped within the Study Area was mapped as type A and no type B was mapped. Using data collected by Mayflower Wind, Glacial Moraine A habitats were mapped as comprising 4.1% (411 acres) of the habitats mapped at the Brayton Point ECC in Federal Waters (GLD) and comprising 3.1% (185 acres) of the habitats mapped at the Brayton Point ECC in RI State Waters, predominantly located in Rhode Island Sound. Glacial moraines, as identified in the OSAMP (RI CRMC, 2010), intersect the Brayton Point ECC in two areas within the GLD portion of Federal Waters; at Southwest Shoal and where the ECC turns due west outside of RI State Waters.

Essential fish habitat (EFH) and habitat areas of particular concern (HAPC) are designated by the New England Fishery Management Council for certain species and life stages of fish and invertebrates in the nearshore and offshore waters of New England, including the area covered by the Study Area. These designations are comprised of two components: (1) broad geographic areas (e.g., nearshore waters and seafloor shallower than 20 m; mapped 10-min squares) and (2) text documentation that describes the habitat characteristics that shall constitute EFH and/or HAPC within the designated geographic areas. Therefore, spatial data on the distribution of those habitat characteristics are needed to refine the specific location of EFH and/or HAPC. Habitat types mapped by Mayflower Wind using geophysical data and sediment and benthic community data from grabs and imagery collected in 2021 and 2022 within the HAPC designated geographic area and with characteristics that match the HAPC description for juvenile cod encompass 361 acres of the Study Area within RI State Waters (6.0% of the Brayton Point ECC within RI State Waters). Habitat types mapped by Mayflower Wind within the EFH designated geographic area and with characteristics that match the EFH description for winter flounder encompass 731 acres of the Study Area, all within RI State Waters (12.1% of the Brayton Point ECC within RI State Waters).

1. Introduction

1.1 Mayflower Wind Project Overview and Layout

The Mayflower Wind Lease Area OCS-A 0521 (Lease Area) encompasses 127,388 acres (51,552 hectares) located in Federal Waters 26 nautical miles (nm), (48 kilometers [km]) south of Martha's Vineyard, 20 nm (37 km) south of Nantucket, and 51 nm (94 km) southeast of the Rhode Island coast (Figure 1-1). There will be up to 149 positions in the Lease Area occupied by up to 147 wind turbine generators (WTGs) and up to five offshore substation platforms (OSPs). The 149 positions will conform to a 1.0 nm x 1.0 nm (1.9 km x 1.9 km) grid layout with an east-west and north-south orientation, which is aligned with layouts across the entire Massachusetts/Rhode Island Wind Energy Area (MA/RI WEA). Submarine inter-array cables (IACs) will connect WTGs and OSPs within the Lease Area.

Within the offshore export cable corridor (ECC) from the Lease Area to Brayton Point (Brayton Point ECC), up to two HVDC offshore export power cables and associated communications cabling. The cables within the Brayton Point ECC will be installed in a bundled configuration where practicable, will connect the OSPs to the landfall site at Brayton Point. The Brayton Point ECC is nominally 1,640 feet (ft, 500 meter [m]) to 2,300 ft (700 m) wide, to allow for maneuverability during installation and maintenance. The ECC may be locally narrower or wider to accommodate sensitive locations and to provide sufficient area at landfall locations, at crossing locations, or for anchoring. The ECC has been surveyed to assess seabed conditions and to allow for micro-siting (micro-routing) of cables to avoid where practicable sensitive resources and areas where cable burial may be difficult.

The Brayton Point ECC extends from the Lease Area north and then west through Federal Waters, into RI State Waters through Rhode Island Sound to the Sakonnet River where heads north, crosses Aquidneck Island in Portsmouth, RI, continues northeast into Mount Hope Bay, and then into Massachusetts State Waters to Brayton Point in Somerset, MA (Figure 1-1). Intermediate landfall on Aquidneck Island will require sea-to-shore transitions via horizontal directional drilling (HDD) at two locations, one entering and one exiting Aquidneck Island in Portsmouth, RI. HDD will be used at all cable landfalls to avoid impacts to sensitive coastal resources.

For the purposes of this report, the benthic habitat study area (Study Area) includes the subtidal seafloor of the portion of the Brayton Point ECC within RI State Waters and within the area described in the RI Ocean Special Area Management Plan (OSAMP; RI CRMC, 2010) as the Geographic Location Description (GLD) in Federal Waters [referred to as Brayton Point ECC – Federal Waters (GLD)] where the RI Coastal Resources Management Council (RI CRMC) has Federal consistency review authority (Figure 1-2). This report provides a detailed assessment of benthic habitats that have been mapped from geophysical and benthic ground-truth data within the Study Area. Ground-truth data refer to physical samples and imagery collected during benthic surveys conducted by Mayflower Wind to provide direct measurement and observations of the physical and biological characteristics for the seafloor surface. These data were used to develop and calibrate an understanding of the seafloor characteristics associated with different acoustic signatures observed in the geophysical data. This calibration process is particularly useful in assessing backscatter data, which have a relative rather than absolute scale and can vary in relation to a number of factors (see Section 2.1.1 for details).

Additional details on the Study Area relevant to the benthic habitat mapping assessment are provided in Table 1-1.

Table 1-1. Mayflower Wind Project Components for the Brayton Point ECC

Cable Characteristics	Design Parameters
Number of Cables	Two offshore export power cables plus associated communications cabling [a]
Cable Diameter (per cable)	6.9 in (175.0 mm)
Nominal Cable Voltage	±320 kV
Length of Cable Corridor (RI State Waters)	20.4 mi (32.8 km)
Length of Cable Corridor (RI GLDs)	50.0 mi (80.4 km)
Cable Corridor Width	1,640 ft to 2,300 ft (500 m to 700 m)
Number of Cable / Pipeline Crossings Anticipated	3 in the Sakonnet River Up to 13 in the GLDs
Anticipated Cable Burial Depth (below level seabed) (Target Burial Depth = 6 ft (1.8 m))	3.2 to 13.1 ft (1.0 to 4.0 m)
Approximate Cable Load Current	2,000 A

Notes:
[a] The cables will be installed in a bundled configuration, consisting of two power cables plus associated communications cabling installed together, where practicable, in order to minimize seabed impacts from installation. Maximum cable bundle width is twice the maximum cable diameter.

1.2 Benthic Assessment Survey and Reporting History

Two surveys were conducted in Summer 2021 and Spring 2022 to characterize benthic resources for the Project in the Study Area. A total of 339 stations were sampled across the Study Area (Table 1-2; Figures 1-3 and 1-4). Many stations were re-sampled across the multiple surveys, for a total of 348 station sampling events over the course of the six field surveys (Table 1-3). All benthic field surveys and analyses were conducted by Fugro USA Marine, Inc. (Fugro) and Integral Consulting, with the exception that the summarization of benthic community analysis results from grab samples in 2021 was conducted by AECOM. Laboratory analysis of grab samples was conducted by Alpha Analytical, Inc. for sediment grain size and by AECOM or EcoAnalysts, Inc. for benthic community parameters.

A variety of sampling techniques were utilized to collect data on the physical and biological characteristics of the seafloor (Table 1-4). These techniques were used in combination across the surveys and included sediment profile and plan view imaging (SPI/PV), sediment grab sampling, and GrabCam imaging (a video camera attached to the grab sampler). Up to three replicate SPI/PV image pairs were collected and analyzed at each individual SPI/PV station. At select areas, transects across the ECC were sampled by either collecting a series of single SPI/PV image pairs along the transects (referred to as “Transect SPI/PV”), or by using the GrabCam to collect video across the transect (Transect GrabCam). At grab sample locations, one sample was collected with a dual bucket van Veen grab sampler with 0.04-square meter bucket size and GrabCam imagery was collected. Sampling effort at stations ranged from one to all three sampling techniques (SPI/PV, grab, GrabCam); at some stations, sampling techniques also varied across surveys. A complete inventory of all data collected by sampling type for all surveys at each station is provided in Attachment A.

For full details and survey-specific benthic data results, see COP Appendix M, Benthic and Shellfish Resources Characterization Report, and COP Appendix M.2, Benthic and Shellfish Resources Characterization Report Addendum #2. RI state data (RIGIS, 2021) were used to assist in mapping submerged aquatic vegetation (SAV) presence at and near the Brayton Point ECC.

Table 1-2. Unique Benthic Stations Sampled Across the Study Area

Portion of Study Area	Number of Stations
Brayton Point ECC - Federal Waters (GLD)	162
Brayton Point ECC - RI State Waters	177
Total	**339**

Table 1-3. Benthic Stations Sampled Across the Study Area During Each Survey

Portion of Study Area	Number of Stations		
	Summer 2021	Spring 2022	**Total**
Brayton Point ECC - Federal Waters (GLD)	63	105	**168**
Brayton Point ECC - RI State Waters	68	112	**180**
Total	**131**	**217**	**348**

*Note, some stations were sampled multiple times, therefore the total here is greater than the total of unique stations sampled in each area as presented in Table 1-2.

Table 1-4. Benthic Sampling Techniques Across Surveys

Sampling Technique	Number of Stations Sampled with Given Technique		
	Summer 2021	Spring 2022	**Total***
SPI/PV	54	24	**78**
Grab	20	47	**67**
GrabCam	20	50	**70**
Transect SPI/PV	64	148	**212**
Transect GrabCam	6	10	**16**
Total	**164**	**279**	**443**

*Multiple sampling techniques were used across all stations; this table records the total number of benthic replicate "samples" (grabs or imagery) that were collected across all surveys.

1.3 Benthic Habitat Mapping Assessment Purpose and Objectives

The purpose of this report and associated data is to provide detailed information about the physical and biological characteristics and spatial distribution of benthic habitats found within the Study Area. The Project requires approvals from various state agencies, including the Rhode Island Energy Facility Siting Board, the Coastal Resources Management Council (CRMC), and the Rhode Island Department of Environmental Management (RIDEM). Most relevant to this report, CRMC regulations in both the Coastal Resources Management Program, or "Red Book", (650-RICR-20-00-1 et seq.) and the OSAMP (RI CRMC, 2010) include requirements pertaining to identification and evaluation of benthic habitats. This report provides the baseline data and information necessary to support CRMC's review of any Project impacts on benthic and demersal fish habitats under its regulations.

Specific Red Book requirements related to benthic habitats pertain to those habitats that support SAV. Section 1.3.1(R) of the Red Book defines CRMC's goals to preserve, protect, and where possible, restore SAV habitat. These habitats are found throughout shallow coastal areas in Narragansett Bay and their presence is periodically mapped across the Bay using aerial imagery and field verification by the URI Environmental Data Center (URI Environmental

Data Center and RIGIS). The Red Book outlines information pertaining to site-specific monitoring, assessment of impacts, and mitigation for SAV.

Specific OSAMP requirements related to benthic habitats pertain to those habitats that meet the criteria for areas of particular concern (APCs), as defined by CRMC in Section 11.10.2 of the OSAMP. Glacial moraines are considered to be APCs because they provide structural complexity and permanence that serve to provide valuable habitat for benthic species and demersal fish. Glacial moraines are complex geoforms that may have many different expressions at the seafloor surface based on geological origin, position within a larger moraine complex, and modern geological processes, including sediment supply. Rhode Island's marine landscapes were by glaciers and remnants of this glaciation are evident on the seafloor. Deposits on the surface of landforms can be a mix of till, and reworked sediments derived from the glacial deposits and subsequent marine transgression. The OSAMP presumptively excludes development in APCs unless an applicant demonstrates, for example, "by clear and convincing evidence that there are no practicable alternatives that are less damaging in areas outside of the APC, or that the proposed project will not result in a significant alteration to the values and resources of the APC."

Benthic habitats mapped using data collected by Mayflower Wind will be compared to distributions of SAV mapped by the state (RIGIS, 2021) and areas mapped as glacial moraine in the OSAMP (RI CRMC 2010). As juvenile cod and winter flounder have been noted as demersal fish species of potential concern, maps of benthic habitats crosswalked to essential fish habitat (EFH) and/or habitat areas of particular concern (HAPC) designated by the New England Fishery Management Council for relevant life stage of these species are provided as well.

Mayflower Wind has collected extensive geophysical data (COP Appendix E, Marine Site Investigation Report [MSIR]) and ground-truth data (COP Appendices M and M.2, Benthic Resources) to support the mapping and characterization of habitats within the Study Area. INSPIRE Environmental (INSPIRE) conducted benthic habitat mapping by using these geophysical and ground-truth data to further delineate and refine geological seabed interpretations prepared for the Mayflower Wind MSIR (COP Appendix E) into detailed benthic habitat classifications mapped across the Study Area (Figure 1-5).

The geophysical data used to support benthic habitat mapping not only meet the recommended resolution specified in BOEM's Geophysical, Geotechnical, and Geohazard Guidelines (BOEM, 2020a) and NMFS' recommendations (NMFS, 2021), but were also collected with state-of-the-art equipment and are provided at the highest resolution possible. The benthic habitat data provided here should be viewed as the most accurate representation of the seafloor possible using the high-resolution geophysical and ground-truth data collected.

2. Input Data and Methods

Multiple sources of geophysical and ground-truth data were used as input for mapping benthic habitats within the Study Area. Brief summaries of these data sources and details pertinent to their use in the habitat mapping process are described here. Full details of geophysical and ground-truth data collection, processing, and analysis are provided in the Marine Site Investigation Report (COP Appendix E, MSIR) and benthic assessment reports (COP Appendices M and M.2, Benthic Resources) appended to the COP.

2.1 Input Data

2.1.1 Geophysical Data and Derived Data Products

Geophysical data surveys of the Study Area were conducted in 2020 and 2021 by Fugro. High-resolution geophysical surveys included collection of high-resolution multibeam echosounder (MBES) and side-scan sonar (SSS) data (COP Appendix E, MSIR). MBES and SSS are collected using different instruments deployed from the same survey vessel (Figure 2-1). The MBES was installed on Fugro's Hydrodynamic Acoustic System pole, which provides a high degree of positional accuracy. The MBES can be optimized for either bathymetric or backscatter data, but not for both. The geophysical surveys conducted for offshore wind development are designed to support engineering and construction design and, therefore, the MBES was optimized for bathymetric data, and backscatter data were collected as an ancillary data product.

Bathymetric data were derived from the MBES and processed to a resolution of 50 cm (COP Appendix E, MSIR). Bathymetric data provide information on depth and seafloor topography (Figures 2-2 and 2-3).

Backscatter data were derived from the MBES and processed to a resolution of 25 cm (COP Appendix E, MSIR). Backscatter data are based on the strength of the acoustic return to the instrument and provide information on seafloor sediment composition and texture. Backscatter data are best interpreted in concert with hill-shaded bathymetry (Figures 2-4 and 2-5). Backscatter returns are relative (see below) and referred to in terms of low, medium, and high reflectance rather than absolute decibel values. In general, softer, fine-grained sediments absorb more of the acoustic signal and a weaker signal is returned to the MBES. However, backscatter strength is disproportionately affected by the coarse sediment fraction (e.g., Goff et al., 2000), so fine sediment with small amounts of shell hash can generate higher backscatter reflectance than coarser sediment. Although backscatter data provide valuable information about sediment grain size, decibel values reflect not only sediment grain size, but also compaction, water content, and texture (Lurton and Lamarche, 2015). For example, sand that is hard-packed and sand that has prominent ripples may have higher acoustic returns than sediments of similar grain size that do not exhibit compaction or ripples.

Backscatter decibel values are also influenced by water temperature, salinity, sensor settings, seafloor rugosity, and MBES operating frequency, among other factors (Lurton and Lamarche, 2015; Brown et al., 2019). Differences in backscatter decibel values can also occur when data have been collected over a very large survey area under dynamic conditions, with different instruments, and in different years. This scenario is common and does not nullify the data; methods to optimize processing (as appropriate to the sensors) and to display the data optimal for interpretation are well developed (Lurton and Lamarche, 2015; Schimel et al., 2018). Backscatter data products vary based on processing (Lucieer et al., 2017) and data display procedures. Mapping of seafloor composition and habitats, while greatly aided by backscatter data, should not rely solely on these data (see Table 1 in Brown et al., 2011). The manner in which the suite of geophysical data was used for habitat delineations is described further in Section 2.2.

SSS data were generated from a towed instrument (Figure 2-1) and, thus, have a lower positional accuracy than MBES data. However, because the SSS towfish is closer to the seafloor with a lower angle of incidence, the resolution, signal to noise ratio, and intensity contrast of SSS images are higher than those of MBES backscatter images (Lurton and Jackson, 2008). The processed SSS images provide the highest resolution data on sediment textures and objects on the seafloor (boulders, debris) (Figures 2-6 and 2-7). Thermoclines and haline variations affect the acoustic signal and result in data artifacts, presenting as sinuous rippling of alternating low and high returns that cannot be removed from the data; these artifacts are visible when viewed at very close range. SSS data were processed to a resolution of 10 cm; this resolution permits detection of medium to large boulders but does not permit the reliable detection of individual cobbles (6.4 cm to 25.6 cm). Although individual small boulders and cobbles cannot be detected in 10-cm resolution SSS, textures and patterns in the data can indicate the presence or absence of higher densities of these features, which can be confirmed by ground-truth data (Figure 2-8).

Boulders greater than or equal to 30 cm (0.3 m) in diameter were identified from the MBES and SSS data; boulder fields and individual boulder "picks" outside boulder fields were mapped by Fugro and used as input data for benthic habitat mapping (Figure 2-9). At the Brayton Point ECC, boulder detection was conducted via Fugro's proprietary machine learning algorithm was followed with manual review and classification of boulders and anthropogenic features (e.g., lobster traps). Boulder fields are defined as a geoform by the Federal Coastal and Ecological Marine Classification Standard (CMECS; FGDC, 2012).

Seabed sediment types were classified by Fugro using a simplified version of the CMECS Substrate classification hierarchy, which is based on the Folk classification scheme (Folk, 1954) (Figure 2-10; COP Appendix E, MSIR). Seabed sediment types within this simplified scheme are Mud to Muddy Sand, Sand, Gravelly Mud, Gravelly Sand, and Gravel. All but Gravelly Sand were delineated within the Study Area (COP Appendix E, MSIR). This CMECS scheme applies only to geological sediments; Shell, Construction Materials, and Anthropogenic Rock Rubble were also used in mapping seabed sediment types. In areas of Gravel with unconsolidated stratified glacial deposits, a geoform morphological unit of Glacial Moraine/Till was delineated. Bathymetry and SSS were used as the primary data sets to delineate these seabed sediment types, and backscatter was utilized as a secondary data set, due to its relative nature, as discussed above in this section and in COP Appendix E, the MSIR. Grain size distribution results from laboratory analysis of grab samples were used to ground-truth the sediment types indicated by the geophysical data (COP Appendix E, MSIR). A combination of backscatter over hillshaded bathymetry and SSS data was used to detect large- and small-scale bedforms, such as mega-ripples and ripples (*sensu* BOEM, 2020a) and ripple scour depressions (RSDs) (COP Appendix E, MSIR) (Figure 2-11).

2.1.2 Ground-Truth Data

As detailed in Section 1.2 of this report, ground-truth data were collected at a total of 339 stations in the Study Area using a variety of benthic sampling techniques, with some stations sampled during multiple surveys and using multiple techniques (Tables 1-2, 1-3, and 1-4; Figures 1-3 and 1-4). These benthic data (SPI/PV, grab samples, GrabCam) were analyzed for a suite of parameters on sediment types, bedform dynamics, and biogeochemical processes, as well as to characterize infaunal and epifaunal biological communities (Table 2-1). Detailed descriptions of each variable analyzed and full data analysis results for each benthic survey can be found in the Benthic and Shellfish Resources Characterization Report and Addendum #2 (COP Appendices M and M.2, Benthic Resources). All benthic data results prepared for Mayflower Wind by Fugro, Integral, and AECOM, were provided to INSPIRE for the purpose of mapping benthic habitats. These data were inventoried and summarized as detailed below to provide a single summarized set of key variables at each station for ground-truthing geophysical data and mapping benthic habitats.

CMECS Substrate and Biotic classifications were consistently evaluated across all surveys from SPI/PV (including Transect SPI/PV), grab samples, and GrabCam (Table 2-1). These variables serve as ground-truth for assessing and calibrating geophysical data signatures and characterizing the physical and biological characteristics of benthic habitats. Primary CMECS Substrate and Biotic classifiers were selected for the summary data set: Substrate Group and Subgroup, Biotic Subclass and Co-occurring Biotic Subclass. Substrate Group and Subgroup parameters provide categorical values describing sediment composition (e.g., Sandy Gravel, 30-80% gravel cover on sand). CMECS Biotic Subclasses describe dominant biota (by percent cover) at a coarse level. Within the Benthic/Attached Biota Biotic Setting, there are eight classes, of which the Faunal Bed class is of most relevance to the U.S. Atlantic outer continental shelf. Three subclasses fall under the Faunal Bed hierarchy: Attached Fauna, Soft Sediment Fauna, and Inferred Fauna (e.g., tracks and trails, egg masses). Although Biotic Subclass is not directly based on sediment grain size distributions, it reflects them at the scale of relevance to the dominant fauna present, thus serving as an integrator of physical and biological characteristics of the seafloor. The CMECS definition expressly states that "substrate type is such a defining aspect of the Faunal Bed class that CMECS Faunal Bed subclasses are assigned as physical-biological associations involving both biota and substrate" (FGDC, 2012).

Because the presence of Attached Fauna can be an important component of benthic habitat utilization by benthic taxa and demersal fish (NMFS, 2021) and may be present at sparse to patchy levels and therefore not classified as the Biotic Subclass, INSPIRE summarized Attached Fauna presence into a single variable. Attached Fauna were noted as present if Attached Fauna types were noted at the level of the Biotic Subclass or Co-occurring Biotic Subclass, or, where available, the Biotic Group or Co-occurring Biotic Group across all available replicate-level sampling data (i.e., a replicate is a single SPI/PV image pair, single grab, or a single GrabCam video).

The presence of sensitive and non-native taxa were evaluated from PV images by INSPIRE (Table 2-1). Sensitive seafloor habitats include corals, SAV beds, and valuable cobble and boulder habitat (BOEM, 2019). Cobble and boulder habitat can serve as structure for hard and soft corals, nursery grounds for juvenile lobster, and as preferable benthic habitat for squid to deposit their eggs. The benthic data collected serve as baseline presence/absence data for marine non-native species within the Study Area. The colonial tunicate *Didemnum vexillum* is known to have widespread presence on Georges Bank and other areas of New England (Stefaniak et al., 2009), and dense colonies of this tunicate can smother native species (Bullard et al., 2007). Because species-level identification cannot be confirmed without a physical sample, presence observed in the PV images was noted as *Didemnum* spp.

The summarized data set includes predominant values across all available replicate data for Substrate Group, Substrate Subgroup, Biotic Subclass, and Co-occurring Biotic Subclass, presence/absence values for Attached Fauna, and types of sensitive taxa and non-native taxa. Predominance was determined across all analyzed samples and surveys with the predominant category having the maximum number of analyzed replicates. If multiple categories occurred with equal frequency, then the predominant category was classified as "Varies." Sample type and replicate count are also provided.

In addition, variability across replicate level data was examined for Substrate Subgroup and Biotic Subclass. This examination evaluated variation of the result in a scalar, quantitative format. Calculations to compare the variable categories, as well as the predominant results while accounting for overall sampling effort, are described below.

Two measures to assess variable heterogeneity within a station were computed:

- Categorical Variability: variability of relevant categorical variables across all surveys and sample types was calculated by dividing unique number of categories by the number of analyzed replicates. Numerical results ranged from 0 to 1, with 1 indicating high variability and heterogeneity.
- Percentage of Predominance: quantitative measure (%) of a category's dominance at a station across time and over sample types was calculated by dividing the number of replicates in the predominant category at a station by the total number of analyzed replicates. Numerical results ranged from 0% to 100%, with 100% indicating the category at that station was fully dominant (all replicates were categorized the same way).

Stations without a quantitative value designated as N/A indicates a "Varies" result for predominant category, as percentage of predominance could not be calculated; stations designated as Not Analyzed indicates the station was not analyzed for the variable being examined. Because variability cannot be measured with a sample size of one, results that are designated as N/A for categorical variability indicate there was only one analyzed replicate for the station.

Table 2-1. Benthic Ground-truth Parameters with Corresponding BOEM COP Requirements and Guidelines

BOEM COP Guidelines and *NOAA*† *Recommendations*	Parameters Derived from PV Images	Parameters Derived from SPI Images	Parameters Derived from Grab Samples	Parameters Derived from GrabCam
Classification of CMECS sediment type Grain size analysis	CMECS Substrate Class CMECS Substrate Subclass CMECS Substrate Group CMECS Substrate Subgroup	CMECS Substrate Group CMECS Substrate Subgroup Grain size major mode & descriptor	CMECS Substrate Class CMECS Substrate Subclass CMECS Substrate Group CMECS Substrate Subgroup Sediment type (based on grain size analysis)	Surface Sediment Type & Features Observed
Identification of distinct horizons in subsurface sediment	None	Grain size major mode & descriptor Apparent Redox Potential Discontinuity (aRPD)*	None	Surface Sediment Type & Features Observed
Delineate hard bottom substrates	CMECS Substrate Class CMECS Substrate Subclass CMECS Substrate Group CMECS Substrate Subgroup	CMECS Substrate Group CMECS Substrate Subgroup Grain size major mode & descriptor	CMECS Substrate Class CMECS Substrate Subclass CMECS Substrate Group CMECS Substrate Subgroup Sediment type (based on grain size analysis)	Surface Sediment Type & Features Observed
Identification of bedforms Characterization of physical hydrodynamic properties	Bedform size Mud clasts	Boundary roughness	None	Surface Sediment Type & Features Observed
Identification of rock outcrops and boulders Characterization and delineation of any hard bottom gradients of low to high relief such as coral (heads/reefs), rock or clay outcroppings, or other shelter-forming features	CMECS Substrate Class CMECS Substrate Subclass CMECS Substrate Group CMECS Substrate Subgroup	None	CMECS Substrate Class CMECS Substrate Subclass CMECS Substrate Group CMECS Substrate Subgroup	Surface Sediment Type & Features Observed
Characterization of benthic habitat attributes	Sediment Descriptor* Habitat Type & Complexity	aRPD* Prism penetration depth Sediment oxygen demand and proxies (methane, voids, *Beggiatoa*)	Sediment type (based on grain size analysis)	Surface Sediment Type & Features Observed

BOEM COP Guidelines and *NOAA*† *Recommendations*	Parameters Derived from PV Images	Parameters Derived from SPI Images	Parameters Derived from Grab Samples	Parameters Derived from GrabCam
Classification to CMECS Biotic Component to lowest taxonomic unit practicable	CMECS Biotic Subclass CMECS Co-occurring Biotic Subclass	None	CMECS Biotic Subclass CMECS Co-occurring Biotic Subclass CMECS Biotic Group CMECS Co-occurring Biotic Group CMECS Biotic Community CMECS Co-occurring Biotic Community	CMECS Biotic Subclass CMECS Co-occurring Biotic Subclass CMECS Biotic Group CMECS Co-occurring Biotic Group
Characterization of benthic community composition (identify and confirm benthic species (flora and fauna) that inhabit the area) Identification of communities of sessile and slow-moving marine invertebrates (clams, quahogs, mussels, polychaetes, anemones, sponges, echinoderms) *Identification of potentially sensitive seafloor habitat* *Identification of important biogenic habitats:* *Hard bottom substrates with epifauna* *Hard bottom substrates with macroalgae* *Submerged aquatic vegetation (seagrass)* *Long-lived and habitat forming taxa (e.g., emergent fauna)*	CMECS Biotic Subclass CMECS Co-occurring Biotic Subclass CMECS Biotic Group CMECS Co-occurring Biotic Group Epifauna* Infauna* Sensitive taxa[1] Non-native taxa[1] Macroalgae Percent Cover* Burrows/Tubes/Tracks Eel grass	Epifauna* Successional Stage* Feeding voids Subsurface worms Brittle stars Eelgrass	CMECS Biotic Subclass CMECS Co-occurring Biotic Subclass CMECS Biotic Group CMECS Co-occurring Biotic Group CMECS Biotic Community CMECS Co-occurring Biotic Community Taxa Abundance (based on Benthic Community Analysis) Biomass (based on Benthic Community Analysis)	CMECS Biotic Subclass CMECS Co-occurring Biotic Subclass CMECS Biotic Group CMECS Co-occurring Biotic Group Fauna Observed

Source: BOEM, 2019, 2020b; NMFS, 2021

† NMFS Recommendations are indicated by use of italicized characters and support BOEM Guidelines with further detail.

* Indicates variable that is a CMECS modifier. CMECS Modifiers provide additional detail to further characterize habitat components using a consistent set of definitions.

[1] Indicates parameter analyzed by INSPIRE only

Notes:

All 2020 and 2021 analyses and data results can be found in Mayflower Wind COP Appendices M and M.2 Benthic and Shellfish Resources Characterization Reports, as well as in Integral Sediment Profile and Plan View Data Reports for Imaging Surveys conducted of the Mayflower Wind Project Areas.

2.2 Benthic Habitat Mapping Approach

The input data and outputs of INSPIRE's habitat mapping process are detailed in a simplified diagram presented in Figure 2-12. To map habitats for the purposes of assessing the potential impacts of the Project on these biotic communities, derived data products related to seabed characterization developed for the MSIR (COP Appendix E) and discussed in Section 2.1.1 of this report were used as a starting point for mapping benthic habitats relevant to demersal species utilization. These datasets on sediment type, boulders, geoforms, and bedforms (COP Appendix E, MSIR) were used in conjunction with geophysical data (bathymetry, backscatter, SSS) and benthic ground-truth data. All data were reviewed in an iterative process to delineate benthic habitats. Delineations must be of a size appropriate both to the resolution of the data and to the subject of interpretation. The resolution of the geophysical data, delineation size, and the use of CMECS Substrate Component, as well as additional CMECS modifiers, meet Federal agency recommendations (NMFS, 2021).

As discussed in Section 2.1.1 of this report, grain size distributions from analytical laboratory analysis were assessed in ground-truthing geophysical data for seabed sediment classifications (COP Appendix E, MSIR). Additional data collected during benthic surveys for purposes of benthic resource characterization (COP Appendices M and M.2, Benthic Resources) provide a wealth of information for use in describing the seafloor in terms of physical and biological characteristics of relevance to benthic biota and demersal fish. These data include the suite of parameters assessed from SPI/PV and GrabCam imagery (Table 2-1). As detailed in Section 2.1.2 of this report, these data were reviewed, evaluated, and summarized for purposes of supporting benthic habitat mapping. Summarized data values, along with associated imagery, were reviewed for each delineated seabed sediment polygon alongside 50-cm resolution bathymetry, 25-cm resolution backscatter, 10-cm SSS data, boulder fields, individual boulder picks, and seafloor morphological units (geoform, bedform, and biogenic) (Figure 2-13). Applying this additional review of benthic ground-truth data, INSPIRE delineated new habitat polygons and refined seabed sediment classifications as appropriate, as well as incorporated information on seafloor morphology into a single data set of classified and delineated benthic habitats for the Study Area; an example is included in Figure 2-14.

Using all benthic ground-truth data to refine seabed sediment classifications resulted in some categorical changes. For example, the entirety of Mount Hope Bay was classified as Gravelly Mud based on the laboratory results of two grab samples and the MSIR specifically notes that the gravel components could be shell rather than gravel and that information related to this compositional difference was not provided by the laboratory (see Table 2.2 in Appendix E2 to COP Appendix E, MSIR). Review of imagery-based ground-truth data in Mount Hope Bay revealed patchy to complete cover of shell fragments and/or living and/or non-living *Crepidula* (slipper shells). Ground-truth imagery also indicated *Crepidula* cover in polygons identified as Gravelly Mud in the Sakonnet River, RI. Where potential discrepancies between reported data and geophysical signatures were indicated and only reported GrabCam values were available, raw video was consulted. For example, at Station A021, the GrabCam CMECS Substrate Subgroup was reported as Gravelly Muddy Sand and *Crepidula* cover was evident in the video, and the presence of *Crepidula* was incorporated into the final habitat mapping. These types of discrepancies in summarized ground-truth results were infrequent.

Refinements to delineated seabed classifications included using more descriptive terminology to distinguish between different representations of Gravel as mapped in the MSIR (COP Appendix E, MSIR). Additionally, the geoform of Glacial Moraine/Till provided in the separate seabed morphology data layer that overlapped with Gravel sediment classifications in the MSIR data was mapped as a benthic habitat type (COP Appendix E, MSIR).

Furthermore, modifiers were used to provide additional descriptive information about the benthic habitats found within the Study Area; CMECS modifiers and Geoform, Substrate, or Biotic terms were used to the extent practicable. These modifiers include features of the seafloor that are relevant to the biota that utilize these habitats and describe the value of the habitats for these biota beyond what is provided in the geological seabed mapping. Modifiers are related to features that describe the mobility, stability, and complexity of the benthic habitats mapped. Where bedforms, such as mega-ripples and ripples, indicating frequent physical disturbance of the seafloor were observed across the majority of a habitat polygon, the "Mobile" modifier was used. Boulder fields were used to refine habitat boundaries and were applied as modifiers, except where they overlapped with habitat types that by their definition are characterized by the typical or frequent presence of boulder fields. Shell substrate (living or non-living shells), frequently comprised primarily of *Crepidula* (slipper shells) in the Study Area, provides unique habitats for certain species of benthic invertebrates and demersal fish; modifiers were applied where these features were present in ground-truth data and where they were indicated given nearby similar geophysical signatures and ground-truth data a "(Likely)" prefix was added to these modifiers. SAV provides unique habitats for certain species of benthic invertebrates and demersal fish; modifiers were applied for both recent and historical (modifier of "potential") areas of SAV in the Study Area.

All habitats and their distributions within the Study Area are described in more detail in Section 3.0. In addition to the primary habitat data on types and modifiers, separate attributes were included in the geospatial data to record several other features of each habitat polygon: area, type of bedforms observed, presence of scattered boulders and debris, and refinements of Coarse Sediment habitats. In addition to the natural bedforms defined in the BOEM Geophysical Survey Guidelines (2020a): mega-ripples = 5 – 60 m wavelength and 0.5 – 1.5 m height; ripples = <5 m wavelength and <0.5 m height; other bedforms such as ripple scour depressions and trawl marks were noted where present. The presence of isolated boulders and debris (boulder picks and debris contacts) were also noted as "Scattered boulders; Scattered debris" in the habitat data. Additionally, further characterizations of Coarse Sediment habitat polygons were recorded as "coarse sediment refinements" to provide additional detail on the nature of coarse sediment (e.g., gravelly sand, sandy gravel, no gravel in ground-truth) where such a distinction could be reliably made from ground-truth and geophysical data. These refinements were only applied to polygons in which ground-truth stations were located.

3. Results

3.1 Summary of Benthic Assessment Results Across Surveys

As discussed in Section 1.2, ground-truth data were collected at a total of 339 stations in the Study Area using a variety of benthic sampling techniques, and benthic data results were summarized for a suite of CMECS variables and other parameters that meet BOEM Guidelines (2019, 2020b) and NMFS Recommendations (2021) (Table 2-1). Results are presented for each individual station in Attachment B. Note that a small number of stations were assigned different IDs for different surveys. For the summarized data set, these spatially co-located stations were reassigned to an ID that was traceable to the individual survey IDs for that shared station.

Summarized station-level results in Attachment B include predominant values across all available replicate data at each station for Substrate Group, Substrate Subgroup, Biotic Subclass, and Co-occurring Biotic Subclass, presence/absence values for Attached Fauna, and types of sensitive taxa and non-native taxa, as well as the

mapped benthic habitat type within which each station was located is included in Attachment B. These summarized data are presented and discussed in conjunction with benthic habitat distributions in Section 3.3.

Measures of categorical variability and percentage predominance for Substrate Subgroup and Biotic Subclass for each station are also provided in Attachment B. Results across portions of the Study Area reveal that there was generally low to moderate variability and heterogeneity in Substrate Subgroup and Biotic Subclass (Figures 3-1 and 3-2). High predominance percentages across all portions of the Study Area indicates that Substrate Subgroup and Biotic Subclass were homogenous at the station level (Figure 3-2).

3.2 Benthic Habitat Types

Six primary benthic habitat types were mapped within the Study Area: Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, Mud to Muddy Sand, and Bedrock. When habitats were updated with modifiers, a total of 19 habitat types were mapped within the Study Area: 10 at the Brayton Point ECC in Federal Waters (GLD) and 18 at the Brayton Point ECC in RI State Waters. In addition, a few anthropogenic features (rock rubble, dredged material deposits) were mapped at the Brayton Point ECC in RI State Waters; these are not included in the counts of habitat types mapped (Table 3-1). For the purposes of aiding interpretation and presentation of data in ground-truth tables, individual benthic habitat types with modifiers have been grouped and color-coded to consolidate types of related habitats that are present in very small areas (Table 3-1).

Overall descriptions of each habitat type as observed across the Study Area are provided below and descriptions of spatial distribution within the Brayton Point ECC in Section 3.3. Two tables are provided for each portion of the Study Area; the first gives spatial distributions and characteristics of the benthic habitat types, and the second provides key abiotic and biotic information derived from ground-truth variables located within the various benthic habitats sampled. Specifically, this information is provided in Tables 3-2 and 3-3 for the Brayton Point ECC in Federal Waters (GLD), and in Tables 3-4 and 3-5 for the Brayton Point ECC in RI State Waters. The color key presented in Table 3-1 is utilized in all these tables.

3.2.1 Glacial Moraine and Bedrock

Glacial moraines are complex and heterogeneous environments with characteristic surface and subsurface features that relate to their glacial origin. They are complex landforms associated with deposition of sediment carried by glaciers during advance and retreat. Typically, they consist of unstratified drift (till or diamicton) but may have a complex structure with stratified drift interbedded with till and abundant erratic boulders (Bennet and Glasser 2009). Till is characteristically composed of a poorly sorted mix of pebbles, cobbles and/or boulders within a fine-grained matrix of silt and clay. Till has a wide range of origins including supraglacial and subglacial that affect the nature of the deposits (Bennet and Glasser, 2009). It displays distinctive patterns in geophysical data with a wide range of geotechnical properties depending upon the processes that formed it (O´Cofaigh et al., 2007). In southern New England, the glacial moraine landform has a topographic pattern where higher topographic areas can be formed by coarser-grained sediment (e.g., cobbles and boulders) derived from patches of basal till deposited when the ice advanced across the moraine prior to retreat, and lower areas are typically composed by modern sands that have filled meltwater channels (Oldale and O'Hara, 1984). Deposits on the surface of glacial moraine landforms can be a mix of till, stratified drift, and reworked sediments derived from the glacial deposits and subsequent marine transgression. Subsurface expressions of glaciation are present in the Study Area and are reviewed in detail in the Marine Site Investigation Report (COP Appendix E, MSIR); only the surface expressions of these geologic features represent benthic habitats and are of relevance to the assessment presented here.

End moraine deposits on the islands and Martha's Vineyard and Nantucket represent the southern limit of the Wisconsinan and Illinoian glacial maximums (Uchupi et al., 2001). The Brayton Point ECC crosses the offshore extension of the Martha's Vineyard moraine (see Figure 2.1 in COP Appendix E, MSIR). The Martha's Vineyard moraine is rugged and boulder-strewn where it intersects the Brayton Point ECC (COP Appendix E, MSIR). Closer to RI, the Brayton Point ECC also crosses the offshore extension of the Buzzards Bay moraine and near the mouth of the Sakonnet River crosses a terminal moraine that is perhaps an extension of the Point Judith moraine (as mapped by Baldwin et al., 2016).

Narragansett Bay and Rhode Island Sound were once both glacial lakes and Narragansett Bay is a drowned river valley that was shaped by actions of the Laurentide ice sheet during the last glacial period (~18,000 years ago). Channels cut by the ice are evident in the channels of the West and East Passages of the Bay on either side of Conanicut Island. Deglaciation and modern geological action have continued to influence the seafloor and benthic habitats found within Narragansett Bay and Rhode Island Sound. Moraine and bedrock features were present as discrete surface outcroppings and reefs near the southern end of Mount Hope Bay near Aquidneck Island.

The surface benthic habitats associated with glacial moraines often provide habitat for sessile and mobile benthic invertebrates and for demersal fish. Glacial moraine habitats have previously been mapped in the MA/RI WEA as two types (A and B), in order to distinguish unconsolidated glacial moraine deposits (A) from consolidated moraine habitats that have high structural complexity and structural permanence (B) (INSPIRE, 2020; INSPIRE, 2021). Glacial Moraine B habitat was not mapped in the Brayton Point ECC. Glacial Moraine A habitat was mapped at the Brayton Point ECC in both in Federal Waters (GLD) and RI State Waters (specifically in RI Sound and as discrete outcroppings near Aquidneck Island in Mount Hope Bay) (Table 3-1). Small discrete bedrock outcrops are often found near moraine deposits and were mapped at the Brayton Point ECC in RI State Waters (Table 3-1); these habitats are not discussed further and were not sampled by ground-truth data collections.

Glacial Moraine A habitat are complex habitats composed of consolidated and unconsolidated geologic debris directly deposited by glacial movement (rather than reworking from meltwaters or transgressive seas) and are limited in distribution along the outer continental shelf near New England. Due to the presence of very coarse and poorly sorted sediment, the seabed of this habitat type generally exhibits high reflectance in backscatter data, and SSS data reveal a patchwork mosaic of irregularly distributed features, including boulders, textures indicating high prevalence of smaller gravels, and discrete areas of loose mobile sediments near/at the boulders, which can display morphological features (ripples) (Figure 3-3). By definition, these habitats are frequently characterized by boulder fields with boulders, and smaller gravels, present in varying densities; therefore, boulder field modifiers were not applied to the Glacial Moraine A habitat type.

CMECS Substrate Subgroups identified at the 15 stations sampled within Glacial Moraine A habitats included Gravel Pavement, Muddy Gravel, Sandy Gravel, Muddy Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand, and Very Coarse/Coarse Sand (Tables 3-3 and 3-5). Ripples were also present within these habitats where mapped in Federal Waters (GLD) at the Brayton Point ECC (Table 3-2). Although there are generally high densities of pebbles, cobbles, and boulders in areas designated as Glacial Moraine A, these broad areas of high density are rarely continuous. Rather, their distribution is patchy and a high degree of heterogeneity was observed among ground-truth sampling within Glacial Moraine A habitat (Tables 3-3 and 3-5). The 15 ground-truth stations sampled within Glacial Moraine A habitat represent the range and heterogeneity of sediment types and biota found within these habitats (Tables 3-3 and 3-5). Notably, the Attached Fauna were present at most stations sampled (80% at the Brayton Point ECC in Federal Waters (GLD), 90% at the Brayton Point ECC in RI State Waters) and the sensitive

taxa of the northern star coral *Astrangia poculata* were observed at the Brayton Point ECC in Federal Waters (GLD) (20% of stations) and in RI State Waters (80% of stations) (Tables 3-3 and 3-5).

3.2.2 Mixed-Size Gravel in Muddy Sand to Sand

Mixed-Size Gravel in Muddy Sand to Sand habitats composed of varying sizes of gravels dispersed and patchy on the surface of soft sediments were mapped at the Brayton Point ECC in both Federal Waters (GLD) and RI State Waters (Table 3-1). Although the small boulders (<0.3 m) and cobbles present in this habitat were smaller than the threshold for detecting individual objects from the geophysical data, their presence was evident by the irregular textures and patterns in side-scan sonar data and then confirmed by ground-truth data (Figures 2-8 and 3-4). These habitats generally exhibited moderate to high relative backscatter returns (Figure 3-4). Boulder fields often intersected this habitat type, and the Boulder Field(s) modifiers was not applied to the habitat classification.

Ground-truth data were essential to identifying this habitat type and CMECS Substrate Subgroups identified at the 29 stations sampled included Gravel Pavement, Sandy Gravel, Muddy Gravel, Gravelly Sand, Gravelly Muddy Sand, Medium Sand, and Fine/Very Fine Sand (Tables 3-3 and 3-5). Ripples were observed in a small percentage of this habitat type where mapped (Tables 3-2 and 3-4). Attached Fauna were present at 75% of the 4 stations sampled within Mixed-Size Gravel in Muddy Sand to Sand habitats in Federal Waters (GLD) and at 28% of 25 stations sampled within RI State Waters (Tables 3-3 and 3-5). This habitat type supports a diverse range of attached and soft sediment taxa, as well as the sensitive taxa of the northern star coral (Tables 3-3 and 3-5).

3.2.3 Coarse Sediment Habitats

Coarse Sediment habitat types encompass sands with varying degrees of gravel (~5-80% of the surface composition). Coarse Sediment habitats within the Study Area included a broad range of habitats. Coarse Sediment habitats, with various and multiple modifiers (Mobile, Boulder Field(s)), were mapped at the Brayton Point ECC in Federal Waters (GLD) and in RI State Waters (Table 3-1). The seafloor of these habitat types exhibited generally medium to high reflectance values in backscatter and SSS data (Figure 3-5). The Coarse Sediment – Mobile habitat type is characterized by distinct, regular, and prevalent ripples evident in the SSS data (Figure 3-5) where the seafloor is subjected to small, but frequent currents and storm events and is common on the outer continental shelf (Figure 3-5). Ground-truth data provided sufficient information to determine the composition of gravels within Coarse Sediment habitat types and allowed for Coarse Sediment refinement variables to be applied; for example, Sandy Gravel and Gravelly Sand. The Mobile modifier was applied where ripples were present throughout most of the given habitat polygon. In the Coarse Sediment and/or Coarse Sediment – Mobile with Boulder Field(s) habitat types the seafloor exhibited variability and rugosity and ripples were interspersed with boulders (Figure 3-5).

CMECS Substrate Subgroups identified at the 26 stations sampled within Coarse Sediment – Mobile habitat at the Brayton Point ECC in Federal Waters (GLD) included Gravelly Sand, Gravelly Muddy Sand, Very Coarse/Coarse Sand, Medium Sand, and Fine/Very Fine Sand (Table 3-3). Soft sediment taxa were predominantly observed at stations sampled within Coarse Sediment – Mobile habitats at the Brayton Point ECC in Federal Waters (GLD) with Attached Fauna present at less than 10% of these stations (Table 3-2). No sensitive taxa or non-native taxa were observed in Coarse Sediment habitats. No stations were sampled with Coarse Sediment habitats within RI State Waters.

3.2.4 Sand Habitats

The Sand habitat types consist of sand that has been subjected to a wide range of oceanic processes. These habitat types are very common on the outer continental shelf and were mapped in all portions of the Study Area (Table

3-1). The seafloor of these habitats exhibited a range of values in backscatter and SSS data reflectance but were predominantly low to medium (Figure 3-6). The Sand and Muddy Sand – Mobile habitat type describes these sandy habitats where the seafloor is subjected to small but frequent currents and storm events and ripples were prevalent (Tables 3-2 and 3-4; Figure 3-6). Sand – with Boulder Field(s) habitats were mapped at the Brayton Point ECC in Federal Waters (GLD) and RI State Waters (Tables 3-2 and 3-4).

CMECS Substrate Subgroups identified at the 130 stations sampled within Sand habitat types ranged from Sandy Gravel to Fine/Very Fine Sand (Tables 3-3 and 3-5). Sand habitats predominantly supported soft sediment taxa, except where the Boulder Field(s) modifier was applied at the Brayton Point ECC in Federal Waters (GLD) and Attached Fauna were observed at 40% of the stations sampled within these Sand with Boulder Field(s) habitats (Table 3-3). Attached Fauna were also observed at a small percentage of stations within other Sand habitat types (Tables 3-3 and 3-5). The sensitive taxa of northern star coral and a possible non-native tunicate *Didemnum* spp. were also recorded in Sand with Boulder Field(s) at the Brayton Point ECC in Federal Waters (GLD) at very low prevalence.

3.2.5 Mud to Muddy Sand Habitats

The Mud to Muddy Sand habitat types consist of relatively featureless mud, sandy mud, and muddy sand, except where described by modifiers for boulder fields, shell or *Crepidula*, SAV, and/or mobility. These habitats were mapped in all portions of the Study Area (Table 3-1). The seafloor of these habitats exhibited predominantly low backscatter and SSS reflectance indicating that the surface is less dense and the sediments more fine-grained compared to other habitat types, with variability in acoustic signatures related to the various modifiers applied.

CMECS Substrate Subgroups identified at the 114 stations sampled within Mud to Muddy Sand habitat types included Muddy Gravel, Gravelly Muddy Sand, Gravelly Mud, Medium Sand, Fine/Very Fine Sand, and Muddy Sand (Tables 3-3 and 3-5). At the 40 stations sampled within Mud to Muddy Sand – *Crepidula* Substrate, Substrate Subgroups were Pebble/Granule, Sandy Gravel, Muddy Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand, and Gravelly Mud; all of these stations were with the RI State Waters portion of the Brayton Point ECC (Table 3-5). It is important to note that many of these Subgroup determinations were derived from laboratory analysis of sediment samples which may report shell as gravel (COP Appendix E, MSIR). The Mud to Muddy Sand habitat types generally supported soft sediment taxa with a very low prevalence of Attached Fauna, except where the *Crepidula* Substrate modifier was applied (Tables 3-3 and 3-5).

3.2.6 *Crepidula* Substrate

Crepidula Substrate was mapped as a modifier in Mud to Muddy Sand – with Boulder Field(s), and Mud to Muddy Sand habitats (Table 3-1). The seafloor of these habitat types exhibited generally medium to high reflectance values in backscatter and SSS data (Figure 3-7). Ripples were present with low prevalence, 15% in Mud to Muddy Sand – *Crepidula* Substrate at the Brayton Point ECC in RI State Waters (Table 3-4).

Ground-truth data were essential to identifying this habitat type and CMECS Substrate Subgroups identified at the 40 stations sampled were Pebble/Granule, Sandy Gravel, Muddy Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand, and Gravelly Mud (Table 3-5). The CMECS Biotic Subclass of Mollusk Reef Biota was used at some stations to capture dominant *Crepidula* cover (COP Appendices M and M.2, Benthic Resources), and, where patchy in cover, *Crepidula* were captured as part of Attached Fauna presence (Table 3-5).

3.2.7 Submerged Aquatic Vegetation

Mud to Muddy Sand habitats with the potential for SAV were mapped at Brayton Point ECC in RI State Waters, nearshore at the northern end of the Sakonnet River (Table 3-1). Distinct side-scan sonar data signatures indicated

the potential presence of SAV in shallow, nearshore waters south of Aquidneck Island at Portsmouth, RI at the Brayton Point ECC in RI State Waters. Due to the shallow depths in these locations that create accessibility issues for survey vessels, no benthic ground-truth stations were collected.

Table 3-1. Color-coded Key to Benthic Habitat Types with Modifiers and Related Groupings for Ground-truth Tables and Plots

Benthic Habitat Types with Modifiers	Brayton Pt – Fed (GLD)	Brayton Pt – RI	Habitat Color	Grouped Habitat Color	Grouped Habitat Category
Glacial Moraine A	X	X			not grouped
Mixed-Size Gravel in Muddy Sand to Sand	X	X			not grouped
Coarse Sediment – with Boulder Field(s)		X			Coarse Sediment – with Boulder Field(s)
Coarse Sediment – Mobile with Boulder Field(s)	X				
Coarse Sediment – Mobile	X				not grouped
Coarse Sediment	X	X			not grouped
Sand – with Boulder Field(s)	X	X			Sand – with Boulder Field(s)
Sand – Mobile with Boulder Field(s)	X	X			
Sand – Mobile	X	X			not grouped
Sand	X	X			not grouped
Mud to Muddy Sand – with SAV		X			Mud to Muddy Sand or Sand - SAV
Mud to Muddy Sand – *Crepidula* Substrate with Boulder Field(s)		X			Mud to Muddy Sand - with Boulder Field(s)
Mud to Muddy Sand – (Likely) *Crepidula* Substrate with Boulder Field(s)		X			
Mud to Muddy Sand – Shell / *Crepidula* Substrate		X			Mud to Muddy Sand – *Crepidula* Substrate
Mud to Muddy Sand – *Crepidula* Substrate		X			
Mud to Muddy Sand – (Likely) *Crepidula* Substrate		X			
Mud to Muddy Sand – Mobile		X			Mud to Muddy Sand
Mud to Muddy Sand	X	X			
Bedrock		X			not grouped
Anthropogenic		X			not grouped

3.3 Benthic Habitat Distributions

The geophysical and benthic survey data collected by Mayflower Wind have refined the understanding of the distribution of habitats within the Study Area. While six primary benthic habitat types were mapped (nineteen with modifiers) not all types were present in each portion of the Study Area (Table 3-1) or in equal or consistent distributions within or between portions. Habitat composition and characteristics and corresponding ground-truth data within each portion of the Study Area are provided in Tables 3-2 through 3-5. The color key presented in Table 3-1 is utilized in all tables.

A total of ~9,908 acres were mapped at the Brayton Point ECC in Federal Waters (GLD) (Table 3-2). Over 85% of this area was mapped as Sand, Sand – Mobile, or Mud to Muddy Sand habitat types (Table 3-2). Where the Brayton Point ECC enters RI's GLD areas, predominant habitats are Sand and Sand – Mobile before transitioning to a mix of Sand and Coarse Sediment – Mobile habitats with discrete boulder fields (Figure 3-8). Where the Brayton Point ECC crosses Southwest Shoal, benthic habitats are a combination of Glacial Moraine A and Sand – with Boulder Field(s) (Figure 3-8), corresponding to the offshore extension of the Martha's Vineyard moraine (COP Appendix E, MSIR). From Southwest Shoal northwest to the RI State Waters line, the Brayton Point ECC is primarily composed of Sand habitats with small areas of Mud to Muddy Sand and of Sand – with Boulder Field(s) (Figure 3-8).

A total of ~6,036 acres were mapped at the Brayton Point ECC in RI State Waters (Table 3-4), with distinct differences in habitat composition related to spatial location, namely RI Sound, the Sakonnet River, and Mount Hope Bay (Figure 3-9). Forty-one percent of the Brayton Point ECC in RI State Waters was comprised of Mud to Muddy Sand habitat, and 21% of Sand habitat (Table 3-4). The Sand habitat type was mapped in RI Sound and at the mouth of the Sakonnet River. Mud to Muddy Sand habitats were the primary habitat types mapped throughout the Sakonnet River and Mount Hope Bay (Figure 3-9), which are both depositional estuarine environments. *Crepidula* Substrate was found overlying these muds in some areas of the upper Sakonnet River and in the lower Mount Hope Bay (Figure 3-9). Very small areas of Mud to Muddy Sand – with Boulder Field(s), Glacial Moraine A, and Bedrock habitat types were mapped in the lower portion of Mount Hope Bay near Aquidneck Island (Figure 3-9), and larger areas of Glacial Moraine A were mapped in RI Sound near the RI State Waters line. Intermixed with these habitats and extending further north were Mixed-Size Gravel in Muddy Sand to Sand habitats interspersed with Sand habitats (Figure 3-9). The distribution of these habitats is related to the offshore extension of the Buzzards Bay moraine, a terminal moraine that is perhaps an extension of the Point Judith moraine near the mouth of the Sakonnet River (as mapped by Baldwin et al., 2016; COP Appendix E, MSIR).

Clusters of individual surficial boulders generally corresponded with the distribution of habitat types with gravel components (Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand – with Boulder Field(s)) and proximal areas; specifically, at and to either side of Southwest Shoal, near the RI State Waters line offshore, in RI Sound from the RI State Waters Line to the mouth of the Sakonnet River, and in the lower portion of Mount Hope Bay near Aquidneck Island (Figures 3-10 and 3-11).

A total of 314 benthic ground-truth stations were sampled in the Study Area; 146 in Federal Waters (GLD) and 168 in RI State Waters (Tables 3-3 and 3-5). Generally, CMECS Substrate classification defined by >30% gravel composition (Gravel Pavement, Sandy Gravel, Muddy Sandy Gravel), corresponded with Glacial Moraine A and Mixed-Size Gravel in Muddy Sand to Sand habitats. CMECS classifications at ground-truth stations defined by <30% gravel (Gravelly Sand, Gravelly Muddy Sand, Gravelly Mud) were also found in these habitats, as well as in Coarse Sediment – Mobile habitats in the Federal Waters (GLD) portion of the Brayton Point ECC (Figures 3-12 and 3-13). CMECS Substrate classifications composed of various sand grain size composition corresponded to Sand and also Mud to Muddy Sand habitats, and those ground-truth stations classified as Mud, Sandy Mud, or Muddy Sand were

found in the Mud to Muddy Sand habitats (Figures 3-12 and 3-13). Most of the Brayton Point ECC was dominated by the Biotic Subclass of Soft Sediment Fauna, as these were supported by soft bottom sediments in soft bottom sand and mud habitat types and in patches within gravel habitat types (Figures 3-14 and 3-15). Distribution of Attached Fauna corresponded well with habitats defined by high prevalence of large gravels: Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, and those with Boulder Field(s) (Figures 3-14 to 3-17). Northern star coral were observed at the Brayton Point ECC in Federal Waters (GLD), corresponding with Glacial Moraine A and Sand – with Boulder Field(s) habitats at Southwest Shoal (Table 3-3; Figure 3-18), and in RI State Waters in RI Sound corresponding with Glacial Moraine A and Mixed-Size Gravel in Muddy Sand to Sand habitats (Table 3-5; Figure 3-19). One possible occurrence of the non-native tunicate *Didemnum* spp. was recorded in Sand – with Boulder Field(s) habitat in the Federal Waters (GLD) portion of the Brayton Point ECC at Southwest Shoal (Figure 3-20).

Table 3-2. Composition & Characteristics of Mapped Benthic Habitat Types within the Brayton Point Export Cable Corridor in GLD Portion of Federal Waters

Brayton Point ECC – Federal Waters (GLD) ***(~9,908 acres mapped)***	**Presence in Brayton Point ECC – Federal Waters(GLD)**		**Bedforms** *Type Present in Given Percentage of Habitats*		
	Area (acres)	Percentage	Mega-ripples	Ripples	RSD
Glacial Moraine A	411	4.1%	0%	57.8%	0%
Mixed-Size Gravel in Muddy Sand to Sand	18	0.18%	0%	16.8%	42.5%
Coarse Sediment – Mobile with Boulder Field(s)	140	1.41%	0%	100%	0%
Coarse Sediment – Mobile	886	8.9%	0%	99.9%	0.06%
Coarse Sediment	0.08	0.001%	0%	0%	0%
Sand – with Boulder Field(s)	183	1.8%	0%	2.6%	56.4%
Sand – Mobile with Boulder Field(s)	622	6.3%	0%	92.5%	7.5%
Sand – Mobile	2,869	29.0%	7.3%	59.4%	40.6%
Sand	3,982	39.7%	0%	4.2%	55.4%
Mud to Muddy Sand	850	8.6%	0%	0%	23.0%

RSD = Ripple Scour Depression

Table 3-3. Characteristics of Mapped Benthic Habitat Types as Informed by Benthic Ground-truth Data within the Brayton Point Export Cable Corridor in Federal Waters (GLD)

Brayton Point ECC – Federal Waters (GLD) ***(~9,908 acres mapped)***		**Glacial Moraine A**	**Mixed-Size Gravel in Muddy Sand to Sand**	**Coarse Sediment – Mobile**	**Sand – with Boulder Field(s)**	**Sand – Mobile**	**Sand**	**Mud to Muddy Sand**
SPI/PV Ground-truth Values	Number of Benthic stations[1]	5	4	26	25	46	31	9
	Predominant CMECS Substrate Subgroups Observed in Ground-truth Data[2]	Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand	Gravelly Sand, Medium Sand, Fine/Very Fine Sand	Gravelly Sand, Gravelly Muddy Sand, Very Coarse/Coarse Sand, Medium Sand, Fine/Very Fine Sand	Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand, Very Coarse/Coarse Sand, Medium Sand, Fine Sand, Fine/Very Fine Sand	Sandy Gravel, Gravelly Sand, Very Coarse/Coarse Sand, Medium Sand, Fine/Very Fine Sand	Gravelly Muddy Sand, Medium Sand, Fine/Very Fine Sand, Muddy Sand	Medium Sand, Fine/Very Fine Sand, Muddy Sand
	Predominant CMECS Biotic Subclasses Observed in Ground-truth Data	Attached Fauna, Inferred Fauna, Soft Sediment Fauna	Attached Fauna, Inferred Fauna	Inferred Fauna, Soft Sediment Fauna	Attached Fauna, Inferred Fauna, Soft Sediment Fauna	Inferred Fauna, Soft Sediment Fauna	Inferred Fauna, Soft Sediment Fauna	Inferred Fauna, Soft Sediment Fauna
	Presence of Attached Fauna Observed in Ground-truth Data (% of stations)	Yes (80.0%)	Yes (75.0%)	Yes (7.7%)	Yes (40.0%)	Yes (4.3%)	No	No
	Sensitive Taxa Observed in Ground-truth Data (% of stations)[3]	Northern Star Coral (20.0%)	None	None	Northern Star Coral (4.0%)	None	None	None
	Non-Native Taxa Observed in Ground-truth Data (% of stations)[3]	None	None	None	Possible *Didemnum* spp. (4.0%)	None	None	None

Notes:
Of the 10 total habitat types mapped (Table 3-2), 7 intersect with ground-truth stations.
1 Benthic sampling includes SPI/PV, grab, and GrabCam stations
2 Substrate Subgroup determined from combined SPI/PV analysis
3 Sensitive and Non-Native Taxa determined from PV analysis

Table 3-4. Composition & Characteristics of Mapped Benthic Habitat Types within the Brayton Point Export Cable Corridor in RI State Waters

Brayton Point ECC – RI State Waters *(~6,036 acres mapped)*	**Presence in Brayton Point ECC – RI State Waters**		**Bedforms** *Type Present in Given Percentage of Habitats*	
	Area (acres)	Percentage	Ripples	RSD
Glacial Moraine A ***Predominantly in RI Sound***	185	3.1%	0%	0%
Mixed-Size Gravel in Muddy Sand to Sand ***Only in RI Sound***	510	8.5%	16.0%	0%
Coarse Sediment – with Boulder Field(s) ***Only in RI Sound***	0.004	0.0001%	0%	0%
Coarse Sediment ***Only in RI Sound***	0.1	0.001%	0%	0%
Sand – with Boulder Field(s) ***Only in RI Sound***	61	1.0%	0%	74.7%
Sand – Mobile with Boulder Field(s) ***Only in RI Sound***	33	0.6%	11.2%	88.8%
Sand – Mobile ***Only in RI Sound***	121	2.0%	8.7%	91.3%
Sand ***In RI Sound & the Sakonnet River***	1,263	20.9%	31.6%	62.8%
Mud to Muddy Sand – with SAV ***Only in the Sakonnet River***	3.6	0.06%	0%	0%
Mud to Muddy Sand – *Crepidula* Substrate with Boulder Field(s) ***Only in Mount Hope Bay***	4.4	0.07%	0%	0%
Mud to Muddy Sand – (Likely) *Crepidula* Substrate with Boulder Field(s) ***Only in Mount Hope Bay***	86	1.4%	0%	0%
Mud to Muddy Sand – Shell / *Crepidula* Substrate ***Only in Mount Hope Bay***	511	8.5%	0%	0%
Mud to Muddy Sand – *Crepidula* Substrate ***In the Sakonnet River & Mount Hope Bay***	704	11.7%	15.0%	0%
Mud to Muddy Sand – (Likely) *Crepidula* Substrate ***Only in the Sakonnet River***	37	0.62%	0%	0%
Mud to Muddy Sand – Mobile ***Only in the Sakonnet River***	29	0.48%	100%	0%
Mud to Muddy Sand ***In the Sakonnet River & Mount Hope Bay***	2,476	41.0%	0%	0%
Bedrock ***In the Sakonnet River & Mount Hope Bay***	3.3	0.06%	0%	0%
Anthropogenic ***In the Sakonnet River & Mount Hope Bay***	6.7	0.11%	0%	0%

RSD = Ripple Scour Depression

Table 3-5. Characteristics of Mapped Benthic Habitat Types as Informed by Benthic Ground-truth Data within the Brayton Point Export Cable Corridor in RI State Waters, *continued on next page*

Brayton Point ECC – RI State Waters ***(~6,036 acres mapped)***		**Glacial Moraine A** ***Predominantly in RI Sound***	**Mixed-Size Gravel in Muddy Sand to Sand** ***Only in RI Sound***	**Sand – with Boulder Field(s)** ***Only in RI Sound***	**Sand – Mobile** ***Only in RI Sound***
SPI/PV Ground-truth Values	Number of Benthic stations[1]	10	25	4	4
	CMECS Substrate Subgroups Observed in Ground-truth Data[2]	Gravel Pavement, Sandy Gravel, Muddy Sandy Gravel, Muddy Gravel, Very Coarse/Coarse Sand	Gravel Pavement, Sandy Gravel, Muddy Gravel, Gravelly Sand, Gravelly Muddy Sand, Medium Sand, Fine/Very Fine Sand	Sandy Gravel, Medium Sand, Fine/Very Fine Sand	Gravelly Sand, Medium Sand
	CMECS Biotic Subclasses Observed in Ground-truth Data	Attached Fauna, Soft Sediment Fauna	Attached Fauna, Inferred Fauna, Soft Sediment Fauna	Inferred Fauna, Soft Sediment Fauna	Attached Fauna, Soft Sediment Fauna
	Presence of Attached Fauna Observed in Ground-truth Data (% of stations)	Yes (90.0%)	Yes (28.0%)	No	Yes (25.0%)
	Sensitive Taxa Observed in Ground-truth Data (% of stations)[3]	Northern Star Coral (80.0%)	Northern Star Coral (12.0%)	None	None
	Non-Native Taxa Observed in Ground-truth Data (% of stations)[3]	None	None	None	None

Notes:
N/A = Not Applicable
Of the 18 total habitat types mapped (Table 3-4), 8 intersect with ground-truth stations.
1 Benthic sampling includes SPI/PV, grab, and GrabCam stations
2 Substrate Subgroup determined from combined SPI/PV analysis
3 Sensitive and Non-Native Taxa determined from PV analysis

Table 3-5. Continued

Brayton Point ECC – RI State Waters ***(~6,036 acres mapped)***		**Sand** ***In RI Sound & the Sakonnet River***	**Mud to Muddy Sand – with Boulder Field(s)** ***Only in Mount Hope Bay***	**Mud to Muddy Sand – *Crepidula* Substrate** ***In the Sakonnet River & Mount Hope Bay***	**Mud to Muddy Sand** ***In the Sakonnet River & Mount Hope Bay***
SPI/PV Ground-truth Values	Number of Benthic stations[1]	20	1	40	64
	CMECS Substrate Subgroups Observed in Ground-truth Data[2]	Medium Sand, Fine/Very Fine Sand	N/A	Pebble/Granule, Sandy Gravel, Muddy Sandy Gravel, Gravelly Sand, Gravelly Muddy Sand, Gravelly Mud	Muddy Gravel, Gravelly Muddy Sand, Muddy Sand, Fine/Very Fine Sand, Gravelly Mud
	CMECS Biotic Subclasses Observed in Ground-truth Data	Inferred Fauna, Soft Sediment Fauna	None	Attached Fauna, Inferred Fauna, Mollusk Reef Biota, Soft Sediment Fauna	Inferred Fauna, Soft Sediment Fauna
	Presence of Attached Fauna Observed in Ground-truth Data (% of stations)	No	No	Yes (40.0%)	Yes (1.6%)
	Sensitive Taxa Observed in Ground-truth Data (% of stations)[3]	None	None	None	None
	Non-Native Taxa Observed in Ground-truth Data (% of stations)[3]	None	None	None	None

Notes:
N/A = Not Applicable
Of the 18 total habitat types mapped (Table 3-4), 8 intersect with ground-truth stations.
1 Benthic sampling includes SPI/PV, grab, and GrabCam stations
2 Substrate Subgroup determined from combined SPI/PV analysis
3 Sensitive and Non-Native Taxa determined from PV analysis

4. Discussion

The Study Area for this Project includes the Brayton Point ECC in Federal Waters that overlap with RI's GLD and in RI State Waters. Relevant Project components and/or activities within the Study Area include the export cable, any necessary secondary cable protection, and all related seafloor preparation, construction, operation and maintenance, and decommissioning activities. The only anticipated permanent impact to the seafloor would be secondary cable protection.

The primary objective is to achieve a suitable target burial depth of the offshore export cables in the seabed along the entire cable route by micro-routing the cables within the ECC and by assessing and selecting suitable installation/burial tools for the seabed conditions. Secondary cable protection will be used where sufficient burial depth cannot be achieved due to seabed conditions or to avoid risk of interaction with external hazards, including at locations where cables are required to cross existing pipelines. The specific secondary protection materials to be used will be considered and selected as the final cable design and installation engineering is developed; these could include concrete mattresses, frond mattresses, rock bags, and/or rock berms.

For the purposes of this assessment, secondary cable protection on up to 15% of the length of the Brayton Point ECC , including at cable and pipeline crossings, is assumed. The need for secondary cable protection will be minimized to the extent practicable through refinement of cable design and installation engineering decisions (including micro-routing, cable bundling, and burial tool selection as described above). The secondary cable protection will measure approximately 6 m wide, where used.

Temporary impacts may result from seafloor preparation and cable installation activities. Boulder removal/relocation and anchoring are currently only anticipated along discrete segments of the Brayton Point ECC (Figure 4-1). Temporary impacts expected at each landfall are related to the offshore HDD exit pits where the export cables will be un-bundled and brought ashore via HDD. Each offshore export power cable will be installed in a separate HDD conduit in its own bore (communications cabling will be installed in the same HDD bore as a power cable, possibly in its own smaller sub-conduit). A total of four HDDs are considered at each landfall location; this consists of one HDD for each offshore export power cable (two HDDs) plus an additional two HDDs and conduits considered for potential future transmission infrastructure (including potential future export cables from the Mayflower Wind lease area).

At the offshore exit point of each HDD, an offshore exit pit may be excavated to support HDD installation and cable pull-in operations. Figure 4-2 illustrates potential locations of these offshore exit points on either side of Aquidneck Island. Offshore exit point locations for the HDDs may still be further adjusted as the final HDD trajectory design is developed and will be sited considering seabed characteristics in the area at and surrounding the exit point.

All of the potential HDD exit pit locations under consideration in RI State Waters are located within Mud to Muddy Sand – *Crepidula* Substrate or Shell / *Crepidula* Substrate (Figure 4-2). It is expected that *Crepidula* gastropods would recolonize areas disturbed by the HDD exit construction relatively quickly for several reasons. First, in this region, *Crepidula* are present and extend over a much broader area than the specific areas that would be disturbed at the HDD exit point. This regional population will be a source of larvae to aid in recolonization of the disturbed seafloor. Timing for recolonization will depend on larval

recruitment; the gregarious settlement of their larvae on conspecifics (Zhao and Qian 2002) generally leads to very dense accumulations with a flat, reef-like texture as live shells build over dead shells. *Crepidula* have relatively high fecundity, typically reproducing in the spring and/or summer, and often females will reproduce twice per year (Pechenik et al., 2017; Proestou et al., 2008; Richard et al., 2006). These life cycle characteristics aid in the proliferation of *Crepidula* populations and allow for the recovery of populations following disturbance given a source of larvae is maintained. *Crepidula* are native to the U.S. Atlantic coast but have been successful at quickly spreading in the U.S. Pacific Northwest and in Europe where they are not native (SERC, 2022). This indicates that Crepidula are capable of recolonizing an area relatively easily following a disturbance such as HDD exit pit excavation.

The habitats mapped within the Study Area in Federal Waters (GLD) were primarily soft bottom with dynamic sands and muds typical of offshore environments in Southern New England (Table 3-2). These habitats provide a mix of mobile sands and depositional muddy environments that support a combination of small and large tube-building and burrowing infauna, as well as mobile epifauna (mollusks and crustaceans). Where Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, and Coarse Sediment or Sand habitats with Boulder Fields were mapped in the Study Area, these habitats provide structure to support attached fauna and demersal fish, such as black sea bass and tautog, that utilize hard bottom substrates and structure. Within the RI State Waters portion of the Study Area, these structure-providing habitats were predominantly mapped in Rhode Island Sound and in small discrete areas of Mount Hope Bay near Aquidneck Island. Much of the Sakonnet River was characterized as depositional mud habitats, which support a combination of small and large tube-building and burrowing infauna, as well as mobile epifauna (mollusks and crustaceans). Discrete patches of *Crepidula* cover were also mapped; these filter-feeding gastropods provide filtration ecosystem services. This mapping effort adds to the collective understanding of benthic habitats in the offshore waters of Rhode Island Sound and within the Sakonnet River and Mount Hope Bay given that few published benthic studies cover this specific area.

Several recently published studies are available in the peer-reviewed and gray literature related to benthic habitats and fauna within Narragansett Bay, which include the Sakonnet River and/or Mount Hope Bay (e.g., LaFrance et al., 2019; Hale et al., 2018; Shumchenia and King, 2019; Shumchenia et al., 2016). The benthic habitats and their characterizing sediments and benthic biological communities as mapped for this Mayflower Wind assessment generally agree with these recent publications. Surficial sediment and benthic habitat maps compiled from a suite of geophysical data and sediment grab samples show Mount Hope Bay as composed primarily of Sandy Mud and Mud (LaFrance et al., 2019). The Sakonnet River was not mapped in this study.

Recent biotopes mapped from a SPI survey conducted throughout Narragansett Bay in 2018 (Shumchenia and King, 2019) provide further support for the habitat types mapped in the Sakonnet River and Mount Hope Bay by Mayflower Wind. For example, “Mud with Crepidula Beds” was the biotope identified at the sampling station in that study coincident with the Mud and Sandy Mud with *Crepidula* Substrate habitat type mapped by Mayflower Wind at the northern end of the Sakonnet River. Similarly, “Mud with Shell Hash and burrowers” was documented at two stations sampled in that study at the southwestern end of Mount Hope Bay coinciding with and in the vicinity of Mud and Sandy Mud with Shell/*Crepidula* Substrate habitats where Soft Sediment Fauna and Mollusk Reef Biota CMECS Biotic Subclasses were documented by Mayflower Wind. There was similar concordance to the northeast in Mount Hope Bay near the RI-MA State Waters boundary where biotopes of “Mud with burrowers” and “Mud or Organic-rich Mus with small

tube-builders" mapped by that study corresponded to Mud to Muddy Sand habitats with Soft Sediment Fauna CMECS Biotic Subclasses mapped by Mayflower Wind.

SAV beds, dominated by *Zostera marina*, represent unique habitats throughout the shallow coastal waters of Narragansett Bay. SAV extent varies over time and these aquatic plants experience peak growth during late summer months. SAV are found in mud and muddy sand sediments. SAV distribution is periodically mapped across Narragansett Bay using aerial imagery and field verification by the URI Environmental Data Center on behalf of the State of RI (URI Environmental Data Center and RIGIS; Figure 4-3). SAV beds were not mapped by URI within the Brayton Point ECC. The closest SAV mapped by URI is near the mouth of the Sakonnet River, located over 1 km from the edges of the Brayton Point ECC (Figure 4-3). Based on distinct side-scan sonar signatures in the geophysical data collected by Mayflower Wind, SAV and/or macroalgae may be present in the vicinity of the Brayton Point ECC in the Sakonnet River south of the Aquidneck Island crossing, but this area has not yet been field-verified (Figure 4-4).

Glacial Moraine A habitats comprised 4.1% (411 acres) of the habitats mapped at the Brayton Point ECC in Federal Waters (GLD) and comprised 3.1% (185 acres) of the habitats mapped at the Brayton Point ECC in RI State Waters, predominantly located in Rhode Island Sound (Tables 3-2 and 3-4). A distinction was made between Glacial Moraine A and Glacial Moraine B habitats to distinguish between areas of unconsolidated geological debris (A) and consolidated geological debris (B); Glacial Moraine B was not mapped within the Study Area. Glacial Moraine B deposits are characteristically poorly sorted and dense with very high boulder densities resulting in greater structural complexity and permanence. By comparison, the surface of Glacial Moraine A units was reworked with sand and gravel deposits resulting in less structural complexity and permanence.

Glacial moraines identified in the OSAMP (RI CRMC, 2010) intersect the Brayton Point ECC in two areas within Federal Waters that overlap with RI's GLD; at Southwest Shoal and where the ECC turns due west outside of RI State Waters (Figure 4-5). Glacial moraines defined in the OSAMP were based on several sources interpreted by Boothroyd (2009). Most of the data near the Southwest Shoal interpreted in the OSAMP were collected by the United States Geological Survey (USGS) in 1980 over very widely spaced seismic lines and near the RI State Waters boundary in 1975 (McMullen et al. 2009). Because of the paucity of seismic data in the region of the Brayton Point ECC, the areas identified in the OSAMP are general and do not reflect high-resolution distribution of moraine deposits and subsequent erosion and deposition of surficial sediments that affect benthic habitats. Using data collected by Mayflower Wind, most of the area of moraine identified in the OSAMP at Southwest Shoal was mapped as Glacial Moraine A (Figure 4-5). In contrast, only a small, discrete area of the OSAMP-identified moraine near the RI State Waters boundary was mapped as Glacial Moraine A using data collected by Mayflower Wind (Figure 4-5). The OSAMP does not identify any moraines in RI State Waters that overlap with the Brayton Point ECC (Figure 4-5); however, Glacial Moraine A habitats were mapped at the Brayton Point ECC in RI Sound using data collected by Mayflower Wind (Figure 4-5).

EFH and HAPC are designated by the New England Fishery Management Council for certain species and life stages of fish and invertebrates in the nearshore and offshore waters of New England, including the area covered by the Study Area. These designations are comprised of two components: (1) broad geographic areas (e.g., nearshore waters and seafloor shallower than 20 m; mapped 10-min squares) and (2) text documentation that describes the habitat characteristics that shall constitute EFH and/or HAPC within the

designated geographic areas. Therefore, spatial data on the distribution of those habitat characteristics are needed to refine the specific location of EFH and/or HAPC.

HAPC designated by the New England Fishery Management Council for juvenile cod include structurally complex rocky-bottom or vegetated habitat in inshore areas at depths less than 65 ft (20 m) that provide juvenile cod with protection from predation and support a wide variety of prey items (NEFMC, 2017). Cobble habitats are essential for the survival of juvenile cod in that they may assist with avoiding predation by older year classes (Gotceitas & Brown, 1993) and recent studies suggest that rocky, hard bottom habitats may be important for reproduction (DeCelles et al., 2017). Additional studies suggest that structures such as boulders and SAV, which provide vertical relief for predator avoidance and feeding, may be the primary drivers of cod settlement and nursery habitat use in Narragansett Bay and coastal Rhode Island rather than complex cobble substrates given that these waters are largely characterized by fine-grained sediments (Langan et al., 2020). The entire seafloor of both the Sakonnet River and Mount Hope Bay is shallower than 20 m, but only very limited areas contain complex rocky-bottom habitat consistent with characteristics that match the HAPC description for juvenile cod. The majority of the Brayton Point ECC shallower than 20 m was mapped as Sand and Mud to Muddy Sand which are habitats less likely to be used by juvenile cod (Figure 4-6). The majority of the 361 acres (6% of the Brayton Point ECC in RI State Waters;), mapped with HPAC characteristics, is located in Rhode Island Sound.

The actual footprint of Project activities will be smaller than the Study Area (i.e., the entire corridor for which habitats were mapped). Where juvenile cod benthic habitats are found, these habitats would experience some impacts from Project activities that permanently or temporarily disturb the seafloor, such as the burying of export cables and long-term presence of secondary cable protection measures in hard bottom areas where target cable burial depth is not possible. Given their preference for hard bottom/complex habitat, cable mattresses, rock berms, or frond mattresses used as secondary cable protection may provide increased habitat availability for both adult and juvenile cod (Reubens et al., 2013). Depending on the material used, secondary protection may be colonized by barnacles, tube-forming species, hydroids, and other fouling species found on existing hard bottom habitat in the region. Other Project activities are not expected to result in long term adverse impacts to either adult or juvenile cod EFH.

Winter flounder are a demersal species likely to occur year-round within the Study Area. Adult winter flounder prefer soft bottom muddy and sandy substrates, but also utilize hard bottoms on offshore banks (Pereira et al., 1999). Adult winter flounder migrate to nearshore/estuarine waters in the late fall and early winter to spawn and then may migrate to cooler, offshore waters in the summer. Winter flounder lay benthic eggs in shallow (<16 ft [5m]) nearshore waters, bays, and estuaries in mud, muddy sand, gravel, macroalgae, and submerged aquatic vegetation (NEFMC, 2017). EFH designated by the New England Fishery Management Council for winter flounder eggs, young-of-the-year (YOY) juveniles, and spawning adults in the Study Area are likely to be found from January through June (Massie, 1998) in Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, and Mud to Muddy Sand habitats, as well as any benthic substrate with SAV. The characteristic of these mapped habitats match the EFH description and have been mapped to encompass 731 acres of the Brayton Point ECC (12.1% of the portion in RI State Waters; Figure 4-7). Non-spawning winter flounder adults and older juveniles are more frequently found in continental shelf benthic habitats and deeper coastal waters than in the shallower habitats utilized by eggs and YOY (NEFMC, 2017; Phelan, 1992). Therefore, juveniles and non-spawning adults are likely to

utilize Mixed-Size Gravel in Muddy Sand to Sand, Coarse Sediment, Sand, and Mud to Muddy Sand habitats in the Study Area.

Impacts from Project activities related to installation of the export cable in shallow nearshore (<16 ft [5m]) waters may temporarily directly affect winter flounder eggs, YOY, and spawning adults. Eggs could be entrained within the jet plow or experience increased mortality due to sediment suspension (Berry et al., 2011). These impacts are expected to be minor because they will disturb a small portion of available EFH in the area and temporary because the substrates within nearshore portions of the Brayton Point ECC are expected to return to essentially the same as pre-existing conditions, allowing for continued use by spawning winter flounder, YOY, and eggs. Juveniles and adult flounder may also be temporarily displaced by seafloor disturbing activities. Winter flounder are expected to recolonize most areas once construction is complete, however similar to other species that utilize sandy habitats, they may experience small amounts of permanent habitat loss in areas that are converted from sandy sediments to hard bottom habitats should secondary cable protection be needed. Loss of habitat due to conversion to hard bottom is not expected to have a significant impact on these species due to the large area of alternate suitable habitat available.

Mayflower Wind will implement the following environmental protection measures to reduce potential impacts on benthic habitat, invertebrates, and finfish along the Brayton Point ECC. These measures are based on accepted protocols and procedures successfully implemented for similar offshore projects.

- Design the sea-to-shore transition to reduce the dredging footprint and effects to benthic organisms (e.g., consider use of gravity cells, siting of offshore exit points).
- Use HDD at landings to avoid disturbance to nearshore finfish, invertebrates, EFH, and sensitive habitats (e.g., SAV beds) to the extent practicable and to minimize spatial and temporal effects to benthic organisms.
- Micro-route cables within the Brayton Point ECC to avoid complex habitats, where possible.
- Bury cables wherever possible to allow for benthic recolonization after construction is complete.
- Use industry standard cable burial and cable shielding methods to reduce potential effects/change in ambient electric and magnet fields (EMFs) during operations and maintenance.
- Install offshore export cables to target burial depths where possible and use cable shielding materials to minimize effects of EMFs.

