Appendix C: Project Design Envelope and Maximum-Case Scenario

SouthCoast Wind Energy LLC (SouthCoast Wind) would implement a Project Design Envelope (PDE) concept. This concept allows SouthCoast Wind to define and bracket proposed project characteristics for environmental review and permitting while maintaining a reasonable degree of flexibility for selection and purchase of project components such as wind turbine generators (WTGs), foundations, submarine cables, and offshore substation platforms (OSPs).

The Bureau of Ocean Energy Management (BOEM) invited SouthCoast Wind and other lessees to submit construction and operations plans (COPs) using the PDE concept—providing sufficiently detailed information within a reasonable range of parameters to analyze a "maximum-case scenario" within those parameters for each affected environmental resource. BOEM identified and verified that the maximum-case scenario based on the PDE provided by SouthCoast Wind and analyzed in this Environmental Impact Statement (EIS) could reasonably occur if approved. This approach is intended to provide flexibility for lessees and allow BOEM to analyze environmental impacts in a manner that minimizes the need for subsequent environmental and technical reviews. In addition, the PDE approach may enable BOEM to expedite review by beginning National Environmental Policy Act (NEPA) evaluations of COPs before a lessee has finalized all its design decisions.

This EIS assesses the impacts of the reasonable range of project designs that are described in the SouthCoast Wind COP by using the "maximum-case scenario" process. The maximum-case scenario analyzes the aspects of each design parameter that would result in the greatest impact for each physical, biological, and socioeconomic resource. This Final EIS considers the interrelationship between aspects of the PDE rather than simply viewing each design parameter independently. This EIS also analyzes the planned action impacts of the maximum-case scenario alongside other reasonably foreseeable past, present, and future actions.

Certain resources evaluated in this EIS may have multiple maximum-case scenarios, and the most impactful design parameters may not be the same for all resources. A summary of SouthCoast Wind's PDE parameters is provided in Table C-1. Table C-2 details the full range of maximum-case design parameters for the proposed Project and which parameters are relevant to the analysis for each EIS Section in Chapter 3, *Affected Environment and Environmental Consequences*.

Table C-1. Summary of PDE parameters

Project Parameter Details
General (Layout and Project Size)
• Up to 147 WTGs • Up to 5 OSPs • Up to a total of 149 WTG/OSP positions • 1 nautical mile (nm) x 1 nm (1.9 kilometers x 1.9 kilometers) grid layout with east–west and north–south orientation • Project to be developed in two parts or projects: Project 1 refers to the development in the northern portion of the Lease Area and associated interconnection, and Project 2 refers to the development in the southern portion of the Lease Area and associated interconnection.
Foundations
• Monopile, piled jacket, and/or suction-bucket jacket (maximum 85 suction-bucket jacket foundations for Project 2) • Scour protection for up to all foundations • Seabed penetration up to 262.4 feet (80 meters) depth • Foundation piles would be installed using a pile-driving hammer and/or drilling techniques such as using a hydraulic impact hammer, vibratory hammer, or water jetting
Wind Turbine Generators
• Rotor diameter up to 918.6 feet (280 meters) • Blade length up to 452.8 feet (138 meters) • Hub height up to 605.1 feet (184.4 meters) above mean lower low water (MLLW) • Upper blade tip height up to 1,066.3 feet (325 meters) above MLLW • Lowest blade tip height (air gap) 75.5 feet (23 meters) above highest astronomical tide
Offshore Substation Platforms
• Up to five OSPs • OSPs installed atop a monopile, piled jacket, and/or suction-bucket jacket • OSPs may use high voltage direct current (HVDC) or high voltage alternating current (HVAC) technology • Total OSP structure height up to 344.5 feet (105 meters) above MLLW • Scour protection for all foundations • Maximum length and width of topside structure 360.9 feet by 328.1 feet (110 meters by 100 meters; with ancillary facilities) • Foundation piles to be installed using a pile-driving hammer and/or drilling techniques such as using a hydraulic impact hammer, vibratory hammer, or water jetting. • Each HVDC converter OSP will use less than 10 million gallons per day of once-through non-contact cooling water and a maximum end-of-pipe discharge temperature of 86°F (30°C)
Interarray Cables
• Anticipated burial depth of 3.2 to 8.2 feet (1 to 2.5 meters) • Nominal interarray cable voltage: 60 kilovolt (kV) to 72.5 kV • Maximum interarray cable diameter of 1.24 inches (800 millimeter) • Maximum total interarray cable length is 497.1 miles (800 kilometers) • Preliminary layout available; however, final layout pending • Cable lay, installation, and burial: Activities may involve use of a jetting remotely operated vessel (ROV), mechanical cutting ROV system, plowing (pre-cut and mechanical)