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MAYFLOWER WIND

Benthic Habitat Mapping to Support State Permitting Applications - Brayton Point ECC for RI State Waters and GLD - FIGURES

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List of Figures

Figure 1-1. Location of the Mayflower Wind Lease Area with potential wind turbine generator (WTG)/offshore substation platform (OSP) foundation positions and offshore export cable corridors (ECCs) 1

Figure 1-2. Location of the Brayton Point ECC and offshore areas designated by Rhode Island Coastal Resources Management Council (RI CRMC) for consistency review, known as the Geographic Location Description (GLD) 2

Figure 1-3. Locations sampled for benthic ground-truth data across all field surveys at the Brayton Point offshore export cable corridor (1 of 2) 3

Figure 1-4. Locations sampled for benthic ground-truth data across all field surveys at the Brayton Point offshore export cable corridor (2 of 2) 4

Figure 1-5. Generalized benthic habitat mapping workflow diagram 5

Figure 2-1. Schematic depicting a standard geophysical survey vessel set-up and data collection (after Garel et al., 2019) 6

Figure 2-2. Bathymetric data at the Brayton Point ECC (1 of 2) 7

Figure 2-3. Bathymetric data at the Brayton Point ECC (2 of 2) 8

Figure 2-4. Backscatter data over hillshaded bathymetry at the Brayton Point ECC (1 of 2) 9

Figure 2-5. Backscatter data over hillshaded bathymetry at the Brayton Point ECC (2 of 2) 10

Figure 2-6. Examples of side-scan sonar (SSS) data showing soft benthic habitats of sand and mud (left) and heterogeneous and complex habitats of glacial moraine (right) 11

Figure 2-7. Example of SSS data showing individual objects on the seafloor identified as boulders 12

Figure 2-8. Example of SSS data where individual small boulders and cobbles cannot be individually detected but where textures and patterns, paired with ground-truth data, indicate the presence of these features within a sand matrix 13

Figure 2-9. Boulder fields and surficial boulders (>0.3 m) individually identified ("picked") from the geophysical data shown here on side-scan sonar data. Individual boulder picks were aggregated and mapped as boulder fields according to procedures detailed in COP Appendix E, MSIR. 14

Figure 2-10. CMECS ternary diagram with Mayflower Wind's geological seabed sediment interpretation categories, as detailed in COP Appendix E, MSIR 15

Figure 2-11. Ripple scour depressions (RSDs) visible in SSS data 16

Figure 2-12. Simplified schematic diagram showing input data and outputs for the benthic habitat mapping process conducted by INSPIRE 17

Figure 2-13. Examples of data reviewed during the benthic habitat mapping process: CMECS Substrate Subgroup on backscatter over hillshaded bathymetry, with overlays of data products derived from the geophysical data, namely boulder fields, boulder picks, and

the geoform of glacial moraine; inset PV images are from SPI/PV stations collected in Summer 2021 18

Figure 2-14. Geological seabed interpretations refined to benthic habitat types with modifiers..... 19

Figure 3-1. Plots showing the categorical variability (left) and percentage of predominance (right) of Substrate Subgroup across all portions of the Study Area give a high-level depiction of which areas have more heterogeneous stations; sampling effort (# replicate samples collected) is overlaid to evaluate its effects. Categorical variability values range from 0 to 1, with 1 indicating high variability and heterogeneity. Percentage of predominance values range from 0 to 100%, with 100% indicating the category at that station was fully dominant (all replicates were categorized the same way). 20

Figure 3-2. Plots showing the categorical variability (left) and percentage of predominance (right) of Biotic Subclass across all portions of the Study Area give a high-level depiction of which areas have more heterogeneous stations; sampling effort (# replicate samples collected) is overlaid to evaluate its effects. Categorical variability values range from 0 to 1, with 1 indicating high variability and heterogeneity. Percentage of predominance values range from 0 to 100%, with 100% indicating the category at that station was fully dominant (all replicates were categorized the same way)..... 21

Figure 3-3. Glacial Moraine A habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Subgroup assessed from ground-truth data; inset images for Station BP039-BP110 from Summer 2021 show three paired replicate PV images (top) and SPI images (bottom)..... 22

Figure 3-4. Mixed-Size Gravel in Muddy Sand to Sand habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Subgroup assessed from ground-truth data; inset PV images for Stations BPT05-1 and BPT05-4 show the range of gravel distribution within these habitats..... 23

Figure 3-5. Coarse Sediment – Mobile with Muddy Gravelly Sand habitat and scattered boulders and smaller areas of Coarse Sediment – Mobile with Boulder Field(s) habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Subgroup assessed from ground-truth data..... 24

Figure 3-6. Sand and Sand – Mobile habitats as detected in backscatter data over hillshaded bathymetry, and predominant Substrate Subgroup assessed from ground-truth data; side-scan sonar inset shows ripples; inset image from BP062 shows three paired replicate PV images (top) and SPI images (bottom) and the single PV captured at transect Station BPT15-9, with images from Summer 2021 25

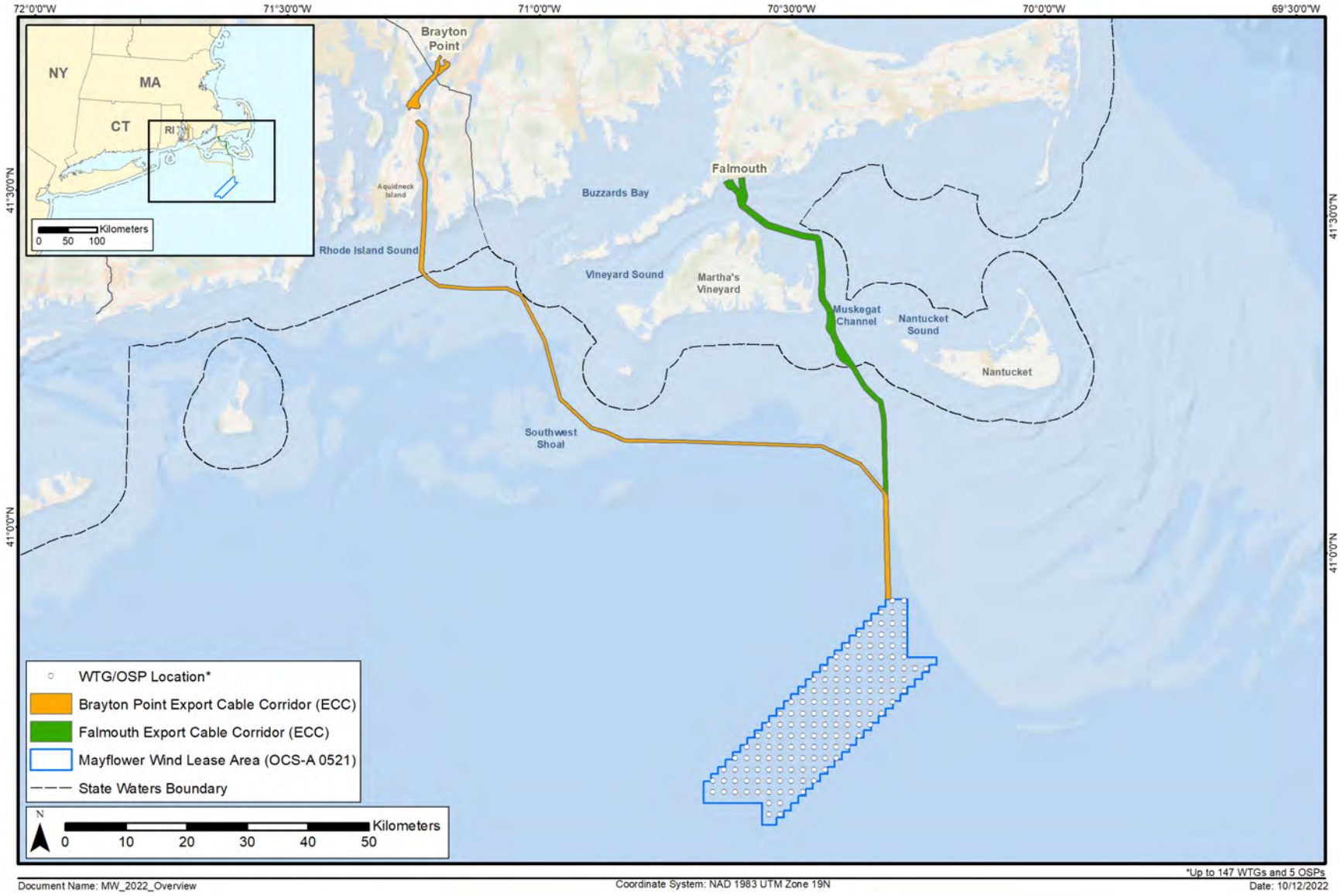
Figure 3-7. Mud to Muddy Sand – Crepidula Substrate habitat as detected in backscatter data over hillshaded bathymetry (top), side-scan sonar (bottom), and predominant Substrate Group assessed from ground-truth data; PV images from Stations BPT03-5 and BPT03-6 show complete cover of *Crepidula*..... 26

Figure 3-8. Benthic habitat types with modifiers mapped at the Brayton Point ECC (1 of 2) and pie chart of habitat composition..... 27

Figure 3-9. Benthic habitat types with modifiers mapped at the Brayton Point ECC (2 of 2) and pie charts of habitat composition 28
Figure 3-10. Benthic habitat types with modifiers and individual large boulders (>0.3 m) mapped at the Brayton Point ECC (1 of 2) 29
Figure 3-11. Benthic habitat types with modifiers and individual large boulders (>0.3 m) mapped at the Brayton Point ECC (2 of 2) 30
Figure 3-12. Benthic habitat types with modifiers mapped and ground-truth CMECS Substrate Subgroup or Substrate Group at the Brayton Point ECC (1 of 2) 31
Figure 3-13. Benthic habitat types with modifiers mapped and ground-truth CMECS Substrate Subgroup or Substrate Group at the Brayton Point ECC (2 of 2) 32
Figure 3-14. Benthic habitat types with modifiers mapped and ground-truth CMECS Biotic Subclass at the Brayton Point ECC (1 of 2) 33
Figure 3-15. Benthic habitat types with modifiers mapped and ground-truth CMECS Biotic Subclass at the Brayton Point ECC (2 of 2) 34
Figure 3-16. Benthic habitat types with modifiers mapped and ground-truth CMECS Attached Fauna presence at the Brayton Point ECC (1 of 2) 35
Figure 3-17. Benthic habitat types with modifiers mapped and ground-truth CMECS Attached Fauna presence at the Brayton Point ECC (2 of 2) 36
Figure 3-18. Benthic habitat types with modifiers mapped and ground-truth sensitive taxa presence at the Brayton Point ECC (1 of 2) 37
Figure 3-19. Benthic habitat types with modifiers mapped and ground-truth sensitive taxa presence at the Brayton Point ECC (2 of 2) 38
Figure 3-20. Benthic habitat types with modifiers mapped and ground-truth non-native taxa presence at the Brayton Point ECC, possible *Didemnum* spp. at BP041 recorded in Summer 2021 39
Figure 4-1. Map of ECC depicting segments where various seafloor preparation and installation temporary disturbances activities, such as sand wave clearance, boulder clearance and removal, and anchoring, could potentially occur 40
Figure 4-2. Export cable corridor and four optional locations for four HDD pits on both sides of Aquidneck Island along with benthic habitat types with modifiers 41
Figure 4-3. Indicative cable route and corridor in RI State Waters and state data on SAV beds; distances between SAV beds and the indicative cable route and corridor are indicated 42
Figure 4-4. Likely presence of SAV mapped based on distinct side-scan sonar data at the east edge of the cable corridor south of Aquidneck Island 43
Figure 4-5. Glacial moraines as identified in the RI Ocean Special Area Management Plan and glacial moraines distribution as mapped by Mayflower Wind 44

Figure 4-6. Habitats crosswalked to juvenile cod HAPC at the Brayton Point ECC, along with the 20-m depth contour 45

Figure 4-7. Habitats crosswalked to winter flounder egg and spawning adult EFH at the Brayton Point ECC 46



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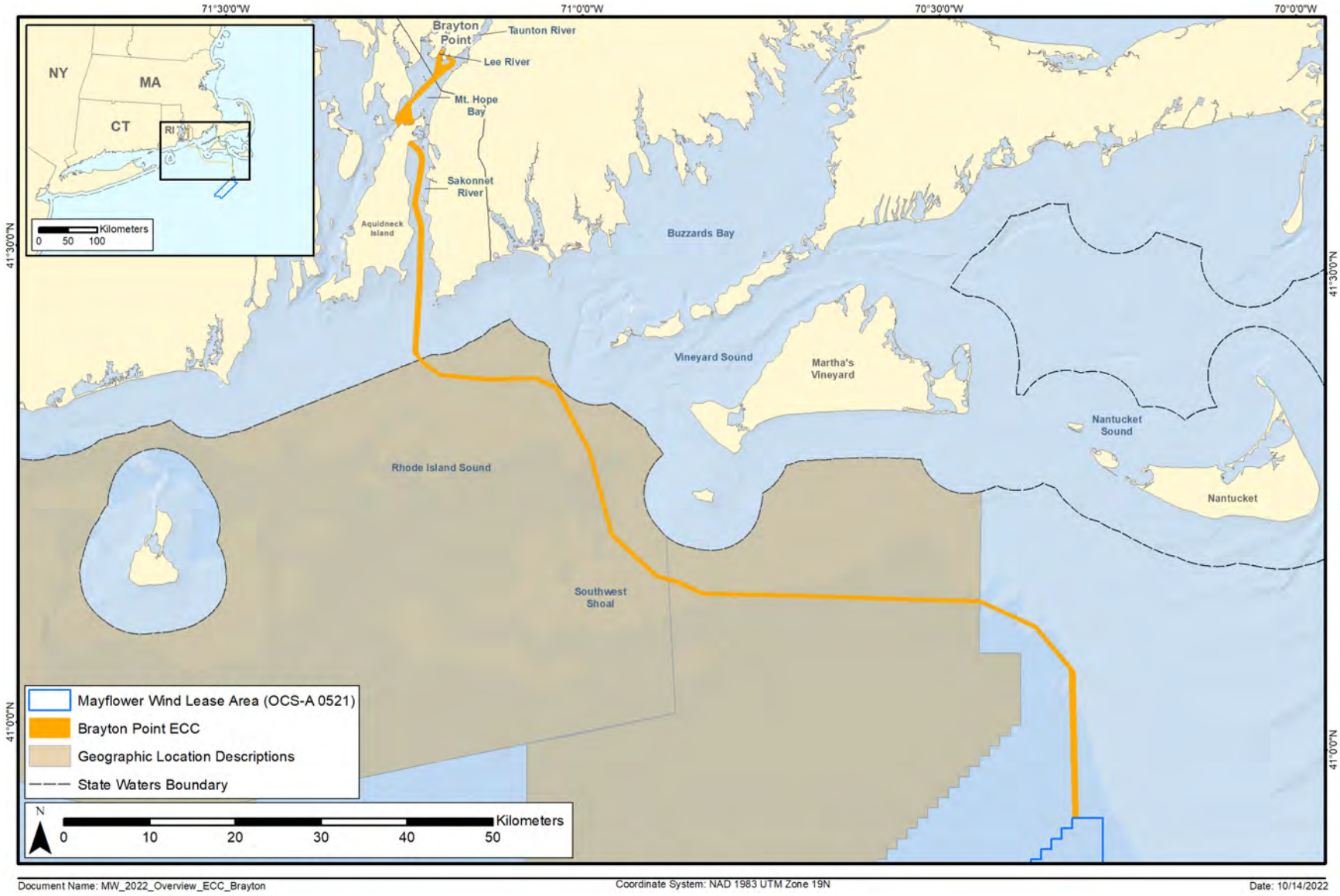

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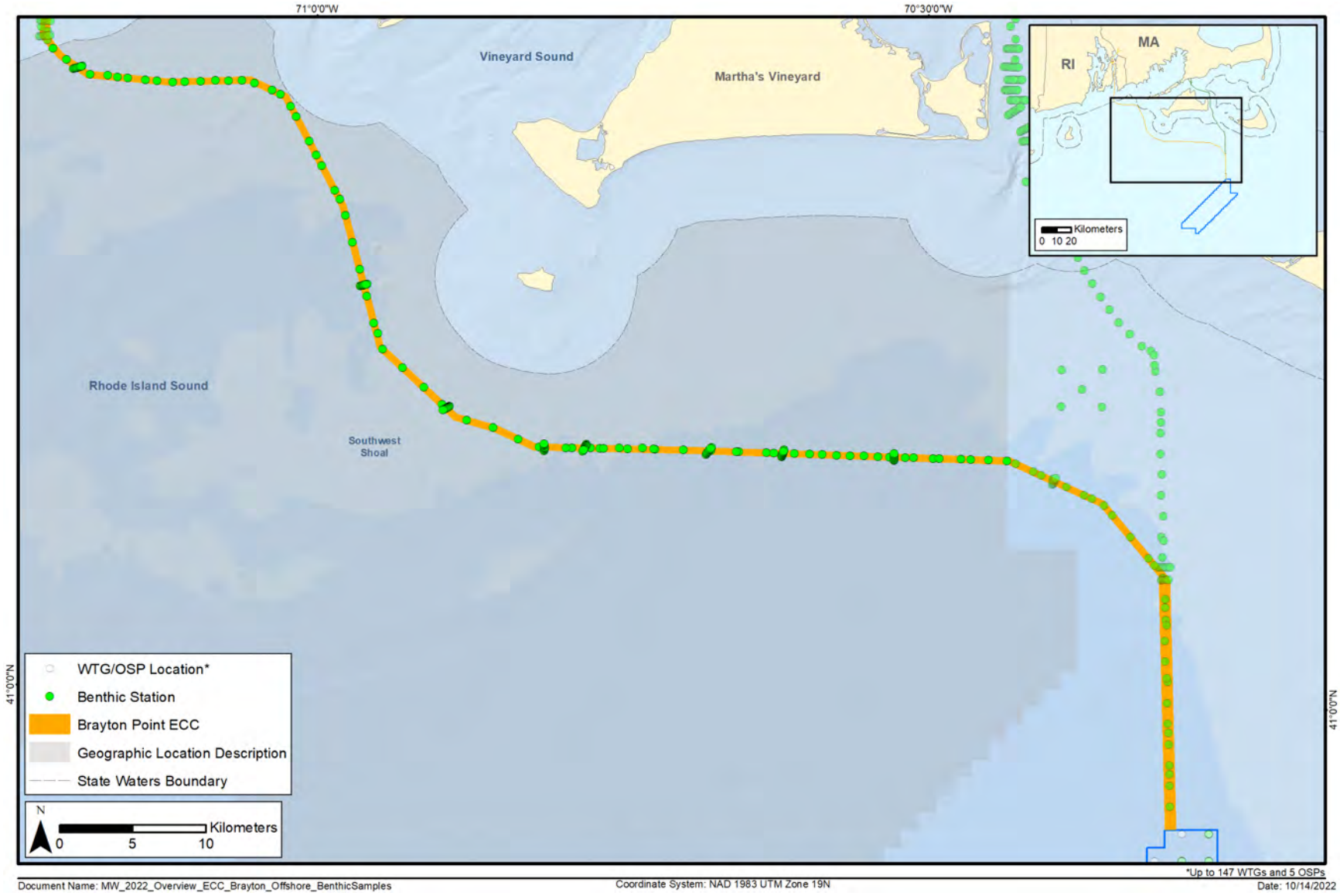


Figure 1-3. Locations sampled for benthic ground-truth data across all field surveys at the Brayton Point offshore export cable corridor (1 of 2)

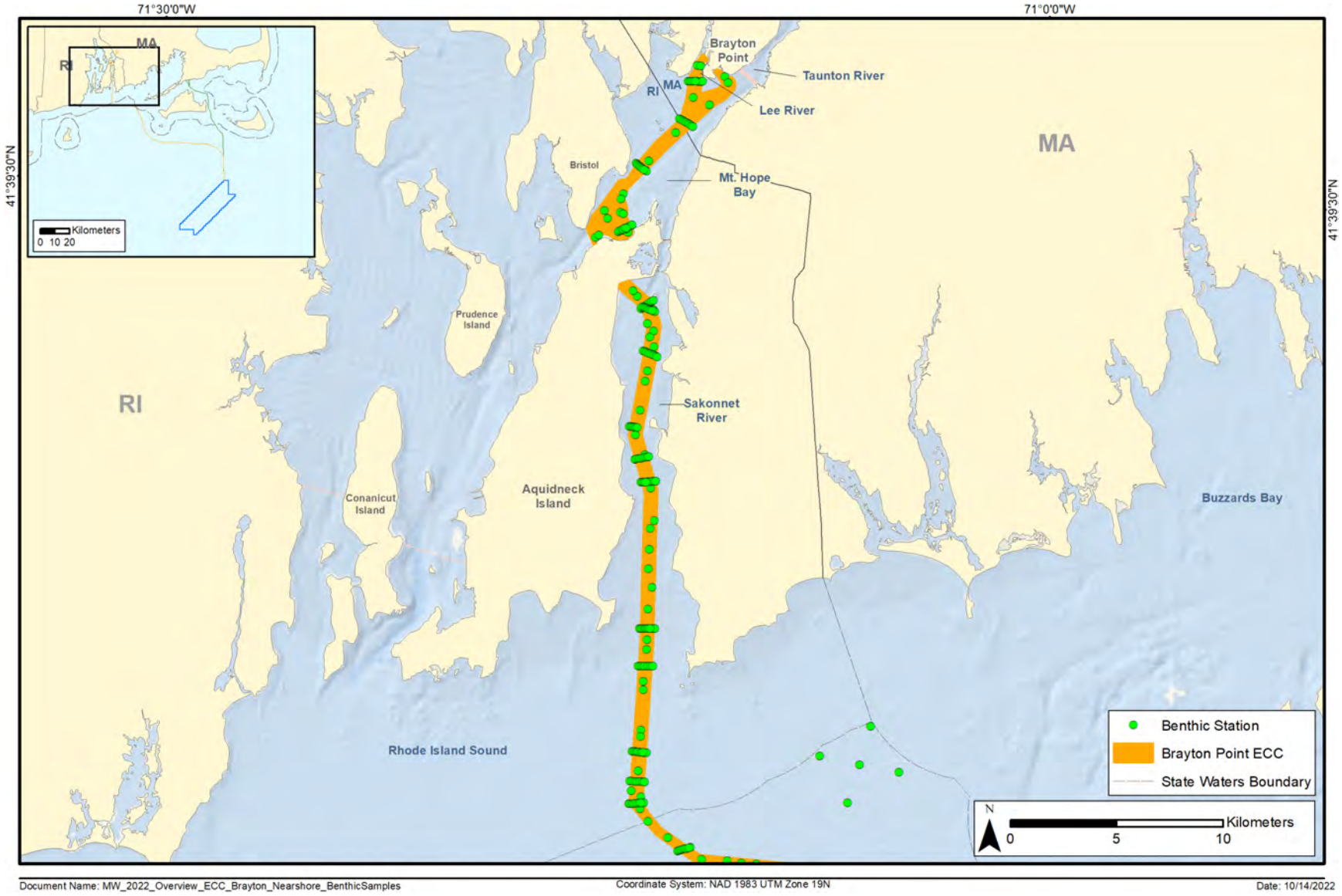
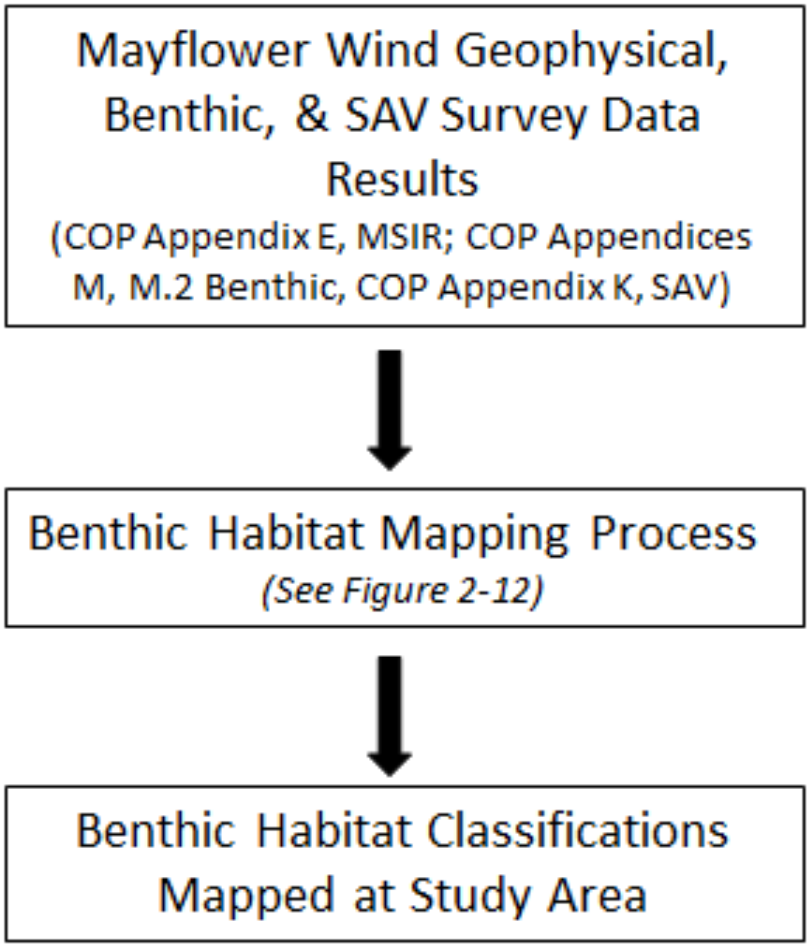


Figure 1-4. Locations sampled for benthic ground-truth data across all field surveys at the Brayton Point offshore export cable corridor (2 of 2)



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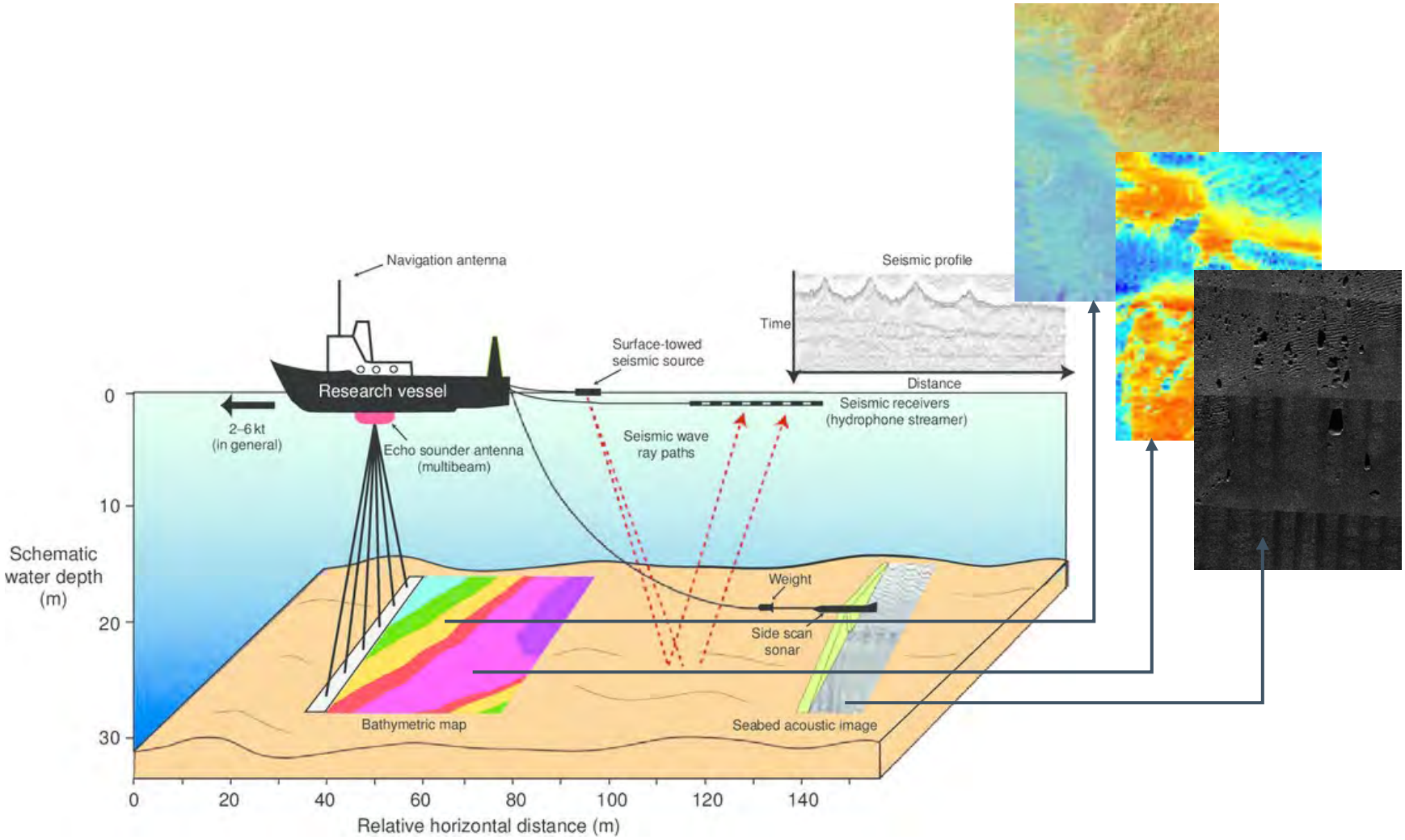

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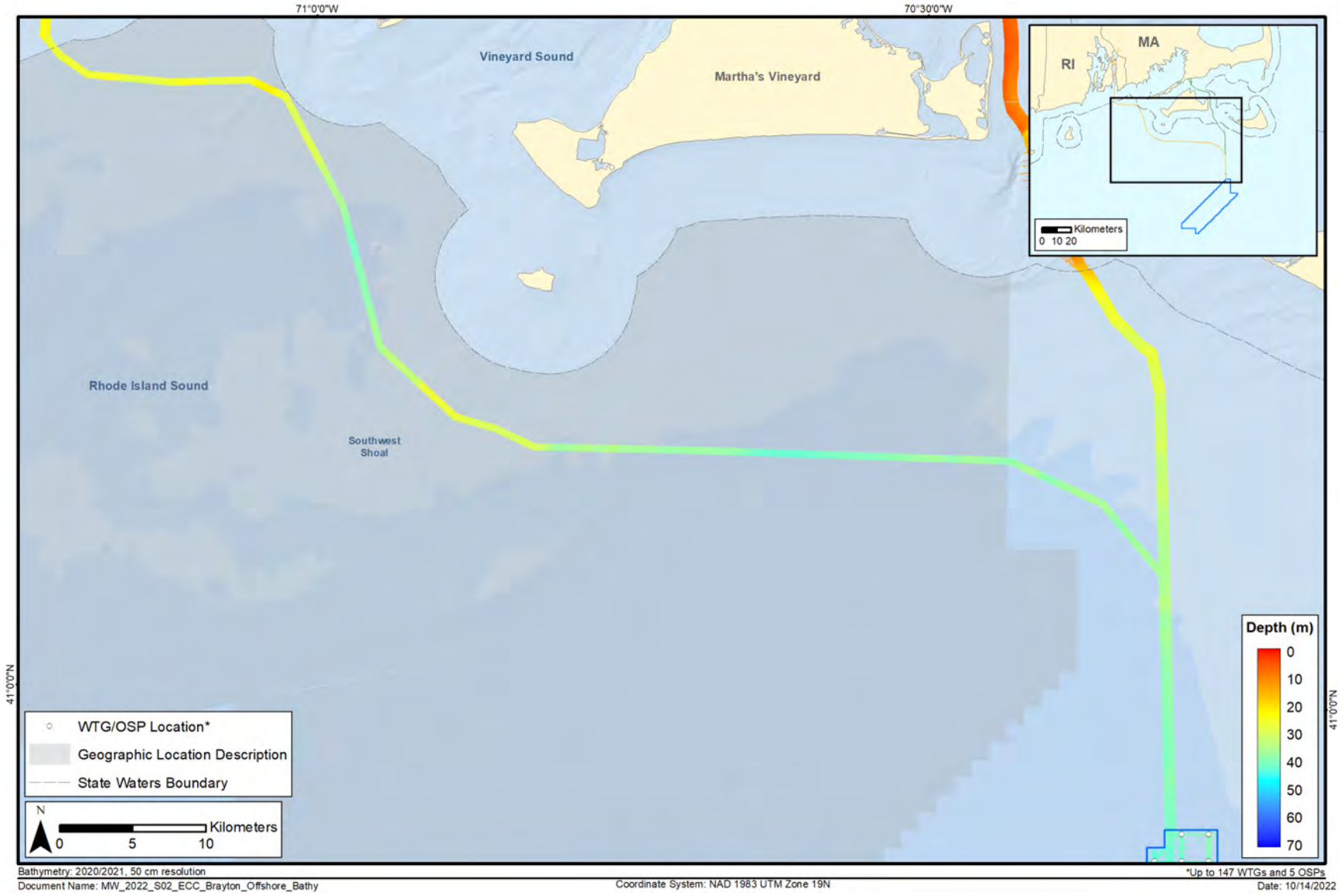

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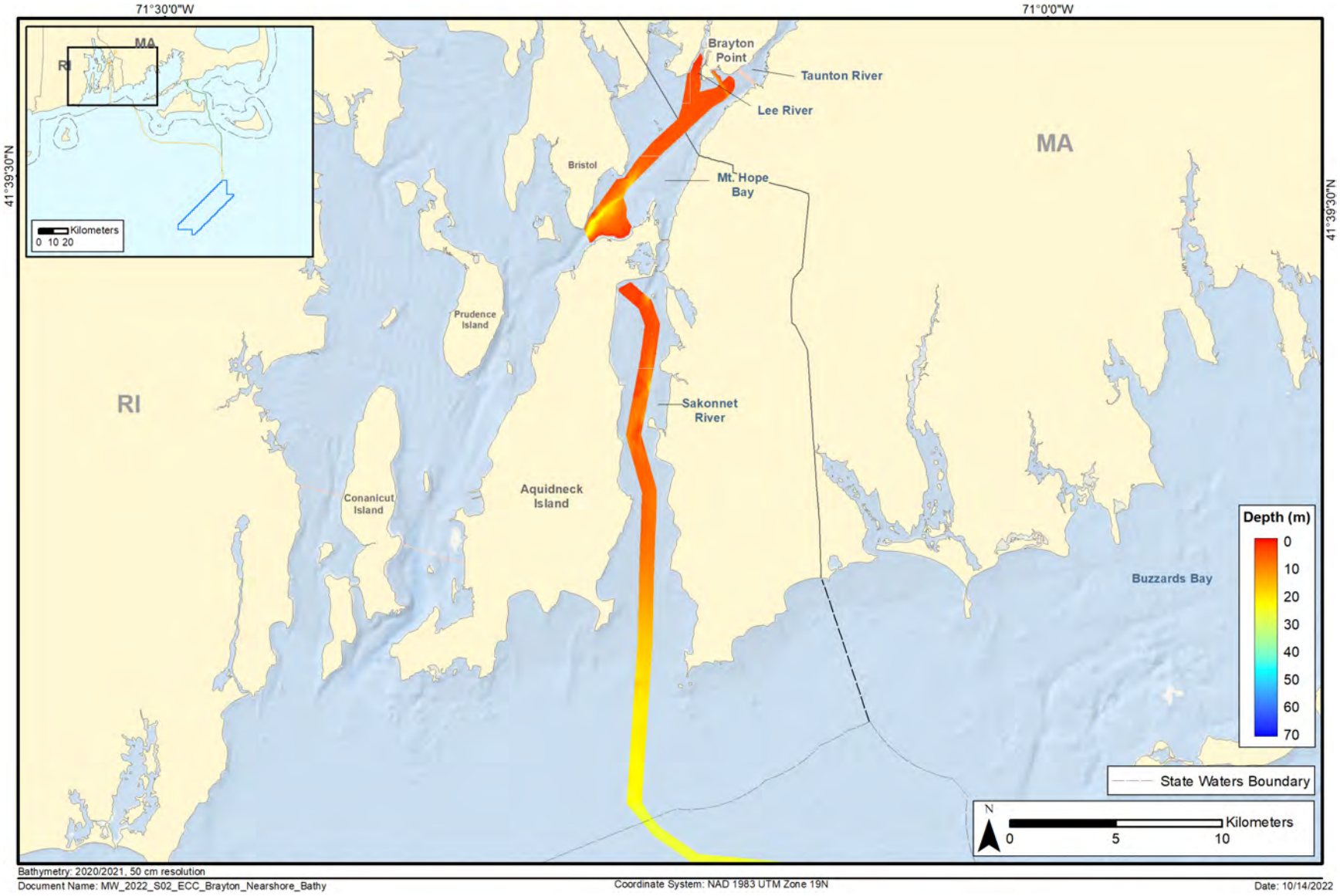


Figure 2-3. Bathymetric data at the Brayton Point ECC (2 of 2)

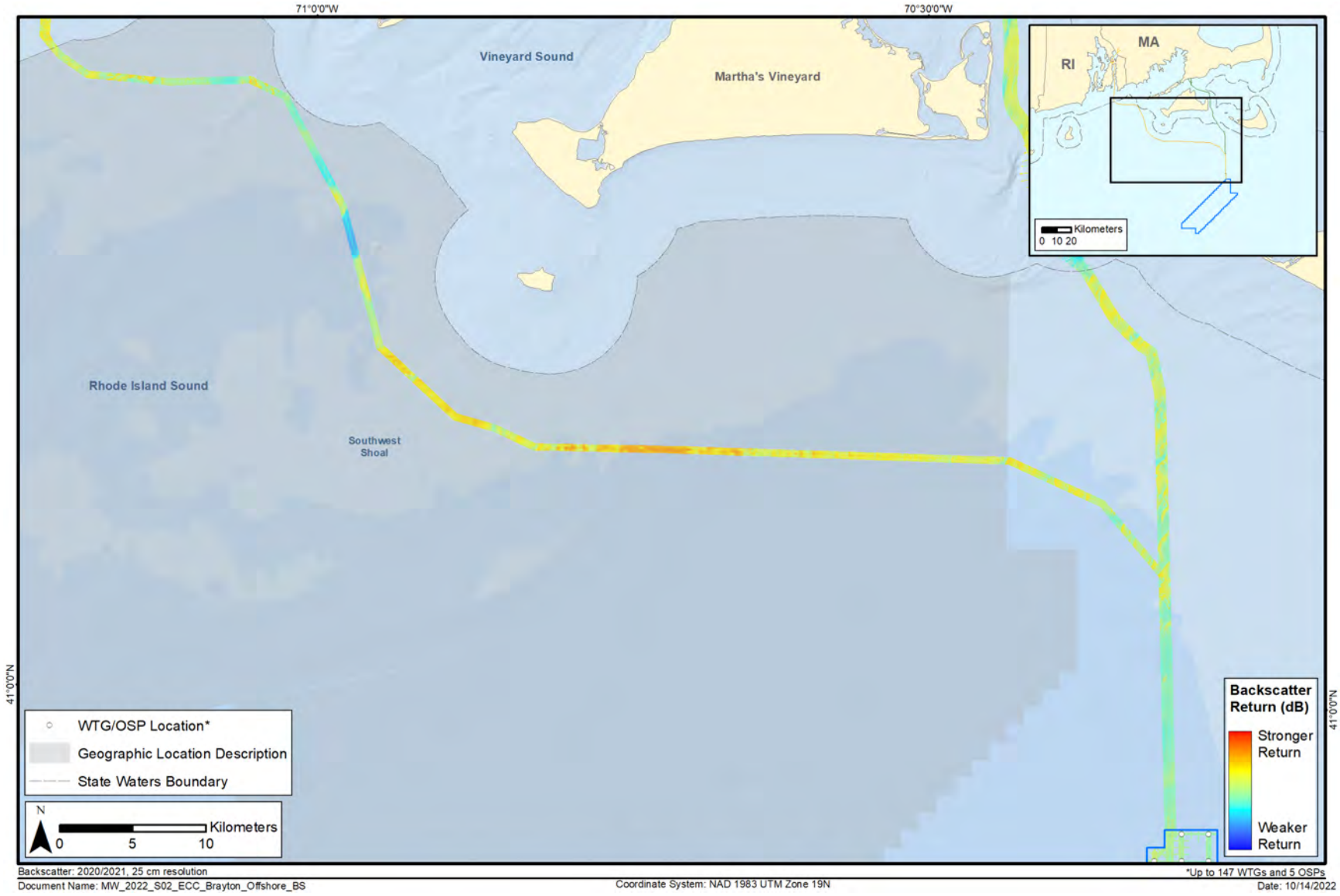


Figure 2-4. Backscatter data over hillshaded bathymetry at the Brayton Point ECC (1 of 2)

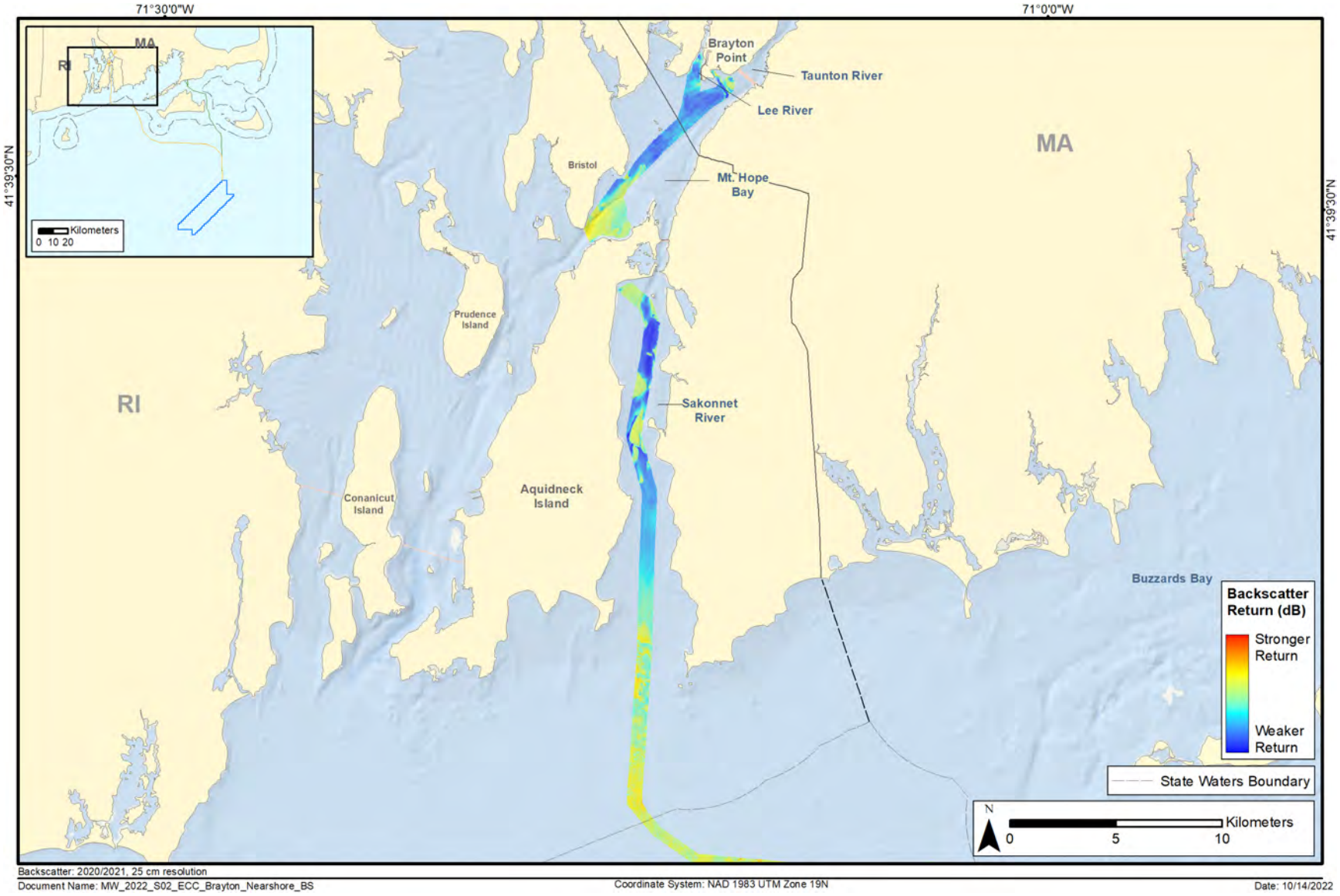


Figure 2-5. Backscatter data over hillshaded bathymetry at the Brayton Point ECC (2 of 2)

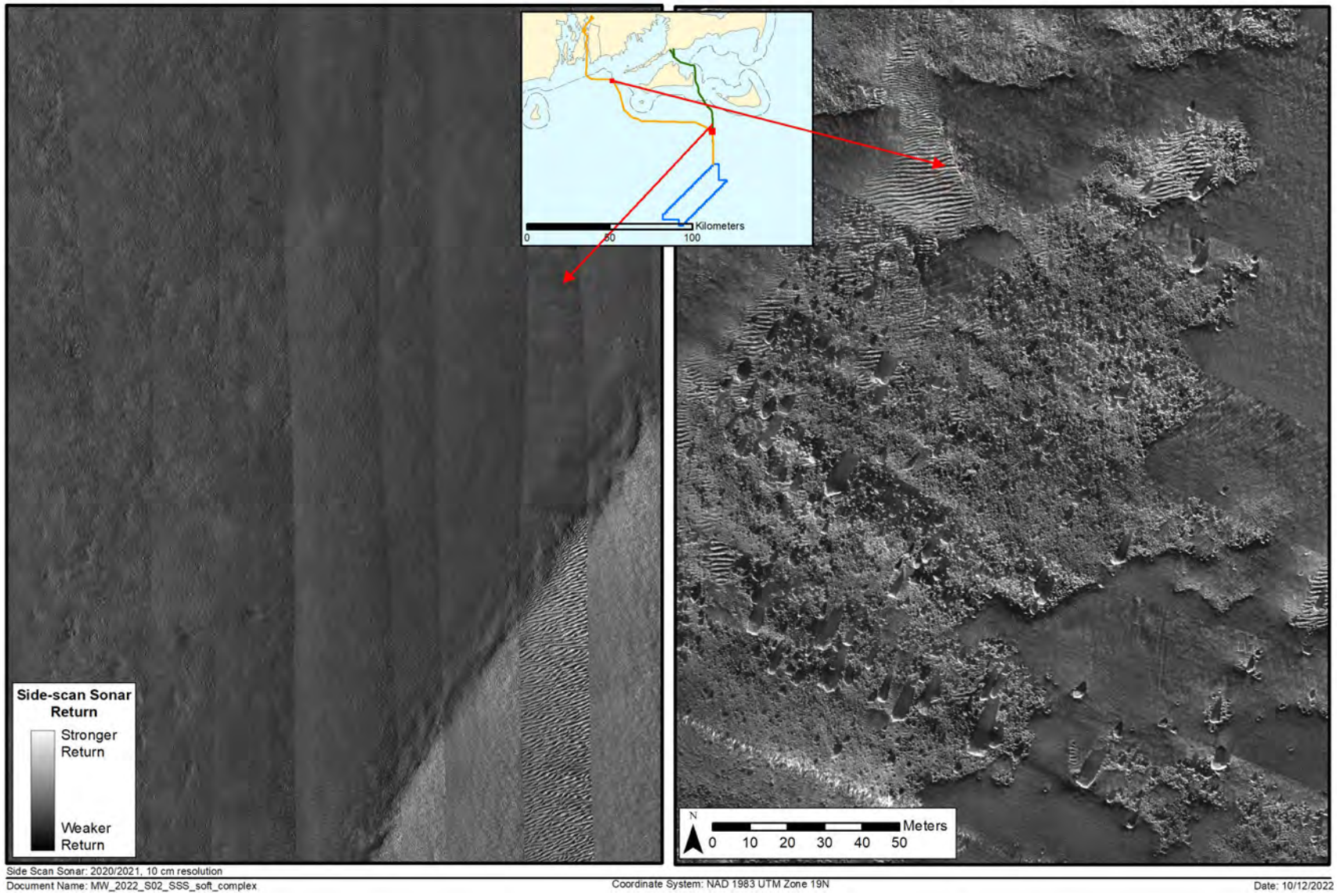
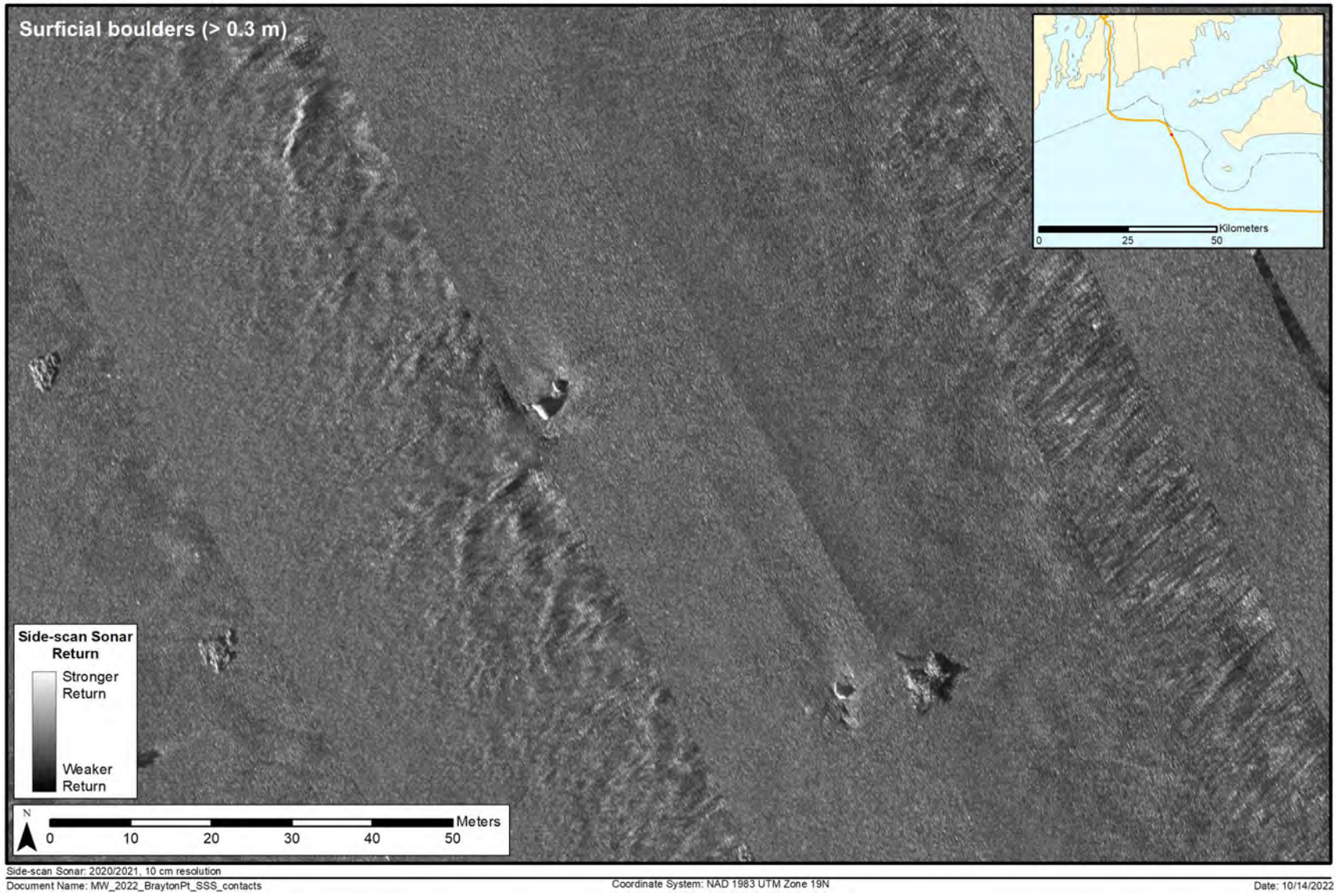


Figure 2-6. Examples of side-scan sonar (SSS) data showing soft benthic habitats of sand and mud (left) and heterogeneous and complex habitats of glacial moraine (right)



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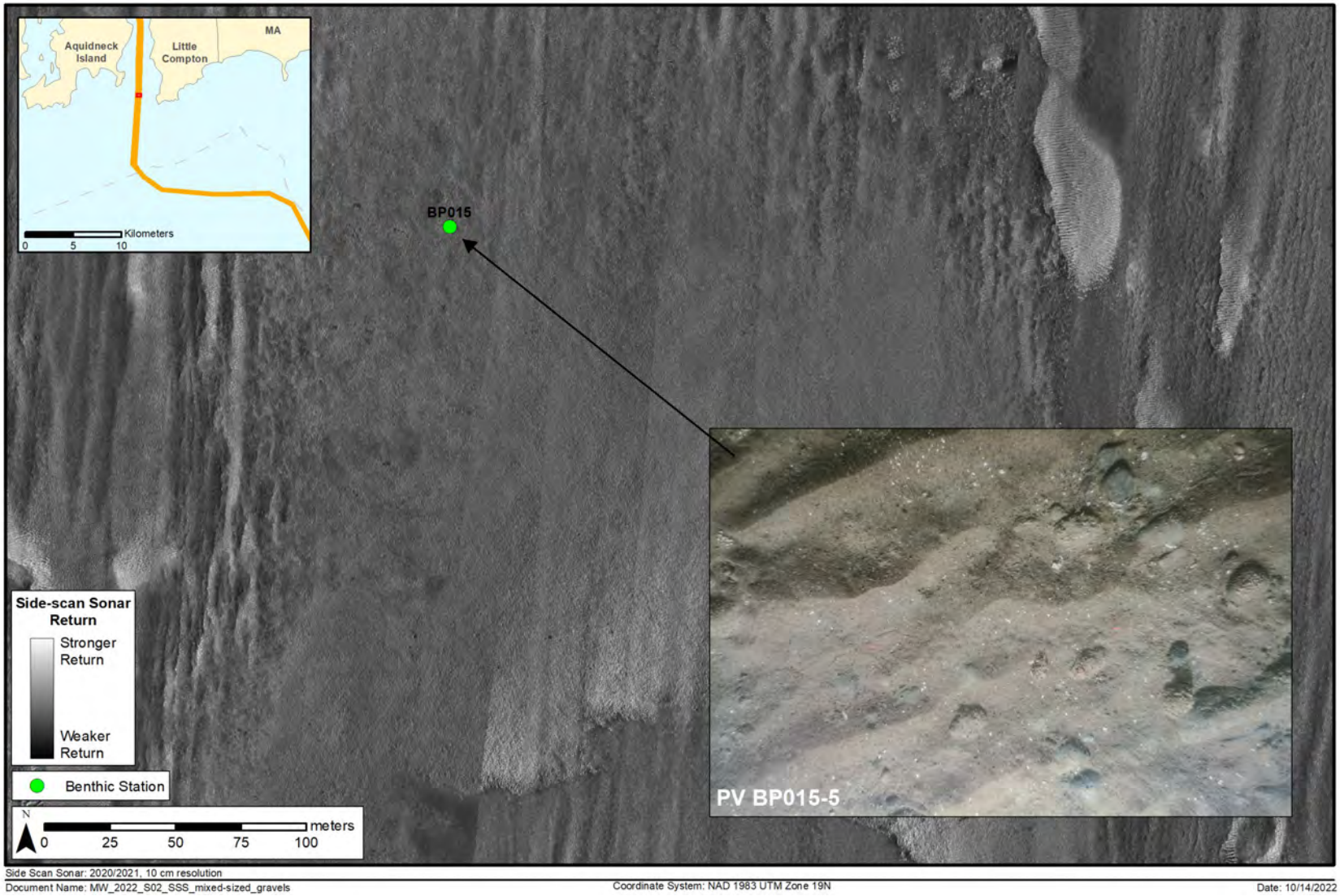

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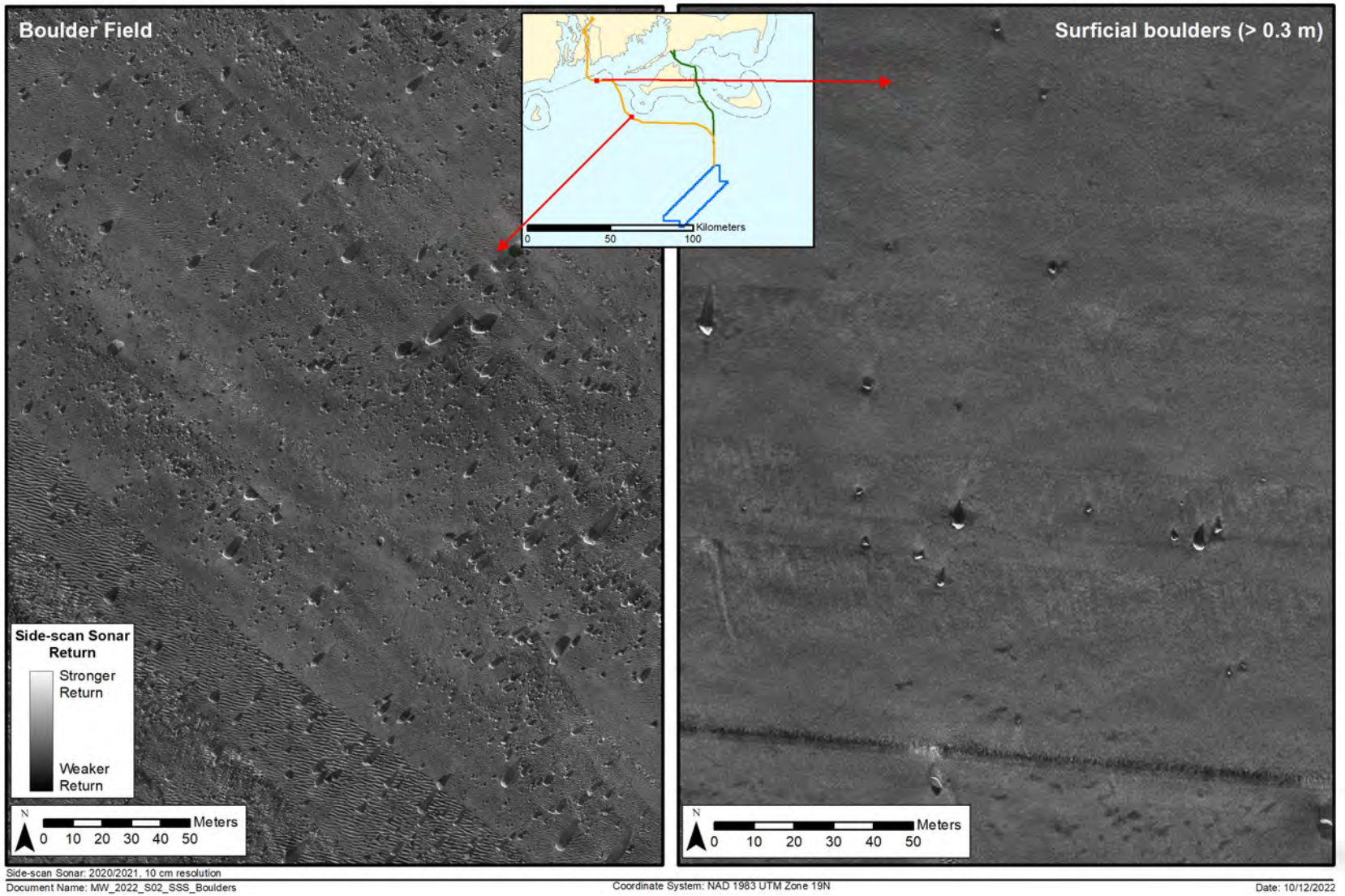

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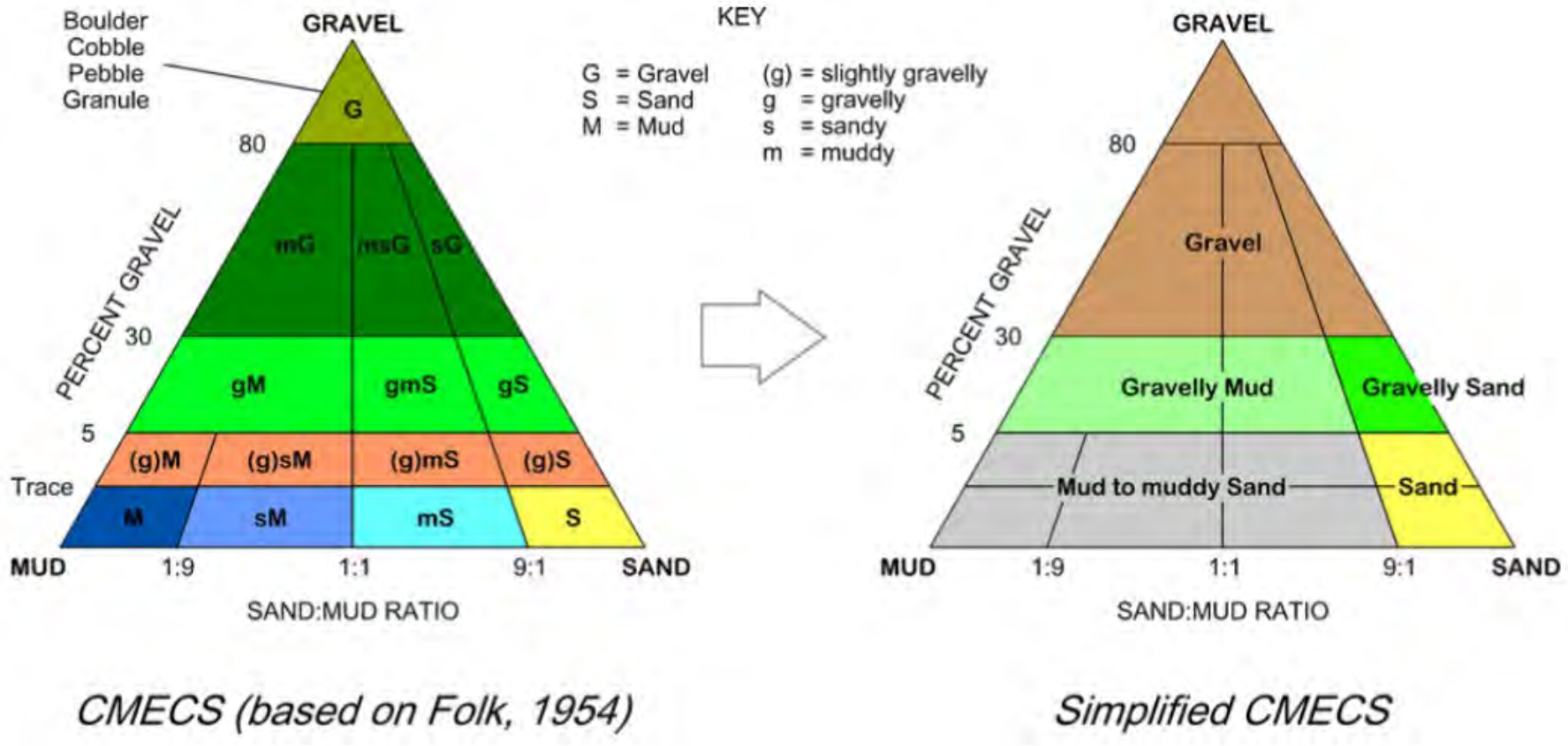

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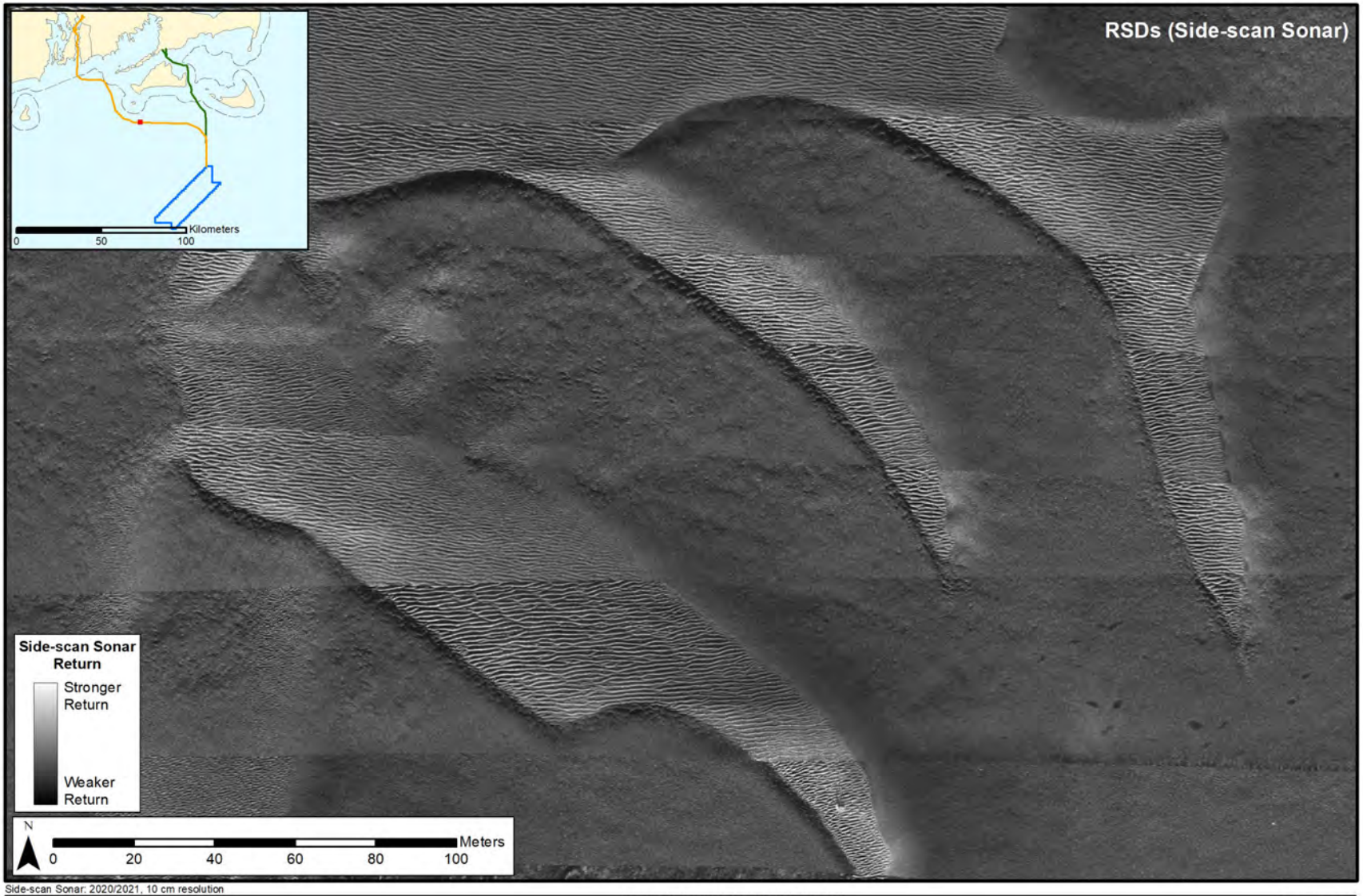


Figure 2-11. Ripple scour depressions (RSDs) visible in SSS data

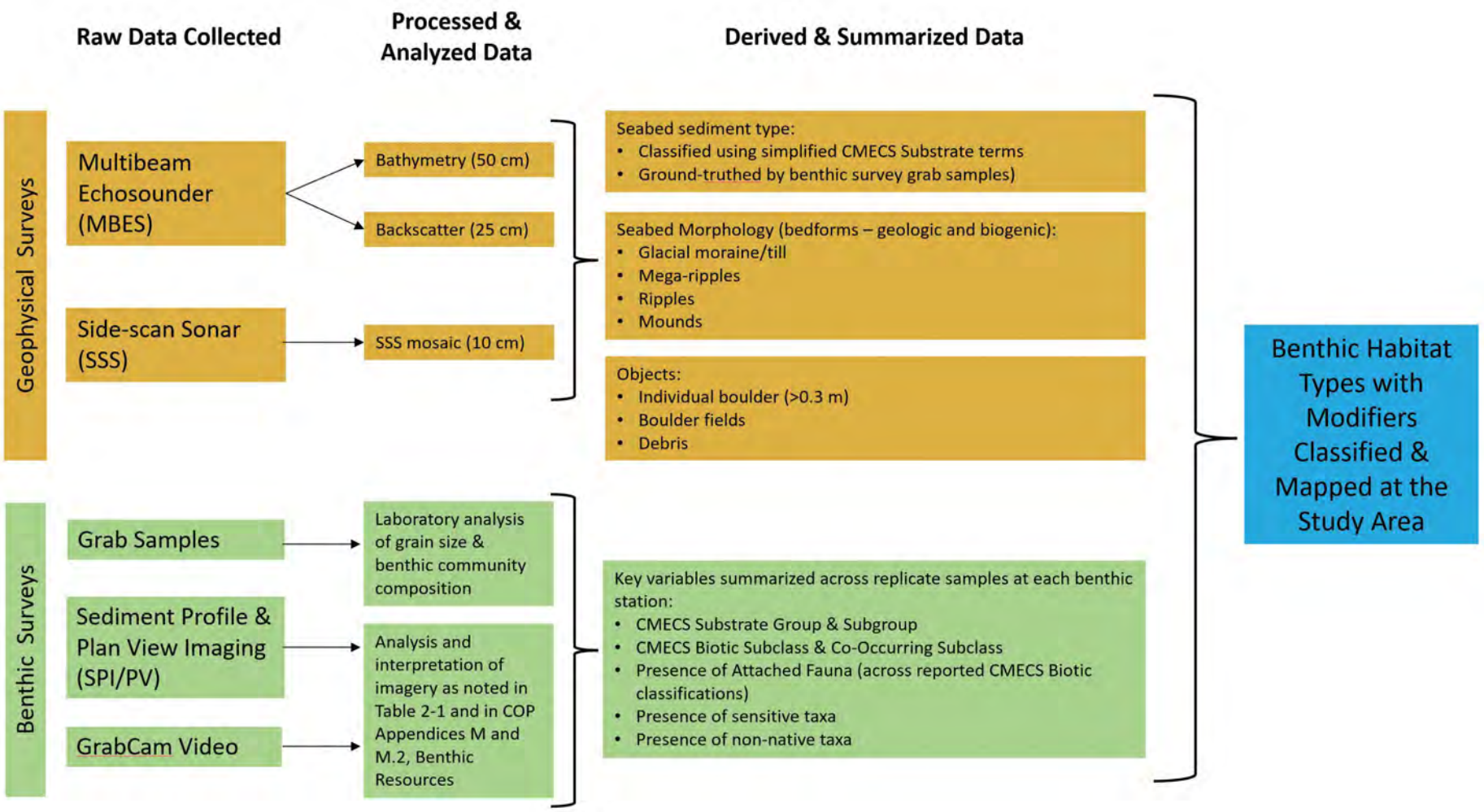
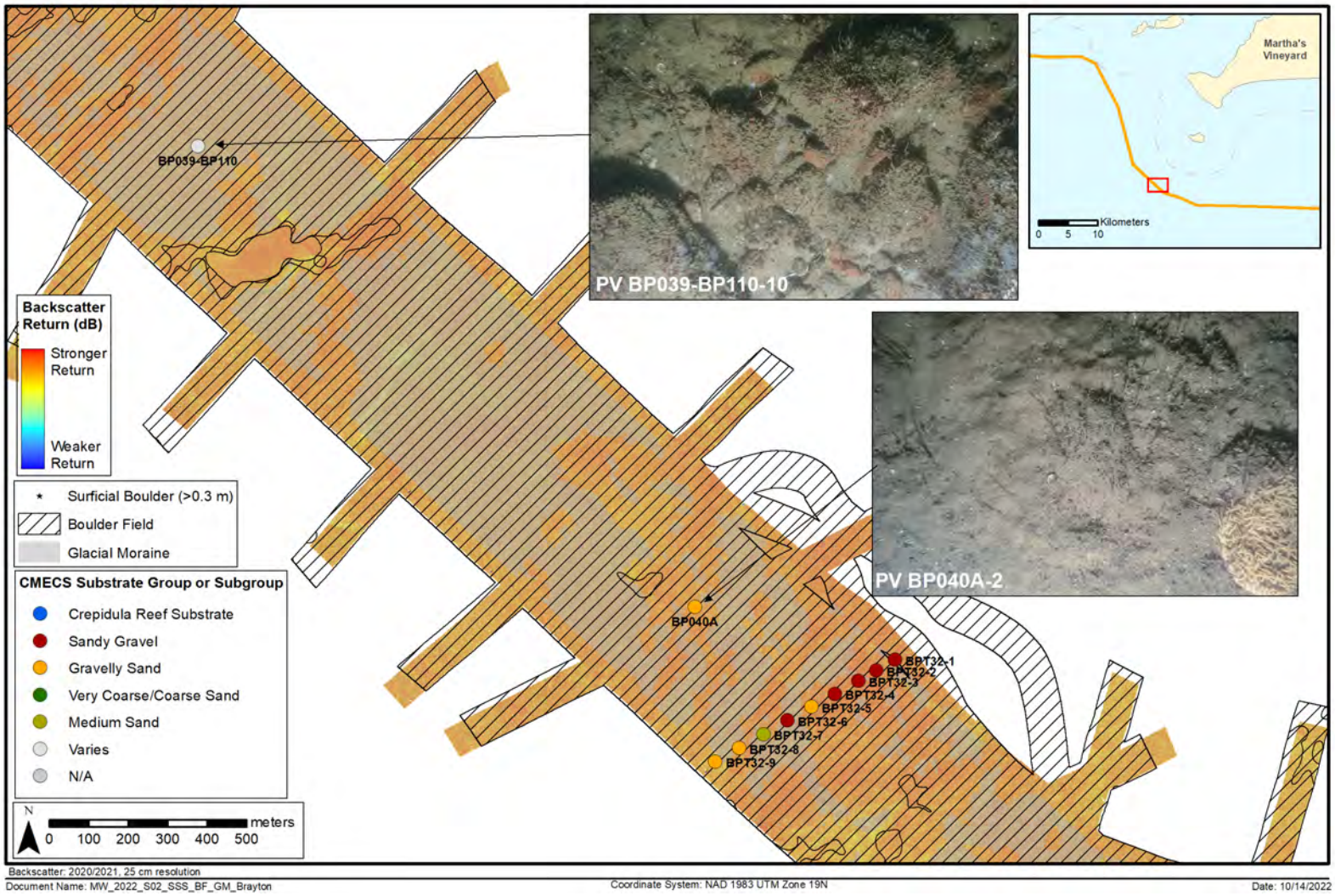


Figure 2-12. Simplified schematic diagram showing input data and outputs for the benthic habitat mapping process conducted by INSPIRE



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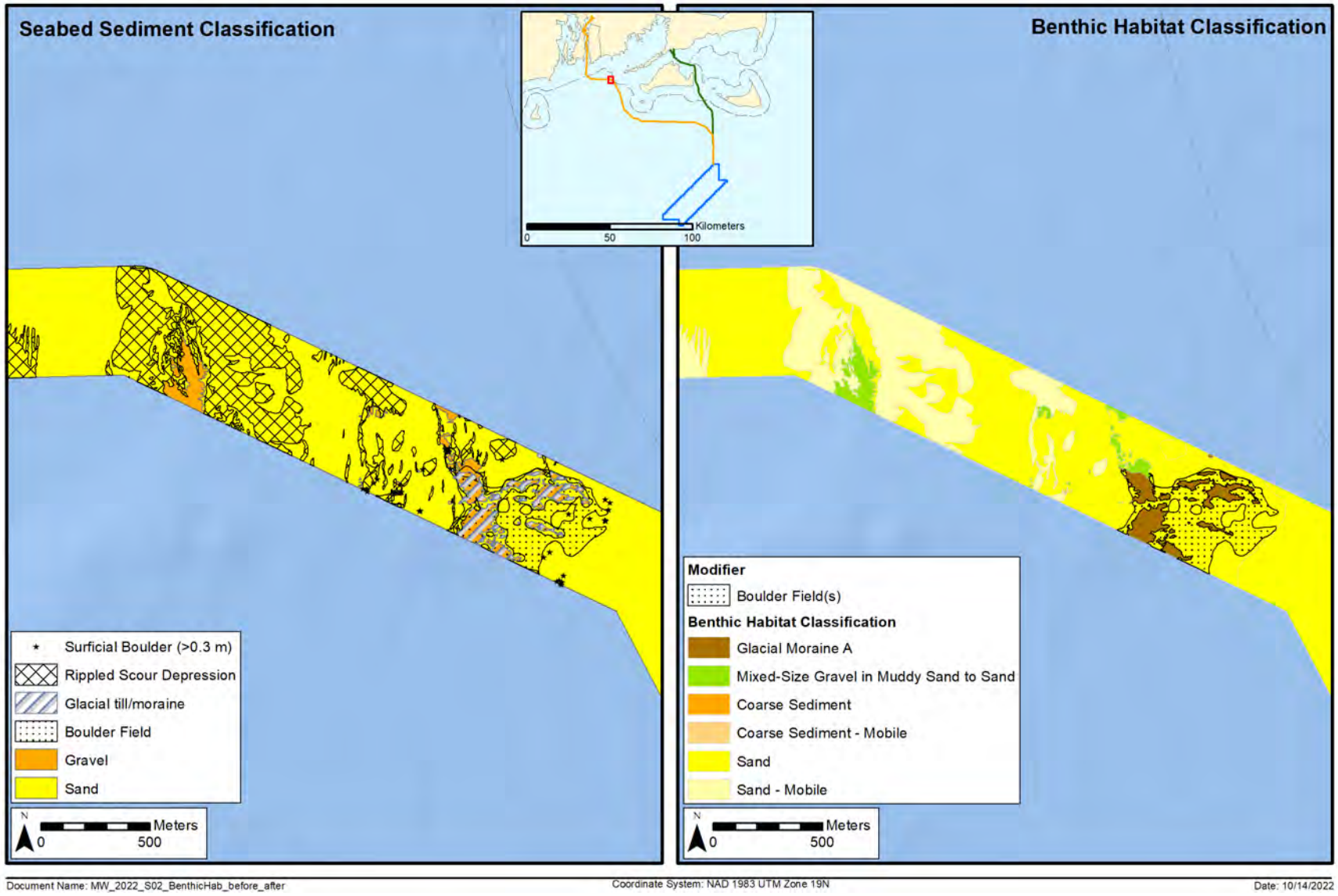

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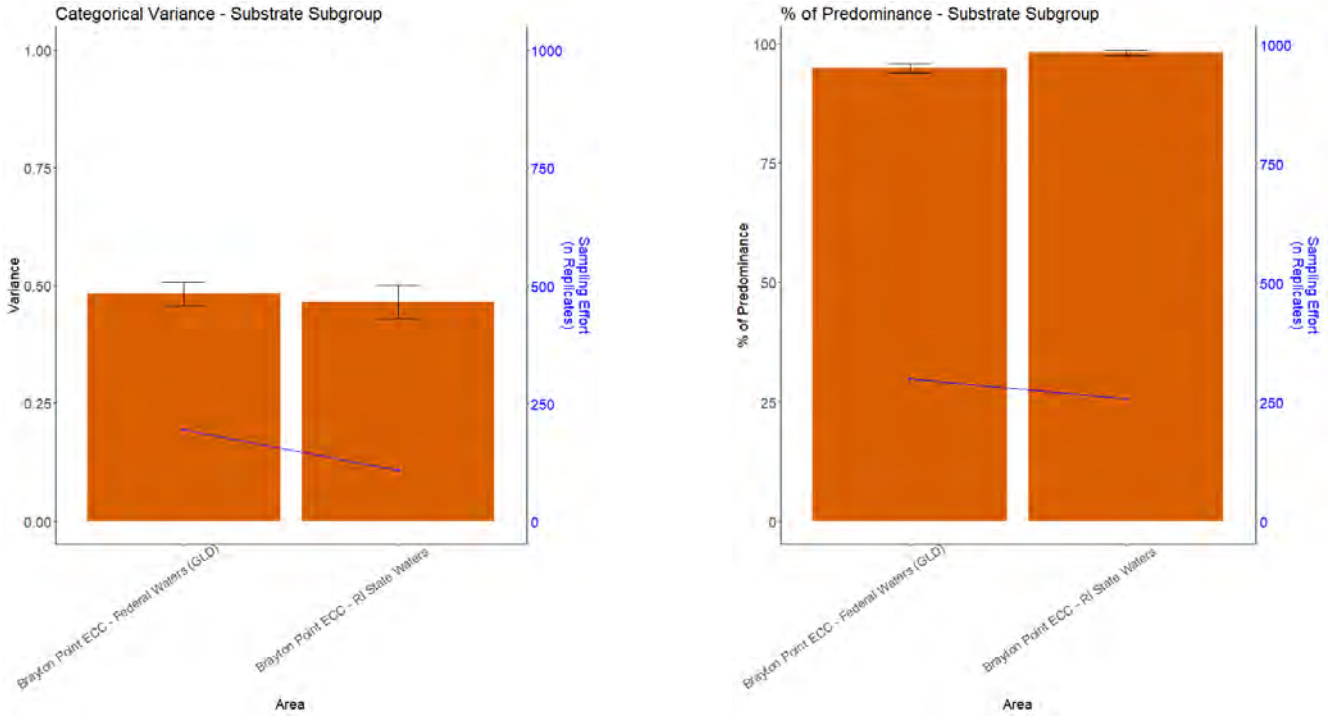

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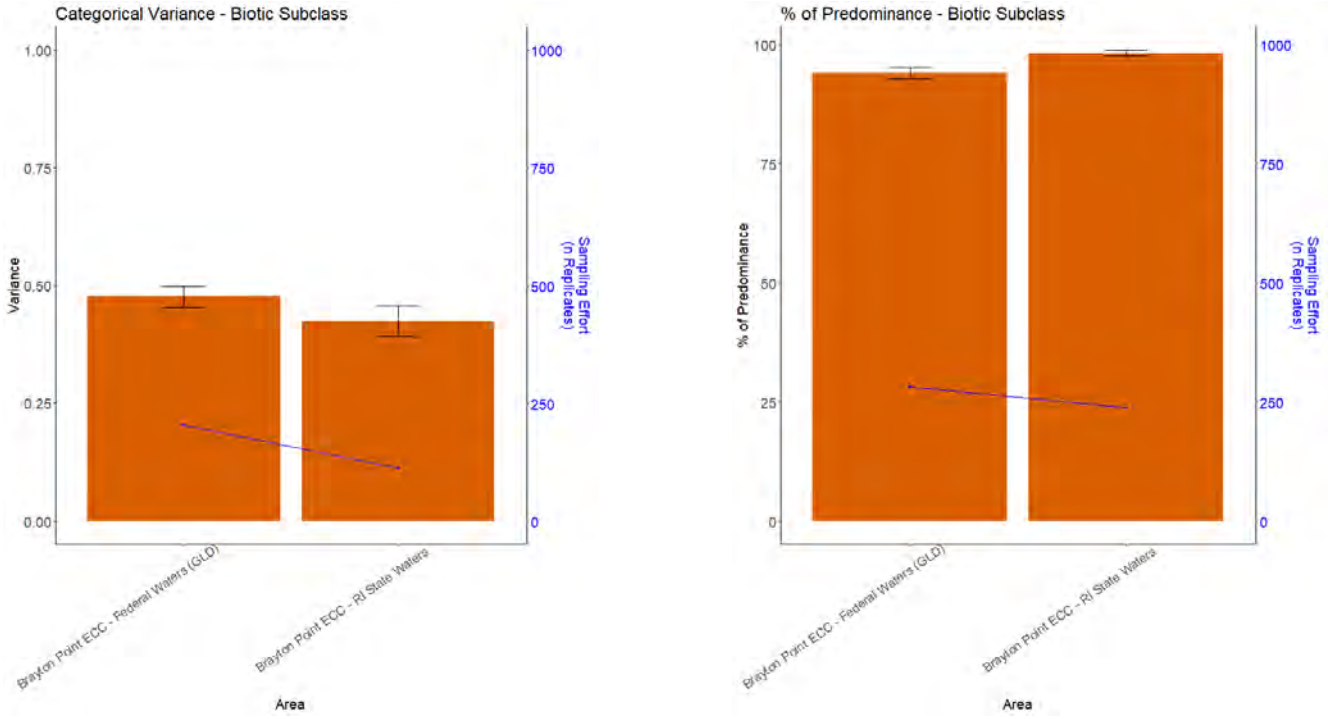

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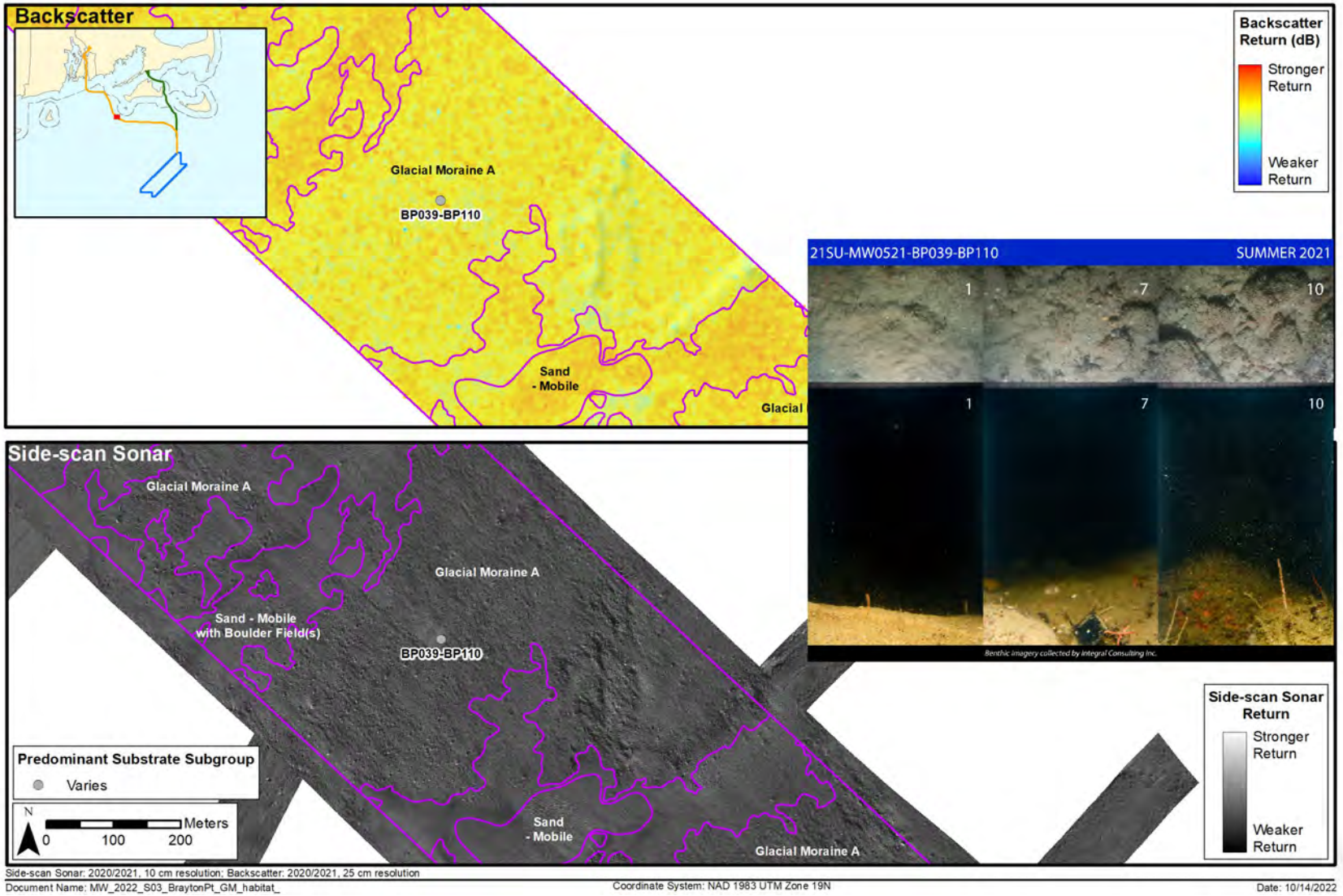

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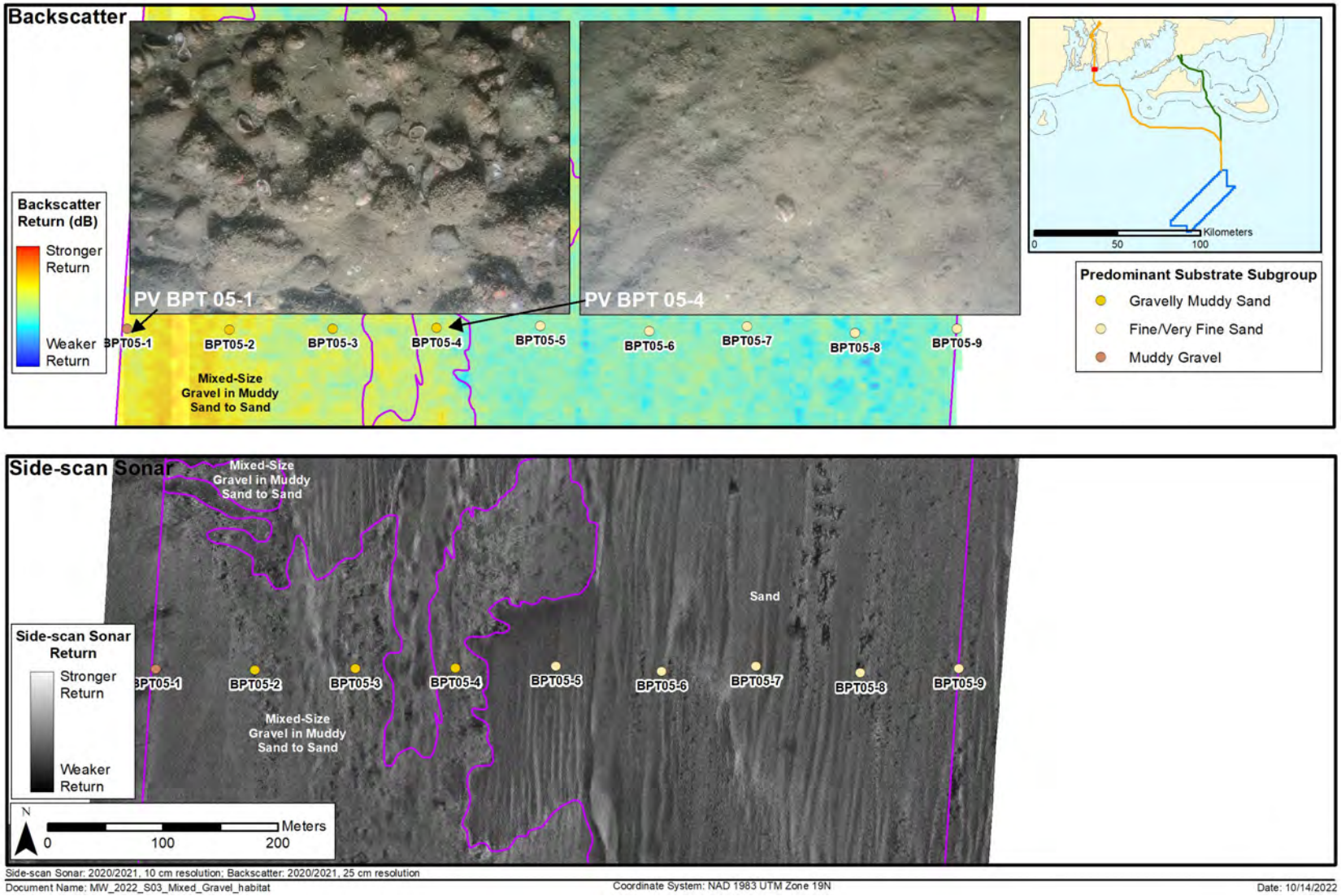

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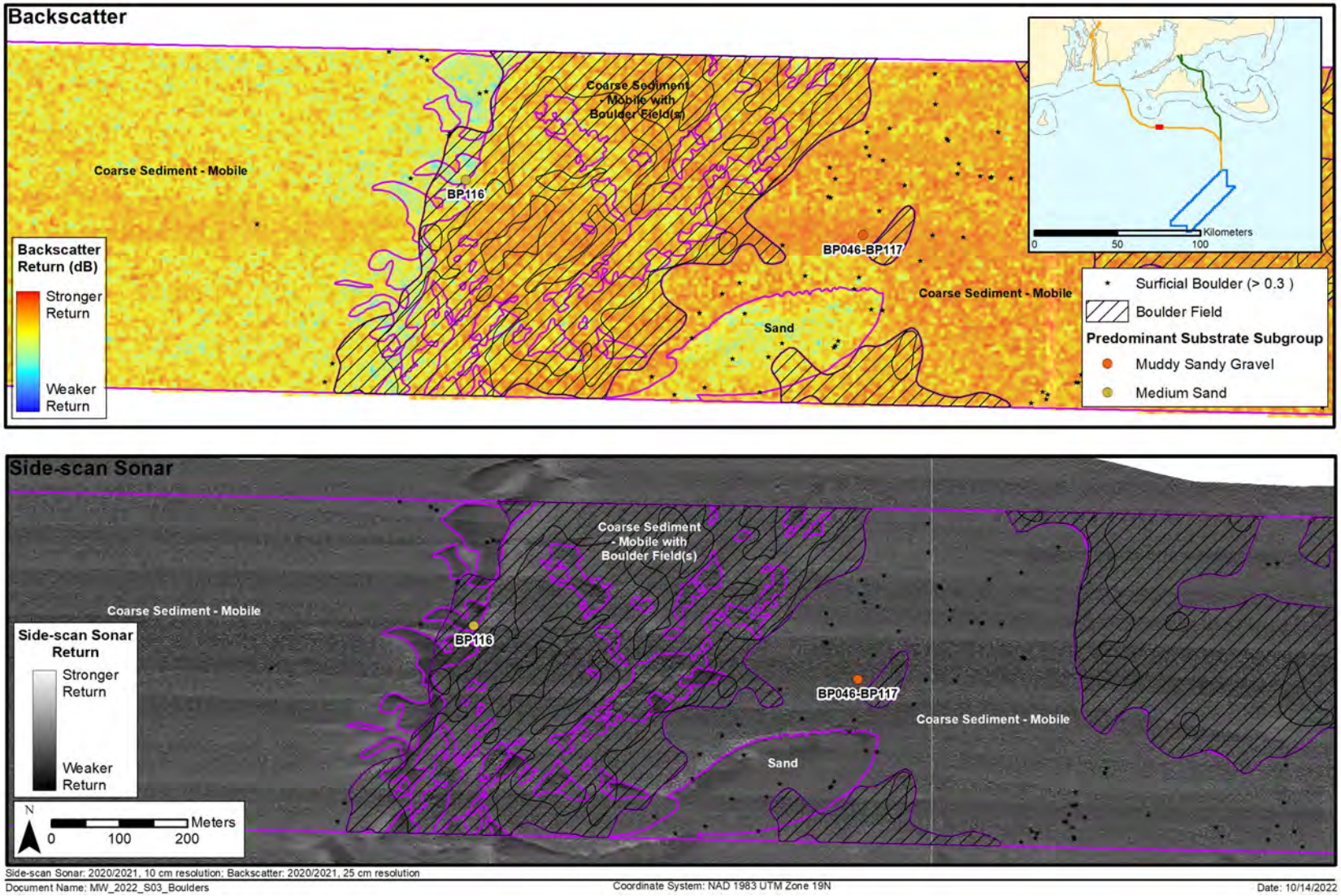

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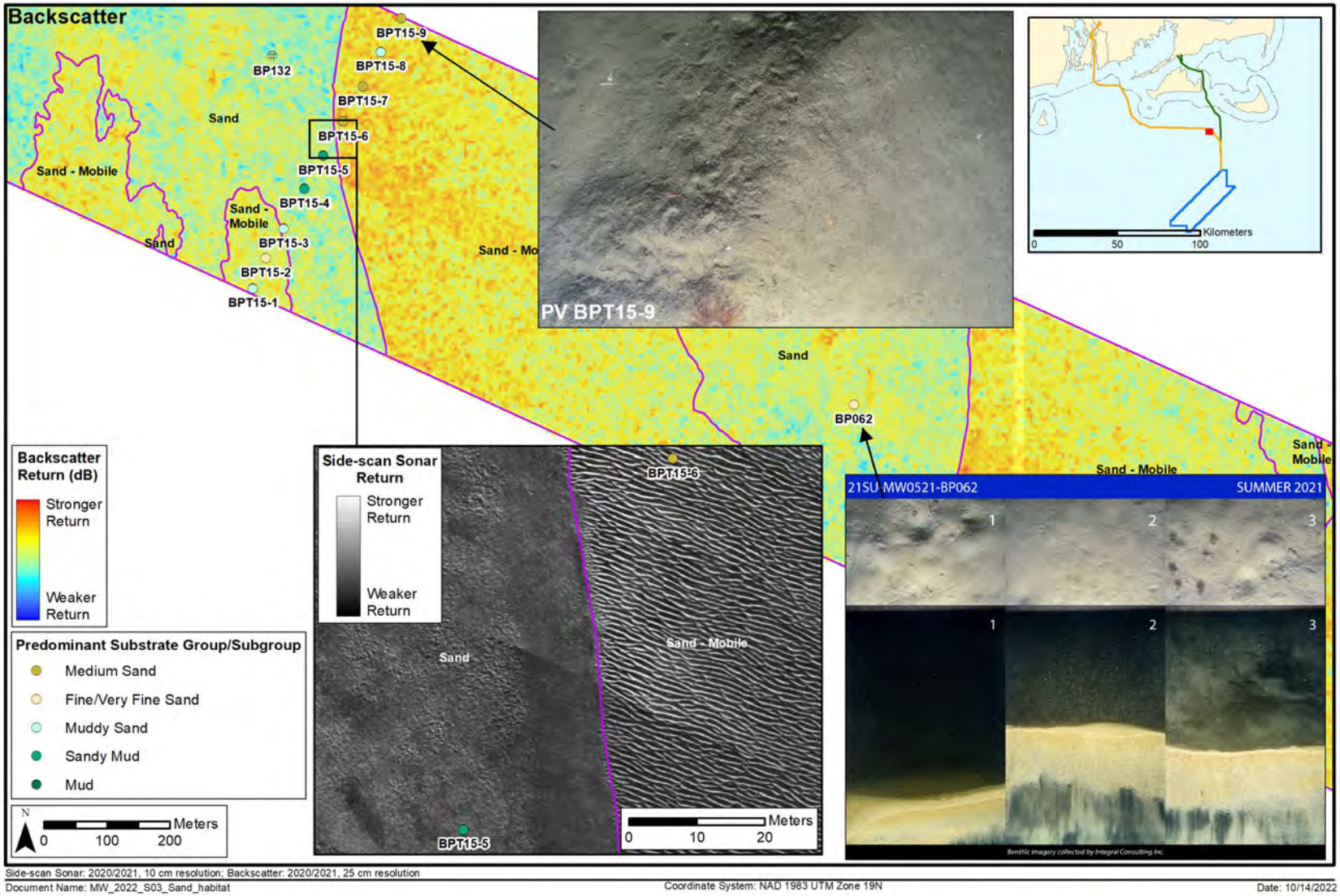

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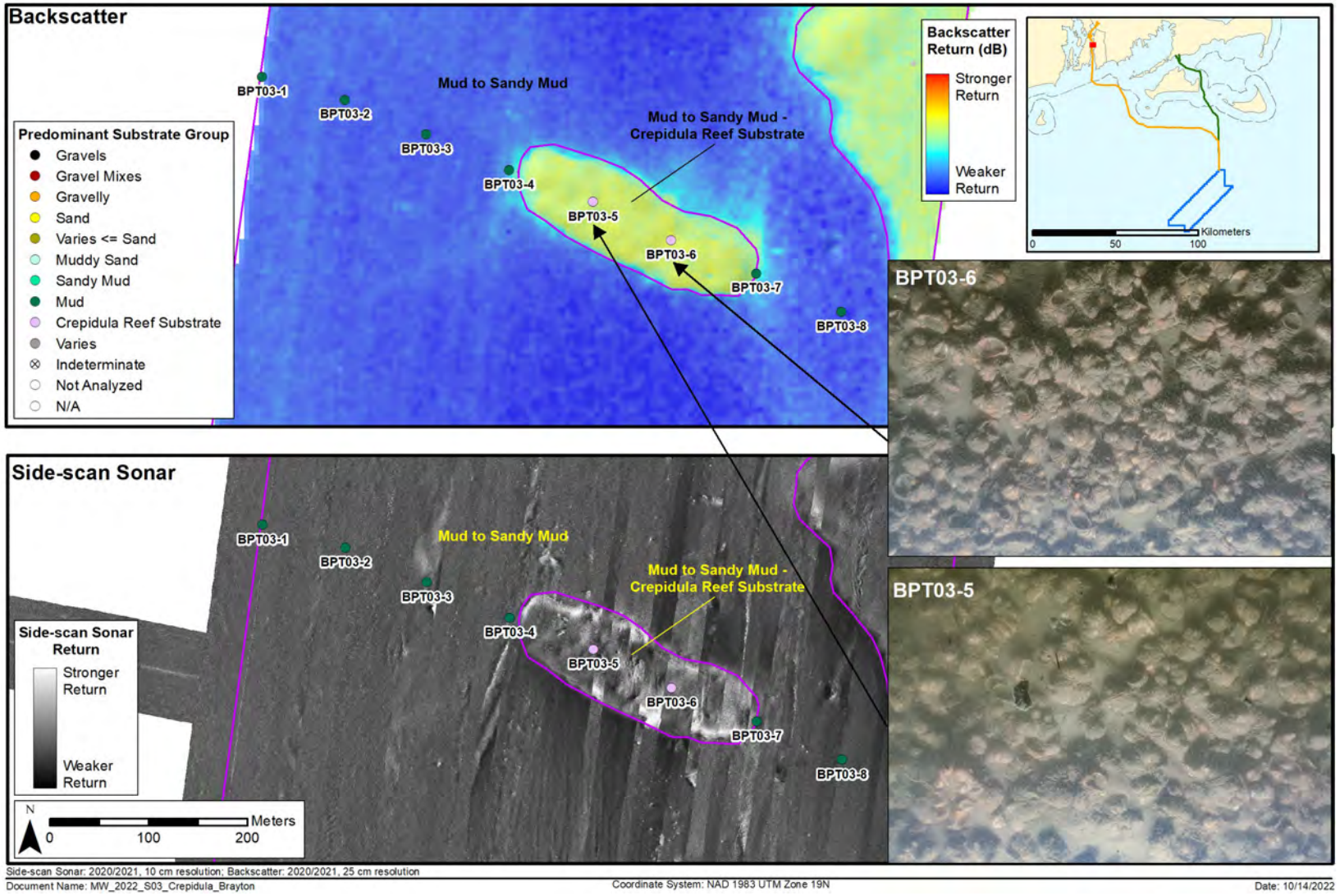

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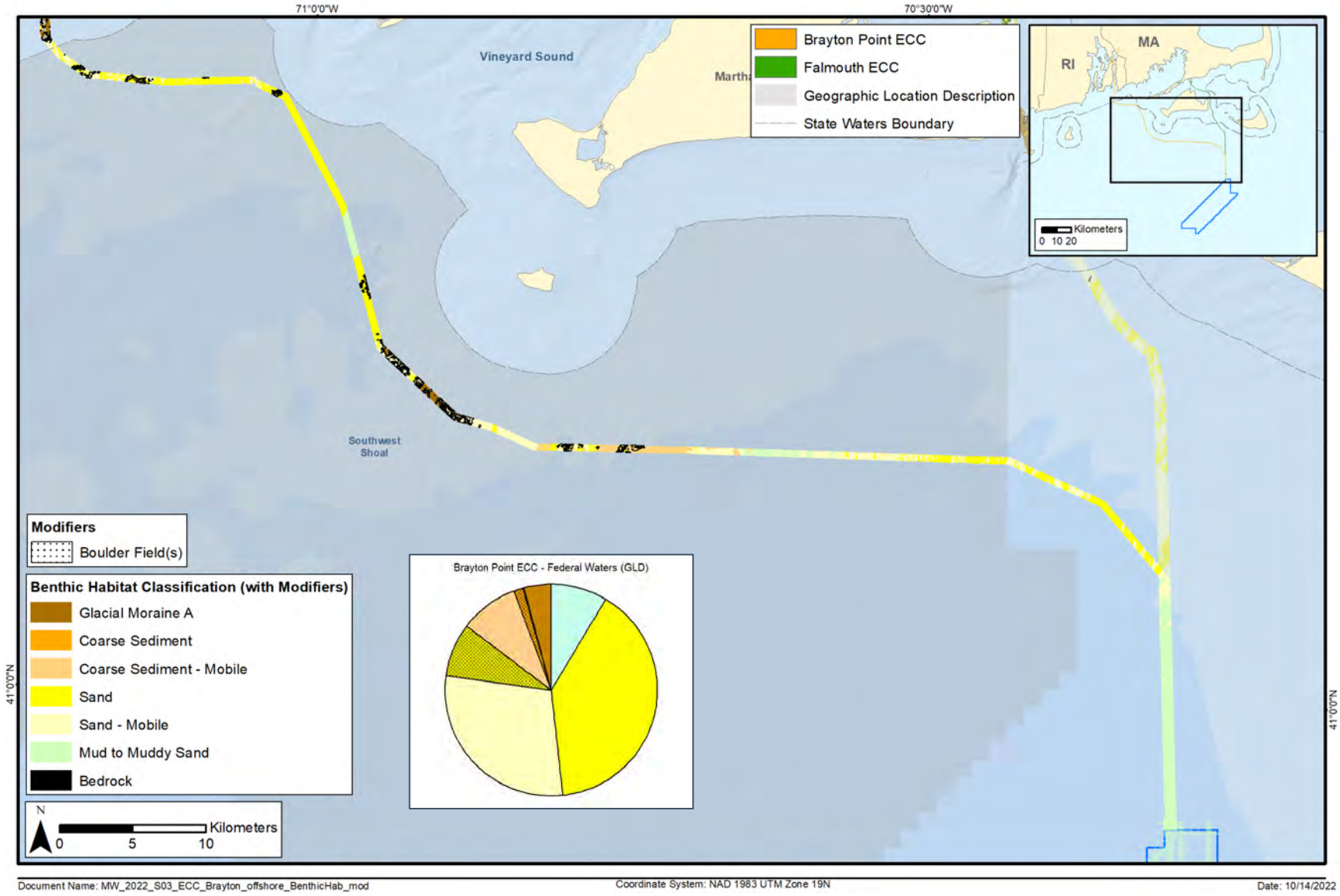