Project Parameter Details
Falmouth Offshore Export Cables [a]
• Up to 5 offshore export cables (4 power cables and 1 communications cable) • Nominal export cable voltage: 200 kV to 345 kV HVAC or ±525 kV HVDC • Maximum total export cable corridor length is 87 miles (140 kilometers) • Maximum export cable length is 434.9 miles (700 kilometers • Anticipated burial depth of 3.2 to 13.1 feet (1 to 4 meters); target burial depth of 6 feet (1.8 meters) • Up to 9 cable / pipeline crossings • Cable lay, installation, and burial: Activities may involve use of a jetting tool (jetting ROV or jetting sled), vertical injection, mechanical cutting ROV system, plowing (pre-cut and mechanical)
Brayton Point Offshore Export Cables
• Up to 6 offshore export cables (2 cable bundles consisting of 2 power cables and 1 communications cable per bundle) • Nominal export cable voltage: ±320 kV HVDC • Maximum total export cable corridor length is 124 miles (200 kilometers) • Maximum export cable length is 744 miles (1,200 kilometers) • Anticipated burial depth of 3.2 to 13.1 feet (1 to 4 meters); target burial depth of 6 feet (1.8 meters) • Up to 16 cable/pipeline crossings • Cable lay, installation, and burial: Activities may involve use of a jetting tool (jetting ROV or jetting sled), vertical injection, mechanical cutting ROV system, plowing (pre-cut and mechanical)
Falmouth Landfall Site [a]
• Three landfall locations under consideration: Worcester Avenue (preferred), Central Park, and Shore Street
Brayton Point Landfall Site
• Two landfall locations under consideration: the western (preferred) and eastern (alternate) shorelines of Brayton Point • Aquidneck Island, Portsmouth, Rhode Island; several locations under consideration for intermediate landfall across the island
Falmouth Onshore Export Cable Corridor[a]
• Up to 12 onshore export cables and up to five communications cables • Nominal underground onshore export cable voltage: 200 kV to 345 kV HVAC • Maximum onshore export cable length is 6.4 statute miles (10.3 kilometers)
Brayton Point Onshore Export Cable Corridor
• Up to 6 onshore export cables and up to two communications cables • Nominal underground onshore export cable voltage: ±320 kV HVDC • Maximum onshore export cable length is 0.7 mile (1.1 kilometer)
Brayton Point Onshore Export Cable Corridor on Aquidneck Island (intermediate landfall)
• Up to 4 onshore export cables and up to two communications cables • Nominal underground onshore export cable voltage: ±320 kV HVDC • Onshore export cable corridor length is 3 miles (4.8 kilometers) across Aquidneck Island

Project Parameter Details
Falmouth Onshore Substation/Interconnection [a]
• Two Falmouth locations under consideration - Lawrence Lynch (preferred) and Cape Cod Aggregates (alternate) • Up to 26 acres (10.5 hectares) permanent area • New 345-kV overhead (preferred) or underground (alternate) transmission line in existing right-of-way up to 2.1 miles (3.4 kilometers) in length • Transmission line to Falmouth point of interconnection would be designed, permitted, and constructed by interconnection transmission owner
Brayton Point Converter Station/Interconnection
• One Brayton Point location under consideration – existing National Grid substation • Up to two new HVDC converter stations • Up to 7.5 acres (3 hectares) permanent area for each converter station • New 345-kV underground transmission route to existing Brayton Point point of interconnection, up to 0.2 mile (0.3 kilometer) on Brayton Point property

[a] To be developed only if Falmouth is the selected point of interconnection for Project 2.

Table C-2. Project design envelope maximum-case scenario per resource

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
WIND FARM																				
Wind Facility Capacity	Up to 2,400 megawatts (MW)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WTG Foundation Arrangement Envelope	1 nm x 1 nm (1.9 kilometers x 1.9 kilometers)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
WIND TURBINES																				
Parameters per Turbine																				
Number of WTG/OSP positions	149 total WTGs and OSPs	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Number of WTGs installed	147 WTGs	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Tip height above mean lower low water (MLLW)	1,066.3 feet (325 meters)			X		X						X	X	X	X	X	X	X	X	X
Hub height above MLLW	605.1 feet (184.4 meters)			X		X						X	X	X	X	X	X	X	X	X
Rotor diameter	918.6 feet (280 meters)			X		X						X	X	X	X	X	X	X	X	X
Blade length	452.8 feet (138 meters)			X		X						X	X	X	X	X	X	X	X	X
Tip clearance above highest astronomical tide	75.5 feet (23 meters)			X		X						X	X	X	X	X	X	X	X	X
PARAMETERS PER WTG FOUNDATION STRUCTURE (COP Volume 1 Table 3-2)																				
WTG Pin-Piled Jacket (COP Volume 1 Table 3-2)																				
Diameter at seabed (seabed centerline diameter)	164.0 feet (50.0 meters)				X			X	X	X		X	X				X		X	
Foundation diameter	14.7 feet (4.5 meters)				X			X	X	X		X	X				X		X	
Footprint diameter across [a]	380.5 feet (116.0 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	4				X			X	X	X		X	X				X			
Depth of penetration below seabed with scour protection	229.6 feet (70.0 meters)				X			X	X	X		X	X						X	
WTG Monopile (COP Volume 1 Table 3-2)																				
Foundation diameter	52.5 feet (16.0 meters)				X			X	X	X		X	X				X		X	
Footprint diameter across [a]	374 feet (114.0 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	1				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	164.0 feet (50.0 meters)				X			X	X	X		X	X				X		X	
WTG Suction Bucket Jacket (COP Volume 1 Table 3-2)																				
Diameter of suction bucket at seabed (seabed centerline diameter)	180.4 feet (55.0 meters)				X			X	X	X		X	X				X		X	
Foundation diameter	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
Footprint diameter across [a]	521.6 feet (159.0 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	4				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	

Design Parameter OFFSHORE SUBSTATIONS	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
PARAMETERS PER OSP FOUNDATION STRUCTURE																				
Topside Offshore Substations																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Height of OSP topside above MLLW	344.5 feet (105 meters)			X	X							X	X				X	X		X
PARAMETERS PER OSP FOUNDATION STRUCTURE (COP Volume 1 Table 3-3) – Option A Modular																				
OSP Monopile (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	52.5 feet (16.0 meters)				X			X	X	X		X	X				X		X	
Footprint diameter at mudline	52.5 feet (16.0 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	1				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	164.0 feet (50.0 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation [a]	2.52 acres (1.02 hectares)				X			X	X	X		X	X				X		X	
OSP Pin-Pile Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	164.0 feet (50.0 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	14.7 feet (4.5 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	Up to 4 foundations and up to 2 piles per foundation				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	229.6 feet (70.0 meters)				X			X	X	X		X	X				X		X	
Distance between adjacent legs at seabed	116 feet (36 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation [a]	2.61 acres (1.05 hectares)				X			X	X	X		X	X				X		X	
OSP Suction-Bucket Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter of suction bucket at seabed (seabed centerline diameter)	180.4 feet (55.0 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	Up to 4 foundations and 1 bucket per foundation				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
Distance between adjacent legs at seabed	65.6 feet (20.0 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation [a]	4.90 acres (1.98 hectares)				X			X	X	X		X	X				X		X	