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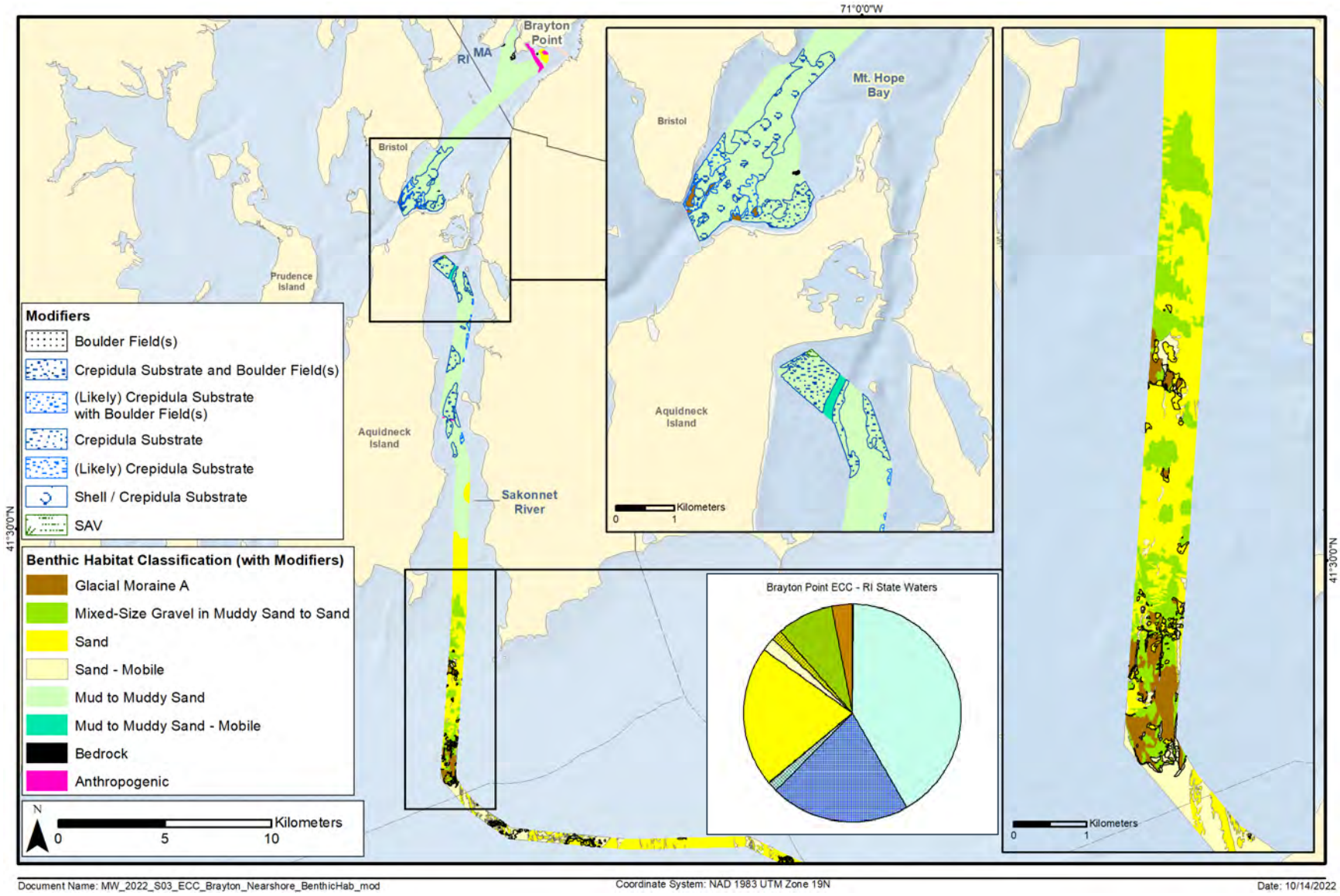

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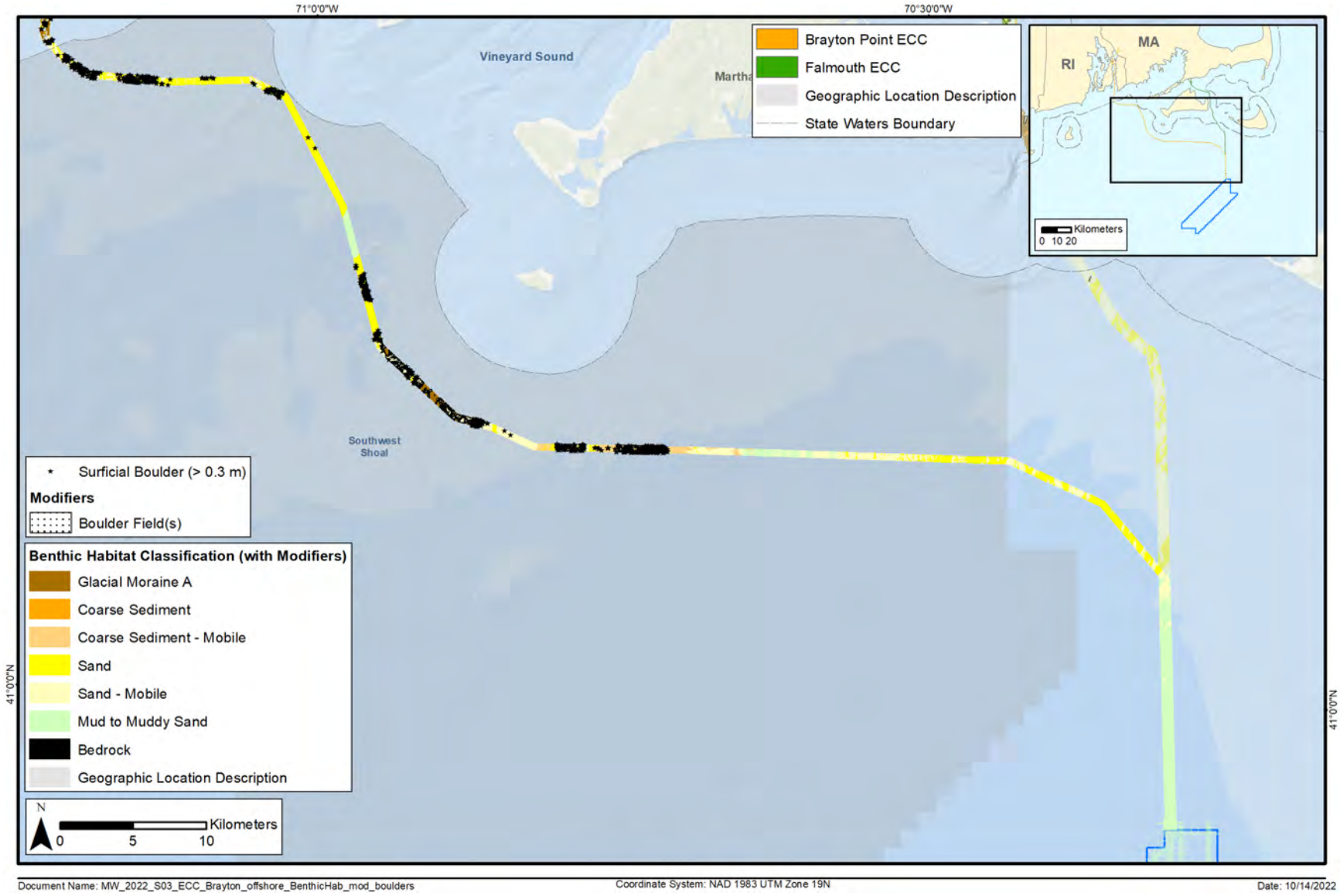

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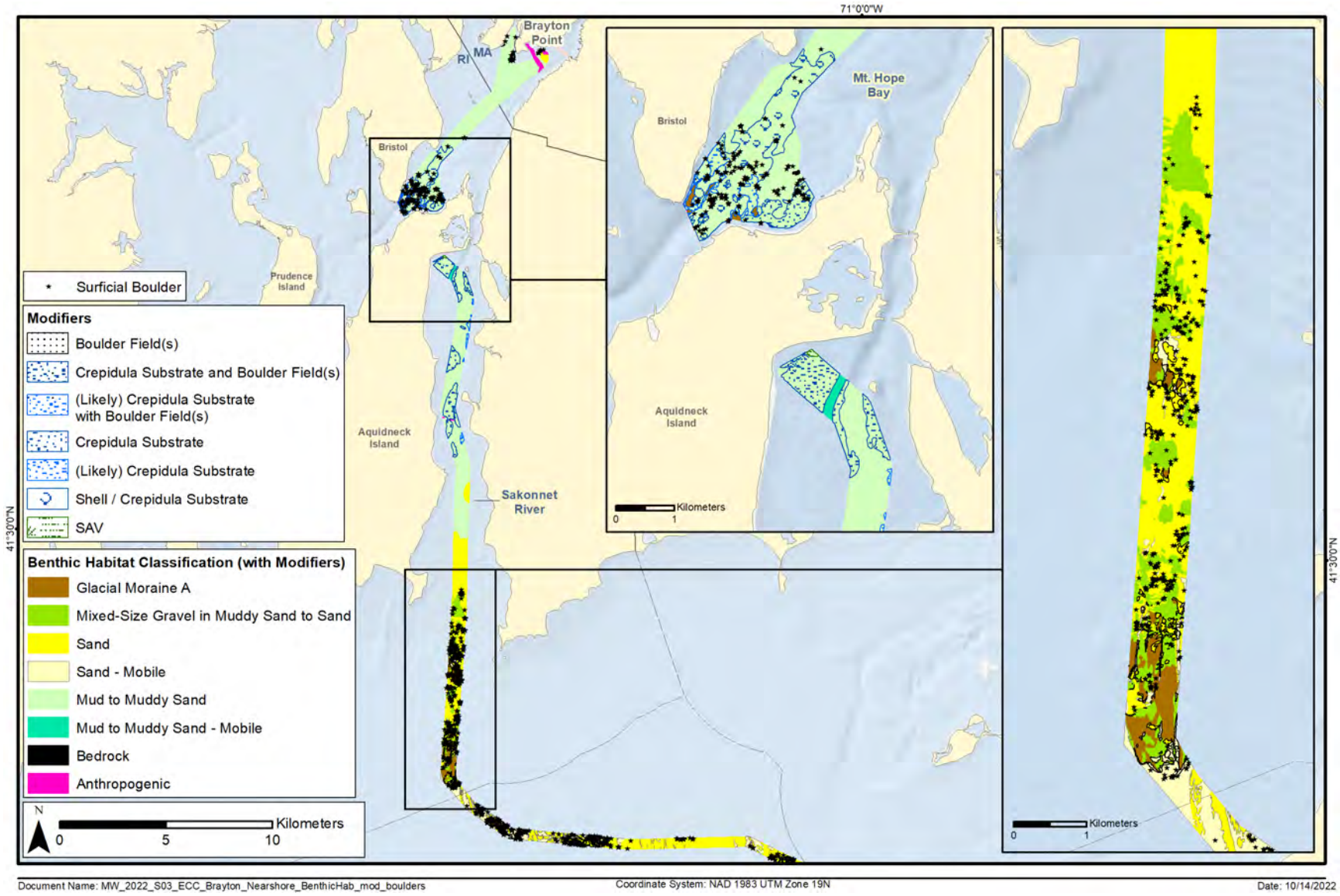

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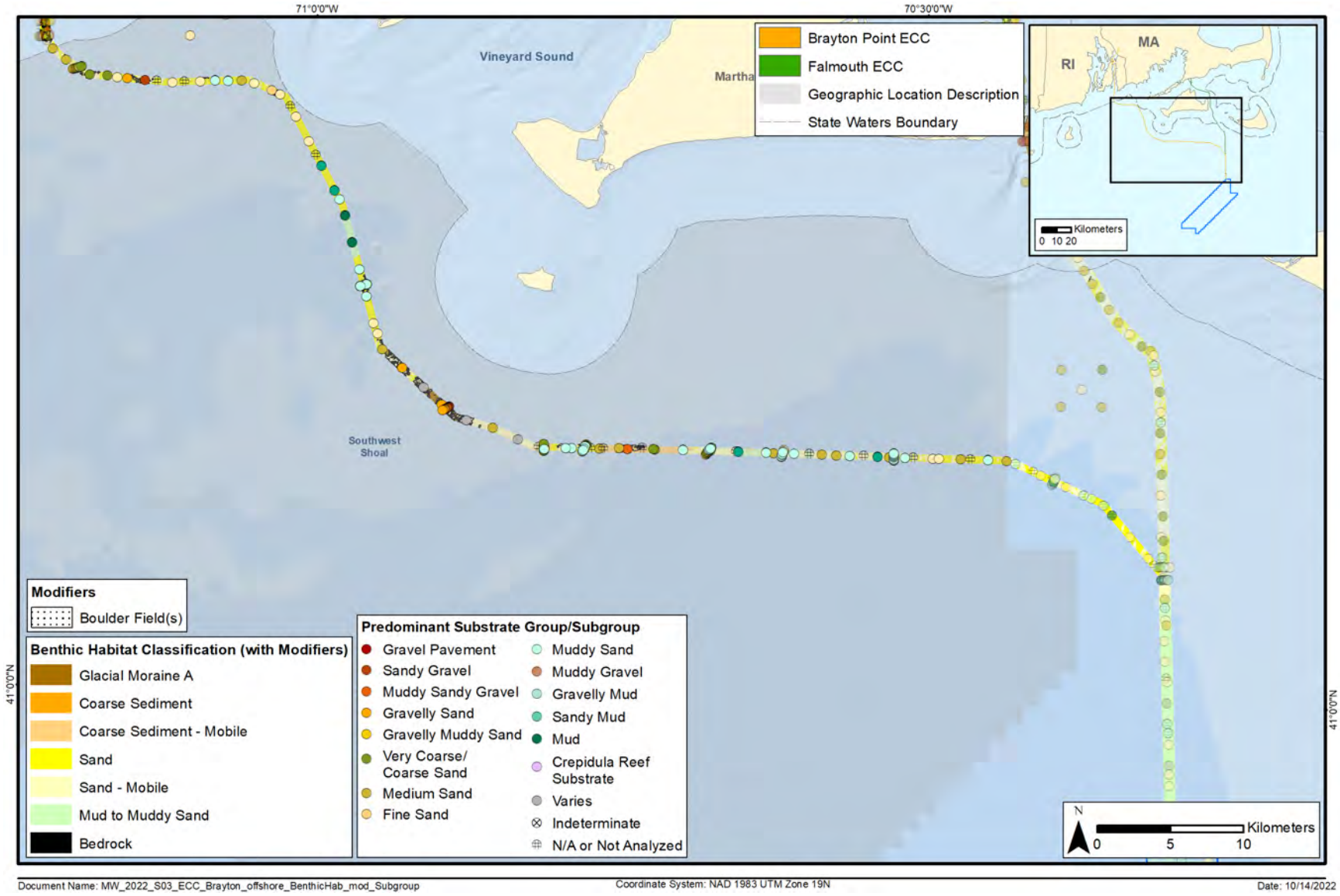

Figure 3-12. Benthic habitat types with modifiers mapped and ground-truth CMECS Substrate Subgroup or Substrate Group at the Brayton Point ECC (1 of 2)

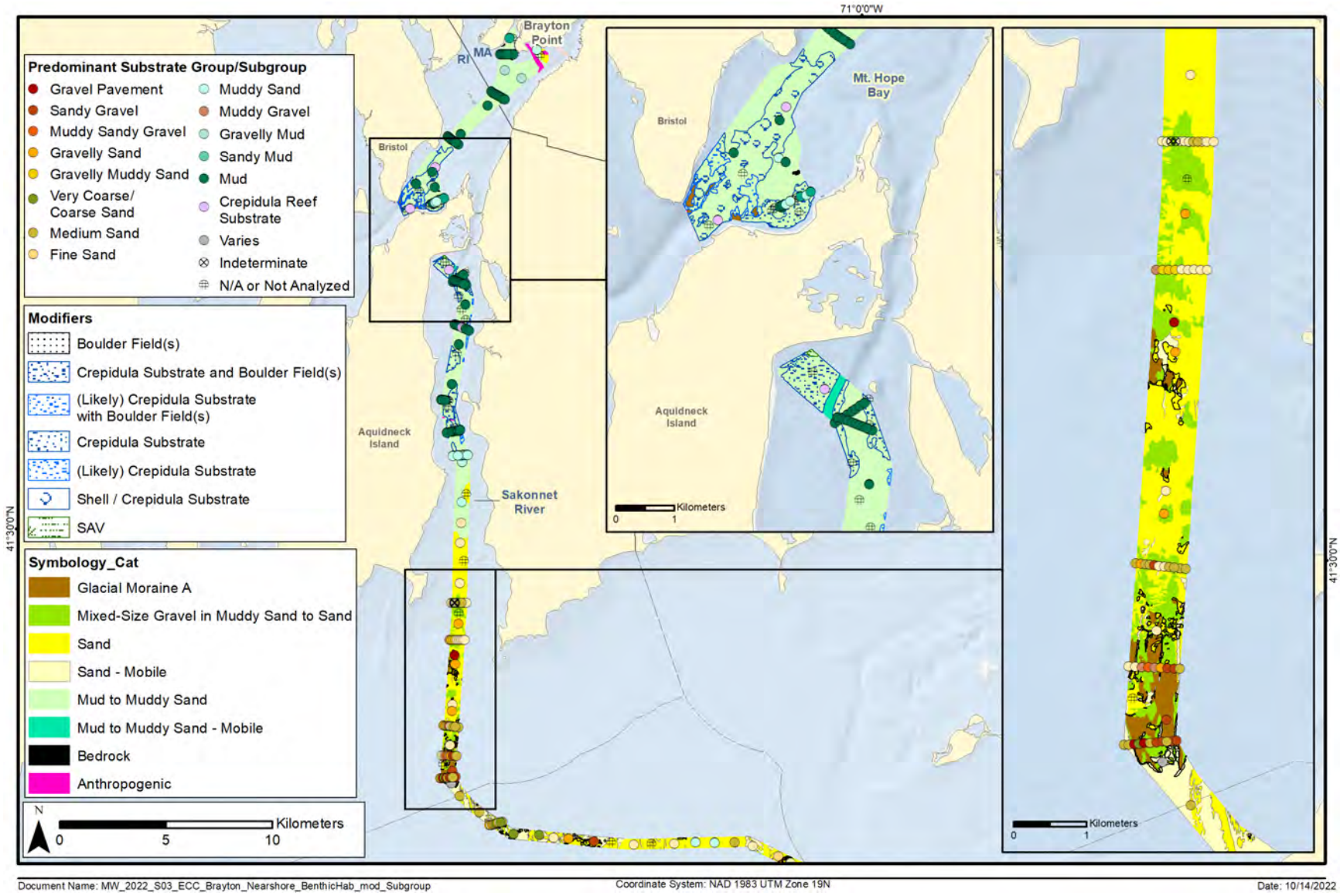

Figure 3-13. Benthic habitat types with modifiers mapped and ground-truth CMECS Substrate Subgroup or Substrate Group at the Brayton Point ECC (2 of 2)

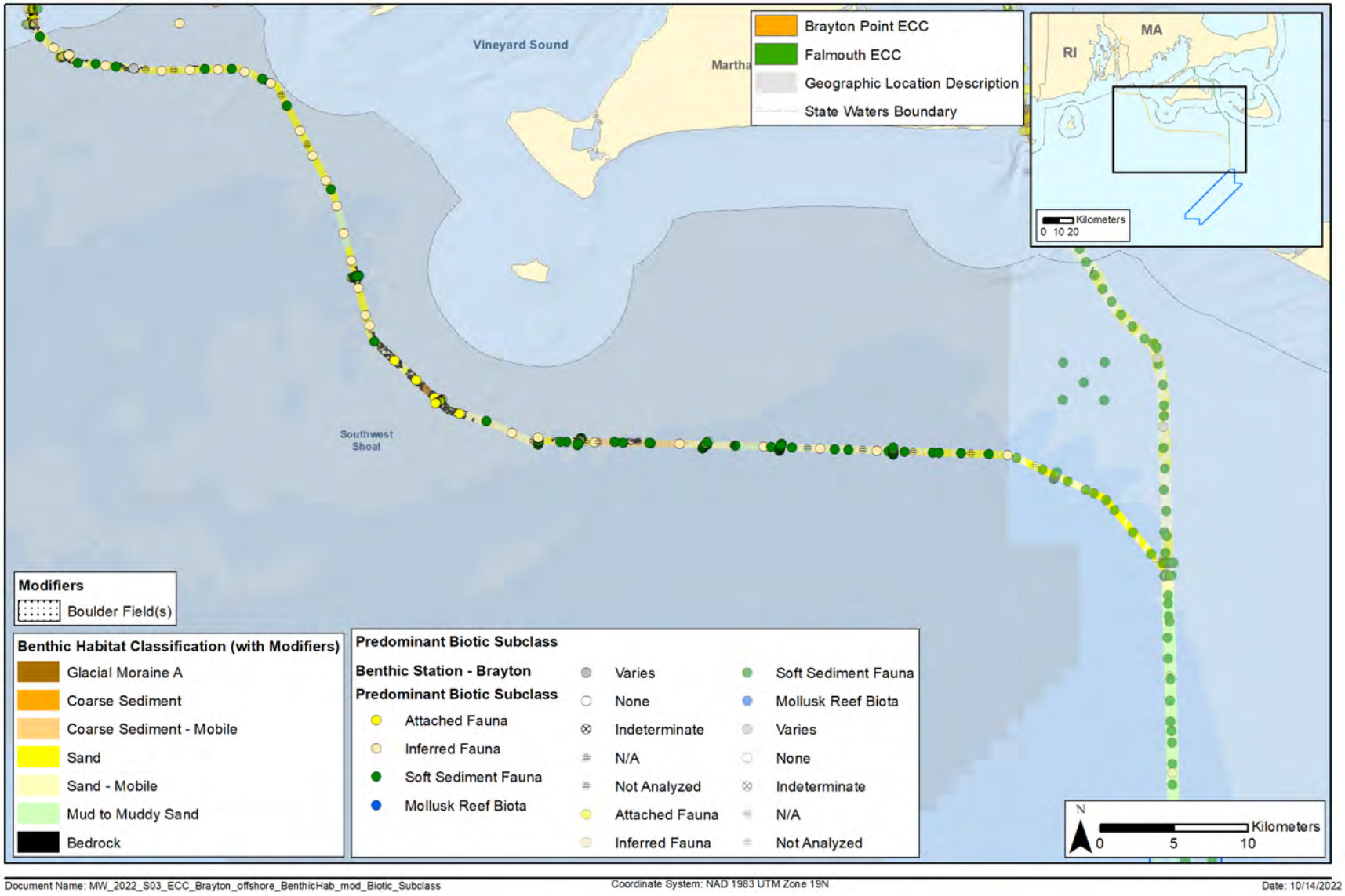

Figure 3-14. Benthic habitat types with modifiers mapped and ground-truth CMECS Biotic Subclass at the Brayton Point ECC (1 of 2)

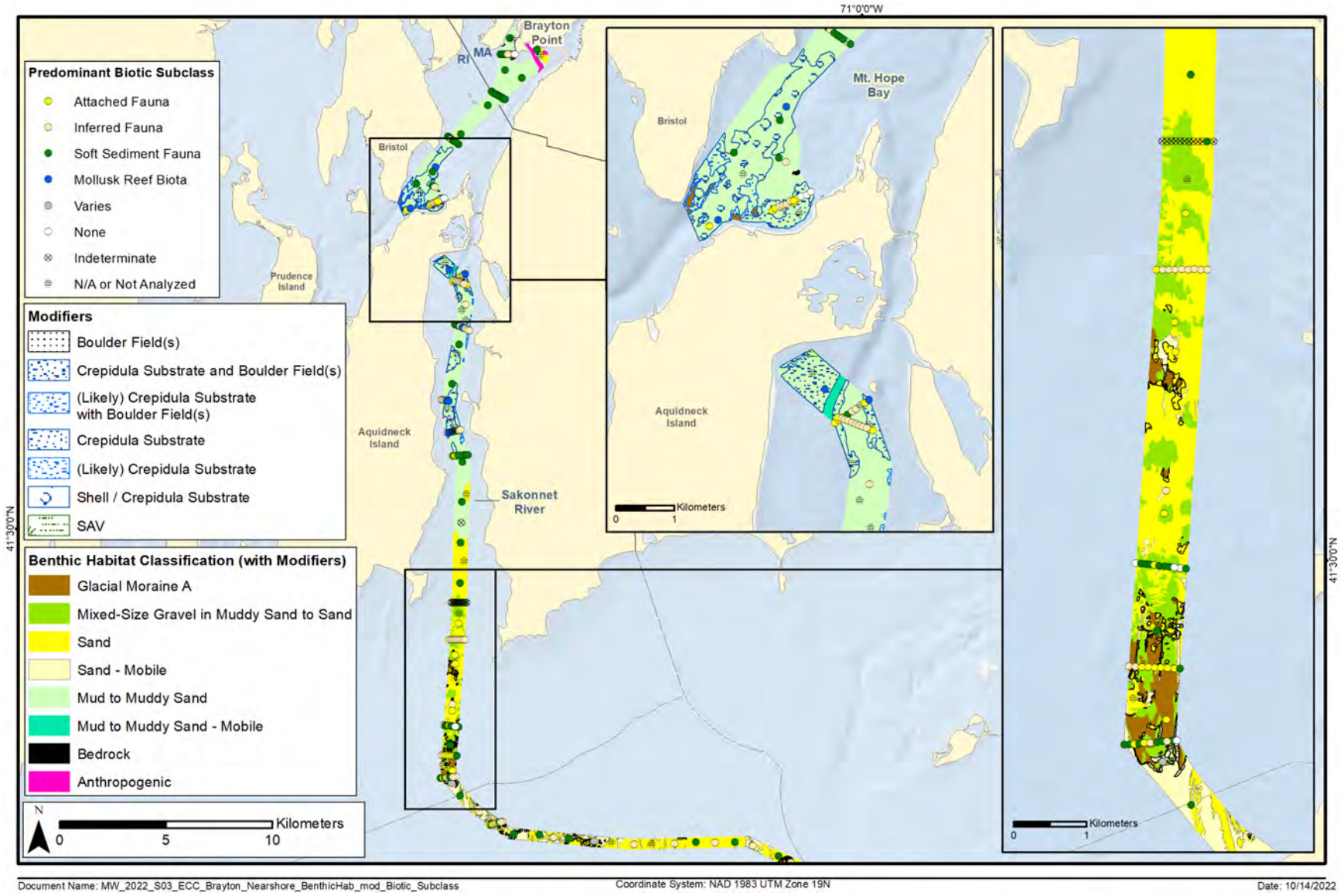

Figure 3-15. Benthic habitat types with modifiers mapped and ground-truth CMECS Biotic Subclass at the Brayton Point ECC (2 of 2)

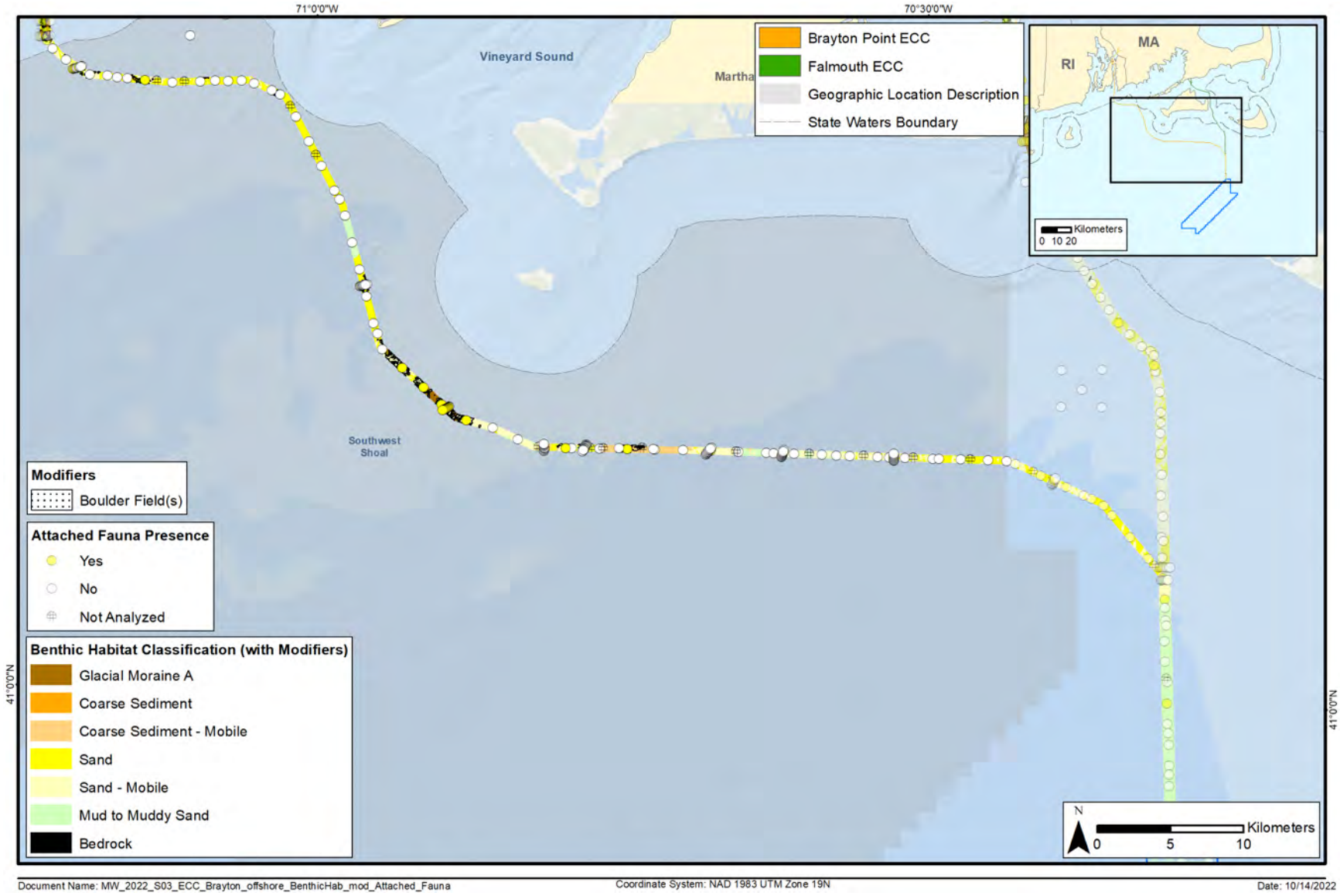

Figure 3-16. Benthic habitat types with modifiers mapped and ground-truth CMECS Attached Fauna presence at the Brayton Point ECC (1 of 2)

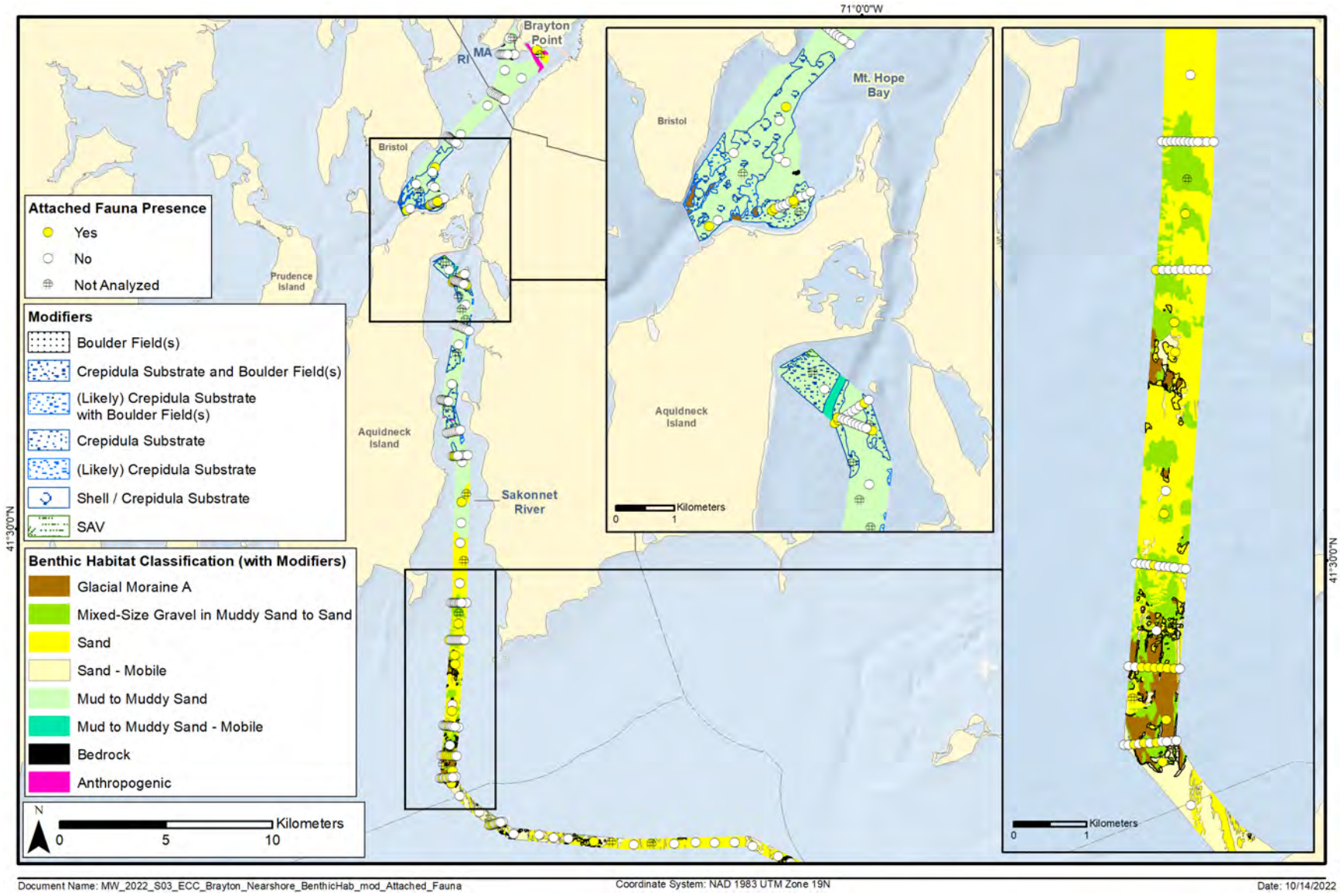

Figure 3-17. Benthic habitat types with modifiers mapped and ground-truth CMECS Attached Fauna presence at the Brayton Point ECC (2 of 2)

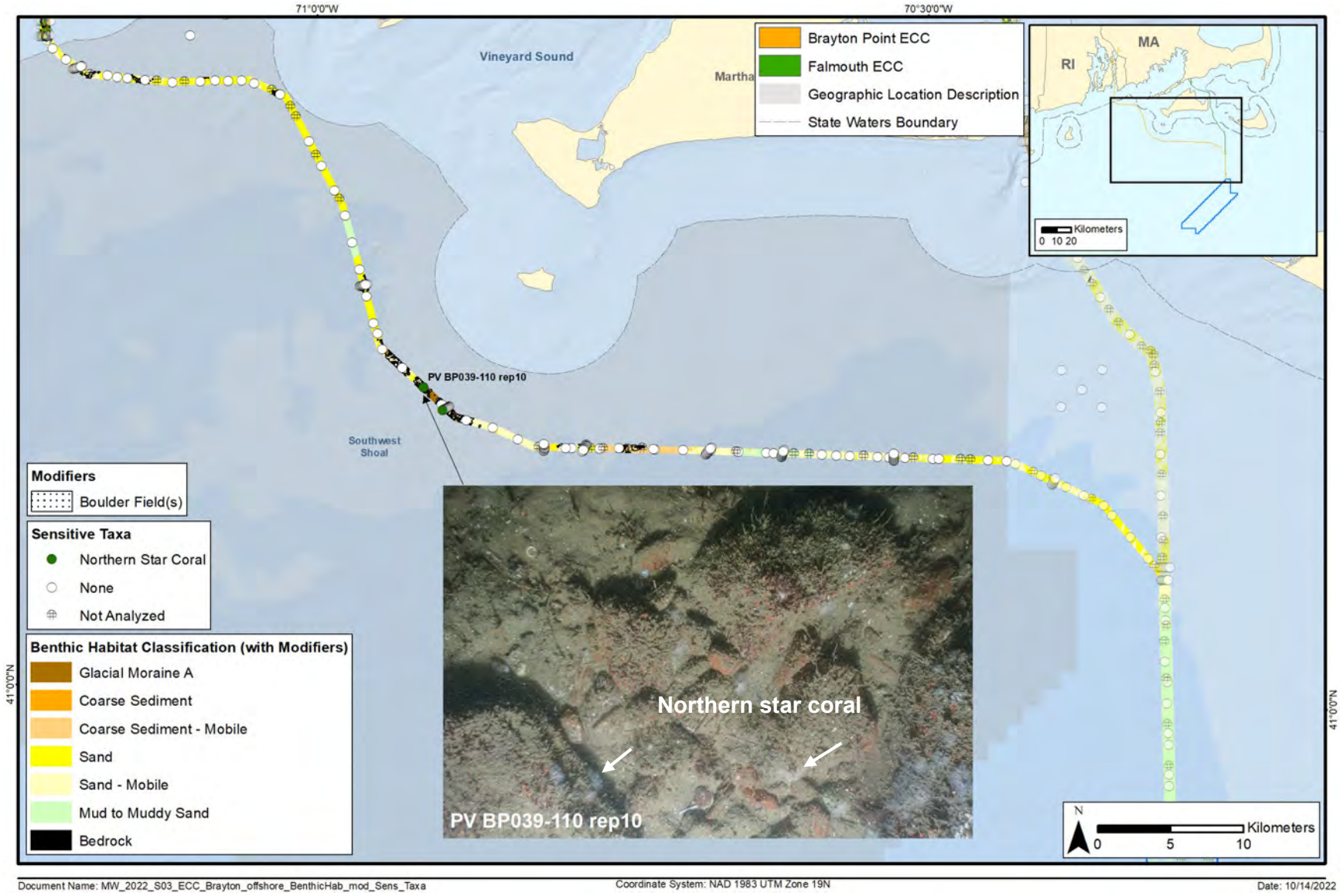

Figure 3-18. Benthic habitat types with modifiers mapped and ground-truth sensitive taxa presence at the Brayton Point ECC (1 of 2)

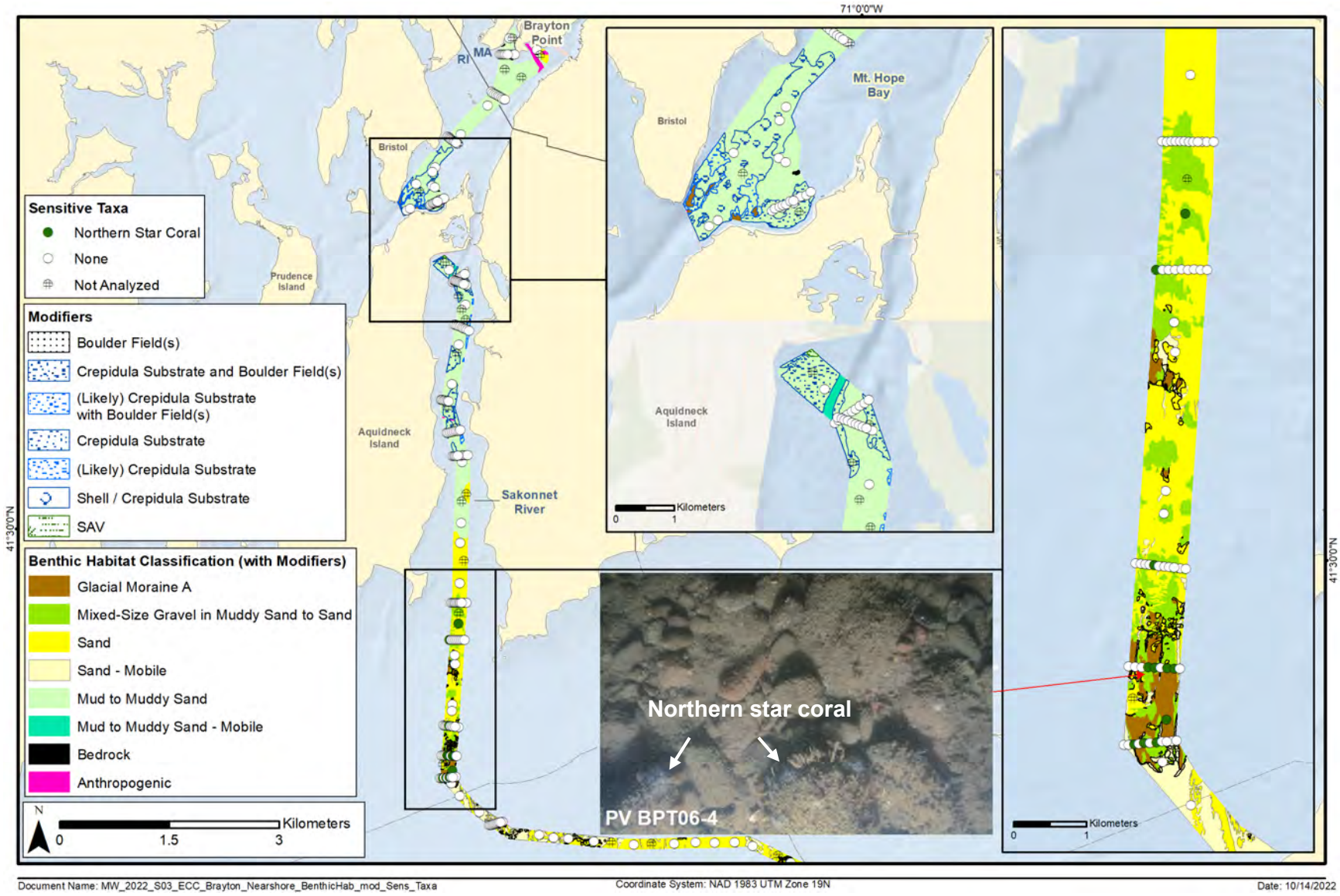

Figure 3-19. Benthic habitat types with modifiers mapped and ground-truth sensitive taxa presence at the Brayton Point ECC (2 of 2)

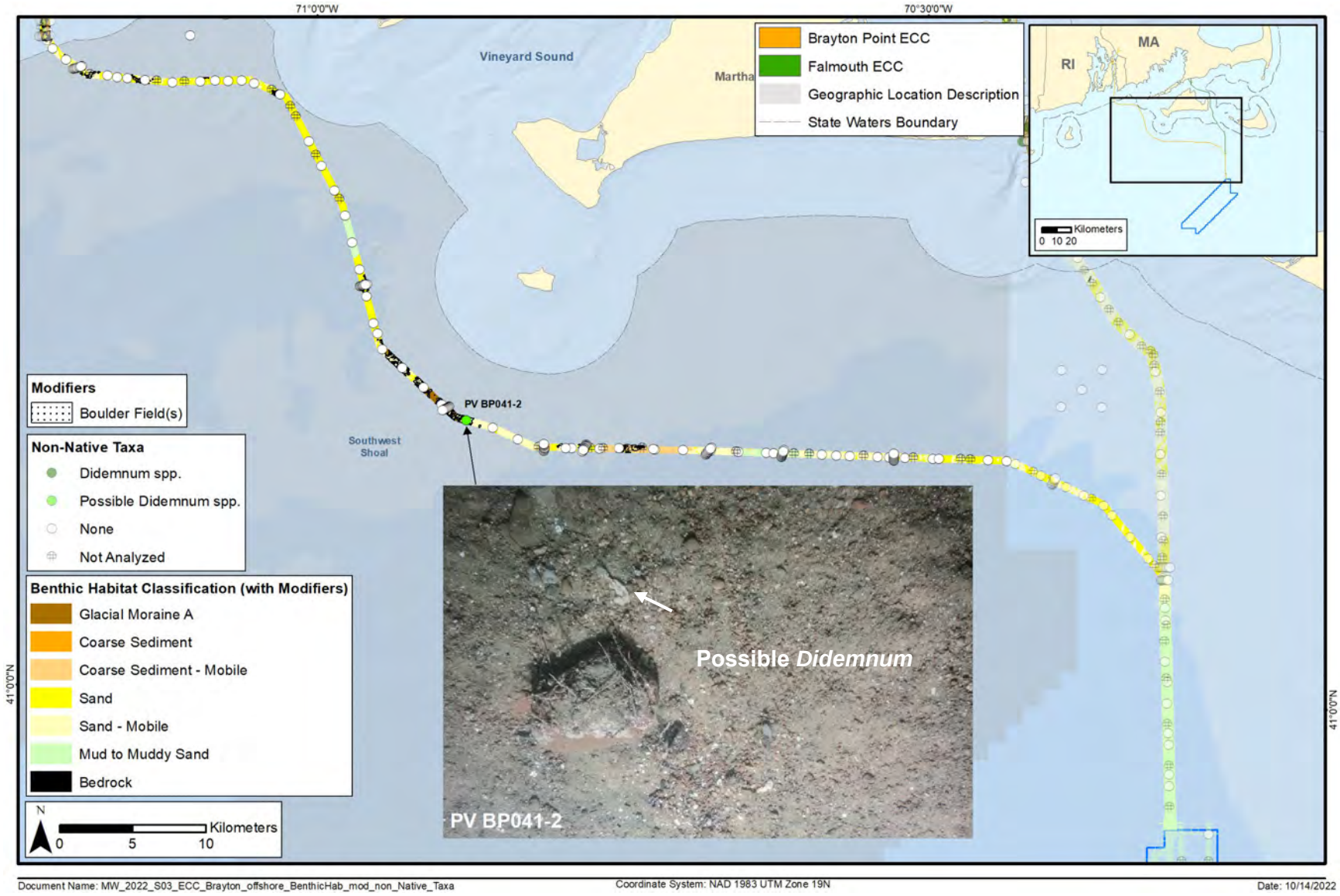

Figure 3-20. Benthic habitat types with modifiers mapped and ground-truth non-native taxa presence at the Brayton Point ECC, possible *Didemnum* spp. at BP041 recorded in Summer 2021

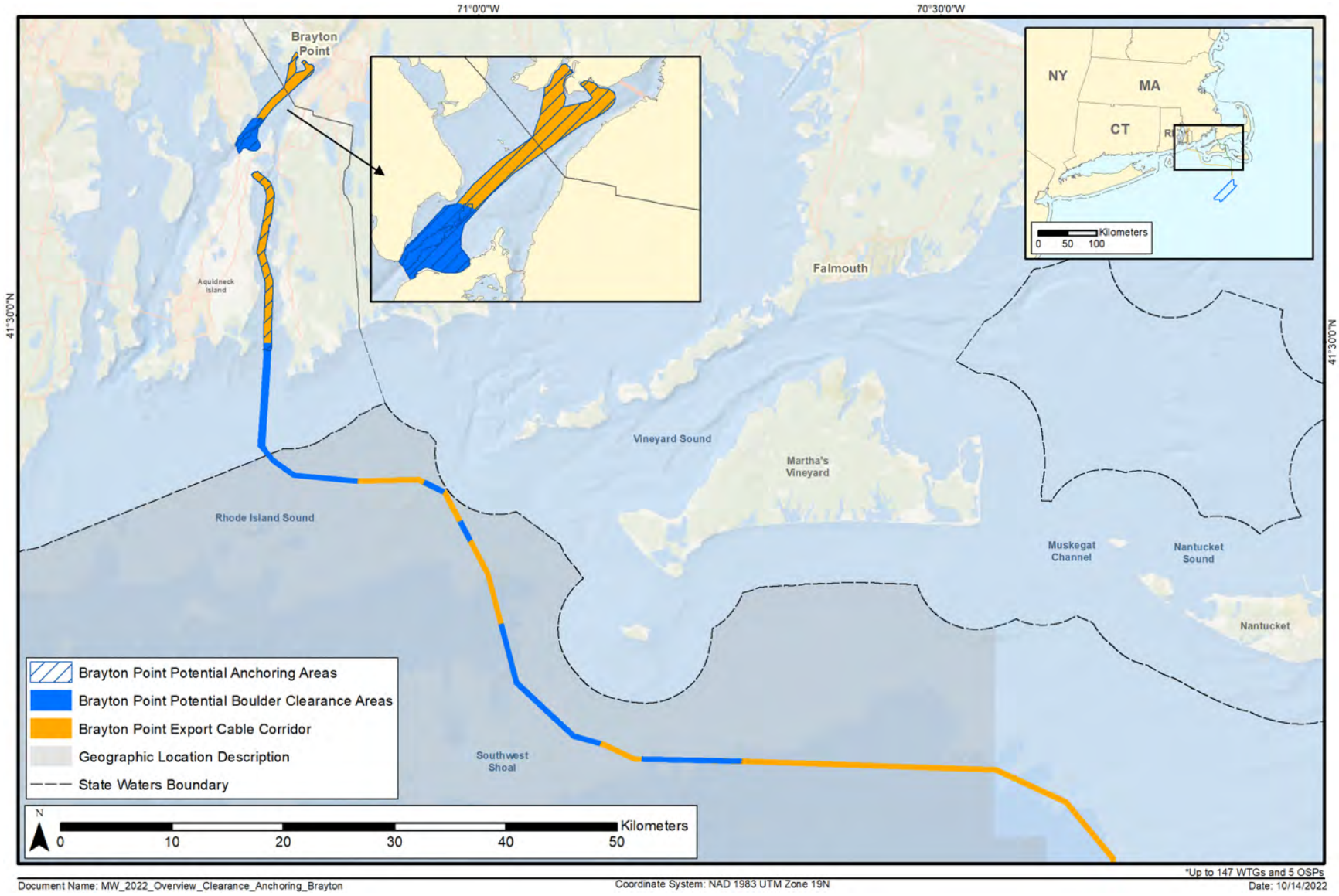

Figure 4-1. Map of ECC depicting segments where various seafloor preparation and installation temporary disturbances activities, such as sand wave clearance, boulder clearance and removal, and anchoring, could potentially occur

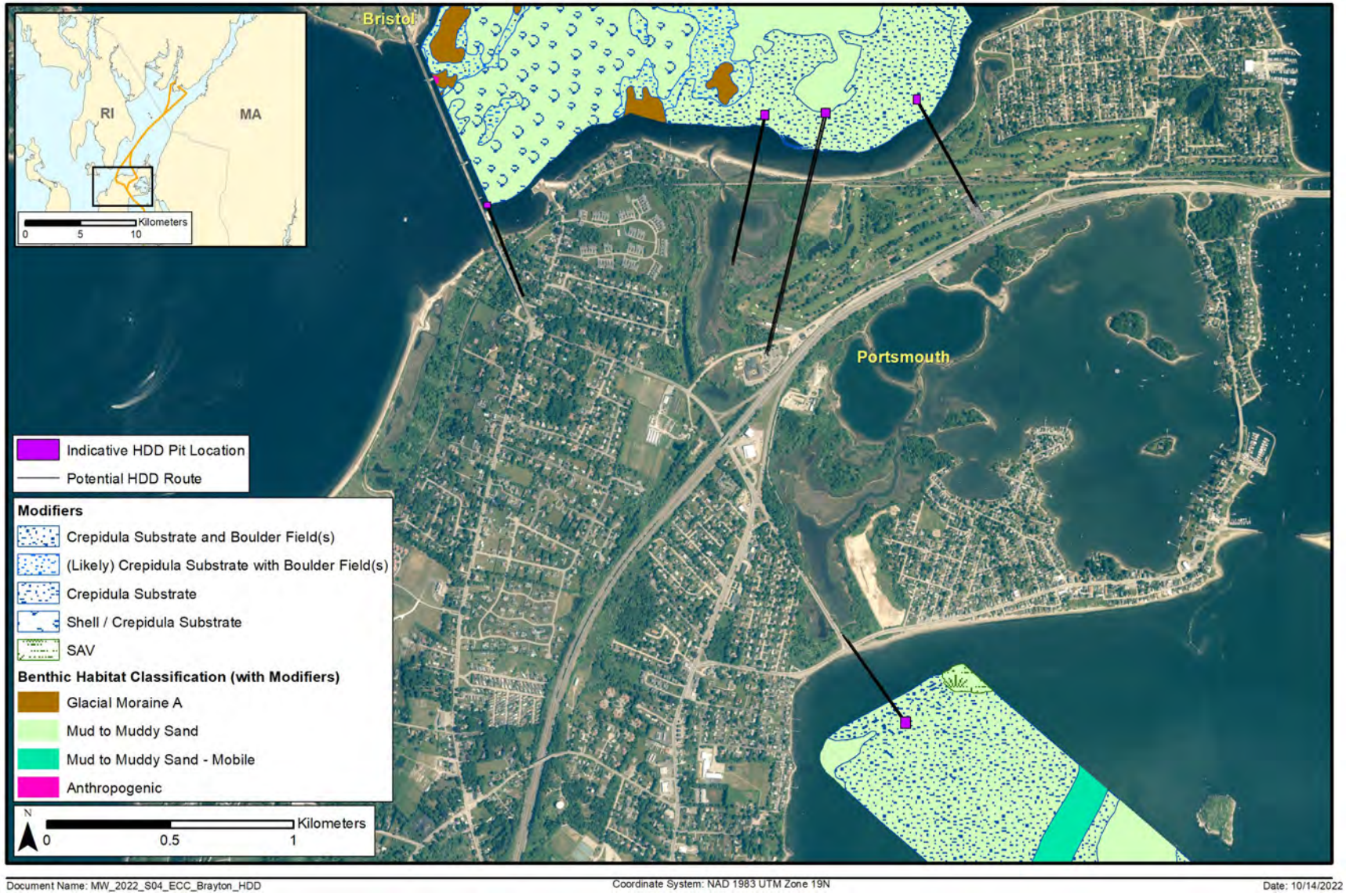

Figure 4-2. Export cable corridor and four optional locations for four HDD pits on both sides of Aquidneck Island along with benthic habitat types with modifiers

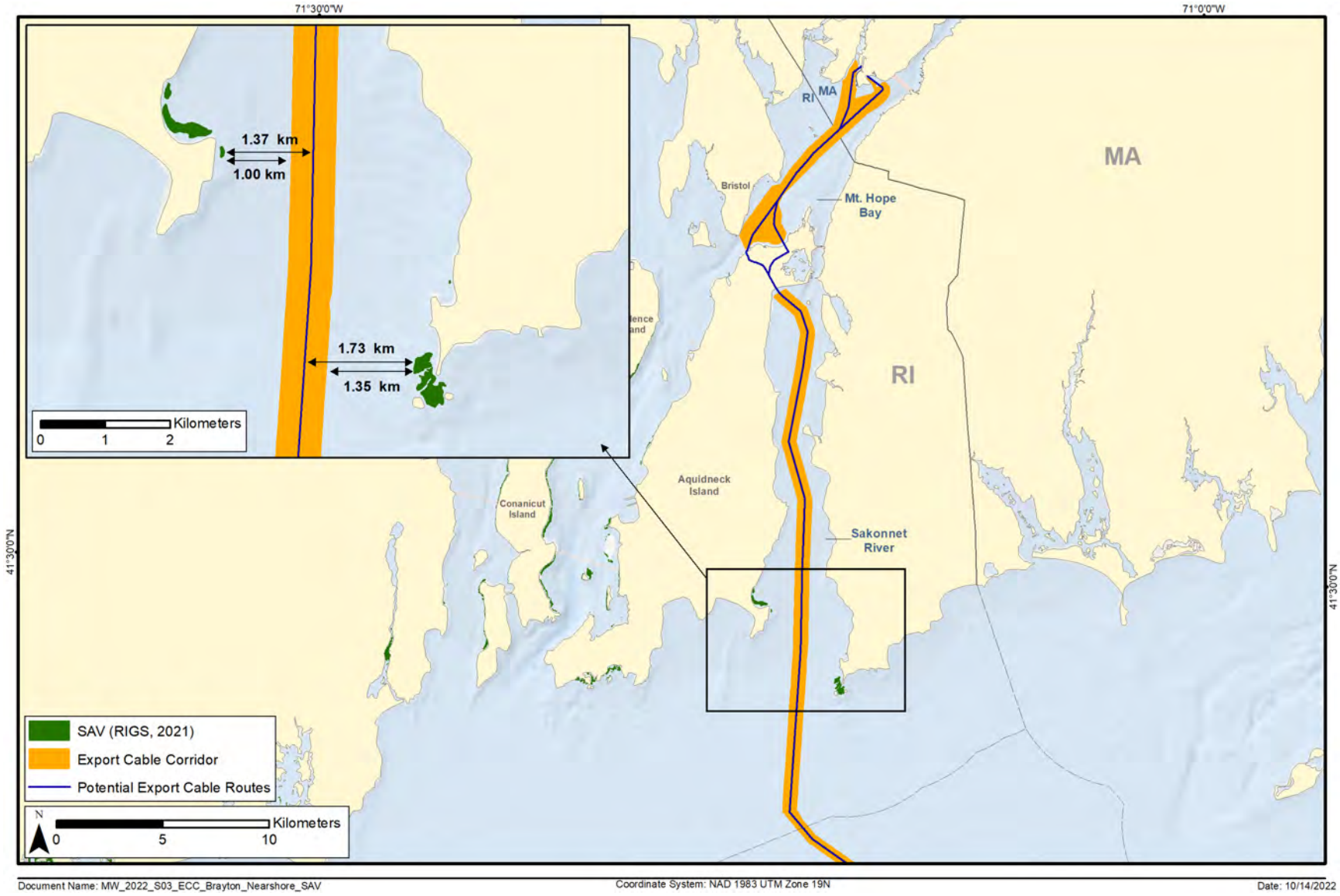

Figure 4-3. Indicative cable route and corridor in RI State Waters and state data on SAV beds; distances between SAV beds and the indicative cable route and corridor are indicated

Figure 4-4. Likely presence of SAV mapped based on distinct side-scan sonar data at the east edge of the cable corridor south of Aquidneck Island

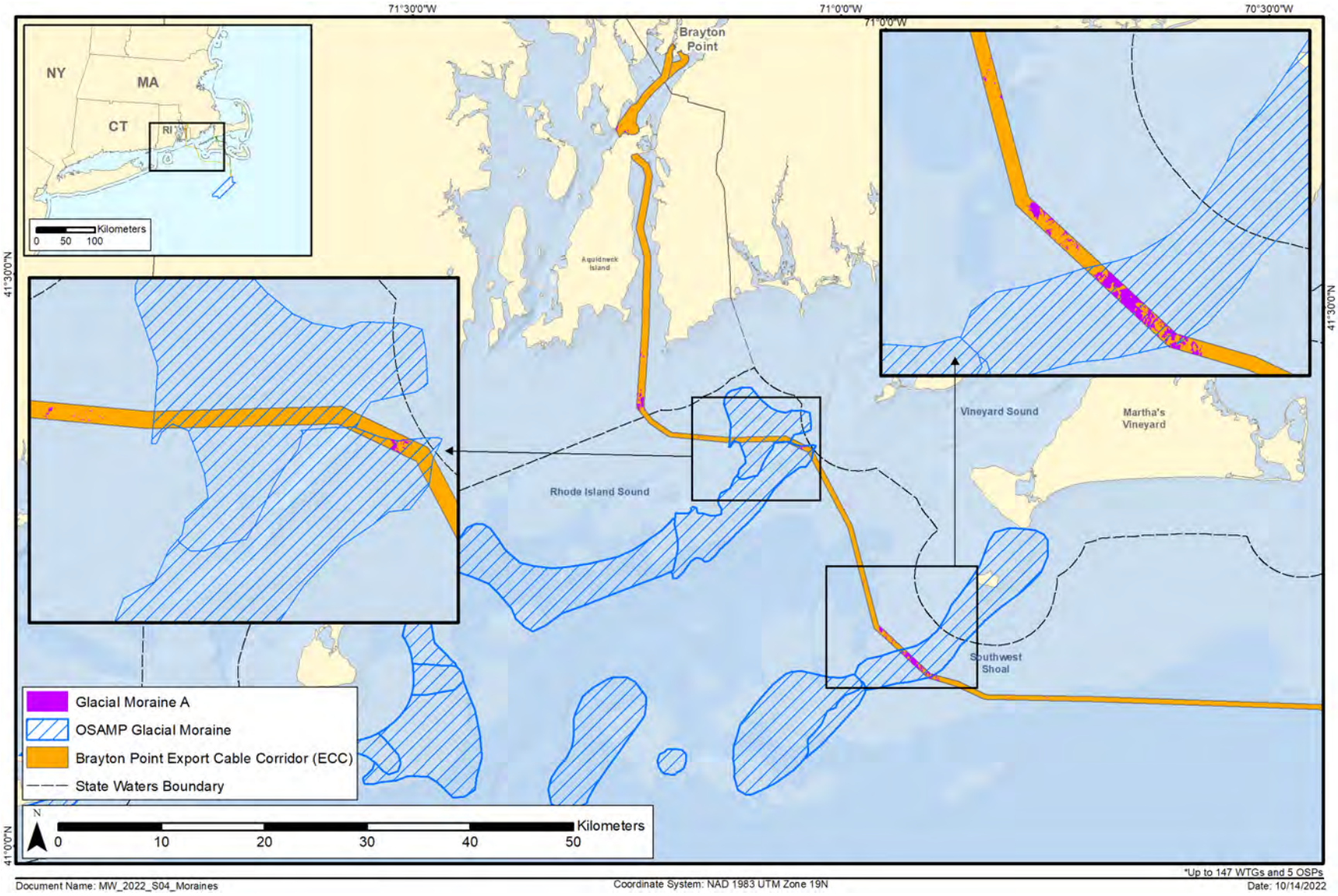

Figure 4-5. Glacial moraines as identified in the RI Ocean Special Area Management Plan and glacial moraines distribution as mapped by Mayflower Wind

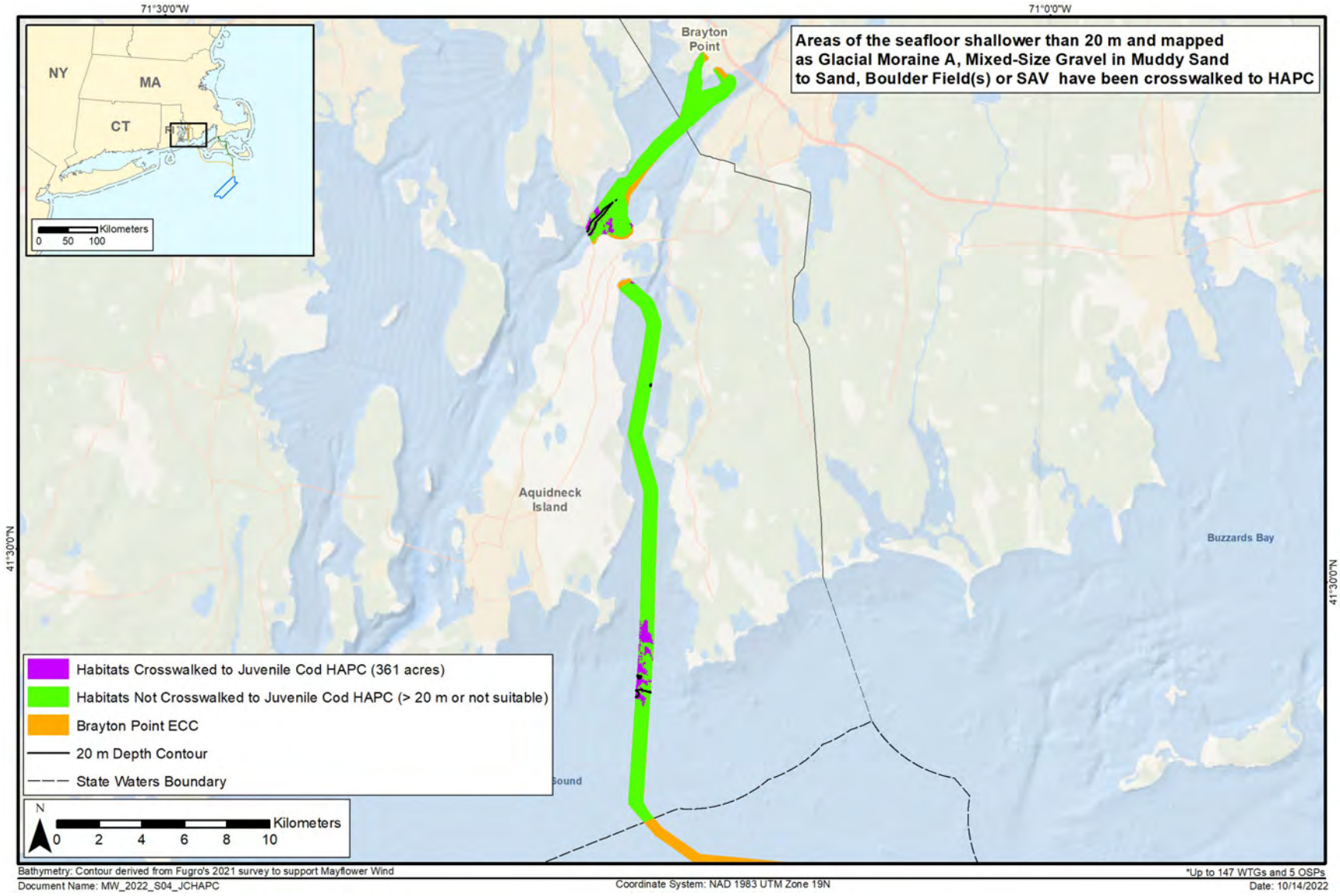

Figure 4-6. Habitats crosswalked to juvenile cod HAPC at the Brayton Point ECC, along with the 20-m depth contour

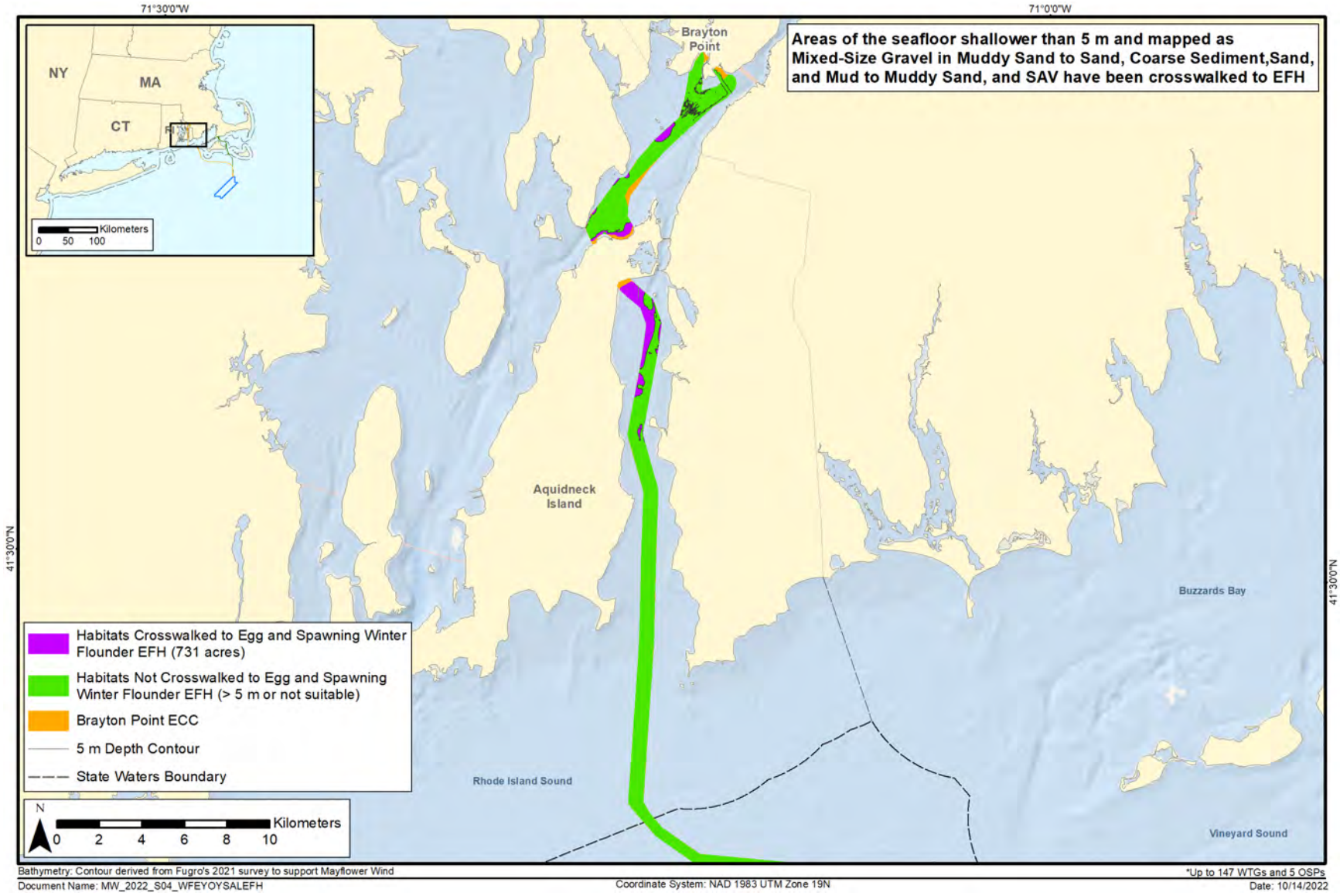

Figure 4-7. Habitats crosswalked to winter flounder egg and spawning adult EFH at the Brayton Point ECC

MAYFLOWER WIND

Benthic Habitat Mapping to Support State Permitting Applications - Brayton Point ECC for RI State Waters and GLD - ATTACHMENTS

Document Number	MW01-COR-PRT-RPT-0112
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Document Status	Final
Owner/Author	INSPIRE Environmental
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Security Classification	Confidential
Disclosure	For use by Mayflower Wind and Authorized Third Parties

List of Attachments

Attachment A Inventory of Benthic Sample Types Collected at Each Sampling Location Across Surveys

Attachment B Summary Benthic Ground-Truth Data Analysis Results

Attachment A Inventory of Benthic Sample Types Collected at Each Sampling Location Across Surveys

Area	StationID	Summer 2021	Spring 2022
Brayton Point ECC - RI State Waters	BP003-BP072	SPI/PV, Grab, GrabCam	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP004-BP073	SPI/PV	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP005	SPI/PV, Grab, GrabCam	-
Brayton Point ECC - RI State Waters	BP006	SPI/PV	-
Brayton Point ECC - RI State Waters	BP007	SPI/PV	-
Brayton Point ECC - RI State Waters	BP008	SPI/PV	-
Brayton Point ECC - RI State Waters	BP009	SPI/PV	-
Brayton Point ECC - RI State Waters	BP010-BP085	Grab, GrabCam	SPI/PV, Grab, GrabCam
Brayton Point ECC - RI State Waters	BP011	SPI/PV	-
Brayton Point ECC - RI State Waters	BP012	Grab, GrabCam	-
Brayton Point ECC - RI State Waters	BP013	SPI/PV, Grab, GrabCam	-
Brayton Point ECC - RI State Waters	BP014	SPI/PV	-
Brayton Point ECC - RI State Waters	BP015	SPI/PV	-
Brayton Point ECC - RI State Waters	BP016	SPI/PV	-
Brayton Point ECC - RI State Waters	BP017	SPI/PV, Grab, GrabCam	-
Brayton Point ECC - RI State Waters	BP018	Grab, GrabCam	-
Brayton Point ECC - RI State Waters	BP019	SPI/PV, Grab, GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BP020	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP021	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP022	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP023	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP024	SPI/PV, Grab, GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BP025	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP026-BP105	SPI/PV	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP027	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP028	Grab, GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BP029	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP030	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP031	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP032	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP033	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP034	SPI/PV	-
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Brayton Point ECC - Federal Waters, GLD	BP036	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP037	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP038	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP039-BP110	SPI/PV, Grab, GrabCam	SPI/PV, Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP040A	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP041	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP042	SPI/PV, Grab, GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BP043-BP111	SPI/PV	SPI/PV, Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP044	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP045	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP046-BP117	Grab, GrabCam	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP047-BP119	SPI/PV	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP048-BP120	SPI/PV	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP049	SPI/PV, Grab, GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BP050	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP051	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP052	Grab, GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BP053	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP054	SPI/PV	-

Area	StationID	Summer 2021	Spring 2022
Brayton Point ECC - Federal Waters, GLD	BP055	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP056	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP057	SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BP058	Grab, GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BP059	SPI/PV	-
Brayton Point ECC - RI State Waters	BP074	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - RI State Waters	BP075	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP076	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - RI State Waters	BP077	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP078	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - RI State Waters	BP079	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP080	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP081	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP082	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP083	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP084	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP086	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP087	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP088	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP089	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - RI State Waters	BP090	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP091	-	GrabCam
Brayton Point ECC - RI State Waters	BP092	-	SPI/PV, GrabCam
Brayton Point ECC - RI State Waters	BP093	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - RI State Waters	BP094	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP095	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP096	-	Grab, GrabCam
Brayton Point ECC - RI State Waters	BP097	-	SPI/PV, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP098	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP099	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP100	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP101	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP102	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP103	-	SPI/PV
Brayton Point ECC - Federal Waters, GLD	BP104	-	SPI/PV
Brayton Point ECC - Federal Waters, GLD	BP106	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP107	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP109	-	SPI/PV
Brayton Point ECC - Federal Waters, GLD	BP112	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP113	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP114	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP115	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP116	-	SPI/PV
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Brayton Point ECC - Federal Waters, GLD	BP121	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP122	-	SPI/PV, Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP123	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP124	-	SPI/PV
Brayton Point ECC - Federal Waters, GLD	BP125	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP126	-	SPI/PV
Brayton Point ECC - Federal Waters, GLD	BP127	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP128	-	SPI/PV

Area	StationID	Summer 2021	Spring 2022
Brayton Point ECC - Federal Waters, GLD	BP129	-	Grab, GrabCam
Brayton Point ECC - Federal Waters, GLD	BP130	-	SPI/PV
Brayton Point ECC - Federal Waters, GLD	BP140	-	SPI/PV
Brayton Point ECC - RI State Waters	BPALT03	SPI/PV	-
Brayton Point ECC - RI State Waters	BPALT04	SPI/PV	-
Brayton Point ECC - RI State Waters	BPALT05	SPI/PV	-
Brayton Point ECC - RI State Waters	BPALT06A	SPI/PV	-
Brayton Point ECC - RI State Waters	BPT01-1	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-1	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-2	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-3	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-4	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-5	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-6	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-7	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-8	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT02-9	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-1	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-2	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-3	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-4	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-5	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-6	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-7	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-8	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT03-9	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT04-1	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT04-2	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT04-3	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT04-4	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT04-5	Transect SPI/PV	-
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Brayton Point ECC - RI State Waters	BPT04-8	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT04-9	Transect SPI/PV	-
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Brayton Point ECC - RI State Waters	BPT05-2	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT05-3	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT05-4	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT05-5	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT05-6	Transect SPI/PV	-
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Brayton Point ECC - RI State Waters	BPT05-8	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT05-9	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-1	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-2	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-3	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-4	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-5	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-6	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-7	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT06-8	Transect SPI/PV	-

Area	StationID	Summer 2021	Spring 2022
Brayton Point ECC - RI State Waters	BPT06-9	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT07	Grab, GrabCam, Transect GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BPT08	Grab, GrabCam, Transect GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BPT09	Grab, GrabCam, Transect GrabCam	-
Brayton Point ECC - RI State Waters	BPT10	Transect GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BPT11	Transect GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BPT12	Transect GrabCam	-
Brayton Point ECC - Federal Waters, GLD	BPT13-1	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-2	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-3	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-4	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-5	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-6	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-7	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-8	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT13-9	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-1	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-2	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-3	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-4	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-5	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-6	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-7	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-8	Transect SPI/PV	-
Brayton Point ECC - Federal Waters, GLD	BPT14-9	Transect SPI/PV	-
Brayton Point ECC - RI State Waters	BPT20-1	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-3	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-6	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-7	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-8	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-9	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-10	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT20-11	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-1	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-3	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-4	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-8	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-9	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-10	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-11	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-12	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT22-13	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-1	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-3	-	Transect SPI/PV

Area	StationID	Summer 2021	Spring 2022
Brayton Point ECC - RI State Waters	BPT23-4	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-6	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-7	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-8	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-9	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-10	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT23-11	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-1	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-3	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-4	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-13	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-14	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-15	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-16	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-17	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-18	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT24-19	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT25	-	Transect GrabCam
Brayton Point ECC - RI State Waters	BPT26-1	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-3	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-4	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-6	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-7	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-8	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-9	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-10	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT26-11	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-1	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-2	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-3	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-4	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-5	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-6	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-7	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-8	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-9	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT27-10	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT28	-	Transect GrabCam
Brayton Point ECC - Federal Waters, GLD	BPT29-1	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-2	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-3	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-4	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-5	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-6	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-7	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-8	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-9	-	Transect SPI/PV

Area	StationID	Summer 2021	Spring 2022
Brayton Point ECC - Federal Waters, GLD	BPT29-10	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT29-11	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT30	-	Transect GrabCam
Brayton Point ECC - Federal Waters, GLD	BPT31	-	Transect GrabCam
Brayton Point ECC - Federal Waters, GLD	BPT32-1	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-2	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-3	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-4	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-5	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-6	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-7	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-8	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT32-9	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT33	-	Transect GrabCam
Brayton Point ECC - Federal Waters, GLD	BPT34	-	Transect GrabCam
Brayton Point ECC - Federal Waters, GLD	BPT35-1	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-2	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-3	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-4	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-5	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-6	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-7	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-8	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-9	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-10	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT35-11	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT36	-	Transect GrabCam
Brayton Point ECC - Federal Waters, GLD	BPT37-1	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-2	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-3	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-4	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-5	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-6	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-7	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-8	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-9	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-10	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT37-11	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT38	-	Transect GrabCam
Brayton Point ECC - Federal Waters, GLD	BPT40-1	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-2	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-3	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-4	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-5	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-6	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-7	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-8	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-9	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-10	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT40-11	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT41	-	Transect GrabCam
Brayton Point ECC - RI State Waters	BPT45-1	-	Transect SPI/PV

Area	StationID	Summer 2021	Spring 2022
Brayton Point ECC - RI State Waters	BPT45-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-3	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-4	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-6	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-7	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-8	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-9	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-10	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT45-11	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-1	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-3	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-4	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-6	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-7	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-8	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-9	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-10	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-11	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT46-12	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT47-2	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT47-3	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT47-4	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT47-5	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT47-6	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT47-7	-	Transect SPI/PV
Brayton Point ECC - RI State Waters	BPT47-1-3	-	Transect SPI/PV
Brayton Point ECC - Federal Waters, GLD	BPT48	-	Transect GrabCam

Attachment B Summary Benthic Ground-Truth Data Analysis Results

Notes:

IND=Indeterminate

N/A=Not Applicable

Not Analyzed=Station not analyzed for the variable

[1]Replicates: total sampling effort at a station, with each replicate representing a collected sample (i.e., grab sample, SPI/PV image pair, video clip). Transect GrabCam stations were not included in summarization.