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
PARAMETERS PER OSP FOUNDATION STRUCTURE (COP Volume 1 Table 3-3) – Option B Integrated																				
OSP Pin-Pile Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	213 feet x 105 feet (65 meters x 32 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	11.7 feet (3.57 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed per substructure	Up to 6 foundations and up to 3 piles per foundation				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	277.2 feet (84.5 meters)				X			X	X	X		X	X				X		X	
Foundation diameter/leg spacing at mean sea level (MSL)	114.8–168.0 feet (35–50 meters				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation [a]	7.54 acres (3.05 hectares)				X			X	X	X		X	X				X		X	
PARAMETERS PER OSP FOUNDATION STRUCTURE (COP Volume 1 Table 3-3) – Option C DC Converter																				
OSP Pin-Pile Jacket (COP Volume 1 Table 3-3)																				
Number of OSPs	Up to 5	X	X	X	X	X		X	X	X		X	X	X	X	X	X	X	X	X
Diameter at seabed (seabed centerline diameter)	279 feet x 197 feet (85 meters x 60 meters)				X			X	X	X		X	X				X		X	
Foundation diameter (pile or bucket diameter at mudline)	12.8 feet (3.9 meters)				X			X	X	X		X	X				X		X	
Number of legs/discrete contact points with seabed	4 foundations and 1 to 4 piles / foundation = 4 to 16 piles				X			X	X	X		X	X				X		X	
Depth of penetration below seabed with scour protection	262.4 feet (80 meters)				X			X	X	X		X	X				X		X	
Total foundation footprint contacting seabed per foundation [a]	9.79 acres (3.96 hectares)				X			X	X	X		X	X				X		X	
PERMANENT SEABED DISTURBANCE (COP Volume 1 Table 3-36; Table 3-37)																				
Monopile WTG Substructures (COP Volume 1 Table 3-37)																				
Total permanent footprint per foundation [a]	2.52 acres (1.02 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 147 WTG foundations [a]	370.44 acres (149.94 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket WTG Substructures (COP Volume 1 Table 3-37)																				
Total permanent footprint per foundation [a]	2.61 acres (1.05 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 147 WTG foundations [a]	383.67 acres (154.35 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket OSP Substructures (COP Volume 1 Table 3-36)																				
Total permanent footprint per OSP foundation [a]	9.8 acres (3.7 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 2 OSP foundations [a]	19.6 acres (7.4 hectares)		X		X			X	X	X		X	X				X		X	

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Suction Bucket Jacket WTG Substructures (COP Volume 1 Table 3-37)																				
Total permanent footprint per foundation [a]	4.90 acres (1.98 hectares)		X		X			X	X	X		X	X				X		X	
Total permanent footprint for 147 WTG foundations (assumes 85 suction-bucket jacket substructures [maximum considered under the Proposed Action] and pin-pile jackets for the remaining 62 WTG positions) [a]	578.32 acres (233.4 hectares)		X		X			X	X	X		X	X				X		X	
TEMPORARY SEABED DISTURBANCE DURING CONSTRUCTION																				
Monopile WTG Substructures (COP Volume 1 Table 3-37; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 147 WTG foundations	73.5 acres (29.4 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket WTG Substructures (Table 3-37; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 147 WTG foundations	73.5 acres (29.4 hectares)		X		X			X	X	X		X	X				X		X	
Pin-Pile Jacket OSP Substructures (COP Volume 1 Table 3-36; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 2 OSP foundations	1.0 acres (0.4 hectare)		X		X			X	X	X		X	X				X		X	
Suction Bucket Jacket WTG Substructures (COP Volume 1 Table 3-37; Table 3-38)																				
Disturbance due to jack-up or anchored vessels per foundation	2.96 acres (1.2 hectares)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint per foundation	0.6 acre (0.3 hectare)		X		X			X	X	X		X	X				X		X	
Total temporary seabed disturbance beyond permanent footprint for 147 WTG foundations (assumes 85 suction-bucket jacket substructures [maximum considered under the Proposed Action] and pin-pile jackets for the remaining 62 WTG positions)	82 acres (37.9 hectares)		X		X			X	X	X		X	X				X		X	
Installation Timeframe																				
Monopile																				
Approximate duration per foundation	4 hours	X	X	X	X	X		X	X	X		X					X		X	
Number of piles driven per day	2	X	X	X	X	X		X	X	X		X					X		X	

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Piled Jacket																				
Approximate duration per foundation	2 hours	X	X	X	X	X		X	X	X		X					X		X	
Number of piles driven per day	8	X	X	X	X	X		X	X	X		X					X		X	
Temporary Seabed Disturbance During WTG Construction (COP Volume 1 Table 3-37; Table 3-38)																				
Area of seabed preparation per foundation monopile	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Area of seabed preparation per foundation pin-pile jacket	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Area of seabed preparation per foundation suction-bucket jacket	0.6 acre (0.3 hectare)		X		X			X	X	X		X	X				X		X	
Area of disturbance per jack-up vessel (vessel spuds including all legs)	0.37 acre (0.15 hectare)		X		X			X	X	X		X	X				X		X	
Number of vessel visits per WTG location	6 to 8	X	X		X			X	X	X		X	X	X	X		X		X	
Temporary Seabed Disturbance During OSP Construction (COP Volume 1 Table 3-36; Table 3-38)																				
Area of seabed preparation per foundation pin-pile jacket	0.5 acre (0.2 hectare)		X		X			X	X	X		X	X				X		X	
Number of vessel visits per OSP location	4	X	X		X			X	X	X		X	X	X	X		X		X	
Temporary Seabed Disturbance During WTG/OSP Construction (COP Volume 1 Table 3-38)																				
Total jack-up vessel spud seabed footprint area (149 WTG/OSP locations)	441.8 acres (178.8 hectares)		X		X			X	X	X		X	X				X		X	
INTERARRAY and EXPORT CABLES																				
Interarray Cable (COP Volume 1 Table 3-12; Table 3-30)																				
Cable diameter	1.24 inches (800 millimeter)		X		X	X		X	X	X		X	X				X	X		
Nominal cable voltage (AC)	72.5 kV				X			X	X	X										
Number of WTGs per interarray cable string	1 to up to 9				X								X	X			X	X		
Seabed preparation (assumes local boulder removal and grapnel run over entire length; sand wave and boulder field clearance is not expected in the Lease Area in preparation for interarray cable installation)	99 acres (40 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable installation (assumed 19.7 feet [6 meters] of surface impact around each cable)	1,186 acres (480 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable protection (assumes mattresses or rock placement at cable crossings and as needed; assumes 10 percent of the interarray cable will require additional protection; a 19.7-foot (6-meter)-wide rock berm would be constructed along these cable sections)	122 acres (50 hectares)		X		X	X						X	X	X			X	X	X	
Total area disturbed	1,408 acres (570 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Interarray cable length	497.1 miles (800 kilometers)	X			X	X		X	X	X		X	X	X			X	X	X	
Target burial depth	8.2 feet (2.5 meters)				X	X		X	X	X		X	X				X	X	X	
Number of cable/pipeline crossings	Up to 10				X													X		