[2]Variable determined from the total number of replicates analyzed for that variable

Area	Sample Type	Station ID	SPI/PV Surveys (n)	SPI/PV, Grab, GrabCam Replicates[1] (n)	Mapped Habitat Type	SPI/PV, Grab, GrabCam, Predominant Substrate Group	SPI/PV, Grab, GrabCam, Predominant Substrate Subgroup	Percent Predominance of Substrate Subgroup[2] (%)	Substrate Subgroup Categorical Variability[2]
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP003-BP072	1	7	Mud to Muddy Sand	Mud	Varies	N/A	0.60
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP004-BP073	1	5	Mud to Muddy Sand	Mud	Muddy Gravel	75.0	0.50
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP005	1	5	Mud to Muddy Sand - Shell / *Crepidula* Substrate	*Crepidula* Reef Substrate	Gravelly Mud	75.0	0.50
Brayton Point ECC - RI State Waters	SPI/PV	BP006	1	3	Mud to Muddy Sand	Muddy Sand	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BP007	1	3	Mud to Muddy Sand - *Crepidula* Substrate	*Crepidula* Reef Substrate	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BP008	1	3	Mud to Muddy Sand	Mud	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BP009	1	3	Mud to Muddy Sand	Mud	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP010-BP085	1	7	Mud to Muddy Sand	Mud	Gravelly Mud	80.0	0.40
Brayton Point ECC - RI State Waters	SPI/PV	BP011	1	3	Mud to Muddy Sand	Muddy Sand	Fine/Very Fine Sand	66.7	0.67
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP012	N/A	2	Mud to Muddy Sand	Sand	Muddy Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP013	1	5	Sand	Sand	Fine/Very Fine Sand	100.0	0.25
Brayton Point ECC - RI State Waters	SPI/PV	BP014	1	3	Sand	Sand	Fine/Very Fine Sand	66.7	0.67
Brayton Point ECC - RI State Waters	SPI/PV	BP015	1	3	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Sand	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BP016	1	3	Sand - Mobile	Gravelly	Gravelly Sand	66.7	0.67
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP017	1	5	Sand	Sand	Fine/Very Fine Sand	100.0	0.25
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP018	N/A	2	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP019	1	5	Mixed-Size Gravel in Muddy Sand to Sand	Gravel Mixes	Varies	N/A	1.00
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP020	1	3	Sand - Mobile	Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP021	1	3	Sand	Sand	Fine/Very Fine Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP022	1	3	Sand - Mobile	Gravel Mixes	Sandy Gravel	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP023	1	3	Sand	Sand	Fine/Very Fine Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP024	1	5	Sand	Sand	Fine/Very Fine Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP025	1	3	Sand	Muddy Sand	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP026-BP105	1	5	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Fine/Very Fine Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP027	1	3	Sand - with Boulder Field(s)	Sand	Fine/Very Fine Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP028	N/A	3	Sand	Sand	Fine/Very Fine Sand	100.0	0.50
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP029	1	3	Sand	Sand	Fine/Very Fine Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP030	1	3	Sand	Sandy Mud	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP031	1	3	Sand	Sandy Mud	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP032	1	3	Mud to Muddy Sand	Mud	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP033	1	3	Mud to Muddy Sand	Mud	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP034	1	3	Sand	Muddy Sand	Fine/Very Fine Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP035	1	5	Sand	Muddy Sand	Gravelly Muddy Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP036	1	3	Sand	Sand	Fine/Very Fine Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP037	1	3	Sand - Mobile	Sand	Medium Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP038	1	3	Sand - Mobile with Boulder Field(s)	Gravelly	Gravelly Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP039-BP110	2	10	Glacial Moraine A	Gravelly	Gravelly Sand	37.5	0.63
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP040A	1	3	Sand - Mobile with Boulder Field(s)	Gravelly	Gravelly Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP041	1	3	Sand - Mobile with Boulder Field(s)	Varies	Varies	N/A	1.00
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP042	1	5	Sand - Mobile	Sand	Medium Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP043-BP111	2	8	Sand - Mobile	Gravelly	Gravelly Sand	57.1	0.29
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP044	1	3	Coarse Sediment - Mobile	Muddy Sand	Gravelly Muddy Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP045	1	3	Coarse Sediment - Mobile	Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP046-BP117	N/A	4	Coarse Sediment - Mobile	Gravel Mixes	Varies	N/A	1.00
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP047-BP119	1	5	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP048-BP120	1	5	Coarse Sediment - Mobile	Muddy Sand	Gravelly Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP049	1	5	Sand - Mobile	Sand	Very Coarse/Coarse Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP050	1	3	Coarse Sediment - Mobile	Sandy Mud	N/A	100.0	0.33

Area	Sample Type	Station ID	SPI/PV Surveys (n)	SPI/PV, Grab, GrabCam Replicates[1] (n)	Mapped Habitat Type	SPI/PV, Grab, GrabCam, Predominant Substrate Group	SPI/PV, Grab, GrabCam, Predominant Substrate Subgroup	Percent Predominance of Substrate Subgroup[2] (%)	Substrate Subgroup Categorical Variability[2]
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP051	1	3	Mud to Muddy Sand	Muddy Sand	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP052	N/A	2	Mud to Muddy Sand	Sand	Muddy Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP053	1	3	Sand - Mobile	Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP054	1	3	Sand - Mobile	Muddy Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP055	1	3	Sand - Mobile	Sandy Mud	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP056	1	3	Sand - Mobile	Muddy Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP057	1	3	Sand	Sand	Fine/Very Fine Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP058	N/A	2	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP059	1	3	Sand - Mobile	Muddy Sand	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP074	1	5	Mud to Muddy Sand - Shell / *Crepidula* Substrate	Mud	Muddy Sandy Gravel	75.0	0.50
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP075	N/A	2	Mud to Muddy Sand - Shell / *Crepidula* Substrate	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP076	1	5	Mud to Muddy Sand	Mud	Gravelly Muddy Sand	75.0	0.50
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP077	N/A	2	Mud to Muddy Sand - *Crepidula* Substrate	Gravelly	Gravelly Muddy Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP078	1	5	Mud to Muddy Sand - Shell / *Crepidula* Substrate	Gravel Mixes	Sandy Gravel	75.0	0.50
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP079	N/A	2	Mud to Muddy Sand - *Crepidula* Substrate	Gravels	Pebble/Granule	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP080	N/A	2	Mud to Muddy Sand - *Crepidula* Substrate	Gravel Mixes	Muddy Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP081	N/A	2	Mud to Muddy Sand - *Crepidula* Substrate	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP082	N/A	2	Mud to Muddy Sand	Gravel Mixes	Muddy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP083	N/A	2	Mud to Muddy Sand	Gravelly	Gravelly Mud	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP084	N/A	2	Mud to Muddy Sand - *Crepidula* Substrate	Gravelly	Gravelly Mud	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP086	N/A	2	Mud to Muddy Sand - *Crepidula* Substrate	Gravelly	Gravelly Muddy Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP087	N/A	2	Mud to Muddy Sand	Gravelly	Gravelly Mud	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP088	N/A	2	Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP089	1	5	Mud to Muddy Sand	Sand	Fine/Very Fine Sand	100.0	0.25
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP090	N/A	2	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	GrabCam	BP091	N/A	1	Mixed-Size Gravel in Muddy Sand to Sand	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	GrabCam, SPI/PV	BP092	1	4	Mixed-Size Gravel in Muddy Sand to Sand	Gravels	Gravel Pavement	66.7	0.67
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP093	1	5	Mixed-Size Gravel in Muddy Sand to Sand	Varies	Varies	N/A	0.50
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP094	N/A	2	Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP095	N/A	2	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP096	N/A	2	Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	GrabCam, SPI/PV	BP097	1	4	Glacial Moraine A	Gravel Mixes	Sandy Gravel	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP098	1	5	Sand	Sand	Medium Sand	100.0	0.25
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP099	1	5	Sand - Mobile	Sand	Very Coarse/Coarse Sand	100.0	0.25
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP100	1	5	Sand - with Boulder Field(s)	Gravelly	Gravelly Sand	50.0	0.75
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP101	N/A	2	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP102	N/A	2	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP103	1	3	Sand	Muddy Sand	N/A	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP104	1	3	Sand - Mobile	Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP106	N/A	2	Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP107	N/A	2	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP109	1	3	Sand - with Boulder Field(s)	Sand	Fine/Very Fine Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP112	N/A	2	Coarse Sediment - Mobile	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP113	1	5	Coarse Sediment - Mobile	Muddy Sand	Varies	N/A	0.75
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP114	N/A	2	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP115	N/A	2	Coarse Sediment - Mobile	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP116	1	3	Sand - with Boulder Field(s)	Sand	Medium Sand	100.0	0.33

Area	Sample Type	Station ID	SPI/PV Surveys (n)	SPI/PV, Grab, GrabCam Replicates[1] (n)	Mapped Habitat Type	SPI/PV, Grab, GrabCam, Predominant Substrate Group	SPI/PV, Grab, GrabCam, Predominant Substrate Subgroup	Percent Predominance of Substrate Subgroup[2] (%)	Substrate Subgroup Categorical Variability[2]
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP118	N/A	2	Sand - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP121	N/A	2	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP122	1	5	Sand - Mobile	Sand	Medium Sand	75.0	0.50
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP123	N/A	2	Mud to Muddy Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP124	1	3	Sand - Mobile	Sand	Medium Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP125	N/A	2	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP126	1	3	Sand - Mobile	Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP127	N/A	2	Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP128	1	3	Sand	Sand	Fine/Very Fine Sand	100.0	0.33
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP129	N/A	2	Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP130	1	3	Sand - Mobile	Sand	Medium Sand	66.7	0.67
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP140	1	3	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BPALT03	1	3	Mud to Muddy Sand - Shell / *Crepidula* Substrate	Mud	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BPALT04	1	3	Mud to Muddy Sand - Shell / *Crepidula* Substrate	*Crepidula* Reef Substrate	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BPALT05	1	3	Mud to Muddy Sand	Mud	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	SPI/PV	BPALT06A	1	3	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	0.33
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT01-1	1	1	N/A	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-1	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-2	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-3	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-4	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-5	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-6	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-7	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-8	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-9	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-1	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-2	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-3	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-4	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-5	1	1	Mud to Muddy Sand - *Crepidula* Substrate	*Crepidula* Reef Substrate	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-6	1	1	Mud to Muddy Sand - *Crepidula* Substrate	*Crepidula* Reef Substrate	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-7	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-8	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-9	1	1	N/A	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-1	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-2	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-3	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-4	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-5	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-6	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-7	1	1	Mud to Muddy Sand	IND	IND	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-8	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-9	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-1	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravel Mixes	Muddy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-2	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Muddy Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-3	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Muddy Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-4	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Muddy Sand	100.0	N/A

Area	Sample Type	Station ID	SPI/PV Surveys (n)	SPI/PV, Grab, GrabCam Replicates[1] (n)	Mapped Habitat Type	SPI/PV, Grab, GrabCam, Predominant Substrate Group	SPI/PV, Grab, GrabCam, Predominant Substrate Subgroup	Percent Predominance of Substrate Subgroup[2] (%)	Substrate Subgroup Categorical Variability[2]
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-5	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-6	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-7	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-8	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-9	1	1	N/A	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-1	1	1	N/A	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-2	1	1	Sand - with Boulder Field(s)	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-3	1	1	Glacial Moraine A	Gravel Mixes	Muddy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-4	1	1	Glacial Moraine A	Gravel Mixes	Muddy Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-5	1	1	Glacial Moraine A	Gravel Mixes	Muddy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-6	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-7	1	1	Glacial Moraine A	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-8	1	1	Glacial Moraine A	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-9	1	1	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BPT07	N/A	2	Sand - Mobile with Boulder Field(s)	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BPT08	N/A	2	Sand - with Boulder Field(s)	Sand	Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BPT09	N/A	2	Sand	Sand	Muddy Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-1	1	1	N/A	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-2	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-3	1	1	Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-4	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-5	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-6	1	1	Coarse Sediment - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-7	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-8	1	1	Coarse Sediment - Mobile	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-9	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-1	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-2	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-3	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-4	1	1	Sand - Mobile	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-5	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-6	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-7	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-8	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-9	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-1	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-2	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-3	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-5	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-6	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-7	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-8	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-9	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-10	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-11	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-1	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-2	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-3	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-4	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-5	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A

Area	Sample Type	Station ID	SPI/PV Surveys (n)	SPI/PV, Grab, GrabCam Replicates[1] (n)	Mapped Habitat Type	SPI/PV, Grab, GrabCam, Predominant Substrate Group	SPI/PV, Grab, GrabCam, Predominant Substrate Subgroup	Percent Predominance of Substrate Subgroup[2] (%)	Substrate Subgroup Categorical Variability[2]
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-8	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-9	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-10	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-11	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Sandy Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-12	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-13	1	1	Mud to Muddy Sand - *Crepidula* Substrate with Boulder Field(s)	Sandy Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-1	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-2	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-3	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-4	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-5	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-6	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-7	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-8	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-9	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-10	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-11	1	1	Mud to Muddy Sand - *Crepidula* Substrate	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-1	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-2	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-3	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-4	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-5	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-13	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-14	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-15	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-16	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-17	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-18	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-19	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-1	1	1	N/A	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-2	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-3	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-4	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-5	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-6	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-7	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-8	1	1	Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-9	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-10	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-11	1	1	Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-1	1	1	Sand - Mobile with Boulder Field(s)	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-2	1	1	Sand - with Boulder Field(s)	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-3	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-4	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-5	1	1	Sand - Mobile with Boulder Field(s)	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-6	1	1	Sand - Mobile with Boulder Field(s)	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-7	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-8	1	1	Sand - with Boulder Field(s)	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-9	1	1	Sand - Mobile with Boulder Field(s)	Sand	Very Coarse/Coarse Sand	100.0	N/A

Area	Sample Type	Station ID	SPI/PV Surveys (n)	SPI/PV, Grab, GrabCam Replicates[1] (n)	Mapped Habitat Type	SPI/PV, Grab, GrabCam, Predominant Substrate Group	SPI/PV, Grab, GrabCam, Predominant Substrate Subgroup	Percent Predominance of Substrate Subgroup[2] (%)	Substrate Subgroup Categorical Variability[2]
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-10	1	1	Sand - Mobile with Boulder Field(s)	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-1	1	1	N/A	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-2	1	1	Glacial Moraine A	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-3	1	1	Glacial Moraine A	Gravelly	Gravelly Muddy Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-4	1	1	Sand - Mobile with Boulder Field(s)	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-5	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-6	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-7	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-8	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-9	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-10	1	1	Sand - with Boulder Field(s)	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-11	1	1	Sand - Mobile with Boulder Field(s)	Gravelly	Gravelly Muddy Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-1	1	1	N/A	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-2	1	1	Sand - Mobile with Boulder Field(s)	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-3	1	1	Sand - Mobile with Boulder Field(s)	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-4	1	1	Sand - Mobile with Boulder Field(s)	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-5	1	1	Sand - Mobile with Boulder Field(s)	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-6	1	1	Glacial Moraine A	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-7	1	1	Sand - Mobile with Boulder Field(s)	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-8	1	1	Glacial Moraine A	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-9	1	1	Sand - Mobile with Boulder Field(s)	Gravelly	Gravelly Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-1	1	1	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-2	1	1	Sand - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-3	1	1	Sand - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-4	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-5	1	1	Sand - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-6	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-7	1	1	Coarse Sediment - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-8	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-9	1	1	Coarse Sediment - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-10	1	1	Coarse Sediment - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-11	1	1	Coarse Sediment - Mobile	Gravelly	Gravelly Muddy Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-1	1	1	Sand - Mobile	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-2	1	1	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-3	1	1	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-4	1	1	Sand - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-5	1	1	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-6	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-7	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-8	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-9	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-10	1	1	Coarse Sediment - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-11	1	1	Coarse Sediment - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-1	1	1	N/A	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-2	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-3	1	1	Mud to Muddy Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-4	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-5	1	1	Mud to Muddy Sand	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-6	1	1	Mud to Muddy Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-7	1	1	Sand - Mobile	Sand	Very Coarse/Coarse Sand	100.0	N/A

Area	Sample Type	Station ID	SPI/PV Surveys (n)	SPI/PV, Grab, GrabCam Replicates[1] (n)	Mapped Habitat Type	SPI/PV, Grab, GrabCam, Predominant Substrate Group	SPI/PV, Grab, GrabCam, Predominant Substrate Subgroup	Percent Predominance of Substrate Subgroup[2] (%)	Substrate Subgroup Categorical Variability[2]
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-8	1	1	Sand - Mobile	Muddy Sand	N/A	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-9	1	1	Sand - Mobile	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-10	1	1	Sand - Mobile	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-11	1	1	N/A	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-1	1	1	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-2	1	1	Sand - Mobile	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-3	1	1	Glacial Moraine A	Gravels	Gravel Pavement	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-4	1	1	Glacial Moraine A	Sand	Very Coarse/Coarse Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-5	1	1	Glacial Moraine A	Gravels	Gravel Pavement	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-6	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-7	1	1	Glacial Moraine A	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-8	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-9	1	1	Sand - with Boulder Field(s)	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-10	1	1	Sand - Mobile with Boulder Field(s)	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-11	1	1	Sand - Mobile with Boulder Field(s)	Gravel Mixes	Sandy Gravel	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-1	1	1	N/A	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-2	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-3	1	1	Mixed-Size Gravel in Muddy Sand to Sand	IND	IND	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-4	1	1	Mixed-Size Gravel in Muddy Sand to Sand	IND	IND	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-5	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-6	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-7	1	1	Mixed-Size Gravel in Muddy Sand to Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-8	1	1	Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-9	1	1	Sand	Sand	Medium Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-10	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-11	1	1	Sand	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-12	1	1	N/A	Sand	Fine/Very Fine Sand	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-1-3	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-2	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-3	1	1	Mud to Muddy Sand	Sandy Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-4	1	1	Mud to Muddy Sand	Mud	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-5	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-6	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-7	1	1	Mud to Muddy Sand - *Crepidula* Substrate	N/A	N/A	100.0	N/A

Area	Sample Type	Station ID	SPI/PV, Grab, GrabCam, Predominant Biotic Subclass	Percent Predominance of Biotic Subclass[2] (%)	Biotic Subclass Categorical Variability[2]	SPI/PV, Grab, GrabCam, Predominant Co-occurring Biotic Subclass	SPI/PV, Grab, GrabCam, Attached Fauna Presence	PV Non-Native Taxa Type	PV Sensitive Taxa Type
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP003-BP072	Soft Sediment Fauna	100.0	0.20	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP004-BP073	Soft Sediment Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP005	Mollusk Reef Biota	80.0	0.40	Soft Sediment Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BP006	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BP007	Mollusk Reef Biota	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BP008	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BP009	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP010-BP085	Soft Sediment Fauna	80.0	0.40	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BP011	Soft Sediment Fauna	66.7	0.67	IND	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP012	Soft Sediment Fauna	50.0	1.00	Attached Fauna	Yes	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP013	Soft Sediment Fauna	80.0	0.40	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BP014	Soft Sediment Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BP015	Attached Fauna	100.0	0.33	Inferred Fauna	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	SPI/PV	BP016	Attached Fauna	66.7	0.67	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP017	Inferred Fauna	60.0	0.40	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP018	Soft Sediment Fauna	100.0	0.50	None	No	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP019	Varies	N/A	0.60	None	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP020	Inferred Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP021	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP022	Varies	N/A	1.00	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP023	Inferred Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP024	Inferred Fauna	60.0	0.40	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP025	Inferred Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP026-BP105	Inferred Fauna	66.7	0.67	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP027	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP028	Soft Sediment Fauna	100.0	0.33	Varies	No	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP029	Inferred Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP030	Inferred Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP031	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP032	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP033	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP034	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP035	Inferred Fauna	60.0	0.40	Varies	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP036	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP037	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP038	Attached Fauna	66.7	0.67	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP039-BP110	Attached Fauna	75.0	0.38	Varies	Yes	None	Northern Star Coral
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP040A	Attached Fauna	100.0	0.33	N/A	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP041	Attached Fauna	100.0	0.33	Inferred Fauna	Yes	Possible *Didemnum* spp.	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP042	Soft Sediment Fauna	40.0	0.60	Varies	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP043-BP111	Inferred Fauna	50.0	0.50	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP044	Soft Sediment Fauna	66.7	0.67	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP045	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP046-BP117	Soft Sediment Fauna	100.0	0.50	Varies	Yes	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP047-BP119	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP048-BP120	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP049	Soft Sediment Fauna	100.0	0.20	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP050	Soft Sediment Fauna	66.7	0.67	Varies	No	None	None

Area	Sample Type	Station ID	SPI/PV, Grab, GrabCam, Predominant Biotic Subclass	Percent Predominance of Biotic Subclass[2] (%)	Biotic Subclass Categorical Variability[2]	SPI/PV, Grab, GrabCam, Predominant Co-occurring Biotic Subclass	SPI/PV, Grab, GrabCam, Attached Fauna Presence	PV Non-Native Taxa Type	PV Sensitive Taxa Type
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP051	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP052	Soft Sediment Fauna	100.0	0.50	Varies	No	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP053	Inferred Fauna	66.7	0.67	Varies	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP054	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP055	Inferred Fauna	66.7	0.67	Varies	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP056	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP057	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP058	Soft Sediment Fauna	100.0	0.50	Soft Sediment Fauna	No	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP059	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP074	Soft Sediment Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP075	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP076	Inferred Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP077	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP078	Attached Fauna	100.0	0.33	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP079	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP080	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP081	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP082	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP083	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP084	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP086	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP087	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP088	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP089	IND	100.0	0.33	IND	No	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP090	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	GrabCam	BP091	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	GrabCam, SPI/PV	BP092	Attached Fauna	100.0	0.33	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam, SPI/PV	BP093	Attached Fauna	100.0	0.33	Soft Sediment Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP094	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP095	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Grab, GrabCam	BP096	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	GrabCam, SPI/PV	BP097	Attached Fauna	100.0	0.33	Soft Sediment Fauna	Yes	None	Northern Star Coral
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP098	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP099	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP100	Soft Sediment Fauna	66.7	0.67	Varies	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP101	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP102	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP103	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP104	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP106	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP107	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP109	Inferred Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP112	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP113	Soft Sediment Fauna	100.0	0.33	Varies	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP114	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP115	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP116	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None

Area	Sample Type	Station ID	SPI/PV, Grab, GrabCam, Predominant Biotic Subclass	Percent Predominance of Biotic Subclass[2] (%)	Biotic Subclass Categorical Variability[2]	SPI/PV, Grab, GrabCam, Predominant Co-occurring Biotic Subclass	SPI/PV, Grab, GrabCam, Attached Fauna Presence	PV Non-Native Taxa Type	PV Sensitive Taxa Type
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP118	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP121	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam, SPI/PV	BP122	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP123	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP124	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP125	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP126	Soft Sediment Fauna	100.0	0.33	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP127	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP128	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BP129	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP130	Inferred Fauna	66.7	0.67	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	SPI/PV	BP140	Soft Sediment Fauna	66.7	0.67	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BPALT03	Soft Sediment Fauna	100.0	0.33	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BPALT04	Mollusk Reef Biota	100.0	0.33	N/A	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BPALT05	Inferred Fauna	100.0	0.33	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	SPI/PV	BPALT06A	Attached Fauna	100.0	0.33	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT01-1	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-1	Attached Fauna	100.0	N/A	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-2	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-3	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-4	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-5	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-6	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-7	N/A	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-8	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT02-9	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-2	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-3	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-4	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-5	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-6	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-7	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-8	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT03-9	Inferred Fauna	100.0	N/A	Mollusk Reef Biota	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-1	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-2	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-3	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-4	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-5	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-6	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-7	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-8	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT04-9	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-1	Attached Fauna	100.0	N/A	N/A	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-2	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-3	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-4	Inferred Fauna	100.0	N/A	N/A	No	None	None

Area	Sample Type	Station ID	SPI/PV, Grab, GrabCam, Predominant Biotic Subclass	Percent Predominance of Biotic Subclass[2] (%)	Biotic Subclass Categorical Variability[2]	SPI/PV, Grab, GrabCam, Predominant Co-occurring Biotic Subclass	SPI/PV, Grab, GrabCam, Attached Fauna Presence	PV Non-Native Taxa Type	PV Sensitive Taxa Type
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-5	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-6	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-7	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-8	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT05-9	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-1	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-2	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-3	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-4	Attached Fauna	100.0	N/A	N/A	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-5	Attached Fauna	100.0	N/A	N/A	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-6	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-7	Attached Fauna	100.0	N/A	N/A	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-8	Attached Fauna	100.0	N/A	N/A	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT06-9	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BPT07	Soft Sediment Fauna	100.0	0.50	None	No	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BPT08	Soft Sediment Fauna	100.0	0.50	Varies	No	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Grab, GrabCam	BPT09	Soft Sediment Fauna	100.0	0.50	Soft Sediment Fauna	No	Not Analyzed	Not Analyzed
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-3	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-4	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-5	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-6	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-7	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-8	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT13-9	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-3	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-4	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-5	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-6	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-7	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-8	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT14-9	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-1	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-3	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-5	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-6	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-7	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-8	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-9	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-10	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT20-11	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	Not Analyzed	Not Analyzed
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-1	Attached Fauna	100.0	N/A	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-2	Attached Fauna	100.0	N/A	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-3	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-4	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-5	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None

Area	Sample Type	Station ID	SPI/PV, Grab, GrabCam, Predominant Biotic Subclass	Percent Predominance of Biotic Subclass[2] (%)	Biotic Subclass Categorical Variability[2]	SPI/PV, Grab, GrabCam, Predominant Co-occurring Biotic Subclass	SPI/PV, Grab, GrabCam, Attached Fauna Presence	PV Non-Native Taxa Type	PV Sensitive Taxa Type
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-8	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-9	Attached Fauna	100.0	N/A	N/A	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-10	Attached Fauna	100.0	N/A	Soft Sediment Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-11	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-12	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT22-13	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-1	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-2	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-3	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-4	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-5	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-6	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-7	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-8	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-9	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-10	Inferred Fauna	100.0	N/A	Attached Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT23-11	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-2	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-3	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-4	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-5	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-13	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-14	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-15	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-16	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-17	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-18	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT24-19	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-1	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-2	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-3	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-4	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-5	Attached Fauna	100.0	N/A	Soft Sediment Fauna	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-6	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-7	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-8	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-9	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-10	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT26-11	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-1	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-3	Attached Fauna	100.0	N/A	Soft Sediment Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-4	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-5	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-6	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-7	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-8	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-9	Inferred Fauna	100.0	N/A	N/A	No	None	None

Area	Sample Type	Station ID	SPI/PV, Grab, GrabCam, Predominant Biotic Subclass	Percent Predominance of Biotic Subclass[2] (%)	Biotic Subclass Categorical Variability[2]	SPI/PV, Grab, GrabCam, Predominant Co-occurring Biotic Subclass	SPI/PV, Grab, GrabCam, Attached Fauna Presence	PV Non-Native Taxa Type	PV Sensitive Taxa Type
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT27-10	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-2	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-3	Inferred Fauna	100.0	N/A	Attached Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-4	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-5	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-6	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-7	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-8	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-9	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-10	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT29-11	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-1	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-2	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-3	Attached Fauna	100.0	N/A	Soft Sediment Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-4	Soft Sediment Fauna	100.0	N/A	Attached Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-5	Attached Fauna	100.0	N/A	N/A	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-6	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-7	Attached Fauna	100.0	N/A	Soft Sediment Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-8	Soft Sediment Fauna	100.0	N/A	Attached Fauna	Yes	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT32-9	Attached Fauna	100.0	N/A	Inferred Fauna	Yes	None	Northern Star Coral
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-3	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-4	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-5	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-6	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-7	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-8	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-9	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-10	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT35-11	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-3	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-4	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-5	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-6	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-7	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-8	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-9	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-10	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT37-11	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-1	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-3	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-4	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-5	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-6	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-7	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None

Area	Sample Type	Station ID	SPI/PV, Grab, GrabCam, Predominant Biotic Subclass	Percent Predominance of Biotic Subclass[2] (%)	Biotic Subclass Categorical Variability[2]	SPI/PV, Grab, GrabCam, Predominant Co-occurring Biotic Subclass	SPI/PV, Grab, GrabCam, Attached Fauna Presence	PV Non-Native Taxa Type	PV Sensitive Taxa Type
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-8	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-9	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-10	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - Federal Waters, GLD	Transect SPI/PV	BPT40-11	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-1	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-2	Soft Sediment Fauna	100.0	N/A	Inferred Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-3	Attached Fauna	100.0	N/A	N/A	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-4	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-5	Attached Fauna	100.0	N/A	N/A	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-6	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-7	Soft Sediment Fauna	100.0	N/A	Attached Fauna	Yes	None	Northern Star Coral
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-8	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-9	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-10	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT45-11	None	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-1	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-2	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-3	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-4	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-5	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-6	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-7	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-8	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-9	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-10	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-11	Soft Sediment Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT46-12	IND	100.0	N/A	IND	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-1-3	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-2	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-3	Inferred Fauna	100.0	N/A	Soft Sediment Fauna	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-4	Inferred Fauna	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-5	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-6	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None
Brayton Point ECC - RI State Waters	Transect SPI/PV	BPT47-7	Mollusk Reef Biota	100.0	N/A	N/A	No	None	None

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment N: Navigation Safety Risk Assessment

Revised: February 2023

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APPENDIX G NAVIGATION SAFETY RISK ASSESSMENT OF THE BRAYTON POINT OFFSHORE EXPORT CABLE CORRIDOR

This appendix presents additional information related to the Brayton Point Offshore Export Cable Corridor (ECC) for the Mayflower Wind Offshore Wind Project (the Project). The Project will be located within the commercial Lease for Renewable Energy Development on the Outer Continental Shelf OCS-A 0521.

A Project-specific Navigation Safety Risk Assessment (NSRA) was conducted per the guidance in United States Coast Guard (USCG) Navigation and Vessel Inspection Circular No. 01-19 (NVIC 01-19) (USCG 2019a). The Project NSRA is used by the USCG and the Bureau of Ocean Energy Management (BOEM) to assist with evaluating the potential impacts of the Project on the marine transportation system, including navigation safety, traditional uses of the waterways, and USCG missions. After issuance of the draft NSRA, a new ECC was added to the Project Design Envelope (PDE), and a portion of the new ECC lies outside the Marine Traffic Study Area of the NSRA.

This appendix updates the draft NSRA with a qualitative evaluation of the potential effects of the Brayton Point ECC on navigation safety for the elements specified in NVIC 01-19, specifically:

1. Site location and coordinates
2. Traffic survey
3. Offshore above water structures
4. Offshore under water structures
5. Navigation within or close to a structure
6. Effect of tides, tidal streams, and currents
7. Weather
8. Configuration and collision avoidance
9. Visual navigation
10. Communications, radar, and positioning systems
11. Risk of collision, allision, or grounding
12. Emergency response considerations
13. Facility characteristics
14. Design requirements
15. Operational requirements
16. Operational procedures

Summary findings for each element are listed in Section G.17.

Appendix F is an updated Checklist for NSRA Development and Review.

The numbering of the topics/sections of this appendix aligns with the numbering system in NVIC 01-19 and in the main report.

Contents

G.1 SITE AND INSTALLATION COORDINATES G-6

G.2 TRAFFIC SURVEY G-8

G.2.1 TRAFFIC PATTERNS AND DENSITY G-9

G.2.2 TRAFFIC STATISTICS G-20

G.3 OFFSHORE ABOVE WATER STRUCTURES G-24

G.4 OFFSHORE UNDER WATER STRUCTURES G-25

G.4.1 CONSTRUCTION PHASE G-25

G.4.2 OPERATIONS PHASE G-25

G.4.3 DECOMMISSIONING PHASE G-26

G.5 NAVIGATION WITHIN OR CLOSE TO A STRUCTURE G-27

G.6 EFFECT OF TIDES, TIDAL STREAMS, AND CURRENTS G-28

G.7 WEATHER G-32

G.8 CONFIGURATION AND COLLISION AVOIDANCE G-33

G.9 VISUAL NAVIGATION G-34

G.10 COMMUNICATIONS, RADAR, AND POSITIONING SYSTEMS G-35

G.11 RISK OF COLLISION, ALLISION, OR GROUNDING G-36

G.12 EMERGENCY RESPONSE CONSIDERATIONS G-37

G.13 FACILITY CHARACTERISTICS G-38

G.14 DESIGN REQUIREMENTS G-39

G.15 OPERATIONAL REQUIREMENTS G-40

G.16 OPERATIONAL PROCEDURES G-41

G.17 CONCLUSIONS AND RISK MITIGATIONS FOR THE BRAYTON POINT ECC G-42

G.18 REFERENCES G-45

G.1 Site and Installation Coordinates

Figure G-1 shows the location of the new ECC with interconnection at Brayton Point in Somerset, Massachusetts (Brayton Point ECC). Up to six high-voltage direct current (HVDC) cables will be buried in the ECC. The target burial depth throughout the route will be 1.8 m (6 ft). The burial depth PDE range is 1 to 4 m (3.2 to 13.1 ft). The installation methods described in the main NSRA report concerning the Falmouth ECC apply to the Brayton Point ECC as well.

For the purpose of this NSRA, the “Project Area” shown in Figure G-1 is defined as the largest possible footprint of the offshore structures, and its boundaries align with the boundaries of offshore lease OCS-A 0521.

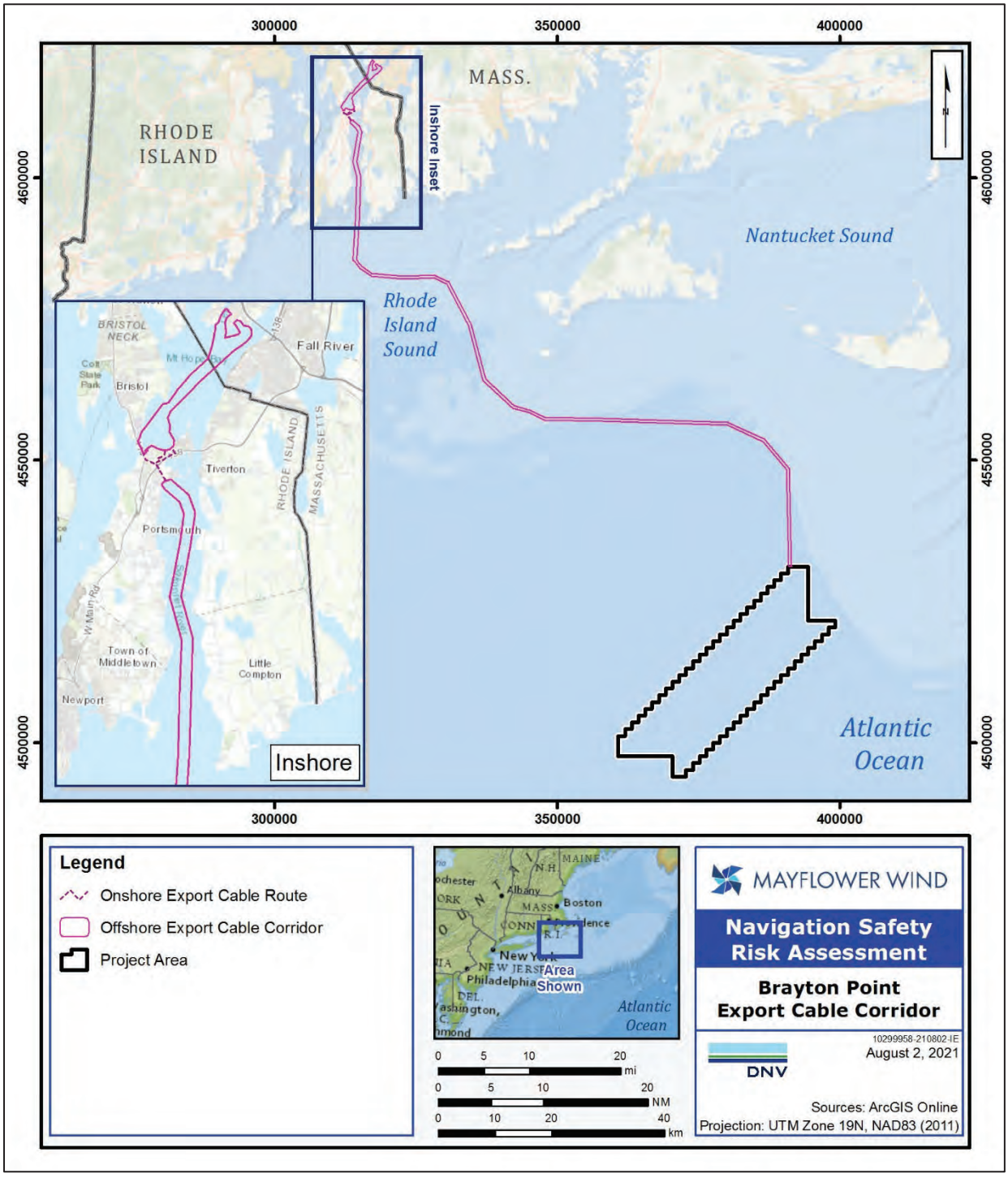

Figure G-1 Map of Brayton Point ECC (Mayflower Wind, 2021)

G.2 Traffic Survey

The marine traffic in the vicinity of the Brayton Point ECC was assessed using summary traffic data from the following sources:

- Vessel transit counts for the year 2019 based on National Automatic Identification System (AIS) data (MarineCadastre, 2021). AIS statistics for 2020 are not relied on for the purposes of the NSRA because of potential effects from COVID-19 on traffic patterns. Use of 2019 data was discussed with USCG prior to preparation of the Mayflower NSRA (see the main NSRA report, Section 2).
- Vessel Trip Reports (VTR) and recreational survey data maps from the Northeast Ocean Data Portal (NOAA, 2016) (SeaPlan, 2013).
- Vessel Monitoring System (VMS) reported vessel activity (NROC, 2018).

G.2.1 Traffic Patterns and Density

The national AIS data show the nature of the traffic in the vicinity of the Brayton Point ECC (Figure G-2).

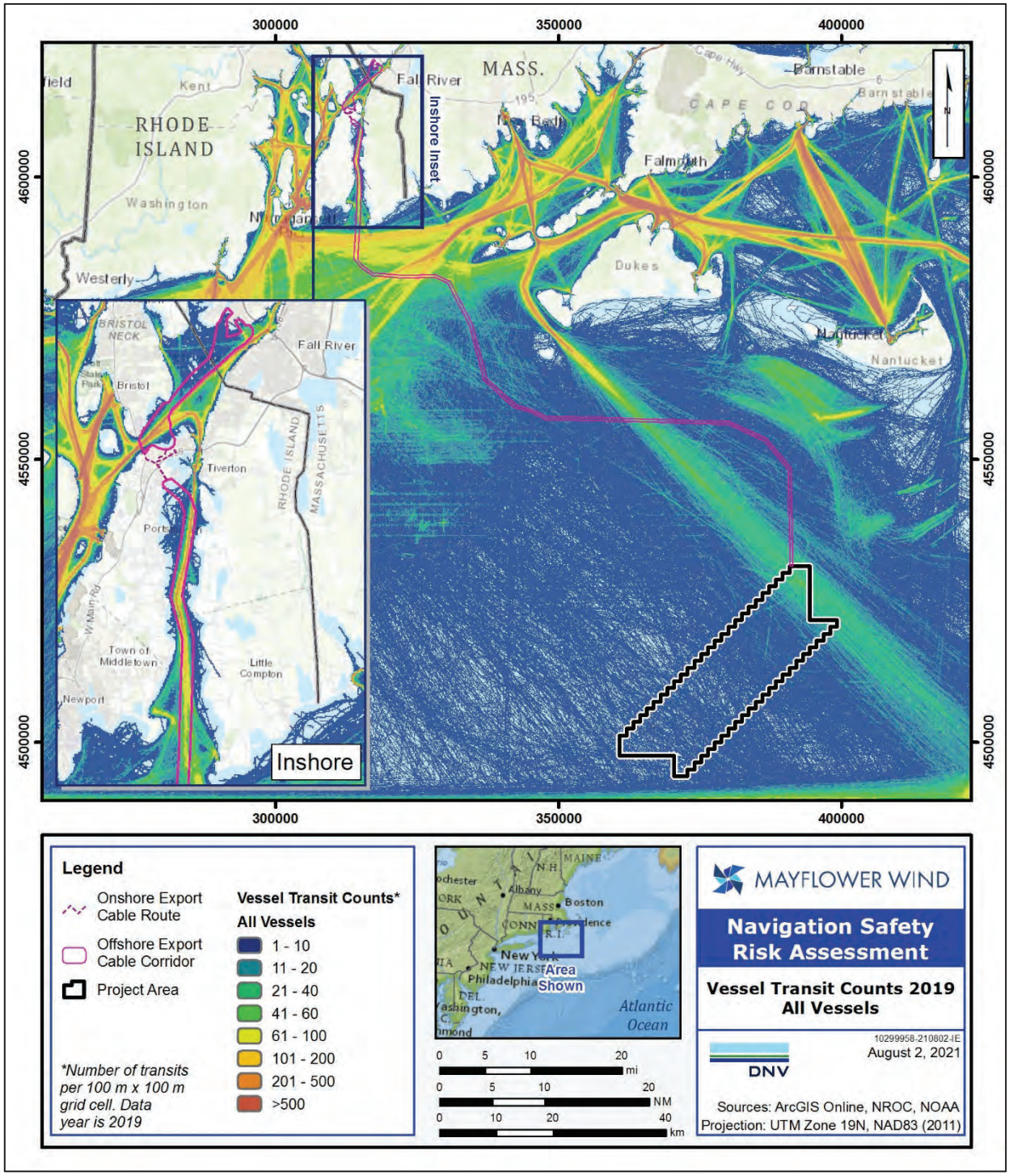

Figure G-2 All Vessel Transit Counts for 2019 (MarineCadastre, 2021)

Views of the transit counts for each vessel type are provided in Figure G-4 through Figure G-9[17].

Cargo vessel traffic in the vicinity of the Brayton Point ECC was predominantly coastwise traffic, crossing the ECC approximately 3 nm (5.5 km) south of the entrance to the Sakonnet River.

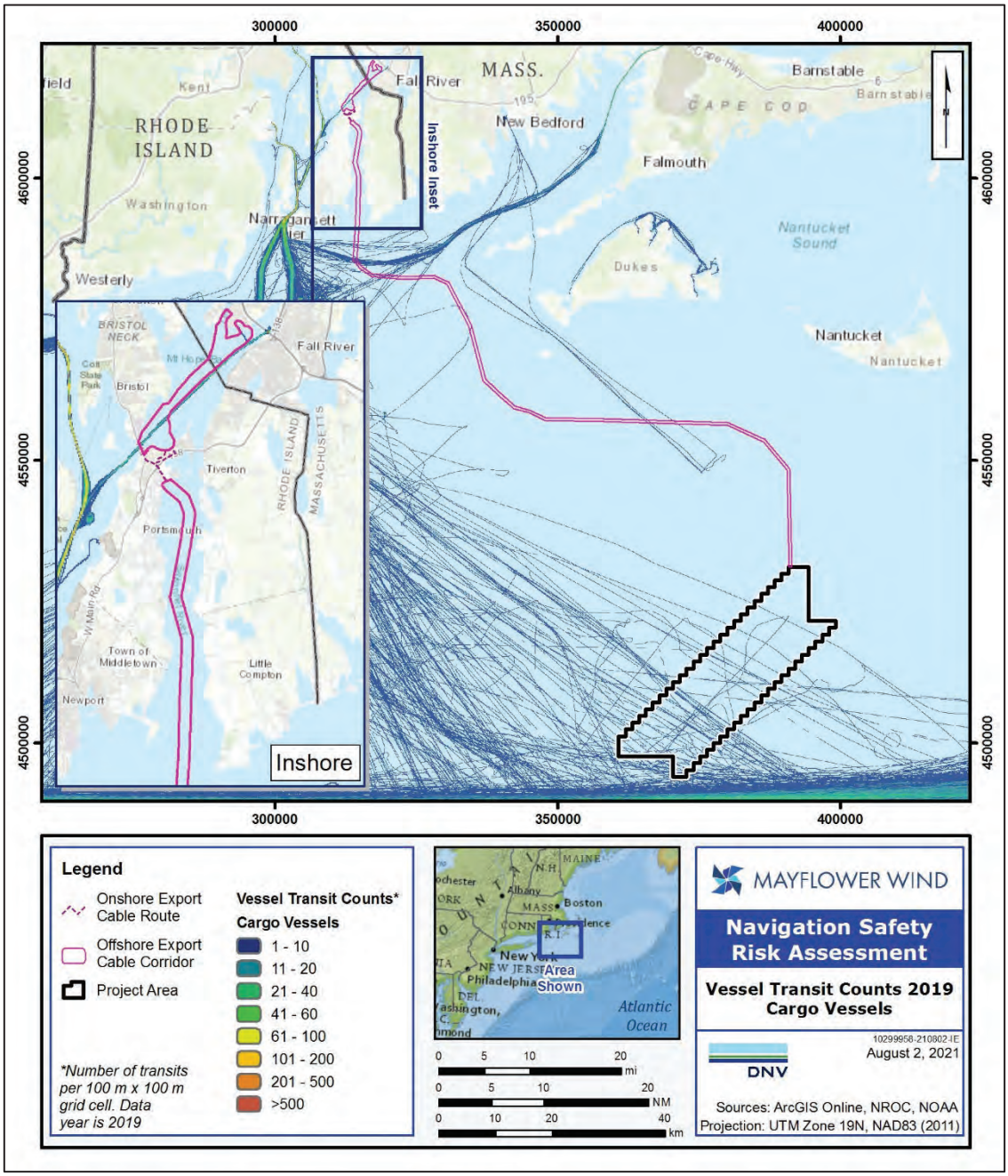

Figure G-3 Cargo Vessel Transit Counts for 2019 (MarineCadastre, 2021)

[17] The vessel types referred to in this appendix are based on the vessel types from MarineCadastre, rather than the vessel types selected for clarity in risk modeling described in the main NSRA. The differences are minor, but noted here for transparency.

The transit paths of fishing vessels cover most of the area relevant to this assessment of the Brayton Point ECC. The majority of the offshore 100 m x 100 m grid cells contain counts of 1 to 10 tracks (NROC, 2018). The highest-count routes taken by fishing vessels are from New Bedford to the southwest, crossing the ECC approximately 8.5 nm (15.7 km) south of the entrance to the Sakonnet River, and south/easterly routes around Martha's Vineyard, crossing the ECC in two locations.

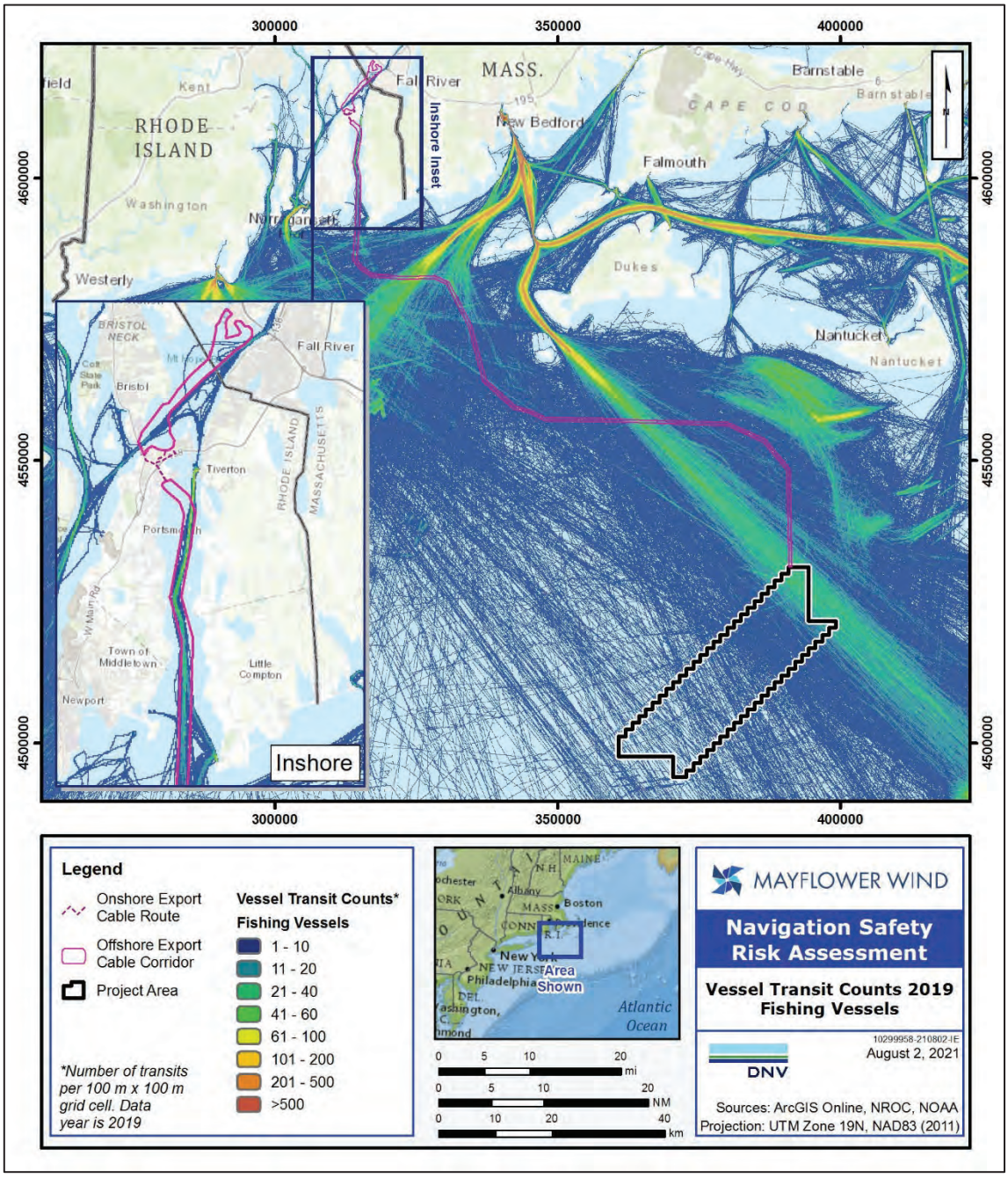

Figure G-4 Fishing Vessel Transit Counts for 2019 (MarineCadastre, 2021)

Transit counts for other vessels show patterns similar to fishing and pleasure vessels.

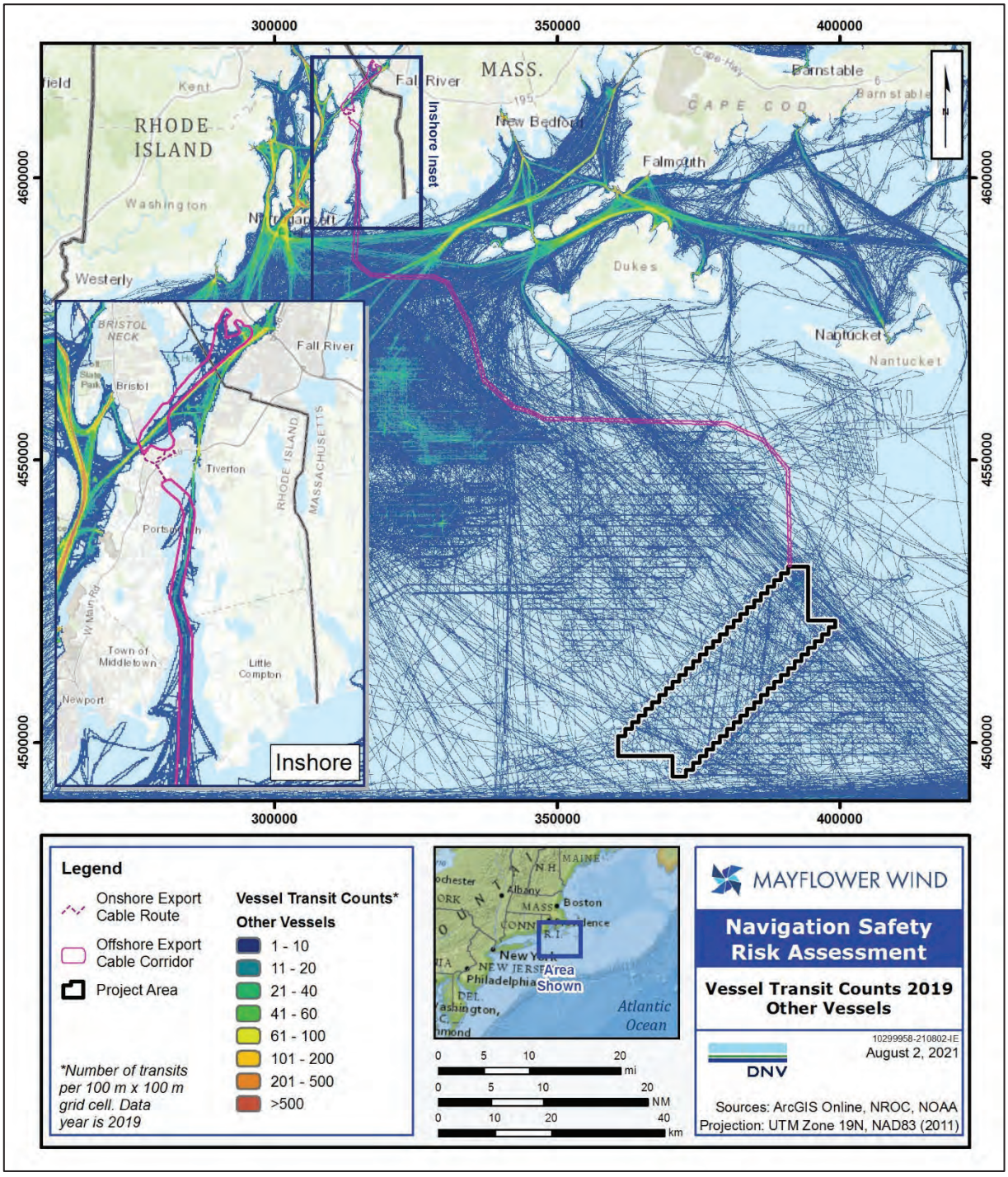

Figure G-5 Other Vessel Transit Counts for 2019 (MarineCadastre, 2021)

Passenger vessel transit counts in the vicinity of the Brayton Point ECC indicate very few grid cells with more than 10 tracks in 2019. Apparent routes include the following:

- From open water through the Sakonnet River and Mount Hope Bay to Fall River. This route contains the highest transit counts, up to 200 tracks per year
- Parallel to the coast and approximately 1.3 nm (2.4 km) south of Sakonnet Point
- From open water through the East Passage of Narragansett Bay and Mount Hope Bay to Fall River

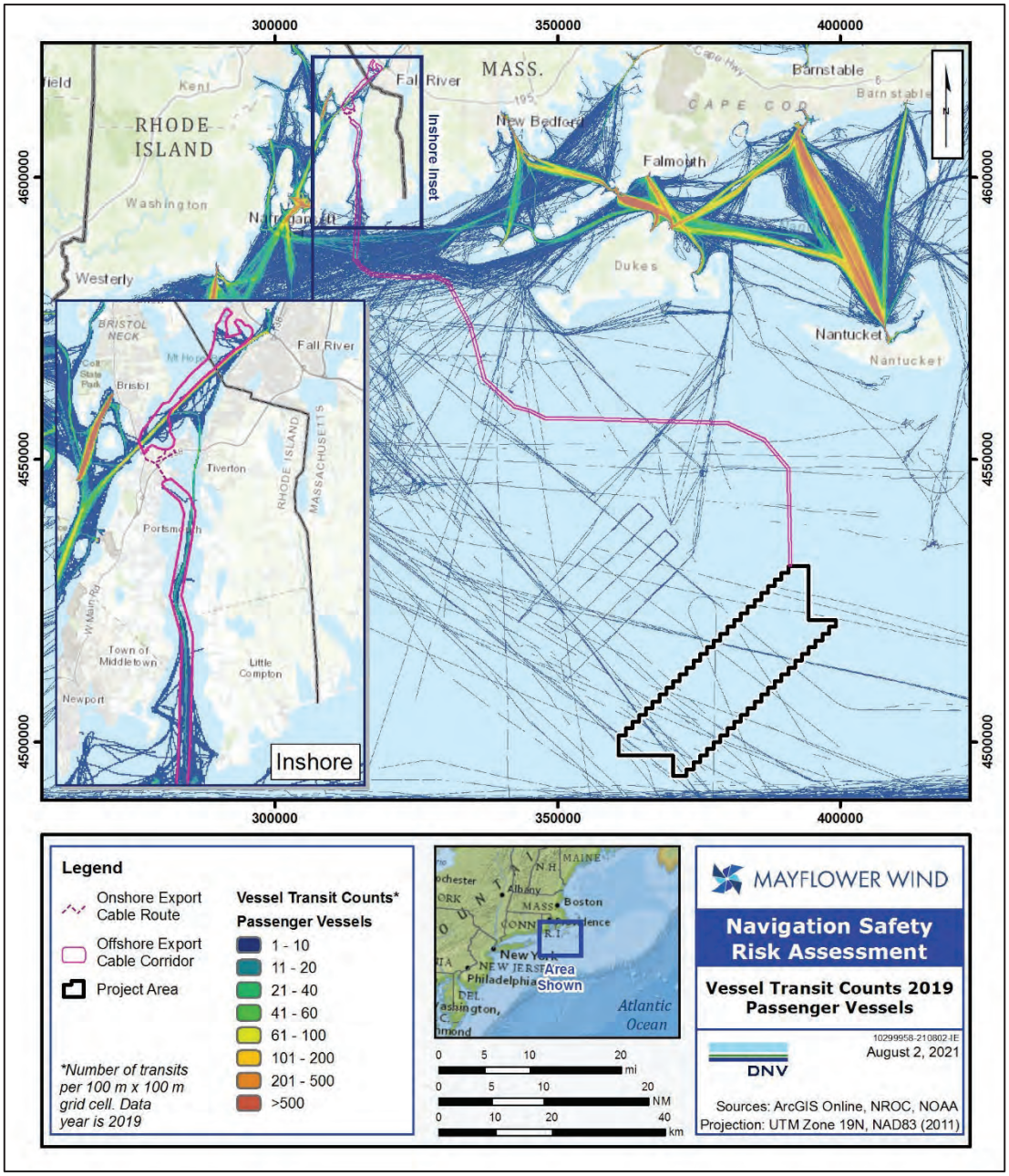

Figure G-6 Passenger Vessel Transit Counts for 2019 (MarineCadastre, 2021)

Pleasure and sailing vessel transit counts show a pattern of transits that were highest near the coast and include relatively high counts in the Sakonnet River and Mount Hope Bay of up to 500 tracks in 2019 (an average of less than 2 per year per grid cell). Very low transit counts (10 or less per grid cell) were indicated further than 10 nm (18.5 km) offshore in the vicinity of the Brayton Point ECC.

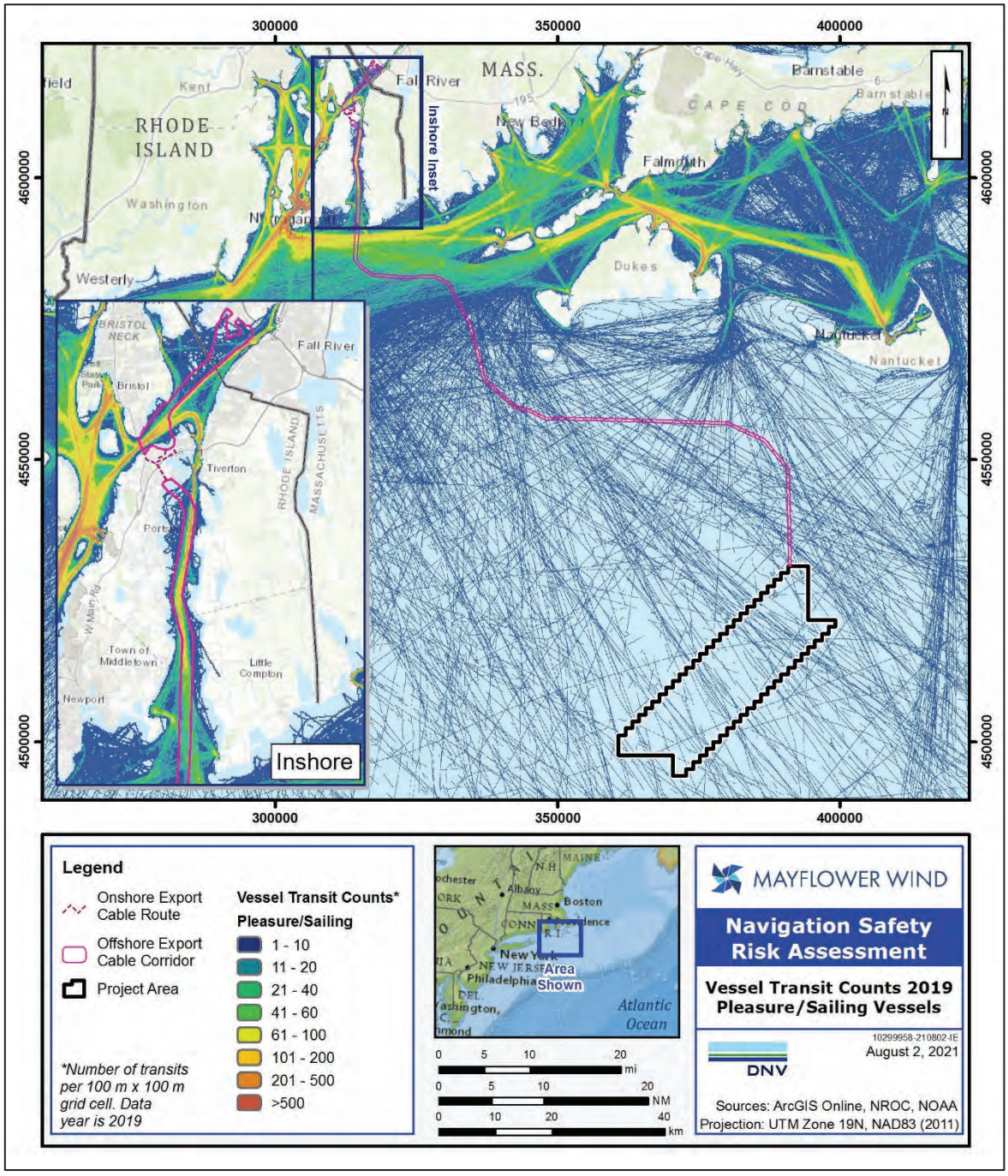

Figure G-7 Pleasure/Sailing Vessel Transit Counts for 2019 (MarineCadastre, 2021)

Tankers in the vicinity of the Brayton Point ECC crossed the ECC along a coastal route that continued through Cape Cod Canal. Very limited tanker activity occurred in Mount Hope Bay or in Sakonnet River.

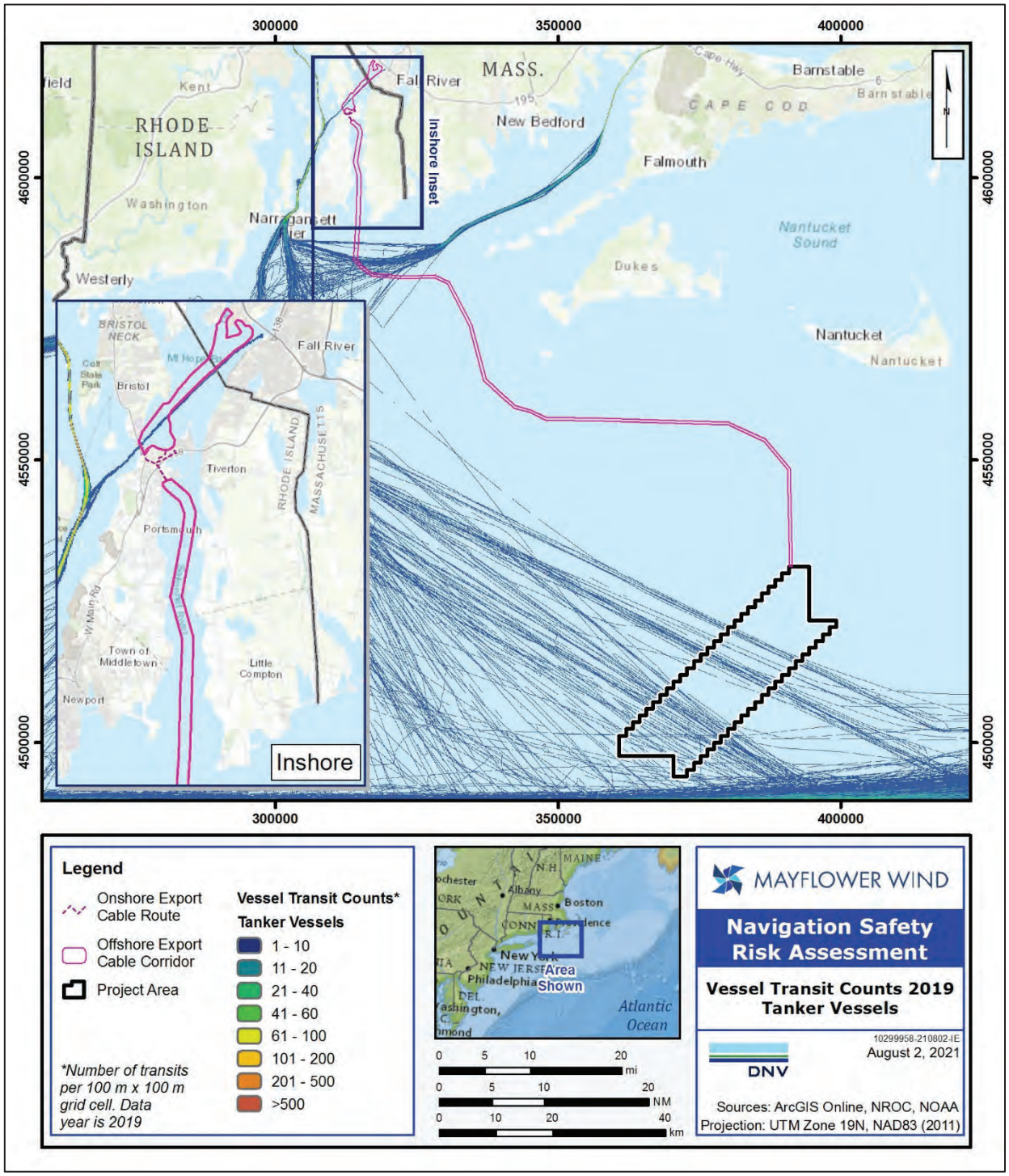

Figure G-8 Tanker Transit Counts for 2019 (MarineCadastre, 2021)

In contrast to the low transit counts for carriers and tankers, tug-tow vessels' routes near the Brayton Point ECC had comparatively higher transit counts on their coastal route in proximity to the ECC. The maximum transit counts per grid cell exceeded 500 per year (an average of less than 2 per day) in a small number of grid cells east of the ECC.

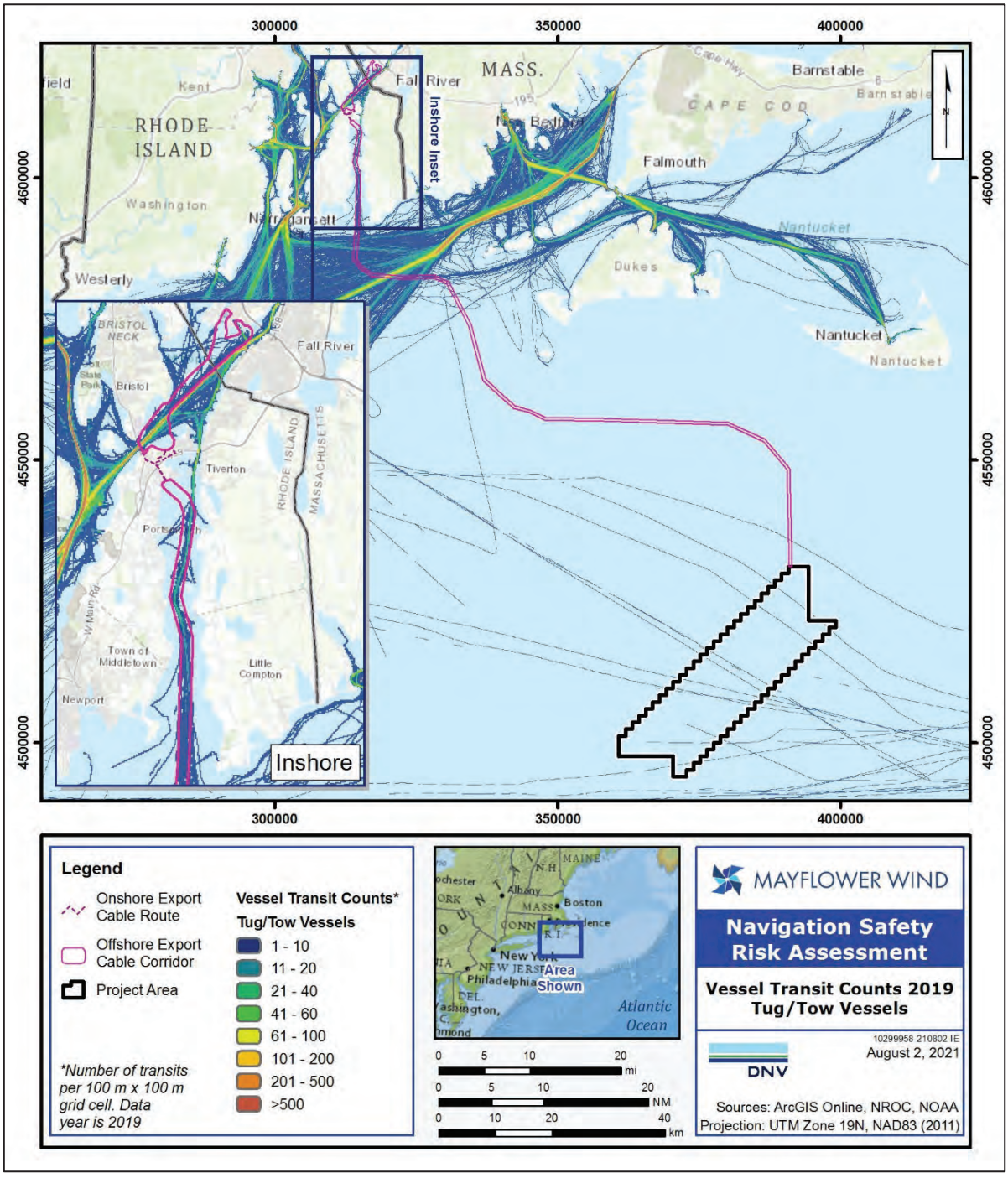

Figure G-9 Tug/Tow Vessel Transit Counts (MarineCadastre, 2021)

Figure G-10 shows the comparative level of fishing activity in the vicinity of the Brayton Point ECC based on data from National Marine Fisheries Service (NMFS) VMS.

Figure G-11 shows the comparative level of fishing gear used in the vicinity of the Brayton Point ECC based on data reported under the VTR program.

Based on the figures, the following observations can be made:

- Mount Hope Bay – Comparatively low levels of fishing for all species. Herring was the most fished, at a medium-low level.
- Sakonnet River – No indicated fishing except for high levels of monkfish fishing and limited gillnet fishing in the south.
- Rhode Island Sound – Fishing is indicated for all species in the vicinity of some portion of the Brayton Point ECC. Squid and pelagics show high levels of fishing that intersect with the ECC. Concerning fishing gear use, longline and pots and traps showed no activity in the vicinity of the ECC, while use of other gear types are indicated at comparatively lower levels. Gillnet use in Rhode Island Sound south of the entrance to the Sakonnet River was the highest of any reported gear use, at a comparatively moderate level. The use of dredge towing, which is potentially the most impacted by buried cables, has not been reported in the vicinity of the ECC.

Figures G-10 and G-11 are illustrative in showing the location and relative intensity of fishing effort for the species groups targeted and gear types utilized by the VMS and VTR fisheries represented in those figures. However, the fisheries-dependent data used to generate those figures does not represent the totality of commercial fishing. This means that there are landings of commercially targeted species that occur in the Brayton Point ECC, particularly inshore, that are not represented in these figures. In addition to the limitations of landings data, a portion of the fishing vessels with landings not represented in these figures are also not represented in AIS charts as AIS carriage is not a requirement of their fishing permits or vessel registration. While the Sakonnet River and Mount Hope Bay exhibit lower levels of fishing effort than other areas of Narragansett Bay in the data sets represented in Figures G-10 and G-11, other fisheries-dependent data, or other forms of information collected on the presence of commercial and recreational fishing, fishing does occur in these areas. Fishing occurs at higher levels in offshore portions of the Brayton Point ECC than in the inshore portions. The commercial and recreational fishing effort in the Brayton Point ECC (as well as the rest of the Project including the Lease Area and the Falmouth ECC) is discussed in Section 11 (Commercial and Recreational Fisheries and Fishing Activity) and Appendix V (Commercial and Recreational Fisheries and Fishing Activity Technical Report) of the Construction and Operation Plan (COP).

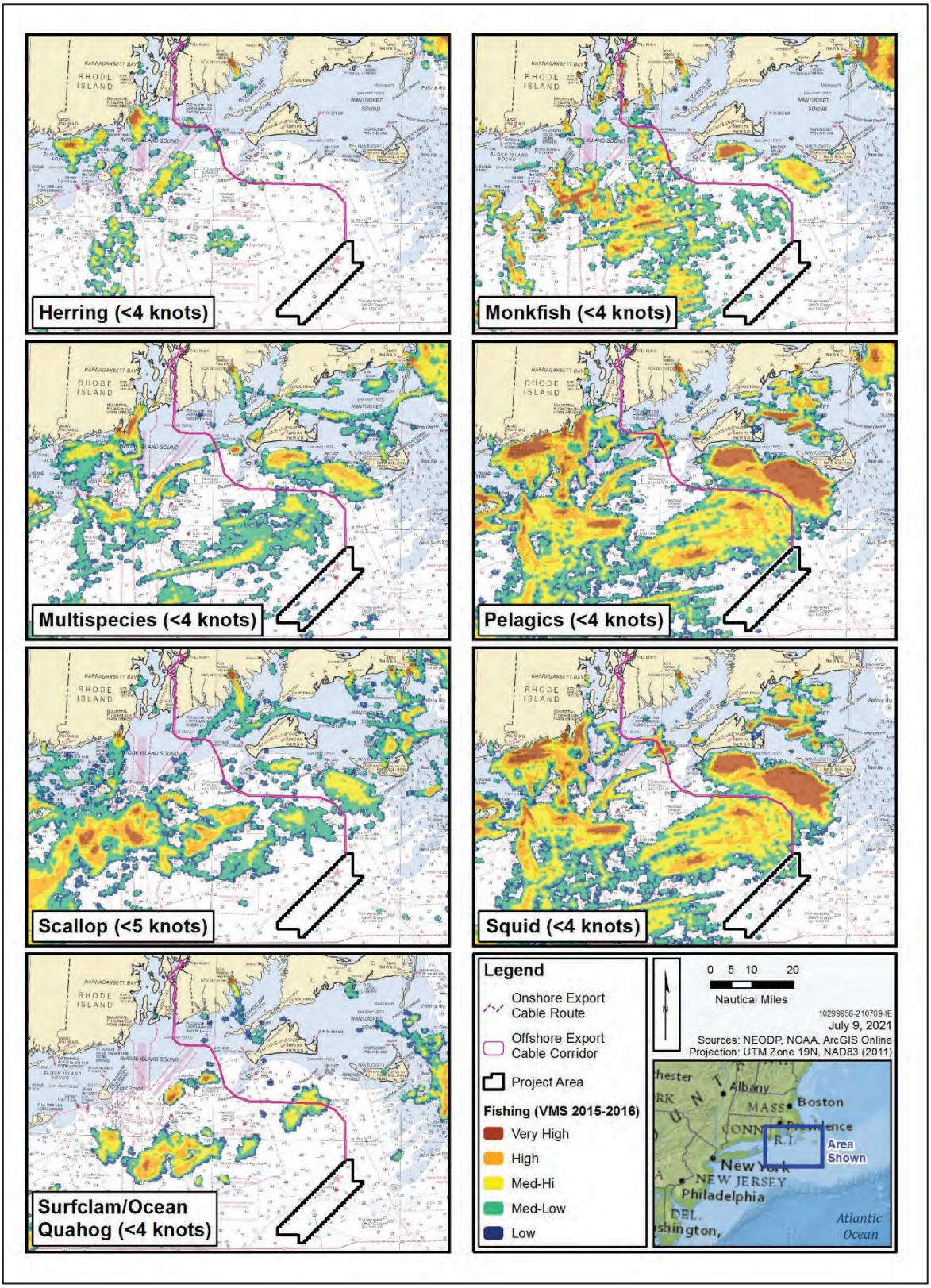

Figure G-10 Fishing Vessel Activity VMS data 2015-2016 (MarineCadastre, 2021)

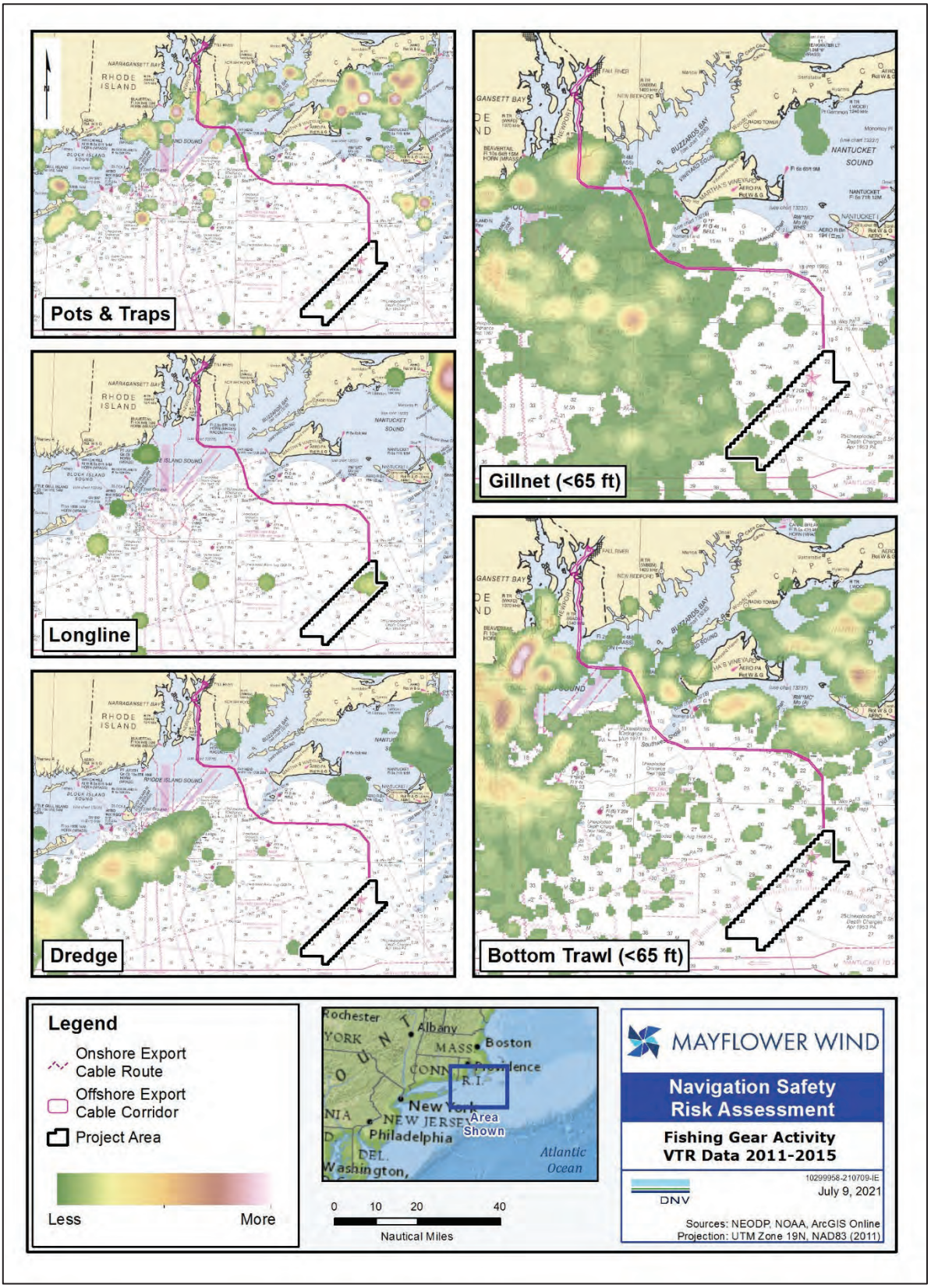

Figure G-11 Fishing Gear Activity VTR data 2011-2015 (MarineCadastre, 2021)

G.2.2 Traffic Statistics

To develop traffic statistics for the Brayton Point ECC, the data used in the traffic survey (Section G.2) was reviewed to identify the highest traffic density along portions of the ECC. The results are summarized in Table G-1, which lists the highest traffic density of any 100 m x 100 m grid cell within 5 nm (9.3 km) of the ECC.

Table G-1 2019 AIS Maximum Vessel Counts (MarineCadastre, 2021)

Vessel type	Maximum Vessel Transit Counts Per Grid Cell within 5 nm of the Brayton Point ECC			
	Mount Hope Bay	Sakonnet River	Rhode Island Sound	South of Martha's Vineyard
Cargo	40-60 (except within 200 m of the Port of Fall River)	0	1-10	1-10
Fishing	40-60	100-200 near Tiverton, 40-60 elsewhere	60-100	40-60
Other	200-500	60-100 near Tiverton, 40-60 elsewhere	100-200	20-40
Passenger	>500	40-60	40-60	1-10
Pleasure	>500	>500	>500	1-10
Tanker	10-20 (only two cells), 1-10 elsewhere	0	1-10	0
Tug-tow	200-500	40-60	100-200	1-10

In the northern portion of the Brayton Point ECC, Mount Hope Bay and the Sakonnet River, shallow draft vessels comprise most of the vessel traffic, primarily passenger and pleasure types. Cargo and tanker densities are very low, averaging a few port calls per month or fewer.

For Rhode Island Sound and south of Martha's Vineyard, the traffic densities and statistics are more completely described in the NSRA main report, Section 2.

To obtain more precise statistics, vessel counts available in Ocean Reports were reviewed for the inshore and offshore areas in the vicinity of the Brayton Point ECC. Ocean Reports is a data portal provided by a BOEM and NOAA partnership (BOEM and NOAA, 2020). It provides summary statistics for 2016 AIS data. Vessel transit counts are taken for grid cells of 100 m by 100 m. The differences between the 2016 and 2019 data are relatively minor, except for Pleasure vessels. There are two probable explanations: increased used of AIS equipment and improved capture of AIS signals.

Table G-2 2016 AIS Mean and Maximum Vessel Counts

Vessel type	Mean and Maximum Vessel Transit Counts Per Grid Cell in the Vicinity of the Brayton Point ECC							
	Mount Hope Bay		Sakonnet River		Rhode Island Sound		South of Martha's Vineyard	
	Mean	Maximum	Mean	Maximum	Mean	Maximum	Mean	Maximum
Cargo	26.46	344	0	0	2.10	12	1.08	18
Fishing	7.65	49	7.99	113	12.01	142	4.58	90
Other	NR*	NR	NR	NR	NR	NR	NR	NR
Passenger	18.96	199	5.67	49	4.81	61	1.03	3
Pleasure	20.47	619	20.38	376	9.96	117	1.21	8
Tanker	0	0	0	0	1.61	8	1.27	4
Tug-tow	29.37	441	3.69	49	11.23	291	1.12	3

* Not Reported

The southern portion of the Brayton Point ECC lies within the Marine Traffic Study Area assessed in the main NSRA report. The northern portion of the ECC follows a path northward and then westward until it aligns with the entrance of the Sakonnet River. The west-east portion of the ECC crosses the corner of the outbound lane of the Buzzards Bay TSS and the Recommended Vessel Route (in green) for deep draft vessels and tugs/barges. The risks associated with the ECC burial depth are assessed in a separate preliminary cable burial assessment (Cathie and Associates, 2021) that is in draft at the time of this NSRA update (August 2021). The relevant recommendations from that assessment are presented in Section G.4.2 and in Mayflower Wind's COP in Section 11.

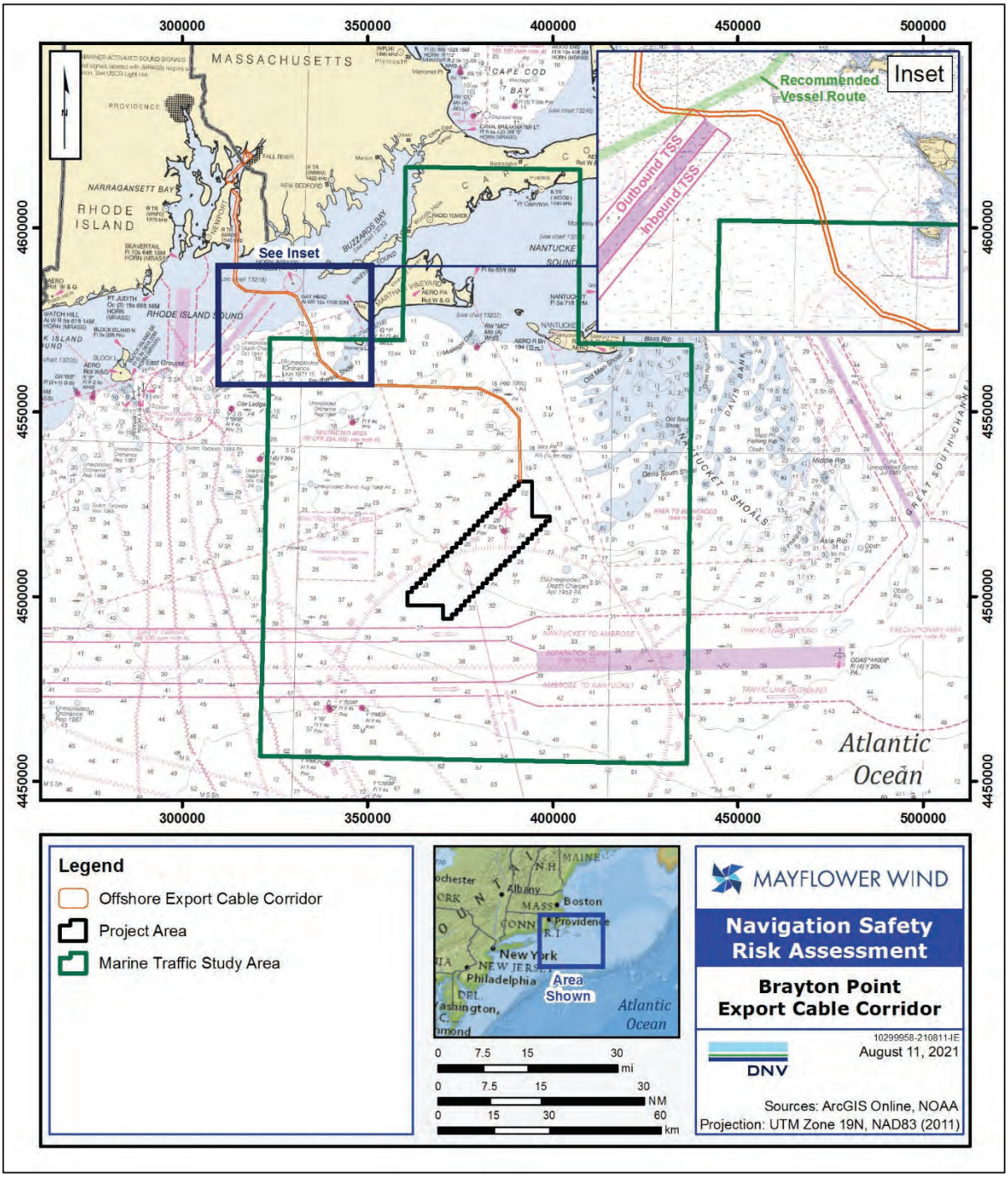

Figure G-12 Brayton Point ECC on a Navigation Chart

Marine cargoes in Mount Hope Bay and Sakonnet River include paper, latex and chemicals, fish, coal and lignite, vehicles, and equipment (World Port Source, 2021). Cargoes in Rhode Island Sound and South of Martha's Vineyard are described in Section 2.4 of the main NSRA report.

Non-transit uses of Mount Hope Bay and Sakonnet River include:

- Recreational boating
- Fishing and shell-fishing
- Public recreational uses such as swimming, wind surfing, bird watching, etc.
- Port facilities and marinas (World Port Source, 2021) The only identified port authority in the Brayton Point ECC is the Fall River Port Authority.
- Naval Undersea Warfare Center, Division Newport Testing Range, which consists of waters within Narragansett Bay, nearshore waters of Rhode Island Sound, Block Island Sound, and coastal waters of New York, Connecticut, and Massachusetts (Naval Facilities Engineering Command, Atlantic, 2016).

The following were not identified within 2 nm (3.7 km) of the Brayton Point ECC:

- Pilot boarding areas
- Anchorage areas
- Danger Zones and Restricted Areas (offshore firing/bombing ranges and areas used for other military purposes)
- Oil and gas platforms or wells, or oil and gas leases
- Sand and gravel leases
- Mining
- Ocean disposal sites

Because the offshore export cables in the Brayton Point ECC will be buried during the Project's operational phase, no cable risks are anticipated to aids to navigation; vessel traffic services; switch to low sulfur fuel; or vessel traffic patterns prior to entering the North America Emission Control Area (ECA).

Based on an evaluation of monthly 2019 AIS data (MarineCadastre, 2021), the seasonal patterns in the vicinity of the Brayton Point ECC are similar to those in the Marine Traffic Study Area discussed in Section 2 of the main NSRA report. The traffic in the AIS data is relatively higher during the summer and autumn than in the winter and spring for most vessel types. The exceptions are cargo vessels and tankers, which are more consistent throughout the year.

G.3 Offshore Above Water Structures

The offshore export cables will be buried below the seabed or covered on the seabed and will not include above-water components.

G.4 Offshore Under Water Structures

This section describes navigation hazards and risks from the export cable during construction, operations, and decommissioning phases of the Project.

G.4.1 Construction Phase

Up to six submarine cables will be installed by dedicated cable laying vessels, simultaneously trenching and laying the cables into the seabed at a target depth of 1.8 m (6 ft) (Mayflower Wind, 2021). During this phase the cable laying vessel will have a restricted ability to maneuver due to the unspooling of cable between the vessel and the seabed.

Vessels involved in cable lay activities will pose a hazard to passing vessels, whether fishing or transiting. Three primary means of reducing this risk are:

- A temporary moving safety zone surrounding the vessels laying the cable (often including a cable lay vessel and a barge) while they are engaged in cable laying operations. Unauthorized persons or vessels will be prohibited from entering into, transiting through, or remaining in the safety zone without permission of the Captain of the Port or designated representative. The vessels laying the cable will meet the requirements to exhibit lights and shapes as required in COLREGS Rule 27 (IMO, 1972), which will facilitate passing vessels to properly identify their obligation to give way. It is noted that from the entrance of the Sakonnet River and further inland vessels are subject to the Inland Navigation Rules Act of 1980 rather than COLREGS, but the requirements are similar.
- Updates to mariners from the Project, and commonly communicated via Local Notices to Mariners, updates on the Project website, and through direct outreach to the fishing community and other mariners.
- Project safety vessel(s) and/or personnel will be on scene to keep watch for vessels that are on course with the cable lay activity.

G.4.2 Operations Phase

During Project operations, the export cables in the Brayton Point ECC will be buried in or covered on the seabed, and may pose a hazard to activities that pierce the sea floor, such as fishing with specific types of bottom gear or vessel anchoring.

To better understand the risks from and to the export cable and how to mitigate them, a preliminary cable burial risk assessment (CBRA) has been completed (Cathie and Associates, 2021). The assessment was based on best industry practice methodology as recommended by Carbon Trust (2015) and DNV GL and considers vessel activity (interpreted from site-specific AIS data), seabed data (including bathymetry and soil properties), and other considerations including anchorages, dredged channels, and existing infrastructure. A probabilistic risk analysis was completed based on these factors, and a minimum depth of lowering (cable burial depth, referenced from mean seabed level to top of cable) was recommended.

The preliminary CBRA completed for the Brayton Point ECC resulted in a recommendation of a minimum depth of burial of 1 m (3.3 ft) along most of the ECC, and up to 2 m (6.6 ft) in a specific zone. This indicates that the target burial depth of the cables of 1.8 m (6 ft) is sufficient to protect the cables in most of the ECC and maintain adequate separation from any activities that pierce the sea floor, such as fishing with specific types of bottom gear or vessel anchoring (Cathie and Associates, 2021). The preliminary CBRA was

completed using suitable data with conservative assumptions applied where appropriate (Cathie and Associates, 2021) and will be updated when the 2021 geophysical and geotechnical surveys of the Brayton Point ECC are complete (Mayflower, 2021). Additionally, seabed mobility will be assessed in more detail to determine whether deeper burial or seabed preparation (i.e., sand wave clearance) is required in certain areas of the ECC to maintain a stable minimum burial depth (Mayflower, 2021).

In addition to posing a hazard to bottom gear, contact with an anchor could pose a risk to the anchoring vessel and its crew and passengers. The risk to offshore vessels from the export cables is described in the NSRA report Section 4.1. The risks to vessels transiting inshore waters near the Brayton Point ECC are similar; however, the largest vessels (cargo and tanker vessels) did not transit the Sakonnet River in 2019 based on National AIS data (MarineCadastre, 2021). Cargo vessels do transit the East Passage of Narragansett Bay to Sakonnet Bay, taking a route that crosses the ECC. Based on the vessel types and indicative sizes, anchor risk is anticipated to be less on the Sakonnet River than it is in offshore waters.

Assessment of tides and currents is in Section G.6.

G.4.3 Decommissioning Phase

Prior to decommissioning, Mayflower Wind will consult with BOEM and submit a decommissioning application for review and approval in line with regulations in place at the time (Mayflower Wind, 2021). An approved decommissioning plan will dictate the removal of the export cables, and if removal is agreed upon, would essentially be a reverse of the installation process.

G.5 Navigation within or Close to a Structure

The Brayton Point ECC does not include any unburied/uncovered structures above the seabed. The risks from the ECC on navigation identified by this NSRA related to navigation are described in Section G.4.

Mobile fishing gear types are employed in the vicinity of the Brayton Point ECC. The predominant bottom-contact mobile fishing gear types utilized in this area have minimal penetration depth. However, these fishing techniques might penetrate the seabed or impact unburied cables that are not otherwise protected, potentially resulting in damage to the gear, a hazard to the vessel, and/or damage the cables. The fishing activities that pose a risk include bottom trawling and especially shellfish dredging. Both activities could occur in the vicinity of the ECC.

Important risk controls include assurance that the cable is buried at sufficient depth for any gear type, and/or adequately protecting cable that cannot be buried to target burial depth, and/or using gear that has limited penetration depth in the vicinity of the cable. To reduce the likelihood of interactions between fishing activities and the cable, BOEM recommends a minimum burial depth of 3.28 ft (1 m) and at least a single armor layer (BOEM, 2011). The CBRA completed specifically for the Brayton Point ECC (see Section G.4.2) and the planned target burial depth support the effectiveness of this risk control.

G.6 Effect of Tides, Tidal Streams, and Currents

Tides, tidal streams, and currents are not significant factors in safe navigation in the offshore portions of the Brayton Point ECC. However, within the inshore portion of the ECC, the tidal stream is significantly stronger than offshore.

Water depths in the offshore portion of the ECC range from 16 m to 41 m (52 ft to 135 ft) and inshore from 0 m to 23 m (0 ft to 75 ft) (NOAA NGDC, 1999).

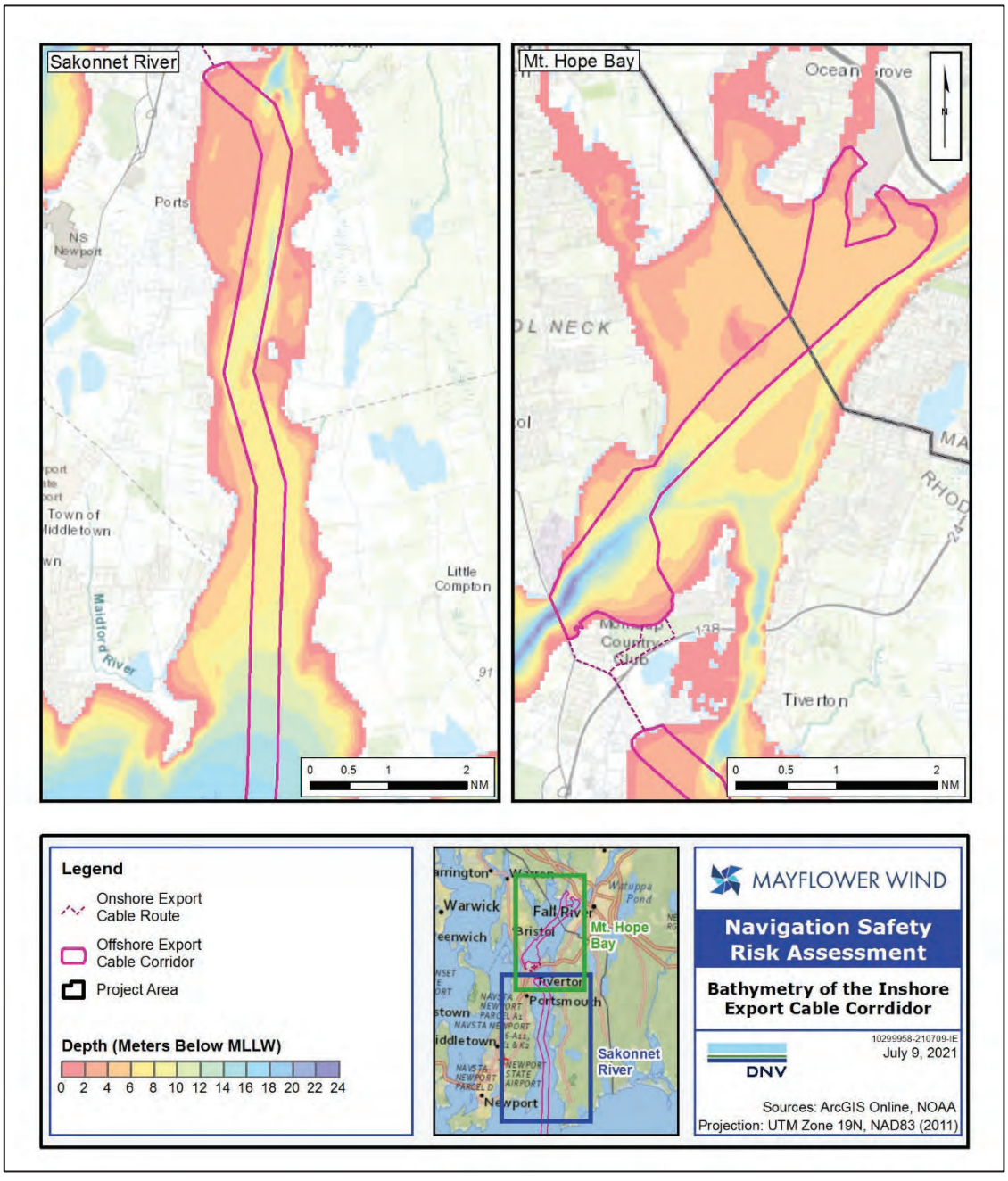

Figure G-13 Bathymetry in the inshore portion of the Brayton Point ECC

The average speed and direction of the current along the offshore portion of the Brayton Point ECC are shown in Figure G-14 and Figure G-15. The monthly average current is from 0.17 to 0.23 m/s (0.33 to 0.45 kt), with maximum recorded current in December of 1.22 m/s (2.37 kt). The preponderant direction of the current is from west-northwest to north-northwest.

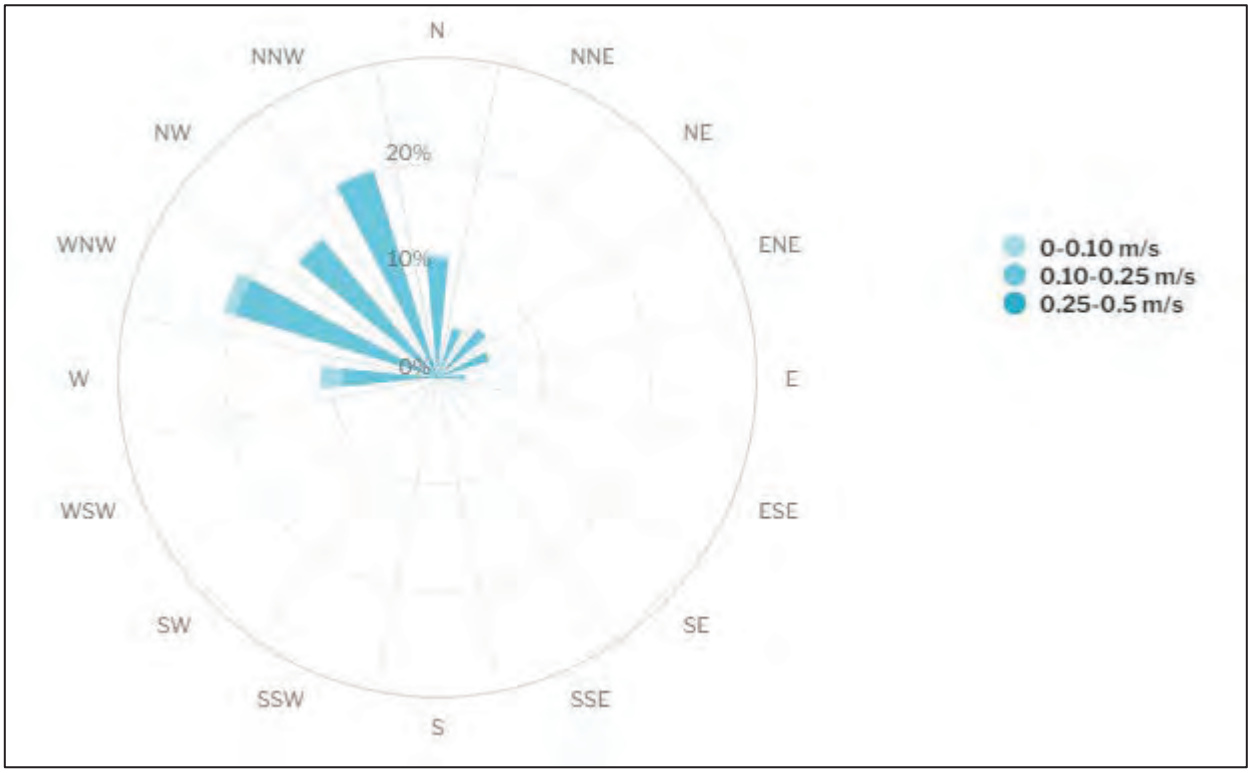

Figure G-14 Average Current Direction along the offshore portion of the Brayton Point ECC (BOEM and NOAA, 2020)

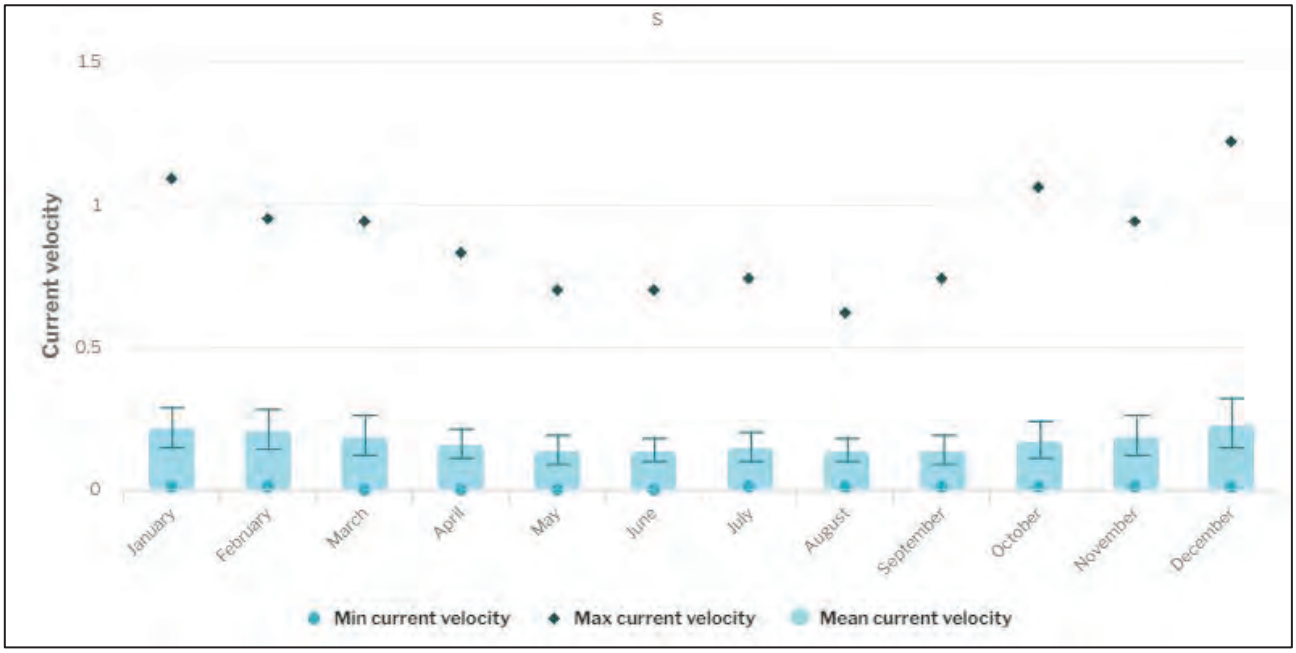

Figure G-15 Average Current Speed along the offshore portion of the Brayton Point ECC (BOEM and NOAA, 2020)

Waves in the offshore portions of the ECC are predominantly from the north and north-northeast. The average wave period is 6 seconds and the significant wave height ranges from 1 to 1.5 m (3.3 to 4.9 ft) as shown in Figure G-14. The portion of the ECC within the Sakonnet River and Mt Hope Bay are sheltered.

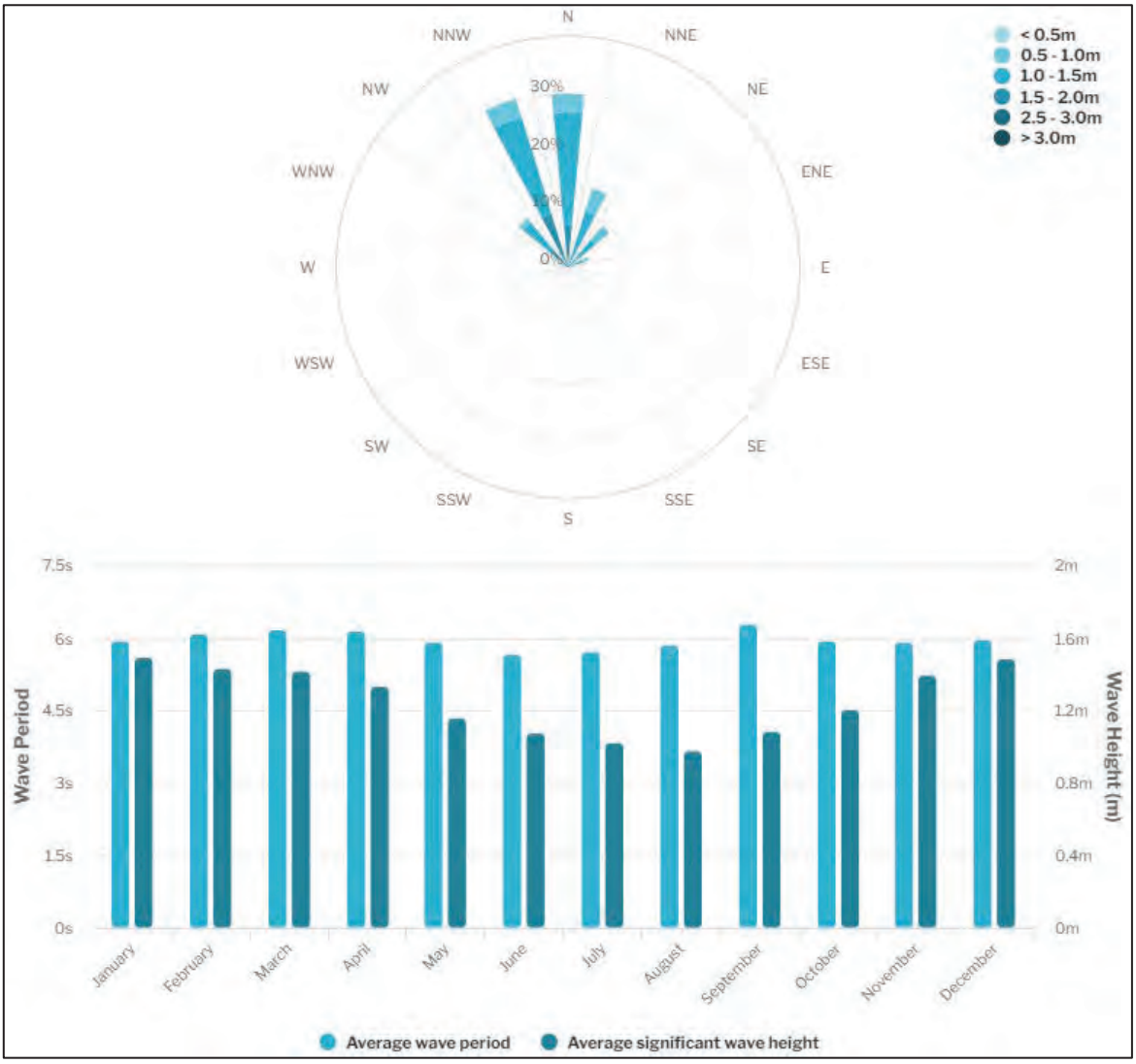

Figure G-16 average wave direction, significant height and period along the offshore portion of the Brayton Point ECC (BOEM and NOAA, 2020)

Tides and currents are not expected to have an impact on the navigation risk caused by the export cables. Over time, the current and the waves could have a scour effect and the burial depth may change. Potential movement of the cables compared to location and burial depth will be monitored during the Project's operational phase and mitigated if necessary through use of, for example, scour protection mattresses (Mayflower Wind, 2021).

G.7 Weather

With the exception of the potential scour effect mentioned in the Section G.6, weather conditions are not anticipated to affect or be affected by the buried export cables in the Brayton Point ECC.

G.8 Configuration and Collision Avoidance

The buried export cables are not anticipated to have direct effects on collision risk. Identified navigation safety risks to anchoring, which could potentially relate to collision avoidance, are described in Section G.4.

G.9 Visual Navigation

The buried export cables are not anticipated to affect visual navigation during the Project's operational phase. Section G.4 describes potential risks to navigation during the Project's construction phase.

G.10 Communications, Radar, and Positioning Systems

Traditional compasses that rely on the earth's geomagnetic field may detect a small effect on compass readings above the cables in shallow water that will diminish quickly with distance. However, compass readings and locations obtained from global positioning system (GPS) receivers would not be affected.

For trenched cables, the compass deviation could reach up to 8 degrees where the depth is lower than 3 m (10 ft) of water depth, but would quickly decrease and be less than 1 degree at 8 m (25 ft) and deeper. Therefore, all the offshore traffic, as well as most of the inland traffic, will not be affected by significant compass variations. Only smaller boats close to the coast near the cables' landing locations could be affected by significant compass variation, although visual navigation would predominantly be used in this situation. In addition, several mitigation measures such as the co-trenching of return cables can significantly reduce the compass deviation (JICABLE, 2015) (Exponent, 2014).

The buried export cables are not anticipated to affect navigation safety related to marine communications, radar, or other positioning systems such as GPS.

G.11 Risk of Collision, Allision, or Grounding

The buried export cables are not anticipated to have any direct effect on collision, allision, or grounding risk. Indirect risks to navigation safety, such as anchoring, are described in Section G.4.

G.12 Emergency Response Considerations

The buried export cables are not anticipated to affect the ability of emergency response assets or personnel to respond. It is possible but unlikely during the Project lifetime that a cable-related anchoring accident could occur and require in-water assistance.

G.13 Facility Characteristics

No effects are anticipated to Federal Aids to Navigation (ATON) or visual navigation from the export cables.

G.14 Design Requirements

Locations and details of offshore Project components such as the export cables will be provided to NOAA so they can be included on nautical charts.

G.15 Operational Requirements

The Project operations center will monitor the export cables, and the cables will be included in marking, monitoring activities, and advisories, and provision of locations of Project components to NOAA.

G.16 Operational Procedures

Project emergency procedures, described in Section 16 of the main NSRA report, will include the export cables in their scope.

G.17 Conclusions and Risk Mitigations for the Brayton Point ECC

The primary conclusions of this study are as follows:

1. Site location and coordinates
   - The Brayton Point ECC will link an offshore substation platform(s) within the Project's Lease Area to the Onshore Project Area at Brayton Point in Somerset, MA.
2. Traffic survey
   - Deep draft vessel (cargo and tankers) traffic is light along most of the Brayton Point ECC. Significant deep draft Traffic crosses the ECC only along the coast of Rhode Island.
   - In the inshore portion of the Brayton Point ECC (Sakonnet River and Mt Hope Bay), traffic primarily consists of shallow draft vessels such as Passenger and pleasure crafts.
   - Along the inshore portion of the Brayton Point ECC, comparatively low levels of fishing for all species were reported.
   - Fishing activity intersects the Brayton Point ECC in the Rhode Island Sound; however, fishing activity occurs but is limited in the inshore portions of the ECC and dredge towing, which is potentially the most impacted by buried cables, has not been reported in inshore portions of the ECC.
3. Offshore above water structures
   - The offshore export cables will be buried below the seabed or covered on the seabed and will not include above-water components.
4. Offshore under water structures
   - The subsea cables will be buried in the Brayton Point ECC, with a target burial depth of 1.8 m (6 ft).
   - During the construction phase, the vessels involved in the cable laying activities have limited maneuverability and may pose a hazard to passing vessels. This risk is planned to be mitigated by implementing a temporary safety zone around the vessels and by informing the mariners (Mayflower, 2021).
   - A preliminary cable burial risk assessment has been performed to assess the risk from and to the buried cables and to determine the appropriate burial depth and mitigation measures. During Project operations, the export cables in the Brayton Point ECC will be buried in or covered on the seabed, and may pose a hazard to activities that pierce the sea floor, such as fishing with specific types of bottom gear or vessel anchoring. This risk is planned to be mitigated by burying the cable at sufficient depth based on risk assessment and periodic monitoring of the cable location during Project operations. This preliminary risk assessment has recommended a minimum burial depth of 1 m (3.28 ft) along most of the ECC, and deeper burial depth in specific zones.

5.	Navigation within or close to a structure	• Mobile fishing gear are employed in the vicinity of the Brayton Point ECC; however, the bottom-contacting mobile gear types used in this area have minimal penetration depths. These fishing techniques might penetrate the seabed or impact unburied cables that are otherwise protected, potentially resulting in damage to the gear, a hazard to the vessel, and/or damage the cables. • Anchors penetrating the seabed within the Brayton Point ECC may also impact the buried cables and may result in damage to the vessel and/or the cables. A Project engineering risk mitigation is routing the ECC to avoid designated anchorage areas. • Another primary risk control is burying the cable at sufficient depth based on risk assessment, covering cables that cannot be buried to target burial depth, and periodic monitoring of the cable location during Project operations. The preliminary cable burial risk assessment has recommended a minimum burial depth of 1 m (3.28 ft). The Project target burial depth is 1.8 m (6 ft).
6.	Effect of tides, tidal streams, and currents	• Water depths in the offshore portion of the Brayton Point ECC range from 16 m to 41 m (52 ft to 135 ft) and inshore from 0 m to 23 m (0 ft to 75 ft). • Along the offshore portion of the Brayton Point ECC, the current is predominantly from the northwest and the waves from the north. In the long term, the current and waves may have a scour effect on the ECC and affect the burial depth. Periodic monitoring of the cable location during Project operations is planned to mitigate this risk (Mayflower, 2021). • Along the inshore portion of the Brayton Point ECC, the current is predominantly generated by the tidal stream and the waves are neglectable.
7.	Weather	• Weather conditions are not anticipated to affect or be affected by the buried export cable in the Brayton Point ECC.
8.	Configuration and collision avoidance	• The buried export cables are not anticipated to have direct effects on collision risk.
9.	Visual navigation	• The buried export cables are not anticipated to affect visual navigation during the Project's operational phase.
10.	Communications, radar, and positioning systems	• The magnetic field generated by the HVDC cables may affect navigation compasses and create a deviation of the readings. This deviation may be significant above the cables in shallow waters but is neglectable at water depths greater than 8 m (26 ft).

	• Other navigation safety related systems such as communications, radar, or other positioning systems like GPS are not anticipated to be affected by the buried cables.
11. Risk of collision, allision, or grounding	• The buried export cables are not anticipated to have any direct effect on collision, allision, or grounding risk.
12. Emergency response considerations	• The buried export cables are not anticipated to affect the ability of emergency response assets or personnel to respond. It is possible but unlikely during the Project lifetime, that a cable-related anchoring accident could occur and require in-water assistance.
13. Facility characteristics	• No effects are anticipated to Federal ATON or visual navigation from the export cables.
14. Design requirements	• Locations and details of offshore Project components such as the export cables will be provided to NOAA so they can be included on nautical charts.
15. Operational requirements	• The Project operation center will monitor the export cables' condition. • Information on the Brayton Point ECC and its location will be provided to NOAA to include on navigation charts.
16. Operational procedures	• Emergency procedures will be developed and reviewed with relevant agencies, including the Coast Guard, to ensure that response plans are adequate and properly resourced.

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About DNV GL

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SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment O: Sediment Sample Grain Size Analytical Results

Revised: February 2023

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TABLE 1. GRAIN SIZE DATA – SUMMER 2021 SEDIMENT SAMPLES COLLECTED DURING BENTHIC SURVEYS

Sample ID	Alpha ID		Grain Size (%)										
		Analysis Date	Cobbles	% Coarse Gravel	% Fine Gravel	% total Gravel	% Coarse Sand	%Medium Sand	%Fine Sand	% Total Sand	% Silt Fine	%Clay Fine	%Total Fines
		Particle Size (mm)	76 - 256	19 - 76	4.76 - 19		2 - 4.76	0.42 - 2	0.074 - 0.42		0.0039 - 0.074	0.0039 - <	
21SU-MW0521-BP003	L2140583-37	08/17/2021 09:15	ND	ND	1.5	1.5	11.2	20.1	9.8	41.1	46.4	10.8	57.4
21SU-MW0521-BP003	L2140583-37	08/30/2021 20:09	ND	ND	1.5	1.5	10.4	6	3.9	41.1	46.4	10.8	57.4
21SU-MW0521-BP005	L2140583-35	08/17/2021 09:15	ND	ND	6.2	6.2	17.9	26.1	13.3	57.3	29.5	7	36.5
21SU-MW0521-BP005	L2140583-35	08/30/2021 20:09	ND	ND	6.2	6.2	8.2	8.2	6.3	57.3	29.5	7	36.5
21SU-MW0521-BP012-BG	L2140583-01	08/17/2021 09:15	ND	ND	ND	ND	0.4	3	85.1	88.5	10.4	1.1	11.5
21SU-MW0521-BP012-BG	L2140583-01	08/17/2021 09:29	ND	ND	ND	ND	0.4	3.1	48.1	88.5	10.4	1.1	11.5
21SU-MW0521-BP013-BG	L2140583-02	08/17/2021 09:15	ND	ND	ND	ND	0.2	5.4	75.4	81	17.1	1.9	19
21SU-MW0521-BP013-BG	L2140583-02	08/17/2021 09:29	ND	ND	ND	ND	1.1	17.4	57.9	81	17.1	1.9	19
21SU-MW0521-BP017-BG	L2140583-04	08/17/2021 09:15	ND	ND	ND	ND	1	2.2	88.4	91.6	7.6	0.8	8.4
21SU-MW0521-BP019-BG	L2140583-06	08/17/2021 09:15	ND	ND	8	8	22.6	47.9	14.5	85	6.3	0.7	7
21SU-MW0521-BP019-BG	L2140583-06	08/17/2021 09:29	ND	ND	8	8	21.6	22.7	3.2	85	6.3	0.7	7

Source: Laboratory Reports are in COP Appendix M.2, Benthic and Shellfish Resources Characterization Report Addendum #2, Attachment 5

TABLE 2. GRAIN SIZE DATA – SPRING 2022 SEDIMENT SAMPLES COLLECTED DURING BENTHIC SURVEYS

Sample ID	Date	Boulder	Cobbles	Pebble	Granule	% Very Coarse Sand	% Coarse Sand	% Medium Sand	% Fine Sand	% Very Fine Sand Sand	Silt	Clay	Analysis
22SP-MW0521-084	3/20/2022	ND (0.100)	ND (0.100)	3.8	6.5	16.3	9.4	4.1	2.7	2.6	45	9.6	Wentworth
22SP-MW0521-084	3/20/2022	ND (0.100)	5.9	10.3	16.2	9.2	7.9	4.4	21.5	52.3	10	62.3	USCS
22SP-MW0521-085	3/20/2022	ND (0.100)	ND (0.100)	0.7	2.2	5.8	7.6	7	10.7	5.7	53.1	7.2	Wentworth
22SP-MW0521-085	3/20/2022	ND (0.100)	0.6	0.8	1.4	1	9.8	18.5	29.3	56.7	12.6	69.3	USCS
22SP-MW0521-086	3/20/2022	ND (0.100)	ND (0.100)	9.8	12.9	17.9	12.4	6.6	4.7	4.7	26.5	4.5	Wentworth
22SP-MW0521-086	3/20/2022	ND (0.100)	11.8	16.9	28.7	12.7	8.6	4.4	25.7	38.3	7.3	45.6	USCS
22SP-MW0521-086-DUP	3/20/2022	ND (0.100)	ND (0.100)	31.2	17.2	18.7	11.8	6	7.5	5.5	1.8	0.3	Wentworth
22SP-MW0521-086-DUP	3/20/2022	ND (0.100)	3.5	16.7	20.2	18.1	12	6	36.1	37.7	6	43.7	USCS
22SP-MW0521-087	3/20/2022	ND (0.100)	ND (0.100)	1.1	4	4.7	3.2	2.4	3.6	15.7	53.8	11.5	Wentworth
22SP-MW0521-087	3/20/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	2.6	8.9	11.5	77.3	11.2	88.5	USCS
22SP-MW0521-088	3/20/2022	ND (0.100)	ND (0.100)	1.2	2.2	1.8	1.4	1.2	26.6	51.1	13.1	1.4	Wentworth
22SP-MW0521-088	3/20/2022	ND (0.100)	ND (0.100)	0.1	0.1	1.1	1.5	75.1	77.7	19.9	2.3	22.2	USCS
22SP-MW0521-089	3/21/2022	ND (0.100)	ND (0.100)	0.1	0.1	0.2	0.5	7.2	50.1	38.5	3	0.3	Wentworth
22SP-MW0521-089	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	0.2	1	90.8	92	7.3	0.7	8	USCS
22SP-MW0521-090	3/21/2022	ND (0.100)	ND (0.100)	0.1	0.4	0.8	2.7	16.7	51.8	22.9	4.1	0.5	Wentworth
22SP-MW0521-090	3/21/2022	ND (0.100)	0.1	0.1	0.2	0.6	4	89.2	93.8	5.4	0.6	6	USCS
22SP-MW0521-093	3/21/2022	ND (0.100)	ND (0.100)	0.1	0.1	1.2	6.8	45.3	42.9	1.3	2.1	0.2	Wentworth
22SP-MW0521-093	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	0.9	11.9	82.9	95.7	3.9	0.4	4.3	USCS
22SP-MW0521-094	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	0.1	0.7	4.2	38.9	37.4	2.7	14.8	1.2	Wentworth
22SP-MW0521-094	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	5.6	92.1	97.7	2.1	0.2	2.3	USCS
22SP-MW0521-095	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	0.2	0.8	6	46.7	43.3	2.1	0.8	0.1	Wentworth

Sample ID	Date	Boulder	Cobbles	Pebble	Granule	% Very Coarse Sand	% Coarse Sand	% Medium Sand	% Fine Sand	% Very Fine Sand Sand	Silt	Clay	Analysis
22SP-MW0521-095	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	0.1	10.1	89.3	99.5	0.5	ND (0.100)	0.5	USCS
22SP-MW0521-095-DUP	3/21/2022	ND (0.100)	ND (0.100)	0.2	0.4	2.2	8	32.4	52.5	2.2	1.9	0.2	Wentworth
22SP-MW0521-095-DUP	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	0.4	17.5	81	98.9	1	0.1	1.1	USCS
22SP-MW0521-096	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	0.1	0.2	6.8	57.5	32.2	1.4	1.6	0.2	Wentworth
22SP-MW0521-096	3/21/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	0.1	10.5	87.8	98.4	1.5	0.1	1.6	USCS
22SP-MW0521-72	4/01/2022	ND (0.100)	ND (0.100)	28.5	9.6	6.5	4.5	1.7	4.1	3.4	35.4	6.3	Wentworth
22SP-MW0521-72	4/01/2022	ND (0.100)	5.3	5.4	10.7	28.5	15.4	8.1	52	30.8	6.5	37.3	USCS
22SP-MW0521-72-DUP	4/01/2022	ND (0.100)	ND (0.100)	26.2	10	4.1	3.6	3.4	3	4.7	34.3	10.7	Wentworth
22SP-MW0521-72-DUP	4/01/2022	ND (0.100)	12.3	12.4	24.7	24	12.4	5.9	42.3	27.7	5.3	33	USCS
22SP-MW0521-73	4/01/2022	ND (0.100)	ND (0.100)	23.8	9	8.1	6.4	3.8	4.6	5.9	33.3	5.1	Wentworth
22SP-MW0521-73	4/01/2022	ND (0.100)	3.1	3.1	6.2	16.4	7.9	3.5	27.8	54.6	11.4	66	USCS
22SP-MW0521-74	3/31/2022	ND (0.100)	ND (0.100)	20.8	12	4.2	7.6	5.7	9.2	10.3	24.6	5.6	Wentworth
22SP-MW0521-74	3/31/2022	ND (0.100)	9.8	9.7	19.5	25.3	17.1	14.8	57.2	19.1	4.2	23.3	USCS
22SP-MW0521-75	3/31/2022	ND (0.100)	ND (0.100)	2.7	4.8	7	17	41.3	21	0.9	4.8	0.5	Wentworth
22SP-MW0521-75	3/31/2022	ND (0.100)	ND (0.100)	ND (0.100)	ND (0.100)	4.6	25.8	63.1	93.5	5.7	0.8	6.5	USCS
22SP-MW0521-76	3/31/2022	ND (0.100)	ND (0.100)	8.2	8.5	5.5	4.9	6.4	21.4	18.5	23.3	3.3	Wentworth
22SP-MW0521-76	3/31/2022	ND (0.100)	2.7	2.7	5.4	14.6	18.1	39.1	71.8	20.5	2.3	22.8	USCS
22SP-MW0521-77	3/31/2022	ND (0.100)	ND (0.100)	10.2	9.8	7.6	14.7	7	21	13	14.6	2.1	Wentworth
22SP-MW0521-77	3/31/2022	ND (0.100)	13.2	15.5	28.7	12.1	28.7	27.3	68.1	2.8	0.4	3.2	USCS
22SP-MW0521-77-DUP	3/31/2022	ND (0.100)	ND (0.100)	28	10.7	8.3	12.9	6.9	14.4	9.2	7.8	1.8	Wentworth
22SP-MW0521-77-DUP	3/31/2022	ND (0.100)	6	5.9	11.9	13.3	28.2	33.7	75.2	11.6	1.3	12.9	USCS
22SP-MW0521-78	3/31/2022	ND (0.100)	ND (0.100)	23.1	9.2	8.3	7.7	7.5	31.7	5.8	5.9	0.8	Wentworth
22SP-MW0521-78	3/31/2022	ND (0.100)	16	17.1	33.1	11.2	18.2	29.8	59.2	6.6	1.1	7.7	USCS
22SP-MW0521-79	3/31/2022	ND (0.100)	ND (0.100)	88.3	3.4	2	1.4	0.7	0.6	0.2	2.9	0.5	Wentworth

Sample ID	Date	Boulder	Cobbles	Pebble	Granule	% Very Coarse Sand	% Coarse Sand	% Medium Sand	% Fine Sand	% Very Fine Sand Sand	Silt	Clay	Analysis
22SP-MW0521-79	3/31/2022	ND (0.100)	8	8.1	16.1	27.3	18.5	7.5	53.3	26.8	3.8	30.6	USCS
22SP-MW0521-80	3/30/2022	ND (0.100)	ND (0.100)	52.8	13.9	6	4.6	1.7	3.5	3.2	11.2	3.1	Wentworth
22SP-MW0521-80	3/30/2022	ND (0.100)	10.1	20.4	30.5	18.8	16.1	9.9	44.8	20.6	4.1	24.7	USCS
22SP-MW0521-81	3/30/2022	ND (0.100)	ND (0.100)	1.4	13.2	2.5	15.2	42.8	16.3	2.4	5.3	0.9	Wentworth
22SP-MW0521-81	3/30/2022	ND (0.100)	0.5	0.6	1.1	2.9	14.5	70.9	88.3	9.6	1	10.6	USCS
22SP-MW0521-82	3/30/2022	ND (0.100)	ND (0.100)	19.5	13.4	5.1	3.1	2.7	5.1	7.8	36.2	7.1	Wentworth
22SP-MW0521-82	3/30/2022	ND (0.100)	2.6	17.9	20.5	19.8	12.1	11.9	43.8	31.5	4.2	35.7	USCS
22SP-MW0521-83	3/30/2022	ND (0.100)	ND (0.100)	ND (0.100)	27.9	8.7	5.8	3.5	3.4	5.7	36.2	8.8	Wentworth
22SP-MW0521-83	3/30/2022	ND (0.100)	3.9	4	7.9	23.8	16.5	9.6	49.9	35.1	7.1	42.2	USCS

Source: Fugro QC of Alpha results

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment P: Fisheries Monitoring Plan

Revised: July 2024

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SOUTHCOAST WIND

Fisheries Monitoring Plan – SouthCoast Wind – Rhode Island Waters

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C	Brian Gervelis	Sam Asci Kyle Cassidy	Jennifer Flood	27-10-23	Response to MA DMF comments

Table of Contents

Revision History i
Table of Contents ii
List of Figures iii
Glossary iv
1. Introduction 1
2. Overview of Fisheries Monitoring 3
3. Fisheries Monitoring 4
3.1 Summary of Existing Fisheries Monitoring 4
3.2 Fishing Activity in the Study Area 5
3.3 Proposed Channeled and Knobbed Whelk Trap Survey 6
3.3.1 Survey Design and Methods 7
3.3.2 Data Management and Analysis 10
3.4 Acoustic Telemetry 11
3.4.1 Survey Design 11
3.4.2 Survey Methods 12
3.4.3 Data Management and Analysis 13
4. Data Management, Reporting, and Data Sharing 15
5. References 17

List of Figures

Page

Figure 1. Location of the SouthCoast Wind Lease Area with proposed wind turbine generator (WTG)/offshore substation platform (OSP) foundation positions and offshore export cable corridors (ECCs). 2

Figure 2. A concept of the study design highlighting the gear configuration and string locations in relation to Brayton Point ECC (adapted from Revolution Wind, LLC and INSPIRE Environmental, 2021). Stations will alternate along either side (east or west) of the cable. 8

Figure 3. Examples of whelk trap designs from Oliveira et al. (2013) (left) and C-Trap (C-Trap, 2023) (right), that could be used to survey along the Brayton Point ECC. 9

Figure 4. A diagram of shell measurements collected on whelk species from Oliveira et al. (2013). 9

Figure 5. Proposed receiver locations along the Brayton Point ECC. 14

Figure 6. (A, B) Diagram of Vemco VR2AR (Acoustic Release) receiver submerged (A) and triggered to release (B). (C, D) Mooring Systems recovery mooring acoustic release system showing canister and recoverable pyramid anchor. (D) Shows “triggered” VR2AR trailing a high strength Dynema rope allowing retrieval, recovery, and redeployment of the whole mooring system. 15

Glossary

Acronym	Definition
BAG	Before-After Gradient
BOEM	Bureau of Ocean Energy Management
C	Celsius
COP	Construction and Operations Plan
CPUE	catch per unit effort
d	day
dB	decibel
ECC	Export Cable Corridor
EMF	electric and magnet fields
FMP	Fisheries Monitoring Plan
ft	feet
HVDC	high-voltage direct current
IAC	Inter-Array Cable
INSPIRE	INSPIRE Environmental
kHz	kilohertz
km	kilometer
m	meter
mm	millimeter
MA	Massachusetts
MA/RI WEA	Massachusetts/Rhode Island Wind Energy Area
MATOS	Ocean Tracking Network or the Mid-Atlantic Acoustic Telemetry Network
µPa	micropascals
MRIP	Marine Recreational Information Program
nm	nautical mile
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
OSAMP	Ocean Special Area Management Plan
OSP	Offshore Substation Platform
QA/QC	quality assurance/quality control
RI	Rhode Island
RIDEM	Rhode Island Department of Environmental Management
RIDMF	Division of Marine Fisheries
RIVTS	RIDEM DMF Ventless Trap Survey
ROSA	Responsible Offshore Science Alliance
s	second
WTG	Wind Turbine Generator

1. Introduction

The SouthCoast Wind Lease Area OCS-A 0521 (Lease Area) encompasses 127,388 acres (51,552 hectares) and will include up to five offshore substation platforms (OSPs), up to 147 wind turbine generators (WTGs), and submarine inter-array cables (IACs) connecting WTGs and OSPs. The OSPs and WTGs will occupy one of the 149 possible positions, which will conform to a 1.0 nautical mile (nm) x 1.0 nm (1.9 kilometers [km] x 1.9 km) grid layout. The grid is oriented in east-west rows and north-south columns, consistent with the layout adopted by SouthCoast Wind and other developers in the Massachusetts/Rhode Island Wind Energy Area (MA/RI WEA). The Lease Area is located entirely in Federal Waters, 26 nm (48 km) south of Martha's Vineyard, 20 nm (37 km) south of Nantucket, and 51 nm (94 km) southeast of the Rhode Island coast (Figure 1).

The SouthCoast Wind Project (the Project) includes two separate export cable corridors (ECCs) that will make landfall at Falmouth, MA and Brayton Point in Somerset, MA (Figure 1).

The Brayton Point ECC extends northward from the Lease Area in Federal Waters before entering Rhode Island (RI) state waters from RI Sound. The Brayton Point ECC then continues in RI state waters and travels northward through the Sakonnet River, crosses Aquidneck Island in Portsmouth, RI, and extends through Mount Hope Bay before crossing into MA state waters to make landfall in Somerset, MA (Figure 1). The Study Area of this Fisheries Monitoring Plan (FMP) is the RI state waters portion of the Brayton Point ECC.

In addition to supporting a diversity of recreational activities, such as tourism, transportation, and industry, RI state waters provide vital habitat for fish (RIDEM 2023). This FMP focuses on a subset of commercial and recreational fishery species based on input from Rhode Island State agencies and fishery stakeholders and concurrent research projects to capitalize on existing efforts. Initial consultation by both INSPIRE Environmental and SouthCoast Wind with RIDEM and local commercial and recreational fishermen, reviews of other fisheries monitoring surveys in the area, and reviews of both commercial and recreational fishing effort and landings in the area, including the fisheries baseline assessment in SouthCoast Wind's Construction and Operations Plan (COP), were used to determine the appropriate species and surveys. These species include channeled whelk (*Busycotypus canaliculatus*), knobbed whelk (*Busycon carica*), striped bass (*Morone saxatillis*), summer flounder (*Paralichthys dentatus*), tautog (*Tautoga onitis*), and little tunny (i.e., false albacore, *Euthynnus alletteratus*).

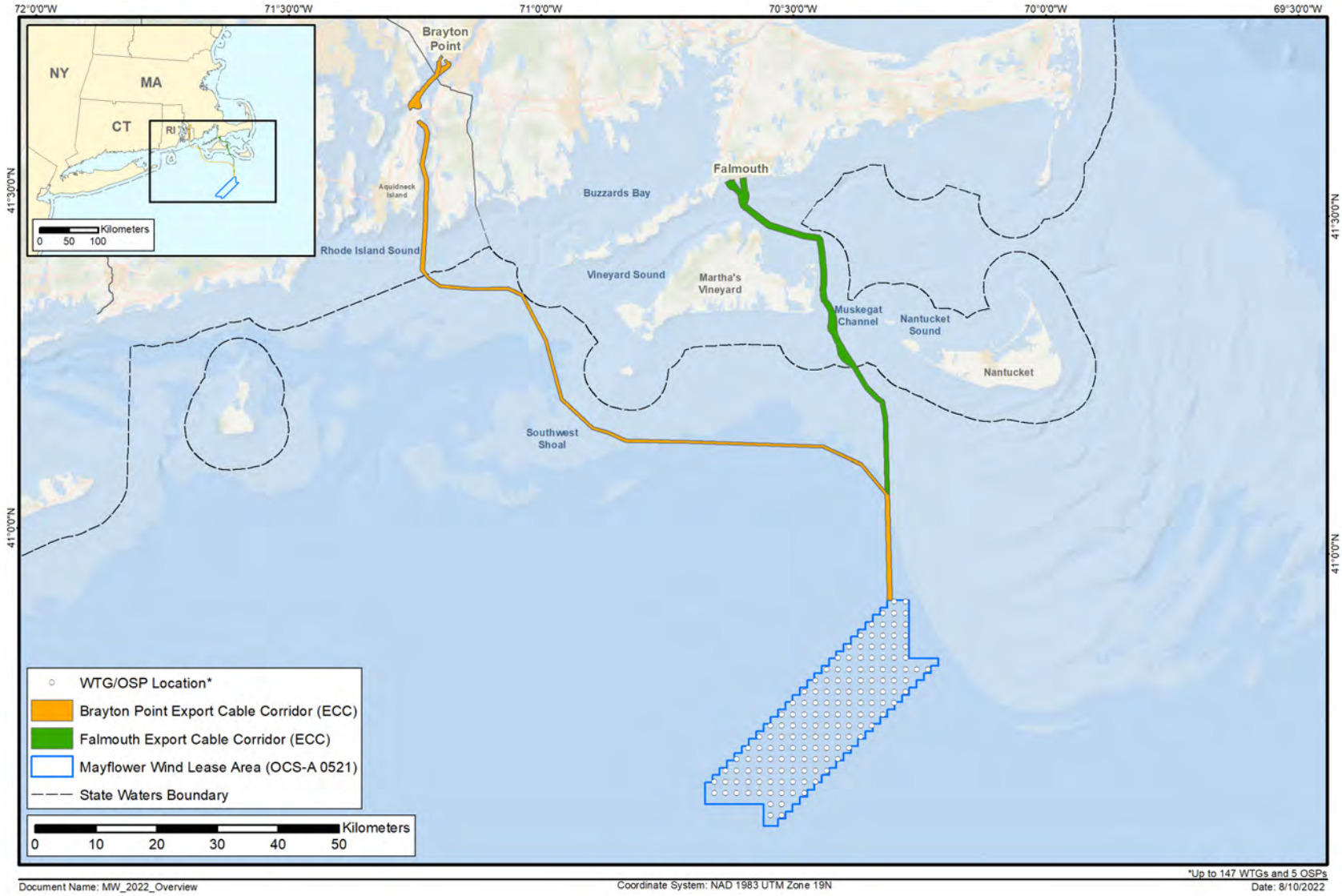

Figure 1. Location of the SouthCoast Wind Lease Area with proposed wind turbine generator (WTG)/offshore substation platform (OSP) foundation positions and offshore export cable corridors (ECCs).

2. Overview of Fisheries Monitoring

This Fisheries Monitoring Plan (FMP) was developed in accordance with the RI Ocean Special Area Management Plan (OSAMP) and applicable sections of the RI Code of Regulations, notably 650-20-05 RI Code R. §11.9.9 (Baseline Assessment Requirements in state waters), and also with recommendations set forth in the Bureau of Ocean Energy Management (BOEM) "Guidelines for Providing Information on Fisheries for Renewable Energy Development on the Atlantic Outer Continental Shelf" (BOEM, 2019). These sections of the RI Code of Regulations state, in summary, that a baseline biological assessment of commercially and recreationally species shall be conducted for two years pre-construction, during each year of construction, and three years post-construction using surveys appropriate for the species identified and for the nature of the offshore development being assessed (in this case, SouthCoast Wind). The BOEM guidelines state that a fishery survey plan should aim to:

- Identify and confirm which dominant benthic, demersal, and pelagic species are using the project site, and when these species may be present where development is proposed;
- Establish a pre-construction baseline which may be used to assess whether detectable changes associated with proposed operations occurred in post-construction abundance and distribution of fisheries;
- Collect additional information aimed at reducing uncertainty associated with baseline estimates and/or to inform the interpretation of research results; and
- Develop an approach to quantify any substantial changes in the distribution and abundance of fisheries associated with proposed operations.

BOEM also provides guidance related to survey gear types that can be used to conduct fisheries monitoring surveys including otter trawl, beam trawl, gillnet/trammel net, and ventless traps if those gear types will effectively sample species identified as appropriate target species. BOEM guidelines stipulate that two years of pre-construction fisheries monitoring data are recommended, and that data should be collected across all four seasons. Consultations with BOEM and other agencies are encouraged during the development of FMPs. BOEM also encourages wind developers to review existing data, and to seek input from the local fishing industry to select survey equipment and sampling protocols that are appropriate for the area of interest.

Additional fisheries monitoring guidance was obtained from the Responsible Offshore Science Alliance (ROSA) "Offshore Wind Project Monitoring Framework and Guidelines" (2021). These guidelines build on existing BOEM guidance, outlining the fundamental elements to include in offshore wind fisheries monitoring plans and associated studies for commercial-scale offshore wind farms and identifying the primary resources to help draft and review such plans. Based on existing BOEM guidance and best practices developed to date, these guidelines help to:

- Streamline project monitoring plan development and review by providing comprehensive standardized recommendations for monitoring marine resources affected by offshore wind development projects;
- Ensure project monitoring plans and supporting studies are effectively designed to provide necessary information that can be used to understand and minimize adverse impacts on marine resources from offshore wind development consistent with established BOEM, National Marine Fisheries Service (NMFS), and state guidelines, best science practices, and decision maker and developer data needs;

- Encourage the use of standardized protocols to collect and analyze biological and environmental data that can be integrated with existing survey data and other research;
- Support the integration of monitoring efforts across multiple spatial and temporal scales (site-specific to regional/ecosystem and before/after construction);
- Focus monitoring efforts on important commercial and recreational species, habitats, and other resources that may be impacted by or vulnerable to offshore wind development; and
- Encourage proactive engagement, collaboration, and involvement among State and Federal agencies, research institutions, wind developers, and fishery members and representatives.

This FMP will be revised through an iterative process, and survey protocols and methodologies have been and will continue to be refined and updated based on feedback received from stakeholder groups. Most of the research described in this plan will be performed on contracted commercial and recreational fishing vessels whenever practicable.

3. Fisheries Monitoring

3.1 Summary of Existing Fisheries Monitoring

Existing fishery independent and dependent data were identified and reviewed during the development of this FMP. Several established fisheries independent surveys have been conducted within RI state waters, specifically within the vicinity the Brayton Point ECC. These surveys and reports provide examples of ongoing and recent work that help to characterize marine communities throughout RI state waters, including Narragansett Bay. This section provides a summary of fisheries monitoring within the area of interest prior to construction of the Project.

For over 38 years, the Rhode Island Department of Environmental Management's (RIDEM) Division of Marine Fisheries (RIDMF) continues to develop and employ a series of finfish monitoring programs in RI's coastal and estuarine waters, including the area transited by the Brayton Point ECC. Such finfish monitoring programs include:

- The RI Coastal Trawl Survey (seasonal, est. 1979; monthly, est. 1990): Otter trawl surveys that consist of seasonal surveys within coastal waters and monthly surveys within Narragansett Bay for assessing the status of finfish and crustaceans in RI state waters (RIDMF, 2022a). Of the 13 fixed stations that are sampled monthly in Narragansett Bay, four stations reside within the Sakonnet River (n = 2) and Mount Hope Bay (n = 2) areas; an additional 26 stations (14 of which are randomly selected) are sampled seasonally in the Narragansett Bay area during the spring (April – May) and fall (September – October) (RIDMF, 2022a).
- The Ventless Fish Pot Survey (est. 2013): An annual survey conducted monthly between April and October to evaluate the abundance and biological characteristics of structure-oriented finfish using fish pots set at randomly stratified locations in Narragansett Bay, including Mt. Hope Bay and the Sakonnet River. The most recent 2021 fish pot survey caught and recorded 14 different finfish species where 97% of the catch consisted of scup (56%), black sea bass (39%), and tautog (2%). In addition to identifying spatiotemporal trends and tracking annual cohorts of finfish with low catchability in demersal trawl surveys, the 2021 fish pot survey opportunistically sampled nine unique vertebrate species, including the commercially important channeled and knobbed whelk (RIDMF, 2022a).
- The RI Narragansett Bay Juvenile Finfish Seine Survey (est. 1988): A monthly beach seine survey to monitor the relative abundance and distribution of juvenile life history stages for finfish species that hold commercial

and recreational importance in Narragansett Bay, including Mt. Hope Bay and the Sakonnet River. This survey samples juvenile fish at 18 fixed stations around the coastal margins of Narragansett Bay from June through October of each year using 1/4-inch mesh beach seine (130 ft [39.62 m] long X 6 ft [1.67 m] deep). Other biological and environmental variables measured during this survey include total length of captured fish as well as bottom temperature, salinity, and dissolved oxygen at each station (RIDMF, 2022a).

- The RI Acoustic Receiver Array (est. 2019): A non-extractive acoustic monitoring method to collect baseline movement data on tagged species that reside and migrate through RI state waters. Through a collaboration with the Atlantic Shark Institute, RIDEM deployed 21 acoustic receivers off RI's coast in 2020, where two receivers were positioned near the mouth of the Sakonnet River. Although RIDEM does not currently conduct a comprehensive finfish tagging program, the seasonal acoustic receiver array records tagged animals deployed during other regional efforts. From May through December 2020, 13,086 detections from nine unique finfish and shark species were recorded throughout RI's acoustic receiver array. Of the recorded detections, 11,271 detections were captured for 193 different striped bass at 20 different stations, including 861 detections in the Sakonnet River study area. Striped bass presence was largely seasonal, with a peak in detections during the summer (July – August) with fewer detections during late spring (May – June) and throughout the fall (September – December) (RIDMF, 2021).

Additional data sources that characterize baseline conditions in the Study Area include:

- Life history assessment of channeled whelk and knobbed whelk in Narragansett Bay, Mount Hope Bay, and Little Narragansett Bay (Angell, 2018).
- Trends in catch and effort in the Rhode Island commercial whelk fishery (Angell, 2021).
- Recreational fishing catch and effort estimates for Rhode Island from the NOAA Fisheries' Marine Recreational Information Program (MRIP) (https://www.fisheries.noaa.gov/data-tools/recreational-fisheries-statistics-queries).

3.2 Fishing Activity in the Study Area

Commercial fishing activity within the proposed area of the Brayton Point ECC was characterized using several sources of publicly available information from Federal and State regulatory agencies. Despite the numerous finfish and invertebrate species targeted in RI state waters, the commercial fishery for channeled and knobbed whelk is of great interest and importance to the local fishing community. Between 2007 and 2011/2012, fishing effort for channeled and knobbed whelk increased substantially due to severe declines in the southern New England commercial lobster (*Homerus americanus*) fishery and dramatic increases in ex-vessel prices for whelks (Angell, 2021). Commercial whelk landings occur year-round, but most landings occur between May and December, often peaking in June and October when whelk reproductive activity is low. Whelk landings are reported throughout Narragansett Bay and are especially prevalent in the Sakonnet River, which represented roughly 30% of all whelk landings in 2021 (RIDMF, 2022b).

Several recreationally valuable fisheries are active within Rhode Island State Waters, including the Sakonnet River and Mount Hope Bay areas that will be transited by the Brayton Point ECC. The fishery species identified in this FMP, specifically striped bass, summer flounder, tautog, and little tunny (i.e., false albacore), were selected based on their overall catch rates and social importance to fishery stakeholders (e.g., Kim et al., 2023). For example, of the 27 species groups reported by NOAA Fisheries' MRIP, tautog, little tunny, summer flounder, and striped bass were among the top eleven groups harvested in RI state waters during 2022 (Personal communication from the

National Marine Fisheries Service, Fisheries Statistics Division. [January 13, 2023]). Although harvesting rates for these species are known to fluctuate drastically based on regulations and availability, they remain a cornerstone resource for fishing communities in Rhode Island and the greater southern New England region.

3.3 Proposed Channeled and Knobbed Whelk Trap Survey

SouthCoast Wind will conduct a trap survey to monitor whelk relative abundance and size structure along commercially fished sections of the Brayton Point ECC in the Sakonnet River. The survey will identify potential impacts from the short-term disturbance of submarine cable installation on the localized channeled and knobbed whelk resources. The cable laying process could disrupt the benthic habitats utilized by whelk species; as these areas become re-worked and sediment suspension occurs. Once the Project becomes operational, potential changes in electric and magnetic fields (EMF) are of interest (Taormina et al., 2018). Given the life history and habitat preferences of whelk, these species are susceptible to impacts from construction and operation processes.

Cable installation and mattressing practices could potentially affect both channeled and knobbed whelk as they are resident to inshore areas of RI (Angell, 2021). Both species inhabit sandy and muddy subtidal waters, preying on shellfish species such as the hard clam (*Mercenaria mercenaria*), the soft-shell clam (*Mya arenaria*), the Atlantic surf clam (*Spisula solidissima*), the blue mussel (*Mytilus edulis*), or the slipper shell (*Crepidula fornicata*) (Nelson et al., 2018). Whelk activity levels and feeding are thermally controlled, as channeled whelk bury into the sediment when temperatures become too hot or too cold (Magalhaes, 1948). Additionally, Wilcox (2013) showed that whelk burrow and stop feeding when water temperatures drop below 8°C. The movement of whelk are limited, and seasonal migrations of less than several kilometers are typical (Sisson, 1972; Edmundson, 2016). This sedentary lifestyle is exacerbated by slow growth, late maturation, and limited larval dispersal (Hancock, 1963; Berg and Olsen, 1988; Gendron, 1992; Shelmeradine et al., 2007; Angell, 2021). Species exhibiting these characteristics are typically vulnerable to the physical disturbances such as those created by export cable placement, which increases the need for monitoring.

A Before-After Gradient (BAG) whelk trap survey will be conducted to evaluate the relative abundance and size distribution of channeled whelk, knobbed whelk, and bycatch species within the Brayton Point ECC in the Sakonnet River pre-, during, and post-construction. A BAG design provides advantages over a Before-After Control-Impact design because the need for a comparable reference area is eliminated and the design allows for assessing spatial scale (Livermore et. al., 2023). Pre-construction data collection from this study will be used to evaluate whether detectable changes occurred to the relative abundance or size structure of the whelk resource during and after construction with respect to distance from the cable location. With direct input from RIDEM, a mark-recapture component will also be added to the trap survey to better understand the movements of local whelk populations, especially with respect to the immediate area surrounding the Brayton Point ECC. Such data will directly support ongoing investigations of both whelk species, including population size estimates, growth rates, and recapture rates, that are necessary for properly managing these resources.

To the extent possible, this survey will pair knowledge from local whelk fishermen with designs from trap surveys conducted within RI state waters. Currently, no standardized survey protocol exists for whelk in RI state waters. This FMP will aim to leverage a survey design from other regional surveys such as the RIDEM DMF Ventless Trap Survey (RIVTS). The RIVTS annual survey was modified to be used in a BAG design and will be applied along the RI state waters portion of the Revolution Wind Export Cable Route (Revolution Wind, LLC and INSPIRE Environmental, 2021). This FMP proposes a similar design which will be paired with trap configurations identified as reputable by the local whelk fishery. To allow for alignment with best fishing practices and to minimize interaction with local commercial operations, SouthCoast Wind has consulted with local whelk fishermen to

provide input on station locations, various aspects of gear design, and survey timing. SouthCoast Wind will continue an open dialogue with local commercial fishermen to ensure best practices and survey gear and design are acceptable to the industry.

3.3.1 Survey Design and Methods

The BAG survey design will allow for the characterization of the pre-construction whelk community present in areas of the Brayton Point ECC fished commercially for whelk. Sampling will continue during and post-construction to quantify any changes in relative abundance or size structure could be attributed to the installation and operation of export cables within the Study Area. Sampling effort will be focused on sites along a spatial gradient within the Brayton Point ECC, rather than using a reference location that may not wholly represent conditions within the work area (Methratta, 2020). An additional strength of this design is that it does not assume homogeneity across sampling sites within the Project Area and presents an opportunity to monitor changes in spatial relationships over time (Methratta, 2020).

Sampling frequency has not been finalized, but will likely occur twice per month from May to November to align with the commercial fishery for whelk within Narragansett Bay, to the extent practicable. Four to six stations will be selected with input from the commercial fishing industry along the Brayton Point ECC in the Sakonnet River. Given the localized effort occurring within the Sakonnet River, SouthCoast will make every effort to minimize impacts to fishing operations. Discussions with RIDEM and local fishermen will continue in order to assess the level of fishing effort in the area and final sampling stations, frequency, and soak time will be determined closer to the start of the survey.

At each of the sampling stations, three six-trap strings will be laid parallel to the export cable and placed at three distance range categories: impact, middle, and furthest. One string will be set on top of the cable as the impact gradient, one string placed 15-30 m from the impact string will act as the middle gradient, and one string 50 m or greater from the impact string will serve as the furthest gradient (Figure 2). These distance categories are supported by EMF modeling results of buried high-voltage direct current (HVDC) cables from Gradient (2021) conducted to inform the SouthCoast Wind Construction and Operations Plan and align with gradients proposed for the nearby ventless trap survey described in the Revolution Wind FMP (Revolution Wind, LLC and INSPIRE Environmental, 2021).

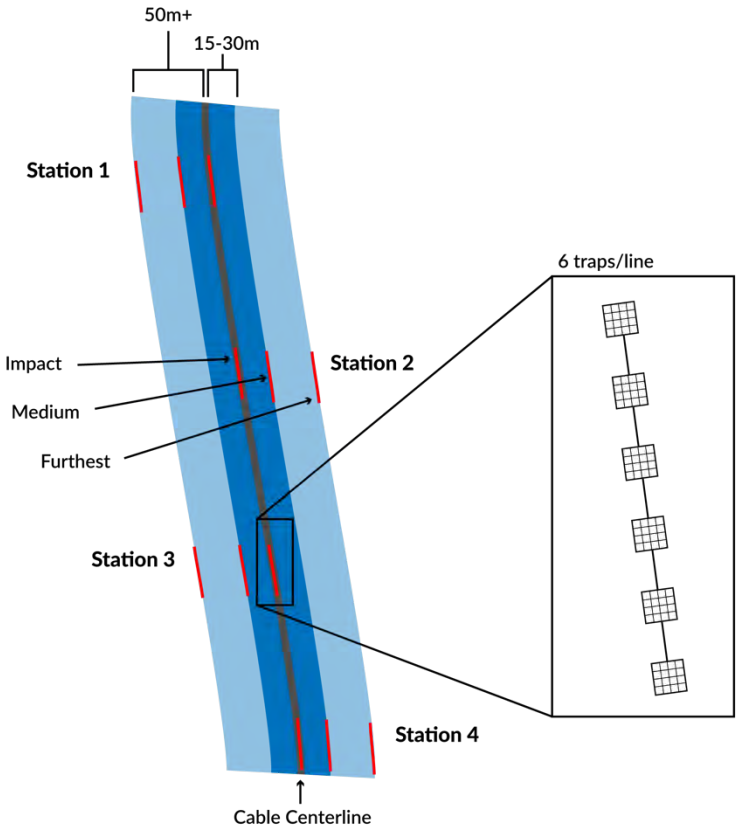

Figure 2. **A concept of the study design highlighting the gear configuration and string locations in relation to Brayton Point ECC (adapted from Revolution Wind, LLC and INSPIRE Environmental, 2021). Stations will alternate along either side (east or west) of the cable.**

Attempts to set gear within the correct gradients contain varying degrees of error. SouthCoast Wind will leverage the experience of the captain of the fishing vessel performing the survey work to set strings as close to the target stations as possible. Station locations may be modified at the captain's discretion to avoid gear conflicts with the local whelk fishery, minimize risk of gear loss, or if safety issues arise if the location was not modified. Stations may also be moved to more appropriate locations prior to the start of the survey, as cable micro-siting has not yet been determined. Efforts will be made to ensure station locations are finalized with sufficient time to ensure an accurate and consistent gradient is established and maintained throughout the survey, to the extent possible.

In the absence of standardized whelk survey practices, SouthCoast Wind has consulted with the local whelk fleet regarding trap design. Various trap designs are utilized within the industry and include traps made from either vinyl-coated mesh or wood (Figure 3). Trap design for this survey will be selected in consultation with the captain of the fishing vessel performing the survey work and, once selected, will remain consistent throughout the entirety of the survey. All traps will be rigged with a rope bridal system and separated by 30 m of groundline when tied to the string, resulting in a groundline length of roughly 150 m. Appropriate surface gear will also be included to visibly mark the beginnings and ends of each string; all gear configurations will comply with regulatory standards for the fishery. Bait will be consistent with that used in the commercial fishery and may include options such as horseshoe crab (*Limulus polyphemus*), rock crab (*Cancer irroratus*), or hard clam (*Mercenaria mercenaria*). Once a bait type is selected, it will remain consistent throughout the entirety of the survey.

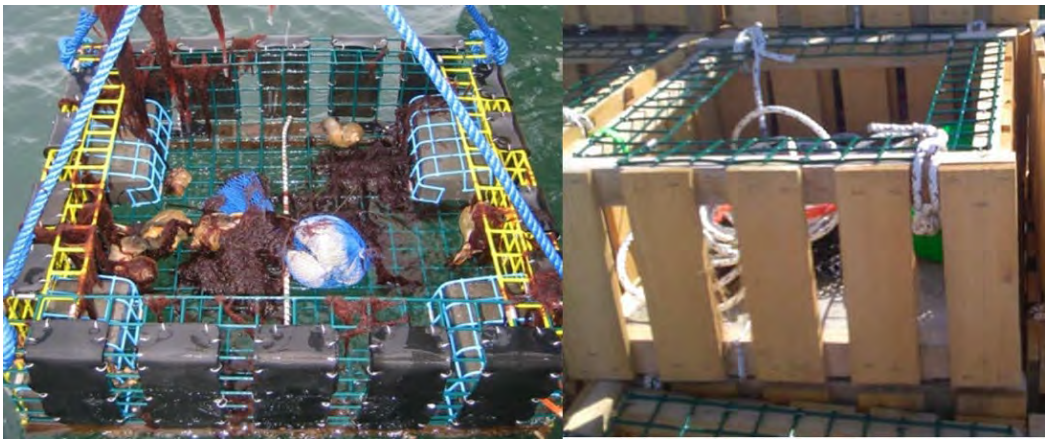

Figure 3. Examples of whelk trap designs from Oliveira et al. (2013) (left) and C-Trap (C-Trap, 2023) (right), that could be used to survey along the Brayton Point ECC.

All whelk and bycaught species caught will be separated by species, enumerated, and weighed to obtain catch per unit effort (CPUE) estimates on a per trap basis. To maintain a record of all species caught, additional bycaught species will be separated and enumerated. To collect shell measurements for whelk caught, a measuring board fitted with a sliding edge will be used to record shell height, width, and length to the nearest millimeter (mm) (Figure 4). Bycaught finfish length sampling will be species dependent and utilize either fork length or total length, depending on the standard for each species to the nearest centimeter (cm). Any American lobster (*Homarus americanus*) or Jonah crab (*Cancer borealis*) caught will be sampled in accordance with regional survey sampling protocols. For lobster, these parameters include recording carapace length (to the nearest mm), sex, shell hardness, shell disease state, egg stage for egg-bearing females, cull status, and note the presence/absence of a V-notch (according to the Lobster Conservation Management 2 Area definition {MA CMRs (322 CMR) at 6.02(5)(c) and (e)(2)}). For Jonah crab, these parameters include recording carapace width measurements, sex, presence/absence of eggs, molt condition, and shell disease state.

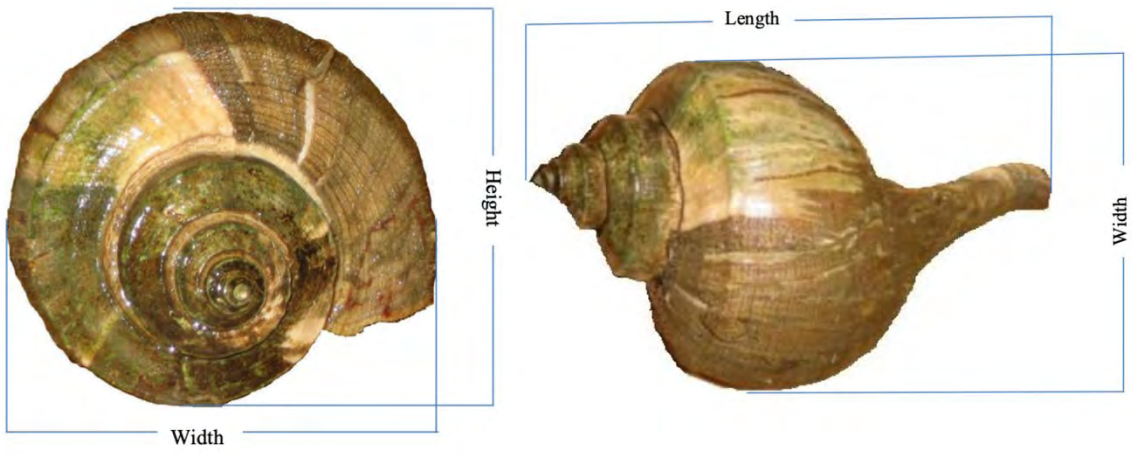

Figure 4. A diagram of shell measurements collected on whelk species from Oliveira et al. (2013).

As part of the mark-recapture component, a subset of all whelk captured (up to 500 per year) will be affixed with an external identification tag to opportunistically monitor their post-release movements in the immediate

area surrounding the Brayton Point ECC. Following methods outlined by Walker et al. (2008), Edmundson (2016), and Stevens and Peemoeller (2016), whelk of suitable size will first be cleaned using a wire brush to remove accumulated dirt and growth and allowed to dry fully. Brightly colored vinyl/polyethylene tags with unique identification numbers will then be cemented to the cleaned surface of each whelk using either a 5-minute epoxy or "SuperGlue" and allowed to cure before being re-introduced to seawater. Each tag will also contain contact information of the researchers conducting the study to facilitate data acquisition of whelk caught by local fishermen as part of their normal fishing efforts. This approach has proven effective in terms of overall retention (≥ 1 year; Edmunson 2016) as well as increasing visual identification of tags by fishermen during the sorting process. All efforts will be made to minimize sampling and tagging time on deck for whelk caught at each station and all whelk (both tagged and untagged) will be released at their capture location.

To gather data on environmental variables, temperature loggers will be attached to one of the center traps in each trawl. Temperature sensors will remain on the gear through the duration of the survey to collect continuous data on water temperature variability during survey months. These data can be used to relate changes in CPUE to varying environmental conditions. A suite of station data will be collected prior to setting and hauling traps that include:

- Start and end dates (MM/DD/YYYY)
- Start and end times (HH:MM)
- Water depth (m)
- Start latitude and longitude (in decimal degrees)
- End latitude and longitude (in decimal degrees)
- Sediment type
- Soak time
- Bait type
- Bottom temperature (°C)
- Air temperature (°C)
- Wind speed
- Wind direction
- Wave height

3.3.2 Data Management and Analysis

By conducting sampling during all three phases of the Project (pre-, during and post-construction), the whelk trap survey will allow for quantification of any detectable changes in relative abundance and size structure, as a function of distance from the cable. Monitoring results will undergo standardized quality assurance/quality control (QA/QC) checks before being stored in a secure, relational database, with yearly findings presented in annual reports. Annual reports will place emphasis on descriptive and quantitative comparisons of whelk metrics at increasing distances from the Brayton Point ECC. Spatial, seasonal, and annual relative abundance and size distribution trends will be presented for whelk species; CPUE and size structure of bycaught species will also be described. Additional analyses for collected mark-recapture data are currently being considered for evaluating the potential influence of EMF from the Brayton Point ECC on the movements of tagged whelk.

The primary question to be addressed is whether whelk metrics (either abundance of individual whelk species or size structure) will change relative to distance from the Brayton Point ECC following installation of export cables. This research question can be framed using the following hypotheses:

- HØ-Whelk metrics will not change over time and will remain consistent with respect to the distance from the export cable.
- H1-Whelk metrics will change over time and will not be consistent with respect to distance from the export cable.

Analyses presented in the final synthesis report will focus on identifying changes along the Brayton Point ECC between pre-and post-construction time periods. Several regression approaches (Generalized Linear Model, Generalized Additive Models, or mixed-effect models) can be compared to examine relationships between whelk CPUE and explanatory variables. Information on depth and water bottom temperature may be considered as covariates in the model to evaluate their influence on whelk catches. Habitat data collected during SouthCoast Wind geophysical surveys could also potentially be considered to evaluate the influence of habitat on whelk abundance. Final analyses will be determined based on the final survey design.

Due to a lack of comparable whelk fishery-independent datasets to utilize in a power analysis, an adaptive sampling strategy will be employed, whereby data collected early in the Study will be analyzed to assess statistical power and modify the sampling scheme or sampling intensity as needed (Field et al., 2007). Upon completion of the first year of sampling, a power analysis (e.g., Gerrodette, 1987) will be conducted to evaluate the power of the sampling design. The intra-annual variance associated with the relative abundance estimates for dominant species in the catch will be calculated. Power curves will be used to demonstrate how statistical power varies as a function of effect size and sample size (i.e., number of samples per area). A single two-tailed alpha (0.10) will be evaluated during the power analysis. The results of the power analysis after the first year of the Study will be considered and could be used to modify monitoring protocols in subsequent years. The decision to modify sampling will be made after evaluating several criteria including the amount of variability in the data, the statistical power associated with the study design, and the practical implications of modifying monitoring protocols.

3.4 Acoustic Telemetry

3.4.1 Survey Design

SouthCoast Wind will conduct acoustic telemetry monitoring along the Brayton Point ECC at the mouth of the Sakonnet River. This Study will use a receiver array of fixed station acoustic receivers to monitor the movements, presence, and persistence of several commercially and recreationally important species (e.g., striped bass, summer flounder, tautog, and little tunny). The focal species and receiver array design were determined based on work proposed or conducted along other wind project cable routes and consultation with local stakeholders, area researchers, and State agencies (South Fork Wind, LLC and INSPIRE Environmental, 2022; Sunrise Wind LLC, 2022; Kim et al., 2023).

Acoustic telemetry can be used to monitor animal presence and movements across a range of spatial and temporal scales. Individuals tagged with an acoustic transmitter that pass within the range (tens to hundreds of meters) of an acoustic receiver provide information on an animal's presence, movements, and behavior at a fine scale within the area of interest. The use of this technology has grown over the last decade with hundreds to thousands of receivers deployed along the U.S. East Coast (Hussey et al., 2015; Freiss et al., 2021). By utilizing information collected across receiver arrays and shared through established data sharing networks, telemetry can also monitor animal presence and movement over a range of spatial scales (tens to hundreds of kilometers) and time scales (e.g., months to years). Therefore, acoustic telemetry is an ideal technology to monitor presence, residency, and movements of species within WEAs and cable corridors using non-lethal methods and to evaluate short and long-term impacts of wind energy projects on these movement parameters.

Acoustic telemetry has been used to investigate the behavior and movements of fish species in offshore wind areas in Europe. Reubens et al. (2013) monitored juvenile cod residency patterns, habitat use, and seasonal movement at the C-Power offshore wind farm in the North Sea and found that the majority of cod aggregated near the foundations and were resident within the wind farm for extended periods of time in the summer and autumn. Winter et al. (2010) tagged sole (n=40) and cod (n=47) with acoustic transmitters and tracked their movements within the Egmond aan Zee wind farm and a nearby reference area. They concluded that sole did not exhibit avoidance of the wind farm, nor did they appear to be attracted to the foundations. Instead, seasonal movements were interpreted as occurring at spatial scales larger than the wind farm.

Several acoustic telemetry projects are ongoing or proposed at offshore wind lease sites along the U.S. East Coast. Scientists from the Massachusetts Division of Marine Fisheries, the University of Massachusetts Dartmouth School for Marine Science and Technology, Rutgers University, The Nature Conservancy, Woods Hole Oceanographic Institution, and the Northeast Fisheries Science Center are using acoustic telemetry (fixed and mobile) to monitor habitat preference and utilization of spawning Atlantic cod in and around Cox Ledge within the South Fork (South Fork Wind, LLC and INSPIRE Environmental, 2022) and Revolution Wind (Revolution Wind, LLC and INSPIRE Environmental, 2021) lease areas. Researchers from the Anderson Cabot Center for Ocean Life and INSPIRE Environmental are conducting a long-term acoustic telemetry project examining the presence and persistence of several highly migratory species within the nine lease areas comprising the MA/RI WEA. Researchers from Rutgers University and Delaware State University are using multiple acoustic methods to monitor several different species both within and around the Ocean Wind lease area off the New Jersey coast (Ocean Wind, LLC, 2021). Researchers from Monmouth University, Stony Brook University, and the Cornell Cooperative extension are also using acoustic telemetry to monitor the potential effects of EMF on fish and invertebrate species along the export cable routes of the South Fork and Sunrise Wind Farms (South Fork Wind, LLC and INSPIRE Environmental, 2022; Sunrise Wind LLC, 2022).

3.4.2 Survey Methods

A receiver array comprised of 12 receivers is proposed for deployment along the Brayton Point ECC (Figure 5). Vemco VR2AR acoustic release omnidirectional receivers will provide maximum coverage for robust and rigorous reporting. The VR2AR-X receivers can detect a tagged individual from a radius of 700 to 1,100 m from the receiver location depending on sea conditions, ambient noise, and transmitter strength. Each receiver will be equipped with a mooring recovery system that will utilize the receiver's acoustic release mechanism to deploy a retrieval line once the receiver is recalled to allow for recovery of the mooring used to anchor the receiver in place which eliminates the creation of marine debris (Figure 6). This, combined with the intentional placement of the array and individual receivers, the limited vertical profile of the receivers, the minimal mooring weight, and notifications SouthCoast Wind and researchers will issue to alert mariners to receiver locations, will mitigate potential interference with fishing and other marine uses. The receivers will be deployed in early spring and retrieved in late fall to ensure seasonal overlap with the target species. Detection data collected by the receivers will be downloaded upon retrieval at the conclusion of the annual monitoring period.

Vemco acoustic transmitters will be deployed on several species of interest specifically including, but not limited to, striped bass, summer flounder, tautog, and little tunny. Local fishing vessels with experience in both fishing for target species and in cooperative research efforts will be used as research platforms. Fish will be tagged within the area in and around the receiver array on targeted tagging trips conducted onboard local, for-hire recreational fishing vessels. Fish will be captured via rod-and-reel utilizing tackle appropriate for each species.

Individuals will be surgically implanted with various Vemco acoustic transmitters depending on the size of the fish. Transmitters will be deployed during the pre-construction period of the Project (two years). Larger individuals (e.g., striped bass) will be implanted with a V16 ultrasonic transmitter (69 kilohertz (kHz), high-power output = 158 decibels (dB) re 1 micropascals (µPa) at 1 m, random transmitter delay = 120 seconds (s), life span = 2,435 days (d)). Medium to small individuals will be tagged with either a V13 (69 kHz, high-power output = 151 dB re 1 µPa at 1 m, random transmitter delay = 180 s life span = 648 d) or a V9 (69 kHz, high-power output = 152 dB re 1 µPa at 1m, random transmitter delay = 120 s life span = 520 d). Once the transmitter has been inserted, the incision will be closed with absorbable interrupted sutures. All surgical implements will be cleaned with CIDEX® OPA solution before and after each surgery to deter bacterial infection.

Due to the variability in power output, and therefore detection range, of the three tag types proposed for this effort, range testing for each tag type will be conducted to determine and refine final spacing of receivers within the proposed array. Upon completion of range testing, final proposed locations of the receivers will be shared with RIDEM and local stakeholders, with updated locations provided after each receiver deployment trip.

3.4.3 Data Management and Analysis

The resulting detection data downloaded from acoustic receivers will be analyzed with the overall goal of establishing pre-construction information on species presence and persistence in the vicinity of the Brayton Point ECC. The primary questions to be addressed are – what is the presence, persistence, and space utilization of the species of interest around the Brayton Point ECC? These research questions can be framed using the following hypotheses:

- $H_{\emptyset}$-Species presence, persistence, and movements will not change between time periods (before and after).
- H_1- Species presence, persistence, and movements will change between time periods (before and after).

Short- and long-term presence, site fidelity (i.e., residency/persistence), fine- and broad-scale movement patterns, and inter-annual presence within the ECC (i.e., whether individuals return to the receiver array each year) will be examined. Any detection data obtained through participation in regional telemetry data sharing networks (see below) will be incorporated into analyses, particularly to examine the distribution and movements of species beyond the boundaries of the Study Area. Analyses will include detailed detection history plots for each tagged individual that depict all detections logged for an animal over the course of each year. Summary tables and figures will be generated that describe: the number of times each fish was detected by receivers within the receiver array, the detection history for each fish, the total number of receivers each individual was detected on, movements within the receiver array, and monthly patterns in presence and persistence. In addition to the fine-scale acoustic monitoring achieved by the proposed receiver array, broad-scale movement data will be accomplished through participation in regional telemetry data sharing programs by obtaining detection data from our tagged animals detected within receiver arrays deployed by other researchers in the greater Atlantic region.

All detection data of animals tagged by other researchers and recorded by the acoustic receivers in this study will be distributed to those researchers through participation in regional telemetry networks such as the Ocean Tracking Network or the Mid-Atlantic Acoustic Telemetry Network (MATOS). Detection data obtained for transmitters that are not deployed as part of this Study will be disseminated to the tag owners (it is the policy of regional data sharing programs that the 'owner' of the data is the entity that purchased and deployed the transmitter, not the entity that detected it on their receiver). Inclusion of these detection data in analyses will be requested of the tag's owner (i.e., metadata on the species detected, number of detections, amount of time the

animal was detected in our receiver array, etc.). Participation in data sharing networks will increase both the spatial and temporal extent of monitoring for species tagged as part of this study and allow for the collection of additional data on the presence and persistence of other marine species tagged with acoustic transmitters in and around the Brayton Point ECC.

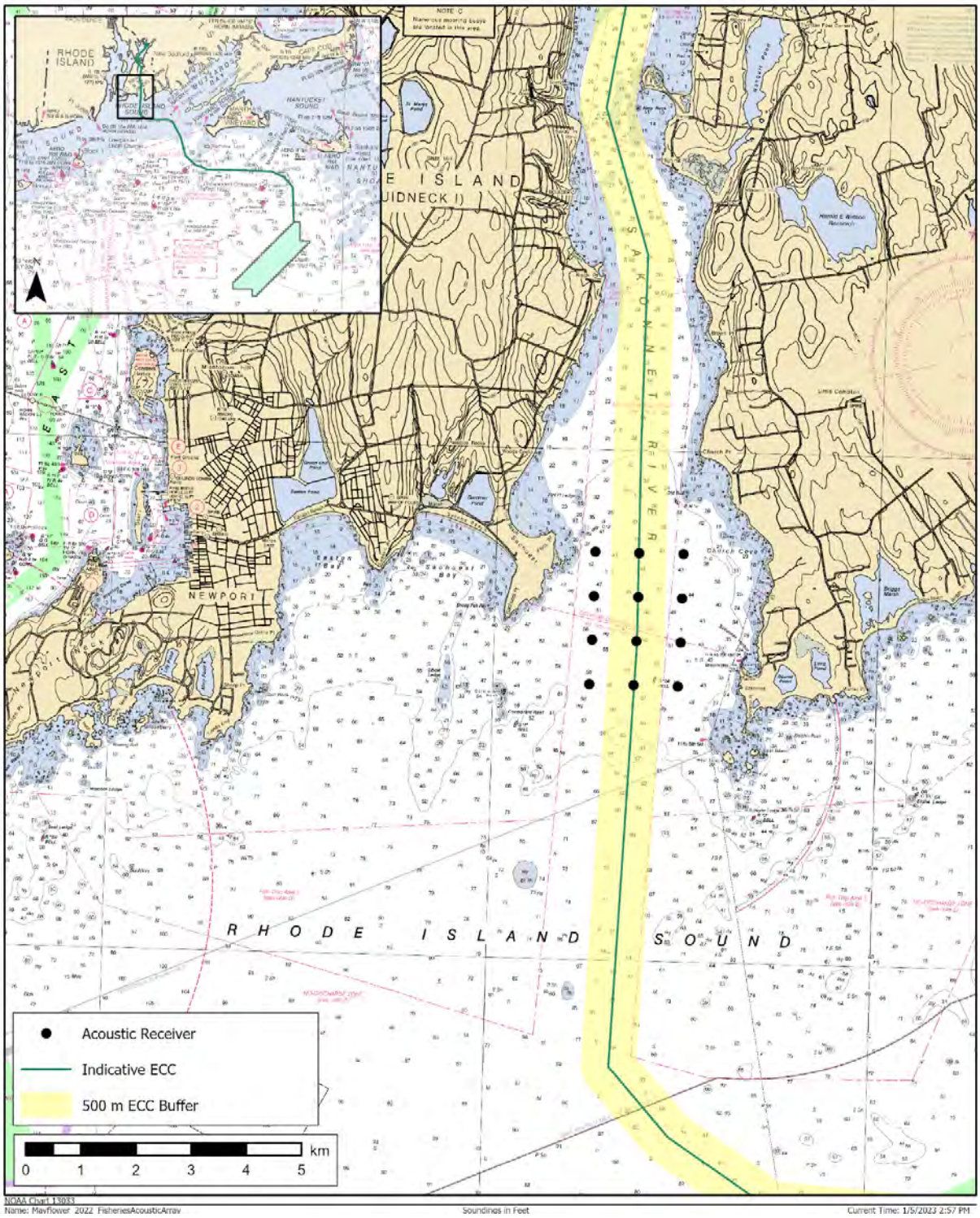

Figure 5. Proposed receiver locations along the Brayton Point ECC

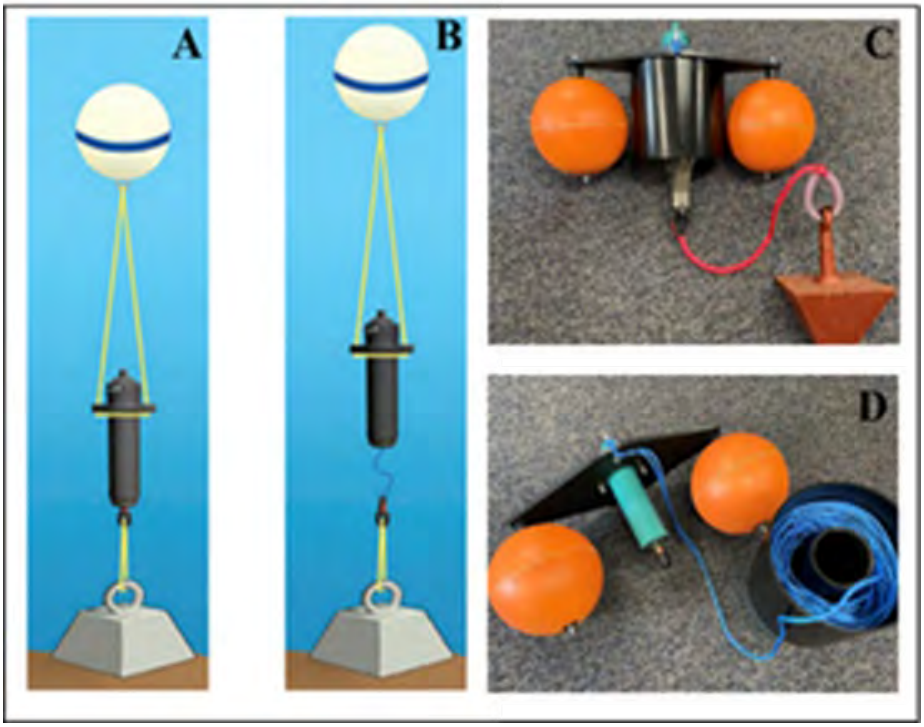

Figure 6. **(A, B) Diagram of Vemco VR2AR (Acoustic Release) receiver submerged (A) and triggered to release (B). (C, D) Mooring Systems recovery mooring acoustic release system showing canister and recoverable pyramid anchor. (D) Shows "triggered" VR2AR trailing a high strength Dynema rope allowing retrieval, recovery, and redeployment of the whole mooring system.**

4. Data Management, Reporting, and Data Sharing

The fisheries and benthic monitoring data will be managed by SouthCoast Wind. Data may be shared with relevant State and Federal agencies and other stakeholders upon request. Data will be prepared and disseminated annually and will undergo rigorous quality control and assurance audits prior to release.

Proper data management and traceability are integral to analysis and accurate interpretation and reporting. The surveys described in this monitoring plan will follow a rigorous system to inspect data throughout all stages of collection, processing, and analysis. This data management system will provide a high level of confidence in the accuracy of the data being reported. Data management will include methods for data collection, data storage and archiving, QA/QC audits, distribution and dissemination protocols and best practices, and analyses. Metadata will be developed for each survey dataset which will include descriptions of data fields, data processing, QA/QC procedures, etc.

An annual report will be prepared upon the conclusion of each year of sampling for each survey type. These reports will be shared with relevant State and Federal resource agencies, as applicable. A final, synthesis report will be prepared for each survey after the final year of post-construction sampling has concluded. That report will

evaluate the survey findings during the pre- and post-construction survey time periods. The Project team will disseminate annual results to agencies and stakeholders through an in-person meeting or webinar to solicit questions or feedback on the survey results, protocols, etc., as applicable.

Data requests submitted to SouthCoast Wind will be dealt with on a case-by-case basis. Any data derived from this FMP provided to end users will be presented in a format that is comparable and consistent with other regional fisheries datasets in consultation with relevant State and Federal agencies. SouthCoast Wind will amend the above data sharing protocols as needed in accordance with current data sharing efforts and guidance being developed through ROSA.

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SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment Q: Coastal Hazard Assessment and Worksheet

Revised: February 2023

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February 21, 2023

Rhode Island Coastal Resource Management Council
Oliver H, Stedman Government Center
4808 Tower Hill Road, Suite 3
Wakefield, RI 02879-1900

Subject: SouthCoast Wind 1 Project
SouthCoast Wind Energy LLC
Coastal Hazard Application Worksheet

Dear Council Members,

The SouthCoast Wind 1 Project (the Project) consists, in part, of approximately 2 mi (3.2 km) of onshore, underground duct bank and export cables, and transition joint bays (TJBs) at the landfalls where the offshore export cables transition to onshore export cables in Portsmouth, Rhode Island.

The horizontal directional drilling (HDD) landfall that approaches from the Sakonnet River is located along the northeast side of the intersection of Boyds Lane and Park Avenue. The HDD landfall approaching from Mount Hope Bay includes two potential landfall options. One location is within the existing paved parking lot of the Montaup Country Club located at 500 Anthony Road. The secondary HDD location is sited on Roger Williams University property on the northeast side of Anthony Road, approximately 0.2 mi (0.3 km) east of the intersection with Boyds Lane. Each of the three (3) HDD landfall locations were evaluated using the Rhode Island Coastal Resources Management Council (CRMC) Coastal Hazard Application Worksheet and online StormTools provided by the CRMC. The following is a discussion of the information used as input for onshore Project Route including the three HDD landfall locations evaluated along with a brief overview of the results.

Boyds Lane and Park Avenue HDD Staging Area

The HDD landfall location at Boyds Lane and Park Avenue is located approximately 220 ft from the current mean-high water (MHW) line and is located in a velocity zone (FEMA Zone VE; elevation 17 ft). The proposed TJBs where the offshore export cables will transition to onshore export cables will be constructed underground and below existing grade. Therefore, for purposes of evaluation in the worksheet, the existing ground elevation was used as the Lowest Horizontal Structural Member (LHSM) in Step 1A of the Coastal Hazard Application (CHA) worksheet. For the Boyds Lane and Park Avenue location, the elevation is 4.6 feet NAVD88.

The results of the worksheet indicate that the location of the proposed TJBs will be inundated in future sea level rise scenarios and provides a Site Design Elevation (SDE) of 26.7 ft (Figures 1 and 4, attached). Underground cable systems, properly installed according to industry standards, are not affected by flooding and weather events, just as the offshore undersea cables are protected from the effects of water. Onshore, the TJBs and the underground duct bank and cable systems will be underground utilities that are designed to withstand coastal environments, including being

temporarily submerged and operated during storm surge. Cables and splices will be designed to be sealed from water intrusion, and quality control and construction processes will be implemented to assure that construction is completed properly in this regard. Future inspection and maintenance within the TJBs may require that entry into the manholes be scheduled, if possible, during low tide and temporary dewatering of the TJBs may be required to allow for safe entry by personnel.

Roger Williams University HDD Staging Area (41.631970, -71.243167)

The HDD landfall location at Roger Williams University (RWU) north of Anthony Road is located approximately 1,200 feet from the closest, current MHW line and is located in a FEMA Zone X (areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 ft or with the drainage area less than 1 square mile; and areas protected by levees from 1% annual chance flood). The proposed TJBs where the offshore export cables transition to onshore export cables will be constructed underground and below existing grade. Therefore, for purposes of evaluation in the worksheet, the existing ground elevation was used as the LHSM in Step 1A of the CHA worksheet. For the RWU location, the elevation is 8.8 ft NAVD88. The results of the worksheet indicate that the location of the proposed TJBs will not be inundated in the future 5-foot sea level rise scenario evaluated and provides a SDE of 21.0 ft (Figures 2 and 5, attached).

Montaup Country Club HDD Staging Area

The HDD landfall location at Montaup Country Club is located approximately 920 feet from the closest, current MHW line and is located in a FEMA Zone X. The proposed TJBs where the offshore export cables will transition to onshore export cables will be constructed underground and below existing grade. Therefore, for purposes of evaluation, in the worksheet the existing ground elevation was used as the LHSM in Step 1A of the CHA worksheet. For the Montaup Country Club location, the elevation is 15.6 ft above NAVD88. The results of the worksheet indicate that the location of the proposed TJBs will not be inundated in the future 5-foot sea level rise scenario evaluated and provides a SDE of 22.7 ft (Figures 3 and 6, attached).

Onshore Export Cable Route

In applying the StormTools model for 5-feet of sea level rise, the only other section of the onshore Project route that would be inundated by the projected rise in sea-level and storm surge is the approximate 900 ft (274 m) along Boyds Lane, and this section of Boyds Lane is already affected by coastal flooding (Figure 1).

Sincerely,

Jamie Durand
Senior Project Manager
POWER Engineers, Inc.

CRMC File Number:

RI CRMC COASTAL HAZARD APPLICATION WORKSHEET

APPLICANT NAME: SouthCoast Wind Energy LLC

PROJECT SITE ADDRESS: Boyds Lane and Park Avenue (41.621372, -71.237940)

STEP 1. PROJECT DESIGN LIFE

☐ A. For properties in a FEMA-designated **A,** or **X** Zone, provide the first floor elevation (FFE) of the proposed structure referenced to NAVD88, **OR** For properties in a FEMA-designated **V** or **Coastal A** Zone, please provide the elevation of the lowest horizontal structural member (LHSM) referenced to NAVD88.

FFE ____ ft

OR

LHSM elevation 4.6 ft

☐ B. How long do you want your project to last? Identify the expected design life for the project (CRMC recommends a **minimum of 30 years**)

Design Life: 33 yrs

☐ C. Add the number of years you identified in 1B to the current year.

Design Life Year: 2061

☐ D. **CHECK** beneath the sea level rise (SLR) projection that matches or comes closest to project design life year.

Year	2030	2040	2050	2060	2070	2080	2090	2100	
SLR	1.47	2.13	3.05	4.00	5.15	6.49	7.94	9.41	
	○	○	○	◉	○	○	○	○	○

Source: Sea Level Rise (SLR) Projections (Feb. 2017). NOAA High Curve, 83% Confidence Interval. Newport, RI Tide Gauge. All values are expressed in feet relative to NAVD88. http://www.corpsclimate.us/ccaceslcurves.cfm

NOTE: The STORMTOOLS sea level rise scenarios depict how high the water will be above the average height of the daily high tide over the 19-year period between 1983 and 2001. There have been between 4 and 5 inches of sea level rise in Rhode Island since then. The higher modeled water level accounts for the uncertainties in ice sheet and ocean dynamics.

STEP 2. SITE ASSESSMENT

☐ A. Open *RICRMC Coastal Hazard Mapping Tool*. Following the tutorial along the left side of the screen, enter the project site address and turn on the sea level layer closest to the number you circled in 1D.

☐ B. **ENTER** the STORMTOOLS SLR map layer closest to the SLR value you checked in Step 1D above. If the value falls between the available STORMTOOLS SLR map layers, round to the closest of these sea level rise (SLR) numbers: 1ft, 2ft, 3ft, 5ft, 7ft, 10ft, or 12ft

5 ft

☐ C. Does the STORMTOOLS SLR map layer you circled above expose your project site to future tidal inundation? **CHECK YES or NO**

◉ YES
○ NO

☐ D. List any **roads or access routes** that are potentially inundated from SLR. To do this, ZOOM OUT from your project location, change BASEMAP on the viewer to "street view" – see Step 2A.

Park Avenue and Boyds Lane

Please be advised that CRMC staff may also review the implications of sea level rise in combination with nuisance storm flooding and discuss these potential project concerns with the applicant. Nuisance flooding impacts may be viewed in STORMTOOLS here.

STEP 3. STORMTOOLS DESIGN ELEVATION (SDE)

☐ A. Select your SLR Scenario using the tabs along the top of the online map (*NOTE: RECOMMENDED scenario is 100-year storm plus 3-feet of sea level rise*). Follow the tutorial included along the left panels of the viewer to enter the address of your project site. Select the tab across the top that corresponds to the sea level rise projection you identified in STEP 1. Enter your address on the map, and then click on the project site to identify **STORMTOOLS Design Elevation (SDE)** from the pop-up box. **Enter the SDE value:**

26.7 ft

RI CRMC COASTAL HAZARD APPLICATION WORKSHEET

STEP 4. SHORELINE CHANGE

■ A. Using the *CRMC Shoreline Change maps*, indicate the transect number closest to your site, and erosion rate listed for that transect. **NOTE: Transects are not available for every site. If this is the case, please enter N/A.**

Transect Number: 3650

Erosion Rate: 0.6 **ft/year**

B. **CHECK** below the Projected Erosion Rate that corresponds to the design life you identified above.

Year	2050	2060	2070	2080	2090	2100
Projected Future Erosion Multiplier	1.34	1.45	1.57	1.70	1.84	2.00
	○	◉	○	○	○	○

Source: Projected Shoreline Change Rate multipliers. (Oakley et al., 2016)

C. **COMPLETE EROSION SETBACK CALCULATION:**

Historic shoreline change rate, STEP 4A		Design Life, STEP 1B		Projected Future Erosion Multiplier, STEP 4B		Erosion Setback (ft) 4A x 1B x 4B
0.6	X	33	X	1.45	=	28.7

***NOTE:** Setbacks are required per the CRMC Red Book, Section 1.1.9. **A minimum setback of 50-feet is required**, but a greater setback may be necessary and/or desirable based on this analysis.*

STEP 5. CERI & OTHER SITE CONSIDERATIONS

■ A. If you live in a community where a Coastal Environmental Risk Index (CERI) has been completed (Barrington, Bristol, Charlestown, Narragansett, South Kingstown, Warren, Warwick, Westerly), CHECK the level of projected damage to your location, as indicated on the map that corresponds to the design life identified in STEP 1.

CERI Level:	Moderate	High	Severe	Extreme	Inundated by 2100	Not applicable
	○	○	○	○	○	◉

■ B. Consider and discuss with your design consultant other forces or factors that might impact the development, such as coastal habitats, shoreline features, public access, wastewater, storm water, depth to water table/groundwater dynamics, saltwater intrusion, or other issues not listed above. In addition, pressure from rising sea levels will result in rising subsurface groundwater levels ultimately effecting wells and septic systems.

STEP 6. LARGE PROJECTS

This step is for Large Projects and Subdivisions only, six (6) or more units, as defined by the CRMC Red Book Section 1.1.6.I(1)(f). This step may be skipped for other projects.

■ A. Use the Sea Level Affecting Marshes Model (SLAMM) Maps to assess potential impacts to large projects and subdivisions from salt marsh migration resulting from projected sea level rise. CRMC SLAMM maps can be accessed here. The CRMC recommends using the 5-foot SLR projection within SLAMM to assess future potential project impacts on migrating marshes. Does the SLAMM map that corresponds to the design life you identified in STEP 1 expose your project site to future salt marsh migration? **CHECK YES or NO**

○ **YES** ◉ **NO**

STEP 7: DESIGN EVALUATION

■ A. Using Chapter 7 of the RI Shoreline Change SAMP as a guide, investigate mitigation options for the exposure identified above and include that in the final application.

This fully completed Coastal Hazard Application Guidance worksheet must accompany the application. If you are a design or engineering professional, please print and sign here that you have discussed the findings of this worksheet with the Owner.

DESIGN/ENGINEER SIGNATURE: _____ **DATE:** 02/21/2023

OWNER'S SIGNATURE: Kelly Smith **DATE:** 02/21/2023

CRMC File Number:

RI CRMC COASTAL HAZARD APPLICATION WORKSHEET

APPLICANT NAME: SouthCoast Wind Energy LLC

PROJECT SITE ADDRESS: Anthony Road, Portsmouth, RI (41.631970, -71.243167)

STEP 1. PROJECT DESIGN LIFE

☐ A. For properties in a FEMA-designated **A, or X** Zone, provide the first floor elevation (FFE) of the proposed structure referenced to NAVD88, **OR**
For properties in a FEMA-designated **V** or **Coastal A** Zone, please provide the elevation of the lowest horizontal structural member (LHSM) referenced to NAVD88.

FFE _____ ft

OR

LHSM elevation 8.8 ft

☐ B. How long do you want your project to last? Identify the expected design life for the project (CRMC recommends a **minimum of 30 years**)

Design Life: 33 yrs

☐ C. Add the number of years you identified in 1B to the current year.

Design Life Year: 2061

☐ D. **CHECK** beneath the sea level rise (SLR) projection that matches or comes closest to project design life year.

Year	2030	2040	2050	2060	2070	2080	2090	2100	
SLR	1.47	2.13	3.05	4.00	5.15	6.49	7.94	9.41	
	○	○	○	◉	○	○	○	○	○

Source: Sea Level Rise (SLR) Projections (Feb. 2017), NOAA High Curve, 83% Confidence Interval. Newport, RI Tide Gauge. All values are expressed in feet relative to NAVD88. http://www.corpsclimate.us/ccaceslcurves.cfm

NOTE: The STORMTOOLS sea level rise scenarios depict how high the water will be above the average height of the daily high tide over the 19-year period between 1983 and 2001. There have been between 4 and 5 inches of sea level rise in Rhode Island since then. The higher modeled water level accounts for the uncertainties in ice sheet and ocean dynamics.

STEP 2. SITE ASSESSMENT

☐ A. Open *RICRMC Coastal Hazard Mapping Tool*. Following the tutorial along the left side of the screen, enter the project site address and turn on the sea level layer closest to the number you circled in 1D.

☐ B. **ENTER** the STORMTOOLS SLR map layer closest to the SLR value you checked in Step 1D above. If the value falls between the available STORMTOOLS SLR map layers, round to the closest of these sea level rise (SLR) numbers: 1ft, 2ft, 3ft, 5ft, 7ft, 10ft, or 12ft

5 ft

☐ C. Does the STORMTOOLS SLR map layer you circled above expose your project site to future tidal inundation? **CHECK YES or NO**

○ YES
◉ NO

☐ D. List any **roads or access routes** that are potentially inundated from SLR. To do this, ZOOM OUT from your project location, change BASEMAP on the viewer to "street view" – see Step 2A.

N/A

Please be advised that CRMC staff may also review the implications of sea level rise in combination with nuisance storm flooding and discuss these potential project concerns with the applicant. Nuisance flooding impacts may be viewed in STORMTOOLS here.

STEP 3. STORMTOOLS DESIGN ELEVATION (SDE)

☐ A. Select your SLR Scenario using the tabs along the top of the online map (*NOTE: RECOMMENDED scenario is 100-year storm plus 3-feet of sea level rise*). Follow the tutorial included along the left panels of the viewer to enter the address of your project site. Select the tab across the top that corresponds to the sea level rise projection you identified in STEP 1. Enter your address on the map, and then click on the project site to identify **STORMTOOLS Design Elevation (SDE)** from the pop-up box. **Enter the SDE value:**

21.0 ft

RI CRMC COASTAL HAZARD APPLICATION WORKSHEET

STEP 4. SHORELINE CHANGE

☐ A. Using the *CRMC Shoreline Change maps*, indicate the transect number closest to your site, and erosion rate listed for that transect. **NOTE: Transects are not available for every site. If this is the case, please enter N/A.**

Transect Number: N/A

Erosion Rate: ft/year

B. **CHECK** below the Projected Erosion Rate that corresponds to the design life you identified above.

Year	2050	2060	2070	2080	2090	2100
Projected Future ErosionMultiplier	1.34 ○	1.45 ◉	1.57 ○	1.70 ○	1.84 ○	2.00 ○

Source: Projected Shoreline Change Rate multipliers. (Oakley et al., 2016)

C. **COMPLETE EROSION SETBACK CALCULATION:**

Historic shoreline change rate, STEP 4A		Design Life, STEP 1B		Projected Future Erosion Multiplier, STEP 4B		Erosion Setback (ft) 4A x 1B x 4B
	X		X		=	

***NOTE:** Setbacks are required per the CRMC Red Book, Section 1.1.9. **A minimum setback of 50-feet is required**, but a greater setback may be necessary and/or desirable based on this analysis.*

STEP 5. CERI & OTHER SITE CONSIDERATIONS

☐ A. If you live in a community where a Coastal Environmental Risk Index (CERI) has been completed (Barrington, Bristol, Charlestown, Narragansett, South Kingstown, Warren, Warwick, Westerly), CHECK the level of projected damage to your location, as indicated on the map that corresponds to the design life identified in STEP 1.

CERI Level:	Moderate	High	Severe	Extreme	Inundated by 2100	Not applicable
	○	○	○	○	○	◉

☐ B. Consider and discuss with your design consultant other forces or factors that might impact the development, such as coastal habitats, shoreline features, public access, wastewater, storm water, depth to water table/groundwater dynamics, saltwater intrusion, or other issues not listed above. In addition, pressure from rising sea levels will result in rising subsurface groundwater levels ultimately effecting wells and septic systems.

STEP 6. LARGE PROJECTS

This step is for Large Projects and Subdivisions only, six (6) or more units, as defined by the CRMC Red Book Section 1.1.6.I(1)(f). This step may be skipped for other projects.

☐ A. Use the Sea Level Affecting Marshes Model (SLAMM) Maps to assess potential impacts to large projects and subdivisions from salt marsh migration resulting from projected sea level rise. CRMC SLAMM maps can be accessed here. The CRMC recommends using the 5-foot SLR projection within SLAMM to assess future potential project impacts on migrating marshes. Does the SLAMM map that corresponds to the design life you identified in STEP 1 expose your project site to future salt marsh migration? **CHECK YES or NO**

○ **YES** ◉ **NO**

STEP 7: DESIGN EVALUATION

☐ A. Using Chapter 7 of the RI Shoreline Change SAMP as a guide, investigate mitigation options for the exposure identified above and include that in the final application.

This fully completed Coastal Hazard Application Guidance worksheet must accompany the application. If you are a design or engineering professional, please print and sign here that you have discussed the findings of this worksheet with the Owner.

DESIGN/ENGINEER SIGNATURE: _____ **DATE:** 02/21/2023

OWNER'S SIGNATURE: Kelly Smith **DATE:** 02/21/2023

CRMC File Number:

RI CRMC COASTAL HAZARD APPLICATION WORKSHEET

APPLICANT NAME: SouthCoast Wind Energy LLC

PROJECT SITE ADDRESS: Montaup Country Club, 500 Anthony Road, Portsmouth, RI

STEP 1. PROJECT DESIGN LIFE

☐ A. For properties in a FEMA-designated **A,** or **X** Zone, provide the first floor elevation (FFE) of the proposed structure referenced to NAVD88, **OR**
For properties in a FEMA-designated **V** or **Coastal A** Zone, please provide the elevation of the lowest horizontal structural member (LHSM) referenced to NAVD88.

FFE _____ ft

OR

LHSM elevation 15.6 ft

☐ B. How long do you want your project to last? Identify the expected design life for the project (CRMC recommends a **minimum of 30 years**)

Design Life: 33 yrs

☐ C. Add the number of years you identified in 1B to the current year.

Design Life Year: 2061

☐ D. **CHECK** beneath the sea level rise (SLR) projection that matches or comes closest to project design life year.

Year	2030	2040	2050	2060	2070	2080	2090	2100	
SLR	1.47	2.13	3.05	4.00	5.15	6.49	7.94	9.41	
	○	○	○	◉	○	○	○	○	○

Source: Sea Level Rise (SLR) Projections (Feb. 2017). NOAA High Curve, 83% Confidence Interval. Newport, RI Tide Gauge. All values are expressed in feet relative to NAVD88. http://www.corpsclimate.us/ccaceslcurves.cfm

NOTE: The STORMTOOLS sea level rise scenarios depict how high the water will be above the average height of the daily high tide over the 19-year period between 1983 and 2001. There have been between 4 and 5 inches of sea level rise in Rhode Island since then. The higher modeled water level accounts for the uncertainties in ice sheet and ocean dynamics.

STEP 2. SITE ASSESSMENT

☐ A. Open *RICRMC Coastal Hazard Mapping Tool*. Following the tutorial along the left side of the screen, enter the project site address and turn on the sea level layer closest to the number you circled in 1D.

☐ B. **ENTER** the STORMTOOLS SLR map layer closest to the SLR value you checked in Step 1D above. If the value falls between the available STORMTOOLS SLR map layers, round to the closest of these sea level rise (SLR) numbers: 1ft, 2ft, 3ft, 5ft, 7ft, 10ft, or 12ft

5 ft

☐ C. Does the STORMTOOLS SLR map layer you circled above expose your project site to future tidal inundation? **CHECK YES or NO**

○ YES
◉ NO

☐ D. List any **roads or access routes** that are potentially inundated from SLR. To do this, ZOOM OUT from your project location, change BASEMAP on the viewer to "street view" – see Step 2A.

N/A

Please be advised that CRMC staff may also review the implications of sea level rise in combination with nuisance storm flooding and discuss these potential project concerns with the applicant. Nuisance flooding impacts may be viewed in STORMTOOLS here.

STEP 3. STORMTOOLS DESIGN ELEVATION (SDE)

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22.7 ft

RI CRMC COASTAL HAZARD APPLICATION WORKSHEET

STEP 4. SHORELINE CHANGE

☐ A. Using the *CRMC Shoreline Change maps*, indicate the transect number closest to your site, and erosion rate listed for that transect. **NOTE: Transects are not available for every site. If this is the case, please enter N/A.**

Transect Number: N/A

Erosion Rate: ft/year

B. **CHECK** below the Projected Erosion Rate that corresponds to the design life you identified above.

Year	2050	2060	2070	2080	2090	2100
Projected Future Erosion Multiplier	1.34 ○	1.45 ◉	1.57 ○	1.70 ○	1.84 ○	2.00 ○

Source: Projected Shoreline Change Rate multipliers. (Oakley et al., 2016)

C. **COMPLETE EROSION SETBACK CALCULATION:**

Historic shoreline change rate, STEP 4A		Design Life, STEP 1B		Projected Future Erosion Multiplier, STEP 4B		Erosion Setback (ft) 4A x 1B x 4B
	X		X		=	

***NOTE:** Setbacks are required per the CRMC Red Book, Section 1.1.9. **A minimum setback of 50-feet is required**, but a greater setback may be necessary and/or desirable based on this analysis.*

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CERI Level:	Moderate	High	Severe	Extreme	Inundated by 2100	Not applicable
	○	○	○	○	○	◉

☐ B. Consider and discuss with your design consultant other forces or factors that might impact the development, such as coastal habitats, shoreline features, public access, wastewater, storm water, depth to water table/groundwater dynamics, saltwater intrusion, or other issues not listed above. In addition, pressure from rising sea levels will result in rising subsurface groundwater levels ultimately effecting wells and septic systems.

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☐ A. Use the Sea Level Affecting Marshes Model (SLAMM) Maps to assess potential impacts to large projects and subdivisions from salt marsh migration resulting from projected sea level rise. CRMC SLAMM maps can be accessed here. The CRMC recommends using the 5-foot SLR projection within SLAMM to assess future potential project impacts on migrating marshes. Does the SLAMM map that corresponds to the design life you identified in STEP 1 expose your project site to future salt marsh migration? **CHECK YES or NO**

○ **YES** ◉ **NO**

STEP 7: DESIGN EVALUATION

☐ A. Using Chapter 7 of the RI Shoreline Change SAMP as a guide, investigate mitigation options for the exposure identified above and include that in the final application.

This fully completed Coastal Hazard Application Guidance worksheet must accompany the application. If you are a design or engineering professional, please print and sign here that you have discussed the findings of this worksheet with the Owner.

DESIGN/ENGINEER SIGNATURE: _____ **DATE:** 02/21/2023

OWNER'S SIGNATURE: Kelly Smith **DATE:** 02/21/2023

CRMC Hazard Analysis Application Maps (For Reference)
5 Feet of SLR (2061)

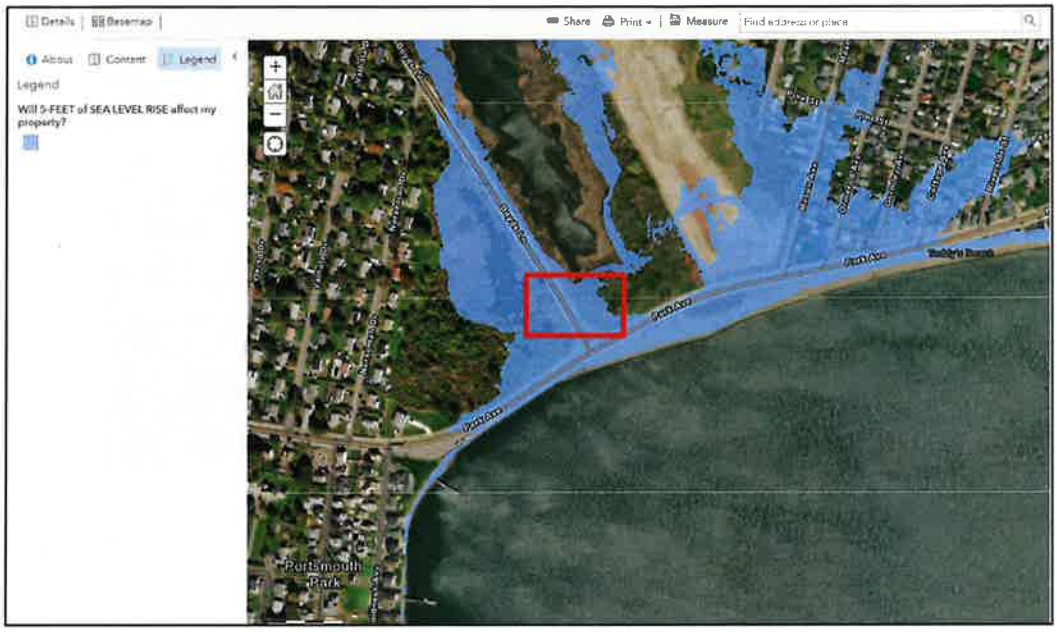

Figure 1 Boyds Lane

Figure 2 Anthony Road

Figure 3 Montaup Country Club

100 year storm + 5 Feet of SLR (2061)

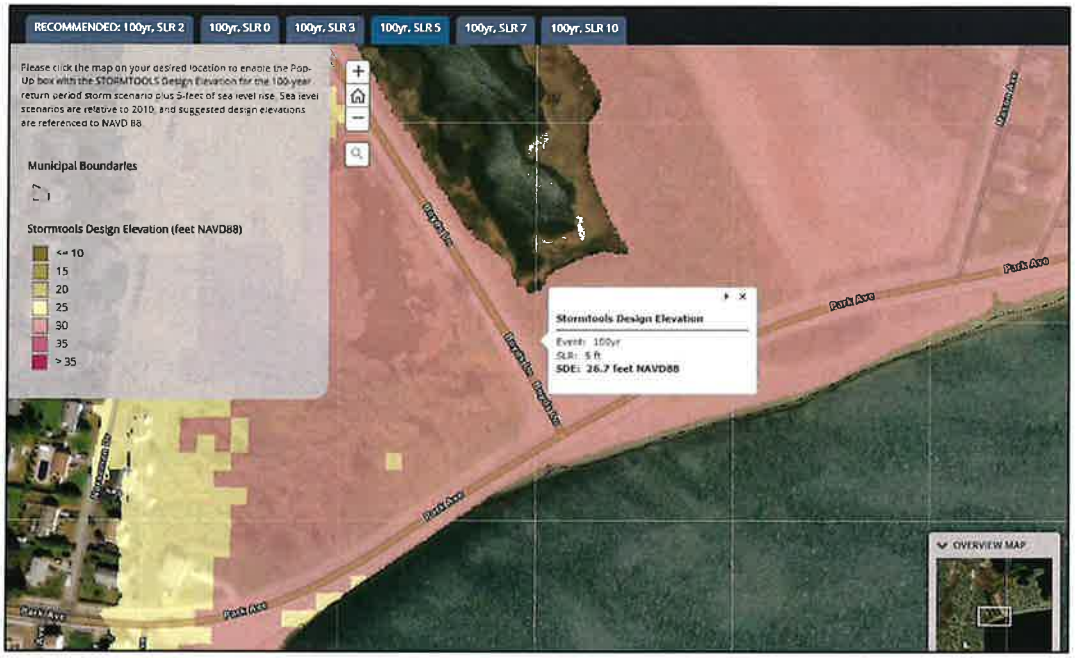

Figure 4 Boyds Lane (SDE = 26.7 feet)

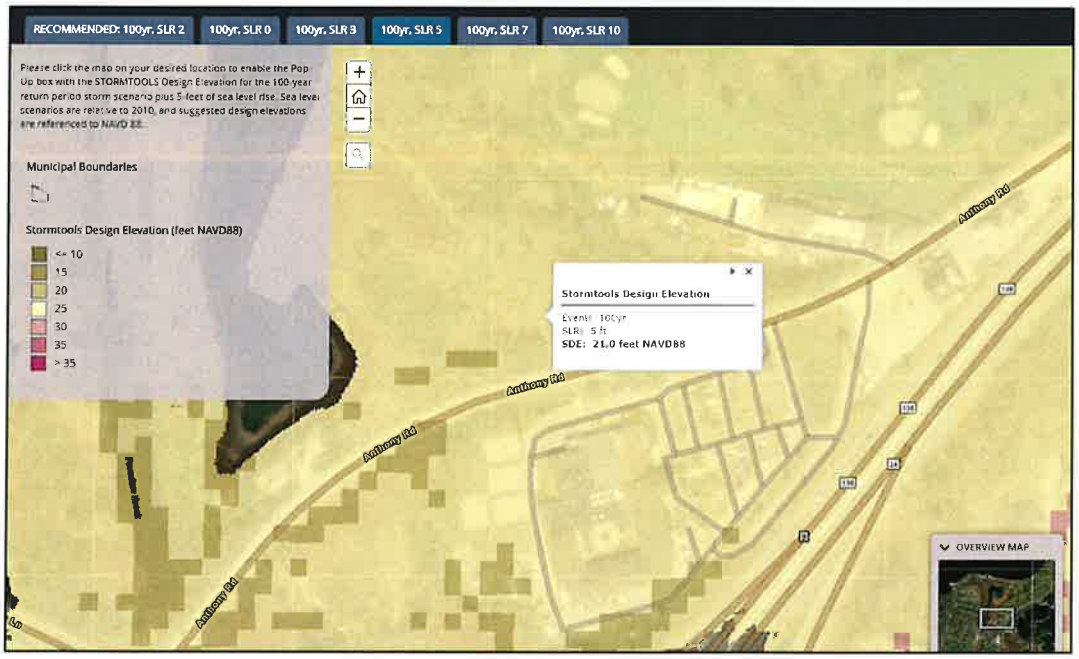

Figure 5 Anthony Road (SDE = 21.0 feet)

Figure 6 Montaup Country Club (SDE = 22.7 feet)

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment R: Abutters List and Mapping

Revised: February 2023

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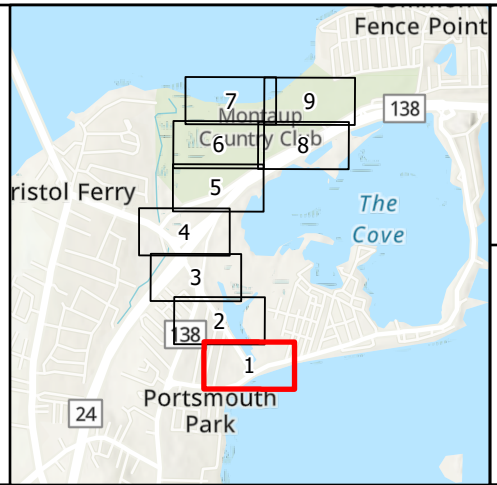
MSPARCEL	MSTYPE	MSLOCATION	MSSSTRFULL	MSSNUM	MSOWNERA	MSOWNERB	MSOWNERC	MSMADDA	MSMCITY	MSMSTAT	MSMZIP	MSMCOUNTRY	MSMADDB	MSLANDUSED	MSZONECODE
13-1		0 BOYDS LN	BOYDS LN	0	TOWN OF PORTSMOUTH			2200 EAST MAIN RD	PORTSMOUTH	RI	02871-1268	USA		MUNICIPAL MDL-00	R20
13-10		171 ANTHONY RD	ANTHONY RD	171	STATE OF RHODE ISLAND	RIDOT HIGHWAY & BRIDGE MAINTENANCE	DEPARTMENT OF TRANSPORTATION	360 LINCOLN AVE				USA	WARWICK RI 02888	STATE MDL-96	R10
13-11		444 BOYDS LN	BOYDS LN	444	MELLO HENRY			364 BOYDS LN	PORTSMOUTH	RI	2871			FARM MDL-00	R20
13-3		0 BOYDS LN	BOYDS LN	0	NARRAGANSETT ELECTRIC CO THE	PROPERTY TAX DEPT		40 SYLVAN RD	WALTHAM	MA	02451-2286			ELEC EASE	R20
13-6		0 ANTHONY RD	ANTHONY RD	0	ROGER WILLIAMS UNIVERSITY			1 OLD FERRY RD	BRISTOL	RI	02809-2923			RES LND PO	R10
13-7		150-156 ANTHONY RD	ANTHONY RD	150-156	150 ANTHONY ROAD LLC			150 ANTHONY RD	PORTSMOUTH	RI	02871-4815			LG BUSINES MDL-96	R10
13-8		144 ANTHONY RD	ANTHONY RD	144	ROGER WILLIAMS UNIVERSITY			1 OLD FERRY RD	BRISTOL	RI	02809-2923			LG BUSINES MDL-94	R10
13-9		181 BOYDS LN	BOYDS LN	181	JEFFERSON DAVIS REALTY LLC			400 LINCOLN AVE	WARWICK	RI	2888			INDUSTRL MDL-96	R10
25-50		0 PARK AVE	PARK AVE		PATYKEWICH THOMAS E			57 FOREST AVE	MIDDLETOWN	RI	02842-4640	USA		VAC NOT DV	R10
19-100		135 VALHALLA DR	VALHALLA DR	135	KOZAKIEWICZ CAROLINE LIFE ESTATE	KOZAKIEWICZ FRANK & JOHN		135 VALHALLA DR	PORTSMOUTH	RI	02871-3248			Single Fam MDL-01	R20
19-108		144 VALHALLA DR	VALHALLA DR	144	MERCURIO CARLOS M & HONESTA R			144 VALHALLA DR	PORTSMOUTH	RI	2871	USA		Single Fam MDL-01	R20
19-109		154 VALHALLA DR	VALHALLA DR	154	FIKRI EROL B & ALLISON M			154 VALHALLA DR	PORTSMOUTH	RI	02871-3249			Single Fam MDL-01	R20
19-110		163 VIKING DR	VIKING DR	163	VICTOR ROBERT E & BARBARA			116 CARRIAGE DR	PORTSMOUTH	RI	2871	USA		TWO FAMILY MDL-01	R20
19-113		153 VIKING DR	VIKING DR	153	INGRAHAM JEAN S			55 SIGOURNEY RD	PORTSMOUTH	RI	2871			Single Fam MDL-01	R20
19-128		162 VIKING DR	VIKING DR	162	POWELL CLAIRE M &	MORGAN PAMELA A		162 VIKING DR	PORTSMOUTH	RI	2871	USA		Single Fam MDL-01	R20
19-129		172 VIKING DR	VIKING DR	172	GORDON LEWIS E			PO BOX 31	PORTSMOUTH	RI	2871	USA		Single Fam MDL-01	R20
19-132		181 CHASE RD RD	CHASE RD	181	181 CHASE ROAD REALTY TRUST			171 CHASE RD	PORTSMOUTH	RI	02871-3241			LG BUSINES MDL-94	C
19-80		202 CHASE RD	CHASE RD	202	202 CHASE ROAD ASSOCIATES LLC			202 CHASE RD	PORTSMOUTH	RI	02871-3239			LG BUSINES MDL-96	C
19-81		314 BOYDS LN	BOYDS LN	314	FBMS LLC			314 BOYDS LN	PORTSMOUTH	RI	02871-3004			LG BUSINES MDL-94	R20
19-81A		310 BOYDS LN	BOYDS LN	310	SILVIA JOHN A &	HASSETT-SILVIA LISA		118 UNION ST	PORTSMOUTH	RI	02871-2217			4 FAMILY MDL-94	R20
19-89		0 BOYDS LN	BOYDS LN	0	LEVESQUE, CHARLES J & THOMAS &	LEVESQUE GEORGE & ERNEST		542 PARK AVE	PORTSMOUTH	RI	02871-4938			UNDEV LAND	C
19-91		0 NORSEMAN DR	NORSEMAN DR	0	JF PROPERTIES LLC			31A BRIDGE ST	NEWPORT	RI	2840			RES LND PO	R20
19-95		126 NORSEMAN DR	NORSEMAN DR	126	BROWN RICHARD K & LINDA G			126 NORSEMAN DR	PORTSMOUTH	RI	02871-3247	USA		Single Fam MDL-01	R20
19-96		136 NORSEMAN DR	NORSEMAN DR	136	TALCOTT KARL HEINZ	GRISSETT TIMOTHY E		136 NORSEMAN DR	PORTSMOUTH	RI	02871-3247			Single Fam MDL-01	R20
19-99		145 VALHALLA DR	VALHALLA DR	145	MAHER BRIAN & HEATHER			145 VALHALLA DR	PORTSMOUTH	RI	02871-3248			Single Fam MDL-01	R20
20-1		0 WALNUT ST	WALNUT ST	0	AP ENTERPRISES LLC			28 TEAL DR	WAKEFIELD	RI	02879-6109			UNDEV LAND	C
24-56		0 PARK AVE	PARK AVE	0	JF PROPERTIES LLC			31A BRIDGE ST	NEWPORT	RI	2840			RES LND PO	R20
25-1		0 PARK AVE	PARK AVE		STEINHOF AVIS F	C/O ROBERT STEINHOF EXECUTOR		144 HARBOR RD	SWANSEA	MA	02777-1446	USA		UNDEV LAND	C
500-1	RAIL ROW	0 RAILROAD TRACK (7 3 MILES)	RAILROAD TRACK (7 3 MILES		STATE OF RHODE ISLAND	NY WH & HARTFORD RAILROAD		275 WESTMINSTER MALL	PROVIDENCE	RI	2903	USA		TRAINS	
7-9		0 BRISTOL FERRY RD	BRISTOL FERRY RD	0	STATE OF RHODE ISLAND			ANTHONY RD	PORTSMOUTH	RI	2871	USA		STATE MDL-00	R20
8-1		500 ANTHONY RD	ANTHONY RD	500	MONTAUP REALTY COMPANY			500 ANTHONY RD	PORTSMOUTH	RI	2871			LG BUSINES MDL-94	R10

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Boyds Lane Horizontal Directional Drill Staging Area
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

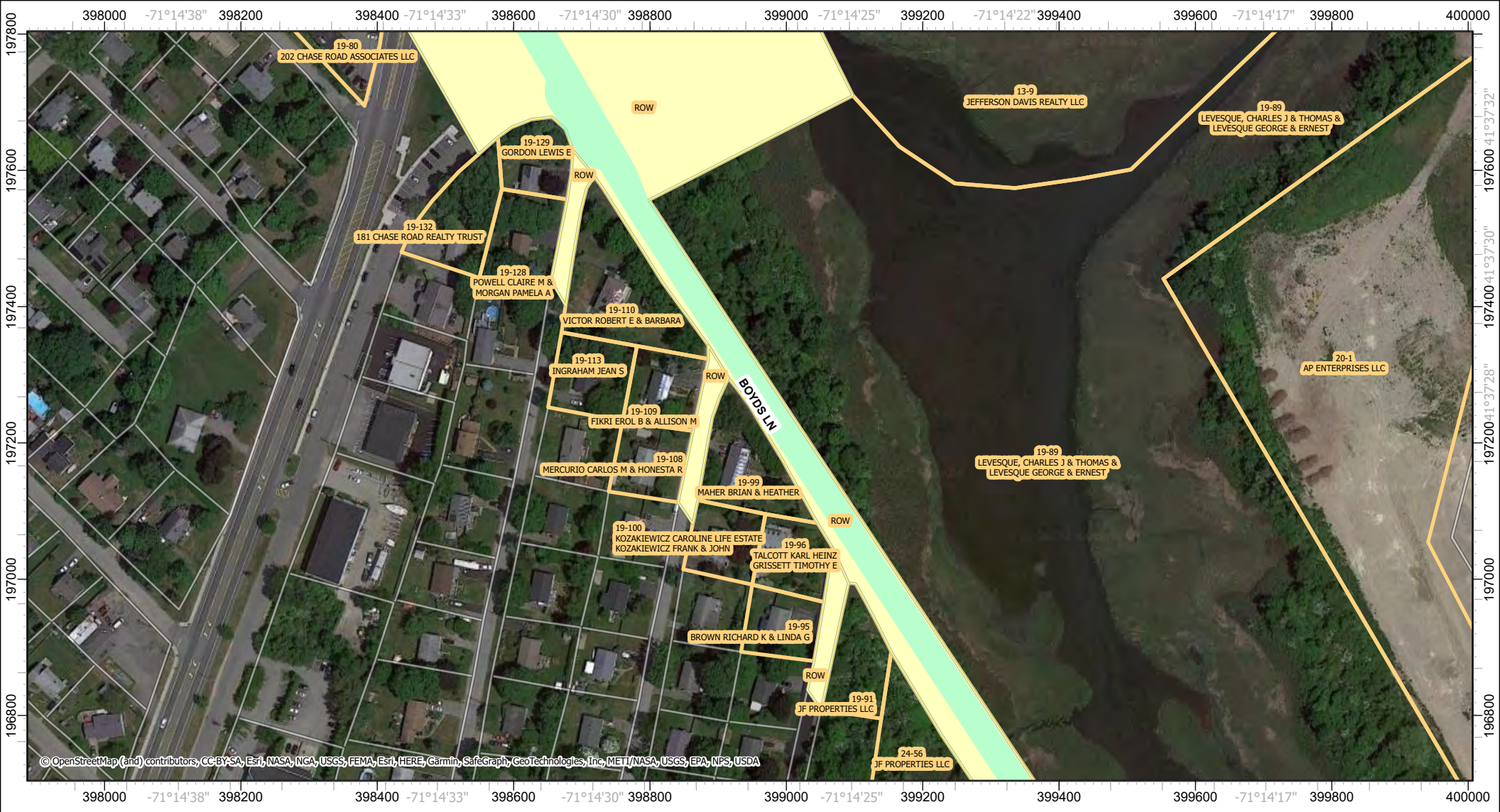
ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE PANEL 1

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

N

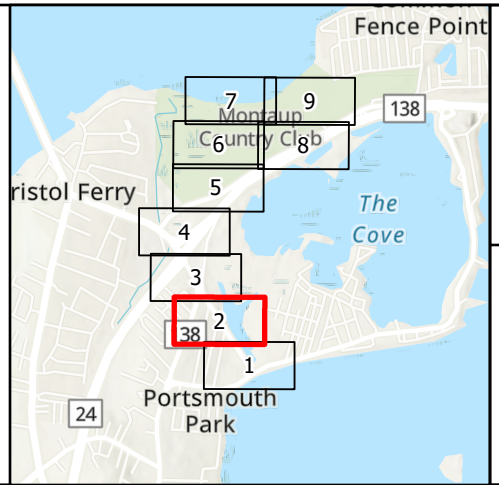
0 200
Feet

POWER ENGINEERS



LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



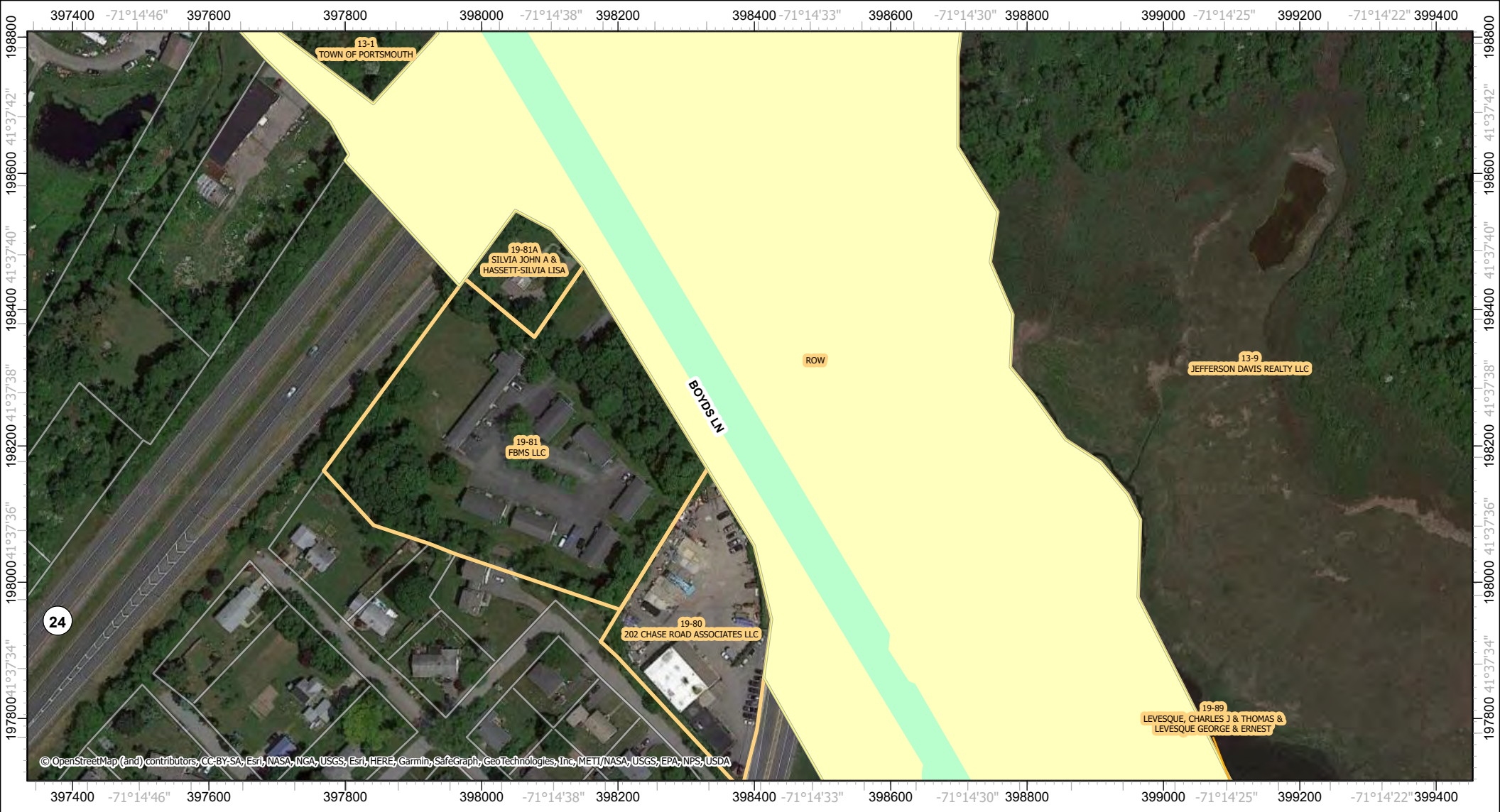
SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE
PANEL 2

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

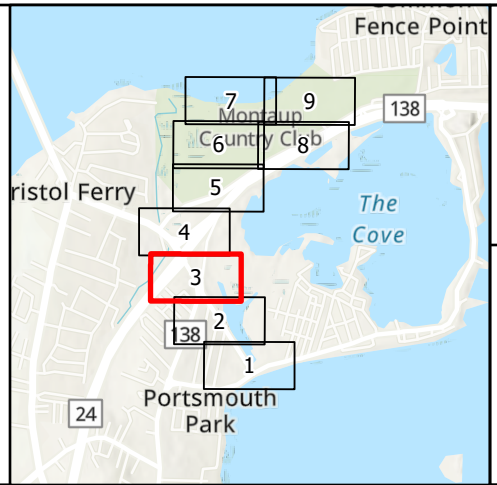
0 200
Feet

POWER ENGINEERS



LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE
PANEL 3

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

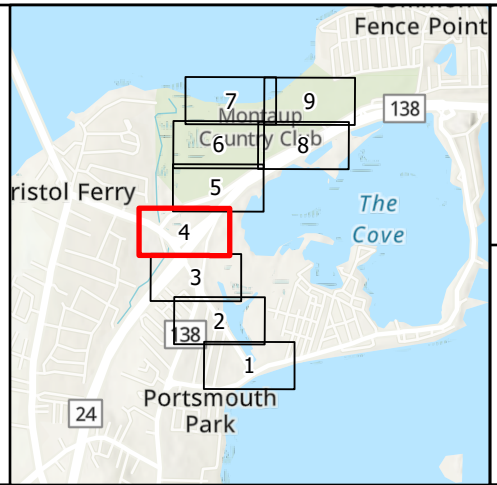
N

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Potential Additional Staging Area
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE PANEL 4

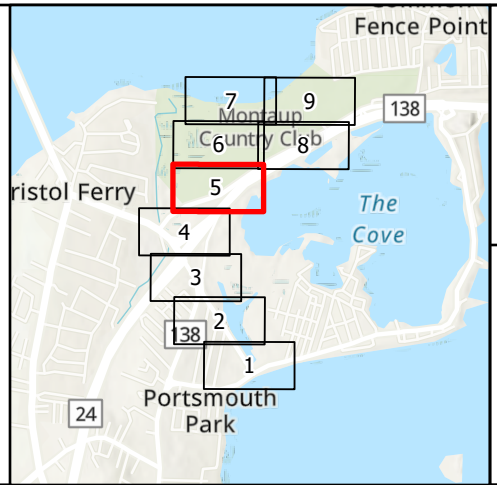
Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- RWU North Parcel Horizontal Directional Drill Construction Area
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE PANEL 5

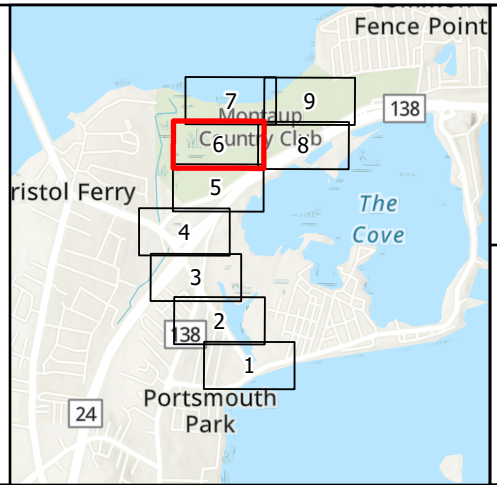
Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Horizontal Directional Drill Trajectory
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE PANEL 6

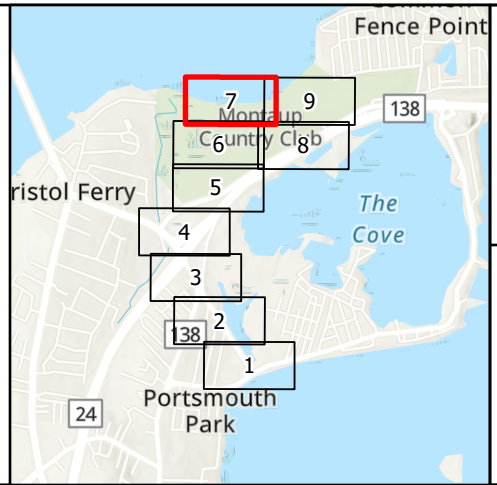
Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Horizontal Directional Drill Trajectory
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE
PANEL 7

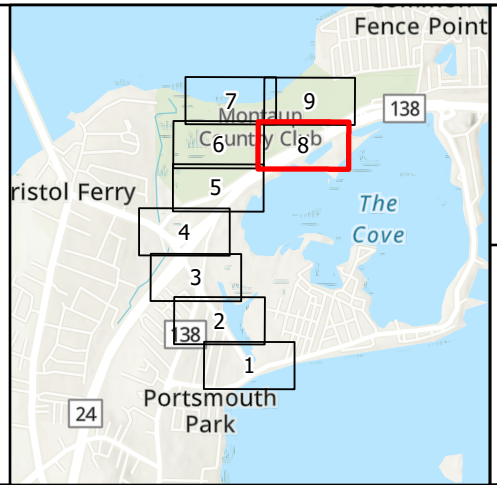
Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Onshore Export Cable Route Corridor Limit of Disturbance
- Montaup Horizontal Directional Drill Staging Area
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE PANEL 8

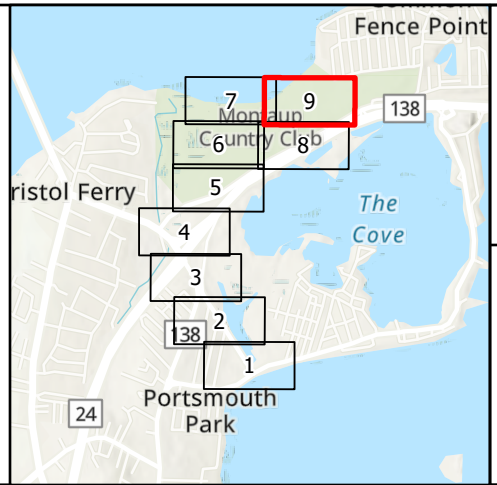
Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

LEGEND

- Horizontal Directional Drill Trajectory
- Montaup Horizontal Directional Drill Staging Area
- Right-of-Way
- Abutters Adjacent to Onshore Export Cable Route Corridor Limit of Disturbance
- Portsmouth Tax Parcel Boundary



SOUTHCOAST WIND

ABUTTERS ADJACENT TO ONSHORE EXPORT CABLE ROUTE CORRIDOR LIMIT OF DISTURBANCE PANEL 9

Date: 2/21/2023
NAD 1983 StatePlane Rhode Island FIPS 3800 Feet
Scale: 1:2,400

0 200
Feet

POWER ENGINEERS

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment S: Building Official Form

Revised: February 2023

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TO: **Coastal Resources Management Council**
4808 Tower Hill Road Suite 3
Wakefield, RI 02879
Phone: (401) 783-3370

FROM: Building Official DATE: 2-10-23

SUBJ: Application of: Mayflower Wind Energy, LLC (South Coast Wind Energy LLC)

Location: Portsmouth, RI in the vicinity of Boyds Lane and Anthony Road

Address: See Attached Plat No. _____ Lot No. _____

To Construct: Underground transmission cable installation - see attached for details

I hereby certify that I have reviewed _____ foundation plan(s).
_____ plan(s) for entire structure
X site plans
Titled: MAYFLOWER WIND GO-1

Date of Plan (last revision): 12/2/22

___ and find that the issuance of a local building permit is not required as in accordance with Section _____ of the Rhode Island State Building Code.

X and find that the issuance of a local building permit is required. I hereby certify that this permit shall be issued once the applicant demonstrates that the proposed construction/activity fully conforms to the applicable requirements of the RISBC.

___ and find that a Septic System Suitability Determination (SSD) must be obtained from the RI Dept. of Environmental Management.

X and find that a Septic System Suitability Determination (SSD) need not be obtained from the RI Dept. of Environmental Management.

___ and find that said plans conform with all elements of the zoning ordinance, and that if said plans require zoning board approval, that the applicant has secured such approval and that the requisite appeal period has passed with no appeal filed or appeal is final. The Zoning Board approval shall expire on _____.

2/10/23
Building Official's Signature Date

X and find that said plans conform with all elements of the zoning ordinance, and that if said plans require zoning board approval, that the applicant has secured such approval and that the requisite appeal period has passed with no appeal filed or appeal is final.

Aaron Ludo 2/10/23
Zoning Officer's Signature Date

rev. 5/11/2001

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment T: COP Contents

Revised: September 2024

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CONTENTS OF THE CONSTRUCTION AND OPERATIONS PLAN
(PURSUANT TO §11.10.5(C)(2) OF THE OCEAN SAMP APPLICATION REQUIREMENTS)

Project Information (§11.10.5 of the Ocean SAMP)	Including	Applicable Section/Response
(1) Contact information	The name, address, e-mail address, and phone number of an authorized representative.	• COP Section 1.7 Authorized Representative and Designated Operators
(2) Designation of operator, if applicable		• COP Section 1.7 Authorized Representative and Designated Operators
(3) The construction and operation concept	A discussion of the objectives, description of the proposed activities, tentative schedule from start to completion, and plans for phased development.	• COP Section 1.1 Project Overview • COP Section 1.3 Purpose and Need • COP Section 3 Description of Proposed Activities • COP Section 3.2 Proposed Project Schedule
(4) Commercial lease stipulations and compliance*	A description of the measures the applicant took, or shall take, to satisfy the conditions of any permit stipulations related to the applicant's proposed activities.	• COP Section 1.2 SouthCoast Wind Lease Area OCS-A 0521 • COP Section 1.12 Commercial Lease Stipulations and Compliance
(5) A location	The surface location and water depth for all proposed and existing structures, facilities, and appurtenances located both offshore and onshore, including all anchor/mooring data.	• COP Section 1.1 Project Overview • COP Section 3.1 Proposed Project Location • COP Section 3 Description of Proposed Activities
(6) General structural and project design, fabrication, and installation	Information for each type of structure associated with the project and, unless the Council provides otherwise, how the applicant shall use a CVA to review and verify each stage of the project.	• COP Section 1.9 Certified Verification Agent Nomination • COP Section 3 Description of Proposed Activities • COP Appendix B. Certified Verification Agent • COP Appendix C. Conceptual Project Design Drawings
(7) All cables and pipelines, including cables on project easements	Location, design and installation methods, testing, maintenance, repair, safety devices, exterior corrosion protection, inspections, and decommissioning. The applicant shall prior to construction also include location of all cable crossings and appropriate clearance from the owners of existing cables.	• COP Section 3 Description of Proposed Activities • COP Section 3.3.5.2 Cable Route and Cable Crossings
(8) A description of the deployment activities	Safety, prevention, and environmental protection features or measures that the applicant shall use.	• COP Section 3 Description of Proposed Activities • COP Section 16 Summary of Avoidance, Minimization, and Mitigation Measures of Potential Impacts • COP Appendix AA. Oil Spill Response Plan (OSRP) • COP Appendix Z. Safety Management System

Project Information (§11.10.5 of the Ocean SAMP)	Including	Applicable Section/Response
		• COP Appendix X. Navigation Safety Risk Assessment of the Offshore Export Cable Corridor
(9) A list of solid and liquid wastes generated	Disposal methods and locations.	• COP Section 3 Description of Proposed Activities • COP Section 3.4.5 Planned Discharges • COP Section 3.3.16 Waste Generation and Disposal
(10) A list of chemical products used (if stored volume exceeds Environmental Protection Agency Reportable Quantities)	A list of chemical products used; the volume stored on location; their treatment, discharge, or disposal methods used; and the name and location of the onshore waste receiving, treatment, and/or disposal facility. A description of how these products would be brought onsite, the number of transfers that may take place, and the quantity that shall be transferred each time.	• COP Section 3 Description of Proposed Activities • COP Section 3.4.5 Planned Discharges • COP Section 3.3.16 Waste Generation and Disposal
(11) A description of any vessels, vehicles, and aircraft you will use to support your activities*	An estimate of the frequency and duration of vessel/vehicle/aircraft traffic.	• COP Section 3 Description of Proposed Activities • COP Section 3.3.14 Vessels, Vehicles, and Aircrafts
(12) A general description of the operating procedures and systems*	(i) Under normal conditions. (ii) In the case of accidents or emergencies, including those that are natural or manmade.	• COP Section 3 Description of Proposed Activities • COP Section 3.3.1.5 Operation and Maintenance • COP Appendix AA. Oil Spill Response Plan (OSRP) • COP Appendix X. Navigation Safety Risk Assessment of the Offshore Export Cable Corridor
(13) Decommissioning and site clearance procedures	A discussion of general concepts and methodologies.	• COP Section 3 Description of Proposed Activities • COP Section 3.3.1.6 Decommissioning
(14) A list of all Federal, State, and local authorizations, approvals, or permits that are required to conduct the proposed activities including commercial operations.	A list of all federal, state, and local authorizations, approvals, or permits that are required to conduct the proposed activities, including commercial operations. In addition, a statement indicating whether the applicant has applied for or obtained such authorizations, approvals, or permits.	• COP Section 1.5 Regulatory Framework
(15) The applicant's proposed measures for avoiding, minimizing, reducing, eliminating, and monitoring environmental impacts.	A description of the measures the applicant shall take to avoid or minimize adverse effects and any potential incidental take before conducting activities on the project site, and how the applicant shall minimize environmental impacts from proposed	• COP Section 3 Description of Proposed Activities • COP Section 16 Summary of Avoidance, Minimization, and Mitigation Measures of Potential Impacts

Project Information (§11.10.5 of the Ocean SAMP)	Including	Applicable Section/Response
	activities, including a description of the measures.	
(16) Information the applicant incorporates by reference	A list of the documents referenced and the actual document if requested.	• COP Section 17 References • COP Appendices A-BB
(17) A list of agencies and persons with whom the applicant has communicated, or with whom the applicant shall communicate, regarding potential impacts associated with the proposed activities.	Contact information, issues discussed and the actual document if requested	• COP Section 1.6 Agency Contacts and Stakeholder Coordination • COP Appendix A. Agency Correspondence
(18) Reference	Contact information	• COP Section 17 References • COP Appendices A-BB
(19) Financial assurance	Statements attesting that the activities and facilities proposed in the applicant's COP are or shall be covered by an appropriate bond or security, as required by § 11.9.8(D)(2) of this Part.	• COP Section 1.8 Financial Assurance
(20) CVA nominations	CVA nominations for reports required.	• COP Section 1.9 Certified Verification Agent Nomination • COP Appendix B. Certified Verification Agent
(21) Construction Schedule	A reasonable schedule of construction activity showing significant milestones leading to the commencement of commercial operations.	• COP Section 3 Description of Proposed Activities • COP Section 3.2 Proposed Project Schedule
(22) Air quality information	Information required for the *Clean Air Act* (42 U.S.C. § 7409) and implementing regulations.	• COP Section 5.1 Air Quality • COP Appendix G. Air Emissions Report
(23) Other information	Additional information as required by the Council.	

Notes:
Information in this table is based on Table 4 in Ocean SAMP § 11.10.5(C)(2)(e).

* *Denotes BOEM COP-specific Project criteria.*

NECESSARY DATA AND INFORMATION PROVIDED IN THE COP
(PURSUANT TO §11.10.5(C)(2) OF THE OCEAN SAMP APPLICATION REQUIREMENTS)

Information (§11.10.5 of the Ocean SAMP)	Report Contents	Including	Applicable Section/Response
(1) Shallow hazards	The results of the shallow hazards survey with supporting data, if required.	Information sufficient to determine the presence of the following features and their likely effects on the proposed facility, including: (i) Shallow faults; (ii) Gas seeps or shallow gas; (iii) Slump blocks or slump sediments; (iv) Hydrates; or (v) Ice scour of seabed sediments	• COP Appendix E.2. Geohazard Report for Brayton Point Export Cable Corridor • COP Section 4.2 Shallow Hazard Assessment
(2) Geological survey relevant to the siting and design of the facility	The results of the geological survey with supporting data.	Assessment of: (i) Seismic activity at the proposed site; (ii) Fault zones; (iii) The possibility and effects of seabed subsidence; and (iv) The extent and geometry of faulting attenuation effects of geologic conditions near the site.	• COP Section 4 Site Geology and Environmental Conditions • Appendix F3. Hydrodynamic and Sediment Transport Modeling Report for the Brayton Point Export Cable Burial Assessment • Appendix E.5. (Attachment 1). Measured and Derived Geotechnical Parameters and Final Results: Mayflower Wind Geotechnical Investigation 2020 • Appendix E.5. (Attachment 2). Measured and Derived Geotechnical Parameters and Final Results: Mayflower Wind Geotechnical Investigation 2020 • Appendix E.6. Measured and Derived Geotechnical Parameters and Final Results: Mayflower Wind Geotechnical Investigation 2021
(3) Biological survey	The results of the biological survey with supporting data.	A description of the results of biological surveys used to determine the presence of live bottoms, hard bottoms, and topographic features, and surveys of other marine resources such	• COP Section 4 Site Geology and Environmental Conditions • COP Section 6.6 Benthic and Shellfish

Information (§11.10.5 of the Ocean SAMP)	Report Contents	Including	Applicable Section/Response
		as fish populations (including migratory populations) not targeted by commercial or recreational fishing, marine mammals, sea turtles, and sea birds.	• COP Section 6.7 Finfish and Invertebrates • COP Section 6.8 Marine Mammals • COP Section 6.9 Sea Turtles • COP Section 6.1 Coastal and Marine Birds • COP Appendix M. Benthic and Shellfish Resources Characterization Report • COP Appendix M.2 Benthic and Shellfish Resources Characterization Report – Addendum • COP Appendix M.3 Benthic and Habitat Mapping to Support Essential Fish Habitat Consultation • COP Appendix N. Essential Fish Habitat and Protected Fish Species Assessment
(4) Fish and fisheries survey	The results from the fish and fisheries survey with supporting data.	A report that describes the results of: (i) A biological assessment of commercially and recreationally targeted species. This assessment shall assess the relative abundance, distribution, and different life stages of these species at all four seasons of the year. This assessment shall comprise a series of surveys, employing survey equipment and methods that are appropriate for sampling finfish, shellfish, and crustacean species at the project's proposed location. This assessment may include evaluation of survey data collected through an existing survey program, if data are available for the proposed site.	• COP Section 6.6 Benthic and Shellfish • COP Section 6.7 Finfish and Invertebrates • COP Section 11 Commercial and Recreational Fisheries and Fishing Activity • COP Appendix M. Benthic and Shellfish Resources Characterization Report • COP Appendix M.2 Benthic and Shellfish Resources Characterization Report – Addendum • COP Appendix M.3 Benthic and Habitat Mapping to Support Essential Fish Habitat Consultation • COP Appendix N. Essential Fish Habitat and

Information (§11.10.5 of the Ocean SAMP)	Report Contents	Including	Applicable Section/Response
		(ii) An assessment of commercial and recreational fisheries effort, landings, and landings value. Assessment shall focus on the proposed project area and alternatives across all four seasons of the year must. Assessment may use existing fisheries monitoring data but shall be supplemented by interviews with commercial and recreational fishermen. (iii) For more information on these assessments see § 11.9.9(C) of this Part.	• Protected Fish Species Assessment
(5) Geotechnical survey	The results of any sediment testing program with supporting data, the various field and laboratory tests employed, and the applicability of these methods as they pertain to the quality of the samples, the type of sediment, and the anticipated design application. The applicant shall explain how the engineering properties of each sediment stratum affect the design of the facility. In the explanation, the applicant shall describe the uncertainties inherent in the overall testing program, and the reliability and applicability of each method.	(i) The results of a testing program used to investigate the stratigraphic and engineering properties of the sediment that may affect the foundations or anchoring systems of the proposed facility. (ii) The results of adequate in situ testing, boring, and sampling at each foundation location, to examine all important sediment and rock strata to determine its strength classification, deformation properties, and dynamic characteristics. A minimum of one boring shall be taken per turbine planned, and the boring shall be taken within 50 feet of the final location of the turbine. (iii) The results of a minimum of one deep boring (with soil sampling and testing) at each edge of the project area and within the project area as needed to determine the vertical and lateral variation in seabed conditions and to provide the relevant geotechnical data required for design.	• COP Appendix E.2. Geohazard Report for Brayton Point Export Cable Corridor • Appendix F3. Hydrodynamic and Sediment Transport Modeling Report for the Brayton Point Export Cable Burial Assessment • COP Section 4 Site Geology and Environmental Conditions

Information (§11.10.5 of the Ocean SAMP)	Report Contents	Including	Applicable Section/Response
(6) Archaeological and visual resources, if required	The results of the archaeological resource survey with supporting data.	A description of the historic and prehistoric archaeological resources, as required by the *National Historic Preservation Act and Antiquities Act* (16 U.S.C. § 470 *et seq*.), as amended, the *Rhode Island Historical Preservation Act and Antiquities Act* and §§ 00-1.2.3 and 00-1.3.5 of this Chapter, as applicable.	• COP Appendix Q. Marine Archaeological Resources Assessment (MARA) • COP Appendix R. Terrestrial Archaeological Resources Assessment •
(7) Overall site investigation	An overall site investigation report for the proposed facility that integrates the findings of the shallow hazards surveys and geologic surveys, and, if required, the subsurface surveys with supporting data.	An analysis of the potential for: (i) Scouring of the seabed; (ii) Hydraulic instability; (iii) The occurrence of sand waves; (iv) Instability of slopes at the facility location; (v) Liquefaction, or possible reduction of sediment strength due to increased pore pressures; (vi) Cyclic loading; (vii) Lateral loading; (viii) Dynamic loading; (ix) Settlements and displacements; (x) Plastic deformation and formation collapse mechanisms; and (xi) Sediment reactions on the facility foundations or anchoring systems.	• COP Appendix E. Marine Site Investigation Report (MSIR)

Notes:
Information in this table is based on Table 5 in Ocean SAMP § 11.10.5(C)(2)(f).

RESOURCES, CONDITIONS AND ACTIVITIES THAT SHALL BE DESCRIBED IN THE CONSTRUCTION AND OPERATIONS PLAN

(PURSUANT TO §11.10.5(C)(2) OF THE OCEAN SAMP APPLICATION REQUIREMENTS)

Type of Information (§11.10.5 of the Ocean SAMP)	Including	Applicable Section/Response
(1) Hazard information and sea level rise	Meteorology, oceanography, sediment transport, geology, and shallow geological or manmade hazards. Provide an analysis of historic and project (medium and high) rates of sea level rise and shall at minimum assess the risks for each alternative on public safety and environmental impacts resulting from the project (see Ocean SAMP Chapter 3, Section 350.2 for more information).	• The modeled 5 feet (1.5 m) of SLR during the life of the project is not expected to impact the onshore Project components so as to threaten public safety or impact the environment. See attached Coastal Hazard Application Worksheets in Appendix E to this application. • COP Section 4.3 Physical Oceanography and Meteorology
(2) Water quality and circulation	Turbidity and total suspended solids from construction. Modeling of circulation and stratification to ensure that water flow patterns and velocities are not altered in ways that would lead to major ecosystem change.	• COP Section 5.2 Water Quality • Appendix F3. Hydrodynamic and Sediment Transport Modeling Report for the Brayton Point Export Cable Burial Assessment
(3) Biological resources	Benthic communities, marine mammals, sea turtles, coastal and marine birds, fish and shellfish not targeted by commercial or recreational fishing, plankton, sea grasses, and plant life.	• COP Section 4 Site Geology and Environmental Conditions • COP Section 6.6 Benthic and Shellfish • COP Section 6.7 Finfish and Invertebrates • COP Section 6.8 Marine Mammals • COP Section 6.9 Sea Turtles • COP Section 6.1 Coastal and Marine Birds • COP Appendix O. Marine Mammal and Sea Turtle Monitoring and Mitigation Plan • COP Appendix M. Benthic and Shellfish Resources Characterization Report • COP Appendix M.2. Benthic and Shellfish Resources Characterization Report – Addendum • COP Appendix M.3. Benthic and Habitat Mapping to Support Essential Fish Habitat Consultation

Type of Information (§11.10.5 of the Ocean SAMP)	Including	Applicable Section/Response
		• COP Appendix N. Essential Fish Habitat and Protected Fish Species Assessment
(4) Threatened or endangered species	As defined by the ESA (16 U.S.C. § 1531 *et seq*.)	• COP Section 6.6 Benthic and Shellfish • COP Section 6.7 Finfish and Invertebrates • COP Section 6.8 Marine Mammals • COP Section 6.9 Sea Turtles • COP Section 6.1 Coastal and Marine Birds • COP Appendix M. Benthic and Shellfish Resources Characterization Report • COP Appendix M.2. Benthic and Shellfish Resources Characterization Report – Addendum • COP Appendix M.3. Benthic and Habitat Mapping to Support Essential Fish Habitat Consultation • COP Appendix N. Essential Fish Habitat and Protected Fish Species Assessment • COP Appendix J. Terrestrial Vegetation and Wildlife Assessment Report
(5) Sensitive biological resources or habitats	Essential fish habitat, refuges, preserves, Areas of Particular Concern, sanctuaries, rookeries, hard bottom habitat, barrier islands, beaches, dunes, and wetlands.	• COP Section 4 Site Geology and Environmental Conditions • COP Section 6.6 Benthic and Shellfish • COP Section 6.7 Finfish and Invertebrates • COP Section 6.8 Marine Mammals • COP Section 6.9 Sea Turtles • COP Section 6.1 Coastal and Marine Birds • COP Appendix M. Benthic and Shellfish Resources Characterization Report • COP Appendix M.2. Benthic and Shellfish Resources Characterization Report – Addendum • COP Appendix M.3. Benthic and Habitat Mapping to Support Essential Fish Habitat Consultation

Type of Information (§11.10.5 of the Ocean SAMP)	Including	Applicable Section/Response
		• COP Appendix N. Essential Fish Habitat and Protected Fish Species Assessment
(6) Fisheries resources and uses	Commercially and recreationally targeted species, recreational and commercial fishing (including fishing seasons, location, and type), commercial and recreational fishing activities, effort, landings, and landings value.	• COP Section 6.6 Benthic and Shellfish • COP Section 6.7 Finfish and Invertebrates • COP Section 11 Commercial and Recreational Fisheries and Fishing Activity • COP Appendix M Benthic and Shellfish Resources Characterization Report • COP Appendix M.2 Benthic and Shellfish Resources Characterization Report – Addendum • COP Appendix M.3 Benthic and Habitat Mapping to Support Essential Fish Habitat Consultation • COP Appendix N. Essential Fish Habitat and Protected Fish Species Assessment
(7) Archaeological resources	As required by the NHPA (16 U.S.C. § 470 *et seq*.), as amended.	• COP Section 7 Cultural Resources • COP Appendix Q. Marine Archaeological Resources Assessment (MARA) • COP Appendix R. Terrestrial Archaeological Resources Assessment
(8) Social and economic resources	As determined by the Council in coordination with the Joint Agency Working Group.	• COP Section 10 Socioeconomic Resources • COP Appendix BB. Economic Development Report
(9) Coastal and marine uses	Military activities, vessel traffic, and energy and non-energy mineral exploration or development.	• COP Section 13 Navigation and Vessel Traffic • COP Section 14 Other Marine Uses (Military Uses, Aviation, Offshore Energy, and Cables and Pipelines) • COP Appendix Y4. Radar and Navigational Aid Screening Study • COP Appendix X. Navigation Safety Risk Assessment of the Offshore Export Cable Corridor

Notes:
Information in this table is based on Table 6 in Ocean SAMP § 11.10.5(C)(2)(g).

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment U: UXO Risk Assessment (Confidential)

Revised: February 2023

SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment V: Benthic Monitoring Plan

New: July 2024

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SOUTHCOAST WIND

Benthic Monitoring Plan – Lease Area and Brayton Point ECC

Document Number	SC01-COR-PRT-RPT-0060
Document Revision	D
Document Status	Final
Owner/Author	INSPIRE Environmental
Issue Date	April 22, 2024
Security Classification	Confidential
Disclosure	For use by SouthCoast Wind and Authorized Third Parties

Revision History

Version	Prepared By	Reviewer(s)	Approver(s)	Date	Purpose of Issue
A	Annie Murphy Lianne Allen-Jacobson	Erin Healy Joel Southall Julia Jackson	Jennifer Flood	31-Jan-23	Draft
B	Annie Murphy	Erin Healy	Jennifer Flood	7-June-23	Final
C	Kori Ktona		Jennifer Flood	30-July-2023	Final
D	Annie Murphy	Kyle Cassidy	Jennifer Flood	17-April-2024	R1

Table of Contents Page

Revision History i
Table of Contents Page ii
List of Attachments iii
List of Tables iv
List of Figures iv
Glossary vi
1. Introduction 1
1.1 Overview of Monitoring 1
2. SouthCoast Wind Benthic Habitat Overview 4
2.1 SouthCoast Wind Lease Area 4
2.2 Brayton Point Export Cable Corridor 8
3. Benthic Monitoring Objectives and Hypotheses 15
4. Novel Hard Bottom Monitoring – WTG Foundations and Cable Protection 20
4.1 Technical Approach – Stereo Camera Imagery 20
4.1.1 Justification 21
4.1.2 Survey and Data Products 21
4.2 Survey Design 22
4.3 Statistical Analyses 23
5. Structure-Associated Organic Enrichment 24
5.1 Technical Approach – SPI/PV 25
5.1.1 Survey and Data Products 25
5.2 Technical Approach – Sediment Sampling 26
5.3 Survey Design 27
5.4 Statistical Analyses 28
6. Cable-Associated Physical Disturbance 30
6.1 Technical Approach 30
6.2 Survey Design 31
6.3 Statistical Analyses 32
7. Data Management, Reporting, and Data Sharing 35
8. References 36

List of Attachments

Attachment A Sediment Profile and Plan View Imagery to Assess Shifts in Benthic Ecological Functions

List of Tables

Page

Table 3-1. Summary of the Benthic Monitoring Plan Including Hypotheses, Approach, and Sampling Schedules for Each Component 17

Table 3-2. Summary of Planned Statistical Analyses for the Benthic Monitoring Surveys for SouthCoast Wind 18

List of Figures

Page

Figure 1-1. Location of the SouthCoast Wind Lease Area with potential wind turbine generator (WTG) and offshore substation platform (OSP) foundation positions and offshore export cable corridors (ECCs) 3

Figure 2-1a. Bathymetry at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)..... 5

Figure 2-1b. Benthic habitats at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)..... 6

Figure 2-1c. Benthic habitats classified using NOAA categories at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022). 7

Figure 2-2a. Bathymetry at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022). 9

Figure 2-2b. Benthic habitats with modifiers at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022). 10

Figure 2-2c. Benthic habitats classified using NOAA categories at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022). 11

Figure 2-3a. Bathymetry at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022) 12

Figure 2-3b. Benthic habitats with modifiers at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP)

Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022) 13

Figure 2-3c. Benthic habitats classified using NOAA categories at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022) 14

Figure 5-1. Conceptual diagram illustrating the Before-After Gradient design of the Structure-associated Organic Enrichment survey design, SPI/PV and sediment grab station locations on the seafloor surrounding each selected foundation. The transect orientation will be based on prevailing water currents in the area, to capture upstream and downstream effects. 29

Figure 6-1. Conceptual diagram illustrating the Before-After Gradient design of Cable-associated Physical Disturbance survey design along the Brayton Point ECC in Federal Waters 33

Figure 6-2. Conceptual diagram illustrating the Before-After Gradient design of Cable-associated Physical Disturbance survey design along the Brayton Point ECC in State Waters 34

Glossary

Acronym	Definition
aRPD	apparent redox potential discontinuity
BAG	Before-After Gradient
BIWF	Block Island Wind Farm
BOEM	Bureau of Ocean Energy Management
CRMC	Coastal Resources Management Council
CMECS	Coastal and Marine Ecological Classification Standard
COP	Construction and Operations Plan
CZM	Office of Coastal Zone Management
DMF	Division of Marine Fisheries
ECC	Export Cable Corridor
ft	feet
GAM	Generalized Additive Model
GLM	Generalized Linear Model
GLMM	Generalized Linear Mixed Model
HD	high definition
HDD	horizontal directional drilling
IAC	Inter-Array Cable
INSPIRE	INSPIRE Environmental
km	kilometer
LPIL	lowest possible taxonomic unit
m	meter
mm	millimeter
MA	Massachusetts
Mass DEP	Massachusetts Department of Environmental Protection
MA CZM	Massachusetts Office of Coastal Zone Management
MA/RI WEA	Massachusetts/Rhode Island Wind Energy Area
MEPA	Massachusetts Environmental Policy Act Office
mm	millimeter
nm	nautical mile
nMDS	non-metric Multidimensional Scaling
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OCS	Outer Continental Shelf
OSP	Offshore Substation Platform
PV	Plan View
QA/QC	quality assurance/quality control
RI	Rhode Island
RIDEM	Rhode Island Department of Environmental Management
RI HAB	Rhode Island Habitat Advisory Board
ROSA	Responsible Offshore Science Alliance

Acronym	Definition
ROV	Remotely Operated Vehicle
SPI	Sediment Profile Imaging
UHD	ultra-high definition
USBL	Ultra-Short Baseline
WTG	Wind Turbine Generator

1. Introduction

SouthCoast Wind Energy LLC proposes to construct and operate the SouthCoast Wind Project (Project) to generate renewable power off the coast of Massachusetts and Rhodes Island (SouthCoast Wind Energy LLC 2022). The wind farm portion of the Project is located in Federal Waters on the Outer Continental Shelf (OCS) in the designated Bureau of Ocean Energy Management (BOEM) Renewable Energy Lease Area OCS-A 0521 (Lease Area). The Lease Area is 26 nautical miles (nm) (48 kilometers [km]) south of Martha's Vineyard, 20 nm (37 km) south of Nantucket, and 51 nm (94 km) southeast of the Rhode Island coast (Figure 1-1). The Lease Area encompasses 127,388 acres (51,552 hectares) and the Project includes the following components:

- up to 147 wind turbine generators (WTGs);
- up to five offshore substation platforms (OSPs);
- submarine inter-array cables (IACs) connecting WTGs and OSPs;
- offshore export cables within up to two offshore Export Cable Corridors (ECCs);
- up to two points of interconnection, with one at Brayton Point in Somerset, MA and one in Falmouth, MA if selected for the POI for Project 2;

The WTGs will occupy up to 147 of the 149 possible positions, which will conform to a 1.0 nm x 1.0 nm (1.9 km x 1.9 km) grid layout. The grid orients east-west and north-south and aligns with layouts across the entire Massachusetts/Rhode Island Wind Energy Area (MA/RI WEA).

In addition to the Lease Area, this Benthic Monitoring Plan focuses on the Brayton Point ECC. The Brayton Point ECC extends from the Lease Area north and then west through Federal Waters, into Rhode Island State Waters through Rhode Island Sound to the Sakonnet River where it will head north, cross Aquidneck Island in Portsmouth, RI, continue northeast into Mount Hope Bay, and then into Massachusetts State Waters to Brayton Point in Somerset, MA (Figure 1-1). The nominal width of the Brayton Point ECC spans 1,640 feet (ft, 500 meters [m]) to 2,300 ft (700 m). A separate benthic monitoring plan will be developed for the Falmouth ECC route.

1.1 Overview of Monitoring

This benthic monitoring plan has been developed in accordance with recommendations set forth in "Guidelines for Providing Benthic Habitat Survey Information for Renewable Energy Development on the Atlantic Outer Continental Shelf" (BOEM, 2019), which states that a benthic habitat survey plan should aim to:

- Identify and confirm dominant macrofaunal and macrofloral communities and substrate present where development is proposed;
- Establish a pre-construction baseline that may be used to assess whether detectable changes occurred in post-construction benthic habitat associated with proposed operations;
- Collect additional information aimed at reducing the uncertainty associated with baseline estimates and/or to inform the interpretation of survey results; and

- Develop an approach to quantify any substantial changes in the benthic community composition associated with proposed operations.

This benthic monitoring plan begins with a brief overview of the existing conditions of the benthic environment associated with the Project as informed by previously conducted baseline surveys and the associated benthic habitat mapping. The benthic monitoring plan then provides specific objectives and hypotheses regarding the potential impacts and recovery of the existing benthic habitats as a result of the development and operations of the wind farm. The general approaches proposed to test each of these hypotheses through benthic monitoring are then described.

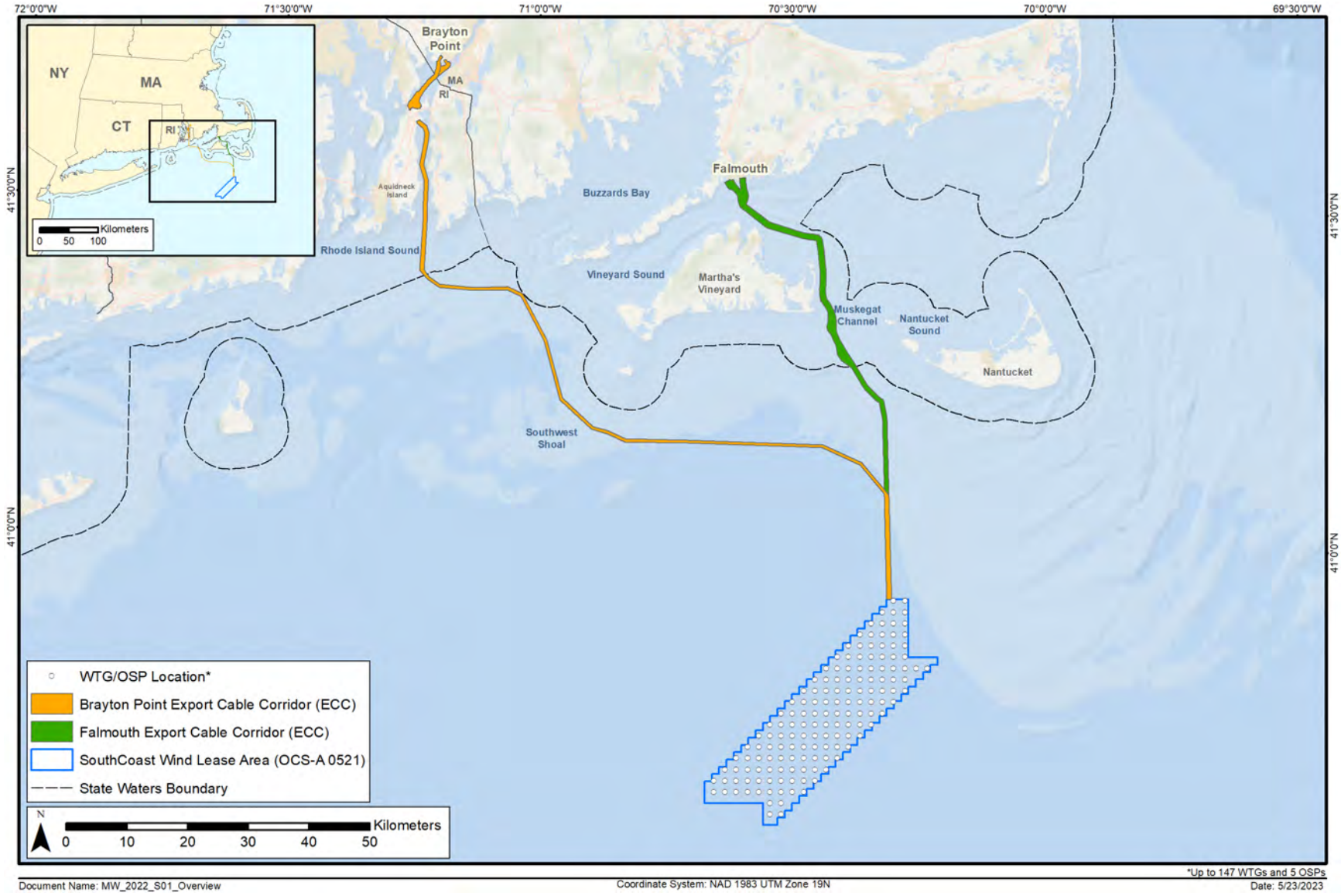

Figure 1-1. Location of the SouthCoast Wind Lease Area with potential wind turbine generator (WTG) and offshore substation platform (OSP) foundation positions and offshore export cable corridors (ECCs)

2. SouthCoast Wind Benthic Habitat Overview

SouthCoast Wind collected extensive site-specific geophysical data and ground-truth data to map and characterize habitats within the Study Area (SouthCoast Wind Construction and Operations Plan [COP] Appendix M.3, Benthic Habitat Mapping to Support Essential Fish Habitat [EFH] Consultation, INSPIRE Environmental [INSPIRE], 2022). To collect these data, surveyors employed state-of-the-art equipment, yielding high-resolution data and meeting the recommended resolution specified in BOEM's Geophysical, Geotechnical, and Geohazard Guidelines (BOEM, 2020a) and NMFS' recommendations (NMFS, 2021).

The Habitat Mapping Report (COP Appendix M.3, INSPIRE, 2022) described two benthic habitat types within the Lease Area (Sand – Mobile, Mud to Muddy Sand), seven benthic habitat types within the offshore portion of Brayton Point ECC (Glacial Moraine A, Coarse Sediment, Coarse Sediment – Mobile, Sand, Sand – Mobile, Mud to Muddy Sand, Bedrock), and eight benthic habitat types within the nearshore portion of Brayton Point ECC (Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, Sand, Sand – Mobile, Mud to Muddy Sand, Mud to Muddy Sand – Mobile, Bedrock, Anthropogenic) (Figures 2-1 through 2-3). When habitats were updated with modifiers, mobile habitats characterized by ripples, discrete areas of boulder fields, discrete areas with extensive Crepidula (slipper shell) cover, and nearshore habitats characterized by submerged aquatic vegetation were identified.

The Habitat Mapping Report crosswalked benthic habitat types with modifiers to the NOAA Habitat Categories (COP Appendix M.3, INSPIRE, 2022). NMFS defines the following NOAA Habitat Categories for EFH consultation (NMFS, 2021): soft bottom, complex, heterogeneous complex, and large grained complex (large boulders). "Complex habitats" includes SAV, shell substrate, and sediments with >5 percent gravel of any size, according to these definitions for EFH consultation, while "heterogeneous complex" includes a combination of soft bottom and complex features (NMFS, 2021). The Habitat Mapping Report outlines the details of the crosswalk (COP Appendix M.3, INSPIRE, 2022).

A comprehensive description of the benthic habitats and their distribution in association with the Project is provided in the Benthic Habitat Mapping Report (COP Appendix M.3). Below, a brief overview of the benthic habitats present at the SouthCoast Wind Lease Area and along the Brayton Point ECC is provided.

2.1 SouthCoast Wind Lease Area

The SouthCoast Wind Lease Area seafloor is predominantly flat with low rugosity and slope (COP Appendix M.3, INSPIRE, 2022). The water depths range from about ~35 m (115 ft) in the northeastern portion of the Lease Area to about ~60 m (197 ft) in the southwestern portion of the Lease Area (Figure 2-1). A single habitat type dominates the Lease Area, representing 98.5 percent of the area: Mud to Muddy Sand habitat (Figure 2-1). Small, isolated areas of Sand – Mobile habitat characterized by ripple scour depressions comprised the remaining 1.5 percent of the area mapped at the Lease Area (Figure 2-1). This habitat is characterized by Soft Sediment Fauna (CMECS Biotic Subclass). The Soft Bottom NOAA Complexity Category comprised 100 percent of the habitat from the Lease Area.

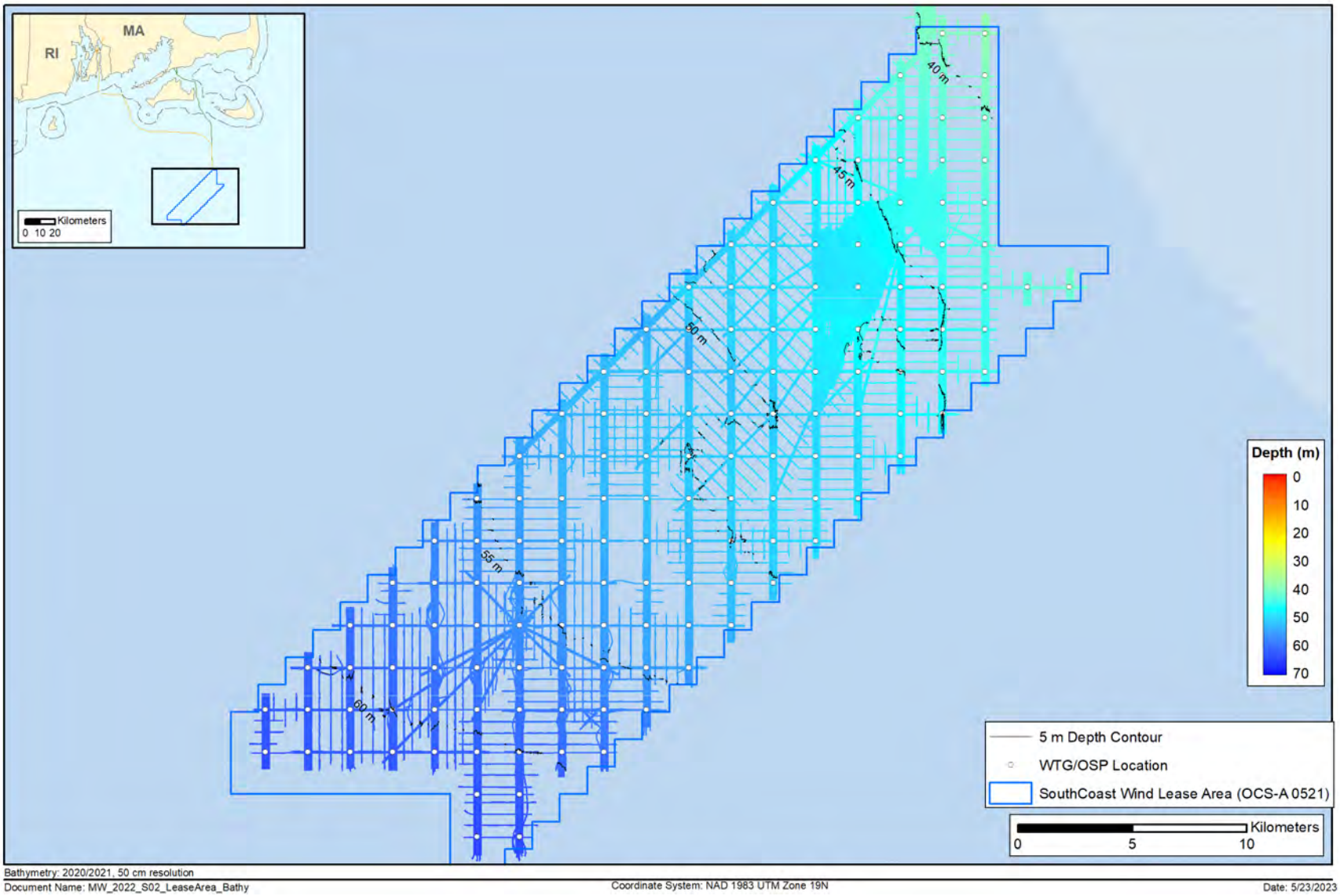

Figure 2-1a. Bathymetry at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).

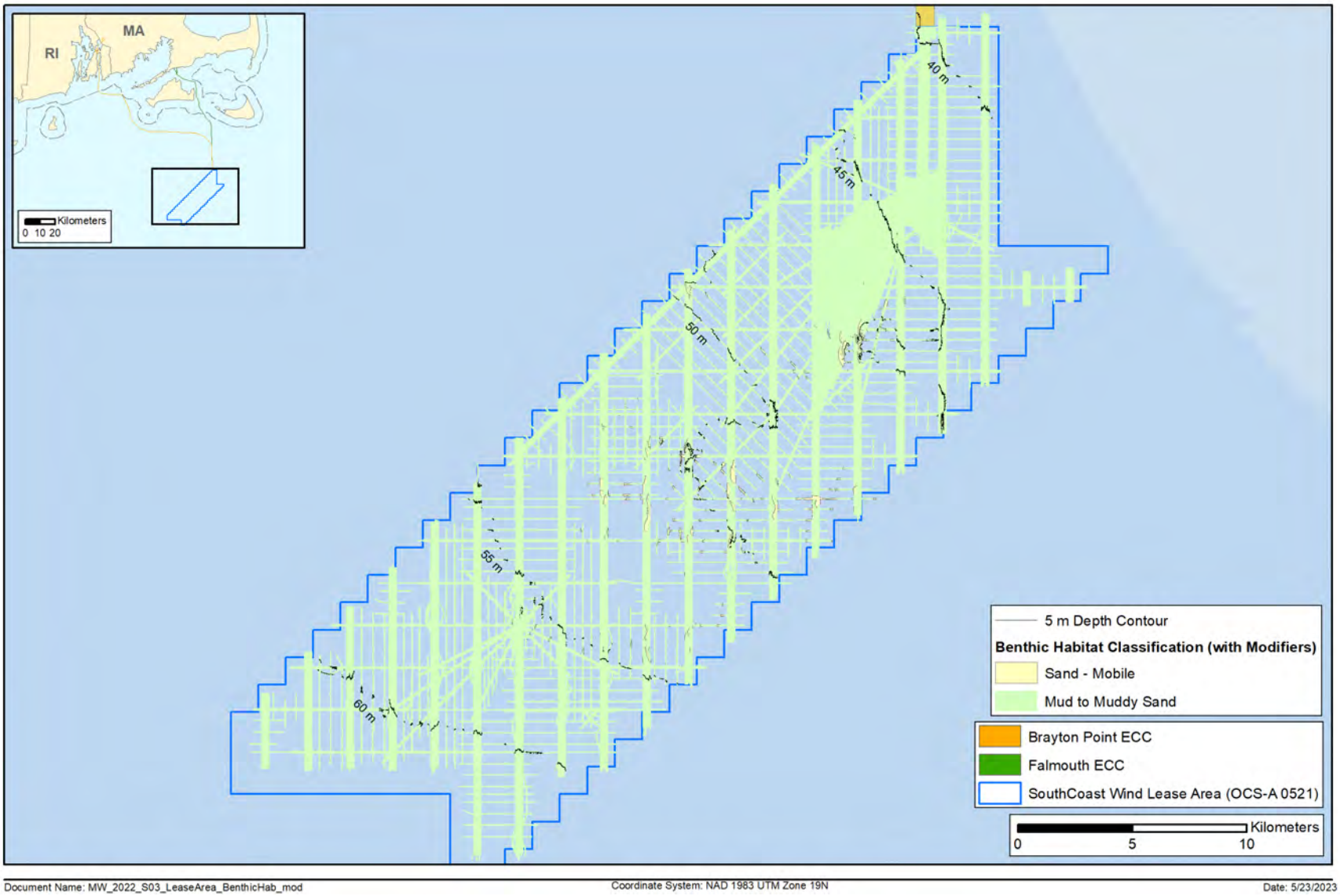

Figure 2-1b. **Benthic habitats at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

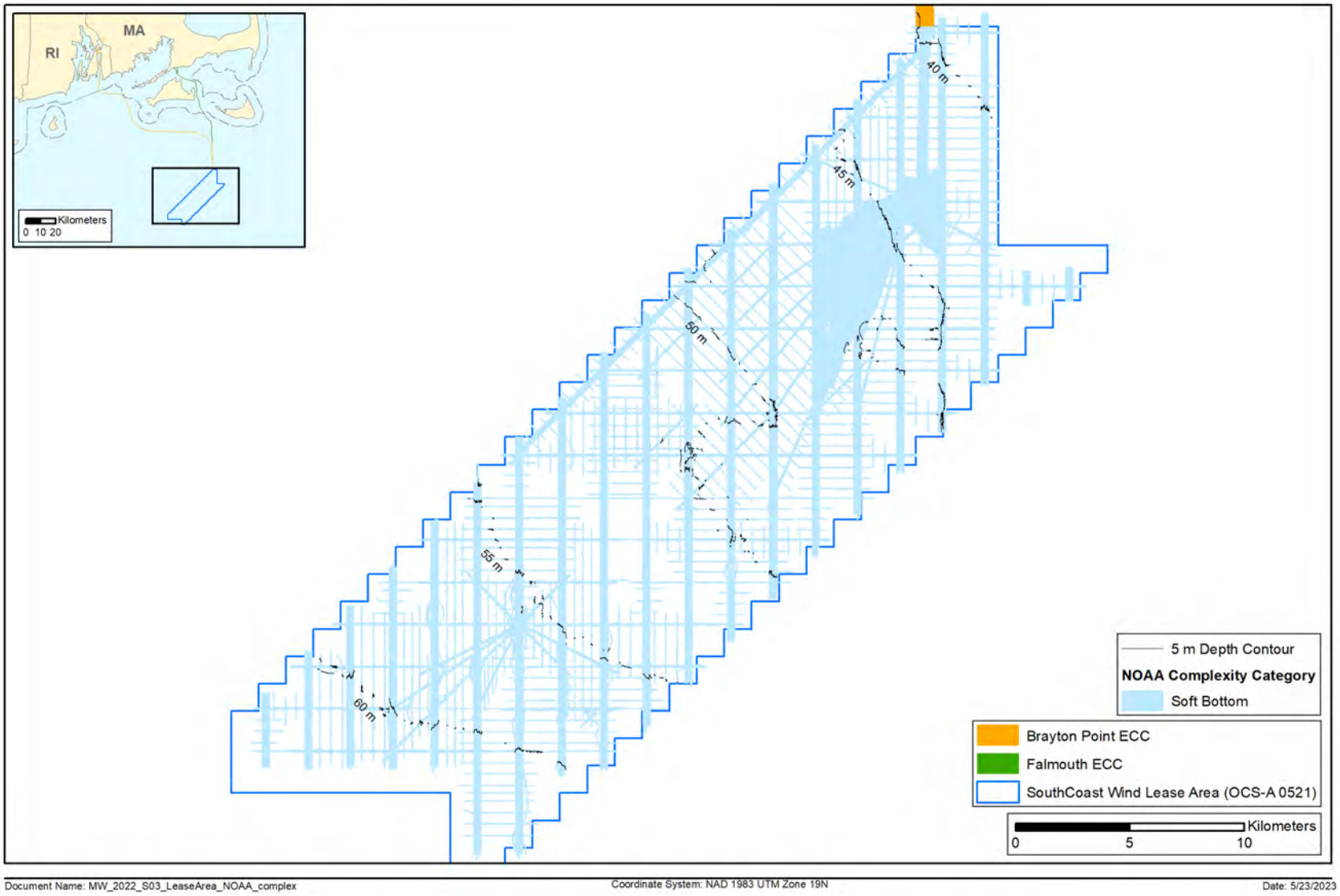

Figure 2-1c. **Benthic habitats classified using NOAA categories at the SouthCoast Wind Lease Area. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).**

2.2 Brayton Point Export Cable Corridor

The water depths range from about ~25 m (82 ft) to about ~40 m (131 ft) in the Federal Waters portion of the Brayton Point ECC (Figure 2-2). Several different benthic habitats occur along Brayton Point ECC in Federal Waters ranging in complexity from Mud to Muddy Sand and Glacial Moraine A (Figure 2-2; COP Appendix M.3, INSPIRE, 2022). The segment of the Brayton Point ECC corridor just north of the SouthCoast Wind Lease Area, is composed of Mud to Muddy Sand and transitions to a combination of Sand and Sand – Mobile as it transits west. These three benthic habitats are classified by the NOAA Complexity Category Soft Bottom (Figure 2-2). A stretch of Coarse Sediment – Mobile habitat, classified as Complex by the NOAA Complexity Category occurs east of where the route redirects to the northwest. A pocket of Glacial Moraine A, characterized by boulder fields (NOAA Complex and Large Grained Complex habitat) occurs along the portion of the Brayton Point ECC adjacent to the Southwest Shoal, where the route redirects north-northwest. From there, the benthic habitat transitions back to a combination of Sand and Sand-Mobile (NOAA Soft Bottom) until it enters Rhode Island State Waters.

In the State Waters portion of the Brayton Point ECC, the water depths range from about <5 m (<16 ft) to about 25 m (82 ft) (Figure 2-3). In Rhode Island State Waters, Mud to Muddy Sand habitat and Sand habitat comprised a total of ~62 percent of the Brayton Point ECC, both of which are classified as the NOAA Complexity Category Soft Bottom (Figure 2-3; COP Appendix M.3, INSPIRE, 2022). In Massachusetts State Waters, Mud to Muddy Sand habitat comprised ~87 percent of the Brayton Point ECC (COP Appendix M.3, INSPIRE, 2022). Where the Brayton Point ECC extends north of the Rhode Island State Waters boundary, the benthic habitat includes a combination of Glacial Moraine A, Gravel Pavement, Mixed-Size Gravel in Muddy Sand to Sand, and Sand (Figure 2-3). Along this stretch of cable corridor, these habitats translate to a mixture of NOAA Complexity Categories Complex, Large Grained Complex, and Soft Bottom (Figure 2-3). At the mouth of the Sakonnet River, the benthic habitat along the Brayton Point ECC is composed largely of Sand and transitions to Mud to Muddy Sand as the corridor extends north into the Sakonnet River and through Mount Hope Bay (NOAA Complexity Category Soft Bottom). Within these areas, pockets of *Crepidula* Substrate and Shell Substrate overlay muds, particularly near Aquidneck Island (NOAA Complexity Category Complex). Small clusters of individual surficial boulders occur in the lower portion of Mount Hope Bay near Aquidneck Island. In Massachusetts State Waters, the benthic habitat is composed mainly of Mud to Muddy Sand, with Anthropogenic features and Sand at the mouth of the Taunton River (Figure 2-3).

Soft Sediment Fauna dominated the portions of the Brayton Point ECC, in soft bottom sediments in sand and mud habitat types and in patches within gravel habitat types (COP Appendix M.3, INSPIRE, 2022). Attached Fauna occurred more frequently in habitats dominated by large gravels: Glacial Moraine A, Mixed-Size Gravel in Muddy Sand to Sand, and those with Boulder Field(s) (COP Appendix M.3, INSPIRE, 2022). Northern star coral occurred in Brayton Point ECC in Federal Waters and in Rhode Island State Waters in Rhode Island Sound. The non-native tunicate *Didemnum* spp. potentially occurred in the Federal Waters portion of the Brayton Point ECC at Southwest Shoal.

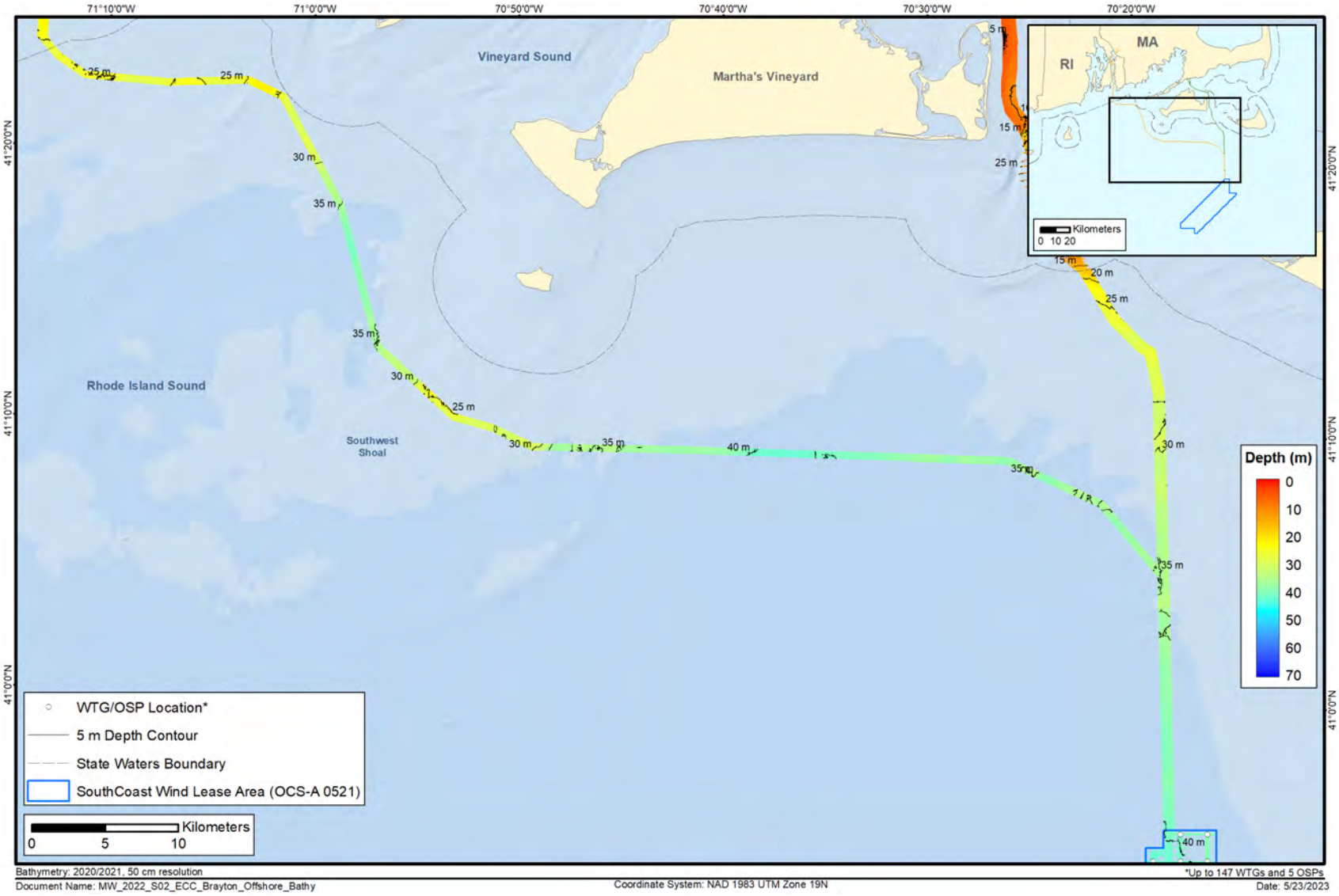

Figure 2-2a. Bathymetry at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).

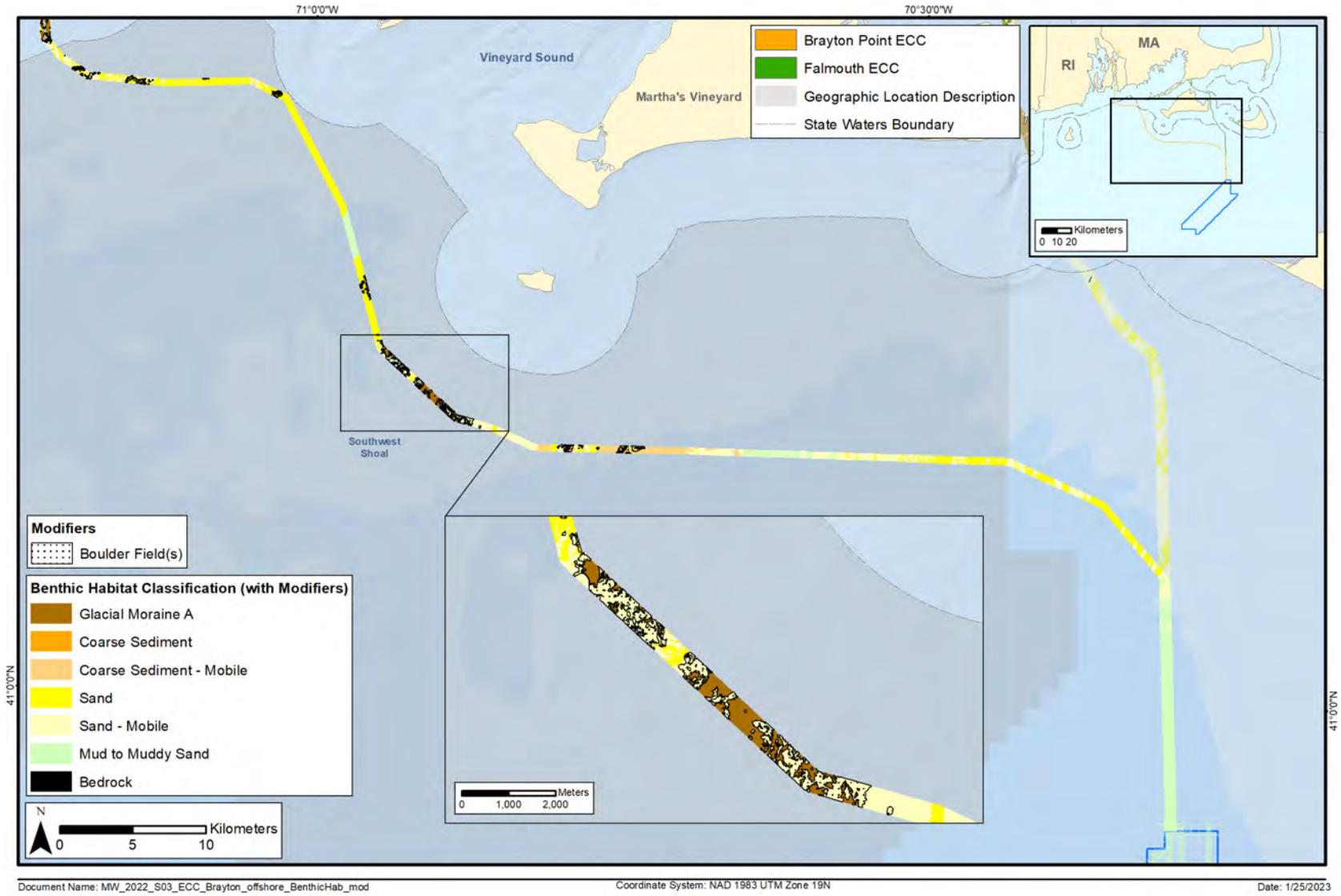

Figure 2-2b. Benthic habitats with modifiers at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).

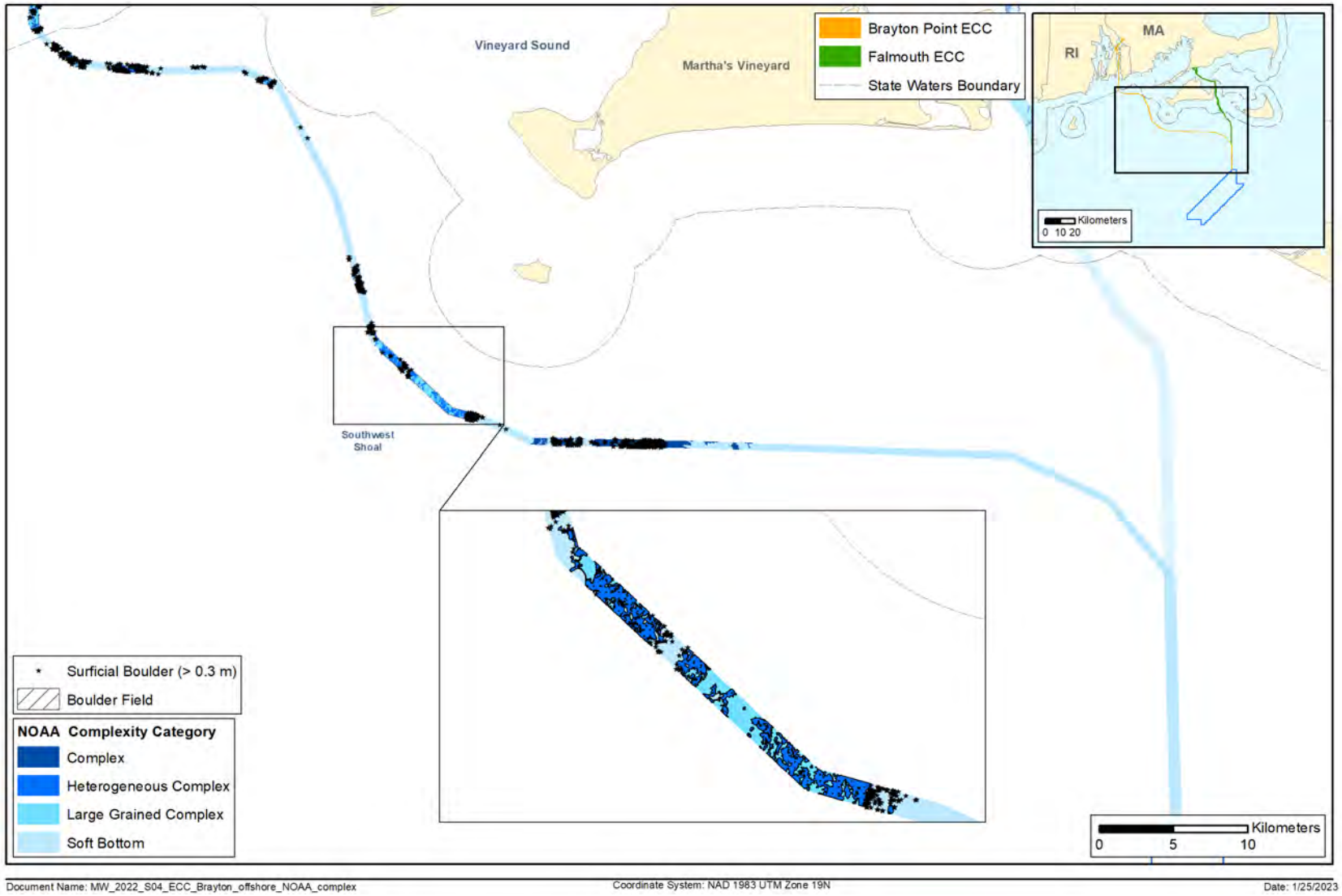

Figure 2-2c. Benthic habitats classified using NOAA categories at the SouthCoast Wind Brayton Point ECC offshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022).

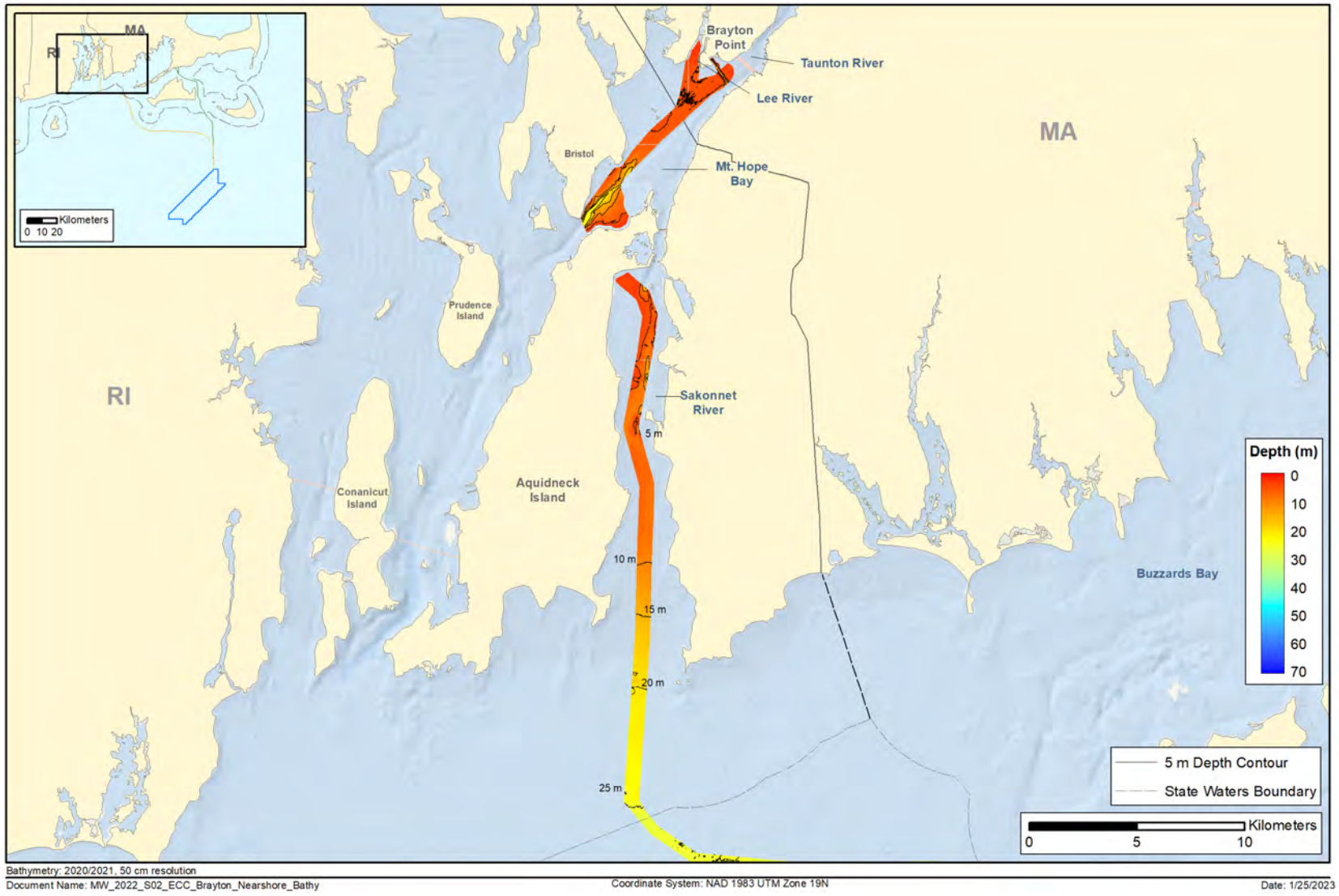

Figure 2-3a. **Bathymetry at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)**

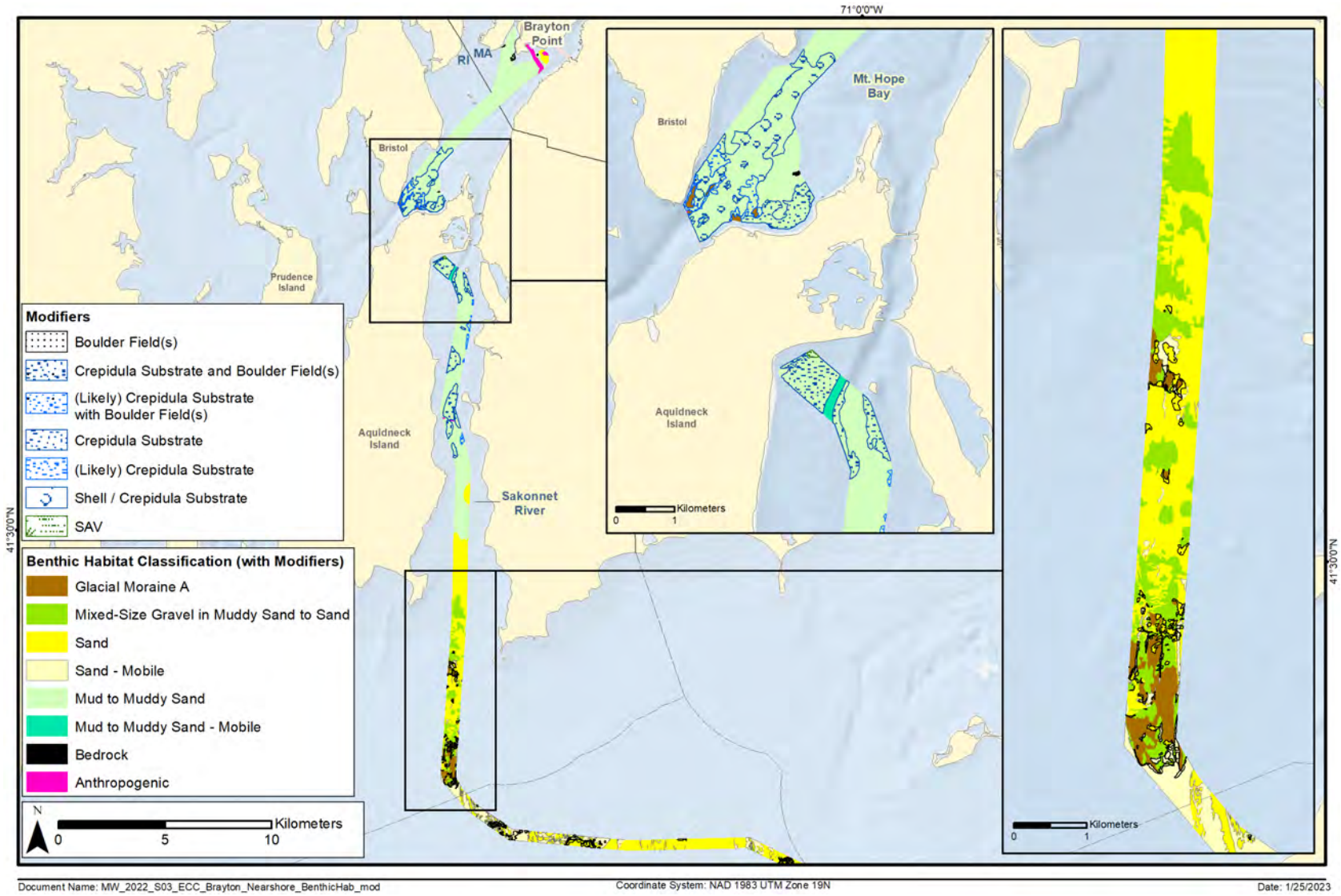

Figure 2-3b. **Benthic habitats with modifiers at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)**

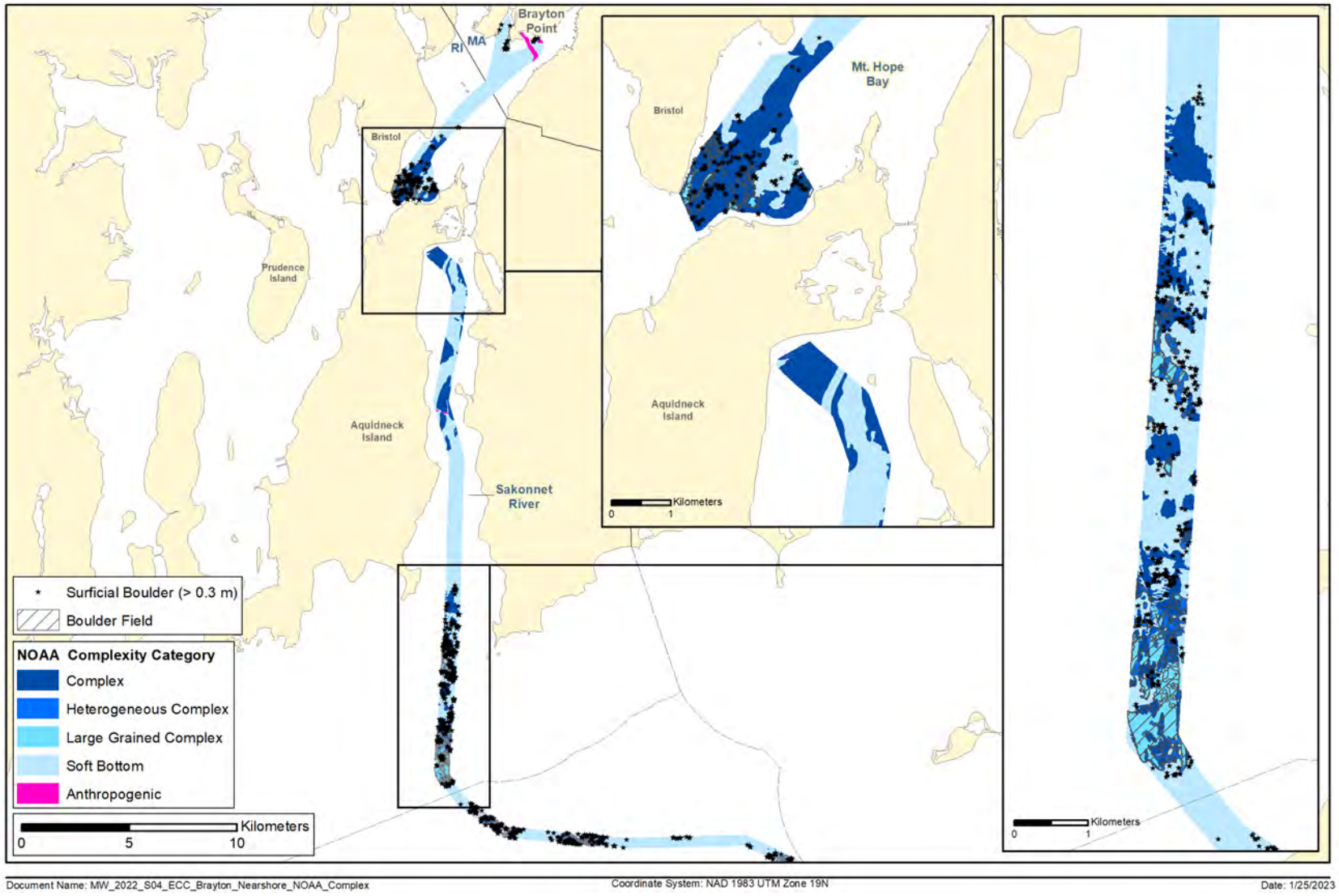

Figure 2-3c. **Benthic habitats classified using NOAA categories at the SouthCoast Wind Brayton Point ECC nearshore. Originally described in SouthCoast Wind's Construction and Operations Plan (COP) Appendix M.3 Habitat Mapping to Support Essential Fish Habitat Consultation (INSPIRE Environmental 2022)**

3. Benthic Monitoring Objectives and Hypotheses

Installation and operation of offshore wind projects can temporarily disturb existing benthic habitats and introduce new habitats. The level of impact and recovery from disturbance can vary depending on existing habitats at the site (Wilhelmsson and Malm, 2008; HDR, 2020). Physical disturbance associated with cable and foundation installation can temporarily affect sediments, resulting in mortality or injury of existing fauna. The introduction of hard substrata (WTG foundations, scour protection layers, and cable protection layers) can lead to extensive biological growth on the introduced surfaces with complex patterns analogous to the depth zonation observed along shoreline intertidal to subtidal gradients (artificial reef effect, Petersen and Malm, 2009; Reubens et al., 2013; Degraer et al., 2020). Patterns of ecological zonation on these structures will be driven mainly by tides, water depth, light availability, and currents. Depending on the community composition and density, this biological epifaunal growth may lead to substantial shifts in the transfer of energy from the water column to other compartments of the ecosystem including the surrounding sediments and upper trophic levels.

Observations from existing offshore wind projects lead to four prevailing hypotheses related to benthic effects relevant to the proposed SouthCoast Wind Project:

> Hypothesis 1 *[Hard Bottom-Novel Surfaces]*: Introduction of novel surfaces (foundations, scour protection, and cable protection layers) act as an artificial reef that accumulates diverse epifauna, which vary with depth and change over time (as reviewed in Langhamer, 2012 and Degraer et al. 2020).
>
> Hypothesis 2 [*Structure-associated – Organic Enrichment*]: The artificial reef effect (epifaunal colonization) associated with the offshore wind structures will lead to enrichment (fining and higher organic content) of surrounding soft bottom habitats resulting in shifts in benthic function (increased organic matter processing) (e.g., Lefaible et al., 2019; Ivanov et al., 2021).
>
> Hypothesis 3 [*Cable-associated – Physical Disturbance Soft Sediments*]: Physical disturbance of soft sediments during cable installation will temporarily disrupt the function of the infaunal community, community function is expected to return to pre-disturbance conditions (e.g., Kraus and Carter, 2018).
>
> Hypothesis 4 [*Cable-associated – Physical Disturbance Hard Bottom]*: Physical disturbance of native hard bottom habitats from cable installation (including seafloor preparation) will alter physical habitat characteristics (e.g., rugosity, complexity, substrate type) along the path of disturbance, which will vary with distance from disturbance (Guarinello and Carey 2020); this shift in physical characteristics will influence benthic colonization of the substrate in a similar way as the natural benthic habitat away from the disturbance.

The consequences of these predicted effects may affect the role of these benthic habitats in providing food resources, refuge, and spawning habitat for fish and shellfish species (Reubens et al., 2014; Krone et al., 2017). Benthic monitoring will focus on determining if there are unexpected changes to the benthic ecosystem associated with the development of the wind farm. Specifically, the monitoring will focus on documenting potential adverse outcomes associated with each of the four hypotheses described above including:

- Relative abundance of non-native species relative to native species [*Hard Bottom-Novel Surfaces*],
- Evidence of impairment associated with organic enrichment on the seafloor surrounding the novel structures [*Structure-associated – Organic Enrichment*], and

- Delayed recovery from physical disturbance along the export cable routes [*Cable-associated Physical Disturbance*].

This benthic monitoring plan is organized according to these four hypotheses (and potential adverse outcomes) associated with the SouthCoast Wind Project. The plan describes the overall approach to tracking changes in benthic habitats associated with the Project development and operation. This monitoring plan is not designed to answer research questions about specific causes and effects on individual species but rather is aimed at monitoring potential changes associated with the benthic habitats of the SouthCoast Wind Project. A comprehensive outline of the benthic monitoring plan, including the hypotheses, sampling schedule, and general approach for each monitoring component is provided in Table 3-1. The planned statistical analyses are summarized by survey type in Table 3-2.

Table 3-1. Summary of the Benthic Monitoring Plan Including Hypotheses, Approach, and Sampling Schedules for Each Component

Hard Bottom-Novel Surfaces	Structure-associated Organic Enrichment	Cable-associated Physical Disturbance
WTG/OSPs, Scour/Cable Protection	*Seafloor surrounding WTG/OSPs*	*Export Cable Segments*
Hypothesis: diverse epifaunal communities will accumulate on novel surfaces that act as an artificial reef. Community composition will vary with water depth (zonation with light and tide) and through time with successional development. Approach: Use ROV/stereo camera to measure changes in % cover, identify key or dominant species, focus on documenting non-native species, estimate volume (biomass), compare across water depths Design: stratified random selection of WTG foundations within water depth contour strata; one OSP foundation sampled [same foundations as Structure-associated Organic Enrichment Surveys]; selection of export cable protection areas to be determined following construction Y0 – N/A no structures in place to monitor, yet Y1 – during the first late spring/early fall after construction Y3- three years post construction	Hypothesis: epifaunal growth on foundations will result in sediment fining and higher organic content in surrounding soft bottom, this will support deposit feeding benthic invertebrates. Effects will decrease with increasing distance from structure foundation. Approach: Use SPI/PV, sediment grab samples (organic matter characterization, grain size) to measure changes in benthic function over time and with distance from foundations, focus on documenting any evidence of impairment (Beggiatoa, methane, zero aRPD depth) Design: stratified random selection of foundations within water depth contour strata [same foundations as Novel Hard Bottom surveys]; BAG design at each selected foundation: 2 radial transects at each foundation, distances are from edge of scour protection layer – • 0-10m (SPI/PV + sediment samples) • 15-25 m (SPI/PV) • 40-50 m (SPI/PV + sediment samples) • 90-100 m (SPI/PV) • 900m (SPI/PV + sediment samples) Y0 – Pre seabed prep Y1 – during the first late spring/early fall after construction Y3 – three years post construction	Hypotheses: (1) After initial physical disturbance during construction, soft sediment community function is expected to return to pre-conditions; effects will decrease with increasing distance from cable. (2) Physical disturbance of native hard bottom habitats from cable installation (including seafloor preparation) will alter physical habitat characteristics (e.g., rugosity, complexity, substrate type) along the path of disturbance, which will vary with distance from disturbance; this shift in physical characteristics will influence benthic colonization of the substrate in a similar way as the natural benthic habitat away from the disturbance Approach: Use SPI/PV and video/still imagery to measure changes in benthic function over time and with distance from cable centerline; focus on documenting any delayed recovery following disturbance. Design: stratified random selection of cable segments within benthic habitat; BAG at each selected cable segment, triplicate transects perpendicular from cable centerline – 10 stations along each transect (5 on each side) with varying distances from cable Y0 – Pre seabed prep Y1 – during the first late spring/early fall after construction Y3 – three years post construction

Table 3-2. Summary of Planned Statistical Analyses for the Benthic Monitoring Surveys for SouthCoast Wind

Survey	Novel Hard Bottom Monitoring	Structure-associated Organic Enrichment	Cable-associated Physical Disturbance
Monitoring Plan Section	4.0	5.0	6.0
Area	SouthCoast Wind Lease Area and Export Cable Segments with Cable Protection	SouthCoast Wind Lease Area	Brayton Point Export Cable Corridor
Design Type	Stratified Random	BAG	BAG
Design Overview	WTG foundations: random samples (WTGs) stratified by depth range; single season. Substation foundations will also be sampled. Segments of export cable route where cable protection materials were used.	Impact only (no reference sites); stations at distances ranging from ~10 m to ~900 m from foundations; 2 directions from each foundation along prevailing current; single season.	Impact only (no reference sites); stations at distances ranging from ~5 m to ~1 km from cable; ≥3 transects within each habitat stratum.
Number of Replicates	4 replicate WTGs per depth stratum; 1 offshore substation platform (OSP) foundation; 3 replicate export cable segments with protection (locations TBD)*.	4 replicate WTGs per depth stratum; 1 OSP foundation.	3 replicate transects per habitat type
Sampling Effort	1 OSP foundation + [2 depth ranges x 4 WTGs] = **~9 structures** 3 segments of protected cable	~ 9 structures x 2 transects x 5 stations = **90 Sediment Profile and Plan View Imaging (SPI/PV) stations.**	3 habitat strata x 3 transects x 10 stations along each replicate transect = **90 SPI/PV stations.**
Design details	**Sampling frame =** WTG foundations **Observational unit** = imaged quadrat (at systematically sampled depth intervals within frame). **Response variable** = macrobiotic cover, relative abundance of native vs non-native, presence of sensitive taxa and species of concern. **Error variance** = among image quadrats at the same depth- and distance-direction (WTGs provide replication).	**Sampling frame** = WTG foundations with mobile sediment classes up/down current. **Observational unit** = SPI/PV station (WTGs randomized first survey event, then fixed throughout study; stations randomized every survey; replicate images are subsamples). **Response variable** = mean or max per station depending on metric. **Error variance** = among stations at the same distance-direction (WTGs provide replication).	**Sampling frame** = benthic areas of export cable route. **Observational unit** = SPI/PV station (transects randomized first survey event, then fixed throughout study; stations randomized every survey; replicate images are subsamples). Video/still transects and subsampled stations in hard bottom habitats. **Response variable** = mean or max per station depending on metric. **Error variance** = among stations at the

Survey	Novel Hard Bottom Monitoring	Structure-associated Organic Enrichment	Cable-associated Physical Disturbance
			same distance-direction (transects provide replication).
Metrics of Interest	**ROV/stereo-camera**: cover (macrobiota, relative abundance of native vs. invasive). **Photogrammetry***:* Estimate of biomass/biovolume.	**SPI**: apparent redox potential discontinuity (aRPD), successional stage, penetration, methane, grain size major mode, *Beggiatoa.* **PV**: cover (macrobiota, shells, cobble), presence/absence of sensitive or invasive species. **Sediment Grab:** percent organic matter, total organic carbon, total nitrogen, C:N.	**SPI**: aRPD, successional stage, penetration **PV**: cover (macrobiota, shells, cobble), presence/absence of sensitive or invasive species. Video/still imagery: cover (macrobiota, gravels), presence/absence of sensitive or invasive species.
Hypothesis framework	Introduced novel surfaces will act as an artificial reef that accumulates diverse epifauna that vary with depth and change over time.	The artificial reef effect associated with novel structures will lead to enrichment (fining and organic matter content) of surrounding seafloor leading to shifts in benthic function (differences in aRPD depths, bioturbation depths, infaunal successional stage, grain size).	Physical disturbance during cable installation will disrupt benthic function, effects expected to decrease with distance from export cable and over time.
Post-Construction Statistical Methods	Fit a parametric generalized model (e.g., Generalized Linear Model [GLM], Generalized Linear Mixed Model [GLMM], or Generalized Additive Model [GAM]) or non-parametric regression tree that best describes the data. Quantify changes in the temporal profiles across spatial gradients. Calculate similarity between stations; graphically depict relationships between stations from different years, directions, or distances with non-metric Multidimensional Scaling (nMDS).	Fit a parametric generalized model (e.g., GLM, GLMM or GAM) or non-parametric regression tree that best describes the data. Quantify changes in the temporal profiles across spatial gradients. Calculate similarity between stations; graphically depict relationships between stations from different years, directions, or distances with nMDS.	Fit a parametric generalized model (e.g., GLM, GLMM or GAM) or non-parametric regression tree that best describes the data. Quantify changes in the temporal profiles across spatial gradients. Calculate similarity between stations; graphically depict relationships between stations from different years, directions, or distances with nMDS.

*for the novel hard bottom survey replication will be the WTG foundations (n=4 within each of the two depth ranges (>50 m, <50 m) and the sections of the cable protection (n=3).

4. Novel Hard Bottom Monitoring – WTG Foundations and Cable Protection

Hypothesis 1: Introduced novel surfaces will act as an artificial reef that accumulates diverse epifauna that vary with depth and change over time. *[Hard Bottom – Novel Surfaces]* (as reviewed in Langhamer, 2012).

The novel hard bottom monitoring will examine three types of novel surfaces: WTG foundations (including associated scour protection layers), export cable protection layers, and an OSP foundation. The novel hard bottom survey primarily aims to measure changes (over time and with water depth) to the nature and extent of macrobiotic cover of novel hard bottom associated with the SouthCoast Wind Project. The results of these surveys will provide insight into whether the accumulated epifauna can enhance ecosystem services including the abundance of species that may have economic value, increase habitat complexity, thereby promoting a diverse and productive reef system (e.g., emergent epifauna), may alter organic matter flow through the food web (with potential implications to carbon sequestration and nutrient dynamics), and/or are non-indigenous and could outcompete native species.

The surveys will document macrofaunal percent cover, identification of species (to the lowest possible taxonomic unit [LPIL]), and the relative abundance of native and non-native organisms using a Remotely Operated Vehicle (ROV) and stereo camera surveying approach. Distinguishing non-native organisms may require physical sampling for accurate identification, using a sampling arm attached to the ROV.

It is expected that the epifaunal community that colonizes the foundations will vary with water depth, dictated by the availability of light and tides, similar to zonation patterns commonly observed at coastal rocky intertidal habitats. Previous studies in Europe and at the Block Island Wind Farm (BIWF) found biological growth led to dense accumulations of filter feeding mussels on the WTG foundations, with amphipods, tunicates, sponges, and sea anemones on the deeper segments of the structures (De Mesel et al., 2015; Kerckhof et al. 2019; HDR, 2020; Wilber et al., 2021; Hutchison et al., 2020). Other studies have also tracked and documented vertical zonation of epibenthic communities along the surface of WTG structures (Bouma and Lengkeek, 2012; Hiscock et al., 2002; HDR, 2020). At any given depth of the WTG structure, the epifaunal species composition is expected to develop successionally, with rapid opportunistic organisms pioneering the site and being replaced by more long-lived established species.

4.1 Technical Approach – Stereo Camera Imagery

To accomplish the objectives of the novel hard bottom surveys, high-definition (HD) video camera and ultra-high-definition (UHD) stereo camera will collect imagery from a compact ROV. This imagery will document epifaunal community characteristics on the novel hard surfaces (WTG foundations and scour protection layers, OSP foundation, cable protection layers). Also, the imagery will be used to build 3D models from these static, stereo images captured from multiple perspectives using the Structure from Motion technique, i.e., photogrammetry. The compact ROV will be equipped with a surface differential positioning system, an Ultra Short Baseline (USBL), and motion and depth sensors. The ROV will host 1) one downward facing UHD stereo camera to observe and capture high-resolution images of the seafloor surface, 2) one forward facing UHD stereo camera to collect data on vertical surfaces and avoid collisions, and 3) one HD video camera.

The UHD stereo imagery analysis will focus on biological features (e.g., percent cover of encrusting epifauna), identifying any non-native organisms, sensitive taxa, species of concern, presence of refuge, and quantifying the biomass of the dominant members of the epifaunal communities. The 3D model will

determine 1) habitat complexity, a component of essential fish habitat, and 2) the thickness and volume of epifauna growing on infrastructure. The HD video will focus on quantitative details of habitat characteristics and quality, including categorical levels for the presence of fish and decapods, and surrounding substrata (sediment type), and the percent cover of emergent fauna.

4.1.1 Justification

Images provide a data-rich record of benthic communities. However, images flatten the landscape, which can introduce bias, limit identification, and distort quantitative analyses. Three dimensional (3D) overcome these challenges and allow for site characterization with improved accuracy compared to traditional 2D methods (Kornder et al., 2021). Furthermore, stereo cameras collect paired images and this pairing enables scaled, 3D model building without scene preparation, which reduces costs, risks, and the need for site modifications. Stereo cameras do not require scene preparation because they are scaled by the specific manufacturer's calibration of the two cameras with each other. Stereo camera systems are not new. For example, Done reconstructed a habitat scale 3D model of a coral reef, using a stereo camera, over forty years ago (Done, 1981). Compared to single camera systems, few researchers use stereo cameras to monitor ecological change because, until recently, commercial vendors did not offer these types of systems for subtidal work. Now, commercial vendors manufacture stereo camera systems and support their use in offshore, subtidal habitats to monitor equipment and environmental impacts for multiple energy industries.

4.1.2 Survey and Data Products

Stereo camera surveys will be conducted to collect UHD images at depth intervals along the WTG foundations and discrete areas of the cable protection layers. The data will include the photographs, the calibrated 3D products, including a dense point cloud with color, a mesh, and a textured mesh. This analysis will generate a point cloud and mesh for quantitative analysis, and a textured mesh for visualization and communication.

By digitally reconstructing segments of the foundations and cable protection at predefined depth intervals, the resulting 3D model can be analyzed for quantitative variables including percent cover, standing biomass, and abundance of individual taxa of interest (as reviewed in Marre et al., 2019). Collecting imagery and constructing spatial photogrammetric models of the structures soon after construction will provide initial reference conditions that can be used to track biological changes over time following subsequent years of data collection (i.e., change analysis).

Habitat complexity, i.e., rugosity, will be estimated from the 3D model, which approximates the abundance of refugia for key species including fish. Traditionally, scuba divers estimate rugosity as the ratio of a straight line and a draped flexible chain over the reef (Risk 1972). Now, researchers (Kornder et al., 2021) estimate rugosity (f_r) from 3D models as

$$f_r = A_t/A_g$$

where A_t is the true surface area of a complex object and A_g is the geometric surface area of a 3D convex hull wrapping the complex object. Larger values of rugosity indicate more refugia and 3D complexity, and values closer to 1 indicate fewer refugia and 3D complexity. This analysis will calculate A_t and A_g from the reconstructed 3D models from 10 sub-sampled chunks for each replicate area, e.g., in python or meshlab. This analysis is comparable to the traditional field methods for rugosity using a transect tape and chain, however, using a virtual 3D model, this analysis can collect more and better data in 3D versus in 2D.

Biological data obtained from the 3D model can be used to estimate ecological functions including secondary production, and physiological rates such as biodeposition associated with the epifaunal community. These biological processes affect the transfer of energy and nutrients to higher trophic levels and to the sediments at the base of the novel structures. This approach will provide an estimate of the increase in standing stock biomass at the basal trophic levels where filter feeding epifauna (e.g., blue mussels, sea squirts) exist. This information can inform ecosystem models that seek to understand how these changes to the basal trophic level may alter food web dynamics, objectives that are beyond the scope of this monitoring plan.

The following parameters will be measured as part of the hard bottom analysis:

UHD stereo images:

- Community assemblages
- Percent cover of encrusting or colonial taxa
- Number of key solitary taxa
- Species identification to the lowest possible taxonomic level
- Non-native species
- Species of concern (Guida et al., 2017)
- Sensitive species (e.g., slow growing species)
- Ecologically valuable taxa (e.g., biogenic structure-forming taxa such as emergent fauna)

HD video:

- CMECS Substrate Group and Subgroup
- CMECS Biotic Subclass and Group
- Presence of fish, identified to the LPIL
- Presence of abandoned fishing gear

3D model reconstructed from UHD stereo images:

- Rugosity, to approximate habitat complexity and essential fish habitat
- Thickness and volume of epifauna on infrastructure

Interpreted data, e.g., model products:

- Potential to alter energy transfer, and therefore carbon sequestration
- Potential to alter nutrient regimes

4.2 Survey Design

ROV stereo camera surveys will monitor novel hard bottom habitats within subareas of the SouthCoast Wind Project, at structures selected using a stratified random design. The selected WTG and OSP

foundations will be surveyed from the air-sea interface down to the seafloor and away from the structure to the edge of the scour protection layer using underwater image collection. For each selected foundation, the field team will collect UHD images with a stereo camera following vendor-specific protocols. For example, the field team will likely collect images with auxiliary lights, with at least 50 percent overlap for all survey lines, with ~1 m (3.3 ft) stand-off distance, in a lawnmower pattern. Furthermore, depending on the software employed, a live sparse point cloud may be rendered during collection to identify and fill gaps in the model by collecting additional images in real time.

The *Novel Hard Bottom Monitoring* program will include the following components:

- WTG foundations selected according to a stratified random design, with water depth ranges as strata (four replicate WTGs per stratum)
- One OSP foundation randomly selected
- Three segments of the export cable that are armored using cable protection material, information that is not yet known. These segments will be selected randomly considering environmental factors including water depth, natural benthic habitat of the surrounding seafloor, and distance from shore as explanatory variables.

The *Structure-associated Organic Enrichment* monitoring survey will include the same WTG foundations selected for this novel hard bottom survey (see Section 5). Using the same WTGs will facilitate synthesis between the degree of enrichment in the surrounding soft sediments and the epifaunal community composition and density colonizing the novel structures at any given time and location.

The WTG foundation monitoring program will be a stratified random design within the SouthCoast Wind Lease Area. Surveys will sample four replicate WTGs, randomly selected within each of two depth contour strata, <50 m (<164 ft) and >50 (>164 ft). Surveys will scan and sample these replicate WTGs during each survey event (Table 3-1). The hard bottom monitoring will occur in late summer/early fall for each survey. The initial baseline survey will occur during the first late summer/early fall following construction (Y1). The survey will then be repeated three years following construction (Y3). Results year 3 monitoring will be reviewed, and additional monitoring will be completed five years post construction (Y5), if needed. If after three years following installation, adverse impacts are detected in association with the benthic function of the recovering benthic community, additional years of surveying will be conducted. This would include the detection of invasion by non-native taxa or the lack of recolonization by benthic taxa. The objective of the benthic monitoring is to determine if adverse shifts in benthic function occurs, observing the full recovery of the benthic community is not a goal of this operational monitoring program. The decision on whether to extend the monitoring program or adjust the frequency will be discussed with appropriate federal and state agencies. For each component of the monitoring program, the analysis will include selected images and sections of the 3D models.

4.3 Statistical Analyses

The planned statistical analyses are summarized by survey type in Table 3-2.

For the Novel Hard Bottom Monitoring dataset collected at WTG foundations and scour protection layers, an OSP foundation, and cable protection layers, data analysis will include exploratory multivariate approaches (e.g., nMDS) to identify patterns among responses (community composition; relative abundance of sensitive taxa, species of concern, non-native species, and ecologically valuable taxa;

rugosity, and volume) and predictors (e.g., depth; distance from the WTG; time since construction). Covariates in the model for the WTG foundation dataset will include direction (categorical); variability among WTGs will provide site-wide random error. For individual metrics that are consistently measured across WTGs, parametric or non-parametric regression (e.g., generalized modeling such as GLM or GAM; or regression trees) will be applied if the data prove to be sufficient and appropriate for these tools.

Additionally, graphical methods and descriptive statistics will be used to assess changes in the community composition and relative abundance over time and as a function of depth, and distance and direction from the novel structures (e.g., WTG). These graphical techniques may help to elucidate the spatial scale at which the greatest changes in benthic habitat quality occur.

Novel hard bottom monitoring surveys will provide count statistics, which determine estimates of occupancy assuming a known detection probability. MacKenzie et al. (2002) developed a framework to estimate detection probabilities from replicate surveys based on a zero-inflated binomial model, thus making it possible to estimate occupancy from count statistics. This approach does not require additional, expensive sampling, so it is well-suited to large-scale monitoring. In these surveys, replicate images for each station or depth will determine the detection probabilities, yielding an occupancy estimate along the gradient (e.g., distance from monopile or depth). As suitable, the analysis will incorporate covariates and quantify goodness of fit. Covariates could include effort or dominant attached type; for example, detection could decrease when the site is colonized by many mussels that obstruct detection of other taxa. These analyses will be completed with the R Package 'unmarked' (Fisk and Chandler, 2011).

5. Structure-Associated Organic Enrichment

Hypothesis 2: The artificial reef effect (epifaunal colonization) associated with the offshore wind structures will lead to enrichment (fining and higher organic content) of surrounding benthic habitats resulting in shifts in benthic function (increased organic matter processing). [*Structure-associated Organic Enrichment*] (e.g., Lefaible et al., 2019; Ivanov et al., 2021).

The *Structure-associated Organic Enrichment* monitoring will include an examination of two offshore wind components: WTG foundations and OSP foundations. The overall objectives of this component of the benthic monitoring program are to measure potential changes in the benthic function of the benthic habitats surrounding these novel structures over time, and to assess whether benthic function changes with distance from the base of the foundations. The focus will be on monitoring for and documenting any evidence of impairment associated with organic enrichment on the seafloor surrounding the foundations (e.g., *Beggiatoa,* methane presence, zero aRPD depth [no oxygen penetrating into the sediment]).

It is expected that the epibenthic community that colonizes the novel structures will supply organic matter to the sediments below through filtration, biodeposition, and general deposition of detrital biomass. This organic material sourced from the biological activity of the epibenthic community on the novel structures will likely alter the infaunal community activity, increasing sediment oxygen demand, and promoting the activity of deep-burrowing infauna. Based on benthic monitoring results at other offshore wind farms, the effects of the foundation on the surrounding soft sediment habitat are expected to decrease with increasing distance from the foundation (as reviewed in Degraer et al., 2020 and modeled in De Borger et al., 2021).

Benthic functioning of the soft bottom habitats at the base of the novel foundations will be captured using SPI/PV imagery, sediment grain size analysis, and organic matter characterization. These approaches will be employed at varying frequencies and spatial resolution as described below. The SPI/PV imagery will provide an overall integrated assessment of the physical parameters (grain size major mode) and biological factors (bioturbation depths, aRPD depths, methane production). At a subset of stations, the SPI/PV imagery will be supplemented by sediment grab samples analyzed for grain size, percent bulk organic matter, and total organic carbon and nitrogen content, which will provide insight into shifts in the organic matter loading to the sediments and the quality of the organic matter in the sediments (carbon to nitrogen ratio).

5.1 Technical Approach – SPI/PV

SPI/PV will be used as the primary monitoring approach for the *Structure-associated Organic Enrichment* monitoring surveys. The SPI and PV cameras capture benthic ecological functioning within the context of physical factors. The PV system captures high-resolution imagery over several meters of the seafloor, while the SPI system captures the typically unseen, sediment–water interface in the shallow seabed. Coupled SPI/PV imagery provides an integrated, multi-dimensional view of the benthic and geological condition of seafloor sediments and can characterize the function of the benthic habitat, physical changes, and recovery from physical disturbance following the construction and during operation of the SouthCoast Wind Project. Additionally, PV data will be used to characterize surficial geological and biotic (epifaunal) features of hard bottom areas within the sampling area (e.g., scour protection layers at the base of the foundations) but will not replace the dedicated novel hard bottom monitoring survey (Section 4).

SPI/PV imagery provides spatial and contextual information, such as oxygen penetration depths (aRPD depth), infaunal bioturbation depths, and small-scale grain size vertical layering that are critical pieces to assessing the ecological functioning of soft sediment habitats. Specifically, ecological functions related to organic matter processing, secondary production, and the forage-value of the benthic community are of particular importance when assessing impacts of offshore wind structures on soft sediment habitats (see Attachment A for more details). Taxonomic analysis of sediment grab samples provides information on the benthic community composition and infaunal abundances, but without making substantial inferences to relate presence and counts to biological activity and further ecological value or function, the sediment grab approach is severely limited in its ability to assess impacts of offshore wind development on soft sediment functioning. Further, given the inherently dynamic and patchy nature of infaunal populations, benthic species count data generally requires extensive replication, substantial transformations for normalization, and overextending inferences to relate species composition to function. SPI/PV imagery provides an effective snapshot of the overall ecological health and condition of the sediments as reflected and integrated over time and space by the continuous activity of the communities present (Germano et al., 2011). It is this holistic community activity, not necessarily the identity of community members, that requires careful assessment to determine impacts of offshore wind development on benthic habitats. Attachment A provides detailed justification for the use of SPI/PV imagery approach to meet these monitoring objectives and more detailed descriptions of several of the parameters that will be obtained during SPI/PV image analysis.

5.1.1 Survey and Data Products

The SPI/PV system will collect quantitative data on measurements associated with physical and biological changes related to benthic function (bioturbation and utilization of organic material) that might result from construction and operation of the SouthCoast Wind Project. SPI/PV and the parameters derived from these

images are standard tools for assessing the response to disturbance and enrichment (Germano et al., 2011). Seafloor geological and biogenic substrates captured in SPI/PV imagery will be described using the Coastal and Marine Ecological Classification Standard (CMECS; FGDC, 2012). Triplicate images will be collected and analyzed at each station.

The following parameters will be measured during SPI and PV image analysis:

- CMECS Substrate Group and Subgroup
- gravel size measurements (predominant, minimum, maximum), where applicable
- CMECS Biotic Class and Subclass
- aRPD depth (See Attachment A)
- maximum bioturbation depth
- infaunal successional stage (See Attachment A)
- methane presence/absence
- grain size major mode
- presence, frequency, size of surficial features such as bedforms (e.g., sand ripples)
- presence of sensitive taxa (e.g., slow growing species) and ecologically valuable taxa (e.g., biogenic structure-forming taxa such as emergent fauna) (see Attachment A)

Results from the three replicate images at each station will be aggregated to provide a summary value for each metric by station. Depending on the metric type, this will include mean, maximum, or predominant (categorical variables) (e.g., predominant CMECS Substrate Subgroup, maximum infaunal successional stage, maximum and median feeding void depth, and mean aRPD depths).

5.2 Technical Approach – Sediment Sampling

Sediment samples will be collected and analyzed for grain size distribution and organic matter characteristics. Sediments closer to the foundation structures are expected to become more organically enriched over time as detrital material originating from the epifaunal community activity (e.g., biodeposition) accumulates on the surrounding seafloor. The level of organic enrichment and organic matter loading will be assessed by analyzing sediment samples for bulk percent organic matter and total organic carbon and nitrogen content. The percent organic matter of the sediments (measured as loss-on-ignition) is expected to increase over time and decrease with distance from the structure. In addition to the quantity of organic matter in the sediments, the quality of sediment organic matter is important to consider when assessing shifts in benthic function. The quality of sediment organic matter will be assessed by analyzing sediment samples for organic carbon and total nitrogen content. The organic carbon to nitrogen ratio (C:N) of sediments provides insight into the quality or lability of the organic matter (i.e., how available it is to be decomposed or consumed). Finally, it is expected that the sediment grain size closer to the foundation structures will become finer over time. This will be measured using both SPI/PV imagery (grain size major mode) and physical sediment samples analyzed for grain size distribution.

5.3 Survey Design

The *Structure-associated Organic Enrichment* monitoring will be conducted using a Before-After Gradient (BAG) survey design to determine the spatial scale of potential impacts on benthic habitats at the SouthCoast Wind Lease Area. The same WTG foundations selected for the Novel Hard Bottom monitoring (Section 4.2) will be selected for the *Structure-associated Organic Enrichment* monitoring. The SouthCoast Wind Lease Area will be divided into two strata based on depth (<50 m [<164 ft] [shallow] and >50 m [>164 ft] [deep]). Four replicate WTGs will be randomly selected within each of the two depth strata for sampling. One OSP foundation will be randomly selected for monitoring. The surrounding seafloor of these replicate WTG and OSP foundations will be surveyed during each survey event (Table 3-1).

At each replicate WTG foundation and OSP foundation, a BAG survey design will be used for statistical evaluation of the spatial and temporal changes in the surrounding benthic habitat (Underwood, 1994; Methratta, 2020). Data will be collected before and after construction and operation at stations oriented along a gradient from the selected foundations (Figure 5-1). Each transect will include stations that sample the edge of the scour protection layer and the surrounding soft sediment. This BAG design is based on an understanding of the habitat distribution at the SouthCoast Wind Lease Area (COP Appendix M.3, INSPIRE, 2022), and an analysis of benthic monitoring results from European wind farms and the RODEO study at BIWF (HDR, 2020; Coates et al., 2014; Dannheim et al., 2019; Degraer et al., 2018; Lefaible et al., 2019; Lindeboom et al., 2011). The proposed BAG survey design eliminates the need for a reference area, as this design is focused on sampling along a spatial gradient within the area of interest rather than using a control location that may not be truly representative of the conditions within the area of interest (Methratta, 2020). This design also allows for the examination of spatial variation within the wind farm and does not assume homogeneity across sampling stations (Methratta, 2020).

The pre-construction benthic survey will be conducted in late spring or early fall (May to October) prior to the start of construction to document benthic habitats prior to disturbance (Y0, baseline). The next survey will occur during the first late spring/early fall following construction (Y1). The survey will then be repeated three years following construction (Y3). All surveys will be conducted in the same seasonal time frame, which will be during late spring or early fall to capture peak biomass and diversity of benthic organisms in alignment with previous studies (South Fork Wind LLC and INSPIRE, 2022; HDR ,2020; NYSERDA, 2017; Stokesbury, 2013, 2014; LaFrance et al., 2010, 2014). Benthic habitats in the northwest Atlantic are generally stable with little seasonality in the absence of physical disturbance or organic enrichment (Steimle, 1982; Reid et al., 1991; Theroux and Wigley, 1998; HDR, 2020).

Data on the mean currents near the SouthCoast Wind Lease Area will be used to establish up current and down current transects extending from each selected WTG foundation. Two transects of benthic stations will be established: one up current and the other down current of the selected WTG locations (Figure 5-1). Pre-construction transects will begin at the center point of the planned foundation with two stations at equal intervals up to the maximum planned extent of the scour protection area and then at intervals of 0-10 m, 15-25 m, 40-50 m, 90-100 m, and 900 m (0-32 ft, 49-82 ft, 131-164 ft, 295-328 ft, and 2,953 ft) extending outward from the edge of the scour protection area (Figure 5-1). Post-construction transects will repeat this design at the same WTGs and the same sampling distance intervals. These distances were chosen based on recent research indicating that effects of WTGs on the benthic environment occur on a local scale (e.g., Lindeboom et al., 2011; Coates et al., 2014; Degraer et al., 2018; HDR, 2019; Lefaible et al., 2019). SPI/PV imagery will be collected at every station. Physical sediment samples will be collected at the following stations beyond the scour protection layer (i.e., in soft sediments): 0-10 m, 40-50 m, and 900

m (0-32 ft, 131-164 ft, 2,953 ft). The lower sampling effort for the physical sediment samples relative to the SPI/PV stations is due to the fact that the sediment sample data (organic matter content) will be ground truthing the information obtained from the SPI/PV imagery.

5.4 Statistical Analyses

The planned statistical analyses are summarized by survey type in Table 3-2.

For the *Structure-associated Organic Enrichment* dataset collected at the base of the selected WTG foundations (BAG design), data analysis will include exploratory multivariate approaches (e.g., nMDS) to identify patterns among responses (SPI/PV metrics, e.g., aRPD, successional stage, feeding voids, presence of methane or *Beggiatoa*) and predictors (e.g., quantitative or categorical epifaunal/epifloral cover estimates on the WTG foundations; and distance from the WTG). Covariates in the model for the WTG foundation dataset will include water depth (continuous) and direction (categorical); variability among WTGs will provide site-wide random error. For individual metrics that are consistently measured across stations (e.g., aRPD depth, sediment organic matter content), parametric or non-parametric regression (e.g., generalized modeling such as GLM or GAM; or regression trees) will be applied if the data prove to be sufficient and appropriate for these tools.

Additionally, graphical methods and descriptive statistics will be used to assess changes in the SPI/PV metrics and sediment sample data over time and as a function of distance and direction from the novel structures (e.g., WTGs). These graphical techniques may help to elucidate the spatial scale at which the greatest changes in benthic habitat quality occur.

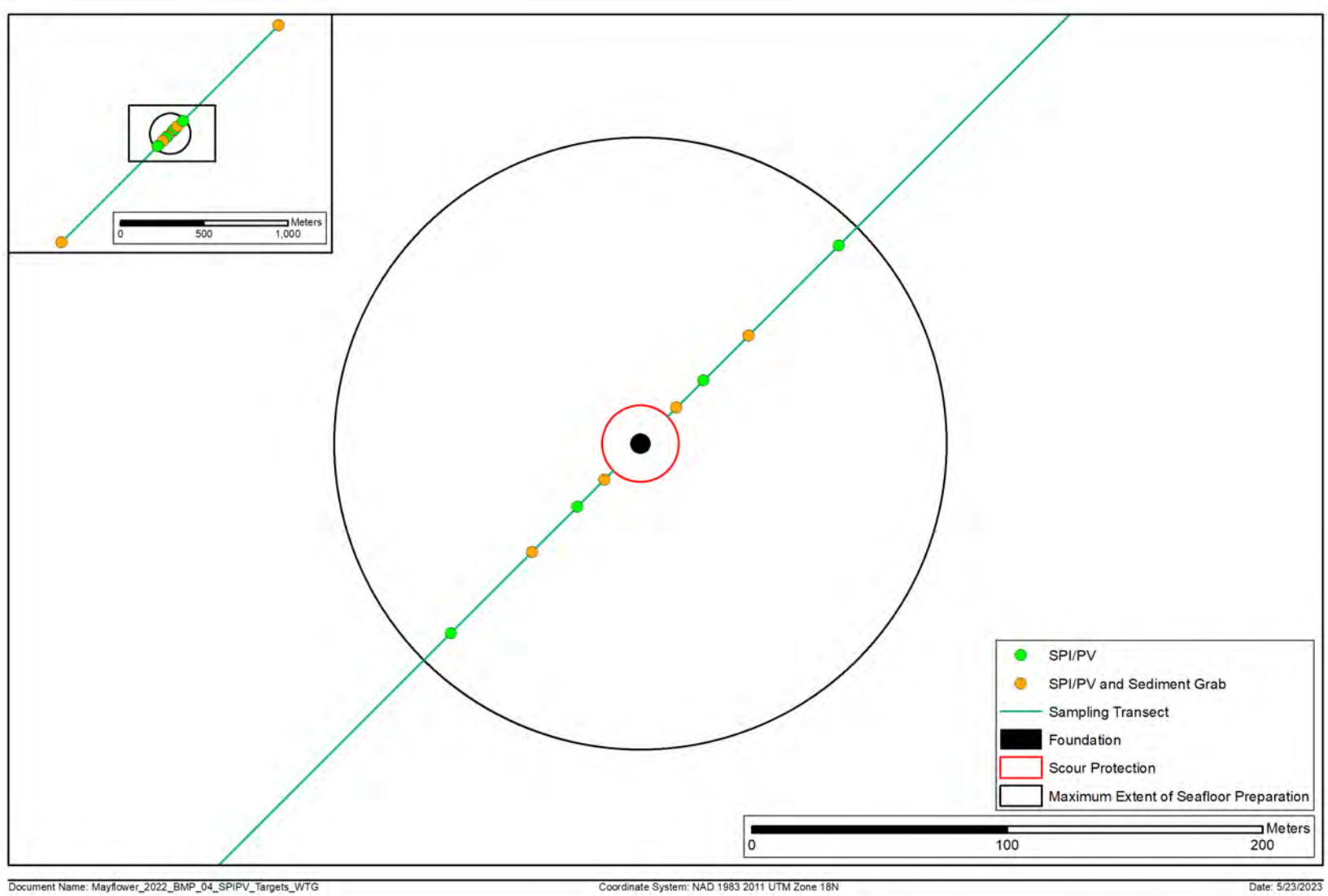

Figure 5-1. **Conceptual diagram illustrating the Before-After Gradient design of the Structure-associated Organic Enrichment survey design, SPI/PV and sediment grab station locations on the seafloor surrounding each selected foundation. The transect orientation will be based on prevailing water currents in the area, to capture upstream and downstream effects.**

6. Cable-Associated Physical Disturbance

Hypothesis 3: Physical disturbance of sediments from cable installation (including seafloor preparation) will temporarily disrupt the function of the infaunal community, community function is expected to return to pre-disturbance conditions. [*Cable-associated Physical Disturbance Soft Sediments*] (e.g., Kraus and Carter, 2018).

Hypothesis 4: Physical disturbance of native hard bottom habitats from cable installation (including seafloor preparation) will alter physical habitat characteristics (e.g., rugosity, complexity, substrate type) along the path of disturbance, which will vary with distance from disturbance (Guarinello and Carey 2020); this shift in physical characteristics will influence benthic colonization of the substrate in a similar way as the natural benthic habitat away from the disturbance. [*Cable-associated – Physical Disturbance Hard Bottom]*

The objective for the *Cable-associated Physical Disturbance* monitoring along the SouthCoast Wind export cables is to examine the effects of installation and operation of the export cables on the benthic habitat over time and along a spatial gradient with distance from the cable centerlines. This component of the benthic monitoring will include focused surveys along the export cable corridor. The focus of this monitoring will be on documenting any delayed recovery of the benthos following the physical disturbance associated with cable construction. Based on the review by Kraus and Carter, 2018, biological and physical recovery following cable installation is expected to take up to two years, with several studies reporting much faster rates of recovery (weeks to one year). Fishing activity may exert substantial physical disturbance in the soft sediment habitats along the cable route which may influence the recovery rate following cable installation. Note that monitoring epifaunal growth on any cable protection material along segments of the export cables is described within the novel hard bottom component of this monitoring plan (see Section 4). A separate monitoring plan will be developed that focuses on the Falmouth ECC if that route is selected as the POI for Project 2.

The primary effect of cable installation in soft bottom habitats is physical disturbance of the sediment resulting in sediment resuspension and temporary loss of infauna. The primary effect of cable installation in hard bottom habitats that requires boulder and cobble clearance is physical disturbance of the seafloor resulting in re-distribution of native substrate and temporary loss of epifauna (Guarinello and Carey 2020). Effects of installation and operation of the cable are expected to be roughly equivalent along the length of the cable within similar benthic habitat types. Other independent variables that may influence the benthic effects of and recovery from cable installation include levels of fishing activity (e.g., bottom trawling, clam dredging), installation methodology, and natural bottom sediment transport from tides, waves, and currents. These variables will be considered during data analysis and interpretation. The sampling design is intended to estimate effects along a spatial gradient away from the cable and will not estimate mean changes along the entire export cable routes. Any potential impacts of the cable on benthic habitats are expected to decrease over time after installation and with distance from the export cable centerline.

6.1 Technical Approach

SPI/PV will be the primary tool used to document any changes to the small-scale physical characteristics and benthic community function following cable installation within soft bottom habitat types. A general summary of the rationale and value of using SPI/PV is provided in Attachment A. Underwater imagery (video and still) will be the primary tool used to document any changes to physical characteristics and

benthic community function following cable installation (including seafloor preparation) within native hard bottom habitat types. Water temperature will be measured at each station.

In areas where the cable transits through complex habitat, underwater video and still imagery will be collected to assess recovery of the benthic habitat. A description of the technical approach for underwater video imagery is provided in Section 4.1. The same type of data will be collected for this component of the monitoring program.

6.2 Survey Design

A stratified random survey design will be used to select sampling frames along the export cables, stratified by predominant habitat types along the cable route. This monitoring plan provides a general overview of the design that can be adjusted when engineering and construction plans are finalized. Within each sampling frame, SPI/PV data will be collected using a BAG design in the areas where soft bottom habitat is predominant, like that proposed for the seafloor surrounding the foundations (Section 5) (Underwood, 1994; Methratta, 2020). Details describing the BAG design approach and its value in evaluating potential temporal and spatial changes following construction are provided in Section 5 above. In areas along the cable route where complex habitat (native hard bottom) occurs, underwater video and still imagery (as described in Section 4) will be used to assess benthic recovery.

The *Cable-Associated Physical Disturbance* monitoring sample design will focus on sampling at representative sections of the export cables based on benthic habitat types as informed by the benthic habitat mapping of the planned export cable corridor (COP Appendix M.3, INSPIRE, 2022). Sampling locations will be selected randomly, stratified by habitat types, including complex habitat (dominated by large substrata [boulders, cobble, and small gravels]). At six locations within each habitat type sampling stratum, transects will be positioned perpendicular to the cable route (three replicate transects per habitat stratum and direction) (Figures 6-1 and 6-2). Along each transect within soft bottom benthic habitat types, a total of five stations will be sampled. At each station, triplicate SPI/PV images will be collected and analyzed. Near the centerline these stations will be distributed roughly 10 m (32 ft) apart and the distance intervals between stations will increase with distance from the centerline (Figures 6-1 and 6-2).

The extent of physical disturbance during cable installation for the majority of the cable route is expected to be an approximately 6 m (20 ft) wide corridor around the cable centerline. The selected sampling locations and sampling intervals relative to the cable will remain fixed for the duration of the survey. The exact locations of the sampling frames will be selected after cable installation is completed; Figure 6-1 provides conceptual diagrams of the planned sampling design along the export cable corridors within potential benthic habitat strata within Federal Waters and State Waters. Sampling along the export cables will occur prior to construction (Y0), within the first calendar year post installation (Y1), and three years post-installation (Y3).

To evaluate cable-associated physical disturbance effects in hard bottom habitats, delineated complex habitat will be included as a stratum in the monitoring program, including Glacial Moraine A and where boulder fields occur (Figures 6-1 and 6-2). The survey design will be consistent with the soft bottom export cable locations, a BAG design, however the spatial scale of data collection will cater to the patchiness and general heterogeneity of these hard bottom habitats. As above, three transects oriented perpendicular to the export cable route will be sampled with video and still imagery. Video imagery will be collected along continuous transects perpendicular to and along the center line of where boulder relocation activities were conducted. At particular locations along the transects, as described above for the SPI/PV stations, multiple

replicates of high resolution still imagery will be collected over a square area of ~25m^2. The primary objective for this component of the hard bottom survey is to measure potential changes over time in the nature and extent of macrobiotic cover in both disturbed and undisturbed natural hard bottom areas. A secondary objective is to characterize overall changes to the physical attributes of the hard bottom habitat resulting from seafloor preparation. Continuous imagery collection along transects will be collected in a BAG design to assess impacts associated with seafloor preparation and cable installation on the surrounding benthic habitats (Figures 6-1 and 6-2).

Within state waters specific areas are of interest to regulatory agencies where complex habitats occur and boulder movement activities are expected prior to cable installation. These areas include the region northeast of Mount Hope Bridge, the pocket of Glacial Moraine west of Sakonnet Point, and the area near the state waters demarcation (Figure 6-2). As outlined in the state permitting requirements, targeted studies will be designed to monitor these three areas of interest following boulder relocation and cable installation; these studies will be further developed within the required Boulder Relocation Plan that will be drafted for agency review in accordance with the state permits. It is expected that monitoring in these areas will rely on a combination of video imagery and still imagery to capture any changes in the biological and physical characteristics of the habitat following cable installation. Figure 6-2 provides a conceptual diagram of the survey design and approach for these particular areas of complex habitat within state waters, however, the final monitoring plan for these areas will be provided in the Boulder Relocation Plan.

6.3 Statistical Analyses

The planned statistical analyses are summarized by survey type in Table 3-2.

For the *Cable-associated Physical Disturbance* dataset collected along the selected export cable segments (BAG design), data analysis will include exploratory multivariate approaches (e.g., nMDS) to identify patterns among responses (SPI/PV metrics, e.g., aRPD, successional stage, feeding voids, sediment grain size layering, percent macrobiotic cover) and predictors (e.g., distance from the cable, water depth). Covariates in the model for the export cable dataset will include habitat type (categorical) and direction (categorical); variability among transects will provide site-wide random error. For individual metrics that are consistently measured across stations (e.g., aRPD), parametric or non-parametric regression (e.g., generalized modeling such as GLM or GAM; or regression trees) will be applied if the data prove to be sufficient and appropriate for these tools.

Additionally, graphical methods and descriptive statistics will be used to assess changes in the SPI/PV metrics over time and as a function of distance and direction from the export cable centerline. These graphical techniques may help to elucidate the spatial scale at which the greatest changes in benthic habitat condition occur.

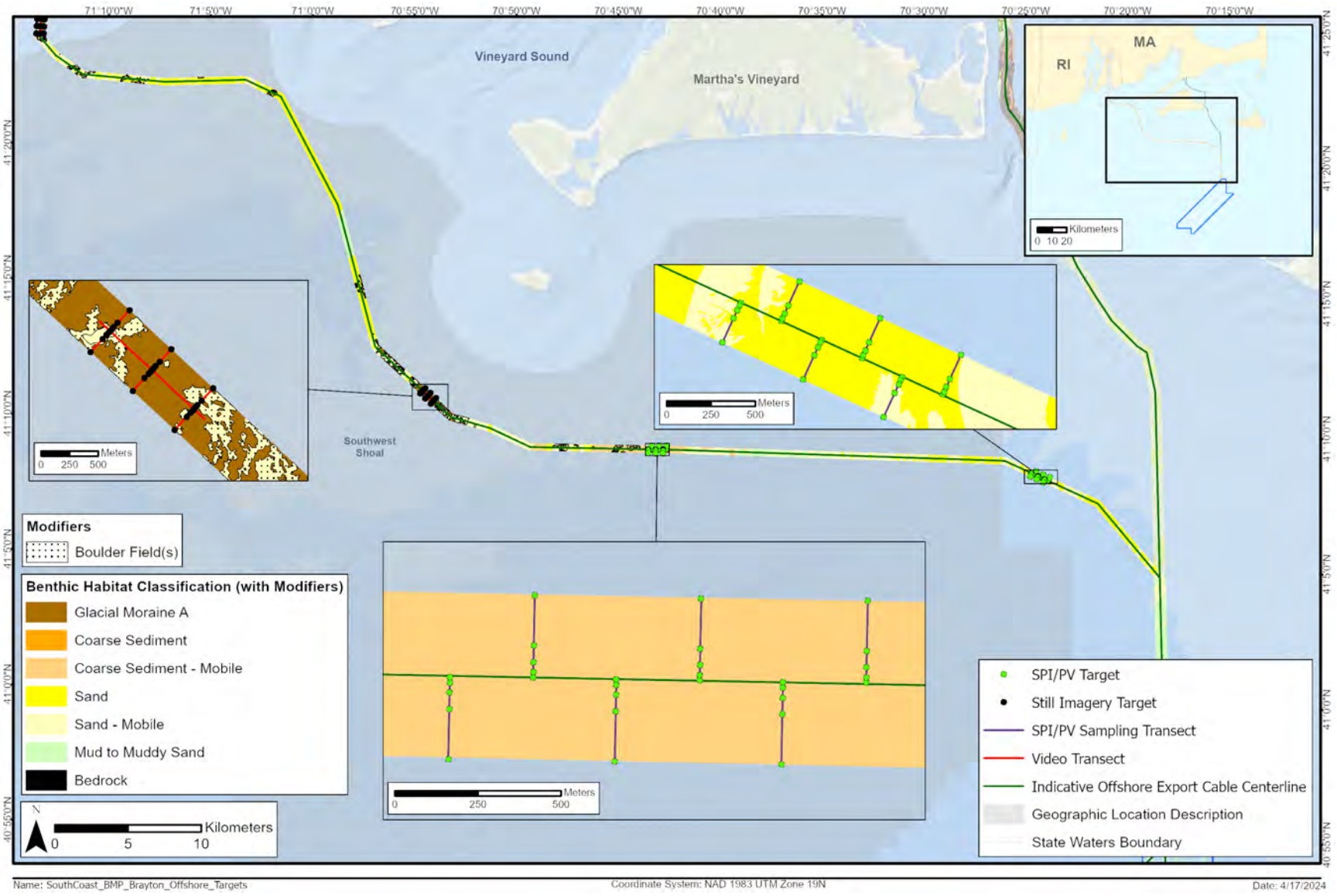

Figure 6-1. Conceptual diagram illustrating the Before-After Gradient design of Cable-associated Physical Disturbance survey design along the Brayton Point ECC in Federal Waters

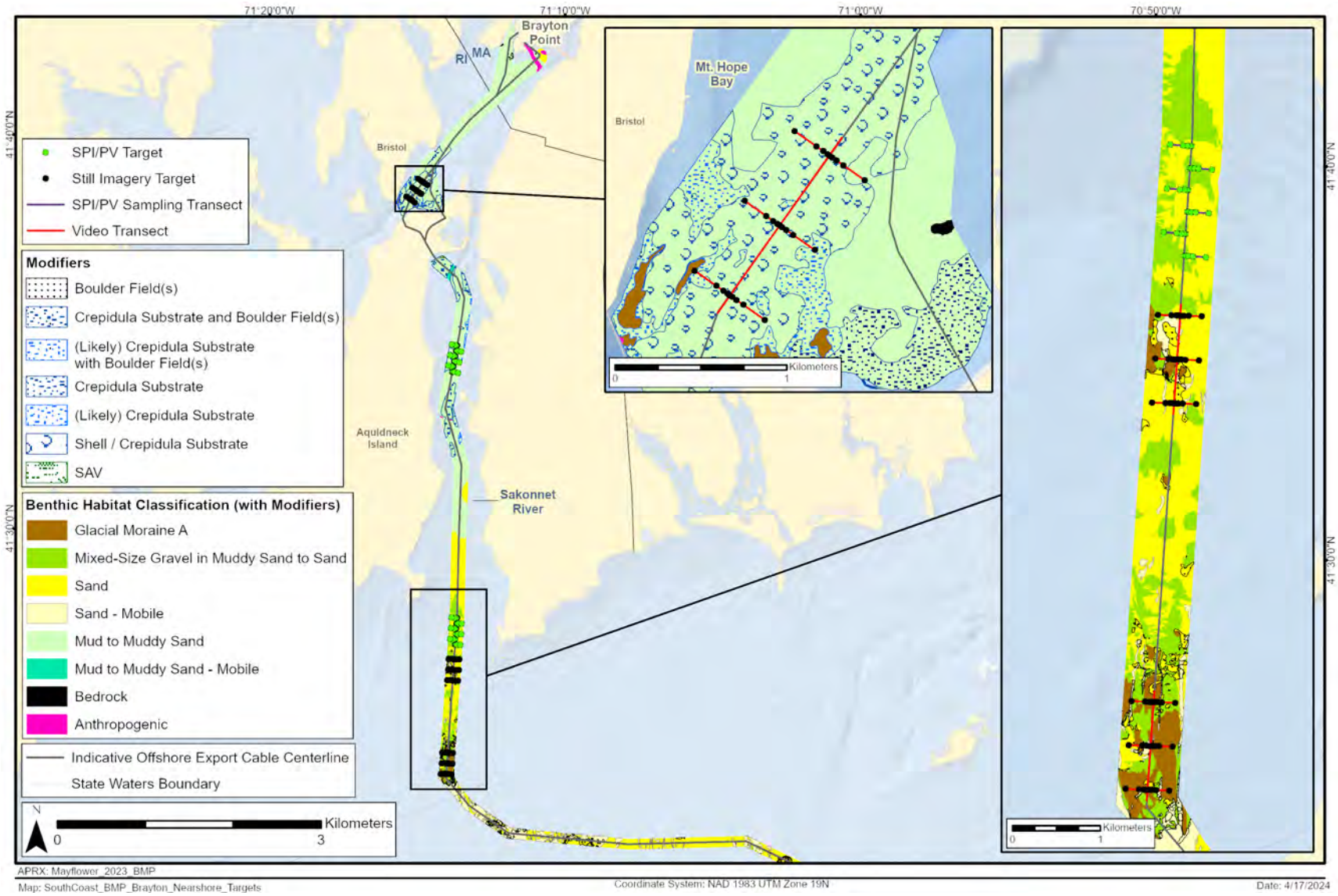

Figure 6-2. Conceptual diagram illustrating the Before-After Gradient design of Cable-associated Physical Disturbance survey design along the Brayton Point ECC in State Waters

7. Data Management, Reporting, and Data Sharing

Data may be shared with State and Federal agencies and other stakeholders upon request. Data will be prepared and disseminated after each survey year and will undergo rigorous quality assurance/quality control (QA/QC) audits prior to release.

Proper data management and traceability are integral to analysis and accurate interpretation and reporting. The surveys described in this monitoring plan will follow a rigorous system to inspect data throughout all stages of collection, processing, and analysis. This data management system will provide a high level of confidence in the accuracy of the data being reported. Data management will include methods for data collection, data storage and archiving, QA/QC audits, distribution and dissemination protocols and best practices, and analyses. Metadata will be developed for each survey dataset which will include descriptions of data fields, data processing, QA/QC procedures, etc.

Survey activities associated with the Benthic Monitoring Plan will adhere to reporting requirements outlined in Section 4.4 of the OCS-A 0521 Lease Agreement. This includes reporting to BOEM, NMFS, and NMFS Greater Atlantic (Northeast) Region's Stranding hotline within 24 hours of sighting any injured or dead protected species (e.g., marine mammals, sea turtles, sturgeon, or giant manta ray). All observed takes of listed marine mammals, sea turtles, sturgeon, or giant manta ray resulting in injury or mortality will also be reported within 24 hours to BOEM and NMFS, using the template outlined in Appendix A to Addendum C of the OCS-A 0521 Lease Agreement.

Annual reports will be prepared upon the conclusion of each year of sampling. These reports will be shared with State and Federal resource agencies upon request and as applicable. A final synthesis report will be prepared for each survey type after the final year of sampling has concluded. These synthesis reports will evaluate the survey findings during the pre- and post-construction survey time periods.

In order to obtain data derived from this monitoring plan, stakeholders must submit a formal request to SouthCoast Wind Energy LLC. A brief proposal will be required that states the purpose of the request, a description of the data requested (e.g., survey type, timeframe, species of interest), a list of collaborators and their affiliations, if applicable, and a description of the anticipated products of the work (e.g., manuscripts, fisheries stock assessments). Data access protocols will be developed to provide conditions for requesting monitoring data. Any data requested will be disseminated provided the criteria outlined in the data access protocols are met. Data will be sent to the requesting party electronically in most cases and any exceptions will be dealt with on a case-by-case basis with the party or parties seeking access. SouthCoast Wind will amend the above data sharing protocols, as necessary and applicable, in accordance with current data sharing efforts and guidance being developed through organizations such as the Regional Wildlife Science Collaborative (RWSC) and Responsible Offshore Science Alliance (ROSA).

8. Fisheries Coordination

SouthCoast Wind's Fisheries Manager actively communicates and collaborates with the fishing industry on behalf of the Project. These efforts are guided by SouthCoast Wind's Fisheries Communications Plan, which is publicly available on the SouthCoast Wind website at this link. Fishermen and other marine stakeholders can contact Fisheries Manager Sam Asci directly at 857-260-4116, or by email at samuel.asci@southcoastwind.com.

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SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment W: BENTHIC-GEOLOGIC REVIEW OF THE SOUTHCOAST WIND ECC

New: July 2024

Review of Benthic Geologic Habitat Mapping for the Proposed South Coast Wind Energy Cable Corridor

Bryan A. Oakley

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Report Prepared for Rhode Island Coastal Resources Management Council

3 November 2023

Oakley Geologic Consulting

The focus of this review is an examination of the interpretated benthic geologic habitats of the proposed South Coast Wind Energy Area (SCW) and Brayton Point Offshore Export Cable Corridor (OECC) within the Rhode Island Coastal Resources Management Council Geographic Location Description Boundary (GLD). A particular focus is on the results of the benthic habitat mapping data interpreted by Inspire Environmental, as well reports provided in the Construction and Operation Plan (COP). The scope of this review focused on the wind energy corridor extending through federal and Rhode Island state waters, however the review extended to cover the entire OECC extending to the landfall at Brayton Point, Massachusetts at the request of Rhode Island CRMC for consistency.

I concur with comments within the COP that the benthic data collected was of sufficient quality for the geologic interpretations, and proper tools and techniques were used in the field surveys. As an aside, the initial geophysical data collection efforts of FURGO (2022) are exceptionally well done, providing clear data sources for interpretation, and the organization of the data into a web-based GIS viewer by INSPIRE is intuitive and very well organized. The overall mapping of geologic habitats (specifically moraine) within the area was mostly sound, particularly around the terminal moraine. Some differences in interpretation are discussed in the report below.

The primary motivation for this review is the identification of areas mapped (or not mapped) as glacial moraine and similar complex habitats; Glacial moraines have been identified as areas of particular concern (APC) as part of the Rhode Island Ocean Special Area Management Plan (§ 11.10.2). Glacial moraines are important habitat areas for a diversity of fish and other marine plants and animals because of their relative structural permanence and complexity. The moraines are also important to commercial and recreational fishermen. Much of the original work on the inner shelf offshore of New England was based on limited seismic reflection profiles, hydrographic data and correlation with stratigraphic units above sea level (e.g., Schafer, 1965; Stone and Borns jr., 1986; Stone and Sirkin, 1996), so it is not unexpected that the recent high-resolution mapping efforts have identified additional moraines/APC. The more detailed mapping completed within the SCW OEC (as well as adjacent wind energy areas) improves upon the existing understanding of the extent of geologic habitats south of Rhode Island beyond those identified in the (OSAMP) (LaFrance et al., 2010). The SCW wind-energy area is south of all previously mapped glacial moraines (and outside RICRMC GLD), however the corridors identified for the transmission cable cross both the terminal and recessional moraine(s) of the Late Wisconsinan Laurentide Ice Sheet, which extended across New England, reaching a terminal position sometime before 26,000 yBP (figure 1). This includes moraine deposits identified in the Ocean Special Area Management Plan (LaFrance et al., 2010) as well as newly mapped moraine deposits and other areas of complex seafloor habitat.

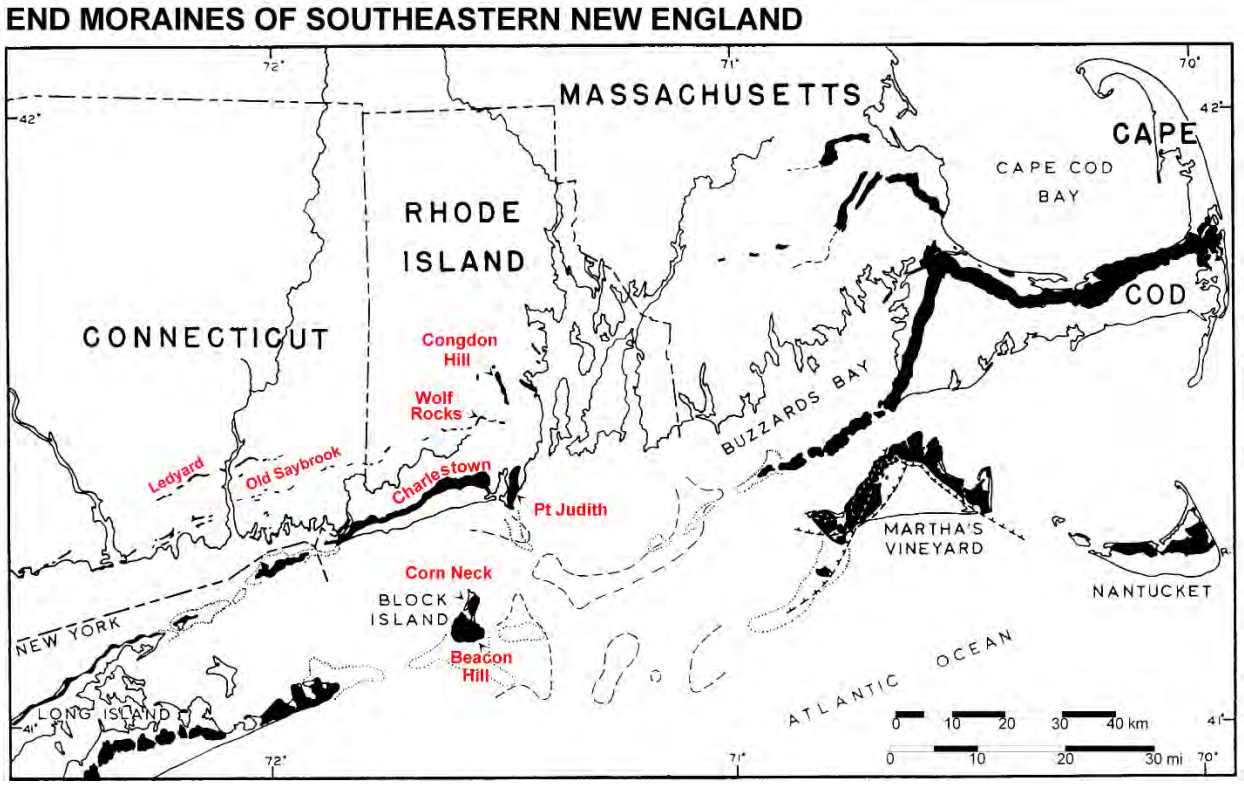

Figure 1: End moraines of southeastern New England (modified from Boothroyd and Sirkin, (2002). Black polygons are moraines exposed above sea level; dashed lines are inferred extensions of the moraines below sea level. Moraines adapted from Shafer and Hartshorn (1965) and Sirkin, (1982).

The moraines of southern New England are glacial tectonic moraines formed from older, pre-existing deposits deformed and thrusted by the fluctuating ice margin of the Laurentide Ice Sheet during the Late Wisconsinan. This produced a complicated stratigraphy and morphology (figure 2) (Oldale and O'Hara, 1984). The pre-existing sediment includes till (diamict) as well as stratified deposits ranging from coarse-grained (i.e., sand and gravel) ice-marginal meltwater deposits to fine-grained (silt/clay) lacustrine deposits. Portions of the moraine contain blocks of Cretaceous aged Coastal Plain strata displaced up to 80 m above the in-place elevation (Oldale and O'Hara, 1984). The stratigraphic complexity of the moraine and glacial-tectonic origin is well illustrated on Block Island, RI (Boothroyd and Sirkin, 2002; Stone and Sirkin, 1996) and Martha's Vineyard (Oldale and O'Hara, 1984). The formation of these moraines is relevant because the process results in a landform composed of a variety of sediment types. The vertical and lateral heterogeneity of the moraine deposits produces a multifaceted suite of geologic habitats at the surface. The complex topography creates a pattern where topographic highs are generally dominated by coarser grained sediment (e.g., cobble-gravel and boulders) which can be derived (figure 2) from discontinuous ablation till deposited when the ice advanced across the moraine prior to retreat (Oldale and O'Hara, 1984) and the flanks of the moraine are often overlain by stratified deposits, reworked glacial deposits or Holocene marine sediment.

Where the moraines are exposed at the surface, boulders, and other coarse-grained sediment (e.g., cobbles) are common. Boulders, as a result, serve as a proxy for 'moraine' habitat, although they are not diagnostic for the broader moraine landform. Other geologic units can also contain boulders, including glacial till over bedrock or very-coarse grained ice-marginal stratified deposits (including eskers, ice-channel fillings and ice-proximal fluvial deposits). These are all areas of complex seafloor habitats and even if not formed by fluctuations of the ice-margin as a "moraine", impacts to these areas should be minimized as they are similar to the moraine deposits in structural form and benthic geologic habitat distribution.

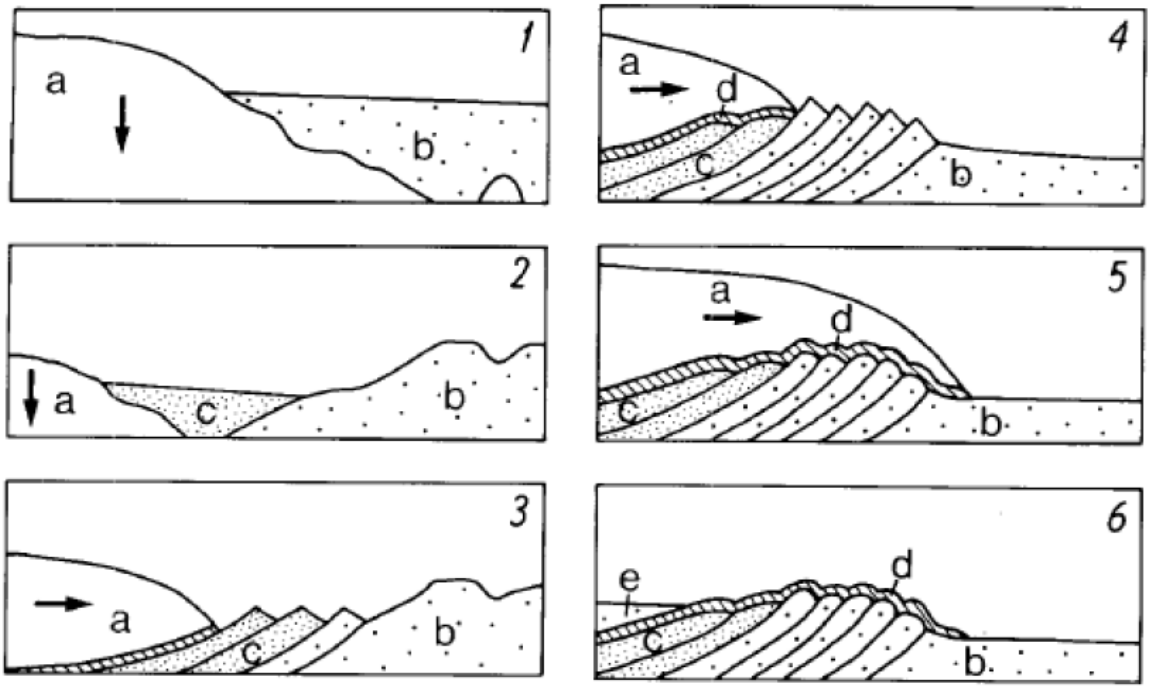

Figure 2: Formation of tectonic end moraines in southern New England (figure 12, Oldale and O'Hara, 1984). The ice sheet is 'a'; units b and c are stratified deposits deformed by the fluctuating ice margin. The number in the box represents the relative age, with 1 being the oldest. Note the till veneer (d) deposited in stages 5 and 6, which in this model extended beyond the main portion of the moraine as a thin layer overlying other ice-contact stratified deposits.

The main issues identified in this review that impact moraine/APC are with the Brayton Point Offshore Export Cable Corridor (OECC), which will connect SCW to Brayton Point, Massachusetts. This review concurs with the contractor mapping that offshore/beyond KP 99, the glacial deposits, which occur within 5 m of the seafloor are glacial stratified deposits laid down by the melting and retreating Laurentide Ice Sheet. (Figure 3.16 MFOW). As well stated by FUGRO (2022) boulders are not transported across the continental shelf by processes other than the advance and retreat of the Laurentide Ice Shet. Boulders are not likely to be found beyond the terminal margin of the ice sheet (unless deposited by an earlier glaciation), however boulders can be encountered at any point north of the terminal margin. Taken together, impacts to glacial moraine/glacial till or other complex habitats were not identified beyond KP 99 or within the wind-energy area.

The Brayton Point OECC crosses both the terminal and recessional moraine(s) of the LIS and these areas are associated with dense boulder fields throughout the corridor. While relict and active fishing gear (i.e., Lobster Traps) and dumped debris may account for some of these targets, the sheer number and concentration of these boulders suggests most are of a geologic origin. The Cable Burial Risk Assessment (CBRA) examines the shallow stratigraphy along the Brayton Point OECC. As noted, glacial diamict/till/moraine deposits, which have a complex benthic habitat when exposed at the seafloor, range from 0 to 20m thick (FUGRO, 2022). These deposits underlie the shallow Holocene transgressive deposits over 62 km (between KP 27 and 89). The COP plan (FUGRO, 2022) reports that moraine/till deposits are exposed at the seafloor between KP 37 and 45 as well as KP 75 and 88 surficial boulders were more abundant between KP74 and 84 (additional areas of concern are discussed below).

The conceptual model shown within FUGRO (2022) provides a general framework for the distribution of boulders within glacial moraines and adjacent areas (figure 3), however these cross-sections lump the glacial till and moraine deposits together stratigraphically. Given the difference in formation processes and composition, geologically these are separate stratigraphic layers. FUGRO (2022) shows different examples of glacial moraine exposed at the seafloor; some examples show positive relief, others negative relief where marine processes have removed the overlying Holocene transgressive deposits to uncover the moraine deposits below. FUGRO (2022) outlines the distribution of boulder and moraine deposits in various illustrative figures. Figure 4 shows the conceptual distribution of boulders by concentration related to glacial till and moraine deposits. Figure 5, modified from Baldwin et al., (2016) shows the main bodies of terminal and recessional moraine deposits. Figure 5 also shows the additional areas of likely glacial moraine and boulder fields south of the inferred terminal limit, as well as the added complexity between the terminal moraine at Martha's Vineyard and recessional Buzzards Baoy Moraine. These are discussed further in the review below. Boulder concentrations were mapped (figure 6) by FUGRO ((2022); see figures 3.7 – 3.10 in the report). This did not translate into the benthic habitat mapping of Inspire. This differs from previous projects and reviews where the boulder density (number of boulders per $100m^2$) was included with the benthic habitat data. The inclusion of boulder concentrations supplies additional context on the level of impact of the cable corridor.

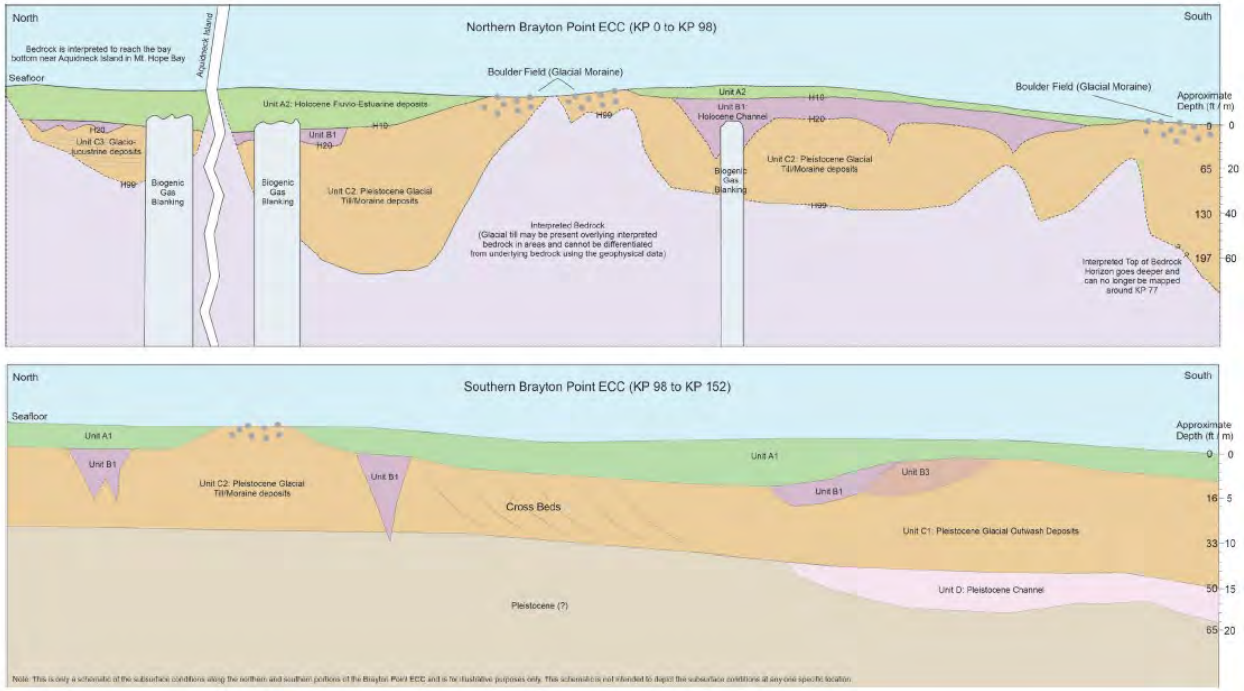

Figure 3: Schematic cross-section of the OCESS within FUGRO, 2022 (figure 2.6) showing a composite cross-section. Note the lumping of glacial till/moraine deposits.

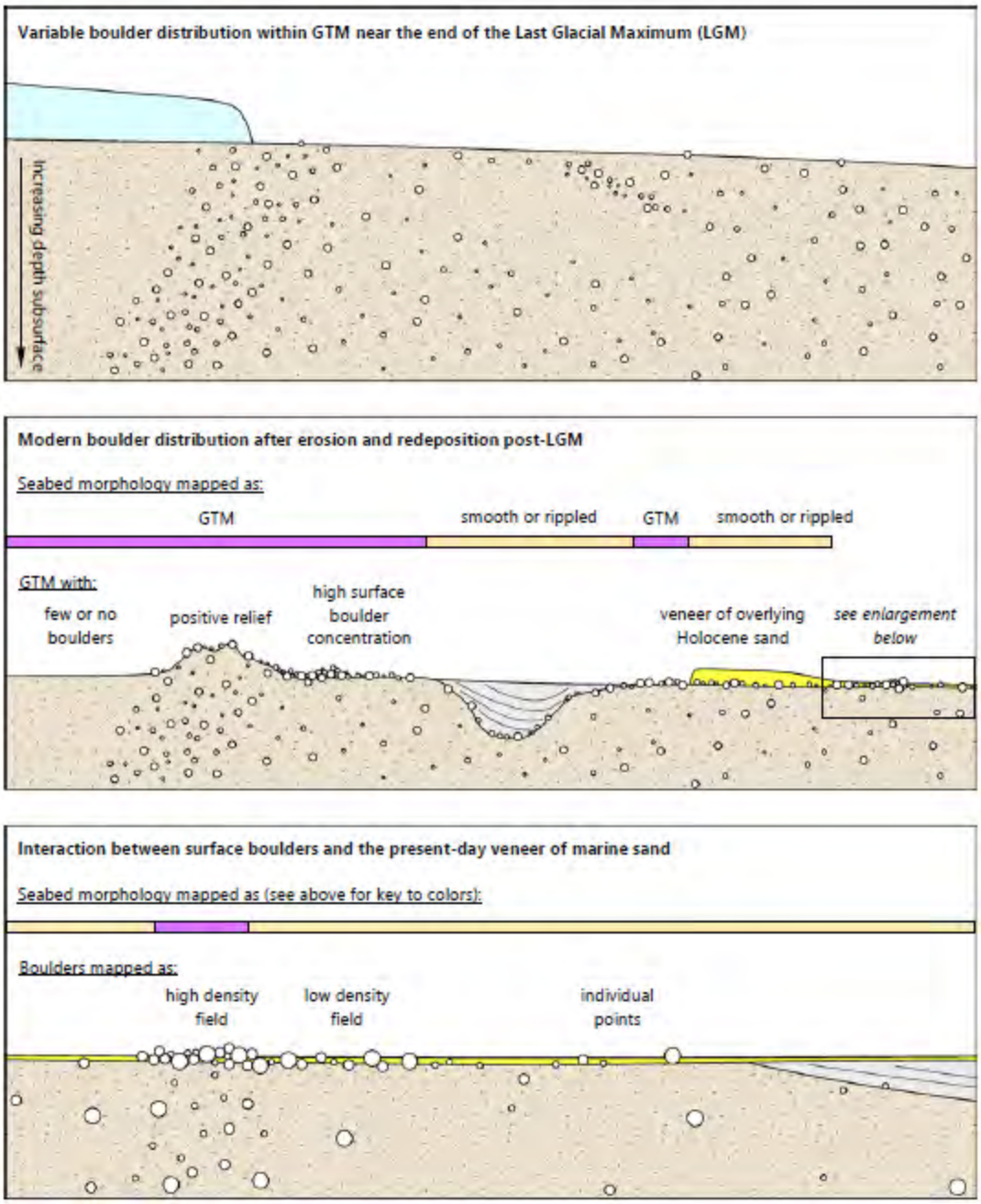

Figure 4. Conceptual model of boulder distribution from FUGRO (2022). Note the presence of boulders at the surface and subsurface in areas of glacial till/moraine (GTM).

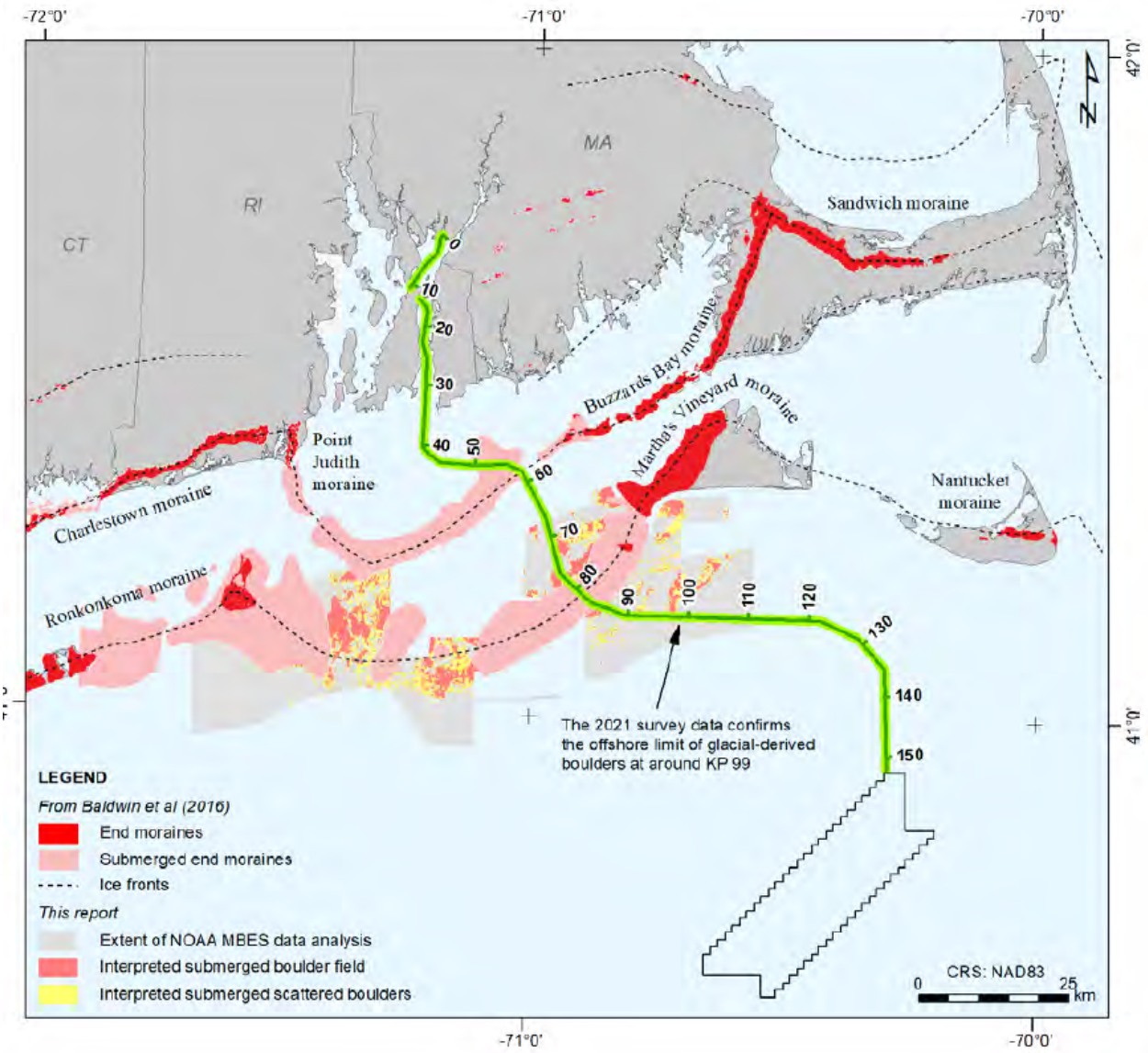

Figure 5: Map of the Brayton Point OECC as shown in figure 3.6 from FUGRO (2022) showing the extent of end moraines, submerged end moraines (Baldwin et al., 2016) and areas of boulder fields and scattered boulders.

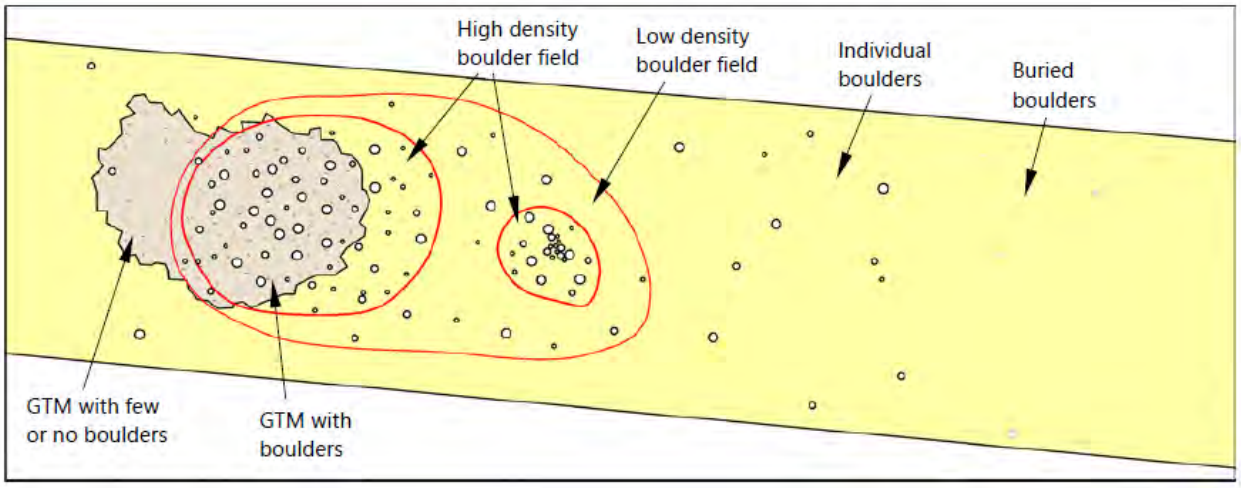

Figure 6: Conceptual model of boulder density related to glacial till/moraine deposits (GTM). This is figure 3.7 in FUGRO (2022).

The geologic origin of these boulders and moraine deposits south of the larger, well mapped terminal moraine complex remains unclear, but given the proximity to the terminal moraine deposits, these are likely related to the last glacial maximum Laurentide Ice Sheet, either as a furthest advance of the ice shee before retreating to the larger terminal moraine complex OR coarse-grained ice-marginal stratified deposits. Other authors have suggested that lobes of the Laurentide Ice Sheet offshore of southern New England extended further south in earlier glaciations than Late Wisconsinan (Siegel et al., 2012). Stanford et al., (2021) report evidence of two glaciations older than the Late Wisconsinan (one from the early Pleistocene and one probably from the Illinoian glaciation ~130,000 yBP. Moraines marking this probable Illinoian glaciation extend ~5 km south of the Late Wisconsinan glacial maximum, suggesting, at least there, the southern extent of the ice sheet was similar during the Illinoian. The possibility that these boulders are moraine deposits from this earlier glaciation cannot be ruled out without a more detailed review of the seismic reflection profiles and geotechnical data. An alternative hypothesis to the deposits being ice-marginal stratified deposits, is that these are till deposits from the maximum Late Wisconsinan extent of the Laurentide, laid down when the ice advanced over the moraine, depositing a till layer beyond the main part of the moraine (See figure 1). Further analysis of the stratigraphy using seismic reflection profiles could address this, but other than potentially impacting cable burial depth, the actual depositional timing of these deposits is beyond the scope of this review.

A final note on the use of the term ‘moraine’ to describe all areas of complex/bouldery benthic-geologic habitats. Careful consideration should be given when applying the term ‘moraine’ to areas of complex habitat that are not formed by fluctuations of the margin of the Laurentide Ice Sheet. While the term ‘moraine’ is used here to identify APC within areas of mapped moraine. Other (bouldery) benthic geologic habitats have other origins not related to the fluctuating margin of the Laurentide Ice Sheet. Given the designation of moraine as areas of particular concern, classifying areas of boulder sediment derived from erosion of till deposits overlying bedrock outcrop could lead to unintended consequences during permitting and review. An

additional concern is that many of these areas that are actually glacial till may have shallow bedrock, which could impact cable burial. Regardless of terminology differences, it bears restating that these areas of coarse-grained (gravel/boulder) sediment are all areas of complex seafloor habitats regardless of the formation process. Impacts to these areas should be minimized as they are similar to the moraine deposits in structural form, permanence and benthic geologic habitat distribution.

Brayton Point Offshore Export Cable Corridor Review

While the entre OECC area was examined, a kilometer post by kilometer post review was not compiled here. For brevity, areas not noted are interpreted to have no significant disturbance to a glacial moraine (or other similar complex habitat). The general flow of this report is from south/east towards the north/west. The proximity of the feature is discussed compared to the nearest kilometer posts (or between kilometer posts).

Kilometer Posts 97 – 91

Areas of moraine and scattered boulder fields were identified south of the previously mapped terminal limit of the Laurentide Ice Sheet, approximately 16 km south of Squibnocket (Martha's Vineyard). Surface sediment grab samples in this area are predominantly sand (with some scattered gravel; see Station BP045 for an example), with some muddy sand, gravelly and gravel mixes. The moraine deposits in these areas are not continuous across the entire Brayton Point OECC and proper routing and siting should minimize impacts in this region.

Kilometer Posts 75 - 85

Where the Brayton Point OECC crosses the terminal moraine extending southwest from Martha's Vineyard through Nomans Land and continuing offshore as Southwest Shoal, boulder fields span the entire width of the corridor. Routing the cable through these sections without affecting the moraine habitat will be difficult. The MFOW noted (figure 3.10 in FUGRO (2022)) that the highest concentration and most continuous boulder fields are in this area. Crossing the moraine here will likely be unavoidable within the OECC and efforts should be made to minimize permeant changes to the habitat. Examples of the extent of boulders within these areas are found below which show different extents of the seafloor around KP 82 using both side-scan sonar (figure 7) and multi-beam bathymetry (figure 8). This area also featured distinct topographic ridges (near KP 81) (figure 9). These features are topographically distinct from other adjacent areas, and could have been mapped as moraine 'B' a classification used by the contractor on a previous project. Distinguishing moraine types was useful to delineate areas that are more topographically complex within the glacial moraine deposits. However, some subjectivity is acknowledged here, and as this area is already mapped as a complex moraine habitat. The cable burial planning (both route and cable burial techniques) should be carefully considered to maximize the cable reaching project depth. Boulders are less dense and/or are not contiguous across the OECC (as visible on side-scan and multi-beam bathymetry) between KP 80 and 77. One small (~200 m^2) area of moraine mapped between KP 76 and 75 can be avoided with proper routing of the OCECC.

Figure 7: Side-scan sonar mosaic showing the extent of boulders in the vicinity of KP82,

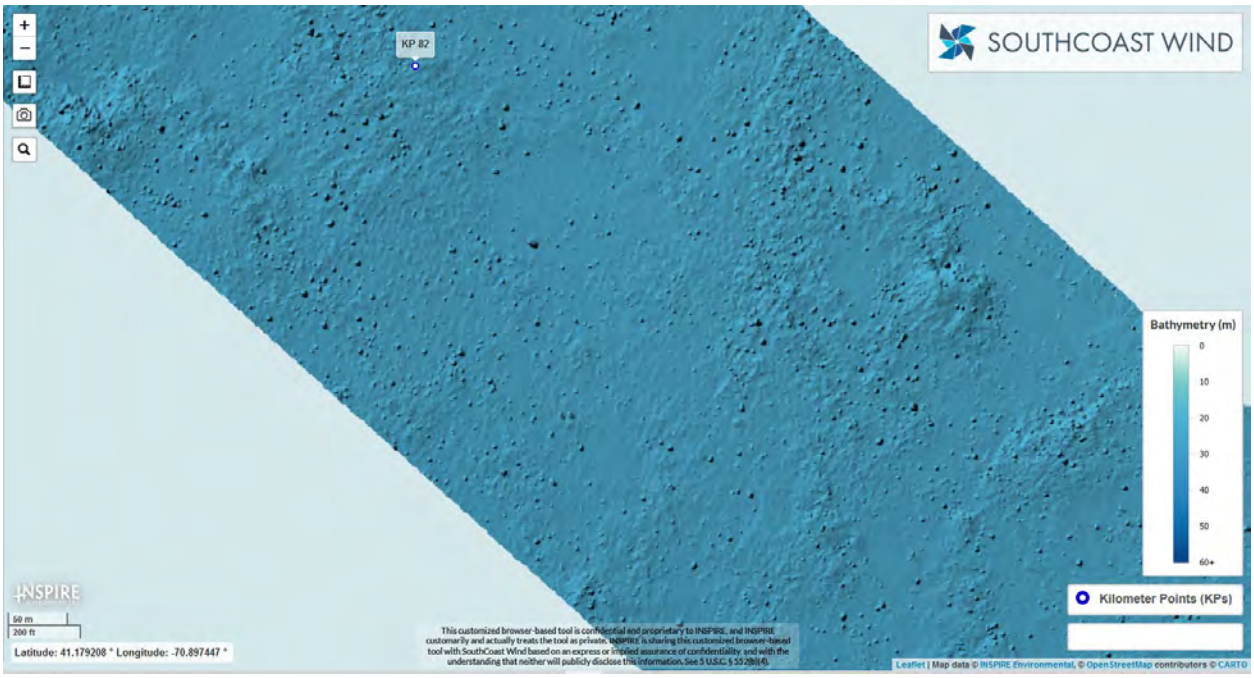

Figure 8: Multi-beam bathymetry showing the extent of boulders in the vicinity of KP82,

Figure 9: Multi-beam bathymetry around KP81.Note the topographic highs that are areas of complex topography within the overall moraine deposits.

Kilometer Posts 73 – 71.5

Boulder fields were mapped ~14km Southwest of Gay Head, Martha's Vineyard between KP 71.5 and 73. The boulders here occur in moderately dense areas of glacial moraine amid sandy substrates (See station BPT29-3). This area is located between the inferred terminal and recessional moraine positions, and it is unclear if these boulders are part of the terminal moraine complex or mark a recessional moraine 3 km north of the terminal moraine. The extent of boulders in both areas is such that routing of the cable could likely minimize impacts to these habitats.

Kilometer Posts 57-58

The cable corridor crosses previously mapped areas of glacial moraine around kilometer posts 58 to 57. This represents a position of the recessional Buzzards Bay Moraine position, and it appears that portions of the moraine are overlain by thin layers of sandy sediment (Figure 10). The extent of boulders in both areas is such that routing of the cable could likely minimize impacts to these habitats, however, the presence of boulders across the corridor could impact cable burial depth here.

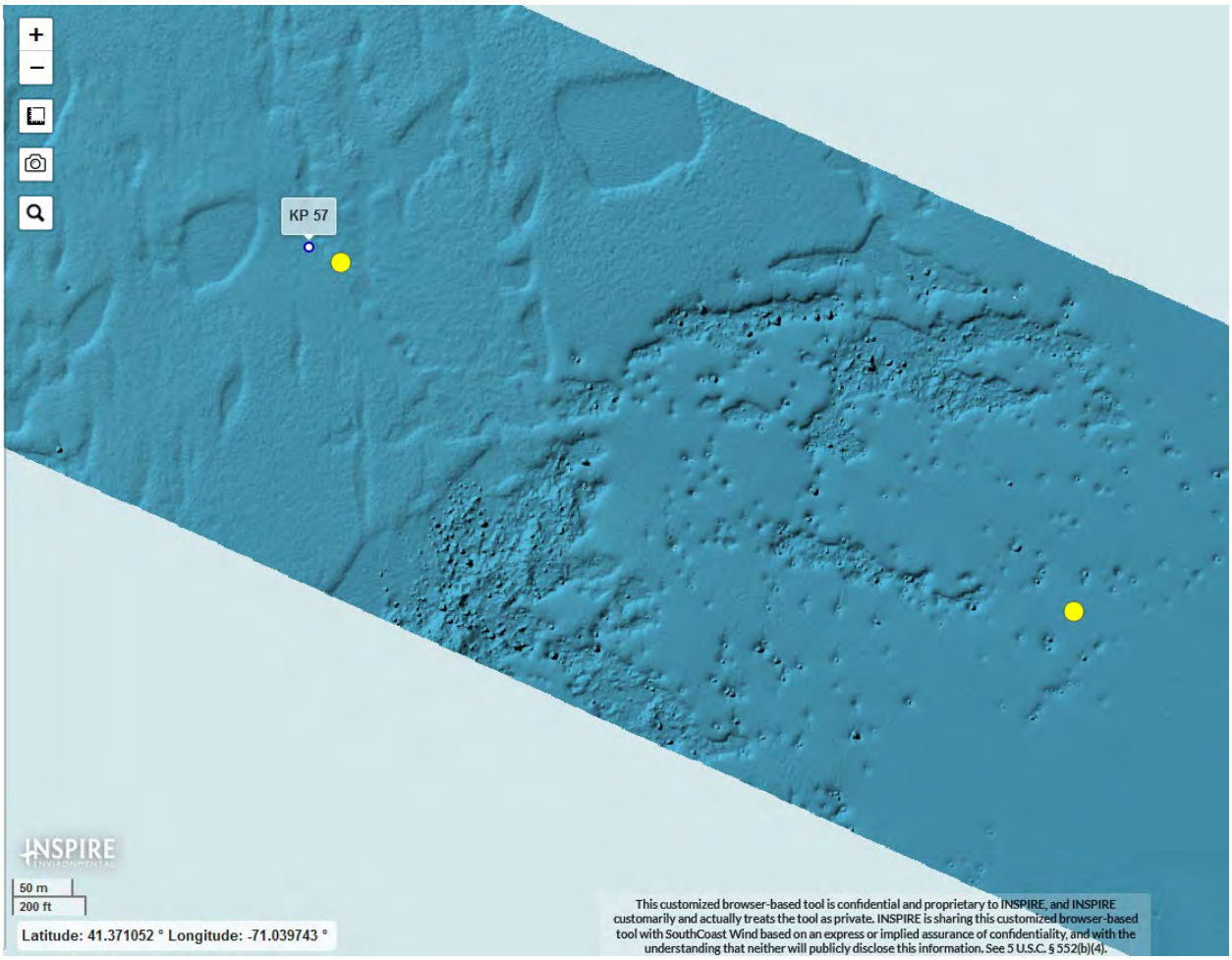

Figure 10: Multi-beam bathymetry across the recessional Buzzards Bay moraine between kilometer posts 57 and 58.

Kilometer Posts 56 – 50

This region crosses an area mapped in the OSAMP as glacial moraine 'boulder' (LaFrance et al., 2010) based on interpretations from previous workers in the region. No areas of boulder were mapped within this region and sediment samples were sandy. An important comment to reinforce is that the mapped extent of moraine refers **only** to the distribution of surface sediment not the overall landform of the area, which is **all** part of the moraine complex. The focus here is to identify areas where coarse-grained, complex habitats cropping out at the seafloor should be considered 'moraines' and identified as areas of particular concern. This is an example where the newer, more detailed mapping has refined our understanding of the geology of Rhode Island Sound.

Kilometer Posts 48.5 – 28

Scattered boulders and areas of glacial 'moraine' were mapped between kilometer posts 28 and 48.5 (figures 11-19). The boulder/complex units extend across the OECC in some portions here, so some impacts are likely. I disagree with the benthic geologic habitat mapping that this is glacial moraine, and instead these are areas where glacial till crops out at the seafloor. The model

for these areas identified between is the adjacent upland areas of Newport and Little Compton, RI; here glacial till with limited pockets of stratified sand and gravel and abundant shallow and outcropping bedrock dominate the landscape (Boothroyd and Smith, 2009; Schiner, 1964). These units, while similar in some respects to the areas where glacial moraine crop out at the seafloor are not formed by depositional processes at the margin of the retreating ice sheet. These represent areas of glacial till overlying what is likely shallow bedrock particularly around KP 34-36 (where bedrock does outcrop) (figures 17-19) and KP31 -32. The latter areas do not have bedrock exposed at the seafloor, however shallow (>5 m, and in some cases >2 m) bedrock occurs in some areas without surface boulders (e.g., KP 28-30) (figure 14) (FUGRO 2022). The cable burial planning (both route and cable burial techniques) should be carefully considered to maximize the cable reaching project depth.

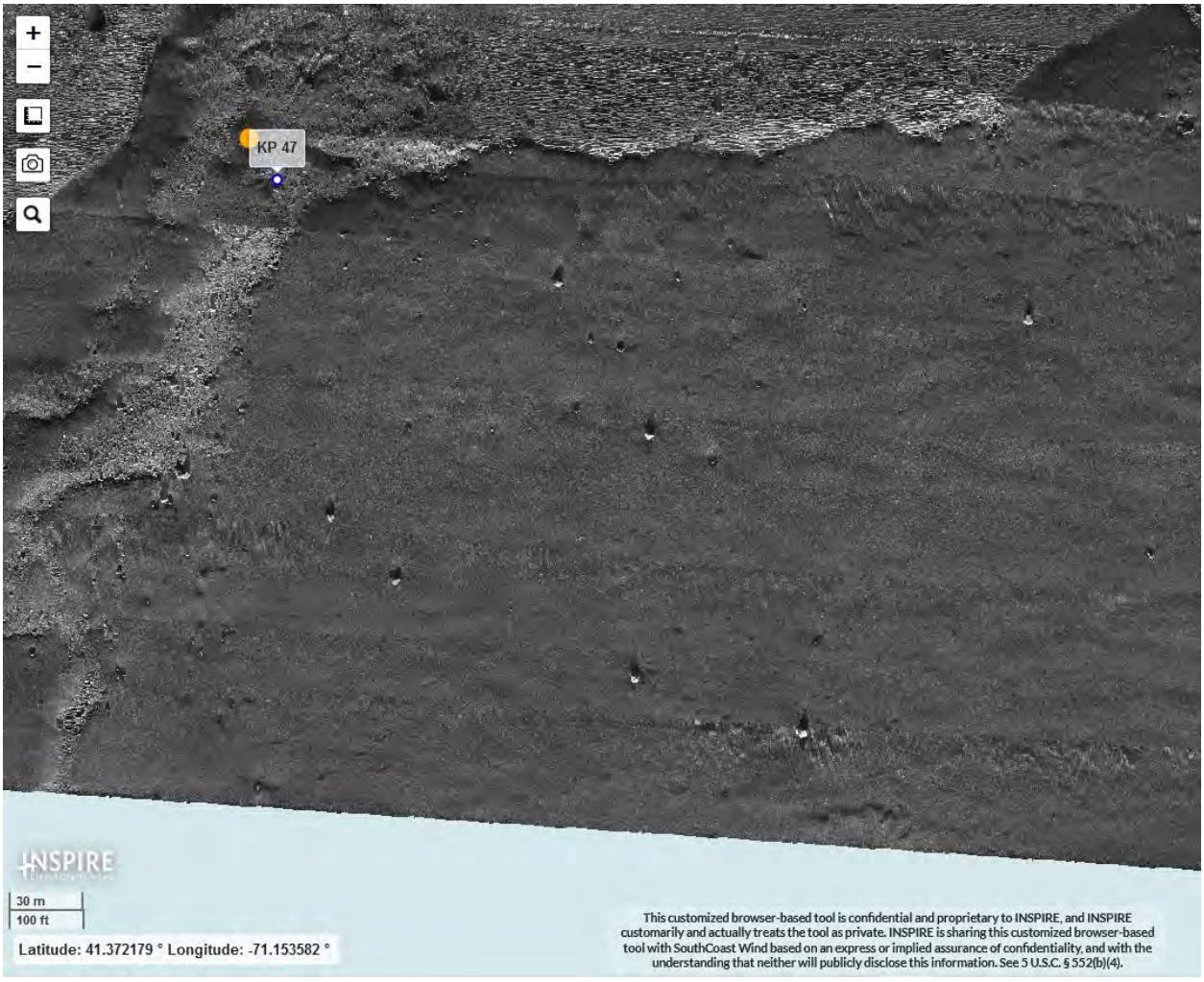

Figure 11: Side-scan sonar mosaic around kilometer post 47 showing areas of scattered boulders (southeast of KP47), denser boulders (south of and adjacent to KP47) and wave-orbital ripples (north of KP47).

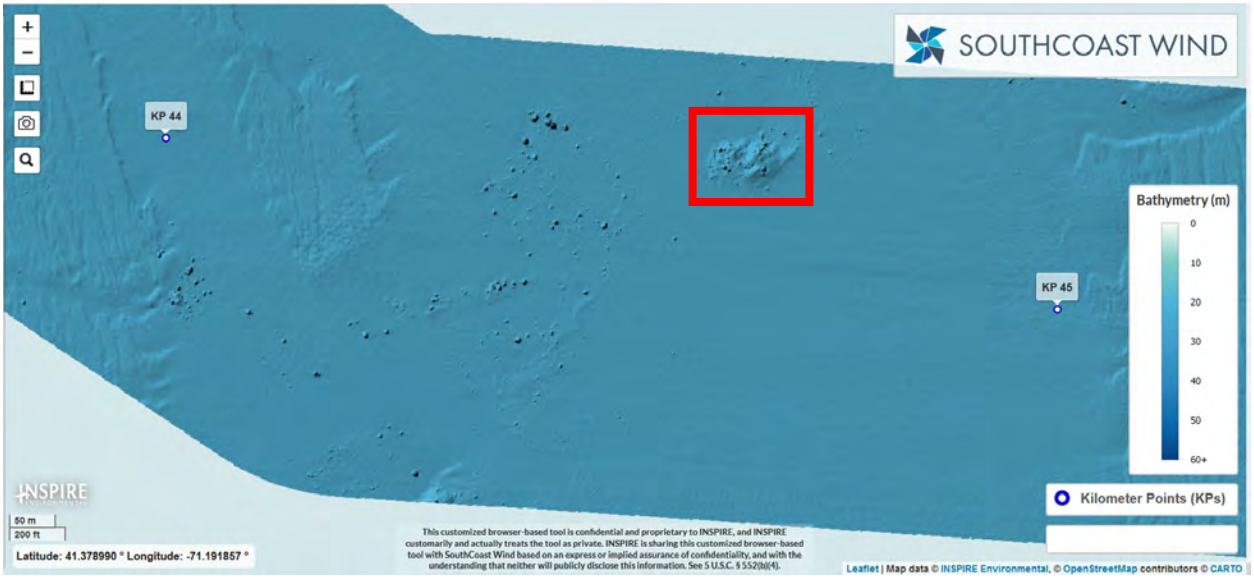

Figure 12: Multi-beam bathymetry showing isolated boulders. The red box shows the extent of the side-scan sonar mosaic seen in figures X.

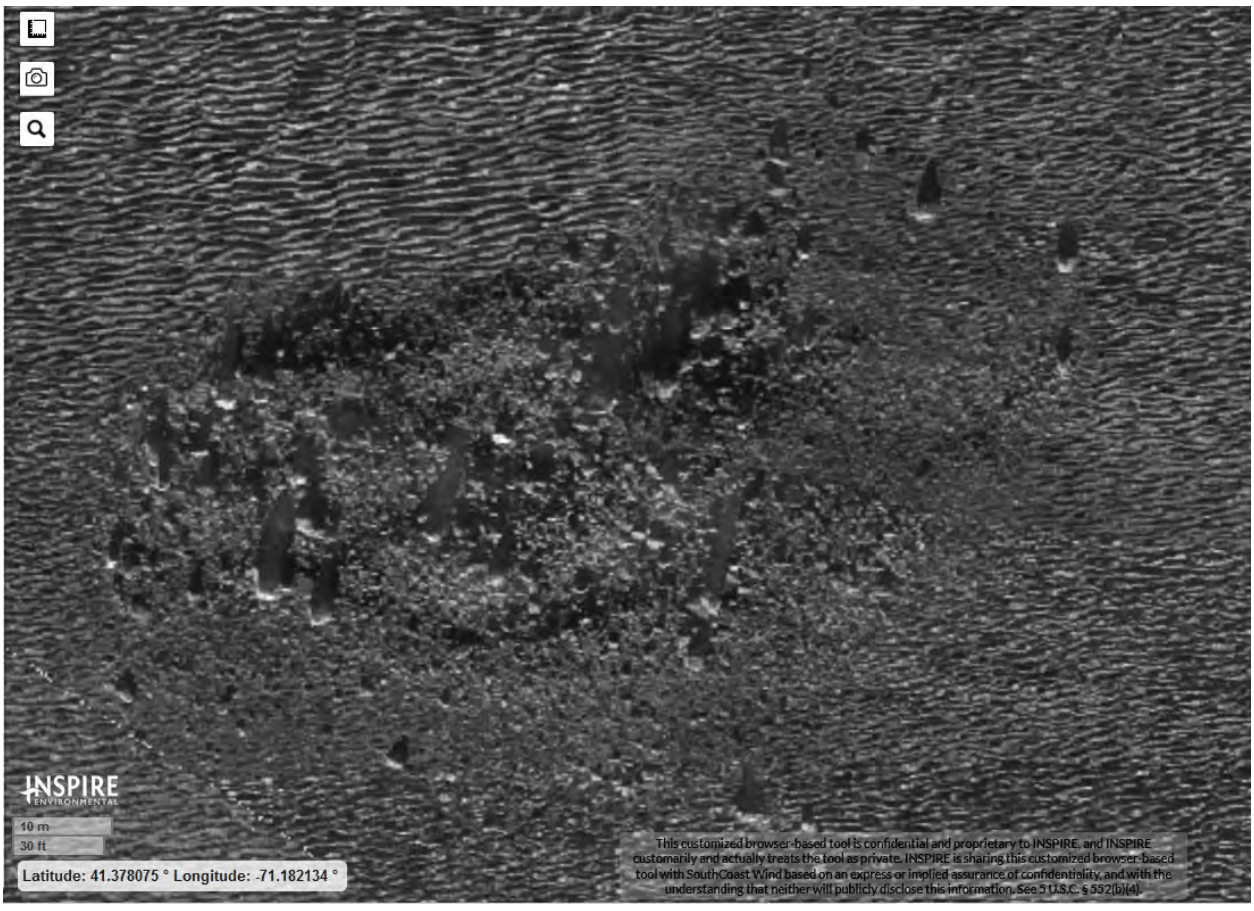

Figure 13: Side-scan sonar mosaic showing an area of dense boulders surrounded by wave-orbital ripples. See figure 11 for the location.

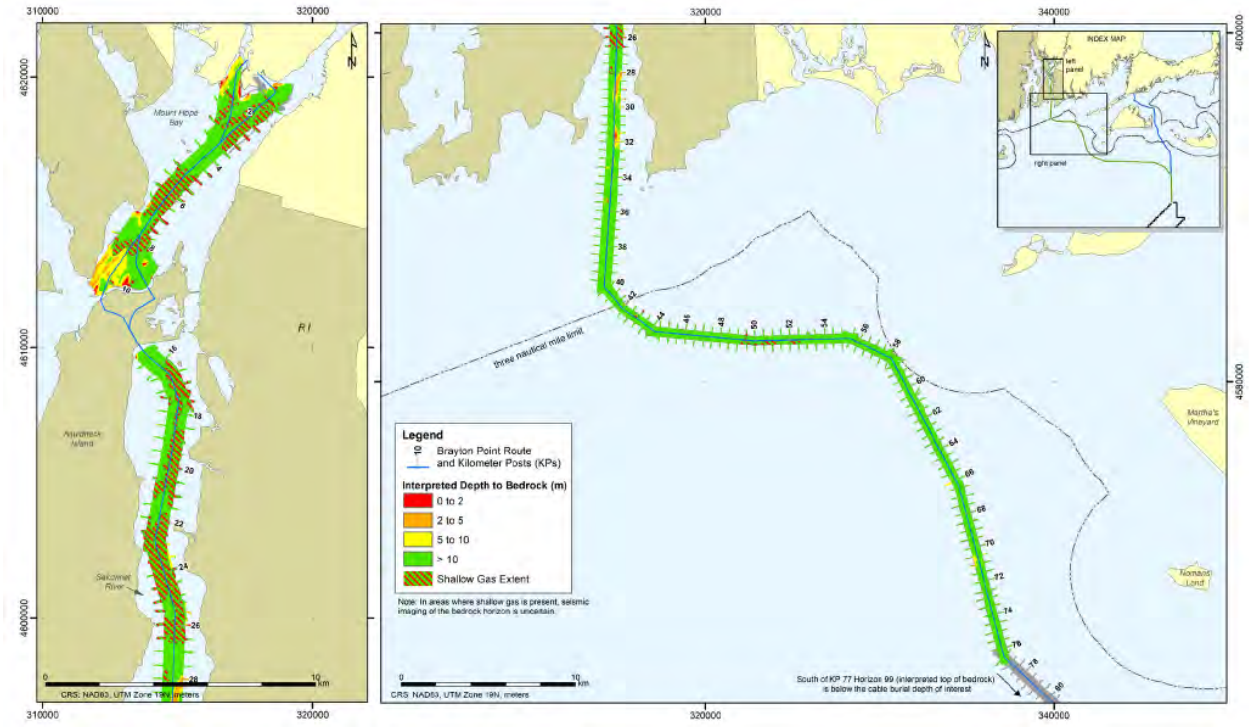

Figure 14: Interpreted depth to bedrock for the OCEE (Figure 3.3; FUGRO 2022).

Figure 15: Side-scan sonar mosaic near kilometer post 40 showing widespread cobbles and boulders.

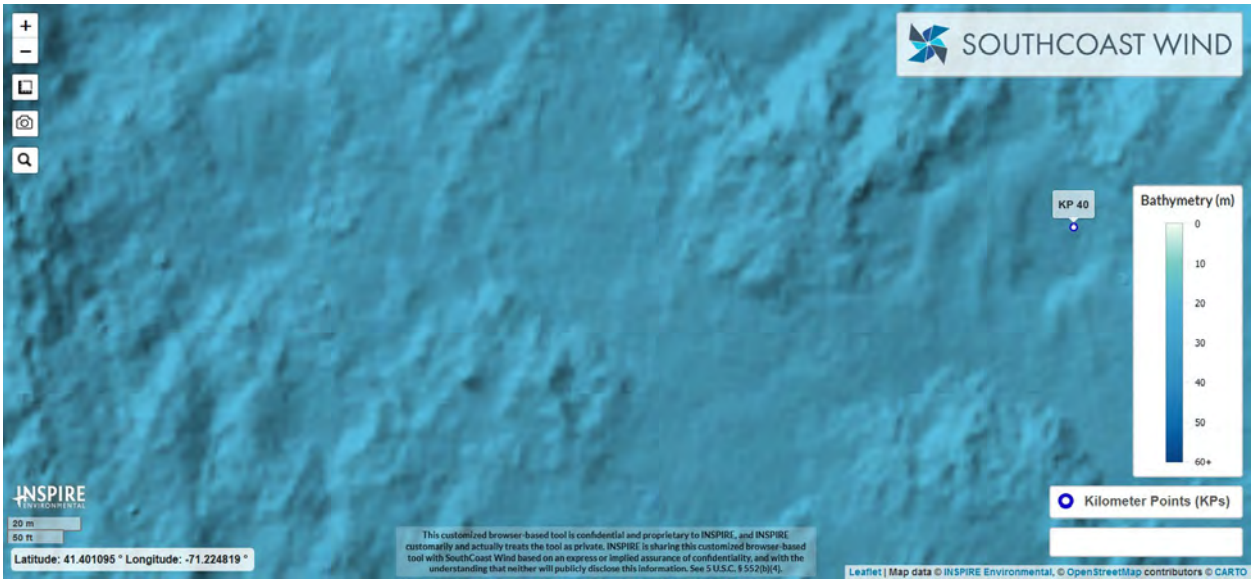

Figure 16: Multibeam bathymetry near kilometer post 40 showing the complex topography of the area. Topographic highs area areas of cobble-boulder gravel (figure 14).

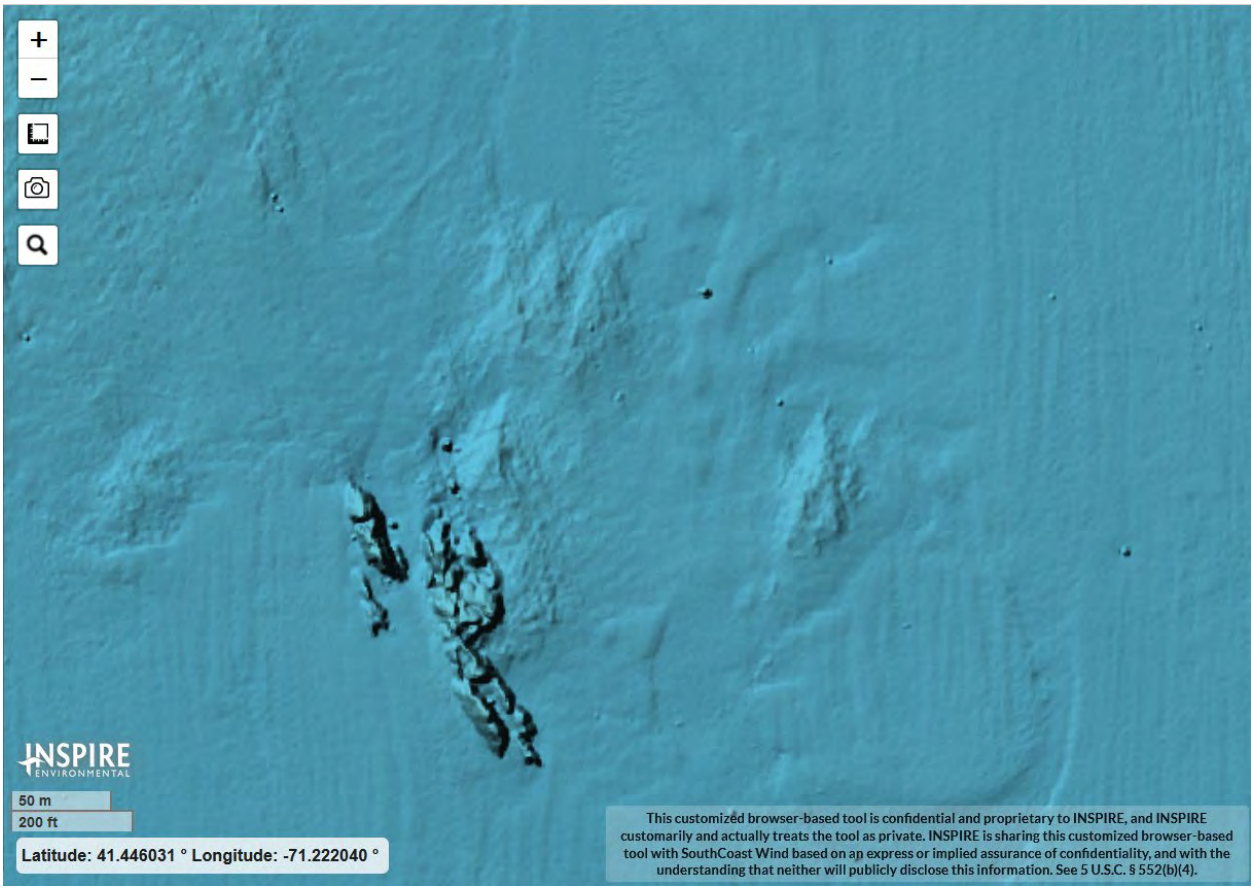

Figure 17: Multi-beam bathymetry near kilometer post 35 showing an area of bedrock outcrop.

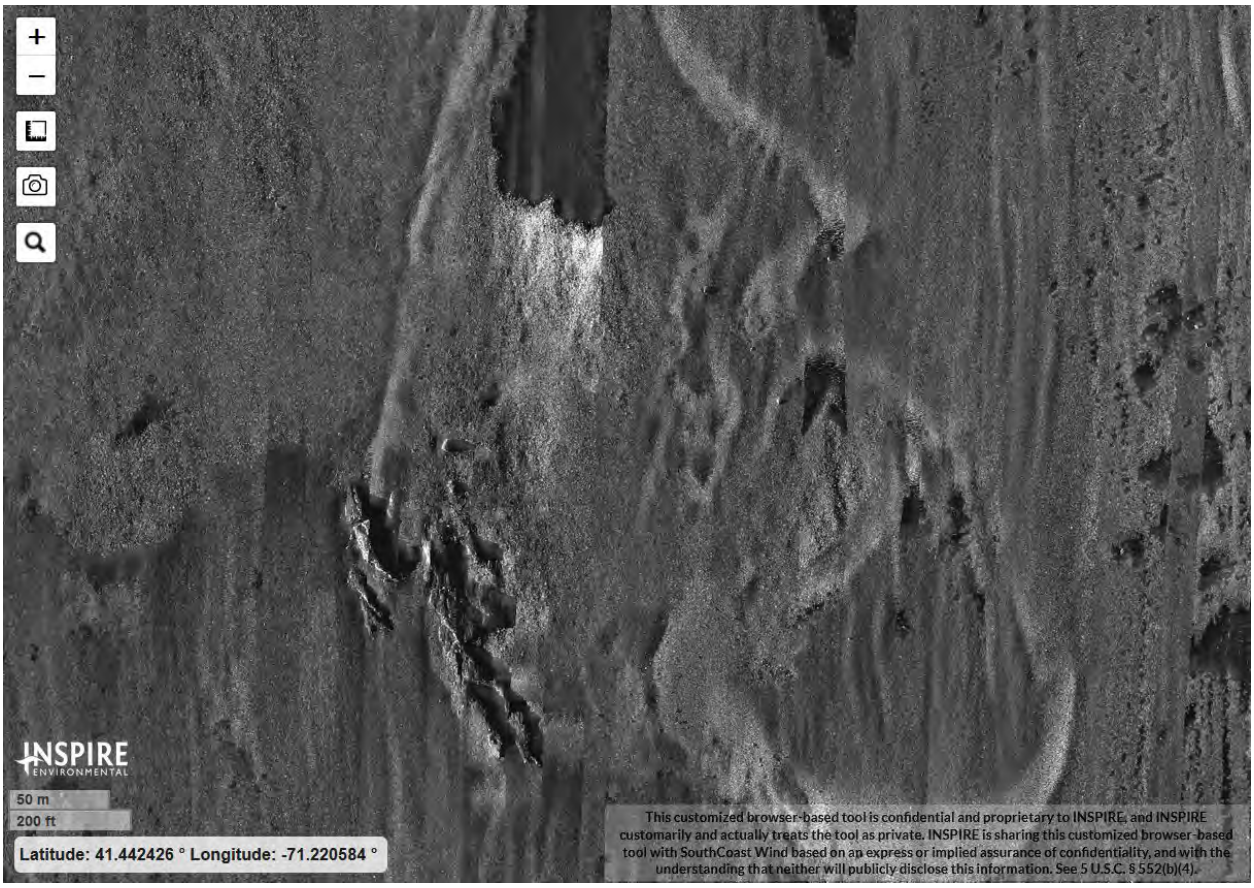

Figure 18: Side-scan sonar mosaic near kilometer post 35 showing an area of bedrock outcrop.

Figure 19: Interpreted benthic geologic habitats near kilometer post 35 showing an area of bedrock outcrop (black polygon). The brown polygons are mapped as glacial moraine by Inspire; these are likely areas of glacial till with shallow bedrock, not glacial moraine.

Kilometer Posts 10 – 9

North of Island Park, areas of glacial moraine were mapped around KP10, between Portsmouth and Bristol, RI. The opinion here, is that these are not areas of glacial moraine. The area offshore of Bristol, RI is interpreted to be similar to the area around KP35, as this represents sediment eroded from glacial till overlying bedrock. Areas west of KP10 mapped as moraine are interpreted to be coarse-grained ice marginal stratified deposits by Oakley (2012) related to the stratified glacial deposits at Island Park (Boothroyd, 2009). One small bedrock outcrop was mapped east of KP9 (figure 20). The center portion of the OECC is mapped to be within the glacial lakefloor deposits, so the more complex habitats can largely be avoided.

Kilometer Post 1

A small area of boulders were mapped west of Brayton Point near KP1. This is interpreted to be boulders eroded from glacial till, which can likely be avoided by the cable route.

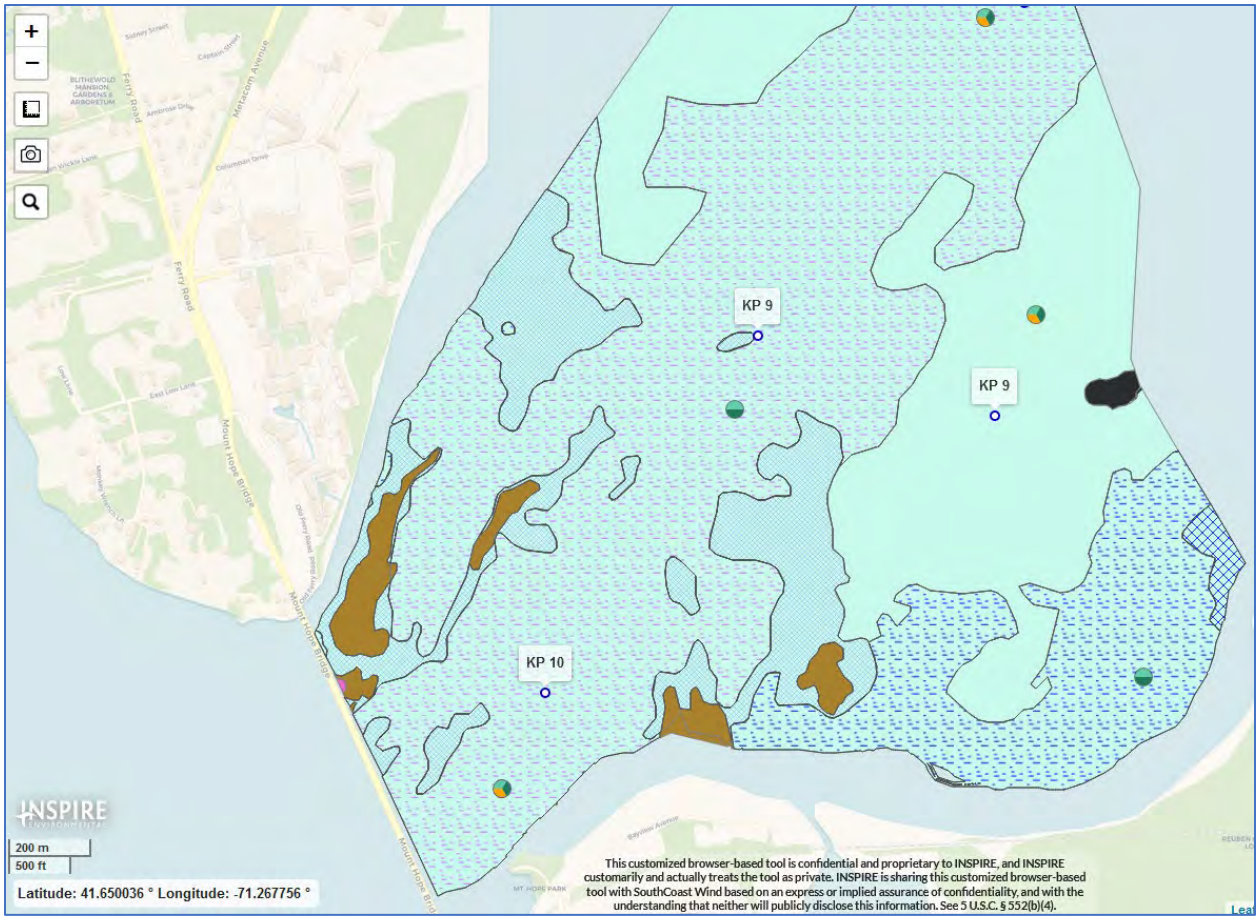

Figure 20: Benthic geologic habitats around KP10 and KP9 in Mount Hope Bay showing the extent of 'glacial moraine' deposits (brown polygons); the black polygon is a bedrock outcrop east of KP9.

Sorted Bedforms and Sandwaves

Bedforms at a variety of scales were found in the OECC area. Most of these features, which are complex patterns of wave and current scoured seafloor, are 'sorted bedforms' (also known as 'Rippled Scour Depressions' – areas of coarser sediment, typically with 2-Dimensional ripples slightly incised relative to the adjacent seafloor. The ripples contained within the features are wave-orbital ripples, and these areas may transition to plane bed (no ripples) during storm events, with the ripples reforming as the wave heights decrease as the wave heights wane following the storm (Clifton, 2006). Examples of this can be seen in multiple areas, but a good example is between KP45 and KP49 (figures 21-22). The total height of the ripples (>0.5 m) suggests this process will not impact the cable, provided the burial depth is met. These sorted bedforms/rippled scour depressions themselves are complex, particularly regarding the exact formation mechanism, although they have been proposed to be self-organizing bedforms, and the inherent roughness of the features inhibits the deposition of finer-grained sediment (Goldstein et al., 2011). These features are common throughout the region in a variety of water depths (Goff et al., 2005; McMullen et al., 2015; Oakley, 2019; Oakley et al., 2019). The low total relief of these features suggests that significant scour and reworking of sediment at depth is unlikely. Goff et al., (2005) working south of Martha's Vineyard in water depths of 8 to 18 m, found that

migration of these features was complex; the boundaries between sorted bedforms may fluctuate over 10's of meters (horizontally) in both alongshore directions, however the general bathymetric features were relatively stable. The relief of these features is less than the proposed cable burial depth (2 meters) so any migration of the bedforms should not uncover the cable provided the target depth is met. Repeat surveys (if the data exists) could provide insight into the migration of these features within the OECC, although migration of some bedforms may only happen in substantial storm events and may not be captured with only a few years of data.

Figure 21: Multi-beam bathymetry around KP46 and KP47 showing examples of the complex sorted bedforms found within the OECC.

Figure 22: Side-scan sonar mosaic around KP46 and KP47 showing examples of the complex sorted bedforms found within the OECC.

Trawl Marks

Several areas of the OECC have evidence of trawling for groundfish ranging from 3-4 m wide and less than 10 cm deep. Features of this scale are interpreted to be from hydraulic dredges used to harvest surf clams. The reported depth of the furrows produced is <0.2 m (figure 23), so impacts to the cable should be avoided as long as project depth is reached. Section 4.3.4 of the Geohazard Report (FUGRO, 2022).

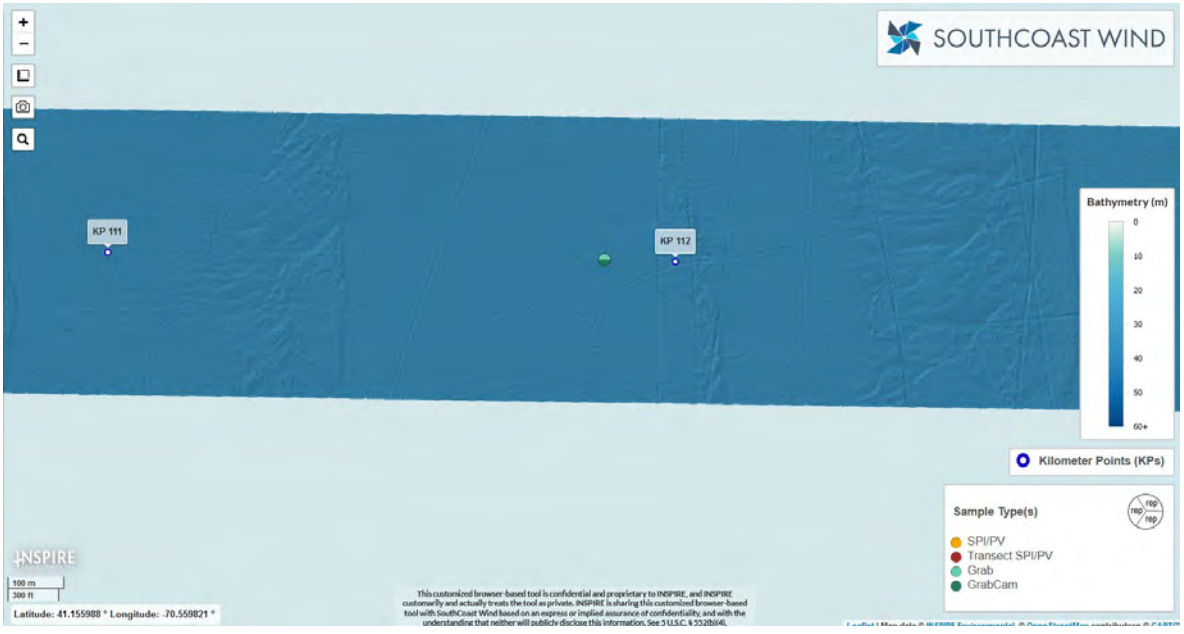

Figure 23: Multi-beam bathymetry showing examples of hydraulic dredge scars around KP111 and KP112.

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Stone, B. D., and Sirkin, L. A., 1996, Geology, *in* Veeger, A. I., ed., Hydrogeology and Water Resources of Block Island, Rhode Island: Providence, RI, U.S. Geological Survey.

Review of Benthic Geologic Habitat Mapping and EMF Considerations: for the Proposed South Coast Wind Energy Cable Corridor

John W. King

jwking@uri.edu

Report Prepared for the Rhode Island Coastal Resources Management Council

November 20, 2023

Introduction

This review has two components. The first section reviews the interpretated benthic geologic habitats of the proposed South Coast Wind Energy Area (SCW) and Brayton Point Offshore Export Cable Corridor (OECC) within the Rhode Island Coastal Resources Management Council Geographic Location Description Boundary (GLD). The second section notes some general concepts that will help guide RI CRMC regarding possible effects/impacts on marine species due to the EMF (electromagnetic fields) produced by the transmission cables associated with SCW wind farm. The geographic scope of this review focused on the wind energy corridor extending through federal and Rhode Island state waters. It was further extended to cover the entire OECC to the landfall at Brayton Point, Massachusetts at the request of Rhode Island CRMC for consistency.

General Interpretations of Benthic Geologic Habitat

The geophysical data collection efforts of FUGRO (2022) are exceptionally well done, providing high-quality data for habitat interpretation, and the organization of the data into a GIS viewer by INSPIRE is easy to use and very well done. The primary issue of the habitat identification review is the validity of areas mapped (or not mapped) as glacial moraine and similar important habitats. Glacial moraines have been identified as areas of particular concern (APC) as part of the Rhode Island Ocean Special Area Management Plan (RIOSAMP) because they are important habitat areas for a diversity of fish and other marine plants and animals. The moraines are particularly important to commercial and recreational fishermen. Disturbance of moraine habitat should be minimized by development activities. The overall mapping of geologic habitats and particularly moraine habitat within the area was generally valid, particularly around the terminal moraine. Some differences in specific interpretations are discussed below.

Specific Interpretations of Benthic Geological Habitat

The more detailed mapping completed within the SCW OEC (as well as adjacent wind energy areas) improves considerably upon the existing understanding of the extent of moraine and other geologic habitats south of Rhode Island waters beyond those summarized and identified in the (RIOSAMP) based on a number of earlier studies (LaFrance et al., 2010). The SCW wind-energy area is south of all previously mapped glacial moraines (and outside RICRMC GLD). However, the proposed transmission cable corridors cross both the terminal and recessional moraine(s) of the Late Wisconsinan Laurentide Ice Sheet (LIS), as shown in Figure 1. This figure includes moraine deposits identified in the Ocean Special Area Management Plan (LaFrance et al., 2010) as well as newly mapped moraine deposits and other areas of complex seafloor habitat.

When moraines are exposed at the seafloor surface, then they contain boulders in abundance ranging in size from cobbles to much larger sizes. Boulders, therefore can serve as a proxy for ‘moraine’ habitat, although they are not uniquely diagnostic for the broader moraine landform. Other geologic deposits can also contain boulders, including glacial till over bedrock or very-coarse grained ice-marginal stratified deposits. These are all areas of complex seafloor habitats

and even if not formed by fluctuations of the ice- margin as a “moraine”, impacts to these areas should be minimized as they are probably functional habitat equivalents to moraine deposits.

Specific comments about the lease area and along the cable routes are as follows. I agree with the interpretation that offshore/beyond KP 99, the deposits, which occur within 5 m of the seafloor are glacial stratified deposits laid down by the melting and retreat of the Laurentide Ice Sheet. As noted by FUGRO (2022) boulders are not transported across the continental shelf by processes other than the advance and retreat of the Laurentide Ice Sheet. Boulders are not likely to be found beyond the terminal margin of the ice sheet., However boulders can be encountered at any point north of the terminal moraine. No potential impacts to glacial moraine/glacial till or other complex habitats are identified beyond KP 99 or within the wind-energy area.

The main issues identified in this review that impact moraine/APC are within the Brayton Point Offshore Export Cable Corridor (OECC) that will connect SCW to Brayton Point, Massachusetts. The Brayton Point OECC crosses both the terminal and recessional moraine(s) of the LIS and these areas are associated with dense boulder fields throughout the corridor. The Cable Burial Risk Assessment (CBRA) examines the shallow stratigraphy along the Brayton Point OECC. The CBRA notes that glacial diamict/till/moraine deposits, which have a complex benthic habitat when exposed at the seafloor, range from 0 to 20m thick (FUGRO, 2022). These deposits underlie the shallow Holocene transgressive deposits for over 62 km (between KP 27 and 89). The COP plan (FUGRO, 2022) reports that moraine/till deposits are exposed at the seafloor between KP 37 and 45 as well as from KP 75 and 88 and that surficial boulders were more abundant between KP74 and 84.

The whole OECC area is examined and areas of potential concern are noted below. Areas not noted are areas of minimal concern. The proximity of the feature is discussed compared to the nearest kilometer posts (or between kilometer posts) moving from offshore to onshore.

Kilometer Posts 97 – 91

Areas of moraine and scattered boulder fields were identified south of the previously mapped terminal limit of the Laurentide Ice Sheet. The moraine deposits in these areas are not continuous across the entire Brayton Point OECC and proper routing and siting should minimize impacts in this region.

Kilometer Posts 75 - 85

Where the Brayton Point OECC crosses the terminal moraine, boulder fields span the entire width of the corridor. Routing the cable through these sections without affecting the moraine habitat will be impossible. Crossing the moraine can’t be avoided and efforts should be made to minimize permeant changes to the habitat.

Kilometer Posts 73 – 71.5

Boulder fields were mapped between KP 71.5 and 73. This area is located between the inferred terminal and recessional moraine positions, and it is unclear if these boulders are part of the terminal moraine complex or mark a recessional moraine 3 km north of the terminal moraine. Boulder density is low in some areas so it might be possible is to route the cable through this section to minimize impacts to these habitats.

Kilometer Posts 57-58

The cable corridor crosses a previously mapped area of glacial moraine around kilometer posts 58 to 57. The extent of boulders in both areas is such that routing of the cable could likely minimize impacts to these habitats.

Kilometer Posts 56 – 50

This region crosses an area mapped in the OSAMP as glacial moraine 'boulder' (LaFrance et al., 2010) based on interpretations from previous workers in the region. No areas of boulder were mapped within this region and sediment samples were sandy. Minimal impact is expected through this area. The new mapping has eliminated an area of concern.

Kilometer Posts 48.5 – 28

Scattered boulders and areas of glacial 'moraine' were mapped between kilometer posts 28 and 48.5. The boulder/complex units extend across the OECC in some portions here, so some impacts are likely. These are areas where glacial till probably crops out at the seafloor and overlies shallow bedrock rather than moraine areas. The cable burial planning (both route and cable burial techniques) should be carefully considered to maximize the cable reaching project depth.

Kilometer Posts 10 –9

North of Island Park, areas of glacial moraine were mapped around KP10. Again these are probably not areas of glacial moraine but may be till over shallow bedrock. The center portion of the OECC may be relatively boulder free and offer a good cable route location.

Kilometer Post 1

A small area of boulders area mapped west of Brayton Point near KP1. This small area is likely a deposit of boulders that have eroded from glacial till that can likely be avoided by careful placement of the cable route.

Other Considerations of Concern to Cable Safety

Bottom Scour

Bedforms at a variety of scales were found in the OECC area. Most of these features, which are complex patterns of wave and current scoured seafloor. The total height of the ripples (>0.5 m) suggests this process will not impact the cable, provided that the proposed project burial depth is met.

Fishing Impacts (Trawl Marks)

Several areas of the OECC have evidence of trawling for groundfish ranging from 3-4 m wide and less than 10 cm deep. Features of this scale are interpreted to be from hydraulic dredges used to harvest surf clams. The reported depth of the furrows produced is <0.2 m, so impacts to the cable should be avoided if project burial depth is reached.

Potential Impacts of EMF from Cables

Recent reviews, (Hutchison, et al., 2021; Hutchison, et al., 2020) of potential impacts of EMF from transmission cables on marine organisms have indicated two factors are the most important to mitigating potential impacts. First, marine organisms are more likely to be sensitive to DC fields (steady fields) than they are to AC (alternating fields). Therefore, ,cables that use an AC design are less likely to cause an impact than are DC cables. I believe a DC cable is proposed for this project area so the second factor below becomes more important. Second, the depth of a cable below the seafloor will significantly reduce either AC, or DC EMF exponentially with depth. Therefore, cables that attain full project burial depth are unlikely to have significant impacts from EMF on marine organisms.

References Cited

Hutchison, Z.L., Gill, A., Sigray, P., He, H. and King, J.W. 2021, A modelling evaluation of electromagnetic fields emitted by buried subsea power cables and encountered by marine animals: Considerations for marine renewable energy development, Renewable Energy, 177 DOI:10.1016/j.renene.2021.05.041

Hutchison, Z.L., D.H. Secor, and A.B. Gill. 2020. The interaction between resource species and electro- magnetic fields associate with electricity production by offshore wind farms. Oceanography 33(4):96-107,

LaFrance, M., Shumchenia, E. J., King, J. W., Pockalny, R., Oakley, B. A., Pratt, S., and Boothroyd, J. C., 2010, Benthic habitat distribution and subsurface geology of selected sites from the Rhode Island Ocean Special Management Study Area: Rhode Island Coastal Resources Managament Council.

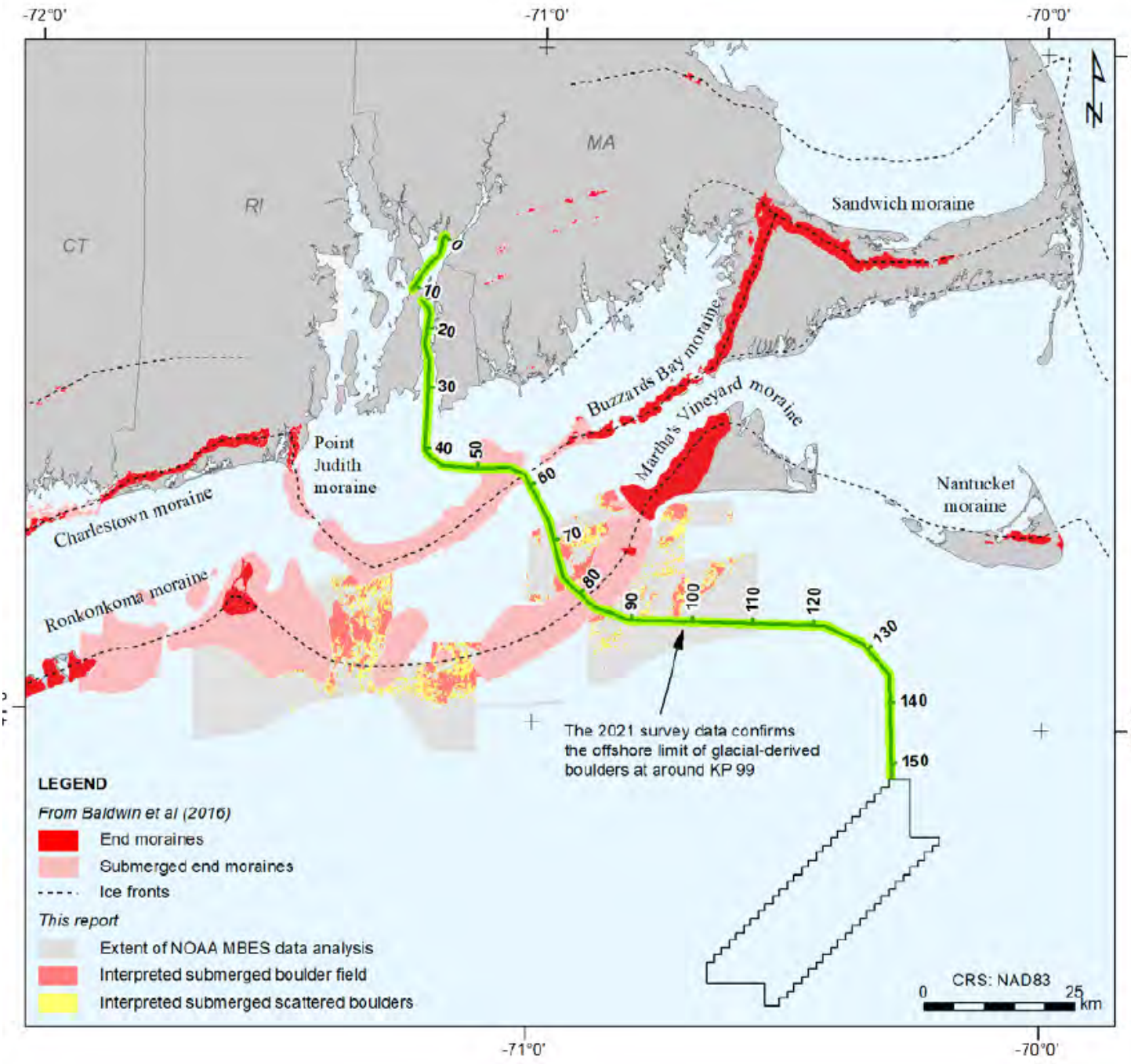

Figure 1: Map of the Brayton Point OECC as shown in figure 3.6 from FUGRO (2022) showing the extent of end moraines, submerged end moraines (Baldwin et al., 2016) and areas of boulder fields and scattered boulders.

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SOUTHCOAST WIND

SouthCoast Wind 1 Project

Attachment X: HISTORIC PROPERTIES TREATMENT PLAN (Confidential)

New: September 2024

SOUTHCOAST WIND

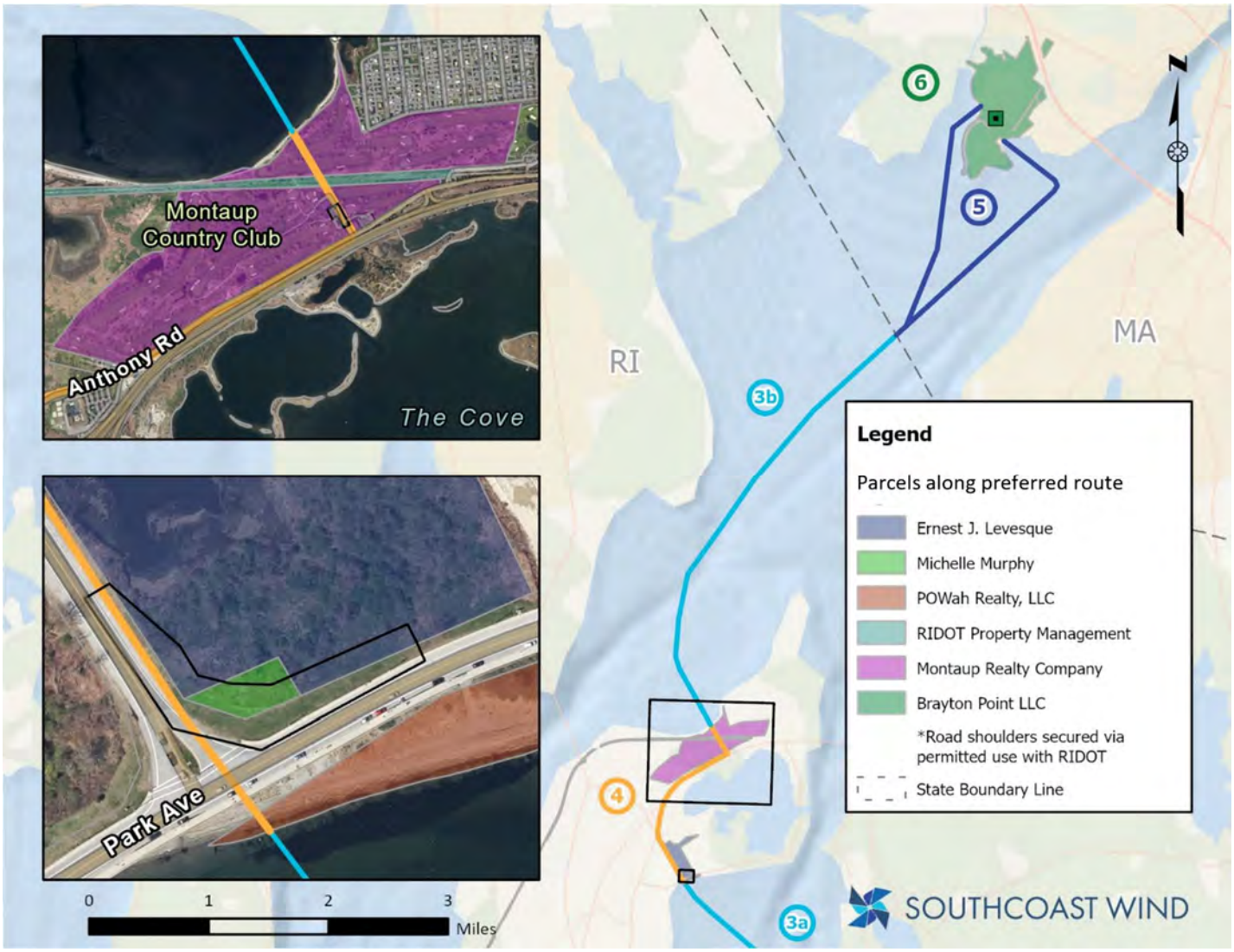
SouthCoast Wind 1 Project

Attachment Y: AQUIDNECK ISLAND NOTICE OF OPTIONS

New: September 2024

SOUTHCOAST WIND

Parcel Map



SOUTHCOAST WIND

Notice of Option

Landowner: Ernest J. Levesque

Parcel: Map 19, Lot 89

Filed Date: April 04, 2024

Bk: 2208 Pg: 327
INST: 00000788

Notice of Option

This Notice of Option Agreement is made as of the 20th day of October, 2023 between Ernest J. Levesque, residing at 15 Water Street, Portsmouth, RI 02871, Thomas Levesque, residing at 59 Greenfield Ave. Portsmouth RI 02871, and Charles J. Levesque, residing at 254 Park Ave, Portsmouth, RI 02781 (collectively, "Owner"), and SouthCoast Wind Energy LLC, a Delaware limited liability company with an address of 101 Federal Street, Suite 1900, Boston, MA 02110 ("SouthCoast").

Background

A. The parties have entered into an Option Agreement (the "**Option**") with an Effective Date of October 20, 2023 (the "Effective Date") for and concerning a utility easement under and through the property identified below (the "**Utility Easement Area**").

B. This Notice of Option is being recorded in the Town of Portsmouth, RI Land Records in order to provide record notice of the existence of the Option.

1. **Utility Easement Area:**

An easement corridor within that certain piece or parcel of land located on Boyds Lane in Portsmouth, RI 02871, also identified as Plat 19 Lot 89 on the Town of Portsmouth Assessors Maps, as more particularly depicted in **Attachment 1**.

2. **Term.** The Term of the Option commenced on the Effective Date and shall continue thereafter for four (4) years.

3. **Addresses**. The parties' addresses are as set forth in the first paragraph hereof.

THIS NOTICE OF OPTION is prepared for recording and for the purpose of making a public record of the Option, and it is intended that the parties shall be subject to all of the provisions of the Option and that nothing herein shall be construed or deemed to alter or change any of the terms or provisions of the Option.

(Signatures appear on following pages)

Bk: 2208 Pg: 328
INST: 00000788

Ernest J. Levesque

Ernest J. Levesque
(Signature)
Date: 10/20/23

State of RI
County of Newport ss.
2023

On this 20th day of October, 2023, before me, the undersigned notary public, personally appeared Ernest J. Levesque, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

Before me,

Denita Rossi
Denita Rossi
Print Name:

Notary Public
Notary Commission Expires:

DENITA M. ROSSI
State of Rhode Island
Notary Public ID # 41025
Commission Expires 05/12/2025

Thomas Levesque

Thomas W Levesque Jr.
(Signature)
Date: 10/20/23

State of RI
County of Newport ss.
2023

On this 20th day of October, 2023, before me, the undersigned notary public, personally appeared Thomas Levesque, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

Before me,

Denita Rossi
Denita Rossi

Print Name:

Notary Public
Notary Commission Expires:

DENITA M. ROSSI
State of Rhode Island
Notary Public ID # 41025
Commission Expires 05/12/2025

Charles J. Levesque

(Signature)
Date: 10/20/2023

State of RI
County of Newport ss.
2023

On this 20th day of October, 2023, before me, the undersigned notary public, personally appeared Charles J. Levesque, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

Before me,

Denita Rossi
Denita Rossi

Print Name:

Notary Public
Notary Commission Expires:

DENITA M. ROSSI
State of Rhode Island
Notary Public ID # 41025
Commission Expires 05/12/2025

SouthCoast Wind Energy LLC

By: Enrique Alvarez
Name: Enrique Álvarez Cordobés
Title: Chief Operating Officer
Date: 3/31/24

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF SUFFOLK, ss.

Bk: 2208 Pg: 330
INST: 00000788

On this 29TH day of March, 2024, before me, the undersigned notary public, personally appeared Enrique Álvarez Cordobés, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

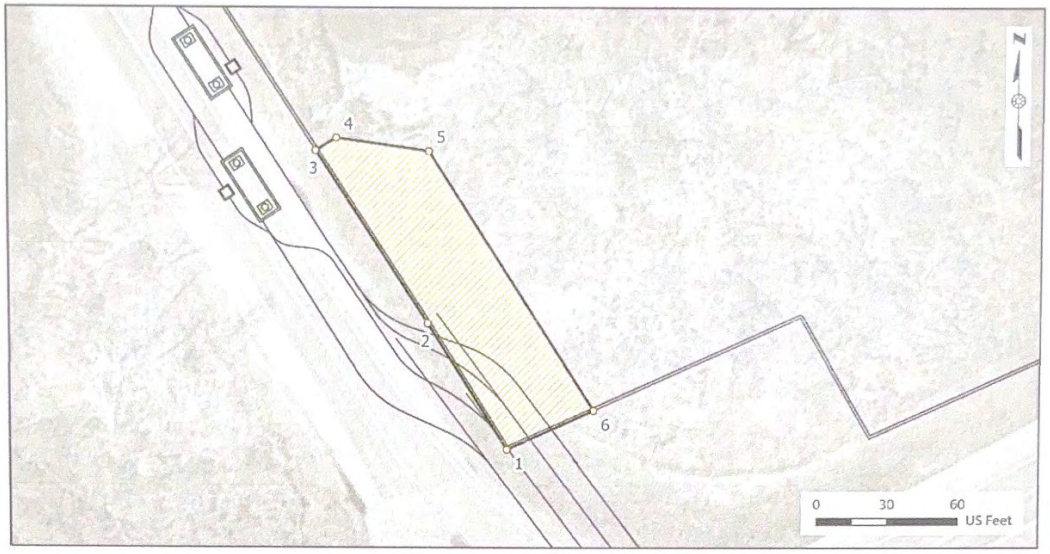
Before me,

Print Name: KATHERINE TURNER
Notary Public
Notary Commission Expires: 1/4/30

KATHERINE TURNER
Notary Public
Massachusetts
My Commission Expires
Jan 4, 2030

Bk: 2208 Pg: 331
INST: 00000788

ATTACHMENT 1 TO NOTICE OF OPTION



EASEMENT EXHIBIT A: UTILITY EASEMENT
Property Description: Levesque

Date: 9/15/2023
Projection: NAD 1983 State Plane Rhode Island (RISP ftUS)
Scale: 1:500

Utility Easement
Easement Coordinate Point
Indicative Cable Route Trajectory
Portsmouth 2021 Tax Parcel Data

Point	Easting (RISP ftUS)	Northing (RISP ftUS)
1	399725.6	196154.5
2	399691.9	196207.4
3	399644.6	196279.1
4	399653.2	196284.3
5	399692.4	196279.0
6	399762.6	196170.9

RECEIVED
PORTSMOUTH, RI
Apr 04,2024 03:04P
JENNIFER M. WEST
TOWN CLERK

SOUTHCOAST WIND

Notice of Option

Landowner: Michelle Murphy

Parcel: Map 25, Lot 1

Filed Date: April 04, 2024

Bk: 2208 Pg: 323
INST: 00000787

Notice of Option Agreement

This Notice of Option Agreement is made as of the 21st day of March, 2024 between Michelle Murphy, with an address of 144 Harbor Road, Swansea, MA 02777 ("Owner"), and SouthCoast Wind Energy, LLC, a Delaware limited liability company with an address of 101 Federal Street, Suite 1900, Boston, MA 02110 ("SouthCoast").

Background

A. The parties have entered into an Amended and Restated Option Agreement (the "Option") with an Effective Date of March 22, 2024 (the "Effective Date") for and concerning a utility easement under and through the property identified below (the "Utility Easement Area").

B. This Notice of Option is being recorded in the Town of Portsmouth, RI Land Records in order to provide record notice of the existence of the Option.

1. **Utility Easement Area:**

An easement corridor within that certain piece or parcel of land located at the intersection of Boyds Lane and Park Ave., Portsmouth, RI 02871, also identified as Plat 25 Lot 1 on the Town of Portsmouth Assessors Maps, as more particularly depicted in **Attachment 1**.

2. **Term.** The Term of the Option commenced on the Effective Date and shall continue thereafter for four (4) years.

3. **Addresses**. The parties' addresses are as set forth in the first paragraph hereof.

THIS NOTICE OF OPTION is prepared for recording and for the purpose of making a public record of the Option, and it is intended that the parties shall be subject to all of the provisions of the Option and that nothing herein shall be construed or deemed to alter or change any of the terms or provisions of the Option.

(Signatures appear on following pages)

Bk: 2208 Pg: 324
INST: 00000787

Michelle Murphy

Michelle Murphy
(Signature)

STATE/COMMONWEALTH OF MA
COUNTY OF BRISTOL ss.

APRIL 1, 2024

On this 1st day of APRIL, 2024, before me, the undersigned notary public, personally appeared Michelle Murphy, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that she signed it voluntarily for its stated purpose.

Before me,

Wendy Allard
Print Name: WENDY ALLARD
Notary Public
Notary Commission Expires: 5/8/2026

WENDY ALLARD
NOTARY PUBLIC
Commonwealth of Massachusetts
My Commission Expires
May 8, 2026

SouthCoast Wind Energy LLC

By: Enrique Alvarez
Name: Enrique Álvarez Cordobés
Title: Chief Operating Officer

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF SUFFOLK, ss. MARCH 27, 2024

On this 27TH day of MARCH, 2024, before me, the undersigned notary public, personally appeared Enrique Álvarez Cordobés, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

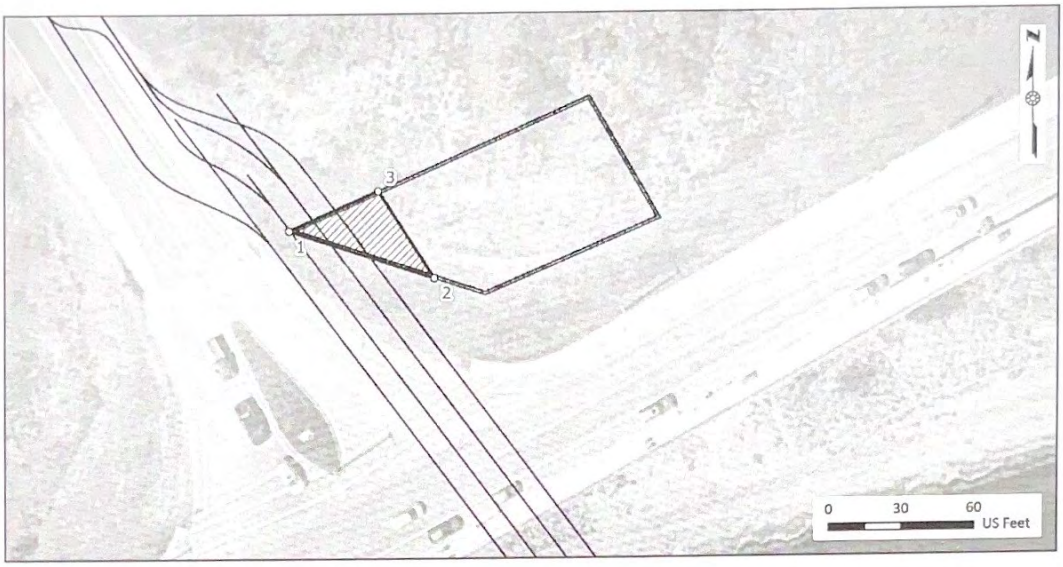
Before me,

Print Name: KATHERINE TURNER
Notary Public
Notary Commission Expires: JAN. 4, 2030

KATHERINE TURNER
Notary Public
Massachusetts
My Commission Expires
Jan 4, 2030

Bk: 2208 Pg: 326
INST: 00000787

ATTACHMENT 1 TO NOTICE OF OPTION



EASEMENT EXHIBIT A: UTILITY EASEMENT
Property Description: Murphy

Date: 9/15/2023
Projection: NAD 1983 State Plane Rhode Island (RISP ftUS)
Scale: 1:500

- Utility Easement
- Easement Coordinate Point
- Indicative Cable Route Trajectory
- Portsmouth 2021 Tax Parcel Data

Point	Easting (RISP ftUS)	Northing (RISP ftUS)
1	399725.6	196154.5
2	399786.0	196135.0
3	399762.6	196170.9

RECEIVED
PORTSMOUTH, RI
Apr 04,2024 03:03P
JENNIFER M. WEST
TOWN CLERK

SOUTHCOAST WIND

Notice of Option

Landowner: POWah Realty, LLC

Parcel: Map 25, Lot 50

Filed Date: April 04, 2024

Bk: 2208 Pg: 319
INST: 00000786

Notice of Option Agreement

This Notice of Option Agreement is made as of the 27th day of March, 2024 between POWah Realty, LLC, with an address of 1446 Wapping Road, Middletown, RI 02842 ("Owner"), and SouthCoast Wind Energy LLC, a Delaware limited liability company with an address of 101 Federal Street, Suite 1900, Boston, MA 02110 ("SouthCoast").

Background

A. The parties have entered into an Option Agreement (the "Option") with an Effective Date of October 20, 2023 (the "Effective Date") for and concerning a utility easement under and through the property identified below (the "Utility Easement Area").

B. This Notice of Option is being recorded in the Town of Portsmouth, RI Land Records in order to provide record notice of the existence of the Option.

1. **Utility Easement Area:**

An easement corridor within that certain piece or parcel of land located at 0 Park Ave, Portsmouth, RI 02871, also identified as Plat 25 Lot 50 on the Town of Portsmouth Assessors Maps, as more particularly depicted in **Attachment 1**.

2. **Term.** The Term of the Option commenced on the Effective Date and shall continue thereafter for four (4) years.

3. **Addresses**. The parties' addresses are as set forth in the first paragraph hereof.

THIS NOTICE OF OPTION is prepared for recording and for the purpose of making a public record of the Option, and it is intended that the parties shall be subject to all of the provisions of the Option and that nothing herein shall be construed or deemed to alter or change any of the terms or provisions of the Option.

(Signatures appear on following pages)

POWah Realty, LLC

By: _____
Name: Andrew Eric Offenberg
Title: Manager

STATE OF RHODE ISLAND
COUNTY OF NEWPORT, ss.

3/27, 2024

On this 27 day of March, 2024, before me, the undersigned notary public, personally appeared Andrew Eric Offenberg, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

Heather L. Cawley
Print Name: Heather L. Cawley
Notary Public
Notary Commission Expires: 12-2-27

Heather L. Cawley
Notary Public - State of Rhode Island
ID #: 59131
My Commission Expires: 12/2/27

SouthCoast Wind Energy LLC

By: Enrique Alvarez
Name: Enrique Álvarez Cordobés
Title: Chief Operating Officer

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF SUFFOLK, ss.

MARCH 27, 2024

On this 27TH day of MARCH, 2024, before me, the undersigned notary public, personally appeared Enrique Álvarez Cordobés, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

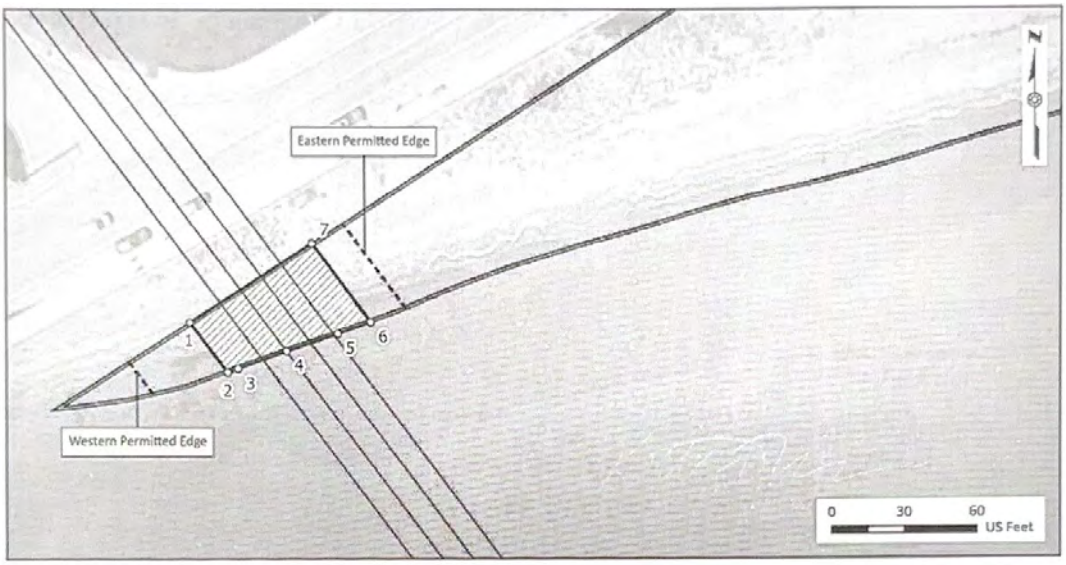
Before me,

Print Name: KATHERINE TURNER
Notary Public
Notary Commission Expires:

KATHERINE TURNER
Notary Public
Massachusetts
My Commission Expires
Jan 4, 2030

Bk: 2208 Pg: 322
INST: 00000786

ATTACHMENT 1 TO NOTICE OF OPTION



NOTICE OF OPTION ATTACHMENT 1: UTILITY EASEMENT AREA
Ownership: POWah REALTY, LLC

Date: 9/26/2023
Projection: NAD 1983 State Plane Rhode Island (RISP ftUS)
Scale: 1:500

- Utility Easement Area
- Easement Coordinate Point
- Indicative Cable Route Trajectory
- Portsmouth 2021 Tax Parcel Data

Point	Easting (RISP ftUS)	Northing (RISP ftUS)
1	399813.8	195997.4
2	399829.3	195976.9
3	399833.6	195978.5
4	399853.8	195985.7
5	399875.0	195993
6	399888.8	195997.7
7	399864.5	196029.8

RECEIVED
PORTSMOUTH, RI
Apr 04,2024 03:02P
JENNIFER M. WEST
TOWN CLERK

SOUTHCOAST WIND

Notice of Option

Landowner: Montaup Realty Company

Parcel: Map 8, Lot 1

Filed Date: April 04, 2024

Notice of Option Agreement

This Notice of Option Agreement is made as of the 25th day of March, 2024 between Montaup Realty Company, a Rhode Island non-profit corporation with an address of 500 Anthony Road, Portsmouth, RI 02871 ("Owner"), and SouthCoast Wind Energy, LLC, a Delaware limited liability company with an address of 101 Federal Street, Suite 1900, Boston, MA 02110 ("SouthCoast"). Montaup Country Club, a RI non-profit corporation with an address of 500 Anthony Road, Portsmouth, RI 02871), executed the Option (as defined below) in its capacity as a tenant of the property in which the Easement Area (as defined below) is located pursuant to a lease agreement with Owner and agreed to be bound by the terms thereof.

Background

A. The parties have entered into an Option Agreement (the "**Option**") with an Effective Date of March 22, 2024 (the "Effective Date") for and concerning an easement over, under and through the property identified below (the "**Easement Area**").

B. This Notice of Option is being recorded in the Registry of Deeds where the Easement Area is located in order to provide record notice of the contents of the Option.

1. **Easement Area**

An easement area within certain property owned by Grantor located at 500 Anthony Road, Portsmouth, RI 02871 (Tax Assessor's Map 8, Lot 1 and Map 4, Lot 292), as more particularly depicted in **Attachment 1**.

2. **Term.** The Term of the Option commenced on the Effective Date and shall continue thereafter for four (4) years.

3. **Addresses**. The parties' addresses are as set forth in the first paragraph hereof.

THIS NOTICE OF OPTION is prepared for recording and for the purpose of making a public record of the Option, and it is intended that the parties shall be subject to all of the provisions of the Option and that nothing herein shall be construed or deemed to alter or change any of the terms or provisions of the Option.

(Signatures appear on following pages)

Montaup Realty Company

By: _____
Name: William Enos
Title: President

STATE OF RHODE ISLAND
COUNTY OF NEWPORT ss. 3/29, 2024

On this 29 day of March, 2024, before me, the undersigned notary public, personally appeared William Enos, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

Before me,

CORT B. CHAPPELL COMM. EXP. 06/01/2025 NOTARY PUBLIC ID# 2870 STATE OF RHODE ISLAND

_____
Print Name: Cort B. Chappell
My Commission Expires: 6/1/25

Bk: 2208 Pg: 334
INST: 00000789

SouthCoast Wind Energy LLC

By: Enrique Álvarez
Name: Enrique Álvarez Cordobés
Title: Chief Operating Officer

COMMONWEALTH OF MASSACHUSETTS
COUNTY OF SUFFOLK ss.

MARCH 27, 2024

On this 27th day of MARCH, 2024, before me, the undersigned notary public, personally appeared Enrique Álvarez Cordobés, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

Before me,

Print Name: KATHERINE TURNER
My Commission Expires:

KATHERINE TURNER
Notary Public
Massachusetts
My Commission Expires
Jan 4, 2030

Montaup Country Club

By: _____
Name: Michael Fonseca
Title: President

STATE OF RHODE ISLAND
COUNTY OF NEWPORT ss. 3-29-, 2024

On this 29th day of March, 2024, before me, the undersigned notary public, personally appeared Michael Fonseca, proved to me through satisfactory evidence of identification to be the person whose name is signed on the preceding document, and acknowledged that he signed it voluntarily for its stated purpose.

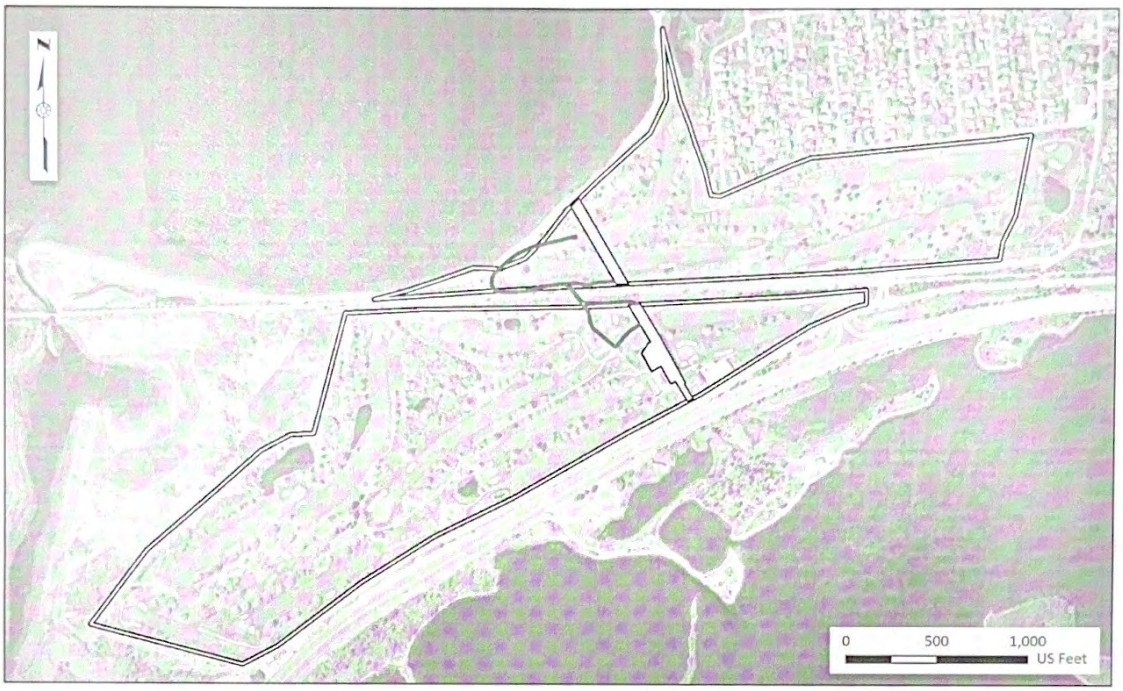
Before me,

_____
Print Name: Deidre Carter
My Commission Expires: 1-4-2027

DEIDRE CARTER
COMM. EXP. 01/04/2027
NOTARY PUBLIC
ID#59681
STATE OF RHODE ISLAND

Bk: 2208 Pg: 336
INST: 00000789

ATTACHMENT 1 TO NOTICE OF OPTION



OPTION EXHIBIT A: PROPERTY DESCRIPTION
Property Description: Montaup Realty Company

Date: 10/16/2023
Projection: NAD 1983 State Plane Rhode Island (RISP ftUS)
Scale: 1:7,000

Montaup Realty Company Property, Portsmouth 2021 Tax Parcel Data
Easement Area
Access Routes

RECEIVED
PORTSMOUTH, RI
Apr 04,2024 03:05P
JENNIFER M. WEST
TOWN CLERK