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Offshore Export Cable (COP Volume 1 Table 3-29; Table 3-14) – Falmouth [b]																				
Number of export cables	Up to 5	X	X		X	X		X	X	X		X	X	X		X	X	X	X	
Nominal cable voltage	345 kV (HVAC) ±525 kV (HVDC)				X			X	X	X										
Burial depth	13.1 feet (4 meters)				X	X		X	X	X		X	X				X	X	X	
Export cable diameter (excluding cable protection)	13.8 inches (350.0 millimeters)		X		X	X		X	X	X		X	X				X	X		
Maximum Length of export cable	434.9 miles (700 kilometers)	X	X		X	X		X	X	X		X	X				X	X		
Length of Offshore cable corridor	87.0 miles (140 kilometers)		X		X	X		X	X	X		X	X				X	X		
Export cable corridor width	3,280.8 feet (1,000 meters)		X		X	X		X	X	X		X	X				X	X		
Number of cable/pipeline crossings (COP Volume 1 Table 3-15)	Up to 9				X													X		
Typical separation distance of export cable	328 feet (100 meters)		X		X	X						X	X				X	X		
Seabed preparation (per cable) (assumes suction hopper dredger over 5 percent of route; boulder field clearance 10 percent of route; grapnel run over the entire route)	138 acres (56 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable installation (per cable) (assumes surface impact of 19.7 feet [6 meters] around each cable)	186 acres (75 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable protection (per cable) (an estimated 10 percent of the route will require additional cable protection. It is assumed that a 19.7 foot- (6 meter)-wide rock berm will be constructed)	27 acres (11 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Total seabed disturbance area (per cable)	351 acres (142 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Total seabed disturbance area (5 cables)	1,753 acres (709 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Offshore Export Cable (COP Volume 1 Table 3-29; Table 3-14) – Brayton Point																				
Number of export cable bundles (each bundle consisting of two power cables and one communication cable)	Up to 2	X	X		X	X		X	X	X		X	X	X		X	X	X	X	
Nominal cable voltage (HVDC)	±320 kV				X			X	X	X										
Export cable diameter (excluding cable protection)	6.9 inches (175.0 millimeters)		X		X	X		X	X	X		X	X				X	X		
Burial depth	13.1 feet (4 meters)				X	X		X	X	X		X	X				X	X	X	
Maximum length of export cable	744 miles (1,200 kilometers)	X	X		X	X		X	X	X		X	X				X	X		
Length of Offshore cable corridor	124 miles (200 kilometers)		X		X	X		X	X	X		X	X				X	X		
Export cable corridor width	2,300 feet (700 meters)		X		X	X		X	X	X		X	X				X	X		
Number of cable/pipeline crossings (COP Volume 1 Table 3-15)	Up to 16				X													X		
Typical separation distance of export cable	164 feet (50 meters)		X		X	X						X	X				X	X		
Seabed preparation (per cable bundle) (boulder field clearance 10 percent of route; grapnel run over the entire route)	65 acres (26 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Cable installation (per cable bundle) (assumes surface impact of 19.7 feet [6 meters] around each cable)	242 acres (98 hectares)		X		X	X		X	X	X		X	X	X		X	X			

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Cable protection (per cable bundle) (an estimated 15 percent of the route will require additional cable protection. It is assumed that a 19.7-foot (6-meter)-wide rock berm will be constructed	56 acres (23 hectares)		X		X	X		X	X	X		X	X	X		X	X			
Seabed disturbance area (per cable bundle)	363 acres (147 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Total seabed disturbance area (2 cables bundles)	727 acres (294 hectares)		X		X	X		X	X	X		X	X	X		X	X		X	
Onshore Components Falmouth (COP Volume 1 Table 3-18; Table 3-19; Table 3-34; Table 3-39) [b]																				
Landfall locations	Worcester Avenue; Shore Street; or Central Park		X	X		X	X				X		X	X	X	X			X	X
Landfall transition method	horizontal directional drilling (HDD)		X	X	X	X	X				X		X			X				
Number of sea to shore HDDs	Up to 4		X	X	X	X	X				X		X			X				
Area of disturbance per HDD	0.1 acre (0.04 hectare)		X	X		X	X				X		X			X				
Total area of HDD disturbance	0.4 acre (0.16 hectare)		X	X		X	X				X		X			X				
Onshore substation locations	Lawrence Lynch or Cape Cod Aggregates		X	X		X	X				X		X	X	X	X			X	X
Maximum distance from landfall to substation (Shore Street to Cape Cod Aggregates)	6.4 miles (10.25 kilometers)		X	X		X	X				X		X			X				
Number of Onshore export power cables	3 to 12		X	X		X	X				X		X			X				
Number of Onshore communications cables	1 to 5		X	X		X	X				X		X			X				
Number of Onshore continuity cables	1 to 4		X	X		X	X				X		X			X				
Approximate cable diameter	5.59 inches (142 millimeters)		X	X		X	X				X		X			X				
Nominal cable voltage (HVAC)	345 kV		X	X		X	X				X		X			X				
Transition joint bay (4 transition joint bays)	0.066 acre (0.027 hectare)		X	X		X	X				X		X			X				
Maximum case duct bank (direct buried duct bank arrangement 12 ducts)	10 acres (4 hectares)		X	X		X	X				X		X			X				
Buried splice vault (installed)	0.4 acre (0.2 hectare)		X	X		X	X				X		X			X				
Maximum case landfall construction	0.91 acre (0.37 hectare)		X	X		X	X				X		X			X				
Trench excavation area along duct bank route	12.4 acres (5 hectares)		X	X		X	X				X		X			X				
Splice vault work area (20 locations; 0.5 acre per location)	10 acres (4 hectares)		X	X		X	X				X		X			X				
Onshore substation (HVAC)	26 acres (10.5 hectares)		X	X		X	X				X		X			X				
Alternate Falmouth underground transmission line	18.86 acres (7.6 hectares)		X	X		X	X				X		X			X				
Onshore Components Brayton Point (COP Volume 1 Table 3-18; Table 3-20; Table 3-35; Table 3-39)																				
Landfall locations	East Brayton Point / West Brayton Point		X	X		X	X				X		X	X	X	X			X	X
Landfall transition method	HDD		X	X	X	X	X				X		X			X				
Number of sea to shore HDDs	Up to 12		X	X	X	X	X				X		X			X				

Design Parameter	Maximum Design Parameters	3.4.1 Air Quality	3.4.2 Water Quality	3.5.1 Bats	3.5.2 Benthic Resources	3.5.3 Birds	3.5.4 Coastal Habitat and Fauna	3.5.5 Finfish, Invertebrates, and Essential Fish Habitat	3.5.6 Marine Mammals	3.5.7 Sea Turtles	3.5.8 Wetlands and Other Waters of the United States	3.6.1 Commercial Fisheries and For-Hire Recreational Fishing	3.6.2 Cultural Resources	3.6.3 Demographics, Employment, and Economics	3.6.4 Environmental Justice	3.6.5 Land Use and Coastal Infrastructure	3.6.6 Navigation and Vessel Traffic	3.6.7 Other Uses (Marine Minerals, Military Use, Aviation, Scientific Research, and Surveys)	3.6.8 Recreation and Tourism	3.6.9 Visual Resources
Area of disturbance per HDD	0.3 acre (0.12 hectare)		X	X		X	X				X		X			X				
Total area of HDD disturbance	1.20 acres (0.48 hectare)		X	X		X	X				X		X			X				
Onshore substation location	Existing National Grid Substation		X	X		X	X				X		X	X	X	X			X	X
Maximum length of onshore cable to Brayton Point	3,940 feet (1,200 meters)		X	X		X	X				X		X			X				
Maximum length of onshore cable at intermediate landfall on Aquidneck Island	3 miles (4.8 kilometers)		X	X		X	X				X		X			X				
Maximum distance from landfall to converter stations (Western Landfall Site)	0.6 mile (1.0 kilometers)		X	X		X	X				X		X			X				
Maximum distance from landfall to converter stations (Eastern Landfall Site)	0.7 mile (1.1 kilometers)		X	X		X	X				X		X			X				
Number of Onshore export power cables	1 to 4		X	X		X	X				X		X			X				
Number of Onshore communications cables	1 to 2		X	X		X	X				X		X			X				
Approximate cable diameter	5.9 inches (150 millimeters)		X	X		X	X				X		X			X				
Nominal cable voltage (HVDC)	±320 kV		X	X		X	X				X		X			X				
Maximum case duct bank (split duct bank, 4 power conduits)	1.8 acres (0.7 hectare)		X	X		X	X				X		X			X				
Buried transition joint bays and splice vaults (installed)	0.14 acre (0.06 hectare)		X	X		X	X				X		X			X				
Landfall construction area	3 acres (1.2 hectares)		X	X		X	X				X		X			X				
Trench excavation area along duct bank route (split duct bank installation)	2.7 acres (1.1 hectares)		X	X		X	X				X		X			X				
Buried transition and splice vault work area	0.11 acre (0.05 hectare)		X	X		X	X				X		X			X				
Number of converter stations (HVDC)	Up to 2		X	X		X	X				X		X			X				
Converter station (HVDC) (temporary and permanent impacts)	10 acres each (4.0 hectares)		X	X		X	X				X		X			X				
Alternate Brayton Point underground transmission line	0.2 acre (0.10 hectare)		X	X		X	X				X		X			X				

[a] Footprint includes combined area of foundation, scour protection, and mud mats
[b] To be developed only if Falmouth is the selected point of interconnection for Project 2